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FRAMES, INCENTIVES, AND EDUCATION: EFFECTIVENESS OF INTERVENTIONS TO DELAY PUBLIC PENSION CLAIMING

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ABSTRACT

Many people forgo a higher stream of public pension income by claiming early. We provide both quasi-experimental and survey-experimental evidence that the timing of public pension claiming is relatively inelastic to changes in financial incentives in Canada. Using the survey experiment, we evaluate the effect of two different educational interventions and different ways of framing the incentive to delay claiming. While all three types of interventions induce delays, these interventions have heterogeneous financial consequences for participants who react.

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1 Introduction

Public pensions are a critical building block of retirees' income. They have become more important in recent years as people live longer and traditional defined-benefit pension plans that protect against longevity risk are declining.[1] The age at which individuals claim their public pension directly impacts the level of pension payments (annuity income). In Canada, the degree of actuarial fairness in pension adjustments for early and late claiming has improved over the years (Milligan and Schirle, 2021). The implicit return from delaying claiming can be well above most investment products with similar risk. Policy circles often discuss the possibility of increasing annuitization in the current environment by encouraging delaying claiming.[2]

Yet, many Canadians claim their public pensions at the earliest age, foregoing higher pension payments in the future.[3] Similar trends are observed in other countries, particularly the United States (Shoven and Slavov, 2014; Slavov, 2023). Delaying claiming is akin to purchasing a deferred annuity: people sacrifice current benefits (the price) for higher future benefits (the annuity). The same reasons for the low take-up of life annuities thus help explain early claiming (Benartzi et al., 2011). While some find full annuitization is optimal (Davidoff et al., 2005), early claiming can be perfectly rational once we account for other factors. One key factor is longevity risk. Penalties for early claiming reflect the mortality prospects of the average retiree, but the life expectancy is distributed unequally across socioeconomic groups.[4] The fewer retirement years remaining, the lower the present value

[1] According to Statistic Canada, a 65-year-old today can expect to live 23.6 more years compared to 18 more years 40 years ago; this number is projected to climb to 28 more years in less than 40 years. At the same time, two-thirds of individuals with a private pension plan have a defined-benefit plan, compared to 85% at the turn of the century (pension coverage statistics from Table 11-10-0016-01 of Statistics Canada.)

[2] For example, the Canadian Institute of Actuaries proposed increasing the earliest age at which benefits someone can claim benefits from 60 to 62 `https://www.cia-ica.ca/docs/default-source/Public-Statement/219042e.pdf`.

[3] Historically, the earliest pension claiming age in Canada was 65 until Québec allowed for early claiming at age 60 in 1984. The rest of Canada followed in 1987. Since then, the fraction claiming at the earliest age increased steadily to around 30% in 2019. See Appendix Figure A.1.

[4] Milligan and Schirle (2021) document that men in the top ventile of the income distribution live on average 8 more years (4 more years for women). Lacroix et al. (2021) estimate that a college education

of expected benefit payoffs. Those in poor health or expecting not to live long are likely better off claiming early.

This paper studies the impact of various interventions to delay claiming on claiming behavior and the present value of expected pension benefits. We start by investigating how sensitive people are to the financial incentives embedded in Canada's largest public pension program—the Canada and Québec Pension Plans. We empirically identify the causal effect by exploiting a policy reform that creates exogenous variation in financial incentives across regions and birth cohorts. To investigate whether other policy tools, such as education and framing, incentivize delays, we run a survey experiment with over 3,000 Canadians nearing retirement. The experiment randomly assigns participants to a control group and one of two education treatments. Respondents then choose a claiming age in six hypothetical choice scenarios that introduce variation in financial incentives and the framing of the claiming decision.

We find robust evidence that financial incentives affect individuals' claiming decisions, but the effects are quantitatively small. Exploiting the reform-induced variation in incentives, we conclude that a 10% increase in the pension accrual—the gain in the present value of pension benefits from claiming one year later—reduces the probability of claiming today by 1.2% (an elasticity of -0.12). We also find that claiming choices in the survey are equally insensitive to financial incentives, despite the magnitude of variation in incentives being much larger. In the survey, the elasticity of the claiming hazard with respect to the pension accrual is -0.10. Moreover, financial incentives do not impact people's decision when to retire.

Our results further suggest that education and framing can be effective tools to influence claiming decisions. The first education treatment informs respondents about the break-even age, a popular decision tool among financial advisors. It is the age at which an individual recoups the lost benefits from delaying claiming one year. The second treatment shows

increases life expectancy by over 4 years.

respondents gender-specific survival rates and informs them about the insurance value of postponing claiming. Both treatments induce respondents who are optimistic about their survival prospects to claim early, while pessimistic respondents delay claiming. Moreover, framing the claiming decision around a normal retirement age of 67 instead of 65 induces substantial delays, suggesting that the normal retirement age is an important policy lever to affect claiming. In contrast, framing the claiming decision in terms of loss versus gains in benefits or showing monthly versus annual payments has no impact on the timing of claiming.

While understanding the effectiveness of an intervention for postponing claiming is important, the rewards from delaying are likely heterogeneous across individuals and interventions. For instance, a policy could incentivize delays for individuals for whom it was optimal to claim early based on their longevity. While such an intervention might be effective, it may not be desirable when evaluated against what economic theory prescribes. To investigate the rewards of delaying, we use a microsimulation model of health that predicts individual-specific survival rates and the claiming age with the highest present discounted value of pension benefits given respondents' longevity. We can then examine whether different interventions improve respondents' financial loss from not picking the claiming age with the highest present discounted value.

We find that stronger financial incentives raise the value of expected pension benefits despite their minor effect on claiming decisions. Similarly, we find that educating people improve their financial outcomes, on average. Using framing to change claiming behavior is attractive from a cost-effectiveness perspective, but it does not have a noticeable impact on respondents' value of expected pension benefits. Overall, our results suggest that incentivizing delays in claiming does not necessarily improve the financial return from public pensions.

Our finding that financial incentives have minor impacts on pension claiming and retirement is consistent with previous literature. Most studies focus on workers' retirement decisions, while few examine how financial incentives affect claiming behavior. Lalive et al. (2023) show in the context of a Swiss reform that pension claiming reacts little to substantial penalties for early claiming. Gorry et al. (2022) provide similar evidence for the US. Manoli and Weber (2016) present evidence for Austria that the elasticity of labor market participation to financial incentives ranges between 0.1 and 0.3. Others find larger responsiveness. For example, Liebman et al. (2009) reports larger effects on retirement and hours worked in the United States.[5]

Our paper also contributes to the literature on the effects of education and framing on benefit claiming and labor supply. When evaluating deferred annuities, (Brown et al., 2017) show that individuals lack financial literacy and misperceive longevity risk. These findings suggest that education and information may work to induce later claiming, but the existing evidence is limited. Mastrobuoni (2011) finds a positive effect of the introduction of the Social Security statement in the US. on pension benefit knowledge but no effect on retirement and claiming behavior. The statement's introduction also does not impact how individuals react to financial incentives. However, Liebman and Luttmer (2015) find evidence that workers are willing to work longer once they learn more about the earnings test—a measure that penalizes work while receiving benefits.

There is some evidence that framing can incentivize delays. For example, individuals are less willing to buy annuities if the choice focuses on the investment aspect rather than the consumption value of annuities (Brown et al., 2008). Lalive et al. (2023) and Gruber et al. (2022) show that a change in the full retirement age with no or minimal changes in penalties generates a substantial amount of delays in claiming. Similarly, Mastrobuoni (2009) and Behaghel and Blau (2012) report that the claiming hazard peak at the normal retirement age moves in lockstep with the recent increases in the normal retirement age

[5] An extensive literature estimates the impact of financial incentives in retirement using cross-sectional variation in incentives. See Lumsdaine and Mitchell (1999) and Coile and Gruber (2007) for a review of this work. Different forms of financial incentives may impact claiming decisions. Maurer et al. (2021) explore the possibility of offering lump-sums when participants delay and find evidence of increased delays.

in the US. Seibold (2021) exploits reference dependence in the German pension system and finds evidence that individuals' retirement decisions are sensitive to reference points. Our finding that the claiming peaks track the statutory retirement age is consistent with reference points playing an important role.

The paper is organized as follows. Section 2 presents the empirical results on the impact of financial incentives using the natural experiment in Canada. Section 3 describes the survey experiments. Section 4 presents the empirical results on the impact of education, frames, and financial incentives in the survey. Section 5 assesses whether the claiming responses from the survey experiments improve respondents' present discounted value of expected pension benefits. Finally, Section 6 concludes.

2 Changes in Financial Incentives: Quasi-Experimental Evidence

Until 2011, workers could claim a Canada and Québec Pension Plan (CPP and QPP, respectively) retirement pension at any age between 60 and 70, subject to a penalty and a bonus of 6% per year of claiming before and after age 65.[6] For example, a person claiming at age 60 would receive a pension 30% lower than the payment at age 65. In contrast, a person claiming at age 70 would receive a pension that was 30% higher than at age 65. In an attempt to strengthen incentives for claiming and retiring later, a 2010 pension reform increased the penalty and the bonus for early and late claiming. Notably, these changes

[6]The Canadian retirement income system has three pillars. The first pillar offers a fixed benefit starting at 65 (based on the number of years in Canada), which is means-tested against other pension income. A supplement is also paid to those with low pension income, but it is means-tested at a high rate. The second pillar is the CPP and QPP (in Québec), a scheme similar to Social Security in the United States. At age 65, the program replaces 25% of a measure of lifetime earnings up to a maximum, set closely to average earnings. The replacement rate from this program therefore declines rapidly with earnings. Contributions are split equally between employers and workers. Workers can claim as early as 60 and as late as 70. There is a malus for claiming early and a bonus for claiming after age 65. In 2016, the CPP introduced a new top-up, increasing the replacement to 33% and the maximum earnings admissible for contributions in the coming decades. The last pillar comprises defined benefit and defined contribution employer-provided pensions. Several voluntary savings programs, often with tax-preferred treatment, complete the system.

were implemented gradually and differently in the CPP and the QPP, creating independent variation in pension adjustment factors (PAFs) across time and pension plans.

Table 1 illustrates the variation in PAFs. Between 2012 and 2016, the CPP increased the early claiming penalty in five steps from 6 to 7.2% per year of claiming before age 65. The QPP increased the early claiming penalty by the same amount but did so in only three increments starting in 2014. Moreover, the new penalties were lower for people with a pension below the maximum pension. For example, after being fully phased in, a person with a pension worth half the maximum pension would incur an early claiming penalty of 6.6% per year, instead of 7.2%. Moreover, the reform increased the bonus for delaying claiming post age 65 from 6 to 8.4% per year, equivalent to a 12% benefit increase for someone who claimed at age 70. The timing of the increase also differed across the two plans. The CPP increased the bonus in three steps between 2011 and 2013, while the QPP increased it in a single step in 2013.

Table 1: Pension Adjustment Factors per Year of Claiming Before/After Age 65 (%)

Year	Penalty Pre-65		Bonus Post-65	
	CPP	QPP	CPP	QPP
< 2011	6	6	6	6
2011	6	6	6.84	6
2012	6.24	6	7.68	6
2013	6.48	6	8.4	8.4
2014	6.72	$6 + 0.36 \cdot (b/b^{\max})^*$	8.4	8.4
2015	6.96	$6 + 0.72 \cdot (b/b^{\max})^*$	8.4	8.4
≥ 2016	7.20	$6 + 1.2 \cdot (b/b^{\max})^*$	8.4	8.4

Notes: * Individuals born before 1954 are exempt from these changes; b is the potential QPP pension at age 65 and b^{max} is the maximal QPP pension at age 65.

The CPP reform implemented one additional change that may matter for our analysis. Before 2012, individuals who claimed a CPP pension prior to age 65 had to earn less than the maximum monthly benefit ($960 in 2011) in the month before and the month of the first benefit payment. The CPP abolished this work cessation test on January 1, 2012, which may affect older workers' retirement and claiming decisions. The QPP abolished the work cessation test two years later, in 2014.

Data and Sample. Our empirical analysis relies on the Longitudinal Administrative Database (LAD), a representative panel of 20% of Canadian tax filers from 1982 to 2018. The LAD is ideal for our analysis for two reasons. First, it contains detailed information on variables needed for our analysis: demographics, earnings, and transfers, including public pension benefits. Second, each individual's potential pension benefits—an essential variable in our analysis—depend on lifetime earnings. Since the LAD follows individuals for 35 years, we observe earnings for almost their entire working years, enabling us to calculate people's potential pensions with great precision.[7]

Our main analysis sample covers all individuals born between 1935 and 1958, ensuring we observe them at least until age 60, when most Canadians claim their pensions. We do not consider individuals born before 1935, because earlier cohorts could benefit from a reduction in the early claiming age from age 65 to age 60 (Staubli and Zhao, 2022). We extract all individuals' entire labor market history from the first age they were observed in the data until age 70, the last age somebody can claim a CPP or QPP pension. We impose one restriction: we drop individuals who never earned more than $3,500 per year before age 60. Each year in which an individual earned $3,500 or more counts as a contribution year. Only individuals with at least one contribution year are eligible for a CPP/QPP pension.[8]

Appendix B.1 describes the steps for calculating potential pension benefits at each age. The pension benefit increases with total lifetime earnings and the number of contribution years between age of 18 and the pension claiming age. We use the earnings information

[7]Tax data does not distinguish the type of benefit claimed while we focus our analysis on the retiree benefit. Hence, some of those we identify as claiming a retiree benefit may receive other benefits. One that is relevant in this age range is the survivor benefit. However, the incidence of those types of benefits is relatively low, even at these ages.

[8]Appendix Table B.1 provides summary statistics of our analysis sample, separately for Québec and the rest of Canada before and after the 2011 reform.

in the LAD to calculate total lifetime earnings and the number of contribution years. We then calculate potential pension benefits using the pension formula.[9]

2.1 Empirical Strategy

Our empirical strategy exploits the exogenous variation in PAF induced by the 2010 reform to estimate the causal effect of pension benefit generosity on pension claiming. Our baseline regression is as follows:

$$Y_{i,a,p,t} = \beta_0 + \beta_1 PDV_{i,a,p,t} + \beta_2 ACC_{i,a,p,t} + \theta_t + \pi_p + \lambda_a + \mathbf{X}'_{i,a,p,t}\gamma + \varepsilon_{i,a,p,t} \tag{1}$$

where $Y_{i,a,p,t}$ is the outcome variable for individual i, at age a, in p, and in year t. PDV is the expected present discounted value of pension benefits. It is defined as

$$PDV_{i,a,p,t} = \sum_{k=60}^{T=110} \beta^{k-60} s_{k,p} B_{i,a,p,t} \mathbf{1}(k \geq a)$$

where $\beta = 0.97$ is the discount factor, $s_{k,p,t}$ is the probability of being alive at age k conditional on being alive at age 60, and B_a is the annual pension at claiming age a (calculated following the steps described in Appendix B.1). ACC is the pension accrual, which captures the change in the PDV from delaying claiming by one year, i.e., $ACC_a = PDV_{a+1} - PDV_a$.[10] In the baseline specification, we control for year fixed effects (θ_t), province fixed effects (π_p), and age fixed effects (λ_a) to capture the spikes in the claiming hazard at the early and normal retirement age. In additional specifications, we also include background characteristics (X_{iapt}).[11]. Specification (1) is similar to those in previous studies (e.g., Gruber and Wise, 1998, Coile and Gruber, 2007), but we use plausibly exogenous variation in benefit levels. In contrast, previous studies have mostly relied

[9] To verify the accuracy of our calculation, Appendix Figure B.2 plots the mean matched pension benefits against mean predicted pension benefits. Actual pension benefits track the predicted pension benefits very closely.

[10] Appendix Figure B.3 illustrates the ACC distribution by age for the Québec Pension Plan and the rest of Canada before and after the 2011 reform.

[11] Dummies for marital status and gender, tax-deductible medical expenditures as a proxy for health, a fourth-order in last earnings, and a fourth-order polynomial in lifetime earnings

on cross-sectional variation, which could be correlated with unobserved factors.

Our main outcome variable Y is a dummy for whether an individual claimed a CPP or QPP pension at age a, in province p, and year t. The main parameter of interest is β_2, which captures the effect of financial incentives to delay claiming. By delaying claiming one year, individuals forgo one year of benefits, but they also "buy" an option to get higher pension benefits in all future years. The higher the PAF, the larger the financial gains from delaying claiming by one year. Thus, we expect that $\beta_2 < 0$: the higher the accrual, the more likely an individual would be to defer claiming. In contrast, β_1 captures the wealth effects of pensions: higher pension wealth will likely induce individuals to claim their pensions earlier. For better comparability, we convert the β_2-estimate into an elasticity, $\varepsilon = \beta_2 \frac{\overline{ACC}}{\overline{y}}$, where $\overline{ACC}$ and $\overline{y}$ are sample means.

The identifying assumption is that, absent the reform-induced change in the PAFs, trends in $Y_{i,a,p,t}$ would have been the same in Québec and the rest of Canada. We explore the validity of this assumption by testing whether key outcomes followed the same trends in the pre-reform period. One concern is that the CPP and QPP abolished the work cessation test in 2012 and 2014, respectively, which could impact benefit claiming independent of the change in $PAFs$. To account for these changes, we run one specification with two additional interaction terms: a dummy for the rest of Canada times a dummy for the year being greater than 2012, and a dummy for Québec times a dummy for the year being greater than 2014.

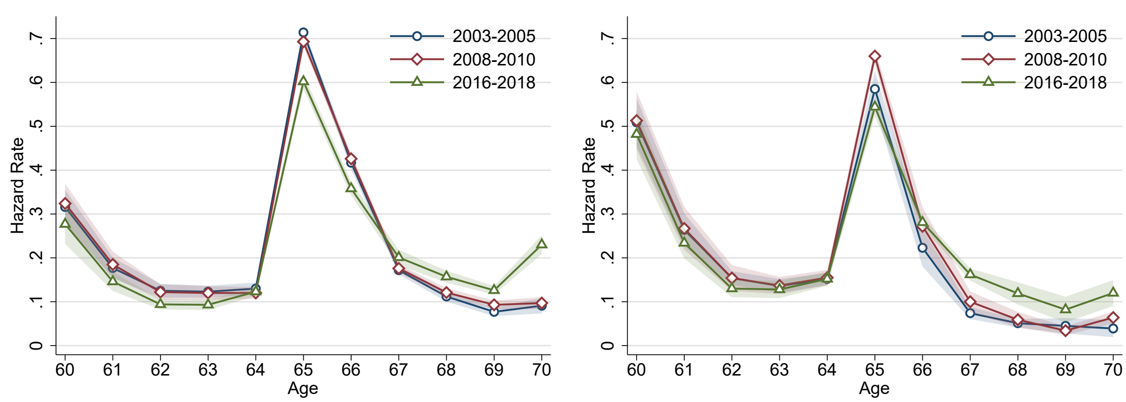
In our preferred specification, we also include the pre-reform ACC and PDV as additional controls. Variation in the ACC and the PDV stem from exogenous changes induced by the 2010 reform, and individual characteristics. Specifically, the ACC and PDV are nonlinear functions of past earnings, and the claiming decision could be correlated with past earnings, leading to biased estimates even after controlling for past earnings. As Nielsen et al. (2010), Mullen and Staubli (2016), and Fevang et al. (2017) show in other contexts, conditioning on the pre-reform ACC and PDV guarantees that the actual ACC and PDV isolate the exogenous variation from the reform.

2.2 Results

We start our analysis by comparing the age profiles of the claiming hazards in the rest of Canada and Québec across different years. This analysis illustrates distributional changes in claiming. Figure A.1 shows that the claiming hazard age profiles were very similar in the pre-reform years (2003-2005 and 2008-2010). As in other countries, the claiming hazard shows significant peaks at the early retirement age of 60 and the full retirement age of 65. About 30 percent of people in the rest of Canada claim their pension at the early retirement age, and the share of people claiming at age 60 is even higher in Québec, about 50 percent.

Figure 1: Claiming Hazards in the Rest of Canada and Québec, Pre- and Post-Reform

(a) Rest of Canada (b) Québec



Notes: Own calculation based on data from the Longitudinal Administrative Database (LAD), 2003-2018.

The figure shows that the reform-induced changes in PAF induce individuals to delay pension claiming. The post-reform claiming hazard (2016-2018) drops at each age between 60 and 64, consistent with the reform raising the penalty for claiming a pension prior to age 65. The claiming hazard at age 65 also drops, suggesting that some people who would have claimed at age 65 before the reform take advantage of the higher bonus for claiming after age 65. Consistent with more people delaying claiming, we see that the post-reform claiming hazard is higher after age 65, both in the rest of Canada and Québec.

Table 2: Main Estimates for Pension Claiming Hazard

	(1)	(2)	(3)	(4)	(5)	(6)
ACC	-0.331***	-0.829***	-0.826***	-0.818***	-0.746***	-0.902***
	(0.097)	(0.083)	(0.08)	(0.083)	(0.074)	(0.106)
PDV	0.066***	0.116***	0.116***	0.116***	0.113***	0.121***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.038)
ACC elasticity	-0.045***	-0.114***	-0.113***	-0.112***	-0.102***	-0.123***
	(0.013)	(0.011)	(0.011)	(0.011)	(0.01)	(0.015)
SES controls	NO	YES	YES	YES	YES	YES
Age×QUE FE	NO	NO	YES	YES	YES	YES
ROC×2012	NO	NO	NO	YES	YES	YES
QUE×2014	NO	NO	NO	NO	YES	YES
Pre-2011 incentives	NO	NO	NO	NO	NO	YES
No. Obs.	4,551,390	4,551,390	4,551,390	4,551,390	4,551,390	4,551,390
R^2	0.136	0.148	0.155	0.155	0.155	0.155

Notes: The table reports estimates from linear regression models where the dependent variable is the hazard of claiming (=1 if claims at age a and zero if not). The variables ACC (pension accrual) and PDV (present discounted value of pension benefits) are reported in hundred thousand dollars. The elasticity is computed at the mean of the claiming hazard and ACC. Specification 1 includes year, province, and age fixed effects. Specification 2 adds controls for health, gender, marital status, number of kids, lifetime earnings, and last earnings. Specification 3 adds Québec times age fixed effects. Specification 4 adds a Post 2012 times ROC dummy. Specification 5 adds a Post 2014 times Québec dummy. Finally, specification 6 adds controls for the pre-2011 ACC and PDV. Standard errors are clustered at census division level. *** p<0.01, ** p<0.05, * p<0.1

Table 2 presents the estimates from equation (1) for alternative specifications. The outcome variable is always a dummy for pension claiming. Since we drop individuals from the sample after they claimed, the coefficient estimates capture the impact on the claiming hazard. Across all specifications, we find robust evidence that financial incentives influence the timing of pension claims. The estimates are statistically significant and quantitatively similar, except for the baseline specification in column 1 where they are about half as large. Our preferred specification is column 6, which flexibly controls for background characteristics and includes the pre-reform ACC and PDV as additional controls. It suggests that a \$100,000 ACC increase reduces the claiming hazard by 0.902 percentage points, while a \$100,000 PDV increase raises the claiming hazard by 0.121 percentage points. Multiplying the ACC estimate with the average ACC and dividing by the average claiming hazard implies an elasticity of -0.123.

While not the focus of our analysis, Appendix Figure B.4 shows the age profile of the retirement hazard in the rest of Canada and Québec across different years. Appendix Table B.2 presents the corresponding retirement hazard estimates from equation (1). Retirement is a dummy for the last age an individual has positive earnings. The figure illustrates that retirement hazards change little across years, suggesting that the impact of public pensions on the timing of retirement is small. Consistent with this view, Appendix Table B.2 shows that the elasticity of the retirement hazard with respect to the ACC is much smaller than the claiming hazard elasticity and is insignificant when we control for the pre-reform ACC and PDV.

The empirical strategy's identifying assumption is that, absent the policy reform, trends in the outcome variables would have evolved in parallel in Québec and the rest of Canada. To shed light on the validity of the assumption, we estimate a variant of equation 1 that replaces ACC and PDV with interaction terms of a Québec dummy times a year dummy, spanning the years 2005 to 2018. The years before 2005 are the reference period. Appendix Figure B.5 plots the estimated interaction term coefficients for the ACC, the pension claiming hazard, and the retirement hazard. For all outcomes, the coefficient estimates for the pre-reform years (2005-2010) are close to zero and statistically insignificant, providing strong support for the validity of the identifying assumption. Panel (a) shows that the ACC differs significantly between Québec and the rest of Canada during the post-reform years. The sign and magnitude of the estimates align with the reform-induced differences in

PAFs. Panel (b) shows that the claiming hazard also starts to diverge between Québec and the rest of Canada during the post-reform years. The estimates are almost the mirror image of the *ACC* estimates: they are negative and large when the *ACC* estimates are positive and large, and vice versa. In contrast, Panel (c) shows that the retirement hazard differs little during the post-reform years between Québec and the rest of Canada, consistent with the small *ACC*-elasticities for the retirement hazard (Appendix Table B.2).

We also explore the heterogeneity in responsiveness across different population subgroups. Table 3 reports the corresponding ACC elasticity estimates for our preferred specification. We find that individuals with above-median average lifetime earnings are significantly more responsive than those with below-lifetime earnings. Similarly, individuals with above-median pension benefits respond more strongly to financial incentives than those with below-median pensions. One explanation is that liquidity constraints force individuals with below-median earnings and pensions to claim their pensions as early as possible, independent of financial penalties. We find that men and single individuals are more responsive than women and married individuals, but the differences are small. We also find that sick—compared to healthy—individuals are less responsive because they tend to claim early independent of financial incentives. Finally, we find that individuals with an employer pension plan are less responsive, as they likely claim their CPP/QPP pensions around the time they claim their employer pensions.

3 The Stated-Choice Experiment

To examine the findings from the previous section in more detail, we fielded a survey experiment on pension claiming in November 2019 using the online survey panel *Asking Canadians*, targeting participants from all Canadian provinces age 55-59. Overall, 3,055 respondents completed the survey.[12] We first provide an overview of the survey structure before presenting each component in more detail.

[12] Each respondent is compensated for their participation in the survey. Compensation is paid by the survey organization using loyalty points at major Canadian outlets for participating in the panel.

Table 3: Heterogeneity Estimates for Pension Claiming Hazard

	No		Yes		Equality
	ACC elasticity	SE	*ACC* elasticity	SE	p-value
	(1)	(2)	(3)	(4)	(5)
High Avg. Earnings	-0.057***	(0.011)	-0.167***	(0.018)	0.000
High Pension	-0.082***	(0.01)	-0.153***	(0.018)	0.000
Female	-0.107***	(0.017)	-0.134***	(0.013)	0.001
Married	-0.141***	(0.014)	-0.117***	(0.016)	0.002
Health Problems	-0.151***	(0.014)	-0.066***	(0.013)	0.000
Employer Pension	-0.147***	(0.012)	-0.084***	(0.019)	0.000

Notes: The table reports estimates from a linear regression model, corresponding to specification 5 in table 2. The dependent variable is the hazard of claiming (=1 if claims at age a and zero if not). The elasticity is computed at the mean of the claiming hazard and ACC. The p-value for the test statistic testing the equality of the elasticities is also reported. Healthy (unhealthy) individuals have below-median (above-median) tax-deductible medical expenditures. Standard errors are clustered at census division level. *** p<0.01, ** p<0.05, * p<0.1

Our survey consists of two parts. First, we elicit individuals' socioeconomic characteristics, preferences, and expectations about longevity, health status, etc. Health status is important because we use it to construct *personalized* survival risks using a microsimulation model. We also elicit the age at which respondents plan to claim their pension, and reasons that could have shaped this decision (e.g., advice received, claiming behavior of friends or family, etc.). In the second part, we elicit choices in hypothetical scenarios where the respondent has to decide on a claiming age. Table 4 summarizes the different parts of the survey and their purpose.[13]

3.1 Description of Scenarios

The experiment included seven hypothetical choice scenarios that introduce variation in financial incentives and framing of the pension claiming decision. This design also allows us to implement an education intervention with a difference-in-differences design. Specifically,

[13] We reproduce the questionnaire in Appendix D).

Table 4: Different Elements of Survey and Experimental Design

Steps	Content	Purpose
1	General demographic and financial questions	Gather information on personal circumstances and expected claiming age
2	Baseline claiming scenario	Elicit claiming age in a scenario with current incentive structure
3	Education Treatment	Provide a heuristic to help with decision making
4	Five scenarios varying incentive structure (see Table 5)	Estimate sensitivity to financial incentives
5	One scenario with framing	Estimate framing effects

we observe choices before and after the intervention for those in the treatment and the control group.

Each scenario presents participants with information about their expected retirement benefits at different ages, under a set of personalized assumptions. Respondents then decide on a claiming age between 60 and 70, the current choices available under CPP and QPP. We reproduce below the specific wording used in the survey (terms in square brackets are respondent-specific):

> "When you turn 60, you will have to decide whether to claim your CPP [14] benefits. Assume your current plan is to retire completely at age [RETAGE], and that until that age, your yearly earnings will be [EARN] if you work.[15] Assume you have [WLTH] in retirement savings, which earn an annual return of [R], and which are not taxed if you choose to withdraw them.
>
> At age 60, you will receive a statement from Services Canada[16] regarding your CPP benefits if you claim at different ages between 60 and 70. These benefits are net of taxes and have no effect on your other pension benefits. Importantly, these benefits protect you against inflation and will be paid no matter

[14] CPP was replaced by QPP if the respondent resided in Québec

[15] This phrase is omitted for respondents that are already retired.

[16] "Retraite Québec" if the respondent resided in Québec

what. Suppose the statement includes the following information regarding the monthly benefit you can get if you claim at different ages: "

The statement is followed by a table showing the pension benefits that would be paid at different claiming ages between 60 and 70.

[RETAGE] is a respondent's expected retirement age, as indicated earlier in the survey. The retirement age [RETAGE] is the age at which they intend to stop working altogether. [EARN] is a respondent's yearly labour earnings.[17] We use the CPP replacement rate of 25% from current earnings to approximate CPP benefits. The benefit amount does not necessarily represent what respondents will receive in real life, but it provides scenarios close to respondents' personal circumstances. Financial wealth [WLTH] is computed as the sum of individual retirement savings, consisting of individual retirement accounts and savings in a defined contribution pension plan. Lastly, [R] is the rate of return on financial wealth shown to respondents; this rate is randomized for each scenario and is either 5% or 2% with equal probability. The higher the rate, the less likely respondents should be willing to delay claiming, since the opportunity cost of funds used to finance consumption in the year when benefits are not paid would be higher. We specify that benefits are net of taxes, to avoid having respondents to think about complicated tax implications.

Scenario 1: Baseline. Scenario 1 is our baseline scenario and uses claiming penalties and bonuses that individuals currently face with CPP and QPP. Specifically, claiming before age 65 reduces the pension by 7.2% per year, and delaying after age 65 increases the pension by 8.4% per year. Thus, claiming at 60 lowers the pension by 36% and delaying claiming to 70 riases the pension by 42%.

Education Treatments: Break-Even Age and Longevity Risk. After participants answer the baseline scenario, we randomize them with equal probability into one of two

[17]We use $12,000 for respondents who provide no exact number nor respond to the bracketing questions, and for respondents who report earnings below $12,000—the minimum earnings for receiving a pension.

education treatments, or a control group with no treatment. The first treatment informs respondents about the break-even age—a decision tool used by financial advisors and public pension representatives to help people think about the claiming decision. Suppose a 65-year-old earns $1,000 more annually by delaying claiming by one year and forgoes $10,000 in benefits this year by delaying. The break-even age in this case is 75 because it would take 10 years to recoup the lost benefits. The break-even age does not take into account discounting. Using this rule, people who think they will live past 75 should delay claiming, and vice versa. Brown et al. (2016) have provide evidence based on survey data that the presentation of a break-even age induces earlier claiming on average.

Previous studies find that presenting the break-even age induces earlier claiming because delaying claiming seems risky: that is, delaying appears to be a bet on a long life. Brown et al. (2016), for example, contrast the average claiming age under a symmetric frame and a break-even frame. They find that the break-even frame induces people to claim about 15 months earlier than the symmetric frame. We diverge from Brown et al. (2016) in presenting an education treatment rather than expressing scenarios in terms of a break-even age. The education treatment graphically shows cumulative pension benefits at different claiming ages for a few hypothetical persons. The cumulative pension benefits are linear functions with different slopes and intercept. The education treatment then explains that the age at which these lines cross defines the break-even age (see Appendix D), and it reports the average life expectancy of a 60-year-old Canadian according to projections from Statistics Canada. Another important difference compared to Brown et al. (2016) is that we do not report the break-even age for the scenarios we present to respondents. Instead, we inform them about this rule that they could use.

Our second treatment primes respondents to consider longevity risk in terms of consumption. To test whether emphasizing the insurance benefit of delaying pension claiming, we design a treatment that informs individuals about the risks of outliving their savings. Moreover, the treatment informs respondents that those who expect to live long might benefit from delaying claiming. We also provide respondents with a gender-specific table with the likelihood of living to ages 65 to 90 (in 5-year increments). While the break-even age should induce earlier claiming, as the salient risk is "Will I live to the break-even age?", emphasizing the insurance aspect should prompt *later* claiming as the salient risk is "Will I have enough income to finance consumption in old age?" Thinking about the claiming decision in terms of consumption insurance is related to the consequence messaging in the annuity context by Brown et al. (2021), who report that people are better at valuing an annuity when they consider its impact on future consumption streams.

Scenario 2-6: Varying Financial Incentives. Following the education intervention (the baseline scenario for respondents in the control group), we present five financial scenarios. The order in which we show those scenarios is randomized. These are identical to the baseline scenario, except that we vary the pension adjustment factors (PAF) to elicit the elasticity of the claiming age with respect to financial incentives. Table 5 shows the adjustment rates for each scenario, including those in the baseline scenario, which are the PAFs currently in use.

Table 5: Pension Adjustment Factors (PAF)

Scenario	Bonus (in %)	Malus (in %)
1 (Baseline)	7.2	8.4
2	2.2	3.4
3	5.2	6.4
4	8.2	9.4
5	11.2	12.4
6	14.2	15.4

Notes: The table reports pension adjustment factors we use in hypothetical scenarios 1 to 6. 'Bonus' refers to the percentage increase in pension for each year a person claims after age 65, and 'malus' refers to the percentage decrease in pension for each year a person claims before age 65. The order of scenarios 2-6 is randomized.

Scenario 7: Varying Framing. In the last scenario, we use the adjustment factors from the baseline scenario but add a sentence that frames the claiming decision in a specific way.

For each respondent, we randomly draw one of five frames that vary along three dimensions: Frequency of pension payments (monthly or annually), the framing (gain or loss), and the reference age (65 or 67). We only use a handful of possible combinations of the three dimensions to ensure we have sufficient statistical power. Table 12 summarizes the frames we use in the survey.

We vary the payment frequency to analyze whether salience plays a role, as the difference in pension amounts is more pronounced when reported annually. We include the gain and loss frames because of the well-documented phenomenon of loss aversion, but Brown et al. (2016) find in the context of pension claiming that reporting gains instead of losses actually delays claiming. In frame 1, we add the following text to the baseline scenario to frame claiming as a loss: "For example, claiming at age 60 instead of age 65 will result in a $[X] reduction in your monthly benefit for your remaining lifetime." We use similar wording for the other loss frames but replace age 65 with age 67 (frame 2) and monthly with annual (frame 4). In contrast, for frame 3 we add the following text to frame claiming as a gain: "For example, claiming at age 65 instead of age 60 will result in a $[X] increase in your monthly benefit for your remaining lifetime." We use the same text in frame 6 but replace monthly with annual.

Finally, we vary the reference age. Recent evidence suggests that individuals have a strong tendency to claim at focal ages, like the full retirement age, which financial incentives cannot explain (Seibold, 2021; Gruber et al., 2022; Lalive et al., 2023). Individuals could see this reference age as an "endorsement" by the pension administration or as a social norm. Frames 1 and 3-5 anchor the reference age at 65, while frame 2 anchors the reference age at 67.

3.2 Calculating Financial Incentive Measures

To measure the financial incentives at different claiming ages, we must first compute a respondent's pension amount at each hypothetical claiming age. The amount of pension

Table 6: Frames

Frame	Frequency	Gain or Loss	Reference point
1	Monthly	Loss	65
2	Monthly	Loss	67
3	Monthly	Gain	65
4	Annual	Loss	65
5	Annual	Gain	65

Notes: The table shows the dimensions across which we vary the framing of the pension claiming decision. Each participant is randomly assigned to one of these frames.

payments depends on the pensionable earnings, which we specify in the scenario description, and the pension adjustment factors, which vary across scenarios. The formula for the annual pension in the context of our experiment is as follows:

$$B_{i,j,a} = 0.25W_i \cdot [1 + (a - 65) \cdot PAF_{j,a}]\,, \tag{2}$$

where $B_{i,j,a}$ is the pension payment for an individual in scenario j claiming at age a; W_i are the earnings of individual i (subject to the CPP and QPP cap) and $PAF_{j,a}$ is the pension adjustment factor that depends on the hypothetical scenario j and the claiming age a.

In the second step, we compute a respondent's expected presented discounted value (PDV) of pension payments and the pension accrual (ACC) for each hypothetical claiming age in each scenario. Specifically, the present value of discounted pension payments at age 60 of respondent i in scenario j who claims at age a is

$$PDV_{i,j,a} = \sum_{k=60}^{110} \beta^{-(k-60)} s_{i,k} B_{i,j,a} \mathbf{1}(k \geq a), \tag{3}$$

where $s_{i,k}$ denotes individual i's probability of surviving to age k. We use the discount rate presented in the scenario description: 2% or 5% with equal probability so that $\beta = 1.02$ or $\beta = 1.05$.

Because we are concerned with how respondents perceive financial incentives, we use subjective survival probabilities to compute the present discounted values. Later, we compute alternative present discount values using *objective* survival risk produced by a microsimulation model of health dynamics. The survey asks each respondent about subjective probabilities of surviving to age 70, age 80, and age 90. We use a minimum distance estimator to find (subjective) Gompertz hazard parameters for each respondent. We then use those parameters to generate survival probabilities at each age. [18] Hence, beyond variation across scenarios in PAFs, discount rates, and earnings, the PDV estimates vary across respondents because of heterogeneous survival beliefs.

The corresponding one-year accrual for scenario j and claiming age a is $ACC_{i,j,a} = PDV_{i,j,a+1} - PDV_{i,j,a}$. Our econometric model uses the one-year accrual to capture the financial incentives for delaying claiming. Since the incentives in Canada's public pension plans are monotonic, the value of postponing claiming is similar when using one-year accruals or the option value (e.g., Coile and Gruber, 2007).

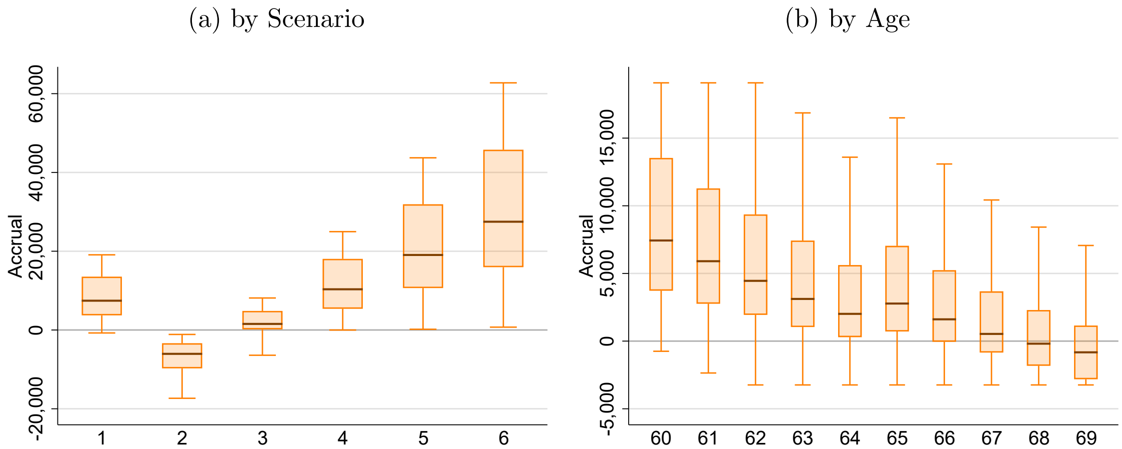
Figure 3 reports the accrual distribution at age 60 by scenario (Panel a) and by age for scenario 1 (Panel b). Three findings emerge. First, accruals at a given age in a given scenario vary considerably across respondents, because of heterogeneity in survival risk and discount rates. Second, accruals vary significantly across scenarios because of the variation in pension adjustment factors. We use this variation to identify the impact of financial incentives on pension claiming. Third, pension accruals are generally positive at younger ages but decline with age. Most respondents in scenario 1 start experiencing negative accruals at around 68, but some do as early as age 60.

3.3 Representativeness of Survey and Descriptive Evidence

This section provides descriptive evidence that our survey is representative of the Canadian population, the assignment of respondents into treatment and control groups is random,

[18] See Appendix C.1 for details on how we estimate subjective survival probabilities

Figure 2: Pension Accruals by Scenario and Age.



Notes: Panel a reports the pension accrual distribution by scenarios at age 60. Panel b shows the distribution of pension accruals by age for scenario 1. Pension accruals are computed using subjective mortality risk. The top and bottom whiskers of the box plots are the 5th and 95th percentiles.

and the scenarios impact respondents' claiming age.

Representativeness and Validity of Experiment. Table 7 reports the mean and standard deviation for 55-59 year-olds in the 2016 Canadian census (column "Population") and our survey sample (column "Sample"). We also present the difference in means in each treatment arm relative to the control group (columns "Insurance arm" and "Break-Even arm"). Our survey data is weighed by gender, education, and region using census data.

The first two columns show that the survey is representative of the overall population in terms of gender and education, the variables used for weighting. [19] Panel B shows that survey respondents tend to have higher incomes, savings in an RRSP (a tax-deferred individual account similar to Keogh IRAs), and savings in a TFSA (a pre-tax savings account similar to Roth IRA) than the overall population, but the standard deviation of

[19] We do not report summary statistics for age in the population because the public-use census only reports the age group (e.g., 55-59).

Table 7: Summary Statistics

	Mean (Std. Dev.)		Diff. Control (Std. Err.)	
	Population	Sample	Insurance	Break-Even
A. Demographics				
Age		57.10	0.05	0.01
		(1.39)	(0.06)	(0.06)
Female (%)	51.06	51.09	1.72	0.99
			(2.20)	(2.22)
Married/Common-Law (%)	71.92	67.13	1.13	2.14
			(2.06)	(2.08)
Widowed/Separated/Divorced (%)	17.08	17.81	0.68	0.18
			(1.65)	(1.65)
Never Married (%)	11.01	15.06	-1.81	-2.32
			(1.60)	(1.61)
HS and less	43.43	43.86	1.18	0.64
			(1.83)	(1.84)
HS but no Univ.	35.83	36.17	1.80	-0.54
			(2.19)	(2.20)
University	19.77	19.97	-2.97	-0.10
			(2.10)	(2.15)
B. Income and Savings				
Income ($1,000)	61.89	75.05	-4.31	-0.01
	(77.21)	(96.11)	(5.16)	(6.94)
Has RRSP (%)		69.73	-2.29	-0.18
			(1.94)	(1.94)
RRSP Amount ($1,000)	107.71	184.53	-13.83	-3.89
	(170.37)	(295.00)	(16.59)	(16.01)
Has TFSA (%)		55.63	-3.98*	-2.51
			(2.15)	(2.17)
TFSA Amount ($1,000)	19.47	58.20	-6.57	-7.23
	(29.25)	(113.45)	(7.79)	(7.96)

Note: The first two columns report the mean and standard deviation for socioeconomic characteristics in the 2016 Canadian census (column "Population") and our survey (column "Sample"). The last two columns report the difference in means between the insurance and break-even treatment group, respectively, relative to the control group. Standard errors are presented in parentheses. ***, **, and * represent significance at the 1, 5, and 10 percent level, respectively. Note that we cannot calculate the mean age for the census because we only observe the age group (i.e., 55-59) and not the exact age.

these variables is also high.

The last two columns show that respondents in the treatment arms do not differ from respondents in the control group, except TFSA ownership is slightly smaller in the insurance arm. To test more formally for random assignment, we estimate a multinomial logit model for treatment arm assignment on observable characteristics (age, gender, marital status, education, income, wealth, financial and retirement literacy, and whether the individual has a defined-benefit pension plan). A χ^2-test cannot reject the null hypothesis that the characteristics jointly cannot explain treatment assignment (p-value: 0.7524), providing further evidence that the randomization is adequate.

Correlates with the Expected Claiming Ages. Table 8 presents summary statistics for respondents' socioeconomic characteristics, financial and retirement literacy, and preferences. To examine which characteristics correlate with expected claiming ages, we split respondents into three groups: those who plan to claim before age 62, those who plan to claim between age 62 and 64, and those who plan to claim after age 64.

Panel A shows that early claiming before age 62 is a bit higher among females, those with lower education, and those who have already retired. In contrast, current age, marital status, and health appear unrelated to the expected claiming age. Moreover, Panel B shows that respondents with lower incomes and those with fewer savings are more likely to claim early. Finally, Panel C shows how financial and retirement literacy correlates with the expected claiming age.[20] The results show that individuals with more correct answers to financial literacy questions are more likely to delay claiming. In contrast, the retirement literacy index—the sum of correct answers to five questions about the retirement income system—is negatively correlated with the expected claiming age. We also ask one question that checks if respondents recognize that annuitization is optimal in a simple vignette of a

[20] We measure financial literacy using the number of correct answers to three questions commonly used in the literature: interest, diversification, and inflation (Lusardi and Mitchell, 2014). To measure literacy regarding the retirement income system, we use five questions tailored to elicit knowledge of key features of the program. We label the sum of correct answers as the retirement literacy index.

fictitious person with an uncertain lifetime.[21] We do not find evidence that the expected claiming age is associated with a lower or higher understanding of annuitization. Overall, the evidence that knowledge explains why some claim early is mixed. While lower financial literacy is associated with early claiming, higher retirement literacy is also associated with earlier claiming.

Finally, we ask respondents several questions regarding their preferences. We measure these preferences using their assessment of several statements as indicated on a 4-point Likert scale (1 "Strongly disagree", 2 "Disagree",3 "Agree", and 4 "Strongly Agree"). The variable "Live well" refers to the statement "I prefer to live well for fewer years than to live long and have to sacrifice my quality of life". The variable "Spend quick" refers to the statement "I would rather spend down my wealth quickly because I might not be healthy enough to enjoy the money later in life." This question assesses the degree to which patience and the fear of worsening health induce early claiming. To elicit risk preference, we ask respondents to rate their willingness to take financial risks on a 5-point scale, ranging from "I am willing to take substantial financial risks expecting to earn substantial returns" (score=1) to "I am not willing to take any risk, knowing I will earn a small but certain return" (score=5). Risk aversion is one reason individuals might want to claim early if they think of claiming late as a risky bet on a long life. Those who claim earlier (before 62) are more likely to prefer living well for fewer years than living old. For the other two variables, there is no clear detectable pattern.

Descriptive Evidence on Impact of Financial Incentives, Education, and Framing. Figure 3 provides descriptive evidence of stated-choice experiments' impact. Panel (a) shows the baseline claiming age distribution for all respondents, pessimistic respondents (who overestimate mortality risk relative to the life table), and optimistic respondents. Distinguishing pessimistic and optimistic respondents becomes essential when analyzing the education intervention. Although optimism or pessimism may be perfectly rational given

[21]See questions Q29 to 33 in the questionnaire in Appendix

Table 8: Expected Claiming Age and Characteristics of Respondents

	Expected Claiming Age		
	Before 62	Between 62 and 64	After 64
A. Demographics			
Age	57.26	57.37	57.08
	(1.37)	(1.34)	(1.42)
Female dummy	0.54	0.52	0.48
HS and less (%)	50.37	42.59	36.37
HS but no Univ. (%)	37.17	39.94	38.02
University (%)	12.47	17.47	25.61
Married/Common-Law (%)	68.71	67.28	67.89
Widowed/Separated/Divorced (%)	17.62	20.55	17.54
Never Married (%)	13.67	12.17	14.56
Number of Health Problems	0.60	0.52	0.62
	(0.85)	(0.77)	(0.89)
Working (%)	64.46	89.65	74.53
Retired (%)	27.60	7.92	14.21
Not working (%)	6.70	2.43	9.91
Planned Retirement Age	62.35	63.17	65.48
	(4.43)	(3.13)	(5.26)
B. Income and Savings ($)			
Income	67,810	66,203	80,646
	(63,497)	(38,643)	(82,710)
Sum of RRSP, TFSA and DC savings	208,014	231,373	252,291
	(363,931)	(274,494)	(414,323)
Has occup. pension (%)	58.03	81.15	53.52
C. Literacy			
Financial literacy			
1 correct answer (%)	10.80	5.21	8.33
2 correct answers (%)	32.93	25.51	28.24
3 correct answers (%)	51.91	67.43	60.41
Retirement Literacy Index (0-5)	3.89	3.71	3.54
	(0.99)	(1.14)	(1.18)
Annuity Question Correct	0.22	0.21	0.19
D. Preferences			
Live Well	2.80	2.57	2.60
	(0.89)	(0.84)	(0.83)
Spend quick	2.17	2.023	2.15
	(0.69)	(0.72)	(0.77)
Risk Aversion	3.04	3.03	3.36
	(0.82)	(0.98)	(1.14)

Notes: The table shows summary statistics on socioeconomic characteristics, financial and retirement literacy, and preferences. We report the means and the standard deviation (in brackets). We split the sample into three groups based on respondents' intended claiming age: before 62, between 62 and 64, and after 64.

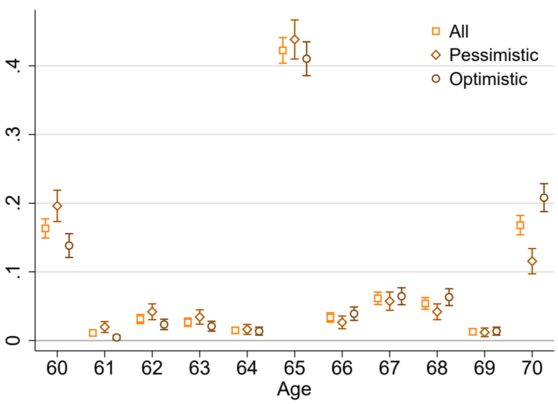
differences in health and other characteristics, we use this terminology to reflect higher (lower) than average survival risks. Teaching respondents about longevity likely increases early claiming among optimistic respondents but reduces early claiming among pessimistic respondents. Indeed, Panel a shows that the age-60 claiming spike is higher among pessimistic and lower among optimistic respondents compared to the overall population. In contrast, pessimistic respondents are less and optimistic respondents more likely to delay claiming until age 70.

Panel (b) shows that the stated claiming age responds to financial incentives in line with economic theory. The smaller the penalty and bonus for early and late claiming, the larger the share of respondents who claim at the earliest age. For example, a 5 percentage points smaller penalty and bonus than in the baseline, i.e., -2.2% and +3.4% per year of claiming before and after age 65, increases the claiming rate at age 60 by about 12 percentage points. Conversely, larger penalties and bonuses are associated with more people delaying claiming beyond age 65. For example, a 7 percentage point larger bonus than in the baseline increases the claiming rate at age 70 by about 6 percentage points.

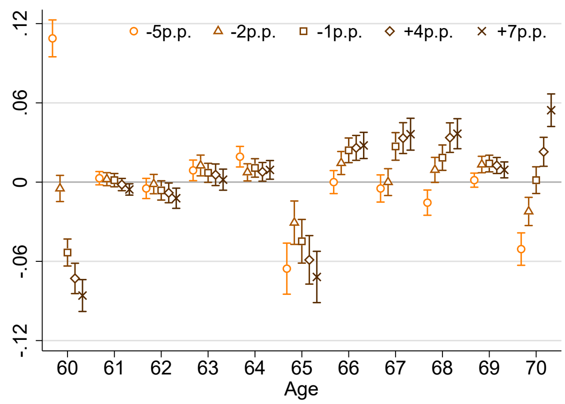
Panel (c) documents changes in the claiming profile from the education intervention, separately for the break-even and insurance treatment and for pessimistic and optimistic respondents. The patterns suggest that the treatments induce pessimistic respondents to delay claiming, particularly for the insurance intervention. In contrast, optimistic respondents' early claiming rates are more stable. Finally, Panel (d) suggests that shifting the reference age from age 65 to age 67 is an effective tool to change people's claiming decisions. The claiming spike moves from 65 to 67 when the reference age is 67. In contrast, framing the decision in terms of losses versus gains and showing benefits in annual versus monthly amounts have minor impacts on claiming profiles.

Figure 3: Baseline and Change in Claiming from Incentives, Education, and Framing

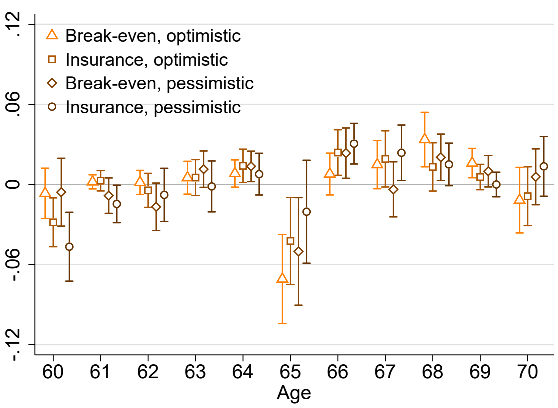
(a) Baseline Claiming Distribution



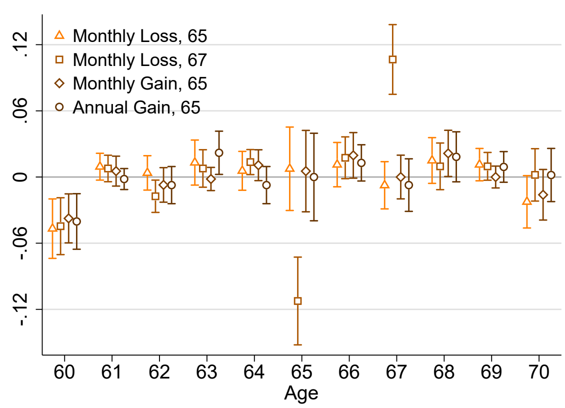
(b) Change Claiming from Incentives



(c) Change Claiming from Education



(d) Change Claiming from Framing



Notes: The figure shows the distribution of stated claiming ages for the baseline (Panel a) and the change in the claiming rates from financial incentives (Panel b), the education interventions (Panel c), and the framing interventions (Panel d). Pessimistic respondents underestimate, and optimistic respondents overestimate the mortality risk. Bars denote a 95% confidence interval.

4 Stated-Choice Experimental Evidence

4.1 Financial Incentives

We now describe the empirical specification for estimating the impact of financial incentives and present the results. A participant i responds to each scenario j with an expected claiming age, denoted by $c_{i,j}$. Let $y_{i,a,j}$ be equal to one if the respondent claims at age a in scenario j, and zero otherwise. When a respondent has claimed, she is dropped from the sample. Hence, $y_{i,a,j}$ measures a hazard in discrete time. Respondents have characteristics X_i, an expected retirement age r_i, and an expected claiming age of a defined benefit pension db_i. Let $db_{i,a} = 1$ if respondent i has claimed his defined benefit pension by age a and zero otherwise. Similarly, let $r_{i,a} = 1$ if the respondent has retired from the labor force and zero otherwise. These triggers help capture potential jumps in the claiming hazard at retirement and defined benefit pension claiming age.

For each respondent and scenario, we compute the present discounted value of claiming at age a, $PDV_{i,a,j}$, and the one-year accrual (gain) from delaying claiming at age a by one year to $a + 1$, $ACC_{i,a,j}$. We have variation in the ACC and PDV in terms of pension adjustment factors (randomized), pensionable earnings, survival risk, and discount rates (randomized). Finally, let $o_{i,j}$ be the order in which scenario j was presented to the respondent. Respondents could be sensitive to the order by which scenarios are presented if there is fatigue or learning.

We specify the hazard of claiming at a given age as

$$y_{i,a,j} = \beta_1 PDV_{i,a,j} + \beta_2 ACC_{i,a,j} + \mathbf{X}_i' \gamma + \lambda_R r_{i,a} + \lambda_D db_{i,a} + \lambda_a + \lambda_{oj} + \epsilon_{i,a,j}, \qquad (4)$$

where $y_{i,a,j}$ denotes the claiming hazard of respondent i at age a in scenario j, λ_R, λ_D, λ_a, and λ_{oj} capture the impact of the retirement age trigger, the defined benefit claiming age trigger, age-in-year fixed effects, and scenario-order fixed effects. We estimate equation (4) by OLS using scenarios 1 to 6, which vary the pension adjustment factors.[22] We cluster standard errors at the respondent level and estimate different specifications with varying controls: SES, preferences, the age triggers ($db_{i,a}, r_{i,a}$), and controls for knowledge, retirement, and financial literacy. As for natural experiment analysis, we compute an

[22]We use a linear probability model to be consistent with the analysis in Section 2. We also estimate a logit regression and calculate the marginal effectsand resulting elasticities. The elasticities are very similar to those from linear probability models and are available upon request.

elasticity of claiming with respect to the ACC at the mean, $\eta = \beta_2 \frac{\overline{ACC}}{\overline{y}}$.

Table 9 reports the coefficient estimates (Table C.3 in the Appendix reports full estimation results). We find that respondents are sensitive to financial incentives, summarized by the ACC, but the effects are small. As column 1 shows, a \$100,000 increase in the accrual reduces the probability of claiming by 15.7 percentage points. Since the mean of the ACC variable is \$8,650, the effect of increasing the accrual by that amount reduces the probability of claiming by 1.36 percentage points. The hazard of claiming is 13.3%, on average, which represents a decrease of 10.2% in the hazard, equivalent to an elasticity of -0.102. This estimate is robust to the presence of controls, as columns 2 to 5 illustrate. Hence, financial incentives are costly as a mechanism to encourage delays. The experiment's price sensitivity estimates are remarkably similar to the evidence shown using quasi-experimental variation. Hence, we replicate the lack of sensitivity to financial incentives estimated from actual behavior.

The full results presented in Table C.3 show that respondents with lower educational attainment tend to claim earlier. We also find that respondents with a preference for spending wealth quickly and those with a higher risk aversion claim earlier. The age at which respondents aim to exit the labor force or claim their DB pensions leads to a significant increase in the CPP/QPP claiming hazard. Higher retirement literacy tends to be associated with earlier rather than delayed, claiming. Similarly, respondents who value annuities correctly are also to claim earlier. However, we find suggestive evidence that respondents with higher financial literacy are more likely to delay.

We can explore the richness of the respondents' characteristics to elicit whether the sensitivity to financial incentives is larger among particular subgroups. Specifically, we split respondents into two groups for each characteristic. For continuous characteristics, we split the sample at the median. Table 10 reports the ACC elasticity estimates for a selected set of characteristics. Overall, we find significant differences in the effect of financial incentives across groups. Respondents with high earnings or wealth are more sensitive to financial

Table 9: Effects of Financial Incentives on the Claiming Hazard

	(1)	(2)	(3)	(4)	(5)
ACC	-0.157***	-0.161***	-0.157***	-0.170***	-0.171***
	(0.0098)	(0.0100)	(0.0101)	(0.0099)	(0.0098)
PDV	0.0013	0.0009	0.0009	0.0014	0.0015
	(0.0011)	(0.0010)	(0.0010)	(0.0010)	(0.0009)
ACC elasticity	-0.102***	-0.104***	-0.102***	-0.111***	-0.111***
	(0.0063)	(0.0065)	(0.0066)	(0.0064)	(0.0063)
Order effects (p)	0.0118	0.0135	0.0140	0.0103	0.0084
SES controls	NO	YES	YES	YES	YES
Preferences	NO	NO	YES	YES	YES
Age Triggers	NO	NO	NO	YES	YES
Knowledge	NO	NO	NO	NO	YES
Observations	100,974	100,974	100,974	100,974	100,974
R-squared	0.204	0.206	0.209	0.224	0.225

Notes: The table reports estimates from linear regression models where the dependent variable is the hazard of claiming (=1 if claims at age a and zero if not). Controls include age dummies and dummies for the order in which scenarios 2 to 6 were presented. The variables ACC and PDV are reported in hundred thousand dollars. The elasticity is computed at the mean of the claiming hazard and ACC. Specification 1 has only controls for age and order effects. Specification 2 adds controls for SES, which include age at the time of doing the survey, gender, marital status, education dummies, the presence of health problems, the log of financial wealth, and earnings. Specification 3 adds dummies capturing a preference for living a shorter life but well, spending quickly, and a low tolerance for risk. Specification 4 adds dummies for whether the respondent has reached the age at which he plans to retire and to claim their defined benefit (DB) pension. We call these variables age triggers. Finally, specification 5 adds controls for retirement literacy, knowledge of annuities, and financial literacy using dummies for the number of correct answers. Standard errors are clustered at the respondent level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 10: Heterogeneity in the Elasticity of Claiming with respect to Financial Incentives

	No		Yes		Equality
	ACC elasticity	SE	*ACC* elasticity	SE	p-value
	(1)	(2)	(3)	(4)	(5)
High Earnings	-0.0891***	(0.0076)	-0.1296***	(0.0075)	0.000
High Wealth	-0.0695***	(0.0072)	-0.1181***	(0.0070)	0.000
High Fin. Lit.	-0.0535***	(0.0084)	-0.1166***	(0.0061)	0.000
College Edu.	-0.0364***	(0.0087)	-0.1201***	(0.0061)	0.000
Prefer Spend Quickly	-0.1104***	(0.0057)	-0.0449***	(0.0098)	0.000
Risk Averse	-0.1104***	(0.0056)	-0.0334***	(0.0108)	0.000
Has DB Plan	-0.1140***	(0.0059)	-0.0654***	(0.0083)	0.000
Female	-0.1039***	(0.0064)	-0.0834***	(0.0076)	0.039
Married	-0.0887***	(0.0090)	-0.0974***	(0.0057)	0.413
Health Problems	-0.0939***	(0.0066)	-0.1028***	(0.0085)	0.403

Notes: The table reports estimates from linear regression models where the dependent variable is the hazard of claiming (=1 if claim at age a and zero if not) and a separate effect of ACC is permitted for each variable. Controls only include the PDV, age dummies, and dummies for order effects. The estimate (and standard error) reported is the elasticity of the pension claiming hazard with respect to the accrual ACC. The p-value for the test statistic testing the equality of the elasticities is also reported. Standard errors are clustered at the respondent level. *** p<0.01, ** p<0.05, * p<0.1

incentives, compared to those with low earnings or wealth, which is consistent with liquidity constraints. Respondents with high financial literacy and college education are more price elastic. In contrast, respondents who want to spend quickly, those who are more risk-averse, and those with a DB plan are less price sensitive. Other characteristics exhibit small elasticity differences and are not statistically significant at the 5%-level. Overall, financial incentives are not very effective in getting respondents to claim later. They are thus unlikely to increase respondents' levels of annuitization (pension income).

4.2 Education

This section discusses the impacts of educating respondents about the break-even age (break-even treatment), remaining life expectancy, and the value of annuities (insurance treatment). We expect these treatments to induce more delays if respondents claim early because they do not understand annuities. Yet, the effects are likely heterogeneous, because of differences in remaining life expectancy. For respondents who are optimistic about living longer, the information on life expectancy may lead them to claim earlier. For pessimistic respondents, these treatments may lead to more delays.

We specify the hazard of claiming as a fixed effect difference-in-differences model:

$$y_{i,a,j} = \alpha Post_j + \sum_k \gamma d_{i,k} Post_j + \beta_{0,i} + \beta_1 PDV_{i,a,j} + \beta_2 ACC_{i,a,j} + \lambda_t + \lambda_{oj} + \epsilon_{i,a,j}. \quad (5)$$

where $d_{i,k}$ is one if respondent i was assigned to treatment k and zero if not. The dummy $Post_j$ is one if scenario $j > 1$ and zero if not. We estimate this specification for the full sample and also tease out heterogeneity by baseline survival expectations. To this end, we compute the percent deviation between the subjective estimate of life expectancy and the life-table life expectancy for each respondent. We call this deviation the "optimism index". We split the sample at zero, with one group being optimistic (subjective life expectancy higher than the life table), and one group being pessimistic. We also run a specification that interacts post-treatment effects with the optimism index.

Table 11 reports the results. The treatments do not appear to have any effect in the full sample (column 1), but this effect masks considerable effect heterogeneity. Once we split the sample (columns 2 and 3), we find a statistically significant negative effect of the insurance treatment for those who are pessimistic (inducing delays). Observing life-table survival probabilities seems to lead pessimistic respondents to re-assess their claiming age towards claiming later, as they now expect to live longer than they thought. This is in line with findings by Hurwitz et al. (2022), who find that teaching individuals about longevity increases the demand for longevity insurance. We do not find statistically significant opposite effects for those who are optimistic, although the effects are in the right direction (inducing early claiming). The impact of the break-even treatment appears to lead to earlier claiming for those who revise their survival expectations downwards.

Table 11: Effect of Education Treatments on the Claiming Hazard

	All	Optimistic	Pessimistic	Interaction
	(1)	(2)	(3)	(4)
Break-even × Post	0.0046	0.0074	0.00034	
	(0.0044)	(0.0055)	(0.0074)	
Insurance × Post	-0.0065	0.0015	-0.0183**	
	(0.0043)	(0.0052)	(0.0074)	
Post	-0.0059**	-0.0056*	-0.0058	-0.0088***
	(0.0028)	(0.0034)	(0.0050)	(0.0019)
Break-even × Post × Optimism				0.0676**
				(0.0285)
Insurance × Post × Optimism				0.113***
				(0.0306)
Observations	100,974	60,567	40,407	100,974
R-squared	0.289	0.266	0.325	0.289

Notes: The table reports estimates from fixed effects linear regression models where the dependent variable is the hazard of claiming (=1 if claims at age a and zero if not). Controls for order effects and age effects are included. The first column reports results for the full sample, where the treatment groups are compared to the control group before and after (Post) scenario 1. The second and third columns split the sample according to whether or not the respondent has a subjective remaining life expectancy larger than what the life table would predict. Those who are optimistic (column 2) have higher subjective life expectancy than the life table would predict. Those in column 3 (pessimistic) have lower life expectancy than the life table would predict. Finally, column 4 reports results where we interact the Post and treatment dummies with the deviation (percent) between subjective and life-table life expectancy (optimism). Standard errors are clustered at the respondent level. *** p<0.01, ** p<0.05, * p<0.1

We can further exploit variation in the optimism index by interacting it with the treatment effects (column 4). Doing so shows that both interventions induce the most optimistic respondents to claim earlier, while pessimistic respondents delay claiming. The effects are relatively strong and imply substantial revisions in survival expectations. The results suggest that one way the education levers affect claiming is to inform respondents about their survival prospects. Hence, one should not expect education treatments of the type we use to induce delays in aggregate. But, to the extent that beliefs about longevity are biased relative to life tables, the induced changes in delays from this type of intervention may benefit respondents. This interpretation relies on life-table survival probabilities reflecting the objective survival risk respondents face. We explore this issue further in section 5.

4.3 Framing

The frames presented to respondents in scenario 7 have three dimensions. First, we randomize the reference age for expressing the gain of claiming at that age to be either 65 (as in other scenarios), or 67. Second, we randomize the gain vs. loss dimension. Finally, we randomize whether the gain (or loss) is expressed in annual or monthly benefits. We have a total of five treatment frames and a control frame. We want to understand how each dimension of the frames impacts the expected claiming age.

We focus on responses to scenarios 1 and 7, since the scenarios are identical regarding the financial incentive parameters. Absent framing effects, we should see no change in claiming ages. It is, however, possible that between scenarios 1 and 7, respondents learn about aspects of this decision task and revise their choice in scenario 1. Since we have a control group that received the same frame as in scenario 1, we can use a difference-in-differences strategy to tease out the effect of each dimension of the frames on expected claiming ages.

Since changing the full retirement age, the reference point is likely to impact claiming at these ages disproportionately, we use a kinked age function:

$$g(nra_j, a) = \gamma_- \max(nra_j - a, 0) + \gamma_+ \max(a - nra_j),$$

to capture reference age effects. There is no bunching at the reference point if $\gamma_- = \gamma_+$. Similarly, a change in the reference point does not affect claiming if this is the case.

We look at the effect of other dimensions (annual vs. monthly) and loss vs. gain, both on the hazard of claiming (first-order effect), as well as on the kinked age function for the reference point. For example, a loss or gain frame could affect the reference age effect differently.

To test this, we specify the following fixed effect difference-in-differences model for the claiming hazard:

$$y_{i,a,j} = \alpha Post_j + g(nra_j, a) + \sum_k d_{i,k} Post_j(\gamma_k + g_k(nra_j, a)) + \beta_{0,i} + \lambda_a + \lambda_{oj} + \epsilon_{i,a,j}, \quad (6)$$

where $g_k(nra_j, a) = \gamma_{-,k} \max(nra_j - a, 0) + \gamma_{+,k} \max(a - nra_j)$. The parameter α captures the pre-post difference, absent any changes in framing. Let k be the two dimensions of the frame, loss vs. gain, annual vs. monthly. Also let $d_{i,k} = 1$ if a respondent had dimension k changed (relative to the control group) in scenario 7. The parameter γ_k captures the change in expected claiming age for those with a frame manipulation in dimension k. We also allow the function g_k to be specific to each dimension. Since we have fixed effects, $\beta_{0,i}$, there is no term for $d_{i,k}$ in the specification. The specification is otherwise the same as previous fixed effect specifications. We estimate by OLS using clustered standard errors.

Table 12 reports the estimates. First, we see that, absent any changes in the frame, respondents tend to claim later ($Post$) in scenario 7 compared to scenario 1. The kinked age term reveals substantial reference age effects. They are identified from the variation in the normal retirement age between scenarios 1 and 7. For each year before the nra, respondents are less likely to claim (more likely to postpone). For each age after the nra, they are also less likely to claim, which induces a strong kink. Suppose someone is 65 and the nra is also 65. Then the value of $g(nra_j, a)$ at 65 is 0. Now consider a change in the nra from 65 to 67. The function now takes the value -0.0171 * 2 = -0.0342. The respondent is now more likely to delay. Similarly, take someone 67 when the nra is 65. The value of $g(nra_j, a)$ is -0.0438*2 = -0.0876. The respondent has an incentive to delay. Consider a change of the nra from 65 to 67. The new value is $g(nra_j, a) = 0$. Compared to before, the respondent is more likely to claim at 67. Figure 3 shows significant impacts of changing the NRA, specifically at ages 65 and 67, captured by the kinked function we estimate.

Turning to the first-order effects of the other dimensions of the frame: loss vs. gain and annual vs. monthly, we see that the estimates of γ_k are close to zero and statistically insignificant. These dimensions of the frame do not seem to impact the reference age effect either, with one exception. When the scenario is framed as a loss, the effect of being above the nra is weaker (a positive coefficient lowers the negative impact of being away from the reference age). Overall, these other dimensions of the frame have little impact on claiming. The dominant effect comes from the reference age used as the normal retirement age. Hence, we conclude that changing the reference age when reporting the gain from delaying has a large impact on claiming delays in the experiment.

5 Do Respondents Gain from these Interventions?

We find substantial effects of frames and education on behavior and some effects of financial incentives. Next we ask whether these effects are desirable for those impacted. This question is difficult to answer. It requires a benchmark for the optimal claiming age. In a very general setting, the optimal claiming age will depend on current and future income, taxes, financial wealth, and preferences, particularly when liquidity constraints are present (Maurer et al., 2018).

Delaying claiming is akin to purchasing a deferred annuity. The pension income sacrificed today is the price paid for an increase in the pension annuity once benefits are claimed. Delaying claiming increases lifetime resources if the return on this purchase is larger than the risk-adjusted return on current financial wealth. Hence, this optimality problem does not involve preferences at first glance, but the problem is more intricate. While in many situations, the path of consumption is independent of the timing of claiming, in other situations, it is not. One situation is when current wealth is too low, and the individual is liquidity constrained. Another occurs when the annuity income in the future is larger than desired consumption (Hurd, 1989). In the latter case, the Euler equation of consumption does not bind at older ages, and preferences will play a role. Introducing bequests also

Table 12: Effect of Framing Treatments on the Claiming Hazard

	(1)	(2)	(3)
Post	-0.0106***	-0.0105**	-0.0105***
	(0.0024)	(0.0041)	(0.0041)
$\max(nra - a, 0)$	-0.0171***	-0.0197***	-0.0219***
	(0.0032)	(0.0037)	(0.0046)
$\max(a - nra, 0)$	-0.0438***	-0.0413***	-0.0475***
	(0.0106)	(0.0107)	(0.0112)
Loss × Post		0.0049	-0.0070
		(0.0049)	(0.0076)
Annual × Post		-0.0051	-0.0040
		(0.0049)	(0.0085)
Loss × Post × $\max(nra - a, 0)$			0.0034
			(0.0023)
Annual × Post × $\max(nra - a, 0)$			-0.0014
			(0.0027)
Loss × Post × $\max(a - nra, 0)$			0.0116**
			(0.0055)
Annual × Post × $\max(a - nra, 0)$			0.0049
			(0.0057)
Observations	33,230	33,230	33,230
R-squared	0.359	0.359	0.360

Notes: The table reports estimates from fixed effects linear regression models where the dependent variable is the hazard of claiming (=1 if claims at age a and zero if not). Controls for age dummies and age triggers are included. Standard errors are clustered at the respondent level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

complicates matters further. If liquidity constraints do not bind and bequest motives are negligible, the optimal claiming age is the age that maximizes the present discounted value of pension benefits, where the discount rate is the rate of return on the competing investment (financial wealth). The optimal choice is then independent of the trajectory of consumption.

Hence, one proxy for sub-optimal choices is the financial loss respondents incur when they expect to claim at an age that does not maximize the PDV of pension payments. Let $PDV_{i,j}$ be the PDV at the age they expect to claim, and $PDV^*_{i,j}$ be the PDV at the age that maximizes the PDV. Then the financial loss measure is

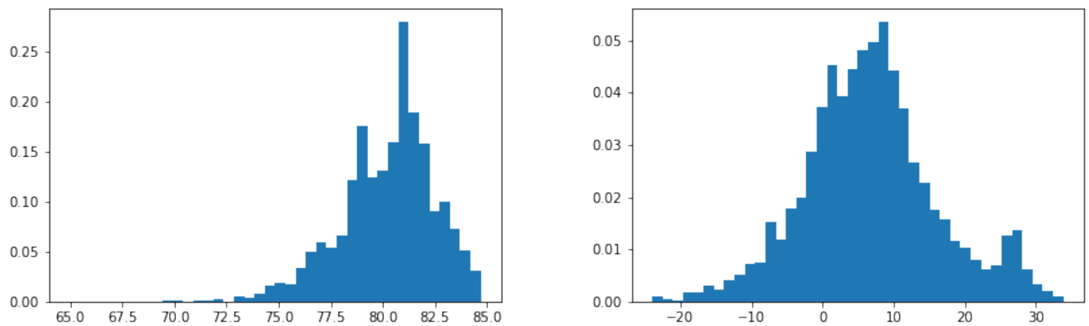
$$M_{i,j} = PDV^*_{i,j} - PDV_{i,j}, \tag{7}$$

where $M_{i,j} \geq 0$ by definition. This optimal PDV calculation requires a good estimate of each respondent's objective survival prospect. We follow the approach by Boyer et al. (2020) and compute objective survival probabilities using a microsimulation model of health (Boisclair et al., 2019). This model takes several individual characteristics as inputs to parameterize a Markovian transition model between health states and death such that it matches transition models estimated from the National Population Health Survey (1994-2010). Based on these transition matrices, we can simulate a number of paths for each respondent, each with a path-specific life span. Then we can average over these paths to find survival probabilities for different ages, as well as expected life spans. In our survey, we designed the first part of the questionnaire to include questions we could use in the microsimulation model. For example, we asked a battery of health-related questions, such as the prevalence of six major health conditions, and smoking habits. In addition, we asked about sex, education, and other characteristics predictive of respondnets' survival. Feeding that information into the microsimulation model generated individualized objective survival probabilities for each respondent.

Panel (a) of Figure 4 shows a histogram of objective life expectancies for our sample. Panel

Figure 4: Objective versus subjective life expectancies

(a) Objective life expectancies | (b) Subjective less objective life expectancies



Notes: These histograms show the dispersion of objective life expectancies (Panel a) and the difference between subjective and objective life expectancies Panel b) for survey respondents. Positive values of this difference indicate individuals with a subjective life expectancy higher than their objective one. Subjective life expectancies are calculated based on reported survival probabilities to ages 70, 80, and 90. Objective life expectancies are calculated based on respondents' gender, reported health status, and other variables using a microsimulation model.

(b) shows a histogram of the difference between objective and subjective life expectancies.[23] We observe that subjective life expectancies are higher than objective life expectancies, on average. When looking at the survival probabilities for each age we surveyed respondents about (70, 80, and 90), we observe that individuals underestimate the probability of living to 70 (0.8590 versus 0.9023). However, they overestimate the probability of living to age 80 (0.6988 versus 0.5495) and age 90 (0.4109 versus 0.0331) by a lot more, which explains the higher subjective life expectancies. Second, we observe that subjective life expectancies are more dispersed than objective life expectancies. The optimal claiming age in our analysis varies between participants mainly because of their different survival risks. As such, our resulting loss measure rests on the assumption that the objective survival probability estimates approximate the actual risk faced by respondents well.

We first focus on the education interventions. Table 13 reports statistics on the change

[23] Appendix Figure C.6 shows a histogram of subjective life expectancies.

Table 13: Effects of Education Treatments on Financial Loss M

	Control (1)	Break-Even (2)	Insurance (3)
$E(\Delta M_{i,j})$	-278	-402	-896*
P-value diff		[0.701]	[0.054]
$\Pr(\Delta M_{i,j} < 0)$	0.172	0.198	0.223***
P-value diff		[0.160]	[0.007]

Notes: The table reports statistics on the change in the financial loss between scenarios 1 and 7. The first line reports the average change in the financial loss. The second line reports the p-value on the t-test for a difference in a given treatment arm relative to the control group. The third line reports the fraction of respondents with a decrease in their financial loss. The fourth line reports the p-value on a t-test for a difference relative to the control group. *** p<0.01, ** p<0.05, * p<0.1

in the financial loss $M_{i,j}$ for each education treatment arm, focusing on the change from scenarios 1 to 7. We only consider respondents who changed their expected age between these two scenarios. We find that the fraction with an improvement in their financial loss is larger for those in the insurance treatment compared to the control group. Here, 22.3% of respondents in that arm make a choice that brings them closer to their optimal age, compared to 17.2% in the control group. The difference is statistically significant. The break-even group also experiences a higher fraction with improvements, but the difference is not statistically significant at the 10% level. In terms of average gains (reduction in financial loss), both treatment arms see an improvement on average, with the improvement larger in the insurance treatment arm (statistically significant at the 10% level). Overall, education appears to reduce financial losses.

We produce similar statistics for the framing intervention. This time, we consider each frame as a treatment relative to the control. Table 14 reports the results for the different frames considered. Overall, there is an imprecise reduction in the average loss for each frame. Yet, the fraction who experience a decrease in the loss is *lower* in all treatments compared to the control. Hence, the treatments induce more participants to make a worse decision, compared to the control group. Overall, there is no clear pattern, suggesting that

Table 14: Effect of Framing on the Financial Loss

	Control	Monthly Loss Age 67	Monthly Gain Age 65	Annual Loss Age 65	Annual Gain Age 65
	(1)	(2)	(3)	(4)	(5)
$E(\Delta M_{i,j})$	-350	-303	-929	-582	-452
P-value diff		[0.911]	[0.161]	[0.577]	[0.807]
$\Pr(\Delta M_{i,j} < 0)$	0.216	0.209	0.188	0.174*	0.203
P-value diff		[0.780]	[0.244]	[0.081]	[0.585]

Notes: The table reports statistics on the change in the financial loss from scenarios 1 to 7. The first line reports the average change in the financial loss. The second line reports the p-value on the t-test for a difference in a given each framing arm relative to the control group. The third line reports the fraction of respondents with a decrease in their financial loss. The fourth line reports the p-value on a t-test for a difference relative to the control group. *** p<0.01, ** p<0.05, * p<0.1

changes due to framing have minor impacts on respondents' outcomes, at least in terms of the present discounted value of benefits.

Consider the effect of financial incentives, focusing on scenarios 1 and 4. In scenario 4, the malus (and bonus) increase by one percentage point, leading to more delays (as shown earlier). Does this lead to a reduction in financial loss for those who change their claiming age? We compute the change in the PDV from scenarios 1 to 4, where negative numbers mean a reduction in financial loss. We find an average change of -1150.56 (p-value < 0.001). In other words, more than 60% of respondents who changed their claiming age had a reduction in the financial loss, while 38.1% had an increased loss. Overall, we find that increasing the malus (and bonus) improves the financial loss from picking a non-optimal claiming age, on average.

6 Conclusion

Many policymakers are advocating policies to increase delays pension claiming. In Canada, the main motivation is to increase annuitization in light of retirees' greater longevity risk. But what is the most effective way of increasing annuitization through delayed claiming?

And are those who change behavior impacted positively, at least financially? This paper combines quasi-experimental and experimental evidence to answer both questions.

First, we find that financial incentives are likely to be an ineffective policy option to incentivize delays in claiming, given that the elasticity of the claiming hazard with respect to financial accruals is small (between -0.1 and -0.15). We obtain similar estimates in behavioral responses using administrative data on actual changes in Canada, and in a survey experiment that features randomized variation in incentives. Our finding that near-retirees are quite inelastic is in line with other studies leveraging exogenous changes in the financial rewards for delaying claiming (Lalive et al., 2023; Gorry et al., 2022; Manoli and Weber, 2016). In addition, we measure the financial impact of choosing a certain claiming age. Our measure is the financial loss survey respondents incur from picking an age that does not maximize the present discounted value of their pension benefits. Interestingly, we find that, while the response to financial incentives is small overall, the financial impact of changing the claiming age for those who react to incentives is positive, on average.

Second, we also find that education, especially information treatments aimed at emphasizing the consumption value of delaying, and informing on longevity risk from life tables, can help respondents either delay or claim earlier, depending on how optimistic they are about their survival prospects. There is some evidence that this leads to better financial outcomes in terms of the present discounted value of pension benefits. However, there is little evidence that the type of education intervention we consider increases delays in a way that has a substantial impact overall.

Third, we find sizeable effects of simply reporting the financial gains from delaying claiming relative to an older reference age. Currently, the full retirement age in CPP and QPP is 65. If the full retirement age were raised to 67, our estimates imply strong impacts on the modal claiming age, even absent any changes in pension adjustment factors. This finding is consistent with strong responses to changes in the normal retirement age found in Mastrobuoni (2009), Behaghel and Blau (2012), Seibold (2021), and Lalive et al. (2023). The cost of such an intervention is nil, making it attractive from a cost-effectiveness perspective. However, we do not find that those impacted by such framing improve their financial outcomes in terms of the present discounted value of pension benefits. Combining a change in the reference age with education may produce better outcomes.

Behind the motivation to incentivize delays is the belief that such delays are in individuals' interest. This paper shows that this is not necessarily the case. The price paid for higher annuitization is that current consumption, or the financial return on financial wealth, must be sacrificed to obtain higher future benefits. For those with poor longevity prospects, claiming early may be perfectly sound from a financial perspective, so the financial impact of delaying is negative for these individuals. Interventions that incentive delays, whether through financial incentives or framing, may push them to delay, leading to a financial loss measured as the present discounted value of future benefits.

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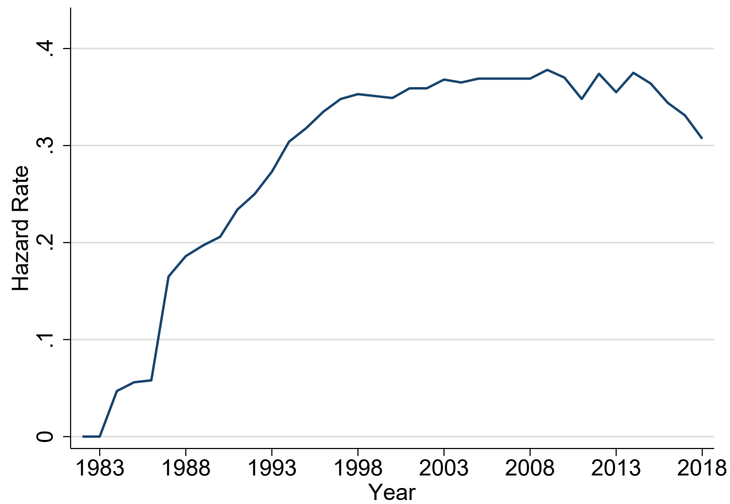
Appendix for Online Publication

A Background Figures

Figure A.1: Fraction claiming CPP (QPP) at Age 60



Notes: Data from the Longitudinal Administrative Database (LAD), 1982-2018.

B Additional Details and Results for Natural Experiment

B.1 Calculation of Potential CPP/QPP Pensions

CPP and QPP pensions are calculated using the same formula, but the parameters differ in some of the years because of the 2010 pension reform. An individual who claims a pension at age a receives an annual pension B_a that is calculated as follows:

$$B_a = 0.25\cdot(1+(a-65)\cdot PAF_a)\cdot \underbrace{\left(\frac{\sum_{k=18}^{a-1}\min\left(\frac{W_k}{YMPE_k},1\right)}{NCY_a}\right)}_{=\text{total adjusted pensionable earnings}} \cdot \underbrace{\left(\frac{\sum_{s=a-4}^{a} YMPE_s}{5}\right)}_{=\text{average}YMPE}, \quad \text{(B.1)}$$

where PAF_a is the pension adjustment factor which depends on the claiming age, W_k are the annual earnings at age k, NCY_a is the total number of contribution years, and $YMPE_s$ is the year's maximum pensionable earnings.

The contribution period begins in the year an individual turns 18 or in January 1966, whichever is later. It ends in the year an individual turns 70, or the year before the individual starts receiving a CPP/QPP pension.[24] The contribution period excludes any year that an individual receives a disability pension. Since we observe the year of birth and whether individuals receive a disability pension, we can calculate each individual's NCY_a at each potential claiming age.

Individuals are eligible for a general dropout, which removes the years with the lowest 15% of earnings from the total NCY_a. The dropout percentage in the CPP increased to 16% in 2012 and to 17% in 2014. For example, a 65-year-old individual who applies for a pension in 2016 can remove the lowest 8 years of earnings from the 47 NCY_a. Additionally, individuals who have been the primary caregiver for their children qualify for child-rearing dropout periods on top of the general dropout periods. Since in the data we cannot observe which parent is the primary caregiver, we ignore the child-rearing dropout provision when calculating the CPP/QPP pension amount. Instead, we control for the number of children directly.

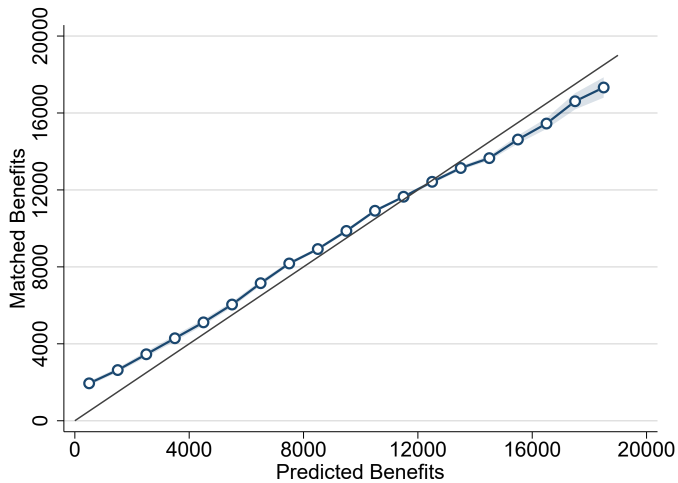
In the next step, we use a person's earnings history to calculate the adjusted pensionable earnings for each age from 18 to $a-1$, $W_k/YMPE_k$, which are capped from above at one. We exclude the lowest adjusted pensionable earnings that fall under the general dropout provision. We ignore contribution years and adjusted pensionable earnings after age 59 because they are likely affected by how people respond to the reform.[25] A challenge when calculating the adjusted pensionable earnings is that we do not observe earnings all the way

[24]The over-65-dropout provision allows people to drop all periods after age 65 from the NCY_a if the earnings after age 65 are less than any of the under-age 65 earnings.

[25]Our retirement hazard estimates in Appendix Table B.2 suggest that people who face higher PAFs retire later, affecting contribution years and pensionable earnings after age 60.

back to age 18 because our data starts in 1982 when individuals in our sample are between 24 and 47 years old. To address this problem, we follow Milligan and Schirle (2020) and estimate gender-birth-cohort-specific growth rates in median earnings. We then use these growth rates to backcast earnings to age 18.

Figure B.2: Comparison of predicted and matched pension benefits



Notes: The figure compares predicted benefits (horizontal axis) with matched benefits (vertical axis). The solid grey line is the 45-degree line.

In the final step, we calculate the average annual pensionable earnings by multiplying the total adjusted pensionable earnings without dropout years with the average $YMPE$ for the five-year period ending in the year a person claims a pension. An individual's annual pension corresponds to 25% of the average annual pensionable earnings multiplied by the pension adjustment factor, PAF_a. Our empirical analysis exploits exogenous variation in PAF_a induced by the 2010 pension reform, as discussed in paper section 2.1.

We verify the accuracy of our calculation by comparing our potential pension benefits with the actual pension payments for individuals who claim their CPP/QPP pension between 2005 and 2018. Figure B.2 plots the mean matched pension benefits against mean predicted pension benefits (in $1,000-bins) for all years together. We see that actual pension benefits track our predicted pension benefits very closely.

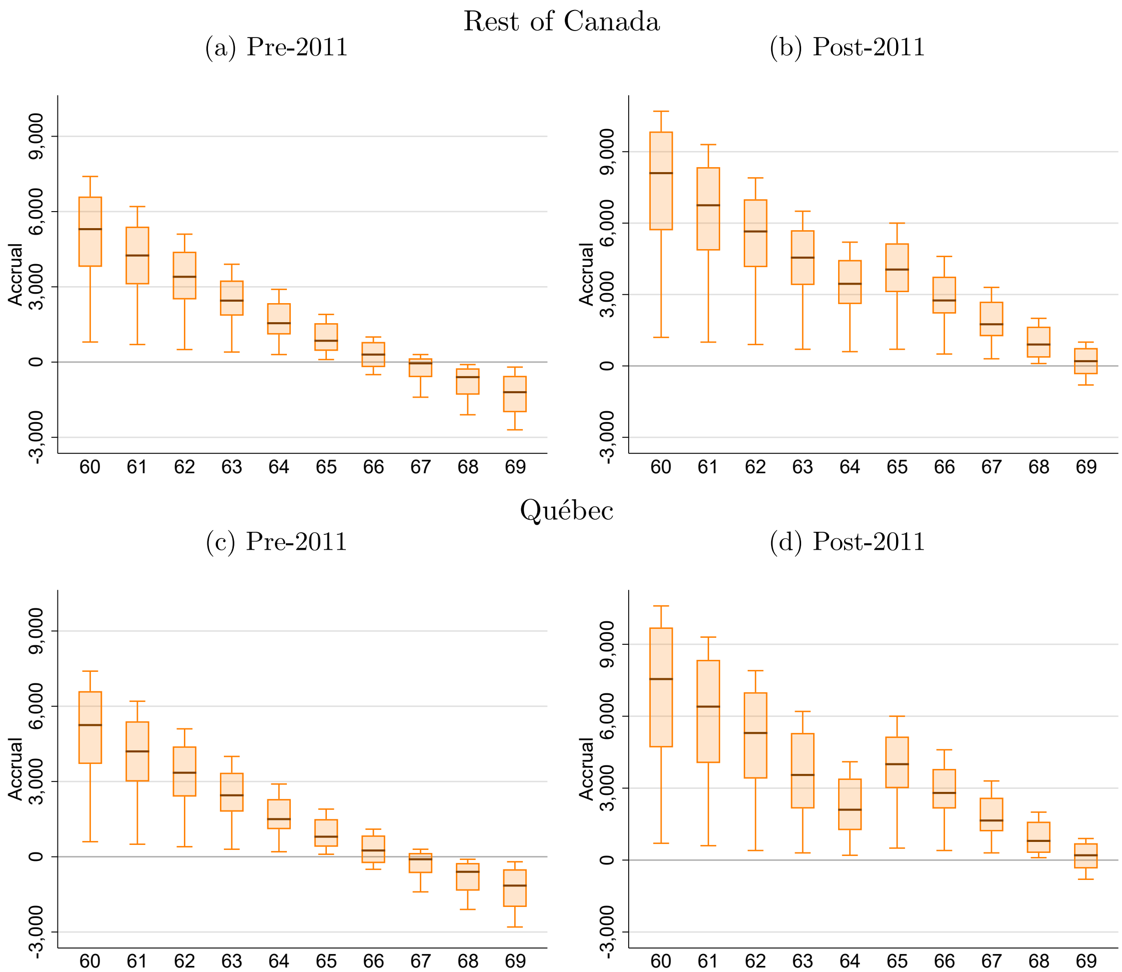
B.2 Additional Tables and Figures

Table B.1: Summary Statistics

	Rest of Canada		Québec	
	Pre-2011	Post-2011	Pre-2011	Post-2011
Claiming age	63.9	63.8	63.1	62.8
	(2.2)	(2.3)	(2.4)	(2.4)
Claiming hazard	0.245	0.232	0.338	0.329
	(0.43)	(0.422)	(0.473)	(0.47)
ACC	0.018	0.025	0.017	0.023
	(0.03)	(0.04)	(0.03)	(0.041)
PDV	1.125	1.139	1.112	1.132
	(0.429)	(0.473)	(0.473)	(0.493)
Age	61.9	62.3	61.7	62
	(2)	(2.2)	(2.1)	(2.3)
Annual earnings	41546.5	46209.2	32435.8	39166.9
	(159237)	(138075)	(114914)	(97540)
Avg. annual earnings	29280.1	30018.8	26609.1	28022.4
	(41324)	(45190)	(32611)	(36594)
% Female	53.6	52	55.1	54.2
	(49.9)	(50)	(49.7)	(49.8)
% Married	77.5	73.3	74.1	70.1
	(41.7)	(44.2)	(43.8)	(45.8)

Notes: The table reports summary statistics for ROC and Québec before and after 2011.

Figure B.3: Accrual Rate by Age and Period for Rest of Canada and Québec



Notes: The figure shows the pension accrual distribution in ROC and Québec before and after 2011. The top and bottom whiskers of the box plots are the 5th and 95th percentiles.

Figure B.4: Retirement Hazard by Age and Year for Rest of Canada and Québec

(a) Rest of Canada

(b) Québec

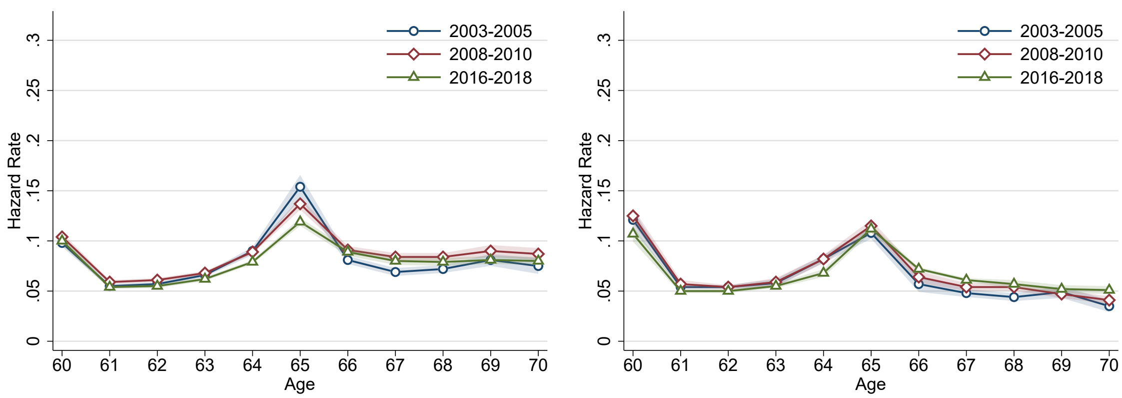


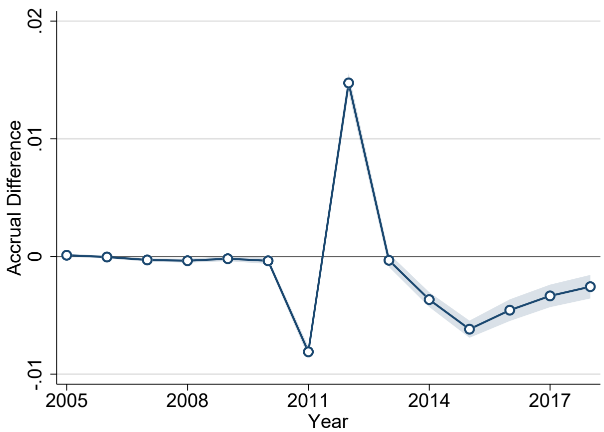
Table B.2: Main Estimates for Retirement Hazard

	(1)	(2)	(3)	(4)	(5)	(6)
ACC	-0.202***	-0.242***	-0.225***	-0.224***	-0.229***	-0.019
	(0.039)	(0.036)	(0.037)	(0.037)	(0.036)	(0.023)
PDV	0.038***	0.043***	0.042***	0.042***	0.042***	0.078***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.009)
Elasticity ACC	-0.062***	-0.074***	-0.069***	-0.069***	-0.070***	-0.006
	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)	(0.007)
Earnings controls	NO	YES	YES	YES	YES	YES
Age×QUE FE	NO	NO	YES	YES	YES	YES
ROC×2012	NO	NO	NO	YES	YES	YES
QUE×2014	NO	NO	NO	NO	YES	YES
Pre-2010 incentives	NO	NO	NO	NO	NO	YES
No. Obs.	8,005,470	8,005,470	8,005,470	8,005,470	8,005,470	8,005,470
R^2	0.012	0.015	0.015	0.015	0.015	0.016

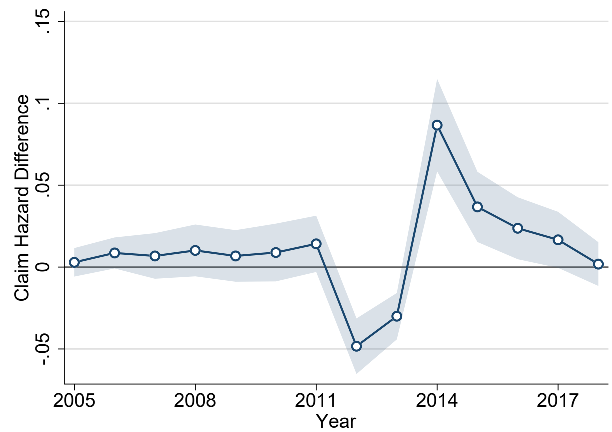
Notes: The table reports estimates from linear regression models where the dependent variable is the hazard of retirement (=1 if retires at age a and zero if not). The variables ACC and PDV are reported in hundred thousand dollars. The elasticity is computed at the mean of the claiming hazard and ACC. Specification 1 includes year, province, and age fixed effects. Specification 2 adds controls for health, gender, marital status, number of kids, lifetime earnings, and last earnings. Specification 3 adds Québec times age fixed effects. Specification 4 adds a Post 2012 times ROC dummy. Specification 5 adds a Post 2014 times Québec dummy. Finally, specification 7 adds controls for the pre-2011 ACC and PDV. Standard errors are clustered at census division level. *** p<0.01, ** p<0.05, * p<0.1

Figure B.5: Difference in Key Outcomes Between Rest of Canada and Québec by Year

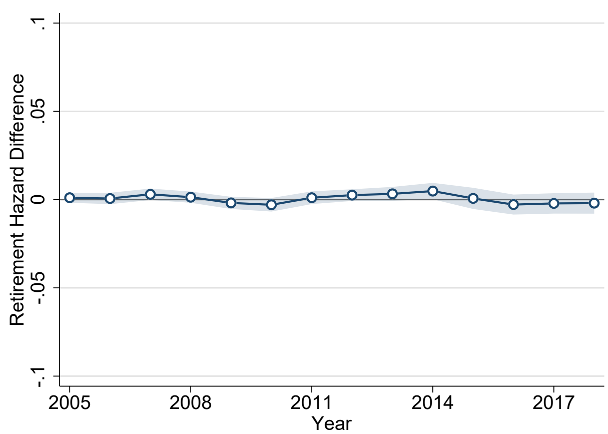
(a) Accrual (in 100,000)



(b) Claiming hazard



(c) Retirement hazard



Notes: The figure plots coefficient estimates of Québec times Year interaction terms from a linear probability model where the dependent variable is the accrual (Panel a), the hazard of claiming (Panel b), and the hazard of retirement. The reference period is pre-2005. The specification includes year, province, and age fixed effects. The shaded area denotes a 95-percent confidence interval.

C Additional Details and Results for Survey Experiment

C.1 Estimating Subjective Survival Probabilities

We derive age-specific survival probabilities for each respondent from three point-estimates that respondents report in the first part of the survey: Their subjective probability of surviving to age 70, age 80, and age 90. To obtain estimates for subjective survival probabilities all ages, we fit a Gompertz form of the subjective survival curve:

$$s_x(a_i, \theta_i) = \exp(-\tfrac{\alpha_i}{\beta_i} \exp(\beta_i(x - a_i))),$$

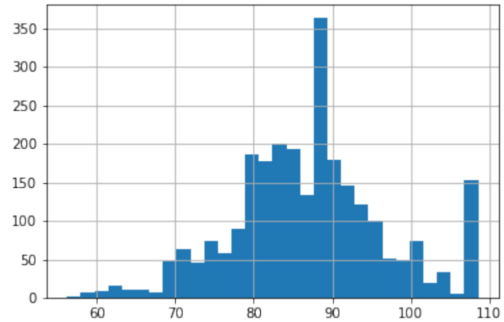
where $\theta_i = (\alpha_i, \beta_i)$ are the subjective parameters for respondent i. To estimate those parameters, we use a minimum distance estimator where we minimize the distance between each reported subjective probability and the one predicted from the Gompertz formulation. This yields 3 distances and two unknowns. We solve for each respondent:

$$\hat{\theta}_{i,MD} = \min_{\theta_i} \sum_x \left(p_x(a_i) - s_x(a_i, \theta)\right)^2, \tag{C.2}$$

where the sum is taken over the non-missing reported probabilities. Since there are two parameters, one needs at least two reports in order to estimate these parameters. For those respondents with two reported subjective probabilities, the distance at the estimates is zero. After having calculated the parameters of the Gompertz distribution for each respondent, we then impute these parameters for respondents who did not provide at least two survival probabilities based on age, gender, education, health conditions, and whether the respondent smoked. The final predicted survival probabilities for ages 70, 80, and 90 are very close to the answers provided in the questionnaire. A simple regression of the predicted probability on the stated probability gives R^2s of 93.56%, 94.28%, and 98.74%, respectively.

To illustrate the expected life expectancy that results from the fitted survival curves, we show in Figure 4 the histogram of life expectancy at the individual level.

Figure C.6: Histogram of subjective life expectancy.



Notes: This figure depicts the distribution of life expectancy at the individual level. Life expectancy is calculated using the parameters of the Gompertz distribution, which are estimated to fit the subjective probabilities of living to ages 70, 80, and 90 as reported in the survey by respondents.

C.2 Additional Results

Table C.3: Full Results for the Effect of Incentives in the Claiming Hazard

	(1)	(2)	(3)	(4)	(5)
ACC	-0.0785***	-0.0778***	-0.0765***	-0.0804***	-0.0802***
	(0.0135)	(0.0136)	(0.0132)	(0.0143)	(0.0146)
PDV	0.000680	0.000326	0.000474	0.000816	0.000978
	(0.000752)	(0.000759)	(0.000791)	(0.000825)	(0.000890)
Age at survey		0.00247*	0.00244*	0.00104	-3.53e-05
		(0.00146)	(0.00146)	(0.00143)	(0.00145)
Female		0.00661	0.00375	-0.00292	-0.00244
		(0.00432)	(0.00438)	(0.00439)	(0.00439)
Married		0.00489	0.00370	0.00102	-0.000223
		(0.00462)	(0.00460)	(0.00453)	(0.00452)
HS		0.0282***	0.0252***	0.0279***	0.0272***
		(0.00491)	(0.00494)	(0.00483)	(0.00484)
Less than HS		0.0533***	0.0509***	0.0515***	0.0515***
		(0.0176)	(0.0175)	(0.0170)	(0.0168)
Health problems		0.00281	0.00187	0.000428	0.000439
		(0.00263)	(0.00266)	(0.00261)	(0.00258)
log wealth		0.000203	0.000588	0.000182	3.52e-05
		(0.000499)	(0.000509)	(0.000511)	(0.000513)
Log earnings		0.00709*	0.00891**	0.00694*	0.00527
		(0.00394)	(0.00389)	(0.00419)	(0.00428)
Livewell, disagree			0.00439	0.00472	0.00404
			(0.00475)	(0.00469)	(0.00469)
Livewell, strongly agree			0.0140**	0.0128*	0.0116*
			(0.00710)	(0.00688)	(0.00691)
Livewell, strongly disagree			0.0111	0.0117*	0.0118*
			(0.00692)	(0.00696)	(0.00696)
Spend quickly, disagree			-0.0197***	-0.0192***	-0.0196***
			(0.00584)	(0.00573)	(0.00569)
Spend quickly, strongly agree			0.00748	0.00219	0.00275
			(0.0135)	(0.0137)	(0.0140)
Spend quickly, strongly disagree			-0.0347***	-0.0341***	-0.0343***
			(0.00683)	(0.00678)	(0.00679)
Risk aversion, average risk			0.0193***	0.0165***	0.0173***
			(0.00486)	(0.00477)	(0.00477)
Risk aversion, below average risk			0.0309***	0.0223***	0.0221***
			(0.00780)	(0.00774)	(0.00775)
Risk aversion, no risk			0.0258***	0.0188**	0.0201**
			(0.00861)	(0.00852)	(0.00874)
Risk aversion, substantial fin risk			-0.0223**	-0.0160	-0.0154
			(0.0106)	(0.0110)	(0.0112)
DB trigger				0.0509***	0.0467***
				(0.00606)	(0.00611)
Ret. trigger				0.0685***	0.0687***
				(0.00419)	(0.00420)
Ret. lit., 1 correct					-8.46e-05
					(0.0168)
2 correct					0.00870
					(0.0156)
3 correct					0.0227
					(0.0153)
4 correct					0.0323**
					(0.0153)
5 correct					0.0402**
					(0.0156)
Correct annuity					0.0122**
					(0.00525)
Fin. lit., 1 correct					-0.0154
					(0.0139)
2 correct					-0.0207*
					(0.0124)
3 correct					-0.0185
					(0.0124)
Constant	0.157***	-0.0790	-0.0990	-0.0360	0.0352
	(0.00577)	(0.0924)	(0.0922)	(0.0926)	(0.0952)
Observations	100,974	100,974	100,974	100,974	100,974
R-squared	0.203	0.205	0.207	0.222	0.223

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: The table reports estimates from linear regression models where the dependent variable is the hazard of claiming. Controls include age dummies and dummies for the order in which scenarios 2 to 6 were presented (not shown). Standard errors are clustered at the respondent level. Refer to the main text for the definition of variables. *** p<0.01, ** p<0.05, * p<0.1.

D Questionnaire

INSTRUCTIONS INCLUDED WITH AN ANONYMOUS QUESTIONNAIRE

CLAIMING PENSIONS

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 without any hesitation. We ask, however, that you take the time needed to consider certain questions on knowledge, which might involve concepts you are less familiar with. There is no time limit for completing the questionnaire, although we have estimated that it should take approximately 20 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. It is possible that the collected data will be shared with other researchers, solely for non-commercial research purposes, but for projects other than the one for which the data was originally collected. The anonymized dataset resulting from the survey may, at a later date, be made publicly available for academic research purposes.

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

[PN: RESPONDENTS SHOULD NEVER BE ALLOWED TO GO BACK EXCEPT WITHIN THE BREAKEVEN TREATMENT]

Section 1: Background

QA Are you…?
1 Male
2 Female

QB How old are you? *Please Enter.* [PN: MUST ENTER THE 2 CHARACTERS.] [RANGE 55-59]
Numeric
[PN: TERMINATE IF NOT 55-59 INCLUSIVELY]

QC Which province or territory do you live in?
1. British Columbia
2. Alberta
3. Saskatchewan
4. Manitoba
5. Ontario
6. Quebec
7. New Brunswick
8. Nova Scotia
9. Prince Edward Island
10. Newfoundland and Labrador
11. Northwest Territories
12. Nunavut
13. Yukon
14. None of the above

[PN: TERMINATE IF QC==14]

*****

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 trade 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 certificate, diploma, 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

Q2a How old is your partner (spouse)? [Ask if Q2==1 or 2][RANGE 18 - 100]

Q3 At the present time, do you smoke cigarettes daily, occasionally or not at all?
1 Daily
2 Occasionally
3 Not at all

[Ask if Q3==2 or 3][SHOW ON SAME PAGE AS Q3]
Q3a Have you ever smoked cigarettes daily? 1 Yes 2 No

[Multiple select]
Q4 Looking at the following list of health conditions, has a doctor ever told you that you had:
1 Heart disease
2 Stroke
3 Lung disease
4 Diabetes
5 Hypertension
6 Depression or other mental health problems
7 Cancer

For the remainder of this survey, it could be useful to have the following documents in front of you, if they are available: your [PN: IF RESPONSE TO QC==6, ADD "federal" HERE] income tax return for 2018 and that of your spouse, as the case may be; your notice of assessment for 2018 from the Canada Revenue Agency; and your most recent investment and pay statements, if applicable.

Section 2: Financial situation

[PN: THE VARIABLES "EARN" AND "WLTH" ARE DEFINED THROUGH THIS SERIES OF QUESTIONS AND WILL BE USED IN THE EXPERIMENT IN SECTION 6.]

Q5 Which of the following statements best describes your work situation for 2018? Note that by being "retired", we mean that you have stopped working entirely.

1 Employed (full time, part time, seasonal work)
2 Self-employed or business owner
3 Not in the labor force (retired)
4 Not in the labor force (for reasons other than retired)
7777777 Don't know
8888888 Prefer not to say

[Ask if Q5==1 or 2]

Q6 For 2018, what is your best estimate of your earnings (salary) before taxes and deductions?

Numeric (0-$5,000,000)
9999999 Don't know or prefer not to say

IF Q6==Numeric: EARN = Q6

[Ask if Q6== 9999999]

Q6a Is it more than $50,000? 1 Yes 2 No 7777777 Don't know 8888888 Prefer not to say

If Q6a==1: EARN = 50,000$
If Q6a==7777777 or 8888888: EARN = 25,000$
[Ask if Q6a==2]

Q6b Is it more than 25,000$? 1 Yes 2 No 7777777 Don't know 8888888 Prefer not to say

If Q6b==1: EARN = 37,500$
If Q6b==2: EARN = 12,500$
If Q6b==7777777 or 8888888: EARN = 25,000$

[Ask if Q5==3]

Q7 Before you retired, what were your average annual earnings in the last couple of years you worked?

Numeric (0-$5,000,000)
9999999 Don't know or prefer not to say

If Q7==Numeric: EARN = Q7

[Ask if Q7== 9999999]

Q7a Was it more than $50,000? 1 Yes 2 No 7777777 Don't know 8888888 Prefer not to say

If Q7a==1: EARN = 50,000$
If Q7a==7777777 or 8888888: EARN = 25,000$
[Ask if Q7a==2]

Q7b Was it more than $25,000? 1 Yes 2 No 7777777 Don't know 8888888 Prefer not to say

If Q7b==1: EARN = 37,500$
If Q7b==2: EARN = 12,500$
If Q7b==7777777 or 8888888: EARN = 25,000$

[Ask if Q5==4]

Q8 Since you turned 18, have you worked in at least one calendar year during which you earned an income of at least $3,500?

1 Yes
2 No
9999999 Don't know or prefer not to say

[Ask if Q8==1]

Q9 How many such years have you worked?

Numeric (1-[RESPONSE TO QB - 18])
9999999 Don't know or prefer not to say
IF Q9==NUMERIC: EXP = [min(Q9,40)]/40
IF Q9==9999999: EXP = 20/40

[Ask if Q9== Numeric and Q9>=2]

Q10 What were your average annual earnings in the last couple of years you worked?

Numeric (0-$5,000,000)
9999999 Don't know or prefer not to say
If Q10==Numeric: EARN = Q10*EXP

[Ask if Q10== 9999999]

Q10a Was it more than $50,000? 1 Yes 2 No 7777777 Don't know 8888888 Prefer not to say

If Q10a = 1: EARN = 50,000$ * EXP
If Q10a = 7777777 or 8888888: EARN = 25,000$ * EXP

[Ask if Q10a==2]

Q10b Was it more than $25,000? 1 Yes 2 No 7777777 Don't know 8888888 Prefer not to say

If Q10b==1: EARN = 37,500$*EXP
If Q10b==2: EARN = 12,500$*EXP
If Q10b==7777777 or 8888888: EARN = 25,000$*EXP

[PN: Because of skip logic it is possible that EARN is blank at this point. If EARN is less than 12,000 now, set it to 12,000]

[PN: DEFINE "WLTH" = 0 BEFORE THIS SERIES OF QUESTIONS.]

[Range 0 - $5,000,000]

Q11 What is your best estimate of how much <u>your household</u> has accumulated in individual Registered Retirement Savings Plans (RRSPs) as of today? (Exclude savings in accounts linked to an employer.)

Numeric
9999999 Don’t know or prefer not to say

If Q11==Numeric: WLTH = WLTH + Q11

[Ask if Q11==9999999]

Q11a Is it more than $50,000? 1 Yes 2 No 8888888 Prefer not to say 7777777 Don’t know

[Ask if Q11a==1]

Q11b Is it less than $200,000? 1 Yes 2 No 8888888 Prefer not to say 7777777 Don’t know

If Q11b==1: WLTH = WLTH + 125,000$
If Q11b==2: WLTH = WLTH + 275,000$
If Q11b ==777777 or 888888 = WLTH + $100,000

[Ask if Q11a==2]

Q11c Is it more than $10,000? 1 Yes 2 No 8888888 Prefer not to say 7777777 Don’t know

If Q11c==1: WLTH = WLTH + 30,000$
If Q11c==2: WLTH = WLTH + 5,000$
If Q11c==777777 or 888888: WLTH = WLTH + $25,000

[Range 0 - $5,000,000]

Q12 What is your best estimate of how much <u>your household</u> has accumulated in individual Tax-Free Savings Accounts (TFSAs) and individual non-registered savings accounts as of today? (Exclude savings in accounts linked to an employer.)

Numeric
9999999 Don’t know or prefer not to say

If Q12==Numeric: WLTH = WLTH + Q12

[Ask if Q12==9999999]

Q12a Is it more than $50,000? 1 Yes 2 No 8888888 Prefer not to say 7777777 Don’t know

[Ask if Q12a==1]

Q12b Is it less than $200,000? 1 Yes 2 No 8888888 Prefer not to say 7777777 Don’t know

If Q12b==1: WLTH = WLTH + 125,000$
If Q12b==2: WLTH = WLTH + 275,000$
If Q12b ==777777 or 888888 = WLTH + $100,000

[Ask if Q12a==2]

Q12c Is it more than $10,000? 1 Yes 2 No 8888888 Prefer not to say 7777777 Don't know

If Q12c==1: WLTH = WLTH + 30,000$
If Q12c==2: WLTH = WLTH + 5,000$
If Q12c==777777 or 888888: WLTH = WLTH + $25,000

Q13 Which annual rate of return do you expect to earn on these savings (RRSP and TFSA)?
[PN: Display box with %-sign next to it. Allow participant to enter one decimal.]
Numeric (0-100)
7777777 Don't know
8888888 Prefer not to say

Q14 Defined-contribution pension plans are plans sponsored by employers, where you choose how much to contribute and where the balance of your account fluctuates with the financial markets. Upon retiring, you are allowed to withdraw as much as you want from the account. Do you [if Q2==1,2 add "or your spouse"] have such a plan? Also include "group TFSAs" and "group RRSPs", which are employer provided.
1 Yes
2 No
9999999 Don't know or prefer not to say

[Ask if Q14==1] [Range 0 - $5,000,000]
Q15 What is your best estimate of how much <u>your household</u> has accumulated in defined-contribution employer pension plans (and which has not been taken out to date)?
Numeric
9999999 Don't know or prefer not to say

If Q15==Numeric: WLTH = WLTH + Q15

[Ask if Q15==9999999]
Q15a Is it more than $50,000? 1 Yes 2 No 8888888 Prefer not to say 7777777 Don't know
[Ask if Q15a==1]
Q15b Is it less than $200,000? 1 Yes 2 No 8888888 Prefer not to say 7777777 Don't know
If Q15b==1: WLTH = WLTH + 125,000$
If Q15b==2: WLTH = WLTH + 275,000$
If Q15b==777777 or 888888: WLTH = WLTH + $100,000

[Ask if Q15a==2]
Q15c Is it more than $10,000? 1 Yes 2 No 8888888 Prefer not to say 7777777 Don't know
If Q15c==1: WLTH = WLTH + 30,000$
If Q15c==2: WLTH = WLTH + 5,000$

If Q15c==777777 or 888888: WLTH = WLTH + $25,000

[Ask if (Q5==1 or 2 or 3) or if (Q5==4 AND Q8==1)]

Q16 A defined-benefit pension plan pays pre-determined benefits during retirement. The benefits depend on the number of years worked and income, but not on the pension plan's returns. [IF Q5==1 (employed), insert "Do you have a defined-benefit pension plan with your current employer?", if Q5==2 or 3 or 4 (self-employed or retired or not in the labor force), insert "Did you have a defined-benefit pension plan with a previous employer?"]

1 Yes
2 No
7777777 Don't know
8888888 Prefer not to say

[Ask if Q16==1]

Q16a Have you already begun receiving the pension from your defined-benefit plan?

1 Yes 2 No 8888888 Prefer not to say

[Ask if Q16a==1]

Q16b At what age did you claim your pension?

Numeric (<= RESPONSE TO QB (AGE))
8888888 Prefer not to say

[Ask if Q16a==1][Range: 0-100]

Q16c What is your best estimate of how much pension income you receive as a fraction of your [if Q5==1 or 2 insert "current", if Q5== 3 or 4 insert "last"] earnings through this defined-benefit pension plan?

Numeric [PN: Show box with % sign next to it]
7777777 Don't know
8888888 Prefer not to say

[Ask if Q16a==2] [RESPONSE TO QB (Age)-100]

Q16d At what age do you plan on claiming the pension from your defined-benefit pension plan?

Numeric
7777777 Don't know
8888888 Prefer not to say

[Ask if Q16a is Numeric]

Q16e Have you inquired what would be the benefits from your defined-benefit pension plan if you claimed at ages other than [RESPONSE TO Q16d]?

1 Yes
2 No
8888888 Prefer not to say

[Ask if Q16a==2]

Q16f What is your best estimate of how much pension income you will receive as a fraction of your [if Q5==1 or 2 insert “current”, if Q5== 3 or 4 insert “last”] earnings through this defined benefit pension plan?

Numeric (0-100%)
7777777 Don’t know
8888888 Prefer not to say

Section 3: Plans for Retirement

In this section, we will ask about your plans for retirement. By being “retired”, we mean that you have stopped working completely.

[PN: DEFINE RETAGE = 60]

[Ask if Q5==1 or 2][DISPLAY Q17 ON SAME SCREEN AS THE INTRODUCTORY TEXT]

Q17 At what age do you plan on retiring?

Numeric (>=RESPONSE TO QB)
7777777 Don’t know
8888888 Prefer not to say

If Q17 == Numeric: RETAGE = Q17

Q18 Do you have a financial plan for your retirement, in the sense that you have thought about how much money you will need in retirement, and how much income you will have from different sources (public programs and private sources)?

1 Yes
2 No
7777777 Don’t know
8888888 Prefer not to say

[PN: For the remainder of this questionnaire, define REG = “Quebec Pension Plan” if QC==6 (Quebec), and REG = “Canada Pension Plan” otherwise. Similarly, define ORG = “Retraite Québec” if QC==6 (Quebec), and ORG = “Service Canada” otherwise.]

Q19 The [REG] is a retirement income program administered by the government. At what age do you plan on claiming your [REG] pension?

Numeric (>=RESPONSE TO QB)
7777777 Don’t know
8888888 Prefer not to say

[Ask if Q19 is Numeric]

Q20 How did you gather information to decide when to claim your [REG] benefits? Please choose at least one and up to three responses.

1 I was advised by a pension representative at my workplace.
2 I was advised by my financial advisor.
3 I was advised by friends and/or family members.
4 I used an online tool offered by [ORG].
5 I used the pension statement and documents mailed to me by [ORG].
6 Other – Please specify: [PN: HAVE TO ENTER A RESPONSE]
7 Until now I had not really thought about it. [PN: Make this an exclusive option]
8888888 Prefer not to say

[Ask if Q20==1]

Q20a Did the pension representative recommend you claim as early as possible?

1 Yes
2 No
7777777 Don't know
8888888 Prefer not to say

[Ask if Q20==2]

Q20b Did your financial advisor recommend you claim as early as possible?

1 Yes
2 No
7777777 Don't know
8888888 Prefer not to say

PN: Q20a and Q20b can be displayed on one screen for respondents with Q20==1 and 2

[Ask if Q20<7]

Q20c What are the main reasons you plan to claim at age [RESPONSE TO Q19]? Please choose at least one and up to three reasons.

1 I did not know I could claim at other ages.
2 I have to claim at that age in order to maintain my standard of living.
3 Claiming my pension at a different age is not financially attractive.
4 I am afraid to be in poor health later in life, which would prevent me from enjoying pension benefits later in life.
5 I have sufficient income from other sources and do not need the pension earlier.
6 I think I will live long enough to still enjoy my pension benefits later in life.
7 I think I can invest the money and come out ahead.
8 I want to claim at the same age I retire.
9 I am unsure of whether the [REG] will be able to pay the pension later on.
10 Other – Please specify: [PN: HAVE TO ENTER A RESPONSE]
8888888 Prefer not to say

Section 4: Risk Perception

Next we would like to ask your opinion about how likely you think various events might be. When we ask a question, we'd like you to give us a number from 0 to 100, where "0" means that you think there is absolutely no chance, and "100" means that you think the event is absolutely certain to happen. For example, no one can ever be sure about tomorrow's weather, but if you think that rain is very unlikely tomorrow, you might say that there is a 10 percent chance of rain. If you think there is a very good chance that it will rain tomorrow, you might say that there is an 80 percent chance of rain.

[PN: Show Q21-Q23 on the same screen]

Q21 What do you think is the likelihood you will live to age 70? Please enter a number between 0 and 100, 0 meaning you expect there is no chance you will live to 70, and 100 meaning that you will live to 70 with certainty.

[PN: Provide box for numerical answer] [Range: 0 – 100]

Numeric (0-100)
7777777 Don't know
8888888 Prefer not to say

[Ask if Q21>0 and is Numeric]

Q22 What do you think is the likelihood you will live to age 80? Please enter a number between 0 and 100, 0 meaning you expect there is no chance you will live to 80, and 100 meaning that you will live to 80 with certainty.

[PN: CAP THE MAX ALLOWED RESPONSE HERE TO THE VALUE OF RESPONSE TO Q21]
[PN: Provide box for numerical answer] [Range: 0 – [RESPONSE TO Q21]]

Numeric
7777777 Don't know
8888888 Prefer not to say

[Ask if Q22>0 and is Numeric]

Q23 What do you think is the likelihood you will live to age 90? Please enter a number between 0 and 100, 0 meaning you expect there is no chance you will live to 90, and 100 meaning that you will live to 90 with certainty.

[PN: CAP THE MAX ALLOWED RESPONSE HERE TO THE VALUE OF RESPONSE TO Q22]
[PN: Provide box for numerical answer] [Range: 0 – [RESPONSE TO Q22]]

Numeric
7777777 Don't know
8888888 Prefer not to say

Q24 What do you think is the likelihood that at some point after you retire you will face a very large expense due to a health problem that requires that you draw down your savings? Please enter a number between 0 and 100, 0 meaning you expect that there is no chance this will occur and 100 meaning that you are certain this will occur.

[PN: Provide box for numerical answer] [Range: 0 – 100]

Numeric
7777777 Don't know

8888888 Prefer not to say

Section 5: Financial literacy and preferences

We would now like to ask you a few questions concerning your familiarity and ease with certain financial concepts, as well as your knowledge of certain pension and retirement programs. Please answer the questions to the best of your knowledge, <u>without any outside assistance.</u>

Q25 Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow during these 5 years?

1 More than $102
2 Exactly $102
3 Less than $102
7777777 Don't know
8888888 Prefer not to say

Q26 Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, with the money in this account, would you be able to buy…

1 More than today
2 Exactly the same as today
3 Less than today
7777777 Don't know
8888888 Prefer not to say

Q27 Do you think the following statement is true or false? "Buying a single company's stock usually provides a safer return than a stock mutual fund."

1 True
2 False
7777777 Don't know
8888888 Prefer not to say

[PN: FOR THIS QUESTION, DEFINE AND RECORD THE VARIABLE "GIVEUP" = [, give up $12,000] WITH A PROBABILITY OF 0.5, AND "GIVEUP" = [], I.E. EMPTY, WITH A PROBABILITY OF 0.5.]

Q28 John learns on first of January that he has at most 3 years to live and he has no heirs. He has a 100% chance of living another year, a 50% chance of living 2 years only and a 25% chance of living 3 years. He has $12,000 in the bank (which pays no interest) and wants to make the best use of it. He has three options:

1) spend $4,000 each year
2) spend $6,000 this year, $4,000 next year and $2,000 in the third year
3) use the money to buy an annuity [GIVEUP] and receive a check of $6,000 each year for as long as he lives.

Which one should he pick?
1 Option 1

2 Option 2
3 Option 3
7777777 Don't know
8888888 Prefer not to say

[PN: FOR Q29, RANDOMIZE ORDER OF CHOICES (SINGLE SELECT).]

Q29 Retirement benefits from the [REG]:
1 Are generally a fixed amount per person
2 Depend entirely on the recipient's income in the previous year
3 Are based on a recipient's career earnings
4 Are based on the value of contributions made to the plan by the recipient, plus a fixed return
5 Are based on the value of contributions made to the plan by the recipient, plus a variable return that depends on financial markets returns
7777777 Don't know
8888888 Prefer not to say

[PN: AFTER QUESTION Q29, SHOW CORRECT ANSWER TO RESPONDENTS (ANSWER #3 IN THE ORDER SHOWN ABOVE). PLEASE USE THE FOLLOWING FORMAT: "Your response is [IF Q29==3, INSERT "correct", ELSE INSERT "not correct"]. Retirement benefits are based on a recipient's career earnings."]. SAME FOR Q30-Q33]

[PN: IN THE FIRST PROGRAMMED VERSION, SOME PARTICIPANTS DO NOT SEE THE CORRECT ANSWER HAVING RESPONDEDN, WHILE OTHERS DO. MAYBE IT DEPENDS ON THE BROWSER (IN SAFARI I DON'T SEE CORRECT RESPONSE E.G.), BUT IT'S IMPORTANT THAT EVERYONE SEES THE CORRECT ANSWER!]

Q30 When is the earliest age at which you can claim retirement benefits from the [REG]?
Numeric (30-100)
7777777 Don't know
8888888 Prefer not to say

[PN: AFTER QUESTION Q30, PROVIDE CORRECT ANSWER (60) TO RESPONDENTS BY SHOWING THIS SENTENCE UNDER THE QUESTION: "Your response is [IF Q30==60, INSERT "correct", ELSE INSERT "not correct"]. The earliest age at which you can claim retirement beenfits from the [REG] is 60 years old".]

Q31 If someone begins to draw [REG] retirement benefits <u>earlier</u> than some "normal age", is there a penalty (a reduction in the amount of the monthly benefit received)?
1 Yes
2 No
7777777 Don't know
8888888 Prefer not to say

[PN: AFTER QUESTION Q31, SHOW CORRECT ANSWER TO RESPONDENTS (ANSWER #1) BY SHOWING THIS SENTENCE UNDER THE QUESTION: "Your response is [IF Q31==1 (Yes), INSERT "correct", ELSE INSERT "not correct"]. If someone begins to receive retirement benefits before some "normal age", monthly benefits are reduced."]

Q32 If someone begins to draw [REG] retirement benefits later than some "normal age", is there a bonus (an increase in the amount of the monthly benefit received)?

1 Yes
2 No
7777777 Don't know
8888888 Prefer not to say

[PN: AFTER QUESTION Q32, SHOW CORRECT ANSWER TO RESPONDENTS (ANSWER #1), BY SHOWING THIS SENTENCE UNDER THE QUESTION: "Your response is [IF Q32==1 (Yes), INSERT "correct", ELSE INSERT "not correct"]. If someone begins to receive retirement benefits later than some "normal age", monthly benefits increase.".]

Q33 At what age can you claim your full [REG] pension without any penalty?

Numeric (30-100)
7777777 Don't know
8888888 Prefer not to say

[PN: AFTER QUESTION Q33, PROVIDE CORRECT ANSWER TO RESPONDENTS BY SHOWING THIS SENTENCE UNDER THE QUESTION: "Your response is [IF Q33==65, INSERT "correct", ELSE INSERT "not correct"]. You can claim your full [REG] pension at 65 years old".]

Q34 Do you agree with the following statements? (Answers: 5 Strongly Agree; 4 Agree; 3 Disagree; 2 Strongly Disagree; 1 Don't know)

Q34a 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
Q34b I prefer to live well but for fewer years than to live long and have to sacrifice my quality of life
Q34c I would rather spend down my wealth quickly because I might not be healthy enough to enjoy the money later in life

Q35 Would you say you are a patient person when it comes to financial decisions?

1 Strongly Agree
2 Agree
3 Disagree
4 Strongly Disagree
5 Don't know

Q36 Which of the following statements comes closest to describing the amount of financial risk that you are willing to take when you wish to 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 6: Making choices

PN: In this section, we first show an intro screen providing information on the task. We then ask question Q37, a "reference choice" scenario with no framing. Follows an "intervention" with three treatment arms. Then, there is a sequence of 5 randomized choices also without a frame (Q38 to Q42), and finally one last choice at Q43 that includes a frame which is itself randomized.

All calculated dollar values in this section are to be rounded to the nearest dollar and formatted as $X,XXX in English and X XXX $ in French

INTRO SCREEN (show only once per respondent)
The following questions present scenarios that relate to the decision to claim benefits from the [REG]. We ask that you answer the questions as best you can. The scenarios may slightly depart from your actual, personal situation, but they approximate the choices you likely face when you reach the age at which you need to make a claiming decision.

Note that while these questions may appear to be similar, relevant details of the scenarios will differ. We therefore ask that you read the scenarios carefully and make your decision based on the information provided on each screen.

*****

PN: Define the following variables:

- *EARN will come from section 2.*
- *WLTH will come from section 2.*
- *RETAGE is defined in section 3, near Q17.*
- *MBEN = 0.25*min(EARN,50000)/12*
- *ABEN = 0.25*min(EARN,50000)*
- *R = 2% with probability 0.5, or R = 5% with probability 0.5*

*****

There are 6 scenarios, each defined by a MALUS and a BONUS. These are given by:

SCENARIO	**MALUS**	**BONUS**
1 (baseline)	7.2%	8.4%
2	2.2%	3.4%
3	5.2%	6.4%
4	8.2%	9.4%
5	11.2%	12.4%
6	14.2%	15.4%

TABLE 1: BONUS and MALUS values.

And here is the matrix of factors FX for each of the 6 scenarios (where X=60,61…70):

	F60	*F61*	*F62*	*F63*	*F64*	*F65*	*F66*	*F67*	*F68*	*F69*	*F70*
Scenario 1	*0.64*	*0.712*	*0.784*	*0.856*	*0.928*	*1*	*1.084*	*1.168*	*1.252*	*1.336*	*1.42*
Scenario 2	*0.89*	*0.912*	*0.934*	*0.956*	*0.978*	*1*	*1.034*	*1.068*	*1.102*	*1.136*	*1.17*
Scenario 3	*0.74*	*0.792*	*0.844*	*0.896*	*0.948*	*1*	*1.064*	*1.128*	*1.192*	*1.256*	*1.32*
Scenario 4	*0.59*	*0.672*	*0.754*	*0.836*	*0.918*	*1*	*1.094*	*1.188*	*1.282*	*1.376*	*1.47*
Scenario 5	*0.44*	*0.552*	*0.664*	*0.776*	*0.888*	*1*	*1.124*	*1.248*	*1.372*	*1.496*	*1.62*
Scenario 6	*0.29*	*0.432*	*0.574*	*0.716*	*0.858*	*1*	*1.154*	*1.308*	*1.462*	*1.616*	*1.77*

TABLE 2: Values of factors "FX" depending on the scenario, where X=60,61…70.

Finally, define the following frames [FRAME] which is a sentence that will be shown in Q43:

Frames	***Frequency***	***Gain or Loss***	***Reference point***	***FRAME text (factors all taken from Scenario 1 in TABLE 2. Note that the statements should be printed in bold and underlined)***
0				*None*
1	*M*	*Loss*	*65*	**<u>For example, claiming at age 60 instead of age 65 will result in a [(F65-F60)*MBEN] reduction in your monthly benefit for your remaining lifetime.</u>**
2	*M*	*Loss*	*67*	**<u>For example, claiming at age 60 instead of age 67 will result in a [(F67-F60)*MBEN] reduction in your monthly benefit for your remaining lifetime.</u>**
3	*M*	*Gain*	*65*	**<u>For example, claiming at age 65 instead of age 60 will result in a [(F65-F60)*MBEN] increase in your monthly benefit for your remaining lifetime.</u>**
4	*A*	*Loss*	*65*	**<u>For example, claiming at age 60 instead of age 65 will result in a [(F65-F60)*ABEN] reduction in your annual benefit for your remaining lifetime.</u>**
5	*A*	*Gain*	*65*	**<u>For example, claiming at age 65 instead of age 60 will result in a [(F65-F60)*ABEN] increase in your annual benefit for your remaining lifetime.</u>**

TABLE 3: "FRAME" texts.

The scenarios in Q37 to Q42 are done with FRAME=0. The last scenario (in Q43) picks one frame at random per respondent among frame texts 1 to 5 in Table 3 (each with probability 1/5).

<u>SCENARIO SCREENS</u> for each of Q37 to Q43
(with the "treatment" defined below shown between Q37 and Q38)

[PN: FOR Q38-Q43 ONLY, INSERT THE FOLLOWING HERE: "Now also consider the following scenario, which differs somewhat from the previous one(s) you have seen.*"]*
[PN: NOTE THAT WE ADDED BOLD FORMATTING TO SOME STATEMENTS]

When you turn 60, you will have to decide whether to claim your [REG] benefits. [If Q5 is not 3 (retired), insert "Assume your current plan is to retire completely at age [RETAGE], and that until that age, your yearly earnings will be [EARN] if you work."] Assume you have [WLTH] in retirement savings, which earn an annual return of [R], and which are not taxed if you choose to withdraw them.

At age 60, you will receive a statement from [ORG] regarding your [REG] benefits if you claim at different ages between 60 and 70. These benefits are *net of taxes* and have no effect on your other pension benefits. Importantly, these benefits *protect you against inflation* and will be paid no matter what. Suppose the statement includes the following information regarding the **monthly** [substitute "monthly" by "**annual**" in Q43 if Frame 4 or Frame 5 is shown] **benefit** you can get if you claim at different ages:

60	61	62	63	64	65	66	67	68	69	70
F60*MBEN	F61*MBEN	F62*MBEN	F63*MBEN	F64*MBEN	F65*MBEN	F66*MBEN	F67*MBEN	F68*MBEN	F69*MBEN	F70*MBEN

TABLE 4: Potential pension payouts depending on claiming age. (Where MBEN is as defined above, and F60 refers to column 1 of Table 2; the row to use to pick the correct cell in Table 2 will depend on the scenario. Format numbers as $X,XXX in English and as X XXX $ in French. Also note that in Q43, Frames 4 and 5 show annual benefits (ABEN) instead of monthly benefits (MBEN).)

[PN: TABLE FORMAT: CENTER TABLE HORIZONTALLY ON SCREEN. DON'T USE VERTICAL BORDERS, ONLY HOROZONTAL. PRINT AGE BOLD. INCREASE HEIGHT OF THE ROWS AND CENTER THE NUMBERS (VERTICALLY AND HORIZONTALLY). MAKE TOP AND BOTTOM BORDER THICKER THAN THE MIDDLE ONE. SHOULD LOOK LIKE THIS (NUMBERS JUST AN EXAMPLE):

60	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**
$667	$742	$817	$892	$967	$1,042	$1,130	$1,217	$1,305	$1,392	$1,480

]

[For Q37 – Q42 only: "This corresponds to a **penalty of [MALUS]** for each year prior to age 65 and a **reward of [BONUS]** for each year after age 65. This penalty or reward will apply *for the rest of your life*."]

[FRAME] *for Q43*

[SCENARIO=1, FRAME=0]
[Range: 60-70]
Q37 Faced with this situation, at what age would you plan to claim your pension?

TREATMENTS (to show once between Q37 and Q38)

There are 2 interventions to randomize (a third arm is the control and does not get an intervention), for a total of 3 treatments. Each respondent gets one and only one treatment. The treatment drawn for a respondent is to be administered to him/her only once, immediately prior to Q38.

Treatment Arms	***Probability for each respondent to get a given treatment***
1. Control	*1/3*
2. Break-Even	*1/3*
3. Insurance	*1/3*

TABLE 5: Treatment probabilities.

The specification of the treatments are given hereafter.

1. CONTROL TREATMENT

Respondents getting this treatment are not shown anything between questions Q37 and Q38. For these respondents, the questionnaire thus goes directly from Q37 to Q38 ("Scenario screens" above).

2. BREAK-EVEN TREATMENT

Respondents getting this treatment are shown the following <u>once</u> between questions Q37 and Q38. Respondents should be allowed to back and forth between the two screens on which this treatment is described.

[PN: Note that names are different in French and in English version]

IF QA=1(Male):
NAME1 = JOHN, NAME2 = ERIC, NAME3=ROB
PRON1 = HE
PRON2 = HIS
IF QA=2(Female):
NAME1 = MEREDITH, NAME2 = BEVERLY, NAME3 = ERIN
PRON1 = SHE
PRON2 = HER

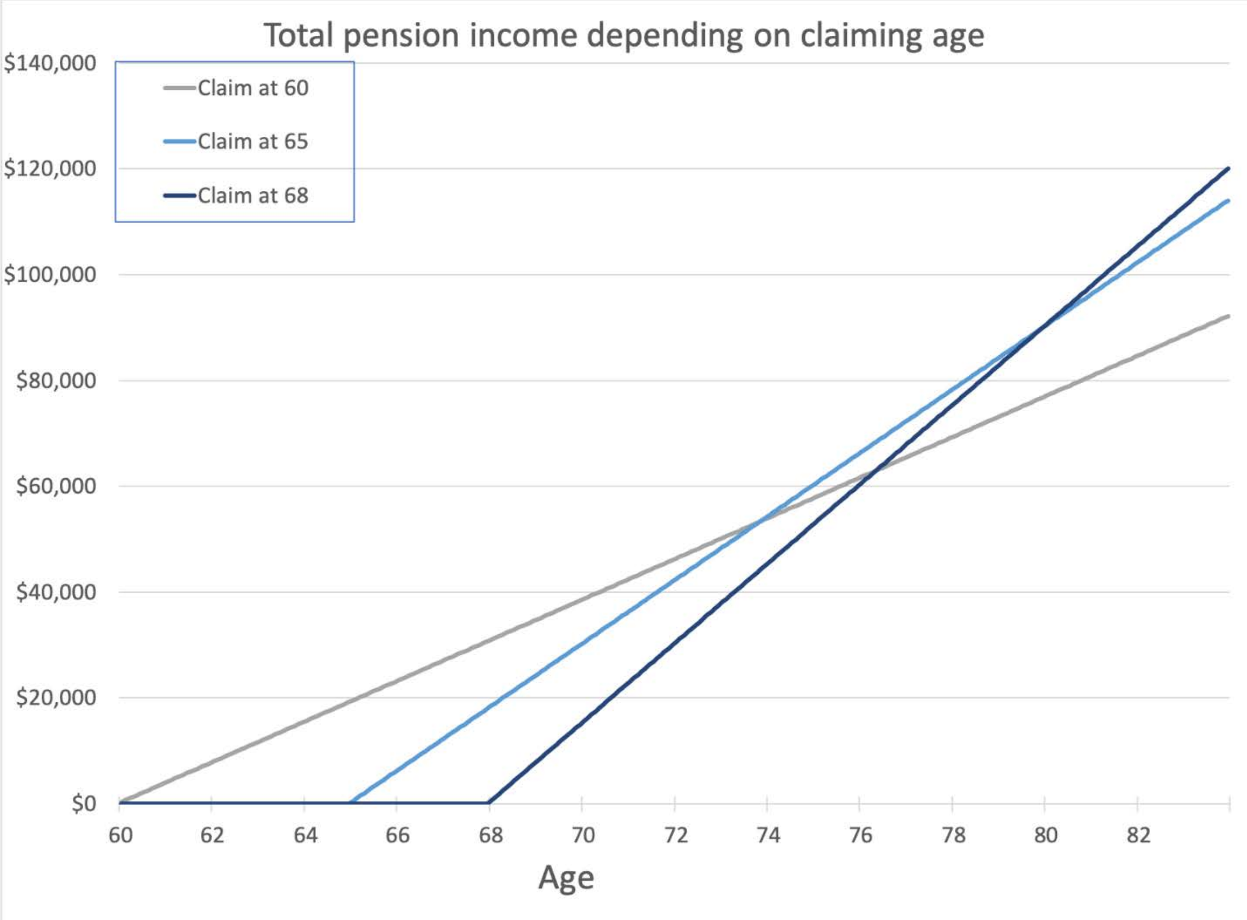
One way of choosing when to claim pension benefits is by comparing the total pension income you receive in retirement depending on what age you claim your pension. As a simple example, suppose that [NAME1] and [NAME2] can both claim a monthly pension of $500 at age 65. [NAME1] decides to claim at age 60 already for a reduced monthly pension of $320. [NAME2] decides to wait with claiming [PRON2] pension until [PRON1] is 65 years old.

For five years, [NAME1] receives [PRON2] pension of $320. When [NAME2] starts [PRON2] pension, [NAME1] has collected 60 monthly pensions of $320, or $19,200. When [NAME2] starts [PRON2] pension, [PRON1] receives a higher monthly benefit than [NAME1] and thus [PRON2] total pension income slowly catches up to [NAME1]'s. Starting at age 74, [NAME2] has collected a higher total pension income than [NAME1], and the difference becomes larger every year.

[NEW SCREEN]

Now consider a third person, [NAME3]. [NAME3] could have also claimed a monthly pension of $500 at age 65, but decided to wait with claiming until [PRON1] is 68 years old for a monthly pension of $625. When adding up [PRON2] monthly pension benefits, we see that starting at age 76, [PRON2] total pension is larger than that of [NAME1] (who claimed at age 60) and starting at age 80, it is also larger than that of [NAME2] (who claimed at age 65).

Below is a graph illustrating the total pension income for different claiming ages.
[PN: Note that graph is different in English and in French version]



Hence, the total expected pension income for different claiming ages depends on **how long one expects to live**. A [male/female] Canadian aged 60 today can expect to live on average [IF QA=1(Male): INSERT “25”; OTHERWISE INSERT “28”] years according to projections by Statistics Canada.

It is important to note that this is just a numerical example. The actual breakeven age will depend on the pension benefits you would receive at different claiming ages.

3. INSURANCE TREATMENT

Respondents getting this treatment are shown the following <u>once</u> between questions Q37 and Q38.

Deciding when to claim one's pension affects income for the rest of your life. Claiming a pension early means one can enjoy a pension income early on. However, the pension can be considerably smaller than if claiming had been delayed by a few years. This is especially relevant because some people run out of savings later in retirement if they live longer than they thought.
Claiming early can be beneficial for individuals who expect to die relatively young, for example due to poor health or known family conditions. Claiming later, on the other hand, can be beneficial for individuals who expect to live relatively long, because they will benefit most from a higher pension, which provides some **insurance against financial risk** at later ages. Furthermore, [REG] benefits provide an **insurance against inflation** since they are adjusted for inflation.

For a [IF QA=1(Male): INSERT "male"; OTHERWISE INSERT "female"] Canadian aged 60 today, the average likelihoods of reaching different ages are as follows according to projections by Statistics Canada. Note that a likelihood of 0 indicates that an event is impossible, and a likelihood of 100 indicates that it is certain that an event will occur.

Age	**Average likelihood of reaching that age**
65	
70	
75	
80	
85	
90	

TABLE 6: Survival likelihoods to be shown to respondents.

To fill Table 6 above, use the appropriate column in Table 7 below depending on response to QA (sex)

Age	***Average likelihood of reaching that age for individual age 60***	
	IF QA=1(male)	*IF QA=2(female)*
65	*96.2*	*97.2*
70	*90.9*	*93.3*
75	*83.5*	*87.9*
80	*72.7*	*79.9*
85	*56.4*	*67.2*
90	*32.3*	*46.2*

TABLE 7: Survival likelihoods by sex as projected by Statistics Canada.

Q38-Q42 *After treatment has been shown, randomize order of scenarios 2 to 6 (5 questions in total) with FRAME=0 and show "Scenario screens" above accordingly.* [Range: 60-70]

Q43 Present scenario 1 again to respondents as in Q37, but this time including a FRAME text randomly drawn from rows 1 to 5 in Table 3, each with probability 1/5. Note that while in questions Q37-Q42, monthly benefits were shown (MBEN), frames 4 and 5 present annual benefits (ABEN) (see Table 3). That means that Table 4 that is shown to respondents has to be changed to show annual benefits.
[Range: 60-70]