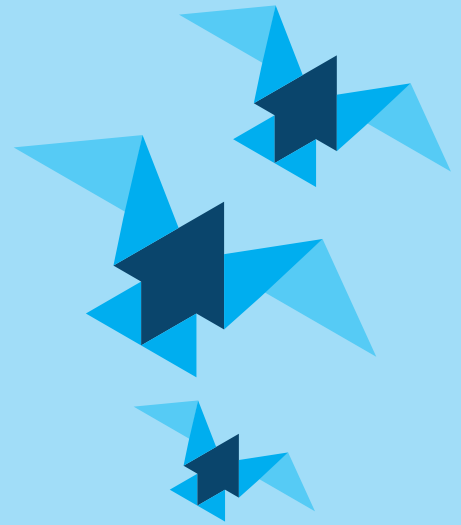




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Reverse Mortgages and Financial Literacy



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Ismael Choinière-Crèvecoeur and Pierre-Carl Michaud

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Reverse Mortgages and Financial Literacy ^{*}

Ismael Choinière-Crèvecoeur[†] Pierre-Carl Michaud[‡]

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Abstract

Few retirees use reverse mortgages. In this paper, we investigate how financial literacy and prior knowledge of the product influence take-up by conducting a stated-preference experiment. We exogenously manipulate characteristics of reverse mortgages to tease out how consumers value them and investigate differences by financial literacy and prior knowledge of reverse mortgages. We find that those with higher financial knowledge are more likely to know about reverse mortgages, not more likely to purchase them at any cost but are more sensitive to the interest rate and the insurance value of these products in terms of the non-negative equity guarantee.

Keywords: reverse mortgages, savings, retirement planning, insurance.

JEL Codes: G53, G21, R21.

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[†]ESG UQAM

[‡]HEC, CIRANO and NBER

1 Introduction

Much attention in the financial literacy literature has been directed to the accumulation phase of the life-cycle (Lusardi and Mitchell, 2014). Financial knowledge is associated with retirement planning and better outcomes in terms of savings. Much less attention has been devoted to the role of financial literacy for decumulation decisions and outcomes. Decumulation is a hard problem as it involves making decisions as to how to spend down savings, insure against risks and manage illiquid assets such as housing.

In fact, housing is a major component of household wealth in retirement. The primary residence accounts for approximately 33% of the median wealth accumulated by Canadian households¹. In retirement, owning a house may provide an important service flow. In addition, home equity may act as an insurance policy against financial risks due to disability risk, since the house is typically sold when individuals enter a nursing home (Davidoff, 2009). Given that housing is to some extent illiquid (at least at the intensive margin), many households are *house rich* and *cash poor*, which limits their capacity of extracting home equity to smooth consumption in retirement.

Borrowing against home equity is feasible using two different products. For those who qualify, home equity lines of credit (HELOC) allow borrowing against equity. HELOC are quite popular among near retirees in Canada. Bedard and Michaud (2021) report that 17.9% of Canadians age 62-66 have a positive HELOC balance compared with 4% in the United States. Americans are much more likely to have a mortgage at these ages. However, borrowing using a HELOC exposes owners to the risk that the loan accumulated will end up being greater than the value of the house. Minimum payments need to be made in retirement. Furthermore, qualification for these loans is restricted among the elderly, because of more stringent income testing.

Reverse mortgages (RMR) have emerged as an alternative solution. A reverse mortgage is

¹<https://www150.statcan.gc.ca/n1/daily-quotidien/171207/dq171207b-eng.htm>

a financial product that allows a homeowner to convert a portion of the current equity of their principal residence into cash. Unlike many other mortgage products, the borrower is not obligated to make payments before moving out, selling or dying. In addition, the borrower is insured against the risk that the loan is worth more than the house when it is sold. This is called the no-negative equity guarantee (NNEG) of the reverse mortgage. This feature means that the borrower's longevity risk, as well as the risk of a decline in house prices, is transferred to the lender. Given that the guarantee is costly, a reverse mortgage will typically command a higher interest rate. In 2017, the rate on a reverse mortgage was roughly 2 percentage point higher than that of a HELOC.

Yet, the market for reverse mortgage purchases is small in many countries. In 2014, only 2.11% of Canadian households reported planning to obtain a reverse mortgage as a source of income upon retirement ([Statistics Canada, 2014](#)). [Nakajima and Telyukova \(2017\)](#) report similar low figures for the United States. Financial literacy may play an important role. The valuation of these products for consumers is complicated. While the consumption smoothing value will be intuitive to many, the distinct feature of reverse mortgages, the insurance value of the NNEG, is likely more difficult to grasp and compute. It involves projecting house prices in the future, survival risk and other considerations such as when one expects to sell the house. Consumers with limited financial literacy may have a harder time making sense of the price and value of the products offered. For example, if consumers value predominantly the NNEG, those who expect negative price growth for their house should favor reverse mortgages over HELOCs because the NNEG is larger in those cases. [Davidoff and Wetzel \(2014\)](#) show that consumers appear to fail to take advantage of this feature of the product when house prices are declining. This paper aims to understand the interplay between financial literacy and the valuation of reverse mortgage products.

In situations where the take-up of a financial product is low and data scarce at the micro level, an experimental approach is well-suited to learn about preferences and how they interact

with knowledge.² In the case of reverse mortgages, [Davidoff, Gerhard, and Post \(2017\)](#) conducts a survey to learn about what consumers know about reverse mortgages. They find relatively high basic awareness of reverse mortgages but poor understanding of actual provisions of reverse mortgages. They also find that while product knowledge is positively associated with demand, general financial literacy is associated with lower demand, a finding similar to [Fornero, Rossi, and Urzi Brancati \(2016\)](#) in the Italian context. To understand how consumers value reverse mortgages, we conduct a stated-choice experiment in which respondents were asked to evaluate various reverse mortgage products. We investigate how financial literacy as well as prior knowledge of reverse mortgages shape the evaluation of reverse mortgage products, in particular the actuarial value of the NNEG and the interest rate charged on the product.

We find that more than half of eligible Canadians (55.48%) lack the basic fundamental knowledge of reverse mortgages prior to participating in our stated-preference experiment. Knowledge of reverse mortgages is positively associated with higher financial literacy as well as having high income and assets. Second, we estimate that consumers are price sensitive to the interest rate charged on reverse mortgages. Importantly, price sensitivity is larger for those with higher financial literacy while the elasticity is lower and statistically insignificant among those with low financial literacy. Third, only financially literate consumers are sensitive to the actuarial value of the NNEG in these scenarios. Consistent with a poor understanding of the NNEG and a stronger weight put on the consumption smoothing possibilities of reverse mortgages, consumers who expect the lowest house price growth are less willing to purchase a reverse mortgage than those who expect prices to increase.

²Several recent papers demonstrate the usefulness of such an approach. [Ameriks, Briggs, Caplin, Shapiro, and Tonetti \(2020\)](#) use an experimental approach to learn about preferences regarding end-of-life savings and long-term care. [Brown, Kapteyn, Luttmer, and Mitchell \(2017\)](#) use an experiment to learn about the valuation of annuities. [Boyer, De Donder, Fluet, Leroux, and Michaud \(2020\)](#) use a stated-preference approach to learn about demand for long-term care insurance and highlight the importance of product knowledge. [Boyer, Box-Couillard, and Michaud \(2020\)](#) use a similar approach to learn how consumers value life annuities in Canada whereas [Boyer, d'Astous, and Michaud \(2022\)](#) investigate how financial education helps consumers make better use of tax-sheltered savings accounts.

The paper is organized as follows. In section 2 we present the main type of reverse mortgage product offered to Canadians and discuss the theoretical foundations for the valuation of reverse mortgages. In section 3, we present survey evidence on knowledge of reverse mortgages. In section 4 we present the experiment and how we compute the actuarial value of the non-negative equity guarantee (NNEG) for each respondent and scenario. In Section 5 we analyze how respondents value reverse mortgages in the experiment, while section 6 concludes.

2 A Primer on Reverse Mortgages

2.1 The Canadian Home Income Plan

Canadians have access to reverse mortgage products through the Canadian Home Income Plan (CHIP) offered by *HomeEquity Bank*. This program was first offered in the Vancouver area in 1986, and then in Ontario and Alberta starting in 2001. In the following years, the program was gradually offered across the country. In order to be eligible to the program, the borrower must be a Canadian citizen and at least 55 years old. In addition, he or she must be the owner of their own residence. Only primary residences are eligible. The initial loan must be at least \$25,000.

The program allows the borrower to remain the owner of the residence, as long as certain conditions are met. These conditions are that the residence must be kept in good condition, property taxes paid and the property must be insured. Eligibility is dependent on a good record in terms of mortgage re-payment. If there is an existing mortgage on the property at the time of initiation, the mortgage must be paid off first with the proceeds from the reverse mortgage.

The CHIP program provides a NNEG, which means that it guarantees that the amount to be repaid will never exceed the fair market value of the property at the time of sale. Once a loan-to-value limit for the reverse mortgage has been set, the homeowner has several options to choose

from in order to receive the funds. They can receive 100% of the funds allowed in one lump sum. They can also initially receive a fraction of the funds granted, in the form of an initial lump sum of \$25,000, with subsequent advances. This line of credit option is similar to the Home Equity Conversion Mortgage (HECM) offered in the United States.

There are administrative fees charged to the borrower. First, CHIP charges a closing and administrative fee of \$1,495, which includes security lookup, title insurance and registration. Fees ranging from \$175 to \$400 are added for an assessment of the property. Finally, a fee between \$300 and \$500 is charged for independent legal advice.

In 2017, year when we ran our survey and experiment, the CHIP program allowed the borrower to borrow between 10% and 55% of the estimated equity of the residence. Most conditions have not changed since then. The loan-to-value depends on the borrower's age, sex and marital status. It also depends on the type of residence and its geographical location. Table 1 provides an example of loan-to-value limits for a single-family dwelling by a single woman between 55 and 75 years old, in the cities of Montreal, Toronto and Vancouver, in 2017.

In order to reduce the losses related to the NNEG, the loan-to-value is lower for younger borrowers. It is also lower for women, since they have a higher life expectancy than men. When compared with single individuals, couples can borrow less since the joint probability of survival is taken into consideration. Finally, according to the type of dwelling and its location, a higher loan is allowed for those for which a higher price growth and a lower price volatility are expected. These reverse mortgages were offered at an interest rate of 5.59% (in 2017) which is above the rate charged on Home equity lines of credit (4% at the time). Contrary to the United States, these reverse mortgages are not federally insured.³

Table 1 here

³In the United States, the Federal Housing Administration (FHA) provides that insurance.

2.2 The Value of Reverse Mortgages

How should households evaluate reverse mortgages? Their value derives from two distinct sources. The first one is the possibility of shifting consumption earlier when an illiquid asset cannot be sold earlier. This first component is not unique to reverse mortgages. One can also shift consumption earlier by extracting home equity using HELOCs. The second source, which is unique to reverse mortgages, is the insurance against the downside risk that the value of the house falls below the value of the loan at the time the house is sold. Hence, a household may be willing to pay a premium on the interest rate charged for a reverse mortgage due to the NNEG.

The impact of illiquid housing wealth on the desire to borrow from home equity was first studied by [Artle and Varaiya \(1978\)](#). Consumers may value borrowing from home equity in retirement because they are liquidity constrained. The presence of this illiquid asset endogenously creates these constraints. Consider a household deriving a utility flow from living in their home. While healthy, the household wants to stay in their home. The house value could be expected to appreciate in retirement. Assume the house will only be sold near death, potentially when sickness occurs. These are states of the world where the marginal utility of consumption could be low, in particular in Canada where out-of-pocket medical expenditures in the case of sickness (nursing homes) is not as large as in other countries, such as the United States ([Boyer, De Donder, Fluet, Leroux, and Michaud, 2020](#)). If that is true, the consumption smoothing motive could be strong and push households to extract home equity earlier in retirement while the marginal utility of consumption is higher. This is the consumption smoothing motive for borrowing against home equity. This should be relevant for those with low levels of liquid assets (relative to income) and with substantial home equity or home equity which is expected to grow fast in retirement.

The second source of value from reverse mortgages is the NNEG. Borrowing a substantial portion of home equity in a HELOC would be risky for the household and their heirs. Since house

prices fluctuate substantially, in particular at longer horizons, the loan value at the time the house is disposed off could be larger than the value of the house. Either the consumer or his/her heirs, would be liable to repay the financial institution who granted a HELOC. A reverse mortgages allows to transfer this risk to the financial institution offering the loan. Hence, from the point of view of the financial institution, a reverse mortgage is more risky than a regular HELOC since it cannot recuperate some portion of the loan if house prices fall substantially. Therefore, a mortgage insurance premium must be charged to cover the losses associated with this risk. The actuarial value of the NNEG is a function of various risks including longevity risk and house prices. The higher the likelihood that someone lives longer in their house, the higher the likelihood that the value of their loan exceeds the value of their house. Similarly, drops in house prices increase the likelihood that loans exceed the value of house. Hence, someone who expects house prices to decline, or appreciate more slowly, should perceive a higher value from a reverse mortgage over a HELOC. With growing degree of sophistication in the modeling of risks, there is a substantial literature which evaluate the non-negative equity guarantee for various reverse mortgage products (Li et al., 2010; Cho et al., 2015; Alai et al., 2014; Shao et al., 2015). Davidoff (2015) estimates that the value of the NNEG embodied in products offered in the U.S. can be large, in particular when idiosyncratic house price risk is taken into account. Hence, the value of the NNEG could be non-trivial.

Both motives for borrowing out of home equity suggest a different relationship between the value of reverse mortgages and expected house price growth. They also suggest that the value of reverse mortgages should vary according to a number of other characteristics of borrowers. Putting the two motives together, there has few been attempts to evaluate the value of reverse mortgages to households using a well-defined life-cycle framework. For example, Nakajima and Telyukova (2017) estimates using a life-cycle model that the value of a reverse mortgage to households in the U.S. is relatively modest, at 252\$ per homeowners and 1770\$ per reverse mortgage borrower.

They attribute this low demand to bequest motive, uncertainty about health and high cost. [Cocco and Lopes \(2019\)](#) also estimate relatively low value of existing products which they attribute to the requirement of having to maintain the house when contracting a reverse mortgage and to other design features of the product. There is substantial uncertainty around the value of reverse mortgages to retirees.

3 Survey Evidence: Knowledge of Reverse Mortgages

3.1 The Survey

In 2017, we conducted a survey experiment with *Asking Canadians*, an online panel provider in Canada. Respondents were aged 55 to 75 and lived in the provinces of Quebec, Ontario or British Columbia. In each province, 50% of respondents came from major census metropolitan areas (CMA), while the rest came from outside the CMA. We focus on those 55 to 75 because this is an age group where reverse mortgages are likely to be most relevant. Because the value of reverse mortgages is tightly linked to house prices, we focus on provinces in which house price growth has been steady over the last decades. This increases the likelihood that respondents have substantial home equity.

The questionnaire consists of five parts. First, we collect socio-economic, demographic and health information from respondents. A second section is on preferences, risk perception and expectations for the future. A third section measures respondents' level of financial literacy and knowledge of probabilities. A fourth section asks respondents about their general knowledge about reverse mortgages. Finally, the last section consists of a stated-choice experiment, where respondents were offered different reverse-mortgage products and had to evaluate them by giving their probability of buying each of these financial products within the next year. A copy of the ques-

tionnaire can be found in the Online Appendix.⁴ Because the resulting sample is slightly more educated than the general population, we created a set of weights based on the Canadian Community Health Survey (CCHS) for the year 2010. We construct weights based on age group (5-year), gender, province and education (3 levels).

Of the 3,000 Canadians surveyed, 2,399 reported owning a home. A total of 2,306 respondents had enough home equity to borrow from a reverse mortgage. Of these respondents, 2,163 were single or had a spouse aged 55 or older, making them eligible for the CHIP program. Finally, 2,140 respondents did not have any missing information and therefore were included in the analysis. Descriptive statistics on those respondents is reported in Table 2.

Respondents are 63.4 years old on average, and half of them are male. Around 20% of them are from British Columbia, 30% from Quebec and 50% from Ontario. Nearly three quarters (75.5%) of them are married or in a common-law relationship and 76.5% reported having at least one living child. Close to two thirds (66%) of respondents consider themselves retired. More than half (56.1%) of the sample have an employer pension plan or receive income from one. On average, their annual household income is \$88,544 and they have average total non-housing savings of \$265,681.⁵ The average current market value of their home is \$570,049. Slightly more than a third of respondents (34.1%) still have a mortgage on their primary residence. The median equity value of their residence is around \$520,000. To define a group who is house rich and cash poor, we borrow from the definition of wealthy hand-to-mouth households proposed by Kaplan et al. (2014). They define wealthy hand-to-mouth consumers as those with positive home equity but liquid assets less than half of total income. To capture the *house-rich* aspect of the definition we are after, we tighten the criterion on home equity and use a threshold of 3 times total income instead of zero home equity.

⁴The survey also included a stated-choice experiment for annuities. This experiment was analyzed in Boyer, Box-Couillard, and Michaud (2020).

⁵To prevent the effect of outliers, we imposed a maximum annual household income of \$500,000 and maximum total savings of \$5,000,000

Respondents who have home equity larger than three times their income but liquid assets (savings) less than half their total income are defined as house rich and cash-poor. In the sample, 9.2% of respondents qualify as house rich - cash poor.

In terms of preferences, we keep two variables for our analysis: one which is a proxy for the presence of a bequest motive and the other to proxy attachment to the house. On a 5-point Likert scale, respondents were asked if they agreed with the following statement: *Parents should set aside money to leave to their children or heirs once they die, even when it means somewhat sacrificing their own comfort in retirement.* We recoded those who agree or strongly agree as showing preferences consistent with a bequest motive (or bequest norm). In the sample, 17.8% of respondents were classified using this statement as having a stronger bequest motive. We also use the response to the statement: *A house is an asset that should only be sold in the case of financial hardship* to characterize a respondent's preference or norm for staying in the home. In the sample, 44% agreed or strongly agreed with the statement.

We asked respondents a series of three questions to assess their level of financial literacy following [Lusardi and Mitchell \(2007\)](#). The first question is on interest rates, the second on purchasing power and the third on risk diversification. We create a binary indicator taking value 1 if the respondent correctly answers all three questions and zero if not. Overall, 54.1% of respondents correctly answer all three questions. Another question asks the respondent about survival probabilities. Respondents are told the probability of surviving to 85 is 60% and asked whether the probability of surviving to 60 is larger, or smaller than 60%. We create a binary indicator if the respondent correctly answers this question. 84.6% of respondents correctly answered this question.

Insert Table 2 here

3.2 Prior Knowledge of RMR

Respondents were asked a sequence of questions with the objective of measuring their level of prior knowledge of reverse mortgages.

Without naming the financial product, we first presented a sentence containing the definition of a reverse mortgage to the respondents⁶. Then, respondents were asked if they had ever heard of this financial product. As shown in Table 3, 77.3% of eligible Canadian homeowners claimed to have heard of that kind of financial product. Fewer homeowners from Quebec answered having heard this definition, a difference of nearly 20 percentage points with the two other provinces.

Then, we asked those who claimed to have heard of this financial product if they could name it. 59.5% of these homeowners claimed to be able to name the product in question. Once again, there was a noticeable difference between provinces. Fewer homeowners from Quebec who had heard of this financial product claimed to be able to name it, a difference of 15 percentage points with the two other provinces.

Finally, those who claimed to be able to name the product were asked to identify it from a list of financial product names. 96.8% of them answered correctly. Once again, fewer homeowners from Quebec answered this question correctly. Overall, 44.52% of all homeowners had heard of the existence and correctly identified the reverse mortgage as the name of that financial product. Moreover, the level of knowledge was twice as big among homeowners in Ontario and British Columbia than it was in homeowners in Quebec. One plausible explanation for this phenomenon is that the CHIP program has been offered longer in Ontario and British Columbia than in the province of Quebec.

Insert Table 3 here

⁶The definition was presented as follows: "Imagine a financial product that lets you turn part of your current home equity into cash. You're not obligated to make any payments until you move, you sell your home, or you die. You have the certainty that once your residence is sold, the required amount to repay the loan will not exceed the selling price of the residence."

To understand how prior knowledge of the product is distributed, we estimate a logit regression with as a dependent variable an indicator for whether or not respondents were able to identify the product (answer all three questions and named the product correctly as a reverse mortgage). We include as controls an indicator for financial literacy, for understanding survival probabilities, socio-demographic characteristics and controls for economic resources. In Table 4, we report estimates of marginal effects along with standard errors.

Insert Table 4 here

We find that those with higher levels of financial literacy have a substantially higher probability of knowing what a reverse mortgage is. Even after controlling for a host of factors, there is a 12.2 percentage point difference in knowledge of reverse mortgages between those with and those without financial literacy. There is also a substantial difference between those who understand of survival probabilities and those who don't. In terms of other correlates, males are more likely to know reverse mortgages. Those with kids are less likely to know about reverse mortgages. In terms of income, those with the lowest level of income (bottom quartile) are less likely to know about reverse mortgages. Those in the 2nd and 3rd quartile of home equity are more likely to know about reverse mortgages (these effects are relative to the 4th quartile). Quite the opposite, those in lowest quartiles of liquid savings are less likely to know about reverse mortgages. Respondents with existing mortgages are more likely to know about reverse mortgages. Interestingly, we do not find that those who are house rich and cash-poor are more likely to know about the existence of reverse mortgages. In terms of economic resources, those who appear to know about reverse mortgages do not exactly fit the profile of house-rich and cash-poor households. However, they are more financially literate.

4 Stated-Preference Experiment

For each of the respondents in our sample, we present five different reverse mortgage scenarios. We focus on lump-sum reverse mortgage loans to simplify the description of reverse mortgages and avoid having to specify the path of interest rates, etc. These are simpler products than those offered in the market. In the scenarios, we vary interest rates offered and loan-to-value that can be borrowed. We reproduce below the introductory text presented to the respondents. ⁷

We will refer to a reverse mortgage as a financial product that lets you turn part of your current home equity into cash. Unlike many mortgage-based financial products, you're not obligated to make any payments until you move, you sell your home, or you die. Importantly, you have the certainty that once your residence will be sold, the amount required to repay the loan will not exceed the selling price of the residence. When we use the expression "current home equity", we are referring to the current market value of your primary residence after subtracting outstanding mortgage balances. For the rest of this section, try to have your current home equity in mind. We are going to show you some simple reverse mortgage products and ask you to rate them. Each reverse mortgage has three attributes:

- 1. The percentage of your current home equity that you can borrow. The amount borrowed must be a minimum of \$25,000.*
- 2. A fixed annual interest rate on the balance of the loan, generating interests that you do not need to pay before you move, sell or die.*
- 3. A fixed fee of \$2,245 that you only have to pay once. The money you obtain from the reverse mortgage will be used to pay this fee.*

We then presented the scenarios as follows:

- 1. You can borrow a minimum of \$25,000 and up to $\beta\%$ of your current home equity.*
- 2. You will be charged a fixed annual interest rate of $r\%$ on the balance of the loan for as long as you hold the loan.*
Reminder: You're not obligated to make any payments until you move, you sell your home, or you die; and you have the certainty that once your residence will be sold, the amount required to repay the loan will not exceed the selling price of the residence.
- 3. There is a fixed fee of \$2,245 that you only have to pay once. The money you obtain from the reverse mortgage will be used to pay this fee.*

⁷A French version was presented to the respondents who chose to answer the questionnaire in French.

For each individual i and scenario j , we exogenously propose an interest rate, $r_{i,j}$, which can take the values in the range

$$r_{i,j} = [3.8\%, 4.1\%, 4.4\%, 4.7\%, 5\%, 5.3\%, 5.59\%, 6\%, 6.5\%, 7\%],$$

each with probability 1/10.

Therefore, the randomization is done around the interest rate of 5.59% proposed by CHIP for a 5-year term at the moment when the survey was conducted. For each individual i and scenario j , a loan-to-value $\beta_{i,j}$ that can be borrowed is shown. We denote the maximum loan-to-value that can be borrowed by the individual i from CHIP as β_i^{CHIP} . We have information on the CHIP's average maximum loan-to-value, by 5-year age group⁸, gender, marital status (single or couple), and residence location (inside or outside the metropolitan area)⁹. These values come from the CHIP calculator that can be found on their website¹⁰ and are presented at the end of the Online Appendix. To randomize the loan-to-value around β_i^{CHIP} , we draw a value, $\tau_{i,j}$,

$$\tau_{i,j} = [0.5, 0.75, 1, 1.25, 1.5], \text{ each with probability of } 1/5.$$

The loan-to-value proposed in the scenario j of the respondent i will therefore be $\beta_{i,j} = \tau_{i,j}\beta_i^{CHIP}$.

Following Manski (1999) we ask the respondent to report the probability, from 0% to 100%, that they would buy this reverse mortgage if a trusted financial institution offered it within the next year. This provides a continuous measure of preference intensity in the form of a probability and accounts for incompleteness of the hypothetical choice situations presented.

⁸For couples, we used the average age of the couple, $\frac{age_R + age_S}{2}$, where age_R is the age of the respondent and age_S is the age of the spouse as reported in the survey. We rounded the result to the nearest integer and set the age at 79 when $\frac{age_R + age_S}{2} > 79$.

⁹To identify the residence location, we asked respondents to give us the first three digit of their postal code. This information allowed us to identify the respondents who were or were not part of the main census metropolitan area of their respective province (Montreal, Toronto and Vancouver).

¹⁰<https://www.chipadvisor.ca/calculator/>

4.1 Computing the Actuarial Value of the NNEG

To compute the actuarial value of each of the contracts offered to respondents, we consider a simple pricing framework. Reverse mortgage pricing models can be extremely sophisticated and account for a number of elements including stochastic discount factors, yield curve modeling and endogenous termination probabilities (see for example [Shao et al., 2015](#)). Since we are interested in the cross-sectional and cross-scenario variation in the actuarial value of the contracts we presented, we will pay more attention to the variation induced across respondents and scenarios than the absolute level of the actuarial value of the NNEG in terms of a mortgage insurance premium. Another important distinction with other pricing models is that we aim to measure the perceived value of the NNEG rather than the actual NNEG. Hence, we will use subjective mortality risk instead of life-table risk.

We compute fair mortgage insurance premiums to cover losses related to the non-negative equity guarantee. Let $\gamma_{i,j}$ be the loan-to-value ratio of the equity of the house with (net equity) value $H_{i,a}$, borrowed by an individual i of age a in scenario j . The initial value of the loan, $L_{a,i,j}$, is then given by $L_{a,i,j} = \gamma_{i,j}H_{i,a}$. The value of the loan at $a + t$ is given by

$$L_{a+t,i,j} = L_{a,i,j}(1 + r_{LC} + \pi_{i,j})^t, \quad (1)$$

where r_{LC} represents the (fixed) interest rate for a home equity line of credit (HELOC), $\pi_{i,j}$ represents a fair mortgage insurance premium to cover losses related to the NNEG in scenario j , and let $r_{i,j}^* = r_{LC} + \pi_{i,j}$ represents the (fair) interest rate for the reverse mortgage. Let $H_{i,a+t}$ be the resale value of the house if the borrower leaves or dies after t years (at age $a + t$). The NNEG ensures that the amount recovered by the lender at the time of the sale of the house is

$$\min\{L_{a+t,i,j}, (1-c)H_{i,a+t}\}, \quad (2)$$

where c is a transaction cost calibrated at 5% of the selling price ¹¹ of the selling price. The potential loss by the lender at the time of selling the house is then defined as

$$\max\{L_{a+t,i,j} - (1-c)H_{i,a+t}, 0\}. \quad (3)$$

The expected present value of future losses related to the NNEG is given by

$$\text{NNEG}(\pi_{i,j}) = E_H \left(\sum_{t=1}^T q_{i,a,a+t} \frac{\max(L_{a+t,i,j} - (1-c)H_{i,a+t}, 0)}{(1+i)^t} \right), \quad (4)$$

where i is a discount rate based calibrated to 4% and $q_{i,a,a+t}$ is the conditional probability of dying at age $a+t$ for someone of age a at $t=0$. These probabilities are respondent specific. Finally, E_H is the expectation operator for the distribution of future house prices which depends on the region of the country and the type of dwelling. For the lender, the expected present value of the accumulated mortgage insurance premiums paid is given by

$$\text{MIP}(\pi_{i,j}) = \pi_{i,j} E_H \left(\sum_{t=1}^T s_{i,a,a+t} \frac{L_{a+t,i,j}}{(1+i)^t} \right), \quad (5)$$

where $s_{i,a,a+t}$ is the conditional probability to survive at age $a+t$ for someone aged a at $t=0$.

¹¹According to Sun Life Financial, the transaction costs in Canada are between 3% and 7%.

Finally, the actuarial fair mortgage insurance premium $\pi_{i,j}$ is such as

$$\text{NNEG}(\pi_{i,j}) = \text{MIP}(\pi_{i,j}). \quad (6)$$

The mortgage insurance premium $\pi_{i,j}$ is the actuarial value of the NNEG guarantee for the risk profile of the respondent. The fair rate on the reverse mortgage is $r_{i,j}^* = r_{LC} + \pi_{i,j}$. To compute the value of the NNEG for each respondent and scenario, we need estimates of house price dynamics as well as survival probabilities.

We first set the interest rate of a home equity line of credit r_{LC} at 4%, which is the average rate that was offered on the Canadian market in 2017¹². We set the maximum loan-to-values offered by CHIP as reported in the Table 1 but use the loan-to-value offered in each scenario using the randomization. We also use a constant discount rate of 4% (i) in the computations.

4.1.1 House Price Dynamics

We calibrate house price dynamics using the MLS Home Price Index from the Canadian Real Estate Association (CREA), which provides information on housing prices in the major Census Metropolitan Areas (CMA) in Canada. This data set provides information regarding the average price of all types of dwellings, as well as the average price per type of dwelling, namely single-family dwellings, townhouses and condos. We used monthly data from January 2005 to August 2016 for the cities of Vancouver, Toronto and Montreal. Figure 1 presents the evolution of the composite price index between 2005 and 2018 for all of Canada, as well as for the cities of Vancouver, Toronto and Montreal. We see that Vancouver and Toronto are the cities that have had the most substantial growth, with an average annual growth of 6% and 6.8%, respectively, while the city of

¹²<https://www.ratehub.ca>

Montreal experienced an average annual growth of 3.7%. The cities of Vancouver and Toronto also demonstrate having higher variability in prices when compared to the city of Montreal. We drop the last two years (2017 and 2018) since the survey was conducted in 2017.

Insert Figure 1 here

We estimate parameters of the house price dynamic using an AR(1) with a deterministic trend

$$\log H_{h,p,m} = \delta_{h,p}m + \epsilon_{h,p,m} \quad (7)$$

$$\epsilon_{h,p,m} = \rho_{h,p}\epsilon_{h,p,m-1} + \eta_{h,p,m}, \quad (8)$$

where $H_{h,p,m}$ is the average house price of type h , in the city p in the month m , $\delta_{h,p}$ is the deterministic trend and $\eta_{h,p,m}$ is an idiosyncratic error term which is assumed normally distributed with an average of zero and a variance of $\sigma_{h,p}^2$. Table 5 reports estimates by type of dwelling for the cities of Vancouver, Toronto and Montreal. In each specification, the coefficient of the deterministic trend and the auto-correlation coefficient are significant at a level of 1%. House prices exhibit behaviour similar to a random walk with some degree of mean-reversion. These estimates were used to calibrate the house price risk in the provinces of Quebec (Montreal), Ontario (Toronto) and British Columbia (Vancouver). While the dynamics in house prices evolve at the monthly level, they are aggregated in simulations at the annual level (when survival and other outcomes are computed).

Insert Table 5 here

Using an aggregate house price index to estimate the dispersion of shocks, as we did, underestimates the volatility in selling prices since an important component of the volatility in house

prices is house-specific and likely idiosyncratic (Davidoff, 2015). Since we do not have Canadian information on the dispersion of house prices within CMA, we instead resort to scaling up the standard deviation of shocks. Nakajima and Telyukova (2017) estimate using zip-code level data a process which is similar to ours (AR(1)). They find an annual standard deviation of (log) house price shocks of 0.125. Our estimates, which vary by CMA and dwelling, are of the order of 0.06 at the annual level. Hence, we scale up the standard deviation of the shocks by a factor of 2 for our computations.

Respondents likely form their own expectations about house price growth. What do respondents expect about house price growth in years following the experiment? We asked respondents to categorize their expectation of their house’s price growth over the next five years: more than 20%, between 5% and 20%, between -5% and 5%, between -20% and -5% and less than -20%. Table 6 reports the distribution of subjective expectations for house price growth over the next 5 years by province. Homeowners from the province of British Columbia are those who expected a higher growth, with almost 80% of them expecting a growth higher than 5%. Homeowners from Ontario and Quebec followed, with 75% and 66% expected growth higher than 5%. If we use the expected growth rates in Table 5, we obtain a 5 year expected growth rate for 43% in British Columbia for single family dwellings, 27% for other types of dwellings. Expected 5 year growth rates are in excess of 35% in Ontario while they are around 20% for Quebec. This suggest that a significant fraction of respondents were more pessimistic than historical house price growth at the time of the survey, in particular for British Columbia and Ontario. While there is no direct way to incorporate these expectations in the calculation of the NNEG, we will assess the role of these expectations in shaping demand for reverse mortgages.

Insert Table 6 here

4.1.2 Survival Rates

Since respondents are likely to evaluate the NNEG using their own beliefs about survival, we exploit a question on subjective survival beliefs which has been shown to be predictive of actual mortality (Hurd and McGarry, 2002). We asked respondents to provide us with the probability they will live up to age 85. To transform this into a life-table, we use the structure of official life-table survival risk by age and adjust those using the information in the subjective beliefs. We follow the approach used by Salm (2010) to model deviations from life-table survival. Assume the subjective mortality hazard of respondent i at age a be given by:

$$\lambda_a^S(x_i) = \psi_i \lambda_a^O(x_i), \quad (9)$$

where $\lambda_a^O(x_i)$ is the individual's objective mortality hazard based on life-tables (x_i corresponds to province, sex and cohort). In the survey, each respondent was asked to give his subjective probability of surviving until the age of 85, $s_{a,85}^S(x_i)$. We use this information to estimate ψ_i . Appendix A provides details on how we estimate this parameter. To avoid indeterminate values at the bounds, we set $s_{a,85}^S(x_i) = 0.01$ as a minimum and $s_{a,85}^S(x_i) = 0.99$ as a maximum for subjective risk responses. Based on the objective life table of individual i , it is then possible to use ψ_i and re-construct their subjective life table using equation 9.

Table 7 reports the distribution of remaining years of life among respondents by age groups in the sample. It also reports the average remaining years of life according the official life-tables. On average, the expected number of remaining years of life is 23.4 years using the prospective life tables from Statistics Canada, and 29 years using the subjective probabilities. Hence, our respondents

overestimate survival to age 85.¹³ There is also considerable dispersion in subjective remaining life expectancy with the 25th percentile at age 65-69 expecting to live fewer than 14.8 years on average while the same number is 29.8, nearly double, at the 75th percentile.

Insert Table 7 here

4.2 Estimates of the Actuarial Value of the NNEG

For each respondent, we first use subjective survival probabilities to generate 1000 draws of death ages which are termination probabilities for the sake of this exercise. For couples, we use the death of the last spouse alive. For spouses, we do not have subjective survival curves. Assuming life-table probabilities would lead to an assumption that there is no correlation in life expectancy across spouses. Instead, we use the subjective survival curve of the respondent. Using the age of death as termination age for the reverse mortgage over-estimates the duration of reverse mortgage contracts as many respondents are likely to sell their property prior to death. This should lead to an over-estimation of the value of the NNEG. We then use the house price process by province and dwelling type of the respondent to generate a distribution of house prices at the time of disposition. Since mortality and house prices are independent, we assume there the decision to sell the house is independent of house prices.

Using the distribution of selling prices and the distribution of durations (time to mortality or termination), we compute both the expected present discounted value of mortgage insurance premiums and non-negative equity guarantee losses for the insurer. We then solve over a grid for the mortgage insurance premium which solves the zero profit condition. We do this for each of the 2140 respondents and for each 5 scenarios. We express the estimates of $\pi_{i,j}$ in basis points (100 basis point is one percentage point).

¹³The finding that respondents overestimate at age 85 is common in many countries. While respondents tend to underestimate when the target age is set to 75, they tend to over-estimate at older ages (Hurd and McGarry, 2002).

Figure 2 shows the distribution of actuarial values of the NNEG across respondents and scenarios for two sets of assumption: the baseline scenario using house price growth estimated over the period 2005-2016 and one where annual growth in house prices (δ) is 50% lower. On average the actuarial value of the NNEG, represented as a premium on the HELOC rate, is 31 basis points, or 0.31 percentage point. It varies substantially across the sample and scenarios with a standard deviation of 39.7, a first quartile of 13 basis points and a 90th percentile of 86 basis points. Under the alternative scenario with lower growth, the premium is on average higher, with a mean of 77 basis points and a standard deviation of 57, a 90th percentile 155 basis points. Hence, these estimates are well below the observed premium in the market of over 200 basis points. One needs however to be careful with concluding that the observed premium is too high. We focus on house price trends in three major cities with substantial growth. If growth is much lower in rural areas for example, this could justify higher premiums, as the sensitivity of our premium estimates to house price growth shows.

To shed light on the variation in the values we computed, we run a regression of the premium in basis point on demographics, subjective remaining life expectancy and the amount borrowed in terms of LTV in the scenario. As one would expect due to the effect of mortality on the value of the NNEG, the premium decreases with age (duration lower), is lower for males and higher for couples. The premium is higher in British Columbia and Ontario. The premium increases with the LTV that is granted as a reverse mortgage in each scenario.

Insert Figure 2 here

5 Demand for Reverse Mortgages

5.1 House Price Growth Expectations

Given the central importance of house price expectations, we first look at the correlation between subjective house price expectations over the next 5 years and the probability of purchasing a reverse mortgage in the scenarios presented. We use the average take-up probability over the 5 scenarios. If the value of the NNEG is what drives demand for reverse mortgages, we should expect a negative correlation between purchase probabilities and house price growth expectations. On the other hand, if the consumption smoothing motive is more important, we should see a positive correlation between the two outcomes.

Table 8 reports average take-up probabilities by province and house price growth expectations. For both Quebec and Ontario, there is a strong positive gradient between subjective house price growth and take-up probabilities. Those who expect the highest growth are more likely to purchase a reverse mortgage in the scenarios we presented. Hence, this would suggest these respondents are motivated by the possibility of taking advantage now of some of the home equity increase they expect to obtain in the future. It could also mean they poorly understand the value of the NNEG. For British Columbia, we do not observe such a gradient which may be due to the fact that most respondents expected substantial house price growth.

Insert Table 8 here

5.2 Regression Analysis

To understand the determinants of take-up probabilities and in particular how respondents respond to the interest rate and the fair value of the NNEG, we specify the following semi-log regression model

$$p_{i,j} = \alpha_r \log r_{i,j} + \alpha_f \log r_{i,j}^* + X_i \beta + \varepsilon_{i,j}. \quad (10)$$

where $p_{i,j}$ is the reported take-up probability (in percentage points from 0 to 100), $r_{i,j}$ is the interest rate on the reverse mortgage in scenario j and $r_{i,j}^* = r_{LC} + \pi_{i,j}$ is the interest rate obtained by adding to the HELOC rate of 4% the fair mortgage insurance premium computed for each respondent and scenario, $\pi_{i,j}$. The vector X_i contains a number of respondent-level characteristics while $\varepsilon_{i,j}$ is an error term. With this specification, the interest rate elasticity of demand is given by $\frac{\alpha_r}{\bar{p}}$ where $\bar{p}$ is a fixed level of the take-up probabilities where the elasticity is evaluated (such as the mean).

The specification nests the case where $\alpha_r = -\alpha_f$ in which case we can express the choice probability as a function of the log of the ratio of the interest rate to the fair rate, a measure of the unfairness of the interest rate charged in the reverse mortgage. [Davidoff and Wetzel \(2014\)](#) show that consumers may have a hard time correctly evaluating the value of the NNEG and therefore the fair rate in the reverse mortgage. This would lead to the prediction of an imprecise estimate of α_f , potentially different from α_r . We can test this assumption given estimation of equation (10).

We control for a rich set of covariates from the survey including quartiles of income, home value and savings as well as controls for preferences as well as house price expectations. We estimate parameters by OLS using clustered standard errors at the respondent level.¹⁴

Table 9 reports OLS coefficients for the full sample as well specifications where we estimate parameters separately by financial literacy as well as a third group representing those who know reverse mortgages and have a high level of financial literacy.

For the full sample, the estimated interest rate elasticity is -0.823 and statistically significant.

¹⁴We obtain very similar estimates by tobit regression to account for censoring at values of 0 and 100.

This suggest that consumers are quite sensitive to the price of reverse mortgages. In the full sample, they are however insensitive to the fair rate that represents the actuarial value of the mortgage insurance premium that covers the NNEG. The estimate is positive but statistically insignificant. Although we do not reject the equality $\alpha_r = -\alpha_f$ (p-value = 0.843), this largely reflects the imprecision of α_f . Hence, we find respondents have trouble using the NNEG as in [Davidoff and Wetzel \(2014\)](#). When we split the sample between those with high financial literacy (who could answer correctly all three questions) and those with low financial literacy, we observe that the interest sensitivity is entirely driven by those with high financial literacy. Among those, the price elasticity is -1.149 (se=0.164) suggesting a relatively high level of price sensitivity while it is -0.318 and statistically insignificant among those with low financial literacy. The difference between the two estimates is statistically significant ($t = -2.89$). Moreover, those with high financial literacy are more likely to purchase reverse mortgage products with a higher value of the NNEG. A 10% increase in the value of the NNEG increases demand by 1.67 percentage points. Among those with low financial literacy, the coefficient on the (log) value of the NNEG is imprecisely estimated to be negative. Hence, financial literacy appears to help respondents with the evaluation of the NNEG. In the last column, we refine even further the specification to exclude those who have high financial literacy but did not know the product prior to the experiment. Although we obtain an even larger interest rate elasticity (-1.479), we do not detect a higher sensitivity to the value of the NNEG among this group (the estimate is of similar size but more imprecise). Overall, we find that despite the lack of effect of financial literacy on average take-up probabilities, financial literacy appears to help consumers in evaluating the reverse mortgage products presented.

In terms of demographics, some differences in demand are observed. Demand appears to decrease with age, is higher for males in the full sample. The effect of age is concentrated among those with higher financial literacy and knowledge of the product while gender differences are widespread

across groups. In terms of economic resources, there is some indication that those with low savings and low income, in particular among those with higher financial literacy, have higher demand for reverse mortgages (the 4th quartile is omitted for these variables). However, there is no relationship between demand and the house-rich and cash-poor variable indicator. Therefore, there is some evidence that demand is higher among those with lower resources (both income and savings) but not necessarily the specific group of house-rich and cash-poor respondents. We find that those with an existing mortgage are more likely to purchase a reverse mortgage. In this case, they must pay first the existing mortgage with the funds from the reverse mortgage. Purchasing a reverse mortgage for these households may allow to effectively postpone mortgage payments until they sell the house (by clearing the existing mortgage and avoiding payments while living in the house). For house price expectations, we find some evidence that those who expect higher price growth are more likely to purchase a reverse mortgage. Expecting negative growth is negatively correlated with demand for reverse mortgages. However, this relationship is not always statistically significant and monotonic.

Finally, there is some evidence that households who want to stay in their house unless they experience financial hardship are more likely to demand a reverse mortgage. This is consistent with the consumption smoothing motive as those households are less willing to sell their house to finance consumption at older ages. We find that those who think that leaving money to their heirs is important are more likely to purchase a reverse mortgage. While a bequest motive should decrease demand for reverse mortgages, it is possible that these households are inclined to make *inter vivos* transfers with the proceeds from the reverse mortgage.

Insert Table 9 here

6 Conclusion

In many countries, the take-up of reverse mortgage is low . While many factors can explain this low take-up, few studies have looked at the relationship between financial literacy and reverse mortgage take-up and in particular how financial literacy may change the evaluation that consumers make of reverse mortgages. Reverse mortgage products are complex and their value arise from both a desire to smooth consumption for liquidity constrained households as well as insuring against downside risk in house prices due to the non-negative equity guarantee. This paper presents survey experimental evidence on the valuation of reverse mortgages by near-retirees and retirees in Canada.

We find that financial literacy is associated with better knowledge of the existence of reverse mortgages. However, we do not find a direct relationship between demand for reverse mortgages and financial literacy. Instead, we find that the interest rate elasticity of demand for reverse mortgages is negative and statistically significant only for respondents who have higher financial literacy. Furthermore, we find that these respondents are also more likely to take-up reverse mortgages when the value of the NNEG is larger. We also uncover an interesting relationship between expected house price growth and demand for reverse mortgages. Respondents who expect higher price growth appear to be more likely to demand reverse mortgages and vice-versa for those who expect declines in house prices. This could suggest that the consumption smoothing motive is the value component of reverse mortgages that these respondents value the most.

These results suggest that the effect of financial literacy on some decisions goes beyond simply increasing or decreasing the likelihood of purchasing a product. In some instances, such as reverse mortgages, financial literacy may enable respondents to judge better financial products and assess their value. These results for reverse mortgages are in line with results found in other domains, where financial literacy helps consumers minimize borrowing costs ([Huston, 2012](#)) or in the savings domain, obtain higher rates of return on savings ([Clark et al., 2017](#)).

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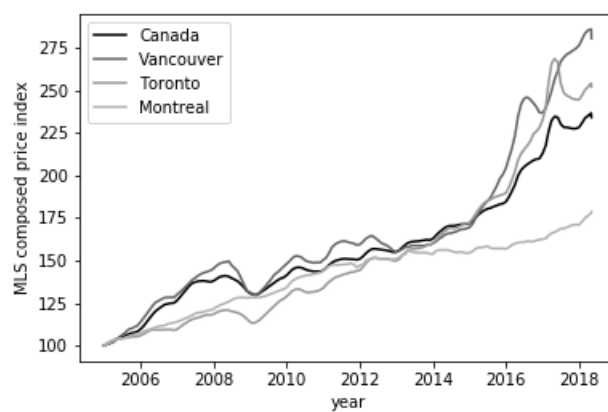


Figure 1: MLS Home Price Index for the cities of Vancouver, Toronto and Montreal, from 2005 to 2018

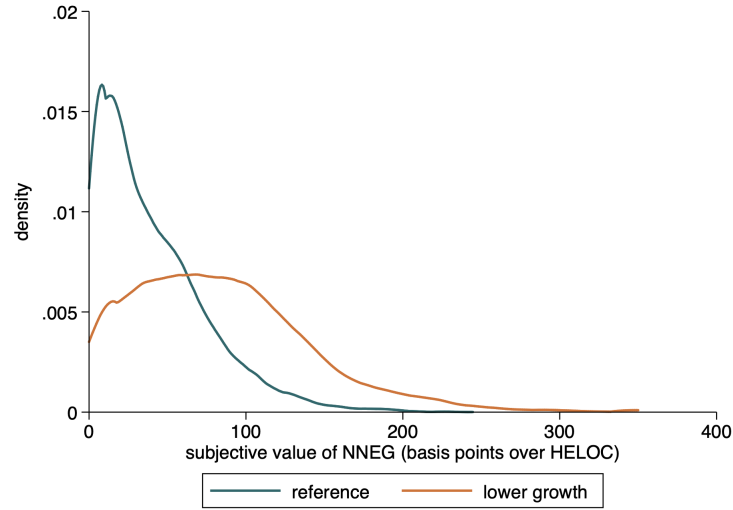


Figure 2: **Actuarial Value of NNEG:** Density estimate of the distribution of NNEG mortgage insurance premiums computed across respondents and scenarios (rate in excess of HELOC). The premium is reported in basis points (100 = 1 percentage point). The distribution is reported in blue for the reference scenario (with historical growth in house prices 2005-2016) and with an alternative scenario (in orange) where historical growth is half of what has been observed by dwelling type and province.

	Montreal	Toronto	Vancouver
Age			
55	0.260	0.253	0.245
65	0.354	0.364	0.347
75	0.420	0.434	0.413

Table 1: **CHIP Maximum loan-to-value:** This table presents the maximum loan-to-value ratios of the home equity that can be borrowed by a single woman living in a single-family dwelling. These limits are reported by age and city. Source: HomeEquity Bank, 2017.

	mean	SD	min	max
Age	63.388	5.305	55.000	75.000
Men	0.488	0.500	0.000	1.000
Ontario	0.502	0.500	0.000	1.000
British Columbia	0.193	0.395	0.000	1.000
Quebec	0.305	0.460	0.000	1.000
Married	0.755	0.430	0.000	1.000
Has kids	0.765	0.424	0.000	1.000
Less than high school	0.180	0.384	0.000	1.000
High school	0.384	0.486	0.000	1.000
College	0.436	0.496	0.000	1.000
Retired	0.663	0.473	0.000	1.000
Total income (\$1,000)	88.544	66.092	0.001	500.000
Total non-housing saving (\$1,000)	265.681	424.297	0.000	5000.000
Home value	570.049	468.803	25.322	3000.000
Has a mortgage	0.341	0.481	0.000	1.000
Equity (\$1,000)	519.638	456.115	25.322	3000.000
House rich & cash poor	0.092	0.287	0.000	1.000
Employer pension plan	0.561	0.496	0.000	1.000
Bequest motive	0.178	0.383	0.000	1.000
House must be sold only if financial hardship	0.580	0.494	0.000	1.000
Financial literacy (3 correct answers)	0.541	0.498	0.000	1.000
Understands surv. probabilities	0.846	0.358	0.000	000

Table 2: **Descriptive Statistics:** This table presents descriptive statistics on the respondents from the survey. N = 2140. Statistics weighted according to 2010 Canadian Community Health Survey (CCHS).

	Canada	B.C.	Ont.	Que.
1: Ever heard of the existence of this fin product: based on definition of reverse mortgages (N=2,140)				
No	22.7%	15.3%	17.1%	36.5%
Yes	77.3%	84.7%	82.9%	63.5%
2: Can you name the financial product: based on definition of reverse mortgages (if heard) (N=1,705)				
No	40.5%	35.2%	36.5%	53.3%
Yes	59.5%	64.8%	63.5%	46.7%
3: Name that financial product: based on definition of reverse mortgages (if can name) (N=1,065)				
Annuity	0.4%	0.1%	0.0%	1.7%
Reverse mortgage	96.8%	96.6%	98.9%	90.9%
Life insurance	0.1%	0.0%	0.0%	0.3%
Line of credit	1.2%	2.9%	0.4%	1.7%
None of the above	1.6%	0.4%	0.7%	5.4%
Correctly answered all three questions (N=2,140)				
No	55.48%	46.94%	47.87%	73.09%
Yes	44.52%	53.06%	52.13%	26.91%

Table 3: **Prior Knowledge of reverse mortgages:** N = 2140. Statistics weighted according to the 2010 Canadian Community Health Survey (CCHS)

	(1)	(2)	(3)
financial literacy	0.174*** (0.0206)	0.130*** (0.0211)	0.122*** (0.0213)
understands survival probabilities	0.150*** (0.0317)	0.128*** (0.0305)	0.128*** (0.0303)
age of respondent		0.00575*** (0.00196)	0.00701*** (0.00200)
male		0.0709*** (0.0211)	0.0649*** (0.0209)
ontario		0.230*** (0.0236)	0.220*** (0.0261)
bc		0.263*** (0.0230)	0.264*** (0.0263)
high school		-0.0695 (0.0701)	-0.0732 (0.0695)
college		0.0232 (0.0687)	0.00608 (0.0687)
married		0.0199 (0.0249)	0.00271 (0.0258)
has kids		-0.0545** (0.0249)	-0.0531** (0.0249)
total income (4th q. excluded)			
1st quartile			-0.0772** (0.0325)
2nd quartile			-0.0292 (0.0310)
3rd quartile			-0.0273 (0.0292)
home value (4th q. excluded)			
1st quartile			0.0376 (0.0349)
2nd quartile			0.0852*** (0.0303)
3rd quartile			0.0680** (0.0289)
savings (4th q. excluded)			
1st quartile			-0.0841** (0.0359)
2nd quartile			-0.137*** (0.0313)
3rd quartile			-0.112*** (0.0295)
has mortgage			0.0387* (0.0225)
house rich cash-poor			-0.0295 (0.0440)
has DB pension			-0.0165 (0.0213)
Observations	2,140	2,140	2,140

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4: **Who Can Identify Reverse Mortgages?:** Marginal effects from a logit regression of whether or not respondents understand reverse mortgages (could identify by name based on description) on a series of controls. Total wealth, home value and savings are included as quartile dummies and the 4th quartile is excluded.

		$\delta_{h,p}$	$\rho_{h,p}$	$\sigma_{h,p}$
prov	type			
Vancouver	SFD	0.006***	0.964***	0.023
	Townhouse	0.004***	0.988***	0.018
	Condo	0.004***	0.993***	0.018
Toronto	SFD	0.006***	0.949***	0.022
	Townhouse	0.006***	0.956***	0.021
	Condo	0.005***	0.966***	0.020
Montreal	SFD	0.003***	0.965***	0.011
	Townhouse	0.004***	0.912***	0.016
	Condo	0.003***	0.968***	0.011

Table 5: **House Price Dynamic Estimates:** This table reports estimated parameters of the house price dynamics by city and type of dwelling. SFD refers to a single-family dwelling. $\delta_{h,p}$ is the monthly deterministic trend, $\rho_{h,p}$ is the AR(1) coefficient and $\sigma_{h,p}$ is the standard deviation of shocks for a dwelling of type h and in city p . SFD refers to single family dwelling. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

	more than 20%	5 to 20%	-5 to 5%	-5 to -20%	less than -20%
British Columbia	0.190	0.603	0.163	0.035	0.009
Ontario	0.165	0.583	0.217	0.020	0.014
Quebec	0.061	0.598	0.322	0.006	0.013

Table 6: **Subjective expectation of house price growth over the next 5 years:** This table presents the distribution of subjective expectation of house price growth over the next 5 years by province (N=2140). Statistics weighted according to the 2010 Canadian Community Health Survey (CCHS).

age	25th	Subjective		mean	Life-table mean
		median	75th		
55-59	28.7	33.5	38.2	34.6	29.3
60-64	22.7	27.3	33.8	29.9	24.5
65-69	18.5	23.0	29.8	25.6	20.1
70-74	14.8	19.1	27.0	22.1	15.6
Total	21.8	27.3	34.8	29.0	23.4

Table 7: **Expected remaining years of life:** This table reports statistics for subjective and life-table remaining life expectancy (N=2140). Statistics weighted according to the 2010 Canadian Community Health Survey (CCHS).

	Expected Change in House Price Over Next 5 Years				
	more than 20%	5 to 20%	-5 to 5%	-5 to -20%	less than -20%
British Columbia	0.059	0.052	0.050	0.064	0.000
Ontario	0.107	0.067	0.038	0.032	0.000
Quebec	0.188	0.052	0.070	0.031	0.052

Table 8: **Probability of buying a reverse mortgage within the next year:** This table presents the average probability of buying a reverse mortgage within the next year by province and category of subjective expectation on the house price growth over the next 5 years (N=2140). Statistics weighted according to the 2010 Canadian Community Health Survey (CCHS)

	Total	high financial literacy (FL)	low financial literacy (FL)	High FL and knowledge RMR
log interest rate	-5.235*** (0.890)	-7.312*** (1.042)	-2.021 (1.545)	-9.412*** (1.465)
log fair rate	4.408 (4.126)	10.67** (4.852)	-3.727 (7.187)	10.37 (6.658)
age (65=0)	-0.203*** (0.0587)	-0.250*** (0.0685)	-0.112 (0.104)	-0.216** (0.0892)
male	2.622*** (0.618)	2.438*** (0.687)	2.916** (1.171)	3.220*** (0.958)
high school	-0.855 (2.471)	-2.198 (4.512)	0.151 (2.796)	-7.428 (7.634)
college	-0.386 (2.448)	-1.412 (4.491)	-0.0545 (2.768)	-5.968 (7.559)
married	-0.971 (0.759)	-1.057 (0.953)	-1.008 (1.227)	-1.018 (1.236)
has kids	0.0627 (0.704)	0.614 (0.819)	-0.459 (1.355)	1.714* (1.009)
non-CMA region	-0.00639 (0.667)	-1.540** (0.766)	1.778 (1.172)	-0.991 (1.025)
total income (1st q)	1.872* (0.966)	2.316** (1.166)	1.585 (1.648)	1.837 (1.443)
total income (2nd q)	-0.204 (0.840)	-0.241 (0.968)	0.231 (1.565)	0.236 (1.385)
total income (3rd q)	0.938 (0.811)	0.342 (0.925)	2.303 (1.558)	0.0632 (1.160)
home value (1st q)	-0.427 (1.037)	-0.811 (1.222)	-0.366 (1.813)	-2.571 (1.908)
home value (2nd q)	-0.793 (0.916)	0.0508 (1.057)	-2.060 (1.651)	0.256 (1.434)
home value (3rd q)	-1.375* (0.795)	-0.529 (0.926)	-2.778* (1.494)	-1.143 (1.155)
savings (1st q)	2.885** (1.204)	3.284** (1.530)	1.290 (2.128)	4.546** (2.146)
savings (2nd q)	1.479 (0.924)	2.448** (0.975)	-0.778 (1.958)	2.130 (1.380)
savings (3rd q)	-0.694 (0.717)	0.0502 (0.756)	-2.709 (1.685)	-0.485 (0.858)
has mortgage	2.942*** (0.688)	3.284*** (0.869)	2.750** (1.112)	2.845** (1.108)
house-rich cash-poor	-1.253 (1.281)	-1.083 (1.807)	-1.161 (1.766)	-2.543 (2.480)
has DB pension	0.111 (0.651)	-0.365 (0.757)	1.008 (1.163)	-0.778 (0.987)
house price: greater than 20 %	1.867* (1.039)	1.321 (1.299)	2.819* (1.679)	2.262 (1.580)
house price: between 5% and 20%	1.480** (0.659)	0.896 (0.773)	2.316** (1.164)	1.776* (1.023)
house price: between -5% and -20%	-0.939 (1.282)	-1.094 (1.530)	-2.471 (2.191)	-1.773 (1.685)
house price: less than -20%	-7.151*** (1.128)	-7.807*** (1.595)	-6.314*** (1.518)	-6.677*** (2.078)
house only sold financial hardship	1.417** (0.589)	0.493 (0.718)	2.685*** (0.994)	0.605 (0.925)
leaving bequest important	1.942** (0.919)	0.716 (0.970)	3.121* (1.741)	1.400 (1.455)
financial literacy	-0.631 (0.711)			
RMR knowledge	0.388 (0.632)			
Observations	10,700	6,440	4,260	3,605
R-squared	0.046	0.056	0.055	0.077
interest rate elasticity	-0.823	-1.149	-0.318	-1.479
(se)	0.140	0.164	0.243	0.230
Equality interest rate	0.843	0.495	0.426	0.890

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 9: **Regression Estimates:** The table reports coefficients estimates from OLS along with (clustered) standard errors in parenthesis. The dependent variable is the take-up probability in percentage points (from 0 to 100). The first column reports estimates on the whole sample. The second and third column report estimates by level of financial literacy. The last column reports results for the subset of those who have high financial literacy and also have prior knowledge of reverse mortgages prior to the experiment. We report below the R-squared the interest rate elasticity computed at the mean in the total sample as well as the standard error. We also report the p-value on the test for the equality of the coefficients on the log interest rate and the log of the fair rate. Statistical significance is denoted using * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

A Additional Online Material: Subjective Mortality Curve Estimation

In continuous time, let the subjective probability of surviving from age a to age 85 be given by:

$$s_{a,85}^S(x_i) = \exp \left(-\psi_i \int_a^{85} \lambda_s^O(x_i) ds \right), \quad (11)$$

where ψ_i is an individual level shifter. The objective probability of surviving based on the model for the same ages is:

$$s_{a,85}^O(x_i) = \exp \left(- \int_a^{85} \lambda_s^O(x_i) ds \right). \quad (12)$$

Let $\Lambda_{a,85}^O(x_i) = \int_a^{85} \lambda_s^O(x_i) ds$. Then,

$$\log(s_{a,85}^O(x_i)) = -\Lambda_{a,85}^O(x_i) \quad (13)$$

and

$$\log(s_{a,85}^S(x_i)) = -\psi_i \Lambda_{a,85}^O(x_i) \quad (14)$$

Dividing equation (14) by equation (13), we have:

$$\psi_i = \frac{\log(s_{a,85}^S(x_i))}{\log(s_{a,85}^O(x_i))}. \quad (15)$$

B Online Appendix: Survey Questionnaire

INSTRUCTIONS INCLUDED WITH THIS ANONYMOUS QUESTIONNAIRE

FINANCIAL PRODUCTS FOR RETIREMENT

The following pages contain an anonymous questionnaire, which we invite you to complete. This questionnaire was developed as part of a research project at HEC Montréal.

Since your first impressions best reflect your true opinions, we would ask that you please answer the questions included in this questionnaire without any hesitation. We ask, however, that you take the time needed to consider certain questions on knowledge, which might involve concepts with which you are less familiar. There is no time limit for completing the questionnaire, although we have estimated that it should take approximately 15 minutes.

The information collected will be anonymous and will remain strictly confidential. It will be used solely for the advancement of knowledge and the dissemination of the overall results in academic or professional forums.

The online data collection provider agrees to refrain from disclosing any personal information (or any other information concerning participants in this study) to any other users or to any third party, unless the respondent expressly agrees to such disclosure or unless such disclosure is required by law.

You are free to refuse to participate in this project and you may decide to stop answering the questions at any time. By completing this questionnaire, you will be considered as having given your consent to participate in our research project and to the potential use of data collected from this questionnaire in future research. Since the questionnaire is anonymous, you will no longer be able to withdraw from the research project once you have completed the questionnaire because it will be impossible to determine which of the answers are yours.

If you have any questions about this research, please contact the principal investigator, Pierre-Carl Michaud, at the telephone number or email address indicated below.

HEC Montréal's Research Ethics Board has determined that the data collection related to this study meets the ethics standards for research involving humans. If you have any questions related to ethics, please contact the REB secretariat at (514) 340-6051 or by email at cer@hec.ca.

Thank you for your valuable cooperation!

Pierre-Carl Michaud
Professor
Department of Applied Economics
HEC Montréal
514-340-6466
pierre-carl.michaud@hec.ca

Section 1: Background

A Are you...?

- 1.1. Male
- 1.2. Female

B How old are you?

- 2.1. *Please Enter (terminate if not 55-75 INCLUSIVELY)*

[PN: MUST ENTER THE 2 CHARACTERS]

QC. Which province or territory do you live in?

- 1.1. British Columbia
- 1.2. Alberta [Screen Out]
- 1.3. Saskatchewan [Screen Out]
- 1.4. Manitoba [Screen Out]
- 1.5. Ontario
- 1.6. Quebec
- 1.7. New Brunswick [Screen Out]
- 1.8. Nova Scotia [Screen Out]
- 1.9. Prince Edward Island [Screen Out]
- 1.10. Newfoundland [Screen Out]
- 1.11. Northwest Territories [Screen Out]
- 1.12. Nunavut [Screen Out]
- 1.13. Yukon [Screen Out]
- 1.14. None of the above [Screen Out]

Q0 Can you please enter the first 3 characters of your postal code? Please type in below [PN: MUST ENTER FIRST 3 CHARACTERS] *FSAs validated with FSA file

Q1 What is the highest degree, certificate or diploma you have obtained?

- 1 Less than high school diploma or its equivalent
- 2 High school diploma or a high school equivalency certificate
- 3 Trade certificate or diploma
- 4 College, CEGEP or other non-university certificate or diploma (other than trades certificates or diplomas)
- 5 University certificate or diploma below the bachelor's level
- 6 Bachelor's degree (e.g. B.A., B.Sc., LL.B.)
- 7 University degree above the bachelor's level

Q2 What is your marital status?

- 1 married
- 2 living common-law
- 3 widowed
- 4 separated

5 divorced

6 single, never married

IF Q2 ==1,2

Q2a How old is your partner (spouse)?

Numeric (>0)

END IF

Q3 Do you have children?

1 Yes

2 No

IF Q3==1 ask Q3b

IF Q3 = 2 skip to Q4

Q3b Have you experienced a loss of a child?

1 Yes

2 No

IF Q3b = 1 ask Q3a

IF Q3b = 2 ask Q3c

Q3a How many of your children are alive today?

Numeric (>=0)

Q3c How many children do you have?

Numeric (>=0)

END IF

Q4 For 2016, what is your best estimate of the total income received by all members of your household, from all sources, before taxes and deductions?

Numeric (>0)

9999999 Don't know or prefer not to say

IF Q4==9999999

Q4a Is it more than \$60,000? 1 Yes 2 No 8888888 Refuse to answer 7777777 Don't know

IF Q4a==1

Q4b Is it less than \$120,000? 1 Yes 2 No 8888888 Refuse to answer 7777777 Don't know

IF Q4b == 1

Q4c Is it more than \$90,000? 1 Yes 2 No 8888888 Refuse to answer 7777777 Don't know

END IF

ELSE IF Q4a==2

Q4d Is it more than \$30,000? 1 Yes 2 No 8888888 Refuse to answer 7777777 Don't know

END IF

END IF

Q5 Do you consider yourself retired?

1 Yes

2 No

IF Q5==2

Q5a What is your best estimate of what total income received by all members of your household will be once you are fully retired, as a fraction of your current income?

Numeric (0%-200%)

9999999 Don't know

IF Q5a==9999999

Q5b Is it more than 50%? 1 Yes 2 No 8888888 Refuse to answer 7777777 Don't know

IF Q5b==1

Q5c Is it less than 75%? 1 Yes 2 No 8888888 Refuse to answer 7777777 Don't know

IF Q5c == 1

Q5d Is it more than 62.5%? 1 Yes 2 No 8888888 Refuse to answer 7777777 Don't know

ELSE IF Q5c == 2

Q5e Is it less than 87.5%? 1 Yes 2 No 8888888 Refuse to answer 7777777 Don't know

END IF

ELSE IF Q5b==2

Q5f Is it more than 25%? 1 Yes 2 No 8888888 Refuse to answer 7777777 Don't know

IF Q5f == 1

Q5d Is it more than 37.5%? 1 Yes 2 No 8888888 Refuse to answer 7777777 Don't know

ELSE IF Q5f == 2

Q5e Is it less than 12.5%? 1 Yes 2 No 8888888 Refuse to answer 7777777 Don't know

END IF

END IF

END IF

END IF

Q6 Do you own your primary residence?

1 Yes

2 No

IF Q6==1

Q6a Which set of property type best fits your primary residence?

1 Single Family Dwelling / Detached Duplex, Triplex or Quadruplex / Link home / Semi-Detached.

2 Townhouse, Rowhouse / Fiveplex and Sixplex / Attached Duplex, Triplex or Quadruplex / Stratified SFD, Bare Land Strata / Semi-Detached Strata Condo / Modular Home

3 Condo-Townhouse / Mobile Home / Condo – Apartment Style

7777777 Don't know

Q7 What is the current market value of your residence?

Numeric (>0)

9999999 Don't know or prefer not to say

IF Q7==9999999

Q7a Is it more than \$300,000? 1 Yes 2 No 8888888 Refuse to answer 7777777 Don't know
 IF Q7a==1
 Q7b Is it less than \$600,000? 1 Yes 2 No 8888888 Refuse to answer 7777777 Don't know
 IF Q7b == 1
 Q7c Is it more than \$450,000? 1 Yes 2 No 8888888 Refuse to answer 7777777 Don't know
 ELSE IF Q7b ==2
 Q7d Is it less than \$750,000? 1 Yes 2 No 8888888 Refuse to answer 7777777 Don't know
 IF Q7d == 2
 Q7e Is it more than \$900,000? 1 Yes 2 No 8888888 Refuse to answer 7777777 Don't know
 END IF
 END IF
 ELSE IF Q7a==2
 Q7f Is it more than \$150,000? 1 Yes 2 No 8888888 Refuse to answer 7777777 Don't know
 END IF
END IF

 Q8 What proportion of the current market value of your residence do you still owe on your mortgage?
 Numeric (0%-200%)
 9999999 Don't know or prefer not to say
 IF Q8 == 9999999
 Q8a Is it more than 50%? 1 Yes 2 No 8888888 Refuse to answer 7777777 Don't know
 IF Q8a == 1
 Q8b Is it less than 75 %? 1 Yes 2 No 8888888 Refuse to answer 7777777 Don't know
 IF Q8b == 1
 Q8c Is it more than 62.5%? 1 Yes 2 No 8888888 Refuse to answer 7777777 Don't know
 ELSE IF Q8b == 2
 Q8d Is it more than 87.5%? 1 Yes 2 No 8888888 Refuse to answer 7777777 Don't know
 END IF
 END IF
 ELSE IF Q8a == 2
 Q8e Is it less than 25 % 1 Yes 2 No 8888888 Refuse to answer 7777777 Don't know
 IF Q8e == 1
 Q8f Is it more than 12.5%? 1 Yes 2 No 8888888 Refuse to answer 7777777 Don't know
 IF Q8f == 2

Q8g Is it less than 5%? 1 Yes 2 No 8888888 Refuse to answer 7777777
Don't know
END IF

ELSE IF Q8e == 2

Q8h Is it more than 37.5%? 1 Yes 2 No 8888888 Refuse to answer
7777777 Don't know

END IF

END IF

END IF

END IF

Q9 We are interested in your pension plan and its nature, if you have one. Do you currently contribute to, or receive benefits from (in the form of regular payments), an employer-provided pension plan?

1 Yes

2 No

3 Don't Know

IF Q9==1

Q9a Do you agree with the following statement: "I have/expect to have sufficient pension income"?

1 Completely disagree

2 Disagree

3 Somewhat disagree

4 Neither agree nor disagree

5 Somewhat agree

6 Agree

7 Completely agree

END IF

Q10 What is your best estimate of how much you have accumulated in Registered Retirement Savings Plans (RRSPs), Tax-Free Savings Accounts (TFSAs) and other non-employer provided savings accounts?

Numeric

9999999 Don't know or prefer not to say

IF Q10==9999999

Q10a Is it more than \$50,000? 1 Yes 2 No 8888888 Refuse to answer 7777777 Don't know

IF Q10a==1

Q10b Is it less than \$200,000? 1 Yes 2 No 8888888 Refuse to answer 7777777 Don't know

ELSE IF Q10a==2

Q10c Is it more than \$10,000? 1 Yes 2 No 8888888 Refuse to answer 7777777 Don't know

END IF

END IF

Q11 Looking at the following list of health conditions, has a doctor ever said you suffered from:

[Check any of:]

1 Heart disease

2 Stroke

- 3 Lung disease
- 4 Diabetes
- 5 Hypertension
- 6 Depression or other mental health problems
- 7 Cancer
- 8 None of the above

Q12 At the present time, do you smoke cigarettes daily, occasionally or not at all?

- 1 Daily
- 2 Occasionally
- 3 Not at all

IF Q12==1 GOTO Q13

ELSE IF Q12==2,3

 Q12a Have you ever smoked cigarettes daily?

- 1 Yes
- 2 No

 IF Q12a==1 GOTO Q13

 ELSE IF Q12a==2

 Q12b Have you smoked 100 cigarettes or more in your life?

- 1 Yes
- 2 No

 IF Q12b==1 GOTO Q13

 ELSE IF Q12b==2

 Q12c Have you ever smoked a whole cigarette?

- 1 Yes
- 2 No

 END IF

 END IF

END IF

Section 2: Risk Perception

Q13 On a scale of 0 to 100, where 0 is absolutely no chance and 100 is absolutely certain, what do you believe is the percent chance you will live to age 85 or more?

Numeric (0-100)

9999999 Don't know

IF Q2==1,2 & Q2a < 85

 Q13a On a scale of 0 to 100, where 0 is absolutely no chance and 100 is absolutely certain, what do you believe is the percent chance your partner (spouse) will live to age 85 or more?

 Numeric (0-100)

 9999999 Don't know

END IF

Q14 On a scale of 0 to 100, where 0 is absolutely no chance and 100 is absolutely certain, what do you believe is the percent chance you will leave a bequest of more than \$10,000?

Numeric (0-100)

9999999 Don't know

IF Q14 >0 & Q6 ==1

Q14a How likely is it that your primary residence will play a role in the bequest you plan to leave?

1 Not likely at all

2 Not very likely

3 Somewhat likely

4 Very likely

5 Extremely likely

END IF

Q15 On a scale of 0 to 100, where 0 is absolutely no chance and 100 is absolutely certain, what do you believe is the percent chance that your family would take up the responsibility of taking care of you if you had important limitations in activities of daily living such as bathing, eating, cleaning?

Numeric (0-100)

9999999 Don't know

Q16 On a scale of 0 to 100, where 0 is absolutely no chance and 100 is absolutely certain, what do you believe is the percent chance that your family would take care of you financially if you needed financial support?

Numeric (0-100)

9999999 Don't know

IF Q6==1

Q17 Here are three possibilities concerning your future expected residence. On a scale of 0 to 100, where 0 is absolutely no chance and 100 is absolutely certain, what is the percent chance that each of these possibilities comes true. Given that only one of these possibilities can occur, the sum of the three probabilities must equal 100.

Q17a I'm going to stay in my current home until I die.

Numeric (0-100)

Q17b I will eventually move from my current home to live in another house or apartment.

Numeric (0 to (100 – Answer Q17a))

Q17c I will eventually move from my current home to live in a long-term care home.

Numeric (0 to (100 – Answer Q17a – Answer Q17b))

[NOTE: SUM OF ANSWERS TO Q17a, Q17b AND Q17c MUST EQUAL 100.]

[NOTE: MAKE SURE THE QUESTION IS PROPERLY NUMBERED ON THE SCREEN.]

[NOTE: WOULD IT BE POSSIBLE TO INCLUDE A COUNTER TO LET THE RESPONDENT KNOW HOW MANY % LEFT TO FILL IN?]

Q18 Over the **next** five years, do you think the value of your home will:

1 Increase a lot (greater than 20 %)

2 Increase moderately (between 5% and 20%)

3 remain rather stable (between +5% and -5%)

4 decrease moderately (between -5% and -20%)

5 decrease a lot (less than -20%)

Q19 Do you agree with the following statement: “House prices can fluctuate a lot”?

- 1 Completely disagree
- 2 Disagree
- 3 Somewhat disagree
- 4 Neither agree nor disagree
- 5 Somewhat agree
- 6 Agree
- 7 Completely agree

END IF

Q20 Do you agree with the following statements? (Answers: 5 Strongly Agree; 4 Agree; 3 Disagree; 2 Strongly Disagree; 1 Don’t know)

Q20a It is the responsibility of the family, when feasible, to take care of elderly parents

Q20b Parents should set aside money to leave to their children or heirs once they die, even when it means somewhat sacrificing their own comfort in retirement

Q20c Children should inherit their parents’ family home

Q20d A house is an asset that should only be sold in case of financial hardship

Q20e Being in debt is never a good thing

[NOTE: Make sure the question is properly numbered on the screen.]

[NOTE: Might the scale for each statement be inverted (i.e. “increasing” from left to right)? We leave this with your expertise.]

Q21 Which of the following statements comes closest to describing the amount of financial risk that you are willing to take when you save or make investments?

- 1 I am willing to take substantial financial risks expecting to earn substantial returns
- 2 I am willing to take above average financial risks expecting to earn above-average returns
- 3 I am willing to take average financial risks expecting to earn average returns
- 4 I am willing to take below average financial risks expecting to earn below-average returns
- 5 I am not willing to take any risk, knowing I will earn a small but certain return

Section 3: Literacy and Knowledge

Now we would like to ask some questions about your familiarity and comfort with financial concepts. Please answer these questions the best you can.

Q22 Suppose you have \$100 in a savings account, the interest rate is 2% per year and you never withdraw money. After 5 years, how much will you have in this account in total?

- 1 More than \$110
- 2 Exactly \$110
- 3 Less than \$110
- 4 Don’t know

Q23 True or false? You should invest most of your money in a single stock that you select rather than in lots of stocks or in mutual funds.

- 1 True
- 2 False

3 Don't know

Q24 Imagine leaving \$1,000 in a savings account that pays 1% interest and has no charges. Imagine that inflation is running at 2%. Do you think that if you withdraw the money in a year's time you will be able to buy more than, exactly the same as, or less than today with the money in this account?

1 More than today

2 Exactly the same as today

3 Less than today

4 Don't know

Q25 Suppose the chances of someone aged 50 living to age 85 are 60%. What do you think the chances are that this same person will live to age 60?

1 Less than 60%

2 Greater than 60%

3 Don't know

Section 4: Annuities

For the purposes of this section, when we use the term '**annuity**', we are referring to a financial product that guarantees you a regular payment every month or year until death (the "benefit"), in exchange for an initial one-time payment (the "premium").

Q26 This section is going to ask you questions about annuities. Which of the following best describes your current knowledge about this type of product?

1 A lot

2 A little

3 None at all

Q27 Have you purchased an annuity in the private market, for which you are currently receiving or will eventually receive benefits (please exclude all government provided annuities such as your provincial pension plan, the Canada Pension Plan and Old Age Security)?

1 Yes, I have purchased an annuity

2 Yes, I have purchased more than one annuity

3 No

4 Don't know

IF Q27==4(Don't know) GOTO Q28

ELSE IF Q27==3 (No)

Q27a Why haven't you bought an annuity? Choose the main reason.

1 I never thought about buying one, and I have never been offered one (for instance by a financial advisor).

2 I thought about buying one, but I have not (yet) made a decision.

3 I do not have sufficient savings to purchase one.

4 Such products do not offer good value for money.

5 Such products do not cover my needs.

6 I do not think I will need such a product.

7 I don't know what an annuity is.

8 Other, open...

GOTO Q28

ELSE IF Q27==1,2 (Yes)

Q27b How did you come to purchase the annuity? If you have purchased more than one annuity, please think about the one you purchased most recently.

1 I was offered an annuity (by my financial advisor, pension plan representative, insurance company, etc.)

2 I searched myself for an annuity

3 Other, open ...

Q27c What was the premium of the annuity (what did you pay)? If you have purchased more than one annuity, please indicate what you paid for the one you purchased most recently.

Numeric (>\$0)

7777777 Don't know

IF Q27c==7777777

Q27d Was it more than \$250,000? 1 Yes 2 No 8888888 Refuse to answer 7777777
Don't know

IF Q27d==1

Q27e Was it less than \$1,000,000? 1 Yes 2 No 8888888 Refuse to answer
7777777 Don't know

IF Q27e == 1

Q28f Was it more than \$500,000? 1 Yes 2 No 8888888 Refuse to answer
7777777 Don't know

END IF

ELSE IF Q27d ==2

Q27g Was it more than \$150,000? 1 Yes 2 No 8888888 Refuse to answer
7777777 Don't know

IF Q27g == 2

Q27h Was it less than \$100,000? 1 Yes 2 No 8888888 Refuse to answer
7777777 Don't know

IF Q27h==1

Q27i Was it more than \$50,000? 1 Yes 2 No 8888888 Refuse to
answer 7777777 Don't know

END IF

END IF

END IF

END IF

Q27j What is the benefit amount the annuity pays out (monthly)? If you have purchased more than one annuity, please indicate the benefit paid by the one you purchased most recently.

Numeric (>\$0)

7777777 Don't know

IF Q27j==7777777

Q27k Is it more than \$1,000? 1 Yes 2 No 8888888 Refuse to answer 7777777 Don't
know

IF Q27k==1

Q27l Is it less than \$4,000? 1 Yes 2 No 8888888 Refuse to answer 7777777
Don't know

IF Q27l == 1

Q27m Is it more than \$2,000? 1 Yes 2 No 8888888 Refuse to answer
7777777 Don't know

END IF

```

ELSE IF Q27k ==2
    Q27n Is it more than $600? 1 Yes 2 No 8888888 Refuse to answer 7777777
    Don't know
    IF Q27n == 2
        Q27o Is it less than $400? 1 Yes 2 No 8888888 Refuse to answer
        7777777 Don't know
        IF Q27o==1
            Q27p Is it more than $200? 1 Yes 2 No 8888888 Refuse to answer
            7777777 Don't know
        END IF
    END IF
END IF
END IF
END IF
END IF

```

Q28 Do you have life insurance for which you currently pay a premium or that is fully paid and still in force?

- 1 Yes
 - 2 No
 - 3 Don't Know
- IF Q28==1 (Yes)

Q28a What type of life insurance policy do you have?

- 1 Term life insurance
- 2 Whole life insurance or Universal life insurance
- 3 Don't know
- 4 Other, open...

END IF

Section 6: Preferences for Annuities [SCENARIOS]

We are going to show you some simple annuities and ask you to rate them. You can assume that the institution offering the annuity will pay the monthly benefit no matter the circumstances. Once you pay the premium, you receive monthly benefits and have nothing else to pay.

Each product has two attributes:

- a) a premium you have to pay;
- b) a monthly benefit starting at a given age and lasting until death.

The benefit is adjusted for inflation (indexed).

Q30-34

[SCENARIOS]

What are the chances, 0% meaning no chance and 100% meaning for sure, that you would purchase this product if it were offered to you by [a trusted / an] insurance company within the next year?

Numeric (0-100)

Randomize [a trusted / an] across individuals with probability 0.5, and keep constant for each respondent for questions 30-34 (i.e., present all of Q30-34 either with [a trusted] or with [an] for a given individual).

Scenarios randomization scheme

Parameters:

Age_benefit = [(age+1), 75,85] with probability [2/5, 2/5, 1/5]
where (age+1)=the age of the respondent+1

Benefit = [200,600,1000] each with probability 1/3

Load = [0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2.0]
each with probability 1/16

For each combination of Age_benefit and Benefit we provide EPremium, which is the fair premium by age and sex (3 x 3 = 9 data points; see table attached).

The premium for the contract is given by (please round to nearest \$500):

$$\text{prem} = \text{EPremium} \times \text{Load}$$

Randomize Age_benefit, Benefit and Load independently (3 x 3 x 16 possibilities) for 5 draws (i.e., each respondent is presented with 5 combinations of Age_benefit, Benefit, and “prem” according to the above probabilities).

Present each draw following this example:

When you buy the annuity	Starting at age [Age_benefit]
--------------------------	-------------------------------

You pay \$[prem]	You receive \$[Benefit] per month until death, indexed annually for inflation
------------------	---

FAIR PREMIUMS (VALUES FOR "EPremium")

For Age_benefit=age+1

Benefit = 200			Benefit = 600			Benefit = 1000		
Age	Male	Female	Age	Male	Female	Age	Male	Female
55-59	45,111.40	49,890.91	55-59	135,334.20	149,672.72	55-59	225,557.00	249,454.53
60-64	38,942.44	43,719.50	60-64	116,827.32	131,158.51	60-64	194,712.20	218,597.52
65-69	32,755.36	37,352.10	65-69	98,266.07	112,056.30	65-69	163,776.79	186,760.50
70-75	26,135.90	30,292.54	70-75	78,407.71	90,877.61	70-75	130,679.51	151,462.69

For Age_benefit=75

Benefit = 200			Benefit = 600			Benefit = 1000		
Age	Male	Female	Age	Male	Female	Age	Male	Female
55-59	13,691.16	17,442.92	55-59	41,073.47	52,328.77	55-59	68,455.79	87,214.61
60-64	15,677.30	19,700.10	60-64	47,031.89	59,100.30	60-64	78,386.48	98,500.51
65-69	18,361.54	22,559.95	65-69	55,084.62	67,679.85	65-69	91,807.70	112,799.74
70-75	22,467.80	26,560.34	70-75	67,403.40	79,681.01	70-75	112,339.00	132,801.69

For Age_benefit=85

Benefit = 200			Benefit = 600			Benefit = 1000		
Age	Male	Female	Age	Male	Female	Age	Male	Female
55-59	3,912.57	5,959.01	55-59	11,737.70	17,877.03	55-59	19,562.83	29,795.06
60-64	4,480.15	6,730.13	60-64	13,440.45	20,190.39	60-64	22,400.75	33,650.65
65-69	5,247.24	7,707.14	65-69	15,741.71	23,121.41	65-69	26,236.18	38,535.69
70-75	6,535.00	9,210.44	70-75	19,605.01	27,631.32	70-75	32,675.02	46,052.19

IF Q6 == 1

Section 5: Financial product to extract the equity value of a primary residence

For the purposes of this section, when we use the expression “**current home equity**”, we are referring to the current market value of your primary residence after subtracting outstanding mortgage balances. This section is going to ask you questions about financial products on the basis of your current home equity.

Imagine a financial product that lets you turn part of your current home equity into cash. You’re not obligated to make any payments until you move, you sell your home, or you die. You have the certainty that once your residence will be sold, the required amount to repay the loan will not exceed the selling price of the residence.

Q29 Have you ever heard of the existence of this type of financial product in Canada?

1 Yes

2 No

IF Q29 == 1

Q29a Can you name that product?

1 Yes

2 No

IF Q29a==1

[DROP-DOWN]

Q29b What is it called?

1 Annuity

2 Reverse mortgage

3 Life insurance

4 Line of credit

5 None of the above

END IF

END IF

Section 7: Preferences for Reverse Mortgages [SCENARIOS]

We will refer to a **reverse mortgage** as a financial product that lets you turn part of your current home equity into cash. Unlike many mortgage-based financial products, you're not obligated to make any payments until you move, you sell your home, or you die. Importantly, you have the certainty that once your residence will be sold, the amount required to repay the loan will not exceed the selling price of the residence.

When we use the expression "**current home equity**", we are referring to the current market value of your primary residence after subtracting outstanding mortgage balances. For the rest of this section, try to have your current home equity in mind.

We are going to show you some simple reverse mortgage products and ask you to rate them.

Each reverse mortgage has three attributes:

- a) The percentage of your current home equity that you can borrow. The amount borrowed must be a minimum of \$25,000.
- b) A fixed annual interest rate on the balance of the loan, generating interests that you do not need to pay before you move, sell or die.
- c) A fixed fee of \$2,245 that you only have to pay once. The money you obtain from the reverse mortgage will be used to pay this fee.

[Suppose you have the certainty that you will never be put under pressure to sell your residence and that the contract terms will be respected.]

Randomize the presence of the sentence above for each respondent with probability 0.5 and keep constant for questions 35-39.

Q35-Q39

[SCENARIOS]

What are the chances, 0% meaning no chance and 100% for sure, that you would buy this reverse mortgage if a trusted financial institution offered it to you within the next year?

Numeric (0-100)

IF Q35>0

Q35a In the event you purchased this reverse mortgage, considering you must borrow a minimum of \$25,000 and taking into account the maximum amount that can be borrowed (« Reverse Mortgage » of your current home equity), what amount of money do you think you would borrow?

Numeric (>=\$25,000)

END IF

[NOTE: REPEAT THE ABOVE SUB-QUESTION AFTER EACH OF Q35 TO Q39, USING THE EXACT SAME LOOP, WORDING AND CRITERIA]

END IF

Scenarios randomization scheme

Parameters:

Interest_rates = [3.8%, 4.1%, 4.4%, 4.7%, 5%, 5.3%, 5.59%, 6%, 6.5%, 7%] each with probability 1/10

Load = [0.5, 0.75, 1, 1.25, 1.5] each with probability 1/5

With these products we provide Borrow (see tables attached), which is the proportion that can be borrowed by city, marital status, age and sex.

The contract of the reverse mortgage is given by (please round to nearest percentage point):

$$\text{Reverse Mortgage} = \text{Borrow} \times \text{Load}$$

Randomize both Interest_rates and Load independently (10 x 5 possibilities) for 5 draws (i.e., each respondent is presented with 5 combinations of Interest_rates and “Reverse Mortgage” according to the above probabilities).

Present each draw following this example:

You can borrow a minimum of \$25,000 and up to [Reverse Mortgage] of your current home equity.
You will be charged a fixed annual interest rate of [Interest_rates] on the balance of the loan for as long as you hold the loan. <i>Reminder: You're not obligated to make any payments until you move, you sell your home, or you die; and you have the certainty that once your residence will be sold, the amount required to repay the loan will not exceed the selling price of the residence.</i>
There is a fixed fee of \$2,245 that you only have to pay once. The money you obtain from the reverse mortgage will be used to pay this fee.

VALUES FOR “Borrow”

[FOR COUPLES, PLEASE USE THE AVERAGE AGE OF THE COUPLE : $\frac{age+Q2a}{2}$, WHERE *age* IS THE RESPONDENT’S AGE GATHERED FROM THE SAMPLING/TARGETING. PLEASE ROUND THE RESULT TO THE NEAREST INTEGER AND SET THE AGE OF THE COUPLE AS 55 IF $\frac{age+Q2a}{2} < 55$ AND AS 79 IF $\frac{age+Q2a}{2} > 79$.]

If Q0 begins with H1, H2, H3, H4, H5, H8, H9 & Q2==1,2
(Island of Montreal, Couple)

Age	55-59	60-64	65-69	70-74	75-79
IF Q6a == 1, 7777777 (Single Family Dwelling / Detached Duplex, Triplex or Quadruplex / Link Home / Semi-Detached)	16.10%	23.10%	31.90%	39.10%	46.70%
IF Q6a == 2 (ownhouse, Rowhouse / Fiveplex and Sixplex / Attached Duplex. Triplex, or Quadruplex / Stratified SFD, Bare Land Strata / Semi-Detached Strata Condo / Modular Home)	15.30%	21.90%	30.30%	37.10%	44.50%
IF Q6a == 3 (Condo - Townhouse / Mobile Home / Condo – Townhouse)	12.90%	18.50%	25.50%	31.30%	37.50%

If Q0 begins with H1, H2, H3, H4, H5, H8, H9 & Q2==3,4,5,6 and sex is Male
(Island of Montreal, Single Male)

Age	55-59	60-64	65-69	70-74	75-79
IF Q6a == 1, 7777777 (Single Family Dwelling / Detached Duplex, Triplex or Quadruplex / Link Home / Semi-Detached)	25.10%	33.10%	39.10%	43.30%	49.90%
IF Q6a == 2 (Townhouse, Rowhouse / Fiveplex and Sixplex / Attached Duplex. Triplex, or Quadruplex / Stratified SFD, Bare Land Strata / Semi-Detached Strata Condo / Modular Home)	23.90%	31.50%	37.30%	41.10%	47.30%
IF Q6a == 3 (Condo - Townhouse / Mobile Home / Condo – Townhouse)	20.10%	26.50%	31.30%	34.70%	39.90%

If Q0 begins with H1, H2, H3, H4, H5, H8, H9 & Q2==3,4,5,6 & sex is Female
(Island of Montreal, Single Female)

Age	55-59	60-64	65-69	70-74	75-79
IF Q6a == 1, 7777777 (Single Family Dwelling / Detached Duplex, Triplex or Quadruplex / Link Home / Semi-Detached)	26.70%	33.10%	37.90%	39.90%	44.90%
IF Q6a == 2 (Townhouse, Rowhouse / Fiveplex and Sixplex / Attached Duplex. Triplex, or Quadruplex / Stratified SFD, Bare Land Strata / Semi-Detached Strata Condo / Modular Home)	25.50%	31.50%	36.10%	37.90%	42.70%
IF Q6a == 3 (Condo - Townhouse / Mobile Home / Condo – Townhouse)	21.50%	26.50%	30.30%	31.90%	36.10%

If Q0 is from Quebec and DOES NOT begin with H1, H2, H3, H4, H5, H8, H9 & Q2==1,2
(Rest of Quebec, Couple)

Age	55-59	60-64	65-69	70-74	75-79
IF Q6a == 1, 7777777 (Single Family Dwelling / Detached Duplex, Triplex or Quadruplex / Link Home / Semi-Detached)	15.03%	21.57%	29.77%	36.50%	43.63%
IF Q6a == 2 (Townhouse, Rowhouse / Fiveplex and Sixplex / Attached Duplex, Triplex, or Quadruplex / Stratified SFD, Bare Land Strata / Semi-Detached Strata Condo / Modular Home)	14.30%	20.50%	28.30%	34.70%	41.50%
IF Q6a == 3 (Condo - Townhouse / Mobile Home / Condo – Townhouse)	12.03%	17.30%	23.83%	29.23%	34.97%

If Q0 is from Quebec and DOES NOT begin with H1, H2, H3, H4, H5, H8, H9 & Q2==3,4,5,6 & sex is Male
(Rest of Quebec, Single Male)

Age	55-59	60-64	65-69	70-74	75-79
IF Q6a == 1, 7777777 (Single Family Dwelling / Detached Duplex, Triplex or Quadruplex / Link Home / Semi-Detached)	23.43%	30.90%	36.57%	40.43%	46.50%
IF Q6a == 2 (Townhouse, Rowhouse / Fiveplex and Sixplex / Attached Duplex, Triplex, or Quadruplex / Stratified SFD, Bare Land Strata / Semi-Detached Strata Condo / Modular Home)	22.30%	29.37%	34.77%	38.43%	44.17%
IF Q6a == 3 (Condo - Townhouse / Mobile Home / Condo – Townhouse)	18.77%	24.70%	29.30%	32.37%	37.23%

If Q0 is from Quebec and DOES NOT begin with H1, H2, H3, H4, H5, H8, H9 & Q2==3,4,5,6 & sex is Female
(Rest of Quebec, Single Female)

Age	55-59	60-64	65-69	70-74	75-79
IF Q6a == 1, 7777777 (Single Family Dwelling / Detached Duplex, Triplex or Quadruplex / Link Home / Semi-Detached)	24.97%	30.90%	35.43%	37.23%	41.97%
IF Q6a == 2 (Townhouse, Rowhouse / Fiveplex and Sixplex / Attached Duplex, Triplex, or Quadruplex / Stratified SFD, Bare Land Strata / Semi-Detached Strata Condo / Modular Home)	23.77%	29.37%	33.70%	35.43%	39.90%
IF Q6a == 3 (Condo - Townhouse / Mobile Home / Condo – Townhouse)	20.03%	24.70%	28.37%	29.83%	33.70%

If Q0 begins with M2, M3, M4G, M4H, M4J, M4K, M4M, M4L, M4M, M4N, M4P, M4R, M4S, M4T, M4V, M4W, M4X, M4Y, M5, M6, M7A, M9L, M9M, M9N & Q2==1,2
(City of Toronto, Couple)

Age	55-59	60-64	65-69	70-74	75-79
IF Q6a == 1, 7777777 (Single Family Dwelling / Detached Duplex, Triplex or Quadruplex / Link Home / Semi-Detached)	14.50%	21.10%	29.70%	36.90%	44.50%
IF Q6a == 2 (Townhouse, Rowhouse / Fiveplex and Sixplex / Attached Duplex. Triplex, or Quadruplex / Stratified SFD, Bare Land Strata / Semi-Detached Strata Condo / Modular Home)	13.70%	20.10%	28.30%	35.10%	42.30%
IF Q6a == 3 (Condo - Townhouse / Mobile Home / Condo – Townhouse)	11.50%	16.90%	23.70%	29.50%	35.70%

If Q0 begins with M2, M3, M4G, M4H, M4J, M4K, M4M, M4L, M4M, M4N, M4P, M4R, M4S, M4T, M4V, M4W, M4X, M4Y, M5, M6, M7A, M9L, M9M, M9N & Q2==3,4,5,6 & sex is Male
(City of Toronto, Single Male)

Age	55-59	60-64	65-69	70-74	75-79
IF Q6a == 1, 7777777 (Single Family Dwelling / Detached Duplex, Triplex or Quadruplex / Link Home / Semi-Detached)	23.10%	30.90%	36.90%	41.10%	47.70%
IF Q6a == 2 (Townhouse, Rowhouse / Fiveplex and Sixplex / Attached Duplex. Triplex, or Quadruplex / Stratified SFD, Bare Land Strata / Semi-Detached Strata Condo / Modular Home)	21.90%	29.30%	35.10%	39.10%	45.30%
IF Q6a == 3 (Condo - Townhouse / Mobile Home / Condo – Townhouse)	18.50%	24.70%	29.50%	32.90%	38.10%

If Q0 begins with M2, M3, M4G, M4H, M4J, M4K, M4M, M4L, M4M, M4N, M4P, M4R, M4S, M4T, M4V, M4W, M4X, M4Y, M5, M6, M7A, M9L, M9M, M9N & Q2==3,4,5,6 & sex is Female
(City of Toronto, Single Female)

Age	55-59	60-64	65-69	70-74	75-79
IF Q6a == 1, 7777777 (Single Family Dwelling / Detached Duplex, Triplex or Quadruplex / Link Home / Semi-Detached)	24.70%	30.90%	35.70%	37.70%	42.70%
IF Q6a == 2 (Townhouse, Rowhouse / Fiveplex and Sixplex / Attached Duplex. Triplex, or Quadruplex / Stratified SFD, Bare Land Strata / Semi-Detached Strata Condo / Modular)	23.50%	29.30%	33.90%	35.90%	40.70%
IF Q6a == 3 (Condo - Townhouse / Mobile Home / Condo – Townhouse)	19.70%	24.70%	28.50%	30.10%	34.30%

If Q0 is from Ontario and DOES NOT begin with M2, M3, M4G, M4H, M4J, M4K, M4M, M4L, M4M, M4N, M4P, M4R, M4S, M4T, M4V, M4W, M4X, M4Y, M5, M6, M7A, M9L, M9M, M9N & Q2==1,2
(Rest of Ontario, Couple)

Age	55-59	60-64	65-69	70-74	75-79
IF Q6a == 1, 7777777 (Single Family Dwelling / Detached Duplex, Triplex or Quadruplex / Link Home / Semi-Detached)	15.03%	21.77%	30.43%	37.63%	45.23%
IF Q6a == 2 (Townhouse, Rowhouse / Fiveplex and Sixplex / Attached Duplex. Triplex, or Quadruplex / Stratified SFD, Bare Land Strata / Semi-Detached Strata Condo / Modular Home)	14.23%	20.70%	28.97%	35.77%	43.03%
IF Q6a == 3 (Condo - Townhouse / Mobile Home / Condo – Townhouse)	11.97%	17.43%	24.30%	30.10%	36.30%

If Q0 is from Ontario and DOES NOT begin with M2, M3, M4G, M4H, M4J, M4K, M4M, M4L, M4M, M4N, M4P, M4R, M4S, M4T, M4V, M4W, M4X, M4Y, M5, M6, M7A, M9L, M9M, M9N & Q2==3,4,5,6 & sex is Male
(Rest of Ontario, Single Male)

Age	55-59	60-64	65-69	70-74	75-79
IF Q6a == 1, 7777777 (Single Family Dwelling / Detached Duplex, Triplex or Quadruplex / Link Home / Semi-Detached)	23.77%	31.63%	37.63%	41.83%	48.43%
IF Q6a == 2 (Townhouse, Rowhouse / Fiveplex and Sixplex / Attached Duplex. Triplex, or Quadruplex / Stratified SFD, Bare Land Strata / Semi-Detached Strata Condo / Modular Home)	22.57%	30.03%	35.83%	39.77%	45.97%
IF Q6a == 3 (Condo - Townhouse / Mobile Home / Condo – Townhouse)	19.03%	25.30%	30.10%	33.50%	38.70%

If Q0 is from Ontario and DOES NOT begin with M2, M3, M4G, M4H, M4J, M4K, M4M, M4L, M4M, M4N, M4P, M4R, M4S, M4T, M4V, M4W, M4X, M4Y, M5, M6, M7A, M9L, M9M, M9N & Q2==3,4,5,6 & sex is Female
(Rest of Ontario, Single Female)

Age	55-59	60-64	65-69	70-74	75-79
IF Q6a == 1, 7777777 (Single Family Dwelling / Detached Duplex, Triplex or Quadruplex / Link Home / Semi-Detached)	25.37%	31.63%	36.43%	38.43%	43.43%
IF Q6a == 2 (Townhouse, Rowhouse / Fiveplex and Sixplex / Attached Duplex. Triplex, or Quadruplex / Stratified SFD, Bare Land Strata / Semi-Detached Strata Condo / Modular Home)	24.17%	30.03%	34.63%	36.57%	41.37%
IF Q6a == 3 (Condo - Townhouse / Mobile Home / Condo – Townhouse)	20.30%	25.30%	29.10%	30.70%	34.90%

If Q0 begins with V5K, V5L, V5M, V5N, V5P, V5R, V5S, V5T, V5V, V5W, V5Y, V6A, V6B, V6C, V6E, V6G, V6H, V6J, V6K, V6L, V6M, V6N, V6P, V6R, V6S, V6T, V6Z, V7G, V7H, V7J, V7K, V7L, V7M, V7N, V7P, V7R, V7S, V7T, V7V, V7W, V7X, V7T & Q2==1,2

(City of Vancouver, Couple)

Age	55-59	60-64	65-69	70-74	75-79
IF Q6a == 1, 7777777 (Single Family Dwelling / Detached Duplex, Triplex or Quadruplex / Link Home / Semi-Detached)	15.30%	22.10%	30.70%	37.90%	45.70%
IF Q6a == 2 (Townhouse, Rowhouse / Fiveplex and Sixplex / Attached Duplex. Triplex, or Quadruplex / Stratified SFD, Bare Land Strata / Semi-Detached Strata Condo / Modular Home)	14.50%	21.10%	29.30%	36.10%	43.30%
IF Q6a == 3 (Condo - Townhouse / Mobile Home / Condo – Townhouse)	12.30%	17.70%	24.70%	30.50%	36.50%

If Q0 begins with V5K, V5L, V5M, V5N, V5P, V5R, V5S, V5T, V5V, V5W, V5Y, V6A, V6B, V6C, V6E, V6G, V6H, V6J, V6K, V6L, V6M, V6N, V6P, V6R, V6S, V6T, V6Z, V7G, V7H, V7J, V7K, V7L, V7M, V7N, V7P, V7R, V7S, V7T, V7V, V7W, V7X, V7T & Q2==3,4,5,6 & sex is Male

(City of Vancouver, Single Male)

Age	55-59	60-64	65-69	70-74	75-79
IF Q6a == 1, 7777777 (Single Family Dwelling / Detached Duplex, Triplex or Quadruplex / Link Home / Semi-Detached)	24.10%	31.90%	38.10%	42.30%	48.70%
IF Q6a == 2 (Townhouse, Rowhouse / Fiveplex and Sixplex / Attached Duplex. Triplex, or Quadruplex / Stratified SFD, Bare Land Strata / Semi-Detached Strata Condo / Modular Home)	22.90%	30.30%	36.10%	40.10%	46.30%
IF Q6a == 3 (Condo - Townhouse / Mobile Home / Condo – Townhouse)	19.30%	25.70%	30.50%	33.70%	38.90%

If Q0 begins with V5K, V5L, V5M, V5N, V5P, V5R, V5S, V5T, V5V, V5W, V5Y, V6A, V6B, V6C, V6E, V6G, V6H, V6J, V6K, V6L, V6M, V6N, V6P, V6R, V6S, V6T, V6Z, V7G, V7H, V7J, V7K, V7L, V7M, V7N, V7P, V7R, V7S, V7T, V7V, V7W, V7X, V7T & Q2==3,4,5,6 & sex is Female

(City of Vancouver, Single Female)

Age	55-59	60-64	65-69	70-74	75-79
IF Q6a == 1, 7777777 (Single Family Dwelling / Detached Duplex, Triplex or Quadruplex / Link Home / Semi-Detached)	25.70%	31.90%	36.70%	38.90%	43.90%
IF Q6a == 2 (Townhouse, Rowhouse / Fiveplex and Sixplex / Attached Duplex. Triplex, or Quadruplex / Stratified SFD, Bare Land Strata / Semi-Detached Strata Condo / Modular Home)	24.50%	30.30%	34.90%	36.90%	41.70%
IF Q6a == 3 (Condo - Townhouse / Mobile Home / Condo – Townhouse)	20.50%	25.50%	29.50%	31.10%	35.10%

If Q0 is from British Columbia and DOES NOT begin with V5K, V5L, V5M, V5N, V5P, V5R, V5S, V5T, V5V, V5W, V5Y, V6A, V6B, V6C, V6E, V6G, V6H, V6J, V6K, V6L, V6M, V6N, V6P, V6R, V6S, V6T, V6Z, V7G, V7H, V7J, V7K, V7L, V7M, V7N, V7P, V7R, V7S, V7T, V7V, V7W, V7X, V7T & Q2==1,2

(Rest of British Columbia, Couple)

Age	55-59	60-64	65-69	70-74	75-79
IF Q6a == 1, 7777777 (Single Family Dwelling / Detached Duplex, Triplex or Quadruplex / Link Home / Semi-Detached)	14.50%	20.97%	29.03%	35.77%	42.97%
IF Q6a == 2 (Townhouse, Rowhouse / Fiveplex and Sixplex / Attached Duplex, Triplex, or Quadruplex / Stratified SFD, Bare Land Strata / Semi-Detached Strata Condo / Modular Home)	13.77%	19.97%	27.70%	34.03%	40.83%
IF Q6a == 3 (Condo - Townhouse / Mobile Home / Condo – Townhouse)	11.70%	16.83%	23.30%	28.70%	34.37%

If Q0 is from British Columbia and DOES NOT begin with V5K, V5L, V5M, V5N, V5P, V5R, V5S, V5T, V5V, V5W, V5Y, V6A, V6B, V6C, V6E, V6G, V6H, V6J, V6K, V6L, V6M, V6N, V6P, V6R, V6S, V6T, V6Z, V7G, V7H, V7J, V7K, V7L, V7M, V7N, V7P, V7R, V7S, V7T, V7V, V7W, V7X, V7T & Q2==3,4,5,6 & sex is Male

(Rest of British Columbia, Single Male)

Age	55-59	60-64	65-69	70-74	75-79
IF Q6a == 1, 7777777 (Single Family Dwelling / Detached Duplex, Triplex or Quadruplex / Link Home / Semi-Detached)	22.83%	30.17%	35.90%	39.77%	45.83%
IF Q6a == 2 (Townhouse, Rowhouse / Fiveplex and Sixplex / Attached Duplex, Triplex, or Quadruplex / Stratified SFD, Bare Land Strata / Semi-Detached Strata Condo / Modular Home)	21.70%	28.70%	34.03%	37.77%	43.50%
IF Q6a == 3 (Condo - Townhouse / Mobile Home / Condo – Townhouse)	18.23%	24.17%	28.77%	31.77%	36.63%

If Q0 is from British Columbia and DOES NOT begin with V5K, V5L, V5M, V5N, V5P, V5R, V5S, V5T, V5V, V5W, V5Y, V6A, V6B, V6C, V6E, V6G, V6H, V6J, V6K, V6L, V6M, V6N, V6P, V6R, V6S, V6T, V6Z, V7G, V7H, V7J, V7K, V7L, V7M, V7N, V7P, V7R, V7S, V7T, V7V, V7W, V7X, V7T & Q2==3,4,5,6 & sex is Female

(Rest of British Columbia Single Female)

Age	55-59	60-64	65-69	70-74	75-79
IF Q6a == 1, 7777777 (Single Family Dwelling / Detached Duplex, Triplex or Quadruplex / Link Home / Semi-Detached)	24.37%	30.17%	34.70%	36.63%	41.30%
IF Q6a == 2 (Townhouse, Rowhouse / Fiveplex and Sixplex / Attached Duplex, Triplex, or Quadruplex / Stratified SFD, Bare Land Strata / Semi-Detached Strata Condo / Modular Home)	23.10%	28.70%	32.97%	34.77%	39.30%
IF Q6a == 3 (Condo - Townhouse / Mobile Home / Condo – Townhouse)	19.43%	24.10%	27.83%	29.30%	33.10%