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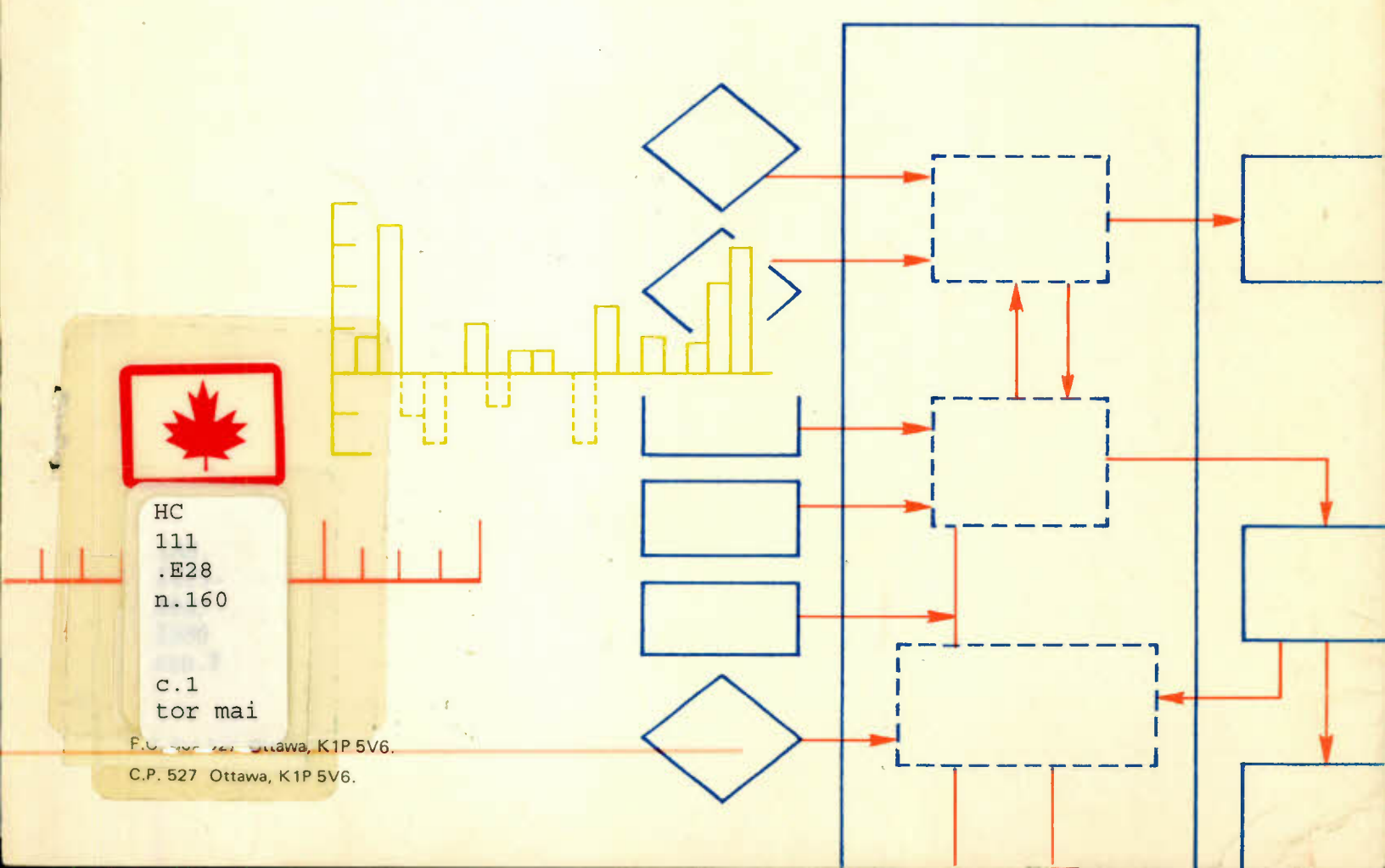

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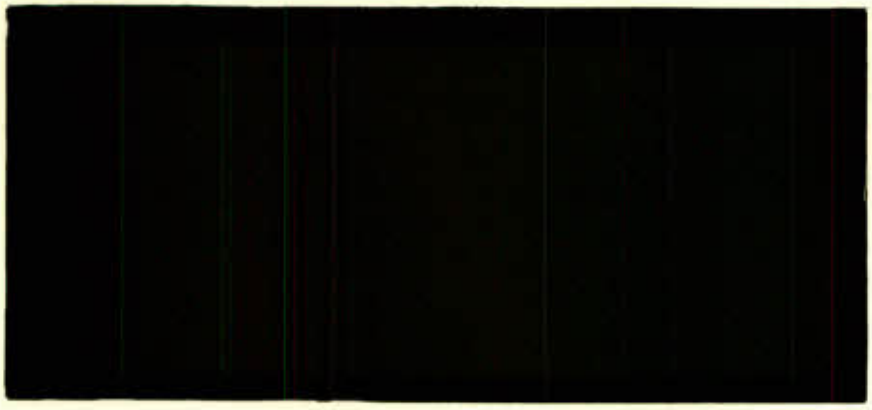

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DISCUSSION PAPER NO. 160

Public Pension Plans and the Incentive to Work

by J. B. Burbidge
and A. L. Robb

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RÉSUMÉ

Dans cette étude, les auteurs présentent une analyse, tant qualitative que quantitative, de l'influence des régimes de retraite et plus particulièrement du Régime de pensions du Canada, sur le comportement des travailleurs âgés. S'il est vrai qu'une pension plus élevée incite ces derniers à se retirer plus tôt, cette réaction peut entraîner un coût réel pour l'économie sous forme d'une perte de production. Il importe donc que l'on élabore un cadre théorique permettant de prévoir maintenant l'impact des diverses politiques possibles en matière de pensions. C'est ce que fait la présente étude, dans laquelle on trouvera une première analyse statistique de la question.

Pour situer le sujet, les auteurs commencent par une analyse de données statistiques canadiennes sur les taux d'activité et de rendement des travailleurs en fin de carrière, en y ajoutant quelques comparaisons avec la situation aux États-Unis. L'un des points qui retient plus particulièrement notre attention est la baisse brutale, à partir du début des années 60, des taux d'activité des travailleurs âgés de sexe masculin.

L'étude passe ensuite en revue les ouvrages, presque exclusivement américains, sur la question de la retraite anticipée. Ceux-ci mettent l'accent sur le noeud d'une question qui continue à se poser : les départs en retraite

anticipée sont-ils le fait de difficultés de santé ou la conséquence du relèvement des pensions ?

Cela fait, les auteurs élaborent, en faisant intervenir le temps comme variable, un modèle théorique des mécanismes de la retraite rendant compte de la rupture observée dans le comportement des travailleurs. A l'aide de ce modèle, ils peuvent étudier les effets de revenu et de substitution produits par divers programmes de retraite, et mettre en lumière les répercussions probables du Régime de pensions du Canada sur le comportement de la population active. Ils font d'ailleurs remarquer que les hausses récentes de prestations des caisses de retraite privées auront probablement les mêmes effets que ceux du Régime de pensions du Canada.

Enfin, les auteurs appliquent leur modèle au cas canadien, afin de déterminer les causes majeures des départs en retraite. Pour ce faire, ils utilisent des données fournies par l'Enquête sur la retraite (dans la partie sur la retraite anticipée) effectuée dans le cadre de l'Enquête sur la population active, publiée par Statistique Canada en février 1975. La conclusion principale à laquelle sont amenés les auteurs est que le revenu sous forme de pension touché par le retraité constitue un facteur essentiel dans la décision des travailleurs de sexe masculin de prendre une retraite anticipée.

L'étude se termine par une revue et un résumé des principales conclusions.

ABSTRACT

The purpose of this study is to make a qualitative and quantitative assessment of the effects of pensions on the retirement behaviour of older workers, with particular reference to the Canada Pension Plan. If higher pension benefits induce individuals to retire earlier there may be a real cost to the Canadian economy in terms of lost output. Hence, it is important to develop a theoretical framework that allows for a careful assessment of alternative pension policies. In this study, we provide a theoretical framework and an initial empirical investigation of the subject.

First, to set the stage, we review data on participation rates and work effort of elderly men and women in Canada, providing some comparisons with the corresponding data for the U.S. One of the most striking observations is the dramatic decline in the participation rates for elderly males since the early sixties.

Next, we survey the literature which deals with the causes of early retirement. This literature consists almost exclusively of U.S. studies. The central, and unresolved issue is the question of whether ill health or, increased pension benefits, is the main cause of early retirement.

Having set the stage, we then develop a formal model of retirement as a discrete change in labour force behaviour in an inter-temporal context. The model enables us to examine the income and substitution effects of various retirement schemes and to shed light

on the likely effects of the Canada Pension Plan on labour force behaviour. We note, in addition, that increases in private pension plan benefits in recent years are likely to have effects similar to those of the Canada Pension Plans.

We then apply the model to Canadian data, to isolate the important causes of retirement. The data source used is the Pre-Retirement Survey of individuals over age 55 and not yet retired, conducted by Statistics Canada as a Labour Force Survey Supplement in February 1975. The most significant result we find is that pension income is a major factor in early retirement decisions of Canadian males.

We conclude the study with a summary and review of the major conclusions.

PREFACE

This study was commissioned by the Economic Council of Canada in the summer of 1977. The project on which it is based commenced in the early fall of that year and concluded in June of 1978. We wish to acknowledge helpful discussions during the course of the project with Frank Denton and Byron Spencer. We would like also to thank Christine Feaver for her valuable research assistance during the course of the project and Gail Kalika who typed the preliminary and final versions of the manuscript.

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A. Leslie Robb

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Introduction

The purpose of this study is to make a qualitative and quantitative assessment of the effects of pensions on the retirement behaviour of older workers, with particular reference to the Canada Pension Plan (hereafter, CPP). If higher pension benefits induce individuals to retire earlier there may be a real cost to the Canadian economy in terms of lost output.

This study fits into the part of the literature in public finance and labour economics which attempts to analyze the effects of changes in (after-tax) wages on labour supply. This question is normally analyzed in terms of a static, one-period income-leisure model. To handle the question of how a pension plan affects labour supply one must take both benefits and contributions (taxes) into account, and, moreover, one should consider the intertemporal nature of the problem. These points will be emphasized in the chapters that follow.

In Chapter 1, we review some data on participation rates and work effort of elderly men and women in Canada, providing some comparisons with the corresponding data for the U.S. One of the most striking observations is the dramatic decline in the participation rates for elderly males since the early sixties.

In Chapter 2, we survey the literature which deals with causes of early retirement. This literature consists almost exclusively of U.S. studies. The central, and unresolved issue is the question of whether ill health or increased pension benefits is the main cause of early

retirement.

In Chapter 3, we present a formal model of retirement which treats retirement as a discrete change in labour force behaviour in a more complete intertemporal context. The model enables us to examine the income and substitution effects of various retirement schemes and to shed light on the likely effects of the CPP on labour force behaviour. We note, in addition, that increases in private pension plan benefits in recent years are likely to have effects similar to those of the CPP.

In Chapter 4, we apply the model developed in the previous Chapter to Canadian data, to isolate the important causes of retirement. The data source used is the Pre-Retirement Survey of individuals over age 55 and not yet retired, conducted by Statistics Canada as a Labour Force Survey Supplement in February 1975. The most significant result we find is that pension income is a major factor in early retirement decisions of Canadian males.

In Chapter 5, we present our summary and conclusions and discuss the implications of the findings.

Chapter 1: The Labour Force Participation of the Elderly

In this section we present some background information on the retirement patterns of men and women in Canada. We begin by considering the trends in participation behaviour of the elderly and then go on to explore some details about participation behaviour in 1971. A word of caution is in order at the outset about the 1971 data. The cross-tabulations we consider here (in Tables 2 to 12) are from the 1971 Census microdata. These data are based on the one-in-a-hundred sample of the one-third of the population that filled in the "long form" in the 1971 Census.* When considering participation behaviour by single years of age, some of the cell sizes for the older ages are quite small and the sampling errors are, no doubt, quite large. Variations in these participation rates must be interpreted with caution, particularly for the ages above 70.

Turning first to the time-series data, we present in Table 1 the participation rates of older males and females since 1961.** For males, there are noticeable downward trends in the participation rates for all three age groups (55-64, 65-69, and 70+). For the two older groups, these trends are apparent throughout the whole period since 1961 while for the younger group aged 55-64 there is a suggestion that the downward trend has been present only since the late 1960's or early 1970's. For this age group (though not for the others)participation rates are available back to 1950. We note that for 55-64 year olds

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*For details see "Public Use Sample Tapes-User Documentation" Statistics Canada, 1975. The responsibility for the use and interpretation of these data is entirely that of the authors.

** The rates have been converted to the Revised Labour Force Survey definitions by adjusting separately the population and labour force series to the "new" levels.

the participation rates during the 1950's (again converted to the Revised Labour Force Survey definition) were always at the 85% to 86% level -- about the same as in the early 1960's. The reduction to below 80% for this group is clearly a recent phenomenon. For the groups aged 65-69 and 70+ the Labour Force Survey Data is not available prior to 1961 but some indication is available from earlier Censuses for males aged 65 and over. The participation rates for this group for the years 1941, 1951 and 1961 are 48%, 40%, and 31% respectively.* These numbers tend to confirm the view that declining participation rates for males 65 and over have a long history, while the decline in the rates for the group aged 55-64 is a more recent phenomenon.

For females the results are quite different. For the age group 55-64 the participation rates increase during the period, reflecting the behaviour of successive cohorts of females. This trend is also apparent back to the early 1950's when the participation rate of this group was only about half its level in the early 1960's. We note, however, that the trend appears to have levelled off in the latter part of the period. For the older age groups 65-69 and 70+ there appears to be some slight downward trend and, given the recent levelling off in the younger age group's participation rates, it seems unlikely that these rates will rise in the near future. However, we note that it is difficult to learn a great deal from such time series in the case of females as they are so strongly influenced by the cohort effects.

We now turn to the cross-section data from the 1971 Census. In these tables we focus on labour force behaviour by single years of age.

*See Ostry and Zaidi (1972), page 25.

As we will see there is much variation in behaviour within the age groups we looked at above. Moreover, by looking at single years of age, we can get a better notion of the age of withdrawal from the labour force.

In Table 2 we present participation rates by single years of age (ages 55-75) for males and females for both Canada and United States. For all four groups the rates decline with age throughout the age range. (Tables 5 and 6, which present data back to age 50, and indicate that, at least in Canada, the participation rates are roughly constant from age 50 to 55.) Moreover, the most substantial drop in all cases occurs between ages 64 and 65. However, it should be noted that while the declines between ages 64 and 65 are substantial they account for only a fraction of the decline that takes place. For example, for Canadian males, between ages 60 and 70 the participation rate declines some 56 percentage points. Of this decline, only 16 percentage points are accounted for between ages 64 and 65 and another 8 percentage points between ages 65 and 66. While it is clear that age 65 is the most common age of retirement, there is a substantial amount of retirement that takes place at ages before and after age 65. We have focussed in this example on Canadian males but note here that the same arguments apply to other groups in Table 2.

One rather interesting comparison between U.S. males and Canadian males is apparent in Table 2. The U.S. male rates are generally higher than corresponding Canadian male rates with the important exception of ages 62 and 63 in which Canadian rates exceed U.S. rates.* It is interesting

*The Canadian rates are also higher in some ages over 70 but these could be due to sampling error because of the small cell sizes.

to note, in light of this observation, that partial Social Security benefits are available in the U.S. - starting at age 62. These lower U.S. rates could be the consequence of induced early retirement. However, it should be noted that there is no similar relationship between U.S. and Canadian females and, moreover, it should be noted that the decline in Canadian male rates between age 60 and age 64 is very similar in magnitude to the U.S. decline in the corresponding ages. The difference at ages 62 and 63 can be no more than suggestive at this time.

The remaining tables in this section provide more detailed information on the age pattern of labour force behaviour of Canadian males and females. The next four tables (3 to 6) provide information on differences in the age-specific participation rates of urban versus rural groups, of marital status groups, and of regions within Canada. The remaining tables (7-12) provide information on the extent of labour force attachment and consider information on both weeks worked (1970) and usual hours worked per week.

Table 3 records information on participation rates by single years of age for urban and rural males and females. The caution noted earlier should be kept in mind here -- for the rural groups many of the cell sizes are quite small and the sampling errors large. Nevertheless, one general pattern emerges. The rural male and female populations appear to have lower participation rates prior to age 65 and roughly equal (in the case of females) or perhaps higher rates (in the case of males) after age 65. These differences could be described loosely as a reduced tendency to retire early for rural persons. This may reflect the greater prospects available

in rural areas to engage in a limited amount of less demanding labour (perhaps on the farm).*

Table 4 presents data on participation rates by marital status (married vs. other; the latter including single, widowed, separated and divorced). Here we note the pattern that married males have higher participation rates at each age than non-married males while the reverse is true for females. This is a pattern that is relatively well known and one that holds for earlier ages as well. One point that is apparent in this table and does not appear to have been noted elsewhere is the particulary abrupt decline in the rates for married males and other females between ages 64 and 65. The drop in the participation rates for other males and married females between ages 64 and 65 is no larger than the drop between ages 63 and 64 whereas for married males and other females the declines between ages 64 and 65 are much more substantial. It appears that this is associated with later retirement for married males and other females. This may be associated with greater financial responsibilities.

Tables 5 and 6 present data on the participation rates by age and region for males and females respectively. Again one should keep in mind the fact that many of the cells here have few observations, especially for B.C. and the Atlantic region. The overall pattern of labour force withdrawal seems similar among regions, although there is some indication of earlier retirement in Quebec and later retirement in the Prairies. Moreover, those regions with higher participation rates in the earlier ages tend to retain higher rates at higher ages.

Tables 7 to 12 provide information on the extent of labour force activity of elderly males and females. Tables 7 and 8 provide information

*However, we note that female farm workers who worked less than 20 hours per week are not counted in the 1971 Census definition of the labour force.

on weeks worked during 1970 while Tables 9 and 10 provide information on usual hours worked. Information of this sort, on the extent of work activity, can provide some useful insights into retirement behaviour. For example, it is clear from these tables that most of the movement out of full time work (either full-week or full year) is movement to the non-labour force. The ages at which large decreases in full-time effort occur are accompanied by similar increases in the non-labour force categories. What we do not know from this type of data is whether there are offsetting flows into and out of the partial-work categories -- we observe the stocks and not the flows. However, this seems to be the best one can do at the moment.*

Finally, Tables 11 and 12 provide information on those usually working full time, separately for different educational groups. Looking first at Table 11 for males, we note the typically lower participation rates throughout the age range for males with lower than grade 5 educational attainment. The other three education groups are roughly similar although there is some suggestion that labour force withdrawal for the grades 9-11 and 12+ groups tends to be more bunched (between age 65 and 66) than for the grade 5 to 8 group (or for that matter, for the less than grade 5 group). Also we note that for the grade 12+ group the participation rates after age 66 or so, tend to be slightly higher than for the grades 5-8 or 9-11 groups.**

Turning now to Table 12, we consider the same information for females. Here we note a tendency for participation to rise with education

*One might note as well that in Tables 7 and 8 the category 27-48 weeks is likely to be dominated by persons working 47 or 48 weeks and as such may well represent full year work.

** The differences in participation behaviour noted here as well the Urban/Rural differences noted earlier are likely to be related to occupational differences between individuals.

level at each age.* For all groups except the most highly educated (the 12+ group) labour force withdrawal seems less "bunched" at a specific age than for males. Rather, the rates fall off gradually starting at about age 61. This may reflect a tendency for women to withdraw from full time work when their husbands retire.

To summarize, the tables discussed in this chapter show that:

(1) retirement is a discontinuous process--part-time working after retirement is uncommon;

(2) participation rates for elderly males have fallen sharply since the early sixties, although this is not true for females;

(3) retirement patterns differ by educational levels attained and by location in an urban or a rural area; and

(4) there appear to be differences in retirement patterns associated with marital status.

The first point, that retirement is a discontinuous process, forms the basis for our theory of retirement presented in Chapter 3. The remaining observations about retirement behaviour provide insights into the selection of control variables in our empirical work in Chapter 4.

*There are of course exceptions. The reader is reminded of the sampling error in many of these cells.

Table 1: Labour Force Participation Rates of Older Males and Females, 1961-77

	Participation Rate (%)					
	Males			Females		
Year	55-64	65-69	70+	55-64	65-69	70+
1961	85.9	50.4	22.0	24.6	10.8	3.8
1962	85.3	49.2	20.4	25.2	11.2	3.4
1963	85.1	45.0	19.3	26.1	12.1	3.4
1964	85.3	47.1	18.4	27.2	12.6	3.8
1965	85.6	46.0	18.1	28.6	12.4	3.4
1966	85.3	46.7	17.5	30.2	11.8	3.5
1967	85.0	45.7	15.1	30.3	12.2	3.4
1968	84.7	44.1	15.2	30.8	12.4	3.4
1969	84.6	41.3	15.5	32.1	11.7	2.9
1970	83.6	37.5	16.3	31.6	10.3	2.9
1971	82.5	32.8	14.6	32.8	10.6	2.9
1972	81.6	31.1	13.1	31.5	9.1	2.5
1973	80.6	30.6	12.3	32.9	9.3	2.4
1974	79.5	30.0	11.9	31.5	8.8	2.4
1975	79.3	29.9	10.9	30.7	9.5	2.3
1976	76.8	25.4	9.7	32.0	7.9	2.1
1977	76.6	25.1	9.2	32.2	8.4	2.0

Note: The rates reported are the averages of the monthly participation rates.

Source: The Labour Force. Rates prior to 1976 are converted to the "new" definition.

Table 2: Participation Rates, by Single Years of Age, Ages 55-75, and by Sex, Canada 1971 and United States, 1970

Age	Canada Males	U.S.A. Males	Canada Females	U.S.A. Females
55	88	89	45	50
56	88	88	38	49
57	85	87	37	48
58	84	86	39	46
59	82	84	35	45
60	79	81	35	43
61	76	79	34	40
62	75	73	30	36
63	70	68	29	33
64	63	63	24	29
65	47	47	15	22
66	39	42	15	19
67	36	39	12	17
68	30	35	11	15
69	30	32	12	13
70	23	27	8	11
71	22	25	8	10
72	23	22	6	9
73	15	20	5	8
74	18	17	4	7
75*	13	12	5	5

Sources: Canadian data from P.U.S.T., Individual File, 1971 Census, U.S. data from A. Munnell (1977), p.70; original source, U.S. Census of Population, 1970.

* U.S. figure for 75 and over.

Table 3: Participation Rates by Age and Urban-Rural* Differences, Males and Females

Age	Males		Females	
	Urban	Rural	Urban	Rural
50	92	89	44	37
51	89	86	47	39
52	90	85	44	43
53	91	86	46	34
54	87	87	43	38
55	89	85	47	36
56	89	85	41	29
57	87	78	39	30
58	84	82	41	33
59	83	79	37	28
60	79	79	36	30
61	80	66	35	30
62	75	73	32	23
63	70	68	31	19
64	64	59	26	18
65	47	48	17	11
66	36	46	16	13
67	33	44	12	12
68	29	34	12	9
69	29	33	12	12
70	23	22	7	10
71	23	20	8	8
72	21	28	6	6
73	13	20	5	5
74	16	24	4	4
75	12	15	5	6

Source: P.U.S.T., Individual File, 1971 Census of Canada.

*Urban includes towns, villages, etc., with populations over 1000, while all the remaining population is Rural. See "Dictionary of the 1971 Census Terms" for details.

Table 4: Participation Rates by Age and Sex and Marital Status

Age	Males		Females	
	Married	Other	Married	Other
50	94	77	38	60
51	91	76	40	66
52	91	74	39	59
53	92	77	37	64
54	89	75	37	59
55	90	75	38	61
56	91	77	31	55
57	88	72	31	55
58	86	73	32	55
59	85	67	29	47
60	83	62	25	55
61	81	55	23	53
62	77	62	21	45
63	73	54	23	37
64	68	43	16	36
65	51	33	12	21
66	42	28	12	18
67	39	25	9	16
68	32	23	5	17
69	33	20	7	15
70	26	15	7	9
71	23	19	3	11
72	26	13	4	8
73	17	9	4	6
74	18	18	3	5
75	14	11	1	7

Source: As in Table 2.

Table 5: Participation Rates by Age and Region, Elderly Males

Age	Canada	Atlantic	Quebec	Ontario	Prairies	B. C.
50	91	85	83	96	96	95
51	88	87	80	93	92	91
52	88	81	84	92	91	90
53	90	84	84	96	91	88
54	87	75	78	93	92	91
55	88	84	81	91	93	89
56	88	77	82	92	95	90
57	85	83	74	88	89	94
58	84	73	72	91	86	89
59	82	76	73	87	88	85
60	79	68	72	84	83	82
61	76	64	70	85	76	77
62	75	64	70	79	80	71
63	70	61	63	74	75	65
64	63	63	49	72	68	54
65	47	30	47	48	60	39
66	39	37	34	43	47	27
67	36	34	28	41	45	29
68	30	14	26	38	30	27
69	30	35	26	35	28	23
70	23	14	19	27	30	14
71	22	16	25	22	25	17
72	23	15	19	24	29	21
73	15	13	10	20	15	8
74	18	8	14	21	21	12
75	13	13	13	15	13	4

Source: As in Table 2.

Table 6: Participation Rates by Age and Region, Elderly Females

Age	Canada	Atlantic	Quebec	Ontario	Prairies	B. C.
50	42	26	32	46	51	52
51	46	44	33	54	52	37
52	44	39	32	51	48	47
53	43	33	33	53	46	42
54	42	39	29	46	56	43
55	45	29	34	52	50	47
56	38	22	27	43	51	47
57	37	35	31	41	45	34
58	39	37	32	41	43	42
59	35	29	26	42	40	33
60	35	33	24	41	45	29
61	34	26	27	39	38	32
62	30	22	28	31	37	27
63	29	28	21	33	29	35
64	24	21	14	31	25	25
65	15	17	14	18	16	7
66	15	3	11	19	16	15
67	12	11	9	14	13	13
68	11	7	14	12	9	10
69	12	3	13	12	14	17
70	8	7	6	8	12	8
71	8	6	8	10	7	4
72	6	0	7	7	9	4
73	5	10	5	4	7	2
74	4	0	6	4	5	3
75	5	4	8	3	6	4

Source: As in Table 2.

Table 7: Weeks Worked in 1970, Males, Age 50-75

Age	Percentage Working			
	Did Not Work 1970	1-26 Weeks	27-48 Weeks	49-52 Weeks
50	6%	6%	20%	67%
51	7	8	21	65
52	6	7	18	69
53	6	7	21	66
54	7	6	22	65
55	7	7	18	68
56	8	8	20	64
57	10	8	18	63
58	11	8	20	61
59	11	9	20	59
60	14	10	19	58
61	16	10	18	56
62	18	8	20	54
63	21	11	16	52
64	26	8	19	47
65	33	14	17	37
66	47	16	12	25
67	54	10	14	22
68	58	11	11	20
69	58	11	10	21
70	64	10	11	15
71	71	10	8	11
72	69	7	6	18
73	79	6	6	9
74	77	6	4	14
75	77	6	5	12

Source: As in Table 2. Rows may not add to 100 due to Rounding.

Table 8: Weeks Worked in 1970, Females, Ages 50-75

Age	Percentage Working			
	Did Not Work	1-26 Weeks	27-48 Weeks	49-52 Weeks
50	52%	10%	13%	25%
51	49	9	13	29
52	52	8	13	28
53	52	8	12	28
54	53	9	14	25
55	50	8	12	30
56	56	8	10	26
57	57	8	11	24
58	56	6	12	25
59	60	7	12	22
60	59	7	11	24
61	60	8	11	21
62	66	5	10	20
63	66	7	7	19
64	71	5	9	16
65	76	6	6	11
66	80	5	6	10
67	84	4	5	7
68	84	3	5	8
69	86	3	6	5
70	90	3	2	5
71	88	3	2	6
72	91	2	3	4
73	91	2	2	4
74	95	1	1	3
75	92	2	2	4

Source: As in Table 2. Rows may not add to 100 due to rounding.

Table 9: Proportion of Males by Usual Hours Worked by Age

Age	1-19 Hours	20-29 Hours	30+ Hours	N. A.*
50	1	1	92	5
51	2	1	92	6
52	1	2	92	5
53	2	2	91	6
54	2	1	90	7
55	2	1	90	6
56	2	2	89	7
57	3	1	87	9
58	2	1	87	10
59	3	2	85	10
60	3	2	82	13
61	3	1	82	14
62	3	2	78	16
63	4	3	74	20
64	3	3	68	25
65	5	3	60	31
66	5	3	46	46
67	6	3	40	50
68	6	3	35	56
69	6	3	34	57
70	7	3	27	63
71	7	4	22	68
72	6	5	23	67
73	5	2	14	78
74	5	2	19	74
75	4	1	21	74

Source: As in Table 2.

* N. A. (not applicable) includes those who did not have a job in the Census week or in 1970. Rows may not add to 100, due to rounding.

Table 10: Proportion of Females by Usual Hours Worked by Age

Age	1-19 Hours	20-29 Hours	30+ Hours	N.A.*
50	9	5	36	50
51	9	6	40	46
52	8	5	37	50
53	8	6	38	49
54	9	6	35	50
55	8	5	40	47
56	7	4	35	54
57	6	6	34	55
58	7	4	34	55
59	7	5	31	58
60	7	5	31	57
61	7	3	32	58
62	5	3	28	64
63	5	4	25	66
64	6	4	22	68
65	5	3	18	74
66	5	2	16	78
67	5	2	11	81
68	4	3	12	82
69	4	1	10	85
70	4	1	5	89
71	2	2	9	87
72	4	1	5	90
73	4	1	7	88
74	2	1	4	93
75	3	1	6	90

Source: As in Table 2.

* N.A. (not applicable) includes those who did not have a job in the Census week or in 1970. Rows may not add to 100, due to rounding.

Table 11: Proportion of Males Usually Working Full-Time* by Age and Education

Age	- Educational Level -				Total
	< Grade 5	5-8	9-11	12+	
50	72	92	94	96	92
51	82	90	92	96	92
52	70	92	94	96	92
53	81	88	96	92	91
54	71	91	93	94	90
55	78	90	90	96	90
56	69	89	93	94	89
57	73	87	90	92	87
58	75	85	88	94	87
59	68	85	90	87	85
60	66	82	91	83	82
61	70	82	84	86	82
62	65	78	85	81	78
63	64	74	78	76	74
64	59	68	74	71	68
65	50	59	66	70	60
66	39	49	44	46	46
67	29	43	37	50	40
68	31	34	37	43	35
69	25	36	34	40	34
70	18	28	32	34	27
71	12	25	21	26	22
72	25	19	28	26	23
73	14	10	20	21	14
74	18	20	12	26	19
75	22	17	16	36	21

Source: As in Table 2.

* Full-Time is defined as 30+ hours per week.

Table 12: Proportion of Females Usually Working Full-Time* by Age and Education

Age	- Educational Level - < Grade 5	5-8	9-11	12+	Total
50	24	34	34	45	36
51	25	33	43	49	40
52	18	34	40	44	37
53	28	35	42	41	38
54	27	27	40	42	35
55	17	36	42	48	40
56	23	27	40	48	35
57	25	30	35	44	34
58	16	26	42	44	34
59	24	25	35	40	31
60	16	25	37	42	31
61	18	26	37	45	32
62	14	25	34	33	28
63	9	21	27	39	25
64	8	17	26	38	22
65	15	13	20	26	18
66	8	14	16	26	16
67	3	10	12	20	11
68	9	8	13	21	12
69	9	7	10	20	10
70	3	3	9	8	5
71	2	10	14	8	9
72	6	4	6	5	5
73	5	9	8	5	7
74	4	3	3	7	4
75	4	7	4	8	6

Source: As in Table 2.

* Full-Time is defined as 30+ hours per week.

Chapter 2: Previous Studies on the Decision to Retire

What are the main factors which cause people to retire? The literature which seeks to answer this question is still very much in a primitive state. The theoretical models which investigators have employed tend to be one-period income-leisure models or two-period life-cycle models. A central question in empirical work has been whether poor health or potential retirement benefit is the major cause of retirement. We will discuss these and other issues in our review of the major studies in the retirement literature.

The theoretical and empirical work on the causes of early retirement consists almost exclusively of U.S. studies. As yet, there has been no Canadian cross-section-econometric analysis which isolates the factors that induce early retirement.* For these reasons, our review must focus on the analyses of the social security system in the U.S.

Since the early 1960's in the U.S., men and women have been eligible for retirement benefits at age 62. The annual level of benefits is higher if an individual retires past the age of 62, with the maximum level being attained at age 65. In addition, there is a "tax-back" feature, which reduces the level of benefits if earnings exceed a modest amount. Munnell (1977) reports that in 1976, benefits were reduced one dollar for every two dollars earned in excess of $1,760 per annum ($230 per month), until the benefits were completely exhausted. This amounts to a 50 percent tax on earnings in excess of $230 per month. The earnings limit is pegged to the level of average wages, so that it will rise in the future.

*Government of Ontario (1977) presents a time series analysis of the effects of pensions on personal saving rates and on retirement. The authors employ a life-cycle model, similar to that presented and tested in Feldstein (1977). Feldstein's results are discussed below.

In 1973, the earnings test affected about 20% of men, between the ages of 62 and 71, who were receiving benefits. The corresponding percentage for women was about 11% (Munnell(1977), pp.65-66).

The Social Security Administration (hereafter SSA) has been studying retirement behaviour in the U.S. through the use of surveys, for over 35 years. Their surveys are based primarily on individual self-evaluation. SSA's early studies of retirement, from 1941-42 onwards, concluded that health, and not the social security program, was the main cause of retirement. Their more recent surveys indicate, however, that social security benefits are a major factor in the retirement decision.* Munnell (1977) reports on some early results from the SSA's recent Retirement History Study. This is a ten-year, longitudinal study of 11,153 persons, aged 58-63, who were first interviewed in the spring of 1969 and are being reinterviewed at two-year intervals. She says:

> "Preliminary findings from this study indicate that 42 percent of male retirees aged sixty-two to sixty-three in 1973 who had been employed in 1969 had left their jobs voluntarily and for non-health reasons. Half of these men cited pension eligibility as their primary motivation. In addition, 52 percent of men aged sixty-four to sixty-five and 54 percent of men aged sixty-six to sixty-seven who left the labor force between 1969 and 1973 cited reasons other than health or job displacement as their main reason for retiring."(p.69)

Since health is a socially acceptable reason for retirement, while a desire for leisure may not be, one would expect more people to claim ill-health as a cause of retirement than are truly affected by ill-health. Thus, results such as those that indicate that non-health factors may be important in causing early retirement probably understate the case.

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*Similar findings are reported in Health and Welfare Canada (1977) based on the Retirement and Pre-Retirement surveys (see, for example, Table 2). We focus here on the U.S. results because the econometric work to be discussed below is based on this data.

One point can be noted immediately. If one is concerned with explaining the decline in participation rates by the elderly that appears in time series data, health cannot be the explanation. Presumably the health of the elderly has done nothing but improve over the last thirty years.*

In the last ten years there have been a number of empirical studies which have attempted to isolate the causes of retirement using econometric techniques. We shall review these in roughly chronological order.

The early econometric studies focussed on finding the factors which explain the labour force participation rates of older males and females. Bowen and Finegan (1969) devote three chapters of their book to this question. In chapter 9, they employ the 1/1000 sample of the 1960 U.S. Census to evaluate the effects of age, marital status, colour, schooling, other income and other variables on labour force participation rates for males 55-64 and 65-74, and for other groups as well. In chapter 10, they again use these cross-section data to examine the effects of labour market conditions on participation rates. In chapter 11, they switch from cross-section data to time-series data to focus on the question of why participation rates have fallen sharply for older men but have risen slightly for women in the post-war period. Their econometric results reported in their Appendix A, Tables 14-19, show that labour force participation rates for

*This point has been made by Boskin (1977). "This sharp secular decline in the labor force participation came during a period when ... the health of the elderly on average improved ... [We should be] ... skeptical of the survey data alleging ... poor health was the prime mover in retirement decisions." (p.5)

males, single women not in a family, and married women with husband present, for ages 55-64 and 65-74, are positively related to schooling and are negatively correlated with "other income" and age. The results show that single women, aged 55-64, appear to be more responsive to schooling and other income than the men, of the same age. One difficulty in interpreting their results is that "other income", which they say is mainly retirement income, is not broken down into pension and other unearned income categories. Recent work by Boskin (1977) and by Quinn (1977b) indicates that this breakdown is important.

When Bowen and Finegan use their regression equations to focus on the prime retirement period for males, i.e., age 64 to age 67, they find that the "other income" variable, and the earnings test, appear to explain much of the 32.9 percentage point drop in participation rates (p.282).* The authors also attempt to examine the effects of health on the retirement decision. The U.S. National Health Survey, concluded in the early 1960's, shows that those individuals reporting a chronic condition, which limited their activity, had a participation rate which was one-half of the rate for those not so afflicted. On the other hand, very different results were obtained with the Current Population Survey for the same period. These data show health limitations to be much less prevalent, and presumably, much less important in the retirement decision (pp.304-309). Clearly one needs a sample which gives observations on health as well as other important variables for each individual in order to separate out the relative importance of social security benefits and health.

*The 1970 U.S. Census data reported in Table 2 suggests that at this later date one would also be interested in the drop in participation rates between ages 61 and 64.

Barfield and Morgan (1969) have studied retirement behaviour under the auspices of the Survey Research Centre at the University of Michigan. They employed data from a national sample of households (1963 to 1966), and on the retirement plans of auto workers from 1967 to 1969. Their study examines the prospective retirement plans of individuals. They use data on age, education, expected retirement income (government and private pension income are lumped in with other earned income), marital status, dependents, respondent's health, current family income, race, sex and other variables.

The results of their regression analysis indicate that the pension and annuity income variable is the main factor in the early (before age 65) retirement plans of all persons aged 35 to 59. They also find that poor health induced early retirement (pp.15-17) and, moreover, that the interaction between health and expected retirement benefits is important. As the authors put it in summarizing their results:

> "If one can afford to retire, then his decision will be affected by his health and his attitudes toward work and retirement. But if one feels economically unable to retire, only rather severe problems with (say) health or work may induce retirement."(p.70)

They go on to say that studies which have found health to be the main determinant of early retirement may be quite consistent with their results because the respondents would simply have assumed that financial conditions permitted retirement, when they checked health as a reason for retiring (p.70).*

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*Garfinkel and Masters (1974) have also examined the effects of pensions on the labour force participation rates of the elderly. They produce estimates of income and substitution effects consistent with other work. In particular, they find that the labour force behaviour of the elderly is quite sensitive to financia variables. One problem in their study is the lack of information on potential pensions for those not retired. They attempt to correct for this using dummy variables and alternative definitions of non-employment income.

Recent econometric work has employed cross-section data on health, pension income and other variables to isolate the factors which cause early retirement. In our view, the main studies are those of Boskin (1977), and Quinn (1977a and b), and Burkhauser (1977). We shall review their work, comparing and contrasting their results as we proceed.

Boskin focusses "on the potential inducement to retire earlier in the presence of social security than in its absence ..."(p.2) His review of the literature emphasizes once again the debate between those that argue it is the social security system which causes early retirement and those that argue poor health causes early retirement. His theoretical framework is a one-period, income-leisure model applied to analyse an elderly individual with and without a social security system.

The social security system gives rise to kinks in an individual's budget constraint because of the tax-back features of the U.S. system. Assuming leisure is normal, if the social security system affects an individual's behaviour (he may continue working full time) it will induce him to retire or to reduce his work effort.

There is, as always, the problem of how to link this analysis to the notion of retirement. Boskin defines retirement to be the reduction from full-time work to one-quarter time work or less. He experimented with a complete-labour-force-withdrawal definition and also with a half-time work definition and he reports that his results were similar in all cases. His view of retirement contrasts sharply with Quinn's view and that of other investigators who are reviewed in this chapter. As Boskin says,

"[The results] ... reveal a picture of gradual (perhaps stepwise is more accurate) retirement; movements from full-time to part-time work (perhaps in a different occupation) to complete retirement over a number of years are now uncommon" (p.17). While Boskin emphasizes this different view of retirement, it should be noted that his results are insensitive to the definition he employs.

Boskin draws on data from A Panel Study of Income Dynamics (1972), a national sample of five thousand households. These households were interviewed annually from 1968 through 1972. From this sample Boskin extracts information on 131 households, headed by the same white married male aged 61 through 65, in 1968. He is able to obtain data on the male head of the household's labour force status, hours worked, wage rate, rent, private pension income, dividends, interest, household assets, age, education, hours ill and spouse's earnings. In addition, he estimates social security benefits available to the household as maximum benefits imputed from information on the monthly earnings of the household.

Boskin employs a multinomial logistic parameterization of a multi-state Markov Chain to estimate the effects on the probability of retirement, of health (hours previously ill), of net earnings, of social security benefits, of income from assets, of spouse's earnings and of a dummy variable for age 65.*

He finds social security benefits to be the most important variable in explaining early retirement. "An increase in social security benefits from $3,000 to $4,000 per year per couple raises the annual probability of retirement from 7.5 percent to 16 percent" (p.13). The

*He employs both a two-state version of his model (working-retired) and a three-state version (working, quasi-retired, retired).

next most important variable is net earnings. This refers to earnings net of earnings-tested decreases in social security benefits. He employs actual earnings for those individuals still working full time and imputed earnings for those who are not. He estimates that an increase in net earnings of $1,000 reduces the probability of retirement by 60 percent. He deduces from this that "A reduction of the implicit tax on earnings from one-half to one-third cuts the annual probability of retirement in half for typical workers" (p.13). Income from assets has a moderate influence in increasing the probability of retirement, while the age dummy for 65 is quite significant and an increase in spouse's earnings tends to reduce the probability of retirement. He finds the coefficient on hours ill to have the wrong sign and to be statistically insignificant. He concludes that health factors are not an important determinant of early retirement. To summarize then, he feels that social security benefits combined with the earnings test have been the prime factors in reducing participation rates of the elderly in the U.S.

One potential problem in the Boskin study is that he looks at only those white male heads of households who were alive in 1972. Someone who was surveyed in 1968, retired, perhaps because of poor health, between 1968 and 1972, and died between his retirement from work and the survey date in 1972, would not be included in Boskin's sample. His results, then, may be biased against finding poor health as a significant factor in early retirement. A related problem is that hours previously ill may not be a good measure of health status. For example, many people may be quite healthy until they are forced to retire from work because of a heart attack.* We

*The measure we use in our empirical work also suffers from this deficiency.

agree with Boskin that it is desireable to avoid subjective measures of health but there may be objectively measurable variables, other than hours ill, that would indicate health status more accurately.*

Another set of problems revolves around the net earnings variable. It is difficult to know how to interpret the meaning of his results, because individuals who are working, who are quasi-retired and who are retired, appear to be treated asymmetrically. Boskin imputes potential earnings to non-workers for an assumed work year, and yet uses actual earnings for those working. Estimated potential wage rates, which are exogenous to individuals, would have been a more appropriate variable to use.

Finally, Munnell (1977) notes that Boskin does not separate the effects of private pensions from public pensions, as does Quinn. She suggests that this may lead Boskin to overstate the effects of public pensions on early retirement. Certainly, Boskin's results indicate much stronger effects, in this regard, relative to those found in other studies.

There are two papers by Quinn on the determinants of early retirement which were published in 1977, one in the Journal of Human Resources (1977a) and one by the Social Security Administration, U.S. Department of Health, Education and Welfare (1977b). Since the latter is a more recent version than the former, we shall concentrate on the second paper here.

Quinn studies the labour force participation behaviour of men and married women aged 58 to 63, focussing as does Boskin on the effects of the social security program on early retirement. Quinn's definition of

*In discussing Boskin's paper, Quinn (1977b) attributes Boskin's result that health is insignificant to the small sample size. We do not consider this to be an adequate explanation.

retirement is "complete labor force withdrawal" (p.7). As we noted above, Boskin uses a different definition of retirement. Without having Boskin's actual data, it is difficult to know how much of the difference in their results can be explained by this factor, although Boskin does say that his results are not particularly sensitive to his definition.

Quinn lists three problems with the view that health is the major factor in the retirement decision. (a) Those that find health to be the key factor base their work on subjective answers to questions in surveys of retired individuals. (b) When a person is not completely disabled, health may induce early retirement, only if financial conditions permit. As we shall see below this is very important in Quinn's view, i.e., it is the interaction between health and social security that induces early retirement. (c) People may tend to list "health" as a reason for early retirement because it is socially acceptable to do so.

Quinn also raises a serious objection to the view that social security is the main determinant of early retirement. For example, in the studies by Bowen and Finegan (1969) and Cohen, Rea and Lerman (1970), the authors present regressions which seek to explain the labour force participation rate of men aged 55 and over with, inter alia, an unearned income concept that includes actual retirement income from social security. Since the retirement income actually received depends on the individual being retired there is two-way causation (or simultaneity bias) between the dependent variable, labour force status, and one of the independent variables, unearned income. This leads to spuriously high coefficients for the

unearned income variable. As Quinn says, "What should be included as an explanatory variable is the potential (our emphasis) amount available from retirement income sources, should one withdraw from the labor force" (p.3).

As in the Boskin paper, Quinn considers a one-period, comparative static model of individual behaviour. He obtains a labour supply function $H = H(W_1, W_2, P, Y)$ where H is the husband's hours of work, W_1, W_2 are the wage rates of the husband and wife, respectively, P is the price of the composite good and Y is the income flow that would result if neither member of the household worked at all. He then lists health, dependants, job characteristics and labour market factors which would, in the context of his model, make the utility functions differ.* These are added to the supply equation as control variables. To obtain the actual equation estimated, H is collapsed into a dichotomous 0,1 variable, where "1" corresponds to complete labour force withdrawal; that is, whereas his theoretical model would have people gradually withdraw from the labour force, the "labour force status" actually used is discrete. The P variable is dropped for reasons of inadequate data. He also could not obtain adequate data on Y so that Y is interpreted as asset income from savings, dividends, interest and rents, and the retirement income dimension is represented by three dummy variables; eligibility for social security, eligibility for other pension benefits, and eligibility for both.

Quinn employs cross-section data from 1969, the first year of the Social Security Administration's Retirement History Survey.** Quinn

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*In fact differences in local labour market conditions really affect the constraint although Quinn does not make this point.

**This is a ten-year study of the retirement process being conducted by the Social Security Administration, which was mentioned earlier. To repeat, more than 11,000 men and nonmarried women aged 58-63 were interviewed in the spring of 1969. They will be interviewed five more times at two-year intervals.

excluded those who were farmers, self-employed or seriously ill from his sample, and focussed on four categories; white married men; white non-married men; married men, other than white; and white nonmarried women.

To avoid the problem of using subjective evaluations of why individuals retire, Quinn uses a health dummy based on the question "Does your health limit the kind or amount of work or housework you can do?"(p.15).

The results for white married men show that health limitations, eligibility for social security, and other pension income are significant factors in increasing the probability of early retirement. The coefficients of these factors are higher for the other groups mentioned above, except that eligibility for social security and pension income are less significant for white nonmarried women. The latter group is the only one for which the wage rate variable is significant. Quinn argues that the greater sensitivity of this group to wage rates and to asset income "is consistent with the view that women in the 58-63 age group are more likely to be secondary workers, with a weaker attachment to the labor force" (p.17). This does not, however, seem to be satisfactory, since these women are not, in the usual sense, secondary workers.

With regard to the other sets of variables, variables dealing with local labour market conditions and job characteristics, the results show that these variables exert a minor influence for white and non-white married men and are not important for the other two groups.

The major problem with Quinn's results appears to be that he has not controlled for age in his regressions so that one cannot know how much

of the "eligibility for social security" effect is a pure age effect and how much is really attributable to the effects of social security. Quinn is aware of this problem. He says:

> "Interpretation of the social security coefficients is complicated by the factor of age. Age dummies are not included in the regression analysis because the age distribution is very narrow (6 years), and because there is high collinearity between social security eligibility and a dummy indicating age 62 or 63. The result of this exclusion is that some of the social security effects may in fact be the pure age effect of turning 62 or 63." (p.15)

We should point out that in the U.S. individuals are eligible for partial social security benefits at age 62. We are led to the conclusion that Quinn's results cannot be regarded as definitive. This feeling is confirmed by comparing his results in the Journal of Human Resources version of this paper with the more recent results in the Health, Education, and Welfare publication, for white married men. The present version increases the sample by only 4.2%, yet the coefficient of the health limitation variable falls by 27% and the coefficient of social security eligibility falls by 54%.

It should be noted that the absence of an age control may also lead to an overestimate of the significance of the health effects found by Quinn. Since poor health and age are likely to be positively correlated some of the age effects may be reflected in the health coefficient.

Another problem arises in Quinn's discussion of the effects of wage rates and asset income. He says:

> "The wage effects should be positive, since a high wage should not induce complete labor force withdrawal. The [asset] income effects should be negative, on the assumption that leisure is a normal good." (p.16)

In terms of his model asset income represents a pure wealth effect and Quinn is correct in concluding that, if leisure is normal, high asset income should be correlated with earlier retirement. The problem, however, is that an increase in income via an increase in the wage rate may also induce earlier retirement. It will clearly have both income and substitution effects.* Quinn is mislead here by his use of the "one-period" model in which it is true that the income effect of an increased wage cannot cause a complete withdrawal from the labour force.

In a recent working paper, Quinn (1977c) has extended his earlier research to examine the effects of job characteristics on the early retirement behaviour of white, married men. He combines the data from the Retirement History Survey mentioned above with the U.S. Labor Department's Dictionary of Occupational Titles to show that individuals are more likely to retire early from jobs with undesirable attributes. In particular, and in line with his results discussed above, he finds that individuals with a health limitation are more sensitive to the job environment than those with good health.

Burkhauser (1977) has also studied the effects of social security benefits on early retirement. He differs from Boskin and Quinn in that he emphasizes the asset nature of social security benefits rather than the annual levels of social security benefits. In addition, the data he uses, from the 1973 Social Security Exact Match File, permit him to calculate the expected present value of social security benefits for individuals in his

*This point is made in the model developed in the next chapter.

sample, rather than a simulated value of worker benefits (Boskin) or a variable indicating eligibility for social security benefits (Quinn).

He adapts a one-period income-leisure model to take into account the asset nature of social security. He emphasizes that the present value of social security benefits may be affected by postponing retirement.* He argues that failure to take the increase in pension benefits into account as a result of postponement leads one to overestimate the effects of the earnings test an early retirement, because postponement shifts the individual's budget constraint outwards. One problem in Burkhauser's paper is that the one-period income-leisure model cannot handle the inter-temporal nature, of the problem he is discussing. This point makes his discussion of pensions that are not actuarially fair difficult to follow. We construct a more sophisticated model of retirement behaviour in the next chapter.

Burkhauser estimates two regressions. The first is based on data on 636 males who were eligible for social security retired workers' benefits at age 62, who were employed in social security covered work at age 61, and who had not previously received social security benefits. The second regression was based on 713 males with the same characteristics except that they need not have been employed in social security covered work at age 61. Burkhauser says that the second regression includes individuals who are, on average, in poorer health and who have a higher propensity to be unemployed, although this is not entirely clear from his paper. The dependent variable can be interpreted as the probability of retiring within three months after turning 62.

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*Remember that in the U.S., although most become eligible for benefits at age 62, the level of benefits is higher if one works longer.

He finds that the asset value of social security benefits increases the probability of early retirement, and that this effect is stronger in the second regression than the first. This may support Quinn's result that poor health makes an individual more sensitive to retirement benefits, but the issue is clouded by the (unknown) employment-history differences between individuals in the two regressions. As with Boskin, Burkhauser finds that higher market earnings reduce the probability of early retirement, presumably because the substitution effect dominates.

Burkhauser also has two private pension variables in his regressions. One is an estimate of the probability that the individual has a private pension option at age 62 or earlier, the other is an estimate of the probability that the individual is ever eligible for a private pension. These probabilities were estimated from data on the proportions of workers eligible for private pensions in various two-digit industries (from the Retirement History Survey, 1969-71). The availability of early private pension plan benefits tends to increase the probability of retirement at age 62. But also, individuals who have private pension plans without the early retirement option, tend to retire later. Burkhauser suggests that this may indicate that private pensions are not actuarially fair at all ages and, in particular, that the last years of work count very heavily in the typical pension plan calculation.*

To put this discussion into perspective it is useful to ask: (a) what are the important qualitative differences among Boskin, Quinn, and Burkhauser? and (b) what explains these differences? All three authors

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*Burkhauser calculates mean value elasticity estimates and obtains the following results:"A 10% increase in (1) the asset value of social security increases the probability of accepting retired worker benefits upon reaching age 62 by 14%; (2) market earnings decreases the probability by 19%; (3) EARLY [Private Pension] increases the probability by 11%; (4) EVER [Private Pension] decreases the probability by 12% " (p.18).

agree that eligibility for social security benefits is an important cause of early retirement, although Quinn's results show benefits to be second in terms of importance, behind health. The major differences among the results of these studies are that Boskin concludes poor health is an insignificant factor in the retirement decision, Quinn shows health to be the most important factor while Burkhauser is only able to infer that health may matter. As we noted above, the difference between Boskin and Quinn may be caused by the bias in Boskin's sample against those with poor health and by his choice of "hours ill" as a measure of poor health which may be inadequate. On the other hand, Quinn's "health limitation" variable is subjectively estimated by the respondents to the survey and may therefore be unreliable, for the reasons mentioned earlier. Further, the lack of a control for age may account for the significant health effect.

Another difference between Boskin and Quinn and also between Bowen and Finegan and Quinn is the effects of age on retirement.* Boskin finds that a dummy for age 65 is significant and Bowen and Finegan also find that age is a significant factor. Quinn excludes age from his regression equation because age (62 and 63) is highly collinear with eligibility for social security benefits. This last point causes us to wonder about the significance of Quinn's results, as we stated earlier.

We conclude that the cross-section econometric studies lend support to the view that eligibility for pension benefits is a major cause of retirement, but the importance of other factors such as age, health, schooling and so on, and the interactions between these factors

*Burkhauser considers individuals just after they turn age 62 and, as a consequence, does not address the issue of the age of retirement.

and social security benefits, is extremely unclear.

All of the literature discussed so far has been based on a one-period, income-leisure model. Feldstein (1977) uses a two-period life-cycle model, in which leisure is fixed in the first period, but variable in the second period, to show that the introduction of a fully-funded pension plan must cause a reduction in work effort in the second period. This he interprets as earlier retirement. He then tests this model using cross-section data on 15 countries from the 1950's. The sample includes all the major non-socialist countries, and finds that higher pension benefits relative to per capita income induces earlier retirement. Since Feldstein's paper was part of an International Economics Association conference on the economies of public services, a number of prominent theorists in public finance commented on his paper. A major objection raised against Feldstein's results was the problem of simultaneity bias, i.e., a low labour force participation rate for the elderly in one country might induce the government to raise pension benefits. In addition, Feldstein's theoretical model assumes individuals know the pension plan details throughout their lives and they plan accordingly. In particular, professor Pauly observed that actual pension plans were changing in the 1950's and individuals were unlikely to have been in equilibrium. Our reaction to the Feldstein paper is simply to observe that cross-country comparisons are bound to be more accident prone than microdata on a single crountry; the difficulty of controlling for other factors in Feldstein's data we suspect is insurmountable.

One Canadian analysis of the incentive effects of pension plans is that by Pesando and Rea (1977). They briefly discuss one-period and

and two-period models of retirement behaviour. They do not present an econometric analysis of the factors which have caused a decline in the labour force participation rates of the elderly in Canada. However, visual inspection of the data leads them to conclude that the CPP, GAINS, and OAS may have caused a decrease in participation rates. In addition, as we have already noted, Health and Welfare Canada (1977) report some tabulations of reasons given for retirement and Government of Ontario (1977) presents some time-series regressions on participation rates of the elderly. To our knowledge, there are no Canadian econometric-cross-section studies of the retirement decision. In the next chapter, we develop a theoretical model of the retirement decision that provides a basis for such an analysis, on which we report in Chapter 4.

Chapter 3: The Theory of Retirement

This chapter presents a model of the retirement decision and employs the model to analyze the sensitivity of the retirement age decision to exogenous influences including the effects of pension plans. Recent models that have analyzed this problem seemed to be inadequate for our purposes. The most sophisticated models (e.g., Feldstein, 1977) simply extend the traditional work-leisure choice to two periods. The individual is assumed to choose the proportion of leisure time that will be given up to the labour market in each period (or, in some cases, only in the second period). The second period is interpreted as a retirement period and any variables that lead to more leisure in the second period are assumed to lead to earlier retirement. The interpretation is, in fact, forced. While this type of model may give some useful insights into retirement behaviour it fails to capture the notion of retirement as a discrete change and does not allow a proper intertemporal analysis.

The alternative that we focus on here is a model that has a discrete retirement age. The cost of going to a model of this sort is that the model does not allow an analysis of part-time work after retirement from full-time work. While this is potentially an important oversight, in practice it does not seem to be so.* It would appear that

*For example, in the Retirement Survey (conducted by Statistics Canada in February 1975 as a supplement to the Labour Force Survey) well over 90 percent of those retired from full-time work were out of the Labour Force entirely. In addition, we noted in Chapter 1 that this view is consistent with the 1971 Census data.

most individuals work a normal work week until retirement and then quit work completely. The model presented below emphasizes the discrete change in labour force behaviour that occurs when an individual decides to retire.

We now discuss the model and present some theoretical results that follow from it. In section I we present the assumptions of the model. In section II we outline the model itself and some algebraic results. We interpret three results in section III, and in section IV we examine their implications for the effects of changes in old age security payments and private and public pension plans.

I: The Assumptions

The model is concerned with a single individual who is assumed to be able to retire whenever he wishes. To the extent that invidivuals are forced to retire because of ill health, this model does not apply. Clearly, such individuals will have to be given special attention in empirical tests of the retirement model outlined here.

Without loss of generality, assume the individual makes his retirement decision at some specific age, say at age 50. He behaves as if he had T years to live, a of which will be spent working full-time and T-a of which will be spent in retirement. At the age of 50, which is time zero in our model, the individual has a wealth of W_0. We assume he wishes to leave a bequest of B. He can earn income at a constant rate, Y, until retirement, and he pays an income tax on Y at a propor-

tional rate, α. We assume that this individual has a utility function, U(C,L), defined over consumption and leisure in each year and that he consumes a constant amount, C, in each of the T years left in his life. In keeping with our theme of the discreteness of the retirement decision, we assume that the only way leisure can be varied is by changing the age of retirement. The individual can thus be characterized as maximizing his utility by choosing his age of retirement. Again, without loss of generality, denote the leisure available to the individual in his working years as 0, and the leisure available in his retirement years as 1. Thus he obtains a utility level of $U^1 = U(C,0)$ in his working years and $U^2 = U(C,1)$ in his retirement years. W_0, B, Y and C are all measured in real terms. We assume the individual can borrow and lend at a constant rate of interest r, which is continuously compounded.

II: The Model and Some Results

Given the above assumptions, the individual's situation can thus be formally represented as *

$$\underset{a}{\text{Max}}\ V = \int_0^a U(C,0)dt + \int_a^T U(C,1)dt \qquad (1)$$

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* It is worth noting that discounting utility levels in equation (1) to reflect time preference affects the form but not the substance of the results. If the individual discounts utility at the rate δ, equation (1) becomes

$$\underset{a}{\text{Max}} \int_0^a U(C,0)e^{-\delta t}dt + \int_a^T U(C,1)e^{-\delta t}dt.$$

subject to the constraint that

$$\int_0^T Ce^{-rt}dt = W_0 - Be^{-rT} + \int_0^a Y(1-\alpha)e^{-rt}dt \qquad (2)$$

Equation (1) simplifies to *

$$\max_a V = aU^1 + (T-a)U^2$$

and the constraint simplifies to

$$C(1-e^{-rT}) = rW_0 - rBe^{-rT} + (1-\alpha)Y(1-e^{-ra}) \qquad (3)$$

The first-order condition, $\frac{\partial V}{\partial a} = 0$, yields**

$$U^1 - U^2 + aU^1_c\frac{\partial C}{\partial a} + (T-a)U^2_c\frac{\partial C}{\partial a} = 0 \qquad (4)$$

or $$U^2 - U^1 = \{aU^1_c + (T-a)U^2_c\}\frac{\partial C}{\partial a} \qquad (4')$$

---

* With the discounting of utility mentioned in footnote * on p.43, the a and T-a terms would become $\frac{e^{\delta a}-1}{\delta}$ and $\frac{1-e^{-\delta(T-a)}}{\delta}$, respectively.

The interpretation is simply that the weights attaching to U^1 and U^2 are adjusted to reflect time preference.

** In the case with discounting, the first-order condition, equation (3), becomes

$$U^1-U^2 + \frac{\partial C}{\partial a}\left\{U^1_c\left(\frac{e^{\delta a}-1}{\delta}\right) + U^2_c\left(\frac{1-e^{-\delta(T-a)}}{\delta}\right)\right\} = 0.$$ This equation reduces to our equation (3) (by L'Hopital's Rule) as δ tends to zero.

$\frac{\partial C}{\partial a}$ (the derivative of C with respect to a in the constraint) can be interpreted as the increase in consumption per period as a result of postponing retirement by one year, and $U_c^1 (= \frac{\partial U^1}{\partial C})$ and $U_c^2 (= \frac{\partial U^2}{\partial C})$ are the marginal utilities of consumption in the working years and in retirement, respectively. Thus the right-hand side of (4') is the increase in utility due to increased consumption over the individual's lifetime (a working years and T-a retirement years) as a result of postponing retirement by one year. The left-hand side is the loss in utility of leisure due to postponing retirement for one year; note $U^2 > U^1$ because C is the same in both periods and leisure is greater in retirement (U^2) than in pre-retirement (U^1), so long as the marginal utility of leisure is positive.

The first-order condition also admits of a straightforward graphical interpretation. In Figure 1 we graph C against (T-a), the number of retirement years.

The curve FM is simply the constraint (equation (3)), in C,(T-a) space. The slope of this constraint, $\frac{\partial C}{\partial (T-a)}$ equals $\frac{-\partial C}{\partial a}$, since T is always fixed. One can show that the slope of an indifference curve defined by dV = 0 is equal to

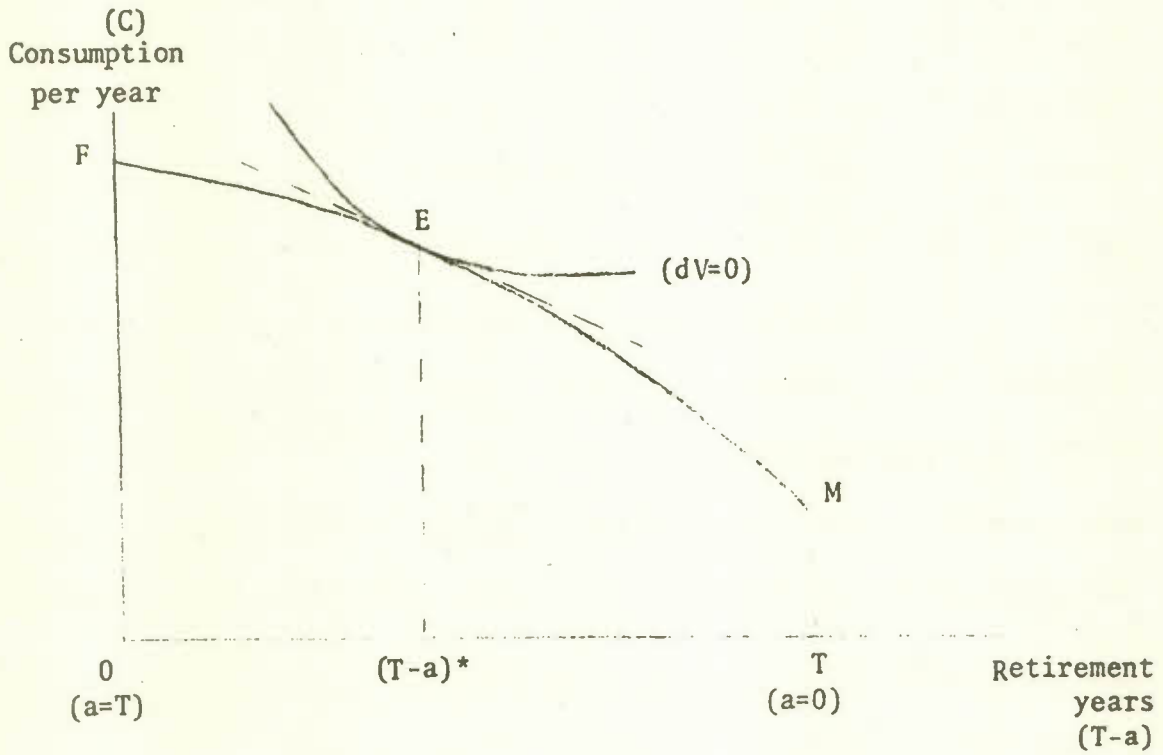
$$\frac{dC}{d(T-a)} = \frac{U^1 - U^2}{aU_c^1 + (T-a)U_c^2} .$$

Moreover, the first-order condition, equation (4'), can be rewritten as

$$\frac{U^1 - U^2}{aU_c^1 + (T-a)U_c^2} = -\frac{\partial C}{\partial a} \qquad (4'')$$

In other words, when the individual is in equilibrium at E, the slope of the indifference curve, given by the left-hand side of (4''), must

Figure 1: Graphical Interpretation of the First-order Condition



equal the slope of the constraint, given by the right-hand side of (4''). At E, the indifference curve is tangent to the consumption-retirement-years constraint; the individual has maximized his utility level V. The details of this diagram will be discussed along with our interpretation of the results in section III.

Equations (3) and (4') form a system in which a and C are determined endogenously and α, Y, W_0, B, r and T are exogenous. What happens to the age of retirement, a, when these exogenous variables are changed? For the moment we shall ignore changes in r and T. The following results can be deduced from the constraint, equation (3):

(i) $$\frac{\partial C}{\partial a} = \frac{(1-\alpha)Yre^{-ra}}{1-e^{-rT}} > 0$$

(ii) $$\frac{\partial C}{\partial \alpha} = -\frac{Y(1-e^{-ra})}{1-e^{-rT}} < 0$$

(iii) $$\frac{\partial C}{\partial Y} = \frac{(1-\alpha)(1-e^{-ra})}{1-e^{-rT}} > 0$$

(iv) $$\frac{\partial C}{\partial W_0} = \frac{r}{1-e^{-rT}} > 0$$

(v) $$\frac{\partial C}{\partial B} = \frac{-re^{-rT}}{1-e^{-rT}} < 0$$

(vi) $$\frac{\partial^2 C}{\partial a^2} = -\frac{(1-\alpha)Yr^2e^{-ra}}{1-e^{-rT}} < 0$$

$$\text{(vii)} \quad \frac{\partial^2 C}{\partial \alpha \partial a} = -\frac{Yre^{-ra}}{1-e^{-rT}} < 0$$

$$\text{(viii)} \quad \frac{\partial^2 C}{\partial Y \partial a} = \frac{(1-\alpha)re^{-ra}}{1-e^{-rT}} > 0$$

$$\text{(ix)} \quad \frac{\partial^2 C}{\partial W_0 \partial a} = \frac{\partial^2 C}{\partial B \partial a} = 0.$$

Totally differentiating (4) with respect to a, α, Y, W_0 and B we obtain:*

$$da \left\{ 2(U_c^1 - U_c^2)\frac{\partial C}{\partial a} + a \left\{ U_{cc}^1 \left(\frac{\partial C}{\partial a}\right)^2 + U_c^1 \frac{\partial^2 C}{\partial a^2} \right\} \right.$$

$$\left. + (T-a) \left\{ U_{cc}^2 \left(\frac{\partial C}{\partial a}\right)^2 + U_c^2 \frac{\partial^2 C}{\partial a^2} \right\} \right\}$$

$$+ \sum_i di \left\{ (U_c^1 - U_c^2)\frac{\partial C}{\partial i} + a \left\{ U_{cc}^1 \frac{\partial C}{\partial i}\frac{\partial C}{\partial a} + U_c^1 \frac{\partial^2 C}{\partial i \partial a} \right\} \right.$$

$$\left. + (T-a) \left\{ U_{cc}^2 \frac{\partial C}{\partial i}\frac{\partial C}{\partial a} + U_c^2 \frac{\partial^2 C}{\partial i \partial a} \right\} \right\} = 0 \qquad (5)$$

where $i = \alpha$, Y, W_0 and B.

---

*With time preference, the da terms would be changed as follows. a and T-a would be replaced as in footnote * on p. 44, and the first term would become

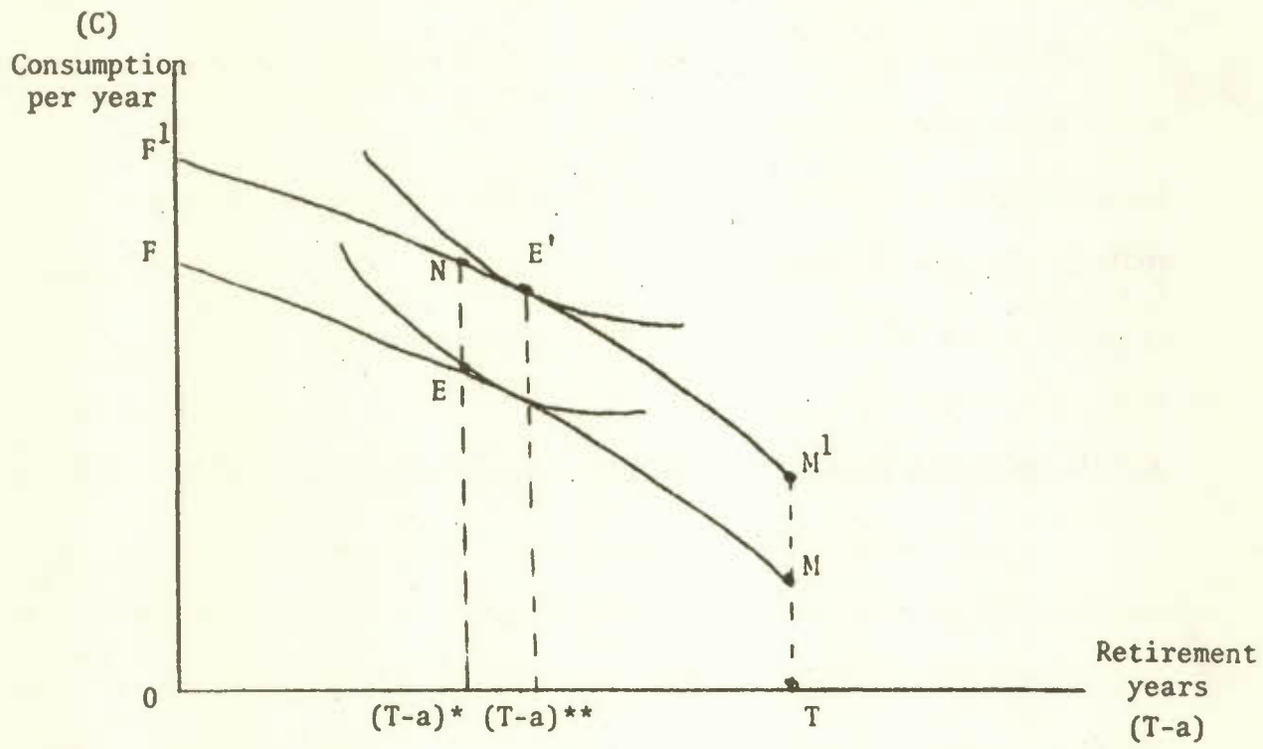
$$\left\{ (U_c^1 - U_c^2) + (U_c^1 e^{\delta a} - U_c^2 e^{-\delta(T-a)}) \right\} \frac{\partial C}{\partial a}.$$

III: Analysis and Interpretation of the Results

In order to have a sensible problem, i.e., that V be maximized subject to the constraint set out in equation (3), the second-order conditions must be satisfied. This requires that the coefficient of da in equation (5) be negative. The assumption of diminishing marginal utility of consumption, $U_{cc} < 0$, and result (vi) above, $\frac{\partial^2 C}{\partial a^2} < 0$, guarantee that the a and T-a terms are negative. If, in addition, the marginal utility of consumption increases with an increase in leisure, as is often supposed, then $U_c^1 - U_c^2 < 0$, and the coefficient of da must thus be negative. The only way in which this coefficient could be positive would be for the marginal utility of consumption to fall with an increase in leisure and for this effect to be so large that the first term, $2(U_c^1 - U_c^2)\frac{\partial C}{\partial a}$, outweighs the other two terms. We assume in what follows that the coefficient of da is always negative.

It is more difficult to sign the coefficients of $d\alpha$, dY, dW_0 and dB. However, the diagram in Figure 1 turns out to be very helpful in the interpretation of these changes. One can show that the ordinate of the constraint, point F in Figure 1, is $(1-\alpha)Y + \frac{r(W_0 - Be^{-rT})}{1-e^{-rT}}$, and the ordinate of M is $\frac{r(W_0 - Be^{-rT})}{1-e^{-rT}}$. The constraint must be concave since $\frac{\partial^2 C}{\partial (T-a)^2} = \frac{\partial^2 C}{\partial a^2} < 0$ by result (vi). The indifference curves for various levels of V may or may not be convex; we glossed over this in our picture in Figure 1 by drawing the special case when the indifference curve was convex. What the second-order conditions, that we discussed earlier, guarantee is that the constraint must be more concave than the indifference curves. If the constraint were a

Figure 2: Consumption-Retirement Years Diagram with an Exogenous Change in W_0



straight line, $\frac{\partial^2 C}{\partial a^2}$ would equal zero, and satisfaction of the second-order conditions would require the indifference curves to be strictly convex. Nothing is lost by drawing the pictures with convex indifference curves, and using these pictures helps in the interpretation of the results. Indeed, one may consider the diagrams as the exact analogue of the standard income-leisure diagrams except that here we have a curved budget constraint.

Consider now an exogenous increase in W_0. Figure 2 reproduces Figure 1 with this change added. From the expressions for the ordinates for F and M and from result (ix), $\frac{\partial^2 C}{\partial W_0 \partial a} = 0$, we know that the budget constraint must shift up vertically by the same amount at every level of T-a , so that the slope of the constraint is unchanged at each level of T-a . This is the exact analogue of a pure income effect in the standard income-leisure model. One can show that strictly convex indifference curves guarantee, in this model, that "retirement years" or "leisure" is normal,* i.e., that the

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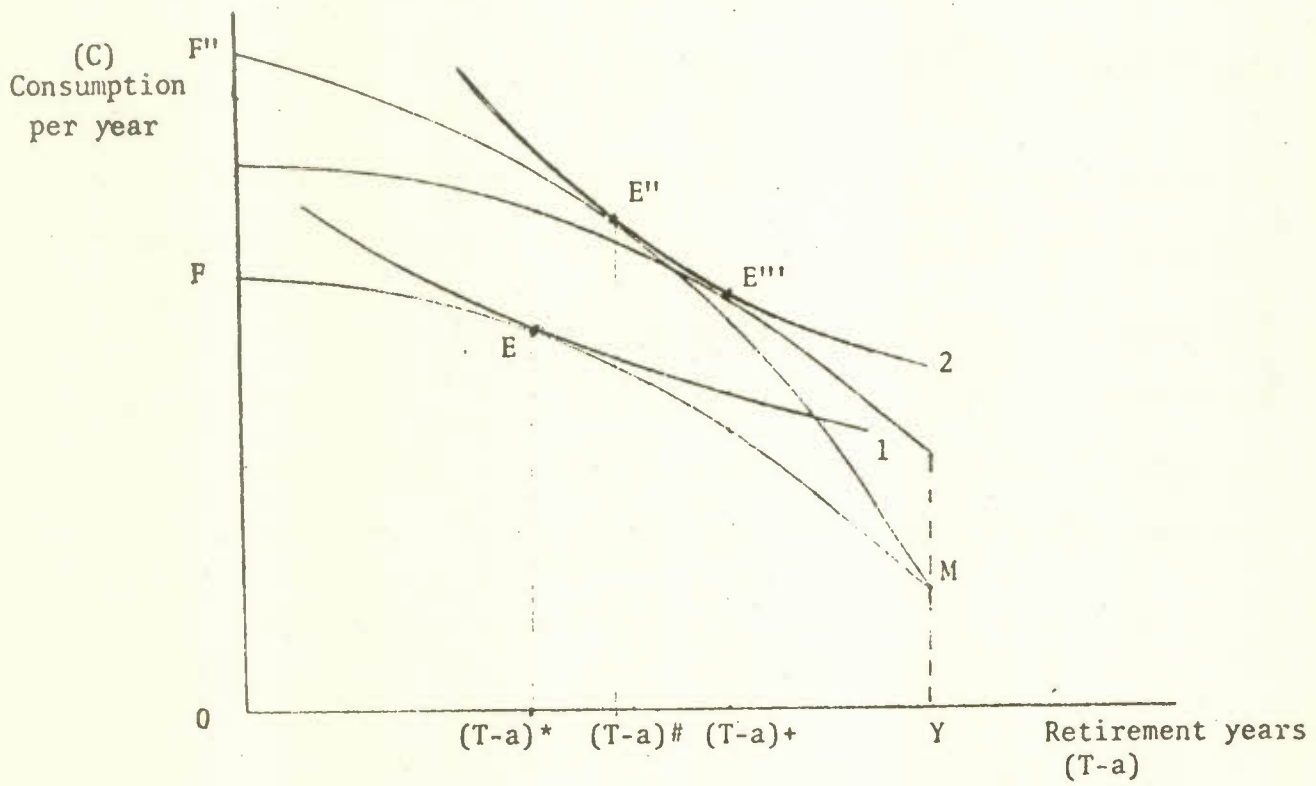
*Convex indifference curves imply

$$2(U_c^1-U_c^2) + \frac{\partial C}{\partial a}\left\{aU_{cc}^1 + (T-a)U_{cc}^2\right\} < 0 \quad \text{which, in turn,}$$

implies $(U_c^1-U_c^2) + \frac{\partial C}{\partial a}\left\{aU_{cc}^1 + (T-a)U_{cc}^2\right\} < 0$ since $U_c^1-U_c^2$ is the only term that could be positive, if $U_{cc} < 0$. Hence, the coefficient of dW_0 is negative because it equals the above term times $\frac{\partial C}{\partial W_0}$.

This yields $\frac{d(T-a)}{dW_0} > 0$.

Figure 3: Consumption-Retirement Years Diagram with an Exogenous Change in Y



coefficient of dW_0 in (5) is negative, and $\frac{da}{dW_0} < 0$, or $\frac{d(T-a)}{dW_0} > 0$.

With concave indifference curves it is possible that $U_c^1 - U_c^2$ could be a large enough positive number so that the coefficient of dW_0 could be positive and thus $\frac{d(T-a)}{dW_0} < 0$. However, if the marginal utility of consumption rises with an increase in leisure, $U_c^1 - U_c^2 < 0$, this last result cannot occur. In what follows we assume that "retirement years" are normal. The results for dB can be obtained by reversing everything we have said for dW_0; $\frac{da}{dB} > 0$ whenever $\frac{da}{dW_0} < 0$.

Now consider an exogenous increase in income, Y. Algebraically, in terms of equation (5), we now have an extra pair of terms multiplying $\frac{\partial^2 C}{\partial Y \partial a} > 0$. In terms of the diagram, since $\frac{\partial^2 C}{\partial Y \partial (T-a)} < 0$, the slope of the constraint becomes steeper (more negative) at each T-a value. Figure 3 shows that the budget constraint shifts from FM to F"M, and equilibrium moves from E to E".

Algebraically,

$$\frac{da}{dY} = \frac{\left\{(U_c^1 - U_c^2) + (aU_{cc}^1 + (T-a)U_{cc}^2)\frac{\partial C}{\partial a}\right\}\frac{\partial C}{\partial Y}}{(-\Delta)} + \frac{\left\{aU_c^1 + (T-a)U_c^2\right\}\frac{\partial^2 C}{\partial Y \partial a}}{(-\Delta)},$$

where Δ is the coefficient of da, and thus $-\Delta > 0$. Since $\frac{da}{dW_0}$ equals the first term in $\left\{\ \right\}$ times $\frac{\partial C}{\partial W_0}$, we can write this as*

$$\frac{da}{dY} = \left(\frac{da}{dW_0}\right)\left(\frac{\partial C/\partial Y}{\partial C/\partial W_0}\right) + S, \text{ where } S = \frac{\left\{aU_c^1 + (T-a)U_c^2\right\}\frac{\partial^2 C}{\partial Y \partial a}}{(-\Delta)} > 0.$$

The right-hand side of $\frac{da}{dY}$, in turn, equals $\left(\frac{da}{dW_0}\right)\left(\frac{dW_0}{dY}\right) + S$, where

$\frac{dW_0}{dY}$ is the decrease in wealth that would have to occur when Y increases, to keep the individual at the same level of satisfaction. The first term is a pure income effect and can be represented graphically by the move from E to E"'; it tends to increase T-a. The second term, S, can be interpreted as the substitution effect: the effect of changing the "price" of retirement years in terms of consumption, holding the level of satisfaction constant. In Figure 3, this effect is depicted by the move from E"' to E". So long as the second-order conditions are satisfied, this effect tends to reduce time spent in retirement because the "price" of "retirement years" (or "leisure") increases when Y increases. As we have drawn it, the income effect outweighs the substitution effect, but there is no reason to believe

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* To see why the first term in this expression is correct, refer back to footnote * on page 51.

that this would always occur. Thus, as in the standard leisure choice model, the sign of $\frac{da}{dY}$ must be determined empirically.* Note further, that by the structure of the model, an increase in α, the tax rate, is equivalent to a reduction in Y.

IV Old Age Security Payments and Pension Plans in the Retirement Model

The model outlined above is helpful in analyzing a number of different public policies with respect to the elderly. Consider first an age-conditioned old age security payment. Age conditioned means that the only criteria for receiving the payment is the age of the recipient. The payment would be received whether or not the individual continued to work and regardless of income from other sources. Such a scheme clearly has only a wealth effect and, if we retain the argument that leisure (retirement years) is normal, will lead to an earlier retirement.** Consider, secondly, a scheme that is both age conditioned and work conditioned. Such a scheme might involve a monthly payment starting say, at age sixty-five but the payment would be available only to those who had retired. Here the constraint is changed in a different way. Specifically, the constraint is flatter beyond age 65 than without the plan (or with the plan that was only age-conditioned). Figure 4 shows the two different cases. The line F M is the individual's constraint with no plan and F'M' is the constraint with the plan that is only age conditioned.

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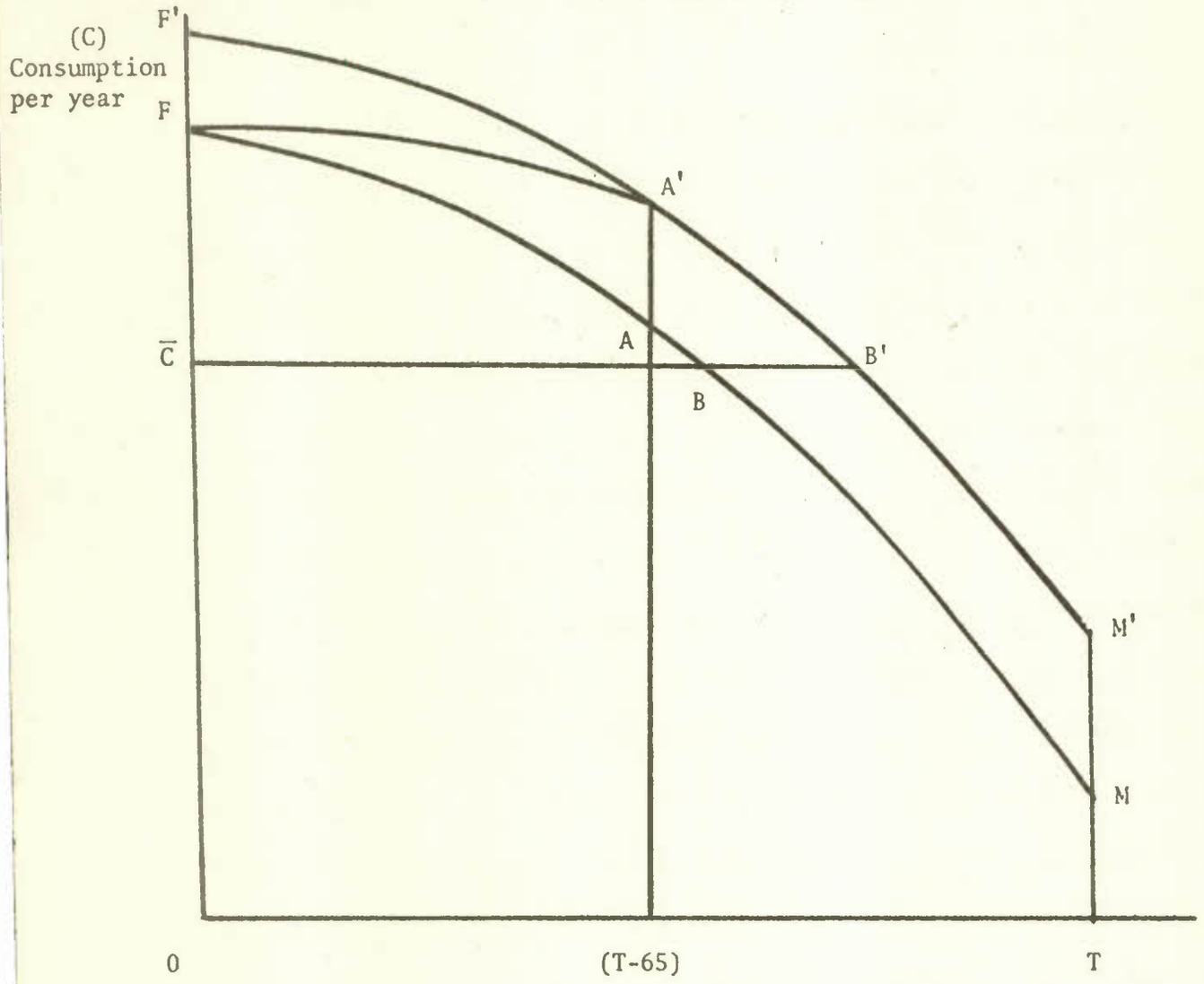
*This result contradicts Quinn's assertion (1977a,p.339) that an increased wage could never lead to complete labour force withdrawal. He comes to that conclusion because he attempts to interpret retirement in a one-period model.

**We ignore here and elsewhere, unless specified, any tax increase required to finance the payment. If taxes and benefits are increased together, the tax increases will give rise to additional substitution effects in favour of early retirement. This assumes that the present value of the new scheme is positive, at least for the elderly.

Figure 4

An Age and Retirement Conditioned Old Age Security Plan



The line F A'M' represents the scheme that is both age and work conditioned at age 65. The portion A'M', representing retirement before age 65, will be the same as in the case that is not work conditioned. Since the individual retires before the work conditioning begins to matter (at age 65), the individual receives the full value (i.e., present value) of the security payment. For an individual retiring after age 65, however, each additional year of work involves a loss of a year's security payment and means that consumption per year must be lower than in the case when the payments are not work conditioned. The individual that never retires gains nothing from the work conditioned scheme and hence the constraint must eventually reach F, the maximum consumption per period that was available in the absence of the scheme. The segment F A' is flatter than the segment F'A'(or F A) reflecting the fact that leisure (retirement) has become cheaper relative to consumption. Thus, in the age-and-work-conditioned scheme there is, in addition to an income effect in favour of early retirement, also a substitution effect that leads one to reduce work years. Thus, such a scheme provides greater retirement incentive than the straight age-conditioned scheme. However, it should be kept in mind that the extra incentive applies in any event only to those that intend to retire late in life, (i.e., beyond the age at which the payments start).

It is somewhat more complicated to analyze a scheme that is age and income conditioned in this context. The complications arise because the axis here represents consumption rather than income. However, in this

framework, consumption is linked directly to wealth (after the bequest is subtracted). Thus an analysis of a program that is consumption conditioned approximates an income or wealth conditioned program.*

A consumption conditioned program would typically involve an income transfer to families or individuals with low consumption (income) per year that would be reduced in amount for those with higher consumption. Some individuals will of course have high enough consumption per year that the scheme would leave their constraints unaffected. Others, will have such low consumption that whatever they do (even if they work continuously) they will always receive the full transfer. For this latter group of individuals the constraint would shift vertically (to, say, F'M' in Figure 4) as in the case where the payments were only age conditioned. This case would yield income effects leading to earlier retirement as in the age conditioned program.

The intermediate case where the constraint is affected differentially is slightly more complex. Refer back to Figure 4 and let $\overline{C}$ be the consumption flow after which the conditioning comes into effect. Suppose, to start, that the transfer is cut off entirely for consumption levels above $\overline{C}$. In this case the constraint would become F B B'M'. Alternatively, if the scheme does not have a total cut off but rather a proportional tax back then the portion B B' would not be horizontal but would approach the F M curve from above B B'. In any event both income and substitution effects are again operative. Both will induce earlier retirement.

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* Most actual programs that are income conditioned are more complicated because they include certain types of income (e.g., interest income) and exclude others (e.g., imputed income from home ownership).

To attempt to analyze pensions formally in this model (or any other) is difficult due to the wide variety of types of plans available (and since any one plan often treats different individuals differently). However, it is possible to characterize the general nature of the major schemes and this we do below.

The major difference between pension plans (private or public) and the old age security plans just discussed is that the pension plans involve funding through contributions of the individual (and typically the employer). However, there is one aspect of many of these plans that is, in fact, similar to the old age security plans. This aspect is that often such plans have unanticipated benefit increases. For example, in recent years many employees have made substantial gains when new pensions have been introduced and/or when existing pension plans have been upgraded. The pension plan most discussed in this regard is the Canada Pension Plan which provided substantial benefits without corresponding contributions to workers that were near retirement when it was introduced. However, perhaps just as important are the many private pension plans that have been substantially upgraded in the last decade. Increases in benefits have become common as concern about the adequacy of retirement incomes has mounted. A recent report by the Pension Commission of Ontario shows that there are substantial unfunded liabilities that represent increases in benefits in recent years.* (Unfunded liabilities due to experience deficiencies of plans are shown separately in this report.) These increases in

*The Pension Commission of Ontario (1975), in a survey of 943 plans, reports Initial Unfunded Liabilities amounting to $1.1 billion of a total liability of $3.9 billion.

benefits may take various forms: benefits may be increased for each year of contributory service; years of service before the plan came into existence may be counted in calculating benefits; the minimum benefit levels may be increased, and so on. But what all these changes have in common is that for the individual who receives benefits of these sorts they give rise to an increase in wealth. In terms of our model we should expect wealth effects from these increases in benefits that (with leisure or retirement years normal) should give rise to earlier retirement.

To return to the question of funded pensions, however, consider first a pension that is individually funded. By individually funded we mean that the expected present value of contributions is precisely equal to the expected present value of benefits. The most common pension of this sort is a money purchase scheme, where the contributions (and the interest therefrom) are used to buy an annuity at the time of retirement. An individually funded pension should have no effects on individual behaviour in the type of model considered above. The accumulation of pension rights is just another form of saving for the individual and he will fully offset such saving elsewhere if he is behaving optimally.* An alternative

*This raises the question of why such plans should exist. We do not attempt to address that question here but do note the tax advantages of such schemes. Moreover, before RRSP's were available, a pension plan was the only way to take advantage of such tax incentives. The tax incentives themselves, of course, may alter the return on such an investment -- we ignore such effects here.

way of viewing this case is that the introduction of such a scheme does not shift the budget constraint in any way and hence leaves the individual's optimal plans unchanged.

The scheme just discussed was one in which it was presumed that the present value of benefits equalled the present value of contributions no matter when the individual retired. Often, however, schemes may be designed, that have this feature only if the individual retires at a standard age (e.g., 65). For individuals who retire earlier or later than the standard age, retirement benefits may not just offset contributions. Consider, for example, a pension that is exactly individually funded if the individual retires at age 65 but, should he retire at age 64 he loses more in benefits than his last year of contributions. That is, at the margin, the last year of contributions results in benefit increases of a greater magnitude (in present value terms) than the contributions. This scheme in the years before the standard retirement age would have substitution effects in favour of work (the cost of taking the extra year of leisure includes the loss of pension benefits) and income effects also in favour of more work (this is relative to either no scheme at all or to a scheme that is funded at each age). In terms of Figure 4, if the individual could attain point A' without the scheme, he can also attain A' with the scheme. But to the right of A' the budget line falls below A'M'.

On the other hand, many schemes have the feature that retirement delayed beyond the standard age adds very little to benefits per year but involves the loss of a year's pension for each additional year

worked. Plans with this feature could have substitution effects against delayed retirement for individuals who otherwise would have worked beyond age 65 (though the income effects are offsetting). Consider, as an example, an individual that, in the absence of any pension plans, had budget line F'A'M' in Figure 4. Suppose a plan is introduced such that it is individually funded at age 65 and has the feature in regards to delayed retirement discussed above. Then, an individual could have point A' in the presence or absence of the scheme. However, if he initially would have chosen a point between F' and A', his budget constraint would now become something like FA'. The changed constraint gives rise to substitution effects that lead him to retire closer to age 65 and income effects that tend to offset these substitution effects.

The case just discussed involved a plan in which additional years of contribution beyond a standard age reduced the present value of benefits. Other plans may have just the opposite feature. For example, a not uncommon arrangement involves a benefit formula that links benefits to years of service and average earnings. Suppose that a plan has benefits equal to 1.5 percent of final earnings for each year of service to a maximum of 30 years of service or, 45 percent of final earnings. Suppose moreover, that benefits begin on retirement. For the individual with the maximum pension there are incentives to take the benefits as soon as they are available while for the individual with fewer than 30 years of service, there might be incentives to delay retirement depending on whether at the margin an additional year of service adds more to benefits than to costs (contributions).

What we have said so far should make clear that there are a great variety of pension schemes possible and that even a single scheme can have different effects on different workers. Another issue that is equally complex is the question of how to treat contributions that are paid, all or in part, by the employer. If we treat such contributions simply as part of the worker's gross pay, then the above analysis applies. While this might be the most appropriate way to treat the Canada Pension Plan contributions and other joint contributory schemes, it is not clear that one would want to treat a plan solely financed by the employer in this way. Suppose, instead, that the worker simply knows about the pension benefits that are accumulating on his behalf. Suppose that a plan is introduced that promises the worker one percent of earnings for each year of service and that the pension is payable at age 65. To simplify matters assume that the individual is compulsorily retired from this job exactly at age 65 and that should he retire earlier the pension will, nevertheless, start at age 65 and be based on the same formula. This scheme can be treated exactly as an increase in earnings for the individual. Each year of work increases his consumption possibilities. As with an increase in earnings there are offsetting substitution and income effects (at least in the ages prior to age 65). Many aspects of private pensions seem to be of this latter sort and should be treated in this manner.

We now turn to a brief consideration of government schemes for the elderly in Canada and their effects on retirement behaviour. The main scheme, of course, is the Canada Pension Plan. It can be divided

into two different periods. First, the period 1966 to 1975 was a phase-in period that had special features. The plan "matured" in 1976 and is now in a second phase. We note below, however, that some phase-in features are still present in the plan.

During the phase-in period, 10 years of contributions entitled one to a full pension.* If one contributed for 7 out of 10 years the entitlement would be 70 percent, and for 8 years 80 percent, and so on. Thus, during the phase-in period, an individual at, say, age 65 with, say 6 years of contributions could add substantially to his pension benefits by working one further year. An individual could delay taking a pension between ages 65 and 70. In each year he lost benefits and made further contributions, but increased his future annual pension considerably (e.g., 10 percentage points per year). This could give rise to strong substitution effects towards delayed retirement.** In fact, during this phase-in period from 1966-1975, one might expect that the net effects were in the direction of delayed retirement. Certainly during the phase-in period there was talk of the advantages of delayed retirement and one heard of individuals delaying retirement for that reason.

The present form of the Canada Pension Plan, now in its post phase-in period, is well documented elsewhere***. However, it is worth commenting here on the key features. First, it is neither income nor work conditioned in the sense discussed earlier. Thus the plan avoids the substitution effects leading to earlier retirement inherent in such schemes. The overall Canada Pension Plan was intended to be approximately

* A full pension in this context depends on the earnings of the individual relative to the maximum pensionable earnings in the plan.

** In addition, pensions were both earnings conditioned and retirement conditioned during the phase-in period.

*** See, for example, Pesando and Rea (1977), Chapter 5.

funded for an individual entering the work force after the plan had commenced (although it has been argued that it is not) but it certainly is not funded for an individual nearing retirement at the present time. If such an individual has paid contributions since 1966, when he reaches age 65 he is entitled to a full pension.* However, as it would require a lifetime's contributions to fund the individual's pension, individuals now nearing retirement must have pension benefits considerably in excess of their own (including the employers') contributions. Thus, for some time to come, the Canada Pension Plan will confer income effects on those nearing retirement. As we argued earlier, these income effects are expected to lead to earlier retirement.

In addition to the Canada Pension Plan, the Canadian Old Age Security Program also provides an income to people over age 65 that is neither work nor income conditioned. This provides further income effects. However, the Guaranteed Annual Income Supplement and a number of provincial supplements and/or tax credits are income conditioned and do have substitution-effect incentives for early retirement.** Thus, for individuals now nearing retirement, the Canadian schemes taken together seem to provide incentives for early retirement.

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*See footnote * on page 64.

**The Federal plans and Ontario plans are documented in Pesando and Rea (1977), Chapter 5.

Chapter 4: An Empirical Application

The application of the model developed in Chapter 3 to Canadian data, and in particular of the effects of the Canada Pension Plan, is severely restricted by the existence of the "phase-in" of the Canada Pension Plan. As indicated in that chapter, during the first ten years of the Canada Pension Plan there were unusually strong incentives for individuals to delay retirement. In addition, prior to 1975 there was a severe earnings test and a retirement test that further complicated the issue. It would, as a consequence, be very difficult if not impossible to infer from this transition stage the long run (or post-transition stage) effects of the plan. This has led us to concentrate our attention on the one data source that relates to retirement after this transition phase. This source is the Pre-Retirement Survey of individuals (over age 55 and not yet retired) conducted by Statistics Canada in February 1975. The survey collected information on retirement plans of individuals together with information on current and expected (in the first year of retirement) income by source as well as a wide variety of other data.*

The discussion in Chapter 3 of the Canadian pension system suggested that beneficiaries of the present system are, to a considerable degree, receiving pensions in excess of the contributions they have made. This is clearly true of the Canada Pension Plan and appears to be true also of many private pensions that have in recent years increased benefits for those near retirement. This we expect to be true also in the next few

*In that the information on individuals relates to expectations rather than behaviour, the data are most comparable to Barfield and Morgan (1969) discussed earlier.

years as new workers near retirement. For our sample, then, we expect the pension income available to give rise to income effects that reduce the age of retirement. To the extent that some or all of the pension income represents accumulations on the part of the individual, the implications are less clear (see the discussion in Chapter 3).

While the survey is by no means ideal for our purposes it has a number of advantages over other microdata sources that were available.* Besides the obvious advantage of providing information on incomes both before and after retirement, and for a time after the phase-in period discussed above, the Pre-Retirement Survey provides information on the health of individuals and on compulsory retirement. A health-status variable has typically been important in U.S. studies and it appears desireable to have a data source that allows one to differentiate between the healthy and unhealthy.** Munnell (1977) has speculated on the role of compulsory retirement in the context of U.S. studies but so far no one has examined the role of compulsory retirement directly.***

On the other hand, there are some problems with these data that must be acknowledged. First, the information we have on expected income in the first year of retirement is less than ideal. The present value of pension income would have been a more appropriate variable. In addition, while there is some disaggregation of income by source, there is no disaggregation of pension income into private and government sources. Moreover, we do not know from the information provided to what extent the expected

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*These include; Census data, Survey of Consumer Finances data, and the Retirement Survey conducted at the same time as the Pre-Retirement Survey.

**See, for example, Quinn (1977b). Neither Census nor Survey of Consumer Finance data contain health information.

***No one, of course, is retired compulsorily. An individual may be required to leave a particular job at a certain age, and it may be difficult to find another, but he cannot be compelled to withdraw from the labour force.

pension income would be available only if the individual actually retired. The theory presented in the last chapter suggested that such distinctions should be important. In addition, the self enumeration in the survey led to a large number of non-responses, particularly in the questions relating to expected retirement income.

An additional problem with the data concerns selectivity bias in the sample. As we are dealing only with those who are yet to retire (pre-retired) some early retirement will have already taken place. This will be more serious, of course, for the older ages and we will remind the reader of this problem in discussing the results later.

Finally, we note here also that the sample is smaller than desireable and this has led to more aggregation than we would have liked.

In the sections that follow, we discuss first the data employed, secondly the form of our estimating equations, and finally the results of our empirical investigations.

The data used in this study are from a survey supplementary to the Labour Force Survey in February, 1975. Those individuals 55 years of age and older "rotating out" of the Labour Force Survey sample were provided with one of two "drop-off" questionnaires: the Pre-Retirement questionnaire or the Retirement questionnaire. Which questionnaire was provided was determined by the response to a series of questions* designed to distinguish between those who had left full-time work (retired) and those

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*Each person was read a definition of full-time employment ("35 or more hours per week for more than half the year or its equivalent") and then asked a series of three questions: a) "Are you presently working full-time for pay or profit?", b) "Are you presently looking for work for pay or profit?", and c) "Do you consider yourself permanently retired from full-time work (for pay or profit)?". A "yes" answer to a) or b) or a "no" answer to c) led to the pre-retirement form.

who had not (pre-retired). As a consequence of this selection, the group given the retirement survey had a disproportionate number of females while the pre-retirement group had a disproportionate number of males. The data discussed here are for the pre-retirement group and the questions concern early retirement.

There were a total of 828 records in the pre-retirement file. From this file we selected only males aged 55 to 64.* In addition there were some records that exhibited inconsistency between the Labour Force Survey data and the pre-retirement data.** These records were discarded. Finally, since we were specifically interested in age (by single years) and the expected age of retirement, any records that were incomplete in this information were also disregarded. The above selection process left us with 257 observations on males aged 55 to 64.

The nature of the data led us to partition the data in two different ways. The particular problem related to the nature of the information available on incomes. Individuals were asked about both their 1974 income and the income they expected to receive in the first year of retirement. For some individuals this would be only a few years hence while for others it could be 10 or 15 years away. There was no specific information available to guide individuals on how to adjust for inflation in their responses. Thus, the information about future income might be in terms of 1974 dollars, 1977 dollars, 1982 dollars, etc.

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* The cell sizes for higher ages were too small for analysis and are likely to be seriously biased in terms of the selectivity discussed earlier.

** Age information was available from both sources and some of the records were not consistent (apparently due to the matching process employed by Statistics Canada). Since the survey took place 6 months after the respondent entered the Labour Force Survey we allowed for a one-year age difference, when attempting to match the records.

If one takes the view that the information is "roughly" in 1974 dollars, then it seems reasonable to analyze the age of retirement of all individuals who were, say, 58 in 1975. Some may retire in 2 years and others in 10 but if the expected retirement income they report is in constant (1974) dollars, there is no problem. On the other hand, if one believes that the information reported is inflation adjusted, the above approach encounters problems -- it introduces a positive correlation between retirement age and income available in retirement due to inflation. The second approach we have taken attempts to overcome this problem. Here we consider the number of years until retirement (i.e., the difference between expected retirement age and present age). Thus, we consider all those with, say, 5 years left until retirement and study the determinants of retirement age presuming that the individuals have accounted for inflation in the same way. In fact, the limitation in observations precluded us from analyzing retirement decisions by single years of age (or by single years until retirement). Instead we have worked with groups of ages (or groups of years until retirement) employing dummy variables for single years to control for differences in this respect.

If we then examine variations in the age of retirement for the first classification we are making one assumption about the way future income is accounted for, while if we examine variations in ages of retirement for sub groups of the second classification we are making another. In either case, the variable to be explained is the age of retirement in accordance with the theoretical framework.

It turned out that the two different ways of looking at the problem gave much the same results in our preliminary analysis of the data. We therefore confine our discussion and reporting of results to the first approach -- the one in which the data for given ages are analyzed.

As should be clear from the above discussion, the natural choice for the dependent variable in our regression analysis is the anticipated age of retirement. We have, however, also worked with a dichotomous dependent variable that takes on the value of unity when the expected retirement age is earlier than age 65. This way of looking at the problem involves the determinants of the probability of early retirement.* This second approach was adopted for three reasons. The first reason related to the nature of the data concerning expectations of individuals. It was felt that individuals may often not have a precise idea of the actual date of retirement but might have a better idea about whether they will retire before the normal age. (Normal is used here in the sense that Canada Pension Benefits and Old Age Security payments begin at age 65.) Secondly, some of the U.S. studies have used this framework and comparisons with other work will thus be facilitated. Thirdly, the analysis of the probability of early retirement provides an alternate way to interpret the empirical results.

The main economic determinants of retirement that we have focussed on are income variables representing; a) current (1974) income, b) expected pension income and c) expected income from other sources.** Current income

*Ideally, one should use logit estimation in this context. However, because of the data limitations and the exploratory nature of the present study it was felt that the linear probability model would suffice at this stage.
**The exact descriptions of these and other variables are provided in the Appendix.

in the year prior to the survey is available only as an aggregate and not by source. This variable is included as a measure of the opportunity cost of retirement and ideally would include only income from work. However, since the correlation between income from work and from other sources is likely to be high it should still be a reasonable proxy variable for employment income -- at least as a control variable.

Expected pension income and expected income from other sources (excluding any income from work after retirement) are included separately. The pension variable includes both private and public pensions and annuities. While it would have been useful to separate government pensions from other pensions this was not possible in the data. However, as we have argued earlier, private pensions have recently given substantial bonuses to elderly employees in a manner similar to the Canada Pension Plan and hence are likely to have similar effects on retirement behaviour.* For this reason the aggregation should not be too serious a problem. On the other hand, while the Canada Pension Plan is not retirement tested, some of the private plans are likely to be so tested and this could be a more serious problem.

The most serious problem with the pension variable, however, is that it relates only to the first year of retirement. Since individuals who retire early (before age 65) would not receive, for example, their Canada Pension Plan income in the first year, the pension income reported will tend to understate the actual value of pensions for these individuals. This will tend to give rise to a positive correlation between retirement age and pension income. The theory, however, suggests that the opposite should be the case. We emphasize here that, because of this problem, there is an inherent bias against finding that higher pensions lead to earlier retirement.

*We noted in Chapter 3 that as much as one-quarter of liabilities may be unfunded.

The third income variable relates to income expected from non-pension sources in the first year of retirement. This variable is intended to serve as a proxy for wealth and includes investment income, other government transfers, etc. Unfortunately, the questions that elicited this information were often not answered in the questionnaire so that there is an unusually large number of individuals in the non-response category. This frequency of non-response will make it difficult to have much faith in the parameter estimates associated with this variable. However, it is clearly desireable to include the variable as a control variable in as much as some information is contained in the responses that were made.*

In addition to these income variables two additional income-related variables were considered. A variable representing home ownership as a proxy for a form of wealth not accounted for elsewhere, and a variable recording spouse's income expected in the first year of retirement. The first of these variables was rejected after some early experimentation although the second has been retained. However, this variable turns out to be unimportant in the final analysis.

The other major variable in the study is a health variable that indicates inadequate health. As indicated in our earlier chapters, much of the U.S. literature has focussed on the relative strengths of health and retirement income as forces leading to early retirement. The question

*To find out something about the non-respondents to this question, a cross-classification of non-respondents with 1974 income was performed. Although these were substantial proportions of non-responses at all income levels, the highest proportions were found in the middle income ranges.

we focus on here involves a self-assessment of health status expected at the time of retirement. The variable is based on those responses that indicated inadequate health in this connection. Such a variable, of course, can only capture certain types of health-related retirement effects. An unexpected rapid deterioration in health that forces retirement will be missed entirely by this variable.*

An alternative health variable was also considered. This was based on the responses to the question, "When you retire, do you think it will be because you will be in too poor health to keep working?" This variable was experimented with in early stages of the analysis and gave results similar to (although slightly poorer than) the health variable representing expected health status. The latter variable was retained for the remaining analysis partly on the basis of performance but also because it seemed preferable on theoretical grounds. Explanations by individuals of why they do something have often not proved useful in economics.

Since some of the U.S. studies, particularly those by Quinn, indicated that individuals in poor health tend to be more responsive to pension income, we also experimented with the interaction of the inadequate health variable and pension income.** We could find no evidence of any interactive effect and report later only equations without any interactive term.

The remaining variables included in the regression analysis can best be thought of as control variables. They are included to capture differences in opportunities, obligations, and tastes. Perhaps the most important of these and, without a doubt, the most difficult conceptually, concerns

*This health variable lies somewhere in between the variables used by Quinn and Boskin. Quinn's variable was based on self-assessment after retirement (for those retired), while Boskin's variable objectively measured health status prior to retirement.

**This interactive effect would be consistent with the health of an individual affecting the marginal utility of leisure (or time spent in household production).

compulsory retirement. No one, of course, is compulsorily forced to leave the labour force. Rather, at some age (often 65) one may be forced to leave a particular job.* It is often the case that when this happens, other jobs may not be available and those that are may pay less well. In this sense, the age of compulsory retirement may indicate a change in status of the individual that involves a change in the relative price of work and leisure in favour of retirement. The change in relative prices also has an income effect, however, and the overall effect is ambiguous. At the same time, the compulsory retirement age is often also associated with the age of availability of a private pension. Thus, for example, a compulsory retirement age of 67 could indicate that a private pension is not available until that age is reached.

The questionnaire included questions on whether there is a compulsory retirement age in the present job and if so, what the actual compulsory retirement age is. We have attempted to control for compulsory retirement in two ways. On the one hand, we have included a dummy variable in cases when the individual expects to retire at the compulsory retirement age and, on the other hand, we have excluded from our sample those individuals who expect to retire at the compulsory retirement age. There were too few observations to consider separately only those individuals with a compulsory retirement age with a view to considering what other variables influenced the decision (anticipated) to retire at the compulsory retirement age.

The other control variables included in the equations are :

*An undesireable compulsory retirement age in one job may lead an individual to shift jobs well before retirement. In this sense, the compulsory retirement age may be partly endogenous.

region (only the Atlantic provinces dummy was retained after experimentation); a variable representing a rural location; a variable indicating that the individual expected to live with others besides his spouse after retirement; a variable indicating that the individual was not in the labour force at the time of the survey; a set of occupational dummy variables; and, dummy variables for the various ages (discussed earlier).*

The regression results are reported in Tables 13 to 16. Separate regressions are presented for ages 55 to 59, ages 60 to 64, and for ages 55-64. As we noted earlier, the older ages (60 to 64) are more likely to suffer from selectivity bias in that more individuals in those ages will have already retired and hence are excluded from the sample. This is the reason for partitioning the sample at age 60. In addition, the coefficients on the age variables in the full regression (ages 55-64) suggest that age 60 is the appropriate partition.

Tables 13 and 14 report the results for expected retirement age for the entire sample with a dummy variable to represent retirement at the compulsory retirement age (Table 13), and for the subsample excluding those who expected to retire at the compulsory retirement age (Table 14). Tables 15 and 16 report the analogous results for the dichotomous dependent variable and these can be interpreted as explaining the probability of retirement as discussed earlier.**

Overall, the regressions do not explain a great deal of the variation in the dependent variables. This is not unusual in the case of microdata. Moreover, very few of the independent variables have significant coefficients either singly (from a t-test) or in groups (from an F-test). However, what is clear is that the pension variables have a strong, significant effect on retirement plans. As a set, the pension variables are

*Other control variables experimented with, but dropped after preliminary investigation include: marital status, self-employed, union worker and, as mentioned earlier, home ownership.

**The reader is reminded that the details of the variables are found in the Appendix.

significant at the 1% level for ages 55 to 59 and for the entire sample in all four tables. For ages 60 - 64 the results are weaker but still show significant pension effects -- particularly for the highest pension income group. Not only do we find the pension variables in general significantly different from zero, but also, they are generally negative in the case of the retirement age regressions (Tables 13 and 14) and positive in the case of the probability of early retirement equations (Tables 15 and 16).* These results are encouraging given the fact that the pension income variable suffers from the measurement error problem mentioned earlier. Namely, some positive correlation between the age of retirement and pension income in the first year is present because some of the pension income that will become available at say, age 65, is not counted in the case of early retirees.

The reader is reminded that because of the problems with the data and the nature of the sample, the parameter estimates cannot be treated as precise. Nevertheless, if one had to make a guess, it would seem reasonable from these results to suggest as a first approximation that high, as opposed to low, pension income may be associated with, perhaps, two years earlier retirement. Or, alternatively, that individuals with high, as opposed to low, pension income are thirty to sixty percent more likely to retire early (before age 65).

The non-pension income variables perform much less satisfactorily in these equations. Both income expected in the first year of retirement from non-pension sources and current (1974) income perform poorly and show little consistency from one regression to another (e.g., from one age group

*These results seem quite robust with respect to the exclusion of various sets of other regressors. Although the magnitudes of the coefficients change slightly when, say, income from other sources is excluded, the statistical significance was always retained.

to another, or for the same age group among specifications). The theory gave less guidance on what to expect from these variables (because of income and substitution effects both being operative) but, nevertheless, one might have hoped that they would perform more satisfactorily.

The last income variable in the equations is a dummy variable indicating that a spouse's income is greater than $1000 per year in the first year of retirement. This variable is negative as one might expect in the age of retirement equations (it represents an income effect) but is not significant. In the probability equations, however, it does show up as positive (again, as would be expected) and significant in the case of the older males (ages 60-64).

The compulsory retirement variable (a dummy equal to unity for those expecting to retire at the compulsory retirement age) is highly significant in both Tables 13 and 15. Its sign suggests that individuals who expect to retire at the compulsory retirement age retire, in fact, later than average.* The exclusion of these individuals from the sample (Table 14 and 16) increases the magnitudes of the pension coefficients slightly (and also the t-values). The results, in general, suggest that it is important to control for compulsory retirement in studies that analyze retirement decisions.

Finally, we note that the variable representing poor health generally has the expected sign (reducing retirement age) although the variable is only occasionally significant. The reader is reminded that,

*Is this signalling the availability of a pension at the compulsory retirement age which is an age above average retirement age?

as mentioned earlier, this variable was also experimented with in an interactive form with the pension variable. This was considered because of the U.S. results that suggest persons with inadequate health are more responsive to income variables in their retirement decisions. However, our analysis indicated no interactive effects and the interactive terms are omitted in the regressions reported here.

The remaining variables were included as control variables and little needs to be said about them here. The particular form of these variables is described in more detail in the Appendix.

Table 13 : Regression Equations for the Expected Retirement Age, Canadian Males, Feb. 1975.

	Males Ages 55-64		Males Ages 55-59		Males Ages 60-64	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Constant	63.34	-	63.64	-	64.03	-
Expected Pension Income						
< $3000	-1.07	(2.08)	-1.79	(2.00)	-.16	(.33)
$3000 to 4999	-1.59	(2.92)	-3.42	(3.59)	.14	(.30)
$5000 to 7499	-1.54	(2.98)	-2.82	(3.18)	-.16	(.34)
$7500 and over	-2.17	(3.37)	-2.34	(2.14)	-1.53	(2.51)
No Income or Non-Response	-	***	-	***	-	*
Income Expected from other Sources						
< $1000	.93	(2.02)	1.72	(1.95)	.48	(1.26)
$1000 to 4999	.72	(1.54)	1.46	(1.91)	.28	(.59)
$5000 to 9999	.41	(.63)	.71	(.67)	.39	(.59)
$10,000 and over	2.38	(2.30)	3.03	(1.80)	1.83	(1.75)
No Income or Non-Response	-	*	-	-	-	-
1974 Income						
$5000 to 9999	-.32	(.58)	-.78	(.85)	.36	(.70)
$10,000 to 14,999	.42	(.68)	-.47	(.47)	.54	(.93)
$15,000 and over	-.003	(.004)	-.59	(.47)	1.00	(1.43)
<$5000 or Non-Response	-	-	-	-	-	-
Other Variables						
Spouse Income > $1000	-.23	(.61)	-.36	(.53)	-.20	(.51)
Inadequate Health	-1.24	(2.12)	-1.15	(.98)	-1.11	(2.45)
Retire at compulsory retirement age	1.64	(4.58)	2.65	(4.07)	.48	(1.54)
Expect to live with others	-.83	(2.04)	-1.70	(2.14)	-.55	(1.65)
Atlantic region	.89	(2.06)	1.44	(1.84)	.46	(1.24)
Rural	.42	(.89)	.42	(.52)	.19	(.39)
Not in labour force	-.94	(1.65)	-1.66	(1.43)	-.37	(.86)
Occupation						
Professional	.25	(.44)	.69	(.62)	-.12	(.22)
Services	.19	(.49)	.49	(.74)	-.25	(.72)
Primary	.69	(1.00)	1.79	(1.58)	-.77	(1.11)
Others	-	-	-	-	-	-
Age						
Age 55	-	***	-	-	-	-
56	-.08	(.12)	-.07	(.07)	-	-
57	-.95	(1.42)	-.95	(1.12)	-	-
58	.28	(.41)	.18	(.20)	-	-
59	.39	(.56)	.27	(.31)	-	-
60	1.21	(1.90)	-	-	-	*
61	1.65	(2.28)	-	-	.59	(1.44)
62	1.44	(1.92)	-	-	.41	(.96)
63	2.77	(3.75)	-	-	1.08	(2.65)
64	2.59	(3.25)	-	-	.89	(1.88)
Number of Observations	257		133		124	
$\bar{R}^2$	.23		.22		.12	

Notes: 1) Variables and data selection are defined more completely in the text.
2) ***, **, or * next to an omitted variable in a set of variables indicates significance of the set of variables at the 1%, 5%, or 10% level respectively.

Table 14 : Regression Equations for the Expected Retirement Age, Canadian Males, Feb. 1975 (excluding compulsory retirement).

	Males Ages 55-64		Males Ages 55-59		Males Ages 60-64	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Constant	63.91	-	63.94	-	64.24	-
Expected Pension Income						
< $3000	-1.85	(2.51)	-2.18	(1.68)	-.63	(.84)
$3000 to 4999	-2.66	(3.31)	-4.89	(3.72)	-.32	(.39)
$5000 to 7499	-2.46	(3.06)	-3.38	(2.67)	-.57	(.62)
$7500 and over	-3.55	(3.57)	-3.43	(2.05)	-2.35	(2.08)
No Income or Non-Response	-	***	-	***	-	-
Income Expected from other Sources						
< $1000	1.73	(2.37)	1.79	(1.35)	1.14	(1.65)
$1000 to 4999	1.16	(1.74)	1.83	(1.73)	.36	(.46)
$5000 to 9999	.98	(1.04)	1.52	(.96)	.58	(.56)
$10,000 and over	4.47	(2.77)	4.16	(1.80)	.49	(2.29)
No Income or Non-Response	-	-	-	-	-	-
1974 Income						
$5000 to 9999	-.79	(1.11)	-1.38	(1.19)	.32	(.41)
$10,000 to 14,999	.35	(.43)	.74	(.58)	.36	(.37)
$15,000 and over	-.24	(.24)	-.83	(.49)	.74	(.69)
< $5000 or Non-Response	-	-	-	-	-	-
Other Variables						
Spouse Income > $1000	-.55	(.93)	-.39	(.37)	-.55	(.85)
Inadequate Health	-1.09	(1.36)	-1.14	(.79)	-1.39	(1.81)
Expect to live with others	-1.30	(2.15)	-1.75	(1.53)	-1.02	(1.84)
Atlantic region	1.04	(1.65)	1.16	(1.04)	.68	(1.16)
Rural	.20	(.29)	1.13	(.93)	.32	(.45)
Not in labour force	-1.45	(1.64)	-1.58	(.99)	-.75	(.89)
Occupation						
Professional	.35	(.40)	.60	(.41)	.01	(.00)
Services	.30	(.53)	1.00	(1.08)	-.21	(.33)
Primary	1.06	(1.15)	1.72	(1.17)	-1.10	(.93)
Others	-	-	-	-	-	-
Age						
Age 55	-	***	-	-	-	-
56	-.34	(.33)	-.39	(.30)	-	-
57	-1.19	(1.29)	-1.16	(.98)	-	-
58	-.12	(.13)	-.22	(.19)	-	-
59	.77	(.76)	.99	(.77)	-	-
60	1.52	(1.67)	-	-	-	-
61	2.30	(2.03)	-	-	1.08	1.32
62	2.00	(1.74)	-	-	.35	.46
63	4.03	(3.91)	-	-	1.71	2.65
64	3.55	(2.99)	-	-	1.30	1.51
Number of Observations	168		95		73	
$\bar{R}^2$	.24		.15		.17	

Notes: 1) Variables and data selection are defined more completely in the text.

2) ***, **, or * next to an omitted variable in a set of variables indicates significance of the set of variables at the 1%, 5%, or 10% level.

Table 15: Regression Equations for the Probability of Early Retirement, Canadian Males, Feb. 1975.

	Males Ages 55 64		Males Ages 55-59		Males Ages 60 64	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Constant	.46	-	.42	-	.35	-
Expected Pension Income						
< $3000	.21	(2.69)	.36	(3.10)	.06	(.56)
$3000 to 4999	.20	(2.42)	.42	(3.38)	-.06	(.58)
$5000 to 7499	.24	(3.16)	.41	(3.55)	.08	(.74)
$7500 and over	.38	(3.93)	.31	(2.15)	.39	(2.93)
No Income or Non Response	-	***	-	***	-	**
Income Expected from other Sources						
< $1000	-.06	(.81)	-.14	(1.18)	-.04	(.54)
$1000 to 4999	-.02	(.26)	-.09	(.92)	-.07	(.70)
$5000 to 9999	-.12	(1.24)	-.14	(.97)	.27	(1.85)
$10,000 and over	-.08	(.51)	-.10	(.44)	-.10	(.45)
No Income or Non-Response	-	-	-	-	-	-
1974 Income						
$5000 to 9999	.05	(.55)	-.006	(.05)	.11	(1.04)
$10,000 to 14,999	-.07	(.79)	-.15	(1.13)	.07	(.58)
$15,000 and over	-.06	(.54)	.05	(.29)	-.12	(.79)
<$5000 or Non-Response	-	-	-	-	-	-
Other Variables						
Spouse Income > $1000	.06	(1.07)	-.02	(.19)	.15	(1.97)
Inadequate Health	.21	(2.45)	.23	(1.49)	.18	(1.86)
Retire at compulsory retirement age	-.51	(9.51)	-.57	(6.61)	-.45	(6.63)
Expect to live with others	.10	(1.68)	.08	(.78)	.17	(2.31)
Atlantic region	-.11	(1.73)	-.06	(.55)	-.11	(1.38)
Rural	-.19	(2.63)	-.18	(1.68)	-.23	(2.14)
Not in labour force	.13	(1.53)	.31	(2.04)	.03	(.29)
Occupation						
Professional	-.02	(.28)	-.04	(.31)	.01	(.08)
Services	-.02	(.38)	-.05	(.55)	.05	(.73)
Primary	.15	(1.50)	.09	(.61)	.24	(1.58)
Others	-	-	-	-	-	-
Age						
Age 55	-	***	-	-	-	-
56	.07	(.65)	.08	(.66)	-	-
57	.08	(.77)	.14	(1.21)	-	-
58	.03	(.29)	.03	(.28)	-	-
59	-.08	(.73)	-.06	(.51)	-	-
60	-.15	(1.54)	-	-	-	**
61	-.18	(1.63)	-	-	-.11	(1.24)
62	-.23	(2.05)	-	-	-.16	(1.75)
63	-.41	(3.75)	-	-	-.23	(2.56)
64	-.45	(3.86)	-	-	-.30	(2.93)
Number of Observations	257		133		124	
R^2	.46		.39		.33	

Notes: 1) Variables and data selection are defined more completely in the text.
2) ***, **, or * next to an omitted variable in a set of variables indicates significance of the set of variables at the 1%, 5%, or 10% level respectively.

Table 16: Regression Equations for the Probability of Early Retirement Canadian Males, Feb. 1975 (excluding compulsory retirement).

	Males Ages 55-64		Males Ages 55-59		Males Ages 60-64	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Constant	.38	-	.36	-	.27	-
Expected Pension Income						
< $3000	.30	(2.74)	.46	(2.77)	.17	(1.08)
$3000 to 4999	.31	(2.65)	.64	(3.83)	-.04	(.21)
$5000 to 7499	.37	(3.09)	.49	(3.04)	.19	(1.00)
$7500 and over	.66	(4.51)	.49	(2.31)	.65	(2.77)
No Income or Non-Response	-	***	-	***	-	**
Income Expected from other Sources						
< $1000	-.13	(1.18)	-.15	(.89)	-.08	(.57)
$1000 to 4999	-.04	(.38)	-.12	(.91)	-.15	(.90)
$5000 to 9999	-.22	(1.61)	.33	(1.63)	-.32	(1.43)
$10,000 and over	-.22	(.92)	-.28	(.94)	-.10	(.23)
No Income or Non-Response	-	-	-	-	-	-
1974 Income						
$5000 to 9999	.09	(.91)	.08	(.51)	.19	(1.12)
$10,000 to 14,999	-.12	(.98)	-.18	(1.07)	.05	(.24)
$15,000 and over	-.08	(.54)	.12	(.54)	-.12	(.54)
<$5000 or Non-Response	-	-	-	-	-	-
Other Variables						
Spouse Income > $1000	.14	(1.56)	-.06	(.41)	.38	(2.78)
Inadequate Health	.19	(1.58)	.27	(1.45)	.14	(.85)
Expect to live with others	.12	(1.40)	.02	(.12)	.26	(2.25)
Atlantic region	-.14	(1.50)	.02	(.13)	-.19	(1.56)
Rural	-.18	(1.78)	-.30	(1.93)	-.27	(1.79)
Not in labour force	.18	(1.37)	.25	(1.24)	.16	(.92)
Occupation						
Professional	-.05	(.38)	-.04	(.22)	-.01	(.08)
Services	-.04	(.50)	-.11	(.91)	.08	(.63)
Primary	.14	(1.02)	.12	(.65)	.33	(1.35)
Others	-	-	-	-	-	-
Age						
Age 55	-	***	-	-	-	-
56	.14	(.91)	.15	(.91)	-	-
57	.13	(.94)	.20	(1.32)	-	-
58	.14	(.98)	.10	(.67)	-	-
59	-.15	(1.01)	-.16	(.97)	-	-
60	-.15	(1.09)	-	-	-	**
61	-.18	(1.10)	-	-	-.24	(1.37)
62	-.28	(1.66)	-	-	-.19	(1.20)
63	-.52	(3.42)	-	-	-.30	(2.23)
64	-.65	(3.69)	-	-	-.59	(3.29)
Number of Observations	168		95		73	
R^2	.28		.15		.31	

Notes: 1) Variables and data selection are defined more completely in the text.

2) ***, **, or * next to an omitted variable in a set of variables indicates significance of the set of variables at the 1%, 5%, or 10% level respectively.

Chapter 5: Summary and Conclusions

The purposes of this chapter are to summarize this study, to relate our results to those of the three major U.S. cross-section studies that use microdata, to discuss the limitations of this study and to examine the prospects for future research in this area.

In Chapter 1, we examined some time-series and cross-section data to see what the trends in retirement patterns have been in Canada and the U.S. One observation we made there bears re-emphasis in light of the subsequent discussion in Chapters 2 and 4; poor health cannot explain the sharp decline in the labour force participation rates of elderly men that has occurred in the post-World-War II era.

In Chapter 2, we surveyed the literature (which is largely based on U.S. data) on the causes of early retirement. In our view, the three cross-section, econometric, microdata studies by Boskin, Quinn, and Burkhauser form the core of this literature. All three agree that higher pensions induce earlier retirement, but they disagree on whether poor health, and other variables, are also important determinants of the retirement age.

In Chapter 3, we developed a theoretical model of an individual's retirement decision. This model enabled us to distinguish the income and substitution effects of various types of pension plans. We think that the advantages of this model over other theoretical models are that: it treats retirement as a discontinuous process, and this appears to be realistic empirically; it can handle the intertemporal nature of the

retirement decision; and, it takes the asset nature of pension benefits into account.*

In Chapter 4, we applied our theoretical model to analyze the determinants of retirement in Canada. Our main positive result was that expected pension benefits figure prominently in the retirement plans of individuals; in a negative vein, we found little evidence that expected health status (either by itself or in interactive form with pension benefits) mattered in the retirement decision.

A comparison of our results with those of the major U.S. studies reveals that there is general agreement that pension benefits, actual or expected, significantly affect the age of retirement. But there is not agreement on the role of poor health, and other variables, in the retirement decision. Our results on health fall in between those of Boskin, who finds that health does not matter, and Quinn, who finds that health (and particularly the interaction between health and pensions) does matter. How much of these differences can be explained by the differences in the health variables employed and how much by other factors is certainly unclear at the moment. The potential problems in each study were discussed in some detail in Chapter 2. We remind the reader here that it is difficult to know how to interpret Quinn's results, for both pensions and health, because he has not controlled for age. The same can be said for Boskin, although to a lesser extent, because he does have a dummy for age 65 in his regressions. This point, however, does not apply to Burkhauser since he considers a homogeneous age group (just turned 62). Clearly, further research is needed.

*That the standard one-period income-leisure model does not do this has been emphasized by Burkhauser (1977).

In addition, our results indicate that it is important to control for compulsory retirement in attempting to isolate the factors which induce early retirement. None of the U.S. studies has controlled for compulsory retirement although the studies by Quinn and Burkhauser examine only individuals aged 62 and 63 and hence are unlikely to be much affected by this problem. Boskin, on the other hand, considers persons of ages 61 to 65 and follows them for five years. The exclusion of a control for compulsory retirement could affect his results.

We have cautioned the reader in Chapter 4 that our results cannot be taken as definitive. We have emphasized that the data, while they seemed to us the best available, are far from ideal. The limitations of the data have been discussed extensively in Chapter 4. These data limitations aside, however, there is another consideration that must be kept in mind in interpreting our results. We have argued that pension income can be treated as an exogenous determinant of retirement age because of recent events relating to pension incomes in Canada. In particular, the introduction of the Canada Pension Plan and the large increases in private retirement benefits to those on the verge of retiring could not have been foreseen. Hence, we have argued that a larger pension income can be treated as an exogenous wealth effect leading to earlier retirement. It is unlikely that such an argument can be applied to those nearing retirement, say, twenty years from now. For them, the pension plan parameters will have been known throughout most of their working lives. Their private savings will have been adjusted in response to the pension plan options open to them. It is these options that should be treated as exogenous (and not

just pension income) in an analysis of the retirement decisions of these individuals. Thus, while our results shed some light on the present incentives for retirement, more work will be needed to find long run effects of plans such as the Canada Pension Plan. Finally, in this view, we remind the reader that we have considered here only the retirement decision of males. The retirement behaviour of females is likely to be quite different. Future work will also be needed to understand the retirement behaviour of females.

We end this study with some observations on the possibilities for future work on the determinants of retirement age. As we have argued earlier, pre-1975 data is unlikely to be very helpful in studying retirement behaviour because of the transition phase of the Canada Pension Plan which gave rise to incentives to delay retirement. Post-1975 data that is likely to allow for an analysis of incentive effects seems restricted to the Survey of Consumer Finances. In the past, this survey has asked detailed questions on various income sources including separate questions on government and private pensions. However, Statistics Canada has aggregated these categories to the category Transfer Payments in the microdata tapes they have released, although they provide the detailed information for families. If these data were made available in the same detail for individuals, it would be possible to use this data set for a retirement study. However, past surveys have not included questions on either health or compulsory retirement. It would be very helpful if such questions were included in future surveys. In the U.S. the studies of retirement behaviour are based on longitudinal samples and data extracted from the records of the Social Security Administration. These sources and types of data seem far

superior to any sources we have in Canada. It would appear to us then, that the prospects for future work in this area in Canada will be severely limited by the available data. It may be that we will have to rely heavily in the future on U.S. studies. If this is the case, what seems to be called for is additional applied theoretical work that seeks to understand the extent to which the U.S. results can be applied in the Canadian context.

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Appendix: Variables Used in the Regression Analysis

This appendix provides details of the creation of the variables used in the regression analysis. Throughout the discussion, we will refer to the questions on the Pre-Retirement Survey by number. A copy of the questionnaire is included at the end of this appendix. Some variables were, in fact, derived from the Labour Force Survey questions and this will be noted in the presentation.

The selection of the data from the data tape is discussed in Chapter 4 of the text and will not be reported here. The variables are discussed here in the order they appear in Tables 13 to 16.

Expected Pension Income

The expected pension income variable was derived from question 37. The eight original cells were aggregated to form the five dummy variable groupings shown in the tables. As in other cases, the non-responses were grouped with the no-income category to form the omitted dummy variable. This practice has been followed for two reasons. In some cases, cells have been aggregated because of the paucity of responses in some of the cells. In others, the aggregation resulted because preliminary regression analysis indicated that the non-response cell was insignificantly different from the no-income (or low income) cells.

Income Expected from Other Sources

This set of dummy variables was created by aggregating the income groups in Questions 38, 40 and 41. These questions elicited information about investment income, income from other government payments, and income from other non-work sources. To accomplish the aggregation

required an assumption that the actual income (from a particular source) was at the mid-point of the income range (since the data was reported in income classes). Income from the various sources could then be added up and grouped into the income classes reported in Tables 13 to 16. Again, a non-response (to all these questions) was grouped with a zero income response (to each of the three questions) to form the omitted dummy variable.

1974 Income

Income in the year previous to the survey was constructed from the responses recorded to Question 19. Few responses were recorded in the lower income groups and this gave rise to the aggregation of incomes below $5000 and non-responses into a single category which formed the omitted variable in the regressions. Additional aggregation of income classes into the classes reported in the Tables gave a roughly equal distribution between the groups.

Other Variables

Spouse's income expected in the first year of retirement was based on the responses to Question 43. There were very few positive incomes recorded on this question and most were in the $1000 to $2000 income class. Accordingly a single variable was created for spouse's income greater than $1000.

The inadequate health variable was based on responses to question 50e. A dummy variable was created with its value equal to unity for those individuals recording a 4 or a 5 on that question. As discussed in the text an alternative health variable was also considered based on responses to the third part of Question 21.

The compulsory retirement variable employed in the regressions reported in Tables 13 and 15 (and used to delete observations for the other regressions) was created by a comparison of Questions 3 and 20. The variable was set equal to unity if the ages reported in these two questions were equal.

The variable indicating that the individual expects to live with others (besides his spouse) was created from the responses to Question 25. The dummy was set equal to one if the individual reported that he expected to live in the same household with someone other than his spouse.

The remaining variables with the exception of the age dummies (created from the age reported in the box marked A at the bottom of the introductory page of the questionnaire) were based on labour force survey information. These include a dummy variable for the Atlantic provinces (earlier experimentation with other regions suggested this would adequately control for regional differences); one for rural regions (really non-urban, as the variable partitions geographic areas into those above and below populations of 15,000); one for individuals not in the labour force at the time of the survey (since the sample was confined to non-retired males of working age it was thought prudent to control for possible differences in labour force attachment); and a set of dummy variables representing occupations. This last set of variables was based on the 1971 2-digit Occupational Classification. The dummy variables included were defined as follows: Professional -- groups 01 (Managerial and Administrative) and 02 (Natural Sciences, Engineering, etc); Services -- groups 03 (Clerical), 04 (Sales) and 05 (Services); Primary -- group 06 (Farming, Fishing, Forestry, etc).

The omitted category for this group of dummy variables includes all other occupations. These can be thought of as, basically, blue-collar occupations.

Form RS 1A

Special Surveys Co-ordination Division

SURVEY OF RETIREMENT

PRE-RETIRED FORM

February 14, 1975

Dear Respondent,

The purpose of this survey is to provide data which will increase the understanding of retirement as it is experienced by approximately 2 million retired Canadians. Such an understanding is essential for all levels of government in their efforts to improve the quality of retired life.

Your candid and thoughtful answers are of considerable importance to us, as they will give us an insight into the situation of many other Canadians like yourself. The confidentiality of your answers is ensured under the Statistics Act. Your replies will be used only for statistical purposes in combination with the answers of others.

When this survey is completed, there will be a short report available on request from the Department of Health and Welfare for all those who participated in the survey. The card accompanying this booklet gives more details on how to request your copies.

Thank you for your cooperation.

Yours truly,

(Mrs.) Sylvia Ostry,
Chief Statistician of Canada.

Name (surname)	(Given names)	This questionnaire will be picked up by your interviewer on

1-5 PSU ☐☐☐☐☐ 6-8 Segment ☐☐☐ 9-12 Listing ☐☐☐☐ 13-14 Line ☐☐ 15 M ☐ 0 F ☐ 1 16-17 A ☐☐

This survey is conducted by Statistics Canada on behalf of Health and Welfare Canada under the Authority of the Statistics Act, Chapter 15, Statutes of Canada 1970-71-72.

INSTRUCTIONS: Most of the questions here can be answered with a check mark in a box ☑ beside the answer which suits you best. Occasionally you will be asked to write an answer or some numbers in a box. You will probably not have to answer all the questions, but will be asked to skip some. Please follow these directions as you come to them. Feel free to add comments wherever you wish.

1. **Have you worked full-time for pay or profit since the age of 45?**

18

No ☐1 → Go to question 13.

Yes ☐2

2. **Are you presently working for pay or profit?**

19

No ☐1 → Go to question 5.

Yes ☐2

3. **In your present job, is there a compulsory retirement age?**

20

No ☐1

Yes ☐2 → What age is it? 21 - 22 ☐☐ years.

4. **In your present job, are you a member of a group that bargains collectively for your pay and working conditions? (for example: a trade union or professional association)**

23

No ☐1

Yes ☐2 → What is it called? _____

_____

5. **What is the longest time you have spent with any one employer to date (including self-employment)?**

24

Less than 5 years ☐1

5 to 9 years ☐2

10 to 14 years ☐3

15 to 19 years ☐4

20 to 24 years ☐5

25 or more years ☐6

THE NEXT FEW QUESTIONS ASK YOU ABOUT YOUR WORK LIFE. THE FIRST QUESTIONS ASK ABOUT THE JOB YOU HELD THE LONGEST. (IF YOU HELD TWO OR MORE JOBS FOR THE SAME LENGTH OF TIME, DESCRIBE THE MOST RECENT OF THOSE JOBS.)

6. **For your longest employer, was the work you did mostly...**

(a) in your own business, farm or professional practice:

25

Own business or professional practice ☐1

Own farm ☐2

OR (b) for others for wages, salary or commission:

In private business or industry ☐3

In the public sector (include governments, armed forces, crown corporations, teachers, etc.) ☐4

7. **For your longest employer, what kind of work were you doing? (Use two words or more to describe your work, for example: selling shoes, motor vehicle repairing, secretarial work, managing a factory, teaching high school.)**

_____

8. What were your most important activities or duties? (Use two words or more to describe your duties, for example: fitting shoes, auto body work, taking dictation and typing, budgeting and forecasting, teaching English.)

9. What was your job title? (Use two words or more, for example: manager of shoe department, auto body repairman, secretary-stenographer, general manager, secondary school teacher.)

For office use only 26 - 29

10. In what kind of business, industry or service was this job? (Use two words or more to describe the industry, for example: retail shoe store, auto body repair shop, medical clinic, manufacturing of chemicals, provincial government - education.)

For office use only 30 - 31

11. At what age did you leave this employer? 32 - 33 years.

Haven't left yet ☐01 → Go to question 13.

12. Did you take any other full-time jobs after leaving this employer?

No ☐1 34

Yes ☐2 → How many full-time jobs with different employers did you take? 35 - 36

THE REMAINING QUESTIONS IN THIS SECTION CONCERN RETIRING AND YOUR PREFERENCES ABOUT IT.

13. For people such as you, do you feel a compulsory retirement age is a good idea? 37

Yes, I agree strongly with compulsory retirement ☐1

Yes, I agree moderately ☐2

I am indifferent ☐3

No, I disagree moderately with compulsory retirement ☐4

No, I disagree strongly ☐5

14. What do you think is the best age for COMPULSORY retirement (whether or not you agree with the idea)? 38

55 years ☐1

60 years ☐2

65 years ☐3

70 years ☐4

Other ☐5 → What age? 39 - 40 years.

15. What do you think is the best way for people such as you to retire? 41

Work full-time until the day you retire ☐1

Work part time the last while ☐2

16. There are many possible ways to change work patterns. Which of the following would be your first choice? *(Check ONE only)*

42

- Retire early with the same pension ☐1
- Work fewer weeks per year for same pay ☐2
- Work fewer days per week for same pay ☐3
- Work fewer hours per day for same pay ☐4
- No change in work patterns ☐5

17. Where are you living now?

43

- In your own house ☐1
- In an apartment ☐2
- In the home of children or other relatives ☐3
- In a rooming house or boarding house (where the landlord is not a relative) ☐4
- Other (please specify) _____ ☐5

18. What is your marital status?

44

- Single (never married) ☐1
- Married ☐2
- Widowed ☐3
- Separated ☐4
- Divorced ☐5
- Other ☐6

19. What was your total income from all sources in 1974? Please include all the following sources:

- work and self-employment (before deductions);
- government payments such as social assistance, family allowances, unemployment insurance;
- interest, dividends, rents, other investment income;
- income from other family members;
- regular income from all other sources.

45

- Less than $1000 ☐0
- $1000 - 1999 ☐1
- $2000 - 2999 ☐2
- $3000 - 4999 ☐3
- $5000 - 7499 ☐4
- $7500 - 9999 ☐5
- $10,000 - 14,999 ☐6
- $15,000 - 19,999 ☐7
- $20,000 - 24,999 ☐8
- $25,000 and over ☐9

20. At what age do you expect to retire from full-time work?

46 -- 47

☐☐ years. → Go to question 21.

don't expect to ever retire ☐01 → Although you answered that you don't expect to retire, please continue to answer the following questions as if you would eventually retire.

21. When you retire, do you think it will be because... *(Check as many as apply)*

You have reached the compulsory retirement age? 48 ☐1

You have been laid off and can't find another appropriate job? 49 ☐1

You will be in too poor health to keep working? 50 ☐1

Your spouse has already retired? 51 ☐1

You want more time to pursue your hobbies and interests? 52 ☐1

You want to spend more time with your family? 53 ☐1

You just want to relax and take it easy? 54 ☐1

You feel it would be better for your health? 55 ☐1

You have had enough of work? 56 ☐1

You have enough money to retire? 57 ☐1

You sold your business or professional practice? 58 ☐1

Other (please specify) _____ 59 ☐1

22. At what age would you like to retire, if you had the choice? 60 - 61 ☐☐ years

Never retire ☐01

23. Why would you prefer that?

_____

_____

_____

For office use only 62 - 63 ☐☐

24. Are you now (or have you been) in a program designed to help you prepare for retirement?

No 64 ☐1 → Would you like to be? → No 65 ☐1 Yes ☐2

Yes ☐2

→ What are the contents of the program? *(Check as many as apply)*

Discussion of employment pension benefits 66 ☐1

Discussion of government retirement benefits 67 ☐1

Discussion of the health or medical aspects of retirement 68 ☐1

Discussion of various types of living arrangements 69 ☐1

Discussion of the use of leisure time 70 ☐1

Other (please specify) 71 ☐1

THE REMAINING QUESTIONS ASK YOU ABOUT SOME OF THE CONDITIONS YOU EXPECT IN RETIREMENT. YOU MAY NOT HAVE EXACT ANSWERS TO SOME OF THE QUESTIONS, BUT TRY TO PROVIDE YOUR BEST GUESS OF WHAT YOU EXPECT. THE FIRST FEW QUESTIONS ARE ABOUT LIVING ARRANGEMENTS.

25. Who else do you expect will live in the same household with you when you retire? *(Check all that apply)*

72
No one else ☐1

73
Your spouse or partner ☐1 → Will he/she be working full-time or part-time?

74
No ☐1

Yes ☐2

75
Your children (and their families) ☐1 → How many people? 76 - 77 ☐☐

78
Other relatives ☐1 → How many people? 79 - 80 ☐☐

81
Others who are not relatives ☐1 → How many people? 82 - 83 ☐☐

26. Do you expect to rent your accommodation or own your own home when you are retired?

84
Rent (including free accommodation) ☐1

Own with a mortgage ☐2

Own without a mortgage ☐3

27. Do you expect to permanently change your place of residence to another community after you retire?

85
No ☐1

Yes ☐2

→ Where do you expect to go? *(Check only ONE)*

86
To a city or town in the same province ☐1

To a rural area in the same province ☐2

To another province ☐3

To the United States ☐4

Other (please specify) _____

_____ ☐5

28. Who do you expect will provide the MAIN financial support for you in retirement? *(Check the major ones that apply)*

87
Yourself ☐1

88
Your spouse or partner ☐1

89
Your children or their spouses ☐1

90
Other relatives ☐1

91
Others who are not relatives ☐1

29. Once you have retired, how would you expect to spend your time? For example, how often would you ...

		at least once a day	3-4 times per week	once or twice per week	occasionally	not at all
have a chat with others on the phone?	92	☐1	☐2	☐3	☐4	☐5
see friends or relatives?	93	☐1	☐2	☐3	☐4	☐5
go shopping?	94	☐1	☐2	☐3	☐4	☐5
watch TV or listen to radio?	95	☐1	☐2	☐3	☐4	☐5
read papers, magazines, or books?	96	☐1	☐2	☐3	☐4	☐5
spend time on a special interest or hobby?	97	☐1	☐2	☐3	☐4	☐5
visit a community centre or drop-in centre?	98	☐1	☐2	☐3	☐4	☐5
go out for a drive?	99	☐1	☐2	☐3	☐4	☐5
go out for entertainment? (a show, sports event, museum, etc.)	100	☐1	☐2	☐3	☐4	☐5
play bingo or cards?	101	☐1	☐2	☐3	☐4	☐5
see someone for medical care?	102	☐1	☐2	☐3	☐4	☐5
attend a religious service?	103	☐1	☐2	☐3	☐4	☐5
work for pay or profit?	104	☐1	☐2	☐3	☐4	☐5
do volunteer work?	105	☐1	☐2	☐3	☐4	☐5
go for a walk, go dancing?	106	☐1	☐2	☐3	☐4	☐5
bowl, jog, swim, etc.?	107	☐1	☐2	☐3	☐4	☐5
travel overnight?	108	☐1	☐2	☐3	☐4	☐5
other (please specify) _____	109	☐1	☐2	☐3	☐4	☐5

30. Overall, how satisfied do you expect to be with retirement?

Very satisfied	110 ☐1
Moderately satisfied	☐2
Somewhat dissatisfied	☐3
Very dissatisfied	☐4
Don't know	☐5

31. What do you think will be the main reasons for feeling this way?

_____

_____

_____

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111 - 112

32. How well acquainted are you with some of the programs which the government supports? Do you know about ...

	NO, DON'T KNOW ABOUT IT	YES, KNOW ABOUT IT
Canada/Quebec Pension Plan?	113 ☐1	☐2
Guaranteed Income Supplement?	114 ☐1	☐2
Local Initiatives Project (L.I.P.)?	115 ☐1	☐2
New Horizons Project?	116 ☐1	☐2
Old Age Security Pension?	117 ☐1	☐2
Opportunities for Youth (O.F.Y.)?	118 ☐1	☐2
Unemployment Insurance?	119 ☐1	☐2

For any programs which you know about, answer Question 33. Otherwise go to Question 34.

33. Do you expect to participate in or benefit from any of these programs?

	NO	YES
Canada/Quebec Pension Plan	120 ☐1	☐2
Guaranteed Income Supplement	121 ☐1	☐2
Local Iniatives Project (L.I.P.)	122 ☐1	☐2
New Horizons Project	123 ☐1	☐2
Old Age Security Pension	124 ☐1	☐2
Opportunities for Youth (O.F.Y.)	125 ☐1	☐2
Unemployment Insurance	126 ☐1	☐2

34. What total monthly income do you think you will REQUIRE for a satisfying retirement, if you knew this amount would be adjusted according to the cost of living?

127 - 130

☐☐☐☐ ○○ per month at retirement

35. If you had the chance to retire EARLY, with an adequate pension, what would you do...

131

- Retire early on a permanent basis ☐1
- Retire early and get a part-time job ☐2
- Keep on working until regular retirement age ☐3
- Not sure ☐4

36. What minimum monthly pension would permit you to retire early, if you knew this amount would be adjusted according to the cost of living?

132 - 135

☐☐☐☐ ⓄⓄ per month at retirement.

THE FOLLOWING SIX QUESTIONS ARE ABOUT THE INCOME YOU EXPECT IN RETIREMENT. CONSIDER THE FIRST FULL YEAR YOU ARE RETIRED AS AN EXAMPLE. PLEASE GIVE YOUR OWN INCOME ONLY. CHECK ONE BOX ON EACH LINE.

		Income expected in first year of retirement							
		no income	less than $1000	$1000 -1999	$2000 -2999	$3000 -4999	$5000 -7499	$7500 -9999	$10,000 or over
37.	income expected from pensions and annuities (employment pensions, Old Age Security, Guaranteed Income Supplement, Canada/Quebec Pension Plan, Veteran's Allowance)	136 ☐1	☐2	☐3	☐4	☐5	☐6	☐7	☐8
38.	income expected from investments (interest, dividends, net rents)	137 ☐1	☐2	☐3	☐4	☐5	☐6	☐7	☐8
39.	income expected from work (self-employment, salaries, wages, commissions, tips)	138 ☐1	☐2	☐3	☐4	☐5	☐6	☐7	☐8
40.	income expected from other government payments (unemployment insurance, family allowances, social assistance)	139 ☐1	☐2	☐3	☐4	☐5	☐6	☐7	☐8
41.	total regular income expected from all other sources (including persons living separately from you and the value of free rent)	140 ☐1	☐2	☐3	☐4	☐5	☐6	☐7	☐8
42.	your own expected total income from ALL THE ABOVE sources	141 ☐1	☐2	☐3	☐4	☐5	☐6	☐7	☐8

43. What do you expect the total income of your spouse or partner to be in the first year you are retired?

142 - 143

- No spouse or partner ☐01
- No income ☐02
- Less than $1000 ☐03
- $1000 - 1999 ☐04
- $2000 - 2999 ☐05
- $3000 - 4999 ☐06
- $5000 - 7499 ☐07
- $7500 - 9999 ☐08
- $10,000 or over ☐09

44. Do you have a pension plan through employment (besides the Canada/Quebec Pension Plan)?

No	144 ☐1
Yes	☐2
Not sure	☐3

45. Do you have a pension plan or annuity that you have arranged privately? (e.g. Registered Retirement Savings Plan)

No	145 ☐1
Yes	☐2
Not sure	☐3

46. This question is about some of your pensions. Do you expect to receive ...

	NO	YES
A pension from your job?	146 ☐1	☐2
Canada/Quebec Pension?	147 ☐1	☐2
Old Age Security?	148 ☐1	☐2
A private pension (e.g. Registered Retirement Savings Plan)?	149 ☐1	☐2

For any pensions that you expect to receive, answer Question 47. Otherwise go to question 48.

47. Will that pension be adjusted according to the cost of living?

	NO	YES	NOT SURE
Your pension from your job	150 ☐1	☐2	☐3
Canada/Quebec Pension	151 ☐1	☐2	☐3
Old Age Security	152 ☐1	☐2	☐3
Your private pension	153 ☐1	☐2	☐3

48. After you retire, do you expect to work part-time?

No 154 ☐1

Yes ☐2

→ What would be the main reason? *(Check only ONE)*

To earn money	155 ☐1
To keep in touch with people	☐2
To avoid losing my skills	☐3
To keep physically healthy	☐4
To have good mental health	☐5
Other (please specify):	☐6

THE NEXT THREE QUESTIONS ASK ABOUT SOME FACTORS IN RETIREMENT. IF WE ASKED ABOUT YOUR HEALTH FOR EXAMPLE, AND YOU THOUGHT IT WAS EXTREMELY IMPORTANT, YOU WOULD CIRCLE "1". OR YOU MIGHT CIRCLE "5" IF HEALTH WAS NOT AT ALL IMPORTANT OR "3" IF HEALTH WAS MODERATELY IMPORTANT TO YOU.

	extremely important		moderately important		not at all important
e.g. your health	1	2	3	4	5

49. This question asks you to rate the importance of a number of factors in your life. Please tell us how IMPORTANT each is to you for a SATISFYING RETIREMENT.

	extremely important		moderately important		not at all important	For office use only
a) the neighbourhood in which you live	1	2	3	4	5	156
b) keeping in touch with family	1	2	3	4	5	157
c) keeping in touch with friends	1	2	3	4	5	158
d) keeping in touch with former workmates	1	2	3	4	5	159
e) developing a special interest or hobby	1	2	3	4	5	160
f) making new friends	1	2	3	4	5	161
g) other (please specify) _____	1	2	3	4	5	162

50. When you think about retirement, you may expect that some conditions will be quite adequate for you, while others may be quite inadequate. How adequate do you EXPECT each of the following to be?

	completely adequate		somewhat adequate		not at all adequate	For office use only
a) your income	1	2	3	4	5	163
b) your diet	1	2	3	4	5	164
c) your clothing	1	2	3	4	5	165
d) your housing	1	2	3	4	5	166
e) your physical health	1	2	3	4	5	167
f) your emotional health	1	2	3	4	5	168
g) your knowledge of where to get help when you need it	1	2	3	4	5	169
h) other (please specify) _____	1	2	3	4	5	170

51. There are some opportunities in retirement which you may expect to be quite good while others might be rather poor, from a personal point of view. How good do you expect each of the following to be for you?

	very good		fair		very poor	For office use only
a) opportunities to see friends	1	2	3	4	5	171
b) opportunities to see relatives	1	2	3	4	5	172
c) opportunities to see former workmates	1	2	3	4	5	173
d) opportunities to develop special interests	1	2	3	4	5	174
e) opportunities to live in the neighbourhood you choose	1	2	3	4	5	175
f) opportunities to develop new friendships	1	2	3	4	5	176
g) other opportunities (please specify) _____	1	2	3	4	5	177

52. Overall, do you expect you will be better off in retirement than other Canadians, whom you know?

178
- Better off than they will be ☐1
- About the same as they will be ☐2
- Worse off than they will be ☐3

FINALLY, A FEW QUESTIONS ABOUT PREFERENCES.

53. After you have retired, do you WANT to work part-time or not at all?

179
- Not at all ☐1
- Yes, part-time ☐2
  - What is the main reason? *(Check only ONE)*

180
- To earn money ☐1
- To keep in touch with people ☐2
- To avoid losing my skills ☐3
- To keep physically healthy ☐4
- To have good mental health ☐5
- Other (please specify) _____ ☐6

54. When you first retire, what living situation would you prefer?

181

To live in your own house ☐1

To live in an apartment ☐2

To live in the home of children or other relatives ☐3

To live in a rooming house or boarding house (where the landlord is not a relative) ☐4

To live in a senior citizens' high-rise apartment ☐5

To live in other senior citizens' housing ☐6

To live in a senior citizens' lodge or home for the aged ☐7

Other (please specify) _____ ☐8

55. Why would you prefer this?

_____

_____

_____

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56. *Thank you for answering our questionnaire! You have completed all the questions required of you. If you have any further comments to make, please use the space below.*

Comments: