Income Security Programs

Analysis of Factors Influencing Planned and Actual Retirement Decisions

Strategic Evaluation and Monitoring
Evaluation and Data Development
Strategic Policy
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Table of Contents

List of Tables

1. Background

The retirement decision essentially is a decision not to continue participating in labour market activities. As such, it is conventionally "modelled" in the context of the income-leisure choice perspective of economics.[1] Individuals will retire if their expected well-being or utility when retired exceeds their well-being if they continue to participate in labour market activities. The calculation is a forward-looking one, based on expectations of future factors in the state of retirement versus continued employment.

This framework provides a convenient way of analyzing the expected effect on the retirement decision of a wide range of factors that can influence that decision. These include personal and labour market characteristics of the individual and his or her family circumstances, as well as institutional factors, including the financial incentives embodied in public and private pension plans, as outlined in the simulations.

This paper provides an econometric analysis of a wide range of factors believed to influence the retirement decision. It is based on Statistics Canada's General Social Survey (GSS), Cycle 9, the best currently available data base for this kind of investigation of Canada's changing retirement patterns. The analysis focuses on two measures of retirement, used as dependent variables. The first is a self-reported measure of the respondent's planned age of retirement. The second is the actual retirement decision from a group of potential retirees.

The analysis proceeds as follows. First, the data set and its construction are briefly described. Second, the distribution of the planned ages of retirement is portrayed separately for persons 45 and older and for younger persons age 16-44. Third, the explanatory variables used in the subsequent regression analysis are briefly discussed. Fourth, the econometric results of the regression analysis are presented separately for planned age of retirement and for the actual retirement decision. Fifth, the overall results are summarized.

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[1] Early studies that use this framework include Boskin (1977), Boskin and Hurd (1978), and Quinn (1977).

2. Data

The econometric analysis is based on the General Social Survey (GSS), Cycle 9, conducted in 1994, which, among other things, examined Canada's changing retirement patterns. While Statistics Canada's GSS series deals with general social phenomena, emphasizing demographics, social characteristics and living conditions, GSS Cycle 9 focused on issues of work and retirement. Thus, it is highly appropriate for an analysis of the factors influencing the retirement decision. Other cycles, done in other years and repeated every 5 years, deal with other issues, notably health, time use, personal risk, and family and friends.

The following exploratory variables were examined as potential determinants of the retirement decision: respondent's gender, education, age, health status, spousal status, non-labour market income, region, covered by a collective agreement, industry and occupation prestige.[2]

The target population of the GSS is all persons age 15 and over living in the 10 provinces and not residing full-time in institutions. The sample for Cycle 9 consists of 11,876 respondents, with a disproportionate number of those age 55 to 74, given the emphasis on retirement issues. The survey was conducted through computer-assisted telephone interviewing.

In our analysis, two dependent variables are utilized: (1) the planned age of retirement[3] for persons who had not already retired, and (2) the actual retirement decision, as indicated by a dummy variable coded 1 if the person had retired in the previous 5-year period, 1990-94 (i.e., RET90 = 1) and 0 if they continued in employment. The 5-year period had to be used because, for confidentiality purposes, the Public Use files aggregate the retirees into groups of years when they retired (e.g., 1990-94, 1985-89, 1980-84 etc.).

Because the focus is on retirement plans or retirement decisions, the data set had to be restricted to persons who were employed or previously employed and could reasonably be considered to be making retirement plans or retirement decisions. This entailed the use of certain "screens" or filters to select such persons.

The screen for the subsample used to analyze the planned age of retirement first entailed selecting persons who provided a planned age of retirement, including the response that

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[2] Besides individual pension wealth accrual effects, important determinants of the retirement decision could not be included in these estimations. These included the potential employability by occupation category in 1995 or economy-wide macro determinants of demand for different categories of older worker labour, assuming these individuals were willing and able to work. The occupational status of these individuals could not be easily categorized.

[3] The mnemonic from the codebook for this variable is DVEXREAG. In the subsequent text, all such mnemonics are denoted in capital letters.

they "do not intend to retire" (DVEXREAG < 997).[4] (Our treatment of the "do not intend to retire" response is detailed subsequently.) From the original sample of 11,876, this yielded a subsample of 6,042.

The second filter entailed selecting persons whose main activity in the past 12 months was working at a job or business (DVG2 = 1). This reduced the sample size to 4,180, of whom 1,518 were 45 and older (DVAGEGR > 7) and 2,662 were between the ages of 16 and 44. These are the sample sizes for the simple tabulations of planned ages of retirement for persons 45 and older given in Tables 1A and 1B and persons 16-44 given in Tables 1C and 1D.

The econometric analysis of the *planned* age of retirement was restricted to the subsample of 1,518 persons 45 and older because of the desire to ascertain the importance of such institutional features as employer pension plans. These are the employees who are most likely to know their pension plan features and hence to have their retirement plans shaped by those features.

The econometric analysis of the *actual* retirement decision was restricted to the subsample of persons who are potential retirees and who are making a decision to retire or continue working in the labour market. This was done by selecting persons 45 years of age and over (DVAGEGR > 7) whose main activity 5 years ago was working at a job or business (DVACT5YR = 1). The main activity of 5 years ago had to be used because the retirement decision was based on the previous 5-year period, 1990-94. From the original sample of 11,876, this yielded a subsample of 2,692 potential retirees,[5] of whom 487, or 18 percent, had retired within the last 5 years (1990-94).

Because the actual retirement decision was based on whether the person had retired in the previous 5-year period, 1990-94, it was necessary to use information for the persons' industry and occupation, as well as their coverage by a collective agreement and employer pension plan that referred to their status immediately before that 5-year period.[6] In essence, it would not be possible to use their contemporaneous 1994 information if they had already retired, in which case they would not have an industry or occupation or be covered by a collective agreement or employer pension plan.

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[4] The coding gives the planned age of retirement for those who provided a planned age, with the code 996 given to those who say they "do not intend to retire", 997 for "not applicable", 998 for not known, and 999 for not stated. Therefore, <997 picks up all persons who provided a planned age of retirement including "do not intend to retire".

[5] This is the sample size for the analysis of the actual retirement decision as used in Table 2C and 3C. They do not correspond to any of the numbers in the tables dealing with the planned age of retirement.

[6] This entailed using the following variables from the GSS Cycle 9 codebook. For the industry designation 5 years ago, DVIND5YR, for both retirees and those currently employed. For the PINEO occupational designation 5 years ago, DV5YRPIN, for both retirees and those currently employed. For collective agreement coverage, DVCON5YR for retirees; and for the employed, H42A = 1 (union member) or H43B = 1 (non-member but covered by a collective agreement). For coverage by an employer-sponsored pension plan, K13 = 1 for retirees (i.e., received retirement income from employer) and H34A = 1 for the employed (i.e., covered by an employer-sponsored retirement plan).

3. Distribution of Planned Age of Retirement

Employed Persons Age 45+: Table 1A presents the distribution of the self-reported planned age of retirement for the 1,518 employed persons age 45 and over in the data set and who had not already retired.[7] Clearly, there are large "spikes," or bunching up of the planned retirement ages at specific ages, as suggested in section 4, notably age 65 (25 percent of respondents), age 60 (21 percent of respondents), and age 55 (13 percent of respondents).

Overall, almost 60 percent of the respondents who had stated their retirement preferences and who had not already retired planned to retire at one of those three specific ages. Obviously, this does not reflect those persons who had already retired at those ages, since they would not be included in the data set, which is limited to persons who had not already retired and therefore could have a planned retirement age.

The last column of cumulative percents indicates that for persons 45 and over who had not already retired, 17 percent planned to retire by age 55, 45 percent planned to retire by age 60, and almost 80 percent planned to retire by age 65.

The other notable feature of the table is that 17 percent of the respondents who made a specific statement about their retirement age indicated that they do not intend to retire (last row). This is a large figure, especially considering that a substantial portion of respondents would be subject to a mandatory retirement policy. Although such persons only have to retire from their existing employment relationship and not necessarily from the labour force itself, it still would be a constraining influence on most employees.

The large numbers of those who indicated that they do not intend to retire suggests that the distribution of planned retirement ages would be much more pronounced at the later ages if these persons were included in that distribution. Alternatively stated, the small numbers in the category of post-65 planned age of retirement would be considerably expanded if the 17 percent of the workforce who indicated that they do not intend to retire is distributed throughout those older planned ages of retirement. Obviously, workers should be regarded as having an "older" planned age of retirement if they indicate that they plan never to retire. The question is at what age?

One reasonable assumption is that the statement "I do not intend to retire" means "I won't retire until I die." This could be an upper bound on the planned retirement age, since the

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7   The tabulations represent the 1,518 persons who responded with a specific planned retirement age or with the specific statement that they do not intend to retire. It does not include the 1,306 respondents who said that they "do not know", nor does it include the 46 respondents who did not state a planned retirement age. The latter two figures are never used in the analysis.

person may be compelled to retire for reasons such as ill health prior to death, although of course this can also apply to all persons who did give a planned retirement age. For illustrative purposes, it may be informative to distribute those who indicated that they "do not intend to retire" throughout the latter planned ages of retirement. One such hypothetical distribution would be based on their remaining life expectancy.

Employed Persons 45+, "Never Retire" Imputed from Life Expectancy: Table 1B essentially distributes the "never retire" group throughout the latter planned ages of retirement based on their remaining life expectancy. Their remaining or conditional life expectancy is the appropriate figure, since the conditional life expectancy at a given older age is considerably higher for the "survivors" than is their unconditional life expectancy at birth. By virtue of the fact that they have already survived to a given age, they presumably have characteristics that make it likely that they will survive longer than the average person born in the same year.

Essentially, persons who indicated that they intend not to retire are in our analysis given a planned retirement age equal to their given age plus their remaining life expectancy.[8] The calculations are done separately for males and females, given the considerably longer life expectancy of females (e.g., 4 years longer for females than males at age 65).[9]

As illustrated in Table 1B, when persons who indicated that they never plan to retire are given a planned retirement age based on their remaining life expectancy, the planned retirement ages at later years obviously become more prominent. The earlier "spikes" at ages like 65, 60 and 55 remain, but there is, following this adjustment, a substantial portion of employees who expect to retire at ages of 75 and over.

This suggests that there is a substantial pent-up demand for delayed retirement in the years beyond the normal retirement age of 65. This is the case, whether one uses the response of "don't intend to retire" (as in Table 1A) or the group is distributed to later planned years of retirement based on remaining life expectancy (as in Table 1B). Whether the pent-up demand for postponed retirement reflects a desire to continue working because of the intrinsic satisfaction of work or out of economic necessity is not ascertainable from a simple distribution of planned ages of retirement.

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[8] The conditional life expectancy figures are from Statistics Canada, Life Tables, Canada and Provinces, N⁰. 84-537, 1995.

[9] By way of illustration, a male who indicated that he did not plan to retire and who was age 47 would be given a planned age of retirement of 77, based on his remaining life expectancy of 30 years. A male who is 5 years older at age 52 would be given a planned age of retirement of 78, based on his remaining life expectancy of 26 years. In effect, even though he is 5 years older, his remaining life expectancy drops by only 4 years and not 5, reflecting the fact that conditional life expectancy increases for surviving cohorts. Because the conditional life expectancy increases by 1 year (from age 77 to 78) for such persons who are 5 years older, the planned age of retirement increases by 1 year for such persons. As such, planned retirement ages become somewhat "bunched," since the longer remaining life expectancy somewhat offsets the effect of aging.

A similar female age 47 would be given a planned age of retirement of 83 (compared to 77 for males) based on her longer remaining life expectancy of 36 years. This highlights that females who indicated that they never plan to retire would be given a later planned age of retirement than males, given the longer remaining life expectancy of females.

In essence, while there is considerable "bunching" of planned ages of retirement at specific ages like 65, 60 and 55, there is also considerable diversity in planned ages of retirement. While age 65 is the most common planned age of retirement, it is the expected age for only a little over one-fifth of the older workforce who report a planned age of retirement or give the explicit statement that they do not intend to retire. The planned age of retirement can be characterized as exhibiting considerable diversity, with some well-defined spikes.

The spikes appear to reflect two factors. First, they occur at the ages when institutional features of public and private pension plans apply. Specifically, age 65 is the age of receipt of normal CPP/QPP benefits, and it is the common age of normal retirement in private occupational pension plans, which are also often accompanied by mandatory retirement. Age 60 is the age of eligibility for early CPP benefits, and ages 60 to 62 are common ages for special early retirement in private occupational pension plans. In the latter case, there is no actuarial adjustment to offset the fact that pensions are received earlier and for a longer period of time. Age 55 is a common age for subsidized early retirement in private occupational pension plans. Thus, these results are consistent with a number of findings from our simulations in section 4.

Second, the spikes also likely reflect "rounding" to 5-year designations (e.g., 60, 55, 50) on the part of respondents, as they are all 5 years apart, surrounding the "normal" retirement age of 65. Small spikes also occur, for example, at ages like 50, 70 and 75, even though there is no evidence of any different financial incentives under public or private pension plans at those ages. Such "rounding," however, could not explain the large spikes that occur at ages like 65, 60 and 55, suggesting that the previously discussed financial incentives of public and private pension plans are important influences on the planned ages of retirement.

Employed Younger Persons Age 16-44: Tables 1C and 1D repeat the previous analysis of the planned age of retirement but for younger persons age 16-44, when persons who do not plan to retire are grouped in that separate category (Table 1C) and when they are distributed throughout the planned ages of retirement based on their remaining life expectancy (Table 1D). The main purpose of this exercise is to ascertain whether younger persons have significantly different retirement perspectives than do older employees.

The tabulations suggest strongly that younger workers plan to retire much earlier than do older workers. For example, when Tables 1C (younger workers age 16-44) and 1A (older workers age 45+) are compared, the most common (modal) planned age of retirement for younger workers is age 55 (31 percent), compared to age 65 (25 percent) for older workers. A substantial number of younger workers (10 percent) even planned to retire at age 50.

As was the case for older workers, the spikes at specific ages of 5-year intervals are prominent, but for younger workers the spikes have all shifted to earlier ages. This is perhaps most clearly illustrated by the cumulative distribution. For older workers, 45 percent of the workforce planned to retire by age 60; for younger workers, a comparable

figure of 47.5 percent was reached by age 55. The effect is even more dramatic at earlier retirement ages. For older workers, only 17 percent of the workforce planned to retire by age 55; for younger workers, 48 percent planned to retire by that age.

The pattern of earlier planned retirement ages for younger workers is also apparent when comparisons are made amongst persons who indicated that they did "not intend to retire". Seventeen percent of the older workforce who responded with a specific statement about their retirement plans indicated that they did not intend to retire, compared to only 10 percent of the younger workforce who gave such an indication.

Similar patterns of earlier planned ages of retirement and earlier retirement spikes are prevalent when those who indicated that they did not plan to retire are distributed amongst the planned retirement ages according to their remaining life expectancy.

The strong pattern of earlier planned ages of retirement amongst younger persons is all the more remarkable given that they can also anticipate a longer life expectancy and hence a much longer post-retirement period. Furthermore, it is at odds with the stereotype which is now popular, of the X-Generation never being able to afford the luxuries of their parents, including the luxury of amassing sufficient savings to be able to afford to retire early. This is especially the case if the younger generations may also inherit considerable financial burdens associated with supporting liabilities of pay-as-you-go pensions for a rising proportion of seniors.[10]

In spite of these forces which could work against their being able to retire earlier, younger workers have clear plans to retire at a younger age than do their older counterparts. Of course, their plans may never come to fruition; nevertheless, this highlights that the expectations amongst younger workers are in the direction of earlier retirement, and the magnitudes are quite substantial.

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[10] Of course, younger generations also stand to inherit considerable financial wealth from older generations.

4. Descriptive Statistics for Variables Influencing Retirement

As indicated previously in the literature review and in the theoretical discussion of the determinants of the retirement decision, a wide range of factors are believed to influence that decision. Some of these factors that are available in the GSS data base and that are included as explanatory variables in the subsequent regression analysis are discussed in this section. **This section can readily be skipped by persons interested only in the results and not in the data that "produce" such results.** The descriptive statistics include: the number of observations or cases with information on each variable (hence illustrating missing values); the minimum and maximum values; the mean value (which is the proportion of observations in that category for categorical independent variables); and a measure of the variance (i.e., the standard deviation).

These descriptive statistics are provided separately for the three subsamples that enter each of the three subsequent regression analyzes. In all cases, the regression analysis is restricted to persons age 45 and over. The tables of descriptive statistics differ with respect to the dependent variable (planned age of retirement in Tables 2A and 2B versus the actual retirement decision in Table 2C). The planned age of retirement regressions also differ with respect to whether respondents who indicated that they did not plan to retire are omitted from the analysis (Table 2A) or given an imputed planned age based on their remaining life expectancy (Table 2B). Since Table 2C deals with the actual and not planned retirement decision, there is no "never retire" group to distribute in that analysis.

The discussion of the descriptive statistics will be brief and focus on Table 2A, describing the variables that enter the planned age of retirement regression when persons who indicated that they did not plan to retire are excluded from the analysis. This discussion sets the pattern for the other tables of descriptive statistics.

As indicated in Table 2A, the sample size for the regressions which exclude respondents who indicated that they did not plan to retire is 1,266. This corresponds to the 1,518 observations in the frequency distribution of planned retirement age of Table 1A, less the 252 who indicated that they did not plan to retire. As indicated in the first column, all variables in this subsample have the full sample size of 1,266, indicating that none of the observations (respondents) had missing values on any of the variables.

Since all variables but one are categorical variables, they have a minimum value of 0, denoting not being in that category, or a maximum value of 1 if the observation fell in that category.

The mean values indicate that 59 percent of the respondents are male; and 41 percent, female. The age categories indicate that 34 percent are in the age group 45-49, with only 2.2 percent in the age group 65-69 and less than 1 percent in the age group 70 and over.

A substantial portion (26 percent) of these older workers have less than high-school education, with 22 percent being university graduates. The most prominent spousal category is spouse working (46 percent), with 4 percent having a retired spouse and 2 percent having a spouse who is ill. The respondents were roughly evenly divided with respect to their health being good, very good and excellent, with 1.4 percent reporting their health as poor and 7 percent reporting it as fair.

Only 2 percent had reported receiving other income over the past 12 months (e.g., child support, scholarships), with 36 percent reporting that they received interest income over the past year and 83 percent being home owners. Over two-thirds (68 percent) reported that they were covered by a collective agreement, which is considerably higher than the coverage rate for the workforce as a whole (37 percent) or even that for workers 45 and older (around 47 percent)[11]. Approximately 42 percent were covered by an employer pension plan, which is representative of the 34 percent of the labour force covered by pension plans around that time.[12]

The only non-categorical, continuous independent variable is the occupational prestige index. This is the PINEO index of occupational prestige, reversed in direction so that it goes from a low of 1 to a high of 16, with a mean of 8.5. The industrial and regional distributions of the workforce are representative of their distributions in the economy as a whole. The mean planned retirement age is 61 years.

As indicated in Table 2B, the sample size increases to 1,518 when the 252 responses of those who indicated that they did not plan to retire are distributed to different planned retirement ages based on their remaining life expectancy. The mean planned retirement age also increases to 64.3 years when these observations are included. In this subsample, there are a few missing values, although that is uncommon and exists only for the financial variables of received "other income" (n=1,515, indicating three respondents did not reply to this question), "received interest income" (n=1,515), and "home owner" (n=1,501).

Table 2C provides the descriptive statistics for the variables used in the regression on the actual retirement decision. The sample size increases to 2,692 because these regressions also include persons who retired in the previous 5-year period (while the regressions on the planned age of retirement obviously only included persons who had not yet retired). The mean value of 0.1809 for the "retired" dummy indicates that 18 percent of the respondents had self-reported themselves as retired over the 5-year period of 1990 to 1994. Missing values occurred only for the "home ownership" variable (n=2,641, indicating that 51 respondents did not reply to this question).

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[11] In 1990, coverage was 48.4 percent for workers age 45-54 and 44.6 percent for workers age 55-69 (Murray, G. "Unions: Membership, Structures and Action." In Union-Management Relations in Canada. 3rd Edition. Edited by M. Gunderson and A. Ponak. Toronto: Addison-Wesley, 1995, p. 166).

[12] Statistics Canada, Pension Plans in Canada, No. 74-401, 1996, p. 19.

5. Regression on Planned Retirement Age: "Never Retire" Excluded

Table 3A reports the regression results (ordinary least squares) for the dependent variable planned age of retirement, when those who reported that they never planned to retire are excluded from the analysis. The sample size of 1,266 corresponds to the 1,518 total respondents in Table 1A, less the 252 who responded that they did not plan to retire.[13]

The coefficient[14] on the "male" dummy variable indicates that other things equal, the planned retirement age for males was almost 1 year (79 percent of a year) later than for females.

The planned retirement age increases substantially with the age of the respondent. Relative to the omitted reference category of age 45-49, the planned retirement age is 1.4 years greater (later) for persons age 50-54, rising to 3.3 years greater (later) for persons age 55-59, 5.3 years greater for persons age 60-64, 9 years greater for persons age 65-69, and 13 years greater for persons age 70 and over. In essence, every 5-year increment in age is associated with a 2- to 4-year increase in the planned age of retirement. Other things equal, younger workers (even for workers age 45 and over) clearly plan to retire earlier.

This substantiates the earlier results of Tables 1A and 1C, where the frequency distributions of planned retirement ages were substantially higher (later) for older workers, 45 and older, compared to younger workers, age 16-44. It suggests that the earlier relationship prevails even after controlling for a wide range of other determinants that can affect the planned age of retirement.

Some of this strong positive relationship with age likely reflects the fact that older persons who remain in the labour force have, by not already retiring, revealed their preference for a later retirement age. This is still useful information, however, since it does highlight the strong preferences of such "stayers."

The large coefficients for the age groups 65-69 and 70 and over (indicating the additional years they would work, compared to the 45-49 age group) also highlight the potential role

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[13] For observations that had a missing value on a variable, the mean value of that variable was substituted for the missing value. As indicated in the descriptive statistics tables (2A, 2B, 2C), such missing values were rare and they were confined exclusively to the financial status variables of received interest income, received other income, or owned a home.

[14] In all of the regression results that follow, the coefficients are statistically significant if they exceed the critical t-values of 1.65 and 1.96, respectively, at the 0.10 level and 0.05 level, based on a two-tailed test. In general, when the coefficients are discussed in the text, they are statistically significant unless otherwise stated.

of the financial incentives of private pension plans. Such workers are beyond the age at which early and special retirement features would apply if they had pension plans with such features. Without any such incentives towards early retirement, they clearly plan to work much longer, even in spite of their age.

There is not a strong pattern with respect to education, although university graduates plan to retire about two-thirds of a year later (70 percent of a year) than do persons with less than a high-school education.

Persons whose spouse is working in the labour market or keeping house plan to retire almost 1 year earlier, and persons whose spouse is already retired plan to retire slightly more than 1 year earlier, compared to persons without a spouse. This illustrates the complementary nature of retirement plans within the family. Alternatively stated, it highlights that persons without the family ties of a spouse are more likely to continue working.

The planned age of retirement continually increases with the health status of the individual. Relative to persons in poor health, the planned age of retirement increases by 2.5 years for persons who report their health as fair, rising to 3 years for persons who report their health as excellent.

Although the measures of non-labour market income are crude, they do suggest that higher wealth enables people to afford retirement. Specifically, persons who received interest income (and hence who have savings that generate that income) plan to retire earlier, although the magnitude of the effect is small (one-half of a year). Persons who own a home plan to retire about 2 years earlier than do people who do not own a home. This likely reflects the retirement-inducing effect of higher wealth associated with home ownership and may also reflect the greater potential for "tinkering around the house" after retiring.

Persons covered by a collective agreement plan to retire about one-third of a year earlier than do persons not covered by an agreement, albeit the effect is statistically insignificant.

As will be discussed subsequently, this effect is much larger when persons who say that they never plan to "retire" are given an imputed retirement age based on their remaining life expectancy, which highlights that persons covered by a collective agreement were not likely to respond that they never planned to retire. That is, persons not covered by a collective agreement were more likely to respond that they never planned to retire and hence to be assigned a higher planned retirement age based on their life expectancy.

Persons with an employer defined-benefit pension plan expect to retire about 1.3 years earlier than persons who are not covered by a plan. This likely reflects the wealth effect of such plans, since they enable people to afford to retire. It may also affect the financial incentives or subsidies towards early retirement that are often embodied in such plans, especially through their early and special retirement features. The crude nature of this variable, however, precludes more precise statements about the retirement-inducing effects of such plans.

The significant negative coefficient on the occupational prestige index[15] indicates that persons in high-status occupations plan to retire sooner. This suggests that the wealth effect of such high-status occupations dominates any tendency to postpone retirement emanating from the prestige and likely higher wage associated with continued employment. The magnitude of the coefficient indicates that each unit increase in the index (which ranges from a low of 1 to a high of 16) is associated with a reduction of 0.08 (i.e., less than one-tenth of a year) in the planned age of retirement. Alternatively stated, persons at the highest end of the scale have a planned age of retirement that is 1.3 years younger (16 x -0.08) than do persons at the lowest end of the scale.

There is little variation in the planned age of retirement across industries after controlling for other factors believed to influence the retirement decision. All of the industry variables are statistically insignificant.

Persons in Quebec plan to retire almost 1 year earlier than do persons in Ontario, and persons in the Atlantic provinces plan to retire about six-tenths of a year earlier than do persons in Ontario. Planned retirement ages in the other provinces are similar to those in Ontario (but their coefficients are small and statistically insignificant).

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[15] The occupational prestige index ranges from 1 to a high of 16 for occupations from lowest to highest status.

6. Regression on Planned Retirement Age: Imputed for "Never Retire"

Table 3B repeats the previous regression analysis on the planned age of retirement, but it includes persons who reported that they never plan to retire. They are given a planned retirement age based on their remaining life expectancy. As such, the sample size increases from 1,266 to 1,518, since it includes the 252 persons in this GSS analysis who stated that they plan never to retire. The distribution of planned retirement age for such persons was illustrated previously in Table 1B, and their descriptive statistics were illustrated previously in Table 2B.

Not surprisingly, the regression results sometimes changed (usually by becoming more pronounced), since these persons who indicated that they never plan to retire are distributed into the later planned retirement ages (as illustrated in Table 1B). Furthermore, women who are distributed in this fashion are likely to have later planned ages of retirement, reflecting their longer life expectancy. To minimize repetition with the previous analysis, the discussion here will focus on the main differences between these results and those of Table 3A, where the "never retire" were excluded.

When those who indicated they will "never retire" are distributed into the later retirement ages according to their remaining life expectancy, the gender coefficient remains positive but becomes statistically insignificant. Males now have a planned retirement age that is similar to that of females, rather than being later than that of females, as was the case when those who indicated that they never planned to retire were excluded from the analysis. This clearly reflects the fact that women who plan never to retire are given a later planned age of retirement because of their longer life expectancy. This may also reflect the fact, however, that women may have indicated that they never plan to retire because they are less likely to have an employer pension plan with its retirement-inducing features or that if they have such a plan they may want to continue working to accumulate service credits that they may have lost through interruptions for childrearing activities.

The strong positive effect of age on the planned age of retirement continues in this analysis and in fact becomes more pronounced. This highlights that older workers were disproportionately more likely to indicate that they never planned to retire and hence were distributed into the later planned ages of retirement.

The effect of education also becomes more pronounced. University graduates now have a planned age of retirement that is 2 years later than persons with less than a high-school education, and over 2 years later than high-school graduates.

The previous positive relationship between health and the planned age of retirement remains positive but diminishes in magnitude and becomes statistically insignificant when those who indicate that they never plan to retire are included in the analysis. This change is somewhat puzzling, at least to the extent that such persons who indicated that they never plan to retire are likely to be in good health. If so, their being distributed into the later planned ages of retirement should have increased the positive relationship between health and the planned age of retirement. It is possible that their poor health status was such that they felt they could not enjoy retirement or they needed the income from work to pay for health care. It is also even possible that their poor health was such that they expected to die before retiring.

The effect of coverage by a collective agreement becomes much more pronounced when those who indicated that they never plan to retire are distributed throughout the older planned ages of retirement. Specifically, persons covered by a collective agreement have a planned age of retirement that is 3.3 years younger than that of persons not covered. This highlights that persons who indicated that they planned never to retire were disproportionately less likely to be covered by a collective agreement and hence to be assigned a later retirement age based on their remaining life expectancy.

The effect of an employer pension plan also becomes more pronounced, doubling in magnitude, so that persons with a pension plan have an expected age of retirement that is 2.4 years younger than that of persons without an employer pension plan. As with the collective agreement coverage variable, this highlights that persons who indicated that they planned never to retire were disproportionately less likely to be covered by an employer pension plan and hence to be assigned a later retirement age based on their remaining life expectancy.

The negative coefficient on the occupational prestige index increases in absolute magnitude, highlighting that persons in high-status occupations plan to retire earlier than do persons in low-status occupations. The fact that this effect became more pronounced when persons who indicated that they planned never to retire were distributed into the later retirement ages highlights that persons who planned never to retire were disproportionately in low-status occupations. *This in turn suggests that people who planned never to retire were doing so more out of economic necessity than because they were in low-status jobs. This is further corroborated by the fact that persons who indicated that they planned never to retire were less likely to be covered by a collective agreement or an employer pension plan.*

A more pronounced industrial pattern also emerges. Specifically, relative to the omitted reference category of manufacturing, the planned age of retirement is 1.6 years earlier in construction, 1 year earlier in health and education, and 1.4 years earlier in public administration.

Alternatively stated, after controlling for other determinants of the retirement decision, the planned age of retirement ranks in ascending order from earliest to latest planned age as follows: construction, public administration, health and education, services,

manufacturing, with primary industries having the highest planned age of retirement. The ranking is broadly consistent with the early retirement incentives that likely prevail in sectors like public administration and health and education; nevertheless, the industrial pattern could also reflect a myriad of other considerations.

The main change in the provincial pattern is that while all provinces have a planned age of retirement that is lower than that of Ontario, the difference is statistically significant only for the Atlantic provinces. In those provinces, the planned age of retirement is 1.2 years earlier than that of Ontario.

7. Regression Analysis of the Actual Retirement Decision

The previous analysis focused on the planned age of retirement. In this section the focus shifts to the actual retirement decision as indicated by whether potential retirees retired or remained in the labour force. A combination of ordinary least-squares and logit econometric approaches is employed. The analysis uses the same explanatory variables as in the previous analysis of the planned age of retirement. The dependent variable, however, is a dummy variable coded 1 if the person was self-reported as being retired in the 5-year period prior to and including the survey year (i.e., 1990-94), and 0 if the person was not retired (i.e., remained in employment). Throughout the remainder of the analysis, the phrase "probability of retiring" will be used to denote the probability of self-reporting as being retired in the 5-year period up to and including the survey year (1994).

Since the dependent variable is dichotomous, or binary coded (i.e., coded 1 if retired, 0 if remain in the labour force) conventional OLS regression equations (termed linear probability functions) do not yield predicted values that are between 0 and 1 and hence that can be interpreted as probabilities. But OLS regression coefficients may give useful approximations to changes in the probability of retiring. A positive (negative) coefficient indicates that the variable has a positive (negative) effect on the probability of retiring, with the magnitude of the coefficient indicating the change in the probability associated with a unit change in the explanatory variable. Since the explanatory variables are generally categorical, a unit change in the explanatory variable occurs in the category in question (e.g., male) relative to the omitted reference category (e.g., female).

Logistic regression procedures do yield probability estimates that are bounded by 0 and 1. The results, however, are more complex to present, since the estimated logit coefficients by themselves do not yield changes in the probabilities of retiring associated with a unit change in each explanatory variable (while the OLS regression coefficients do yield approximations to such changes in the probabilities). The logit coefficients can be converted to changes in the probabilities, but this value changes at each probability level and hence has to be evaluated at different probability levels.

As a compromise between clarity of exposition (via the OLS regressions) and econometric "correctness" (via the logistic regressions), the OLS regressions are discussed in the text, with the logistic regressions placed in an Appendix and referred to when the results deviate considerably from the OLS regressions. In general, the simpler OLS results can be considered as providing reasonable approximations of the effect of the different explanatory variables on the decision to retire. The signs of the relationships, their statistical significance, and relative magnitudes of the effects on the retirement decision are similar under OLS regression and logit regressions.

The magnitude of the relationship is generally smaller under OLS regression, reflecting the fact that at the mean probability of retiring[16] of 0.18 (see Exhibits 3C and 3D), changes in the probabilities are more sensitive to changes in the explanatory variables in the non-linear relationship of the logistic function than in the linear approximation of the OLS regression. Thus, the OLS coefficients could generally be considered as indicative of the sign, significance and relative magnitude of the effects of the different variables on the decision to retire, with their absolute magnitude providing a lower bound on the probability of retirement.

While there is an obvious relationship between the probability of retiring (as estimated in Table 3C) and the planned age of retirement (as estimated previously in Table 3A and 3B), that relationship is not straightforward. It may be expected that the coefficients would be opposite in sign; that is, if a variable lowered the planned age of retirement, it would increase the probability of retiring. This need not be the case, however, because if the person retired earlier, then they would not be in the group of potential retirees to make the retirement decision. Furthermore, retirement plans need not come to fruition and lead to actual retirement decisions.

The two concepts measure somewhat different things. The planned age of retirement (of Tables 3A and 3B) measures retirement plans or expectations — plans that may or may not come to fruition. The actual retirement decision (of Table 3C) measures the extent to which potential retirees who had not retired any time before 1990 (i.e., before the 5-year period prior to the survey year of 1994) actually did retire at some time during that 5-year period. It measures the probability of retiring during that period, conditional upon being employed and not having retired up to 1990.

There is also no necessary connection between this measure and the probability of that retirement being early or late. The fact that a variable may increase the probability of a person retiring in that period does not necessarily mean that the person is retiring earlier than another person who did not retire in that period. Persons who retire early may have already retired prior to the 1990-94 period.

Table 3C indicates that males had a statistically significant 4.5 percent higher probability of retiring in the 5-year period prior to the survey year than did females, after controlling for other determinants of retirement.

The probability of retiring is strongly related to age, consistently increasing with the age of the worker, at least up to the age of 70.[17] While workers age 70 and over had a higher probability of retiring than did workers age 45-49, 50-54, 55-59 and 60-64, they had a lower probability of retiring than did workers age 65-69. In essence, the probability of

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[16] The mean probability of retiring is the mean of the dependent variable. It is the proportion of persons who had self-reported themselves as having retired in the 5-year period prior to and including the survey year (i.e.,1990-94).

[17] While the coefficient is statistically insignificant for the age group 50-54 in the OLS regression, it is significant in the logit analysis.

retiring actually falls off for the very oldest age group, in spite of their age. This presumably reflects that fact that workers beyond the age of 70 are not likely to be subject to any retirement-inducing effects of employer pension plans. The effect of such plans are likely to be most pronounced for persons age 60-64 when early and special retirement features apply and age 65-69 when normal retirement features apply, especially at age 65. These, in fact are the age groups with the highest probabilities of retiring. This is suggestive of the incentive effects of such plans, albeit only suggestive since their precise impact cannot be determined through this data.

The relationship between education and the probability of retiring is not straightforward. It is highest for persons with some post-secondary education, although the effect is not statistically significant in either the OLS or logit results. The probability of retiring is lowest for persons who are only high-school graduates, with this effect being statistically significant in both the OLS and logit results. The probability of retiring does not continue to increase with higher levels of education, however, as it falls off for persons with community college as well as university education (in both the OLS and logit results).

The probability of being retired is lowest for persons whose spouse continues to work and by far the highest for persons whose spouse has already retired. This highlights the complementary nature of family retirement decisions. It is obviously easier for families to do things together if both parties are retired; conversely, there is less point in retiring if one's spouse continues to work in the labour market.

The probability of retiring is lower for persons who are in good health (that is, the coefficients on the health variables are all negative relative to the omitted reference category of poor health). In general, the probability of retiring is approximately 0.06 (6 percent) lower for persons who are not in poor health.[18] This is a large effect of ill health, relative to the average probability of retiring of 0.18 in the data set. In essence, the relationship suggests that after controlling for the effect of other factors that influence the retirement decisions, people are much more likely to retire if they are in poor health and to continue working if they are in better health.

Individuals are much more likely to retire if they have the savings to be able to afford to retire, as evidenced by the large and statistically significant coefficient on the interest income variable. Specifically, individuals are 5 percent more likely to retire if they have interest income than persons without such income. This is a large effect, given the average probability of retiring of 18 percent in the data set. The effect of home ownership on the probability of retiring is statistically insignificant (coefficient of -.009 and $t = -0.57$ in Table 3C), even though persons who owned their home had an earlier planned age of retirement (by about 2 years in Tables 3A and 3B). But the insignificant effect on the probability of retiring could reflect reverse causality — that is, it may reflect the impact on the regressions of persons who may have sold their home upon retiring.

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[18] This is the average of the four coefficients where health status was denoted as fair, good, very good or excellent, compared to the omitted reference category of poor health. The average for the logit probabilities was slightly higher at 0.087, or 9 percent.

Other things being equal, persons covered by a collective agreement are significantly less likely to retire, and the effect is quantitatively very large (i.e., -.2585 with $t = -18.7$). This seems at odds with the results of Table 3B, where persons covered by a collective agreement planned to retire more than 3 years earlier than did persons who were not covered (i.e., coefficient of -3.3 and $t = -7.2$). As suggested previously, this could reflect the possibility that persons who had planned to retire earlier had already retired and hence were not in the potential pool of persons who were making the actual retirement decision. It could also reflect the possibility that persons covered by an agreement remain in employment because of seniority protection and because continued employment is made attractive by higher wages that are often seniority-based.

Employees covered by an employer pension plan have a 21 percent greater probability of retiring than do employees that do not have such a plan. This is consistent with the earlier evidence of Table 3B, whereby employees with an employer pension plan expected to retire earlier than those who did not have a plan. This evidence is consistent with the fact that such plans can enable people to afford to retire earlier.

The probability of retiring is positively related to occupational prestige, which is consistent with the earlier results of Tables 3A and 3B that the planned age of retirement was negatively related to occupational prestige. The coefficient of 0.007 in Table 3C indicates that each unit increase in the occupational prestige index (it ranges from a low of 1 to a high of 16) is associated with a seven-tenths of one percent increase in the probability of retiring.

Considerable differences in the retirement probabilities existed across different industry groups, with the lowest probabilities prevailing in primary industries and construction and the highest probabilities of retiring being in public administration.

After controlling for the effect of other factors influencing the retirement decision, the probability of retiring is greatest in the Atlantic provinces and lowest in Quebec and British Columbia.

8. Summary Discussion of Regression Results

Clearly, a summary of the regression results is made difficult by the different measures of retirement that are used (planned ages of retirement in Tables 3A and 3B) and actual retirement decision (Table 3C). Furthermore, with respect to the planned age of retirement, differences result depending upon whether those who said that they planned never to retire are omitted from the analysis (Table 3A) or given hypothetical planned ages of retirement based on their remaining life expectancy (Table 3B).

All specifications provide useful information, dealing with somewhat different questions. In general, they provide results that are broadly consistent with each other. Furthermore, all have similar *r-squareds*, ranging from 0.32 to 0.39, indicating that the variables used in the analysis usually explain more than one-third of the variation in the retirement measures that are used as dependent variables. These are fairly high for cross-section regressions. Is there a "preferred" specification? The results of Table 3B are likely to be most informative, especially when supplemented by the results of the other regressions.

The planned age of retirement measure is likely to be a "cleaner" measure of retirement intentions for the pool of potential retirees, in contrast to the actual retirement measure, which reflects the fact that people who have already retired, perhaps early, are not in the data set as potential retirees. Furthermore, if those estimations where the people who said they never planned to retire are given hypothetical retirement ages based on their remaining life expectancy are preferred, it seems appropriate to incorporate their apparently strong preference for not retiring in the analysis.

The following generalizations of the econometric analysis, therefore, tend to be based on the planned age of retirement regressions of Table 3A and 3B, rather than the actual retirement decision of Table 3C (the results of Table 3A and 3B, however, are supplemented by the other results of Table 3C where appropriate):

• After controlling for other variables that influence the retirement decision, there is no significant difference in the planned retirement ages between males and females.

• The planned age of retirement increases continuously with age, highlighting the fact that younger workers clearly plan to retire earlier than do their older counterparts. Older workers, 65 and older, plan to retire 9 to 13 years later than their younger counterparts in the 45 to 49 age group.

• The planned age of retirement generally increases with education, especially for university graduates, who prefer to continue working and retire later.

• Persons with a spouse generally plan to retire earlier than do persons without a spouse. Furthermore, they are more likely to be retired if their own spouse is retired and less

likely to be retired if their own spouse is still employed, highlighting the complementarity of the retirement decision within households.

- Persons whose health status was not poor were likely to plan to continue working and retire later, and they were less likely to be retired. This suggests that ill-health can be an important factor inducing retirement, after controlling for other variables that also influence the retirement decision.

- Persons who have savings (as evidenced by their interest income) planned to retire earlier, and they have a considerably higher probability of retiring in the 5-year period prior to the survey year, suggesting the importance of savings to finance retirement. The importance of assets is also illustrated by the fact that persons who own a home plan to retire earlier than those who do not own a home.

- Persons covered by a collective agreement plan to retire earlier than do persons not covered by an agreement.

- Persons in high-prestige occupations plan to retire earlier (Tables 3A and 3B) than do persons in low-prestige occupations, and they have higher probability of retiring (Table 3C). This is a somewhat surprising result, however, since the higher prestige and generally higher wage of such jobs should make continued work more attractive and retirement less attractive. It is possible that the higher wealth associated with such high-prestige jobs also enables them to afford to retire, and this is not fully "controlled for" in the analysis by the crude wealth measures of savings (as proxied by interest income) and home ownership.

- Even after controlling for the effect of other determinants of the retirement decision, there is some industry variation in the planned age of retirement. In descending order from the latest to the earliest planned age of retirement, the industry ranking is: primary industries, manufacturing, services, health and education, construction, and public administration.

- After controlling for other variables believed to influence retirement decisions, there is little variation in planned retirement ages (Tables 3A and 3B) and retirement probabilities (Table 3C) across provinces. Persons in the Atlantic provinces tend to plan to retire the earliest, and they have the highest probabilities of retiring. This may well reflect the lower labour market opportunities in that region, coupled with the viability of household production.

- Although the different retirement-inducing features of employer pension plans were not incorporated directly into the analysis, the results strongly suggest that they have important incentive effects on the retirement decisions. This is supported by a number of our findings:

  — The planned age of retirement had strong spikes at the same ages (55, 60) as the spikes in pension benefit accruals in typical employer pension plans (Tables 1A and 1D).

— Persons with an employer pension plan have an expected age of retirement that is 1.3 to 2.4 years younger than persons without an employer pension plan (Table 3A and 3B).

— Persons with an employer pension plan were over 20 percent more likely to retire than were persons without a plan (Table 3C).

— The greater likelihood of males retiring (Table 3C) may reflect the fact that they are more likely than females to have accumulated the service credits and seniority-based wage increases that make early retirement attractive in final-earnings plans.

— The later planned age of retirement for workers already past age 65 (Tables 3A and 3B), and the fact that their retirement probabilities actually drop off after age 65 (Table 3C), likely reflect the fact that they are past any age when early or normal retirement features would apply if they were in occupational pension plans.

— The early ages of planned retirement that prevail in sectors like health, education and public administration (Tables 3A, 3B) are consistent with the early retirement incentives that tend to exist in the employer pension plans in those sectors.

The analysis of the previous section highlights the potential retirement-inducing effect of employer pension plans emanating from their features, such as early, special and postponed retirement, as well as the fact that they provide a form of saving that enables people to afford to retire. The early and special retirement features create large spikes in pension wealth accruals at the ages to which they first apply, typically age 55 and 60, respectively. Those spikes create strong incentives to retire at those milestone ages since retiring prior to those ages would involve forgoing the pension wealth accrual and retiring later would not lead to any further pension wealth accrual.

Evidence presented in this paper suggests that those potential incentive effects of employer pension plans do indeed have the expected effects on both the planned age of retirement and the actual retirement decision. In essence, the spikes in the planned age of retirement and the actual retirement decision line up with the spikes in pension wealth accruals.

The conclusion of this analysis must be qualified, however, by the caveat that the evidence is indirect, since the available data do not enable us to directly incorporate the different features of employer pension plans into the equations on the retirement decisions. Nevertheless, the evidence suggests that employer pension plans both facilitate and induce early retirement, respectively, through the financial security they provide and the incentives they create.

		Frequency	Percent	Cumulative percent
TABLE 1A				
Planned Retirement Age				
(Employed Persons 45+)				
Age	47	1	0.1	0.1
	48	1	0.1	0.1
	50	20	1.3	1.4
	51	6	0.4	1.8
	52	9	0.6	2.4
	53	5	0.3	2.8
	54	7	0.5	3.2
	55	204	13.4	16.7
	56	19	1.3	17.9
	57	28	1.8	19.8
	58	46	3.0	22.8
	59	16	1.1	23.8
	60	324	21.3	45.2
	61	27	1.8	47.0
	62	56	3.7	50.7
	63	32	2.1	52.8
	64	15	1.0	53.8
	65	377	24.8	78.6
	66	12	0.8	79.4
	67	8	0.5	79.9
	68	10	0.7	80.6
	69	3	0.2	80.8
	70	20	1.3	82.1
	71	2	0.1	82.2
	73	3	0.2	82.4
	75	7	0.5	82.9
	76	1	0.1	82.9
	80	3	0.2	83.1
	90	3	0.2	83.3
	100	1	0.1	83.4
	Never	252	16.6	100.0
	Total	1,518	100.0	100.0

Source: Microdata file: 1994 General Social Survey — Cycle 9: Education Work and Retirement.

TABLE 1B
Planned Retirement Age
(Employed Persons 45+; "Never Retire" Given Imputed
Retirement Age Based on Life Expectancy)

		Frequency	Percent	Cumulative percent
Age	47	1	0.1	0.1
	48	1	0.1	0.1
	50	20	1.3	1.4
	51	6	0.4	1.8
	52	9	0.6	2.4
	53	5	0.3	2.8
	54	7	0.5	3.2
	55	204	13.4	16.7
	56	19	1.3	17.9
	57	28	1.8	19.8
	58	46	3.0	22.8
	59	16	1.1	23.8
	60	324	21.3	45.2
	61	27	1.8	47.0
	62	56	3.7	50.7
	63	32	2.1	52.8
	64	15	1.0	53.8
	65	377	24.8	78.6
	66	12	0.8	79.4
	67	8	0.5	79.9
	68	10	0.7	80.6
	69	3	0.2	80.8
	70	20	1.3	82.1
	71	2	0.1	82.2
	73	3	0.2	82.4
	75	7	0.5	82.9
	76	1	0.1	82.9
	77	30	2.0	84.9
	78	31	2.0	87.0
	79	34	2.2	89.2
	80	28	1.8	91.0
	81	19	1.3	92.3
	83	58	3.8	96.1
	84	33	2.2	98.3
	85	9	0.6	98.9
	86	8	0.5	99.4
	87	4	0.3	99.7
	88	1	0.1	99.7
	90	3	0.2	99.9
	100	1	0.1	100.0
	Total	1,518	100.0	100.0

Source: Microdata file: 1994 General Social Survey — Cycle 9: Education Work and Retirement.

		Frequency	Percent	Cumulative percent
TABLE 1C Planned Retirement Age (Employed Persons 16-44)				
Age	45	95	3.6	3.6
	46	2	0.1	3.6
	47	4	0.2	3.8
	48	5	0.2	4.0
	49	4	0.2	4.1
	50	260	9.8	13.9
	51	3	0.1	14.0
	52	18	0.7	14.7
	53	23	0.9	15.6
	54	5	0.2	15.7
	55	845	31.7	47.5
	56	11	0.4	47.9
	57	22	0.8	48.7
	58	69	2.6	51.3
	59	6	0.2	51.5
	60	452	17.0	68.5
	61	1	0.0	68.6
	62	14	0.5	69.1
	63	12	0.5	69.5
	64	1	0.0	69.6
	65	504	18.9	88.5
	66	2	0.1	88.6
	67	2	0.1	88.7
	69	1	0.0	88.7
	70	22	0.8	89.5
	71	1	0.0	89.6
	75	4	0.2	89.7
	80	3	0.1	89.8
	90	1	0.0	89.9
	100	2	0.1	89.9
	Never	268	10.1	100.0
	Total	2,662	100.0	100.0

Source: Microdata file: 1994 General Social Survey — Cycle 9: Education Work and Retirement.

TABLE 1D
Planned Retirement Age
(Employed Persons 16-44+; "Never Retire" Given Imputed
Retirement Age Based on Life Expectancy)

		Frequency	Percent	Cumulative percent
Age	45	95	3.6	3.6
	46	2	0.1	3.6
	47	4	0.2	3.8
	48	5	0.2	4.0
	49	4	0.2	4.1
	50	260	9.8	13.9
	51	3	0.1	14.0
	52	18	0.7	14.7
	53	23	0.9	15.6
	54	5	0.2	15.7
	55	845	31.7	47.5
	56	11	0.4	47.9
	57	22	0.8	48.7
	58	69	2.6	51.3
	59	6	0.2	51.5
	60	452	17.0	68.5
	61	1	0.0	68.6
	62	14	0.5	69.1
	63	12	0.5	69.5
	64	1	0.0	69.6
	65	504	18.9	88.5
	66	2	0.1	88.6
	67	2	0.1	88.7
	69	1	0.0	88.7
	70	22	0.8	89.5
	71	1	0.0	89.6
	75	272	10.2	99.8
	80	3	0.1	99.9
	90	1	0.0	99.9
	100	2	0.1	100.0
	Total	2,662	100.0	100.0

Source: Microdata file: 1994 General Social Survey — Cycle 9: Education Work and Retirement.

TABLE 2A
Descriptive Statistics for Variables Influencing
(Employed Persons 45+; Excluding Persons Indicating "Never Retire")

	N	Minimum	Maximum	Mean	Std. Deviation
(Female)	1266	0.00	1.00	0.4084	0.4917
Male	1266	0.00	1.00	0.5916	0.4917
(Age 45-49)	1266	0.00	1.00	0.3397	0.4738
Age 50-54	1266	0.00	1.00	0.2141	0.4103
Age 55-59	1266	0.00	1.00	0.2883	0.4532
Age 60-64	1266	0.00	1.00	0.1303	0.3368
Age 65-69	1266	0.00	1.00	0.0221	0.1471
Age 70+	1266	0.00	1.00	0.0055	0.0742
(Less than high school)	1266	0.00	1.00	0.2646	0.4413
High school graduate	1266	0.00	1.00	0.1912	0.3934
Some post secondary	1266	0.00	1.00	0.0687	0.2531
Comm.Coll/Voc.Ed	1266	0.00	1.00	0.2543	0.4357
University graduate	1266	0.00	1.00	0.2212	0.4152
(No spouse)	1266	0.00	1.00	0.2828	0.4505
Spouse working	1266	0.00	1.00	0.4605	0.4986
Spouse keeping house	1266	0.00	1.00	0.1864	0.3896
Spouse retired	1266	0.00	1.00	0.0411	0.1985
Spouse ill	1266	0.00	1.00	0.0190	0.1364
Spousal status other	1266	0.00	1.00	0.0103	0.1009
(Health poor)	1266	0.00	1.00	0.0142	0.1184
Health fair	1266	0.00	1.00	0.0727	0.2597
Health good	1266	0.00	1.00	0.2575	0.4374
Health very good	1266	0.00	1.00	0.3570	0.4793
Health excellent	1266	0.00	1.00	0.2930	0.4553
Health status unknown	1266	0.00	1.00	0.0055	0.0742
(No other income)	1266	0.00	1.00	0.9779	0.1471
Received other income	1266	0.00	1.00	0.0213	0.1446
(No interest income)	1266	0.00	1.00	0.6390	0.4805
Received interest income	1266	0.00	1.00	0.3605	0.4803
(No home)	1266	0.00	1.00	0.1675	0.3735
Home owner	1266	0.00	1.00	0.8311	0.3748
(Not covered)	1266	0.00	1.00	0.3223	0.4675
Covered by coll. Agrmt.	1266	0.00	1.00	0.6777	0.4675
(No plan)	1266	0.00	1.00	0.6288	0.4833
Employer pension plan	1266	0.00	1.00	0.3712	0.4833
Occ. Prestige index	1266	1.00	16.00	8.5296	4.3461
(Manufacturing industry)	1266	0.00	1.00	0.1272	0.3333
Primary industry	1266	0.00	1.00	0.0664	0.2490
Construction industry	1266	0.00	1.00	0.0608	0.2391
Service industry	1266	0.00	1.00	0.3697	0.4829
Health and education	1266	0.00	1.00	0.2362	0.4249
Public administration	1266	0.00	1.00	0.1090	0.3118
(Ontario)	1266	0.00	1.00	0.2393	0.4268

TABLE 2A (continued)					
Descriptive Statistics for Variables Influencing					
(Employed Persons 45+; Excluding Persons Indicating "Never Retire")					
Atlantic	1266	0.00	1.00	0.1635	0.3700
Quebec	1266	0.00	1.00	0.1943	0.3958
Man./Sask.	1266	0.00	1.00	0.1493	0.3565
Alberta	1266	0.00	1.00	0.1224	0.3279
British Columbia	1266	0.00	1.00	0.1311	0.3377
Planned ret. Age	1266	47.00	100.00	61.0039	4.9057

Source: Microdata file: 1994 General Social Survey — Cycle 9: Education Work and Retirement.

	N	Minimum	Maximum	Mean	Std. Deviation
(Female)	1518	0.00	1.00	0.3999	0.4900
Male	1518	0.00	1.00	0.6001	0.4900
(Age 45-49)	1518	0.00	1.00	0.3175	0.4657
Age 50-54	1518	0.00	1.00	0.2141	0.4103
Age 55-59	1518	0.00	1.00	0.2767	0.4475
Age 60-64	1518	0.00	1.00	0.1331	0.3398
Age 65-69	1518	0.00	1.00	0.0369	0.1886
Age 70+	1518	0.00	1.00	0.0217	0.1459
(Less than high school)	1518	0.00	1.00	0.2714	0.4448
High school graduate	1518	0.00	1.00	0.1831	0.3869
Some post secondary	1518	0.00	1.00	0.0718	0.2582
Comm.Coll/Voc.Ed	1518	0.00	1.00	0.2484	0.4322
University graduate	1518	0.00	1.00	0.2253	0.4179
(No spouse)	1518	0.00	1.00	0.2938	0.4557
Spouse working	1518	0.00	1.00	0.4473	0.4974
Spouse keeping house	1518	0.00	1.00	0.1845	0.3880
Spouse retired	1518	0.00	1.00	0.0428	0.2025
Spouse ill	1518	0.00	1.00	0.0198	0.1392
Spousal status other	1518	0.00	1.00	0.0119	0.1083
(Health poor)	1518	0.00	1.00	0.0171	0.1298
Health fair	1518	0.00	1.00	0.0718	0.2582
Health good	1518	0.00	1.00	0.2536	0.4352
Health very good	1518	0.00	1.00	0.3452	0.4756
Health excellent	1518	0.00	1.00	0.3037	0.4600
Health status unknown	1518	0.00	1.00	0.0086	0.0922
(No other income)	1518	0.00	1.00	0.9763	0.1522
Received other income	1518	0.00	1.00	0.0218	0.1460
(No interest income)	1518	0.00	1.00	0.6324	0.4823
Received interest income	1518	0.00	1.00	0.3663	0.4820
(No home)	1518	0.00	1.00	0.1772	0.3820
Home owner	1518	0.00	1.00	0.8208	0.3837
(Not covered)	1518	0.00	1.00	0.3920	0.4883
Covered by coll. Agrmt.	1518	0.00	1.00	0.6080	0.4883
(No plan)	1518	0.00	1.00	0.6759	0.4682
Employer pension plan	1518	0.00	1.00	0.3241	0.4682
Occ. Prestige index	1518	1.00	16.00	8.4413	4.2661
(Manufacturing industry)	1518	0.00	1.00	0.1232	0.3288
Primary industry	1518	0.00	1.00	0.0863	0.2809
Construction industry	1518	0.00	1.00	0.0586	0.2350
Service industry	1518	0.00	1.00	0.3854	0.4868
Health and education	1518	0.00	1.00	0.2134	0.4099
Public administration	1518	0.00	1.00	0.0975	0.2967
(Ontario)	1518	0.00	1.00	0.2391	0.4267

TABLE 2B
Descriptive Statistics for Variables Influencing
(Employed Persons 45+; Including Persons Indicating "Never Retire")

TABLE 2B (continued)					
Descriptive Statistics for Variables Influencing					
(Employed Persons 45+;Including Persons Indicating "Never Retire")					
Atlantic	1518	0.00	1.00	0.1535	0.3606
Quebec	1518	0.00	1.00	0.2009	0.4008
Man./Sask.	1518	0.00	1.00	0.1482	0.3554
Alberta	1518	0.00	1.00	0.1206	0.3257
British Columbia	1518	0.00	1.00	0.1377	0.3447
Planned ret. Age (imputed)	1518	47.00	100.00	64.3300	8.7800

Source: Microdata file: 1994 General Social Survey — Cycle 9: Education Work and Retirement.

TABLE 2C
Descriptive Statistics for Variables Influencing Actual Retirement
(Employed Persons 45+)

	N	Minimum	Maximum	Mean	Std. Deviation
(Female)	2692	0.00	1.00	0.4298	0.4951
Male	2692	0.00	1.00	0.5702	0.4951
(Age 45-49)	2692	0.00	1.00	0.2574	0.4373
Age 50-54	2692	0.00	1.00	0.1764	0.3813
Age 55-59	2692	0.00	1.00	0.2749	0.4465
Age 60-64	2692	0.00	1.00	0.1731	0.3784
Age 65-69	2692	0.00	1.00	0.0880	0.2834
Age 70+	2692	0.00	1.00	0.0301	0.1709
(Less than high school)	2692	0.00	1.00	0.3362	0.4725
High school graduate	2692	0.00	1.00	0.1668	0.3729
Some post secondary	2692	0.00	1.00	0.0724	0.2593
Comm.Coll/Voc.Ed	2692	0.00	1.00	0.2363	0.4249
University graduate	2692	0.00	1.00	0.1883	0.3911
(No spouse)	2692	0.00	1.00	0.3094	0.4623
Spouse working	2692	0.00	1.00	0.3912	0.4881
Spouse keeping house	2692	0.00	1.00	0.1842	0.3878
Spouse retired	2692	0.00	1.00	0.0773	0.2671
Spouse ill	2692	0.00	1.00	0.0208	0.1427
Spousal status other	2692	0.00	1.00	0.0171	0.1296
(Health poor)	2692	0.00	1.00	0.0379	0.1910
Health fair	2692	0.00	1.00	0.0906	0.2871
Health good	2692	0.00	1.00	0.2667	0.4423
Health very good	2692	0.00	1.00	0.3236	0.4679
Health excellent	2692	0.00	1.00	0.2656	0.4417
Health status unknown	2692	0.00	1.00	0.0156	0.1240
(No other income)	2692	0.00	1.00	0.9625	0.1901
Received other income	2692	0.00	1.00	0.0267	0.1612
(No interest income)	2692	0.00	1.00	0.6441	0.4789
Received interest income	2692	0.00	1.00	0.3486	0.4766
(No home)	2692	0.00	1.00	0.1839	0.3875
Home owner	2641	0.00	1.00	0.8126	0.3903
(Not covered)	2692	0.00	1.00	0.5702	0.4951
Covered by coll. Agrmt.	2692	0.00	1.00	0.4298	0.4951
(No plan)	2692	0.00	1.00	0.6999	0.4584
Employer pension plan	2692	0.00	1.00	0.3001	0.4584
Occ. Prestige index	2692	1.00	16.00	7.9188	4.3001
(Manufacturing industry)	2692	0.00	1.00	0.1363	0.3432
Primary industry	2692	0.00	1.00	0.0914	0.2882
Construction industry	2692	0.00	1.00	0.0624	0.2419
Service industry	2692	0.00	1.00	0.4049	0.4910
Health and education	2692	0.00	1.00	0.2021	0.4016
Public administration	2692	0.00	1.00	0.0862	0.2807
(Ontario)	2692	0.00	1.00	0.2366	0.4251

TABLE 2C (continued) Descriptive Statistics for Variables Influencing Actual Retirement (Employed Persons 45+)					
Atlantic	2692	0.00	1.00	0.1909	0.3931
Quebec	2692	0.00	1.00	0.1805	0.3847
Man./Sask.	2692	0.00	1.00	0.1430	0.3502
Alberta	2692	0.00	1.00	0.1174	0.3219
British Columbia	2692	0.00	1.00	0.1315	0.3380
Retired dummy	2692	0.00	1.00	0.1809	0.3850

Source: Microdata file: 1994 General Social Survey — Cycle 9: Education Work and Retirement.

TABLE 3A
Planned Retirement Age: Ols Regression
(Employed Persons 45+; Excluding Persons Indicating "Never Retire")

	Coefficient	t-statistic	Sig.
(Constant)	59.720	54.518	0.000
(Female)			
Male	0.794	2.816	0.005
(Age 45-49)			
Age 50-54	1.424	4.448	0.000
Age 55-59	3.285	10.991	0.000
Age 60-64	5.254	13.269	0.000
Age 65-69	9.058	11.061	0.000
Age 70+	13.402	8.580	0.000
(Less than high school)			
High school graduate	0.172	0.470	0.638
Some post secondary	-0.610	-1.186	0.236
Comm.Coll/Voc.Ed	0.365	1.065	0.287
University graduate	0.647	1.520	0.129
(No spouse)			
Spouse working	-0.873	-2.969	0.003
Spouse keeping house	-0.783	-2.022	0.043
Spouse retired	-1.147	-1.849	0.065
Spouse ill	0.572	0.664	0.507
Spousal status other	-1.464	-1.245	0.213
(Health poor)			
Health fair	2.518	2.399	0.017
Health good	2.767	2.795	0.005
Health very good	2.717	2.769	0.006
Health excellent	3.060	3.098	0.002
Health status unknown	3.779	2.042	0.041
(No other income)			
Received other income	0.623	0.776	0.438
(No interest income)			
Received interest income	-0.468	-1.854	0.064
(No home)			
Home owner	-1.921	-5.833	0.000
(Not covered)			
Covered by coll. Agrmt.	-0.301	-1.050	0.294
(No plan)			
Employer pension plan	-1.268	-4.423	0.000
Occ. Prestige index	-0.0794	-2.330	0.020
(Manufacturing industry)			
Primary industry	-0.423	-0.760	0.447
Construction industry	-0.370	-0.660	0.510
Service industry	-0.489	-1.394	0.164
Health and education	-0.0328	-0.078	0.938
Public administration	-1.091	-2.309	0.021
(Ontario)			

TABLE 3A (continued)			
Planned Retirement Age: Ols Regression			
(Employed Persons 45+; Excluding Persons Indicating "Never Retire")			
Atlantic	-0.594	-1.582	0.114
Quebec	-0.920	-2.598	0.009
Man./Sask.	-0.186	-0.479	0.632
Alberta	-0.113	-0.276	0.782
British Columbia	-0.338	-0.850	0.396
r-square=.317, n=1266, Mean Dep. Var.=60.98.			

TABLE 3B
Planned Retirement Age: Ols Regression
(Employed Persons 45+; Imputed Retirement Age
for Persons Indicating "Never Retire")

	Coefficient	t-statistic	Sig.
(Constant)	66.655	39.467	0.000
(Female)			
Male	0.332	0.718	0.473
(Age 45-49)			
Age 50-54	2.368	4.476	0.000
Age 55-59	3.270	6.516	0.000
Age 60-64	5.463	8.496	0.000
Age 65-69	11.893	11.063	0.000
Age 70+	18.017	13.083	0.000
(Less than high school)			
High school graduate	-0.213	-0.354	0.723
Some post secondary	0.453	0.550	0.583
Comm.Coll/Voc.Ed	0.362	0.650	0.516
University graduate	2.035	3.022	0.003
(No spouse)			
Spouse working	-0.979	-2.034	0.042
Spouse keeping house	-1.523	-2.418	0.016
Spouse retired	-0.333	-0.335	0.738
Spouse ill	0.840	0.608	0.543
Spousal status other	-1.089	-0.607	0.544
(Health poor)			
Health fair	1.212	0.761	0.447
Health good	1.635	1.100	0.272
Health very good	1.252	0.850	0.395
Health excellent	2.325	1.572	0.116
Health status unknown	6.884	2.718	0.007
(No other income)			
Received other income	1.930	1.479	0.139
(No interest income)			
Received interest income	-0.415	-1.004	0.316
(No home)			
Home owner	-2.487	-4.749	0.000
(Not covered)			
Covered by coll. Agrmt.	-3.322	-7.222	0.000
(No plan)			
Employer pension plan	-2.414	-4.930	0.000
Occ. Prestige index	-0.139	-2.514	0.012
(Manufacturing industry)			
Primary industry	0.855	1.005	0.315
Construction industry	-1.580	-1.714	0.087
Service industry	-0.447	-0.784	0.433
Health and education	-1.000	-1.435	0.152
Public administration	-1.430	-1.792	0.073

TABLE 3B (continued) Planned Retirement Age: Ols Regression (Employed Persons 45+; Imputed Retirement Age for Persons Indicating "Never Retire")			
(Ontario)			
Atlantic	-1.152	-1.846	0.065
Quebec	-0.149	-0.261	0.794
Man./Sask.	-0.684	-1.073	0.283
Alberta	-0.756	-1.124	0.261
British Columbia	0.415	0.648	0.517
r-square=.332, n=1518, Mean Dep. Var.=64.32.			

TABLE 3C
Actual Retirement Decision: Ols Regression
(Employed Persons 45+)

	Coefficient	*t*-statistic	Sig.
(Constant)	0.1353	3.341	0.001
(Female)			
Male	0.0447	3.123	0.002
(Age 45-49)			
Age 50-54	0.0176	0.962	0.336
Age 55-59	0.1020	6.149	0.000
Age 60-64	0.2571	13.112	0.000
Age 65-69	0.4630	18.596	0.000
Age 70+	0.3457	9.236	0.000
(Less than high school)	-0.0391	-2.110	0.035
High school graduate			
Some post secondary	0.0347	1.388	0.165
Comm.Coll/Voc.Ed	-0.0191	-1.131	0.258
University graduate	-0.0307	-1.437	0.151
(No spouse)	-0.0427	-2.817	0.005
Spouse working			
Spouse keeping house	-0.0048	-0.248	0.804
Spouse retired	0.1181	4.797	0.000
Spouse ill	-0.0342	-0.811	0.418
Spousal status other	-0.0302	-0.601	0.548
(Health poor)	-0.0659	-1.836	0.067
Health fair			
Health good	-0.0443	-1.367	0.172
Health very good	-0.0629	-1.950	0.051
Health excellent	-0.0699	-2.139	0.033
Health status unknown	-0.1054	-1.761	0.078
(No other income)	-0.0230	-0.621	0.535
Received other income			
(No interest income)	0.0474	3.601	0.000
Received interest income			
(No home)	-0.0092	-0.566	0.571
Home owner			
(Not covered)	-0.2585	-18.669	0.000
Covered by coll. Agrmt.			
(No plan)	0.2058	13.991	0.000
Employer pension plan			
Occ. Prestige index	0.0072	4.196	0.000
(Manufacturing industry)	-0.1262	-4.903	0.000
Primary industry			
Construction industry	-0.1058	-3.749	0.000
Service industry	-0.0267	-1.481	0.139
Health and education	-0.0263	-1.173	0.241
Public administration	0.0317	1.227	0.220
(Ontario)			

TABLE 3C (continued) Actual Retirement Decision: Ols Regression (Employed Persons 45+)			
Atlantic	0.0495	2.677	0.007
Quebec	-0.0423	-2.288	0.022
Man./Sask.	-0.0269	-1.336	0.182
Alberta	-0.0200	-0.945	0.345
British Columbia	-0.0354	-1.744	0.081
r-square=.390, n=2692, Mean Dep. Var.=1809.			

APPENDIX 1
Logit Coefficients and Changes in Probabilities (dp/dx)
Compared to OLS Coefficients, Retirement Equations

Variable	Logit coef.	dp/dx		OLS coef.	
Male	0.5884	0.087	**	0.045	**
Age 50-54	1.8473	0.274	**	0.018	
Age 55-59	3.2374	0.480	**	0.102	**
Age 60-64	4.1978	0.622	**	0.257	**
Age 65-69	5.1525	0.763	**	0.463	**
Age 70+	4.6352	0.687	**	0.346	**
Hs Grad	-0.6175	-0.091	**	-0.039	**
Some Postsecondary	0.3906	0.058		0.035	
Comm Coll/Voc.Ed	-0.1465	-0.022		-0.019	
University Grad	-0.0623	-0.009		-0.031	
Spouse Employed	-0.7102	-0.105	**	-0.043	**
Spouse Home	-0.2494	-0.037		-0.005	
Spouse Retire	0.7386	0.109	**	0.118	**
Spouse Ill	-0.2882	-0.043		-0.034	
Spouse Other	-0.4103	-0.061		-0.030	
Health Fair	-0.5804	-0.086	*	-0.066	
Health Good	-0.3747	-0.056		-0.044	
Health Very Good	-0.6818	-0.101	**	-0.063	*
Health Excellent	-0.7188	-0.107	**	-0.070	**
Health Unknown	-0.9113	-0.135		-0.105	*
Other Income	-0.0826	-0.012		-0.023	
Interest Income	0.4165	0.062	**	0.047	**
Own Home	0.0250	0.004		-0.009	
Collective Agreement	3.5689	0.529	**	-0.259	**
Employer Pension	2.2754	0.337	**	0.206	**
Occ. Prestige	0.0513	0.008	**	0.007	**
Primary Industry	1.0492	0.155	**	-0.126	**
Construction	-0.8143	-0.121	**	-0.106	**
Service	-0.2716	-0.040		-0.027	
Health and Education	-0.0425	-0.006		-0.026	
Public Administration	0.6994	0.104	**	0.032	
Atlantic	0.4601	0.068	**	0.050	**
Quebec	-0.5632	-0.083	**	-0.042	**
Man./Sask.	-0.3663	-0.054		-0.027	
Alberta	-0.3072	-0.046		-0.020	
British Columbia	-0.4303	-0.064	*	-0.035	*
Constant	4.4827	0.664	**	0.135	**

For OLS coefficients, significance is denoted by ** at the 0.05 level and * at the 0.10 level, where the critical values based on the two-tailed test are, respectively, 1.96 and 1.65.

For the logit coefficients, significance is based on the Wald statistics from the computer output.

The dp/dx measure is calculated as the logit coefficient times P(1-P), where P=0.1809, the mean probability of retiring in this sample.