

CANADA PENSION PLAN
STATUTORY ACTUARIAL REPORT NO. 3
AS AT DECEMBER 31, 1973

DEPARTMENT OF INSURANCE
OTTAWA K1A 0H2, CANADA

CANADA PENSION PLAN

ACTUARIAL REPORT AS AT DECEMBER 31, 1973

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STATUTORY ACTUARIAL REPORT NO. 3

I. INTRODUCTION

This report has been prepared as at December 31, 1973. It is the third actuarial report since the inception of the plan and was prepared primarily to comply with subsection 116(2) of the Canada Pension Plan which provides that, whenever any Bill is introduced in or presented to the House of Commons to amend the Act, a report shall be prepared indicating the extent to which such Bill would if enacted by Parliament affect any of the estimates contained in the most recent report made pursuant to subsection 116(1) before the introduction or presentation of such Bill.

The most recent report made pursuant to section 116 is the Statutory Actuarial Report No. 2, as at December 31, 1972, which was tabled in the House of Commons on November 5, 1973. That report contained estimates for the Canada Pension Plan as it read prior to the 1973 amendments, as well as estimates for the plan as it exists now, that is, as amended in 1973. The latter estimates (referred to in Report No. 2 as estimates for the "Proposed Plan") may be deemed to be the most recent estimates which pursuant to subsection 116(1) are required to serve as a basis for measuring the effect of the amendments now proposed in Bill C-19. In order to avoid the necessity of referring to the preceding report, the relevant projections for the plan as it is now constituted are repeated in this report with only minor differences largely attributable to adjustments in respect of increases in earnings and prices that have occurred prior to 1974.

The remainder of this report is divided as follows. Section II contains a summary of the amendments proposed in Bill C-19, Section III presents what we refer to as the main tables of financial estimates for

the existing and proposed plans (only seven tables, three of which are rearrangements for easier comparison), and Section IV contains certain observations and conclusions. The report is followed by five appendices containing a substantial volume of tables and explanatory material of the type which was included in the body of the preceding report.

This report differs from the preceding report in that the tables included in the body of the report are based on a single set of assumptions rather than one set of demographic and two sets of economic assumptions; auxiliary projections on different assumptions as well as tables showing benefits and contribution rates in greater detail are appended to the report.

The economic assumptions used for the main tables in respect of any year after 1975 are the same as those designated "moderate inflation" assumptions in the preceding two reports. While there has been a tendency in recent years to regard this set of assumptions as representing the more realistic long term expectation of the two sets that were used, this was not the main reason for relegating "reasonable stability" projections to the Appendices. The main reason for this decision is the fact that the elimination of the limit on the annual increase in the Pension Index, effective January 1, 1974, to a large extent removed the effect of the level of inflation on the required rates of contribution.

Prior to the 1973 amendments, assuming that the differential between increases in earnings and increases in prices remained constant, the relative cost of the plan (expressed as percentages of contributory earnings) tended to decrease more and more, the higher the annual increase in the Consumer Price Index rose above two per cent per annum. Thus it was essential, heretofore, to present at least one set of projections based on the assumption of an annual increase in the Consumer Price Index of less than two per cent per annum, not only because such a contingency

cannot be ruled out and its impact had to be measured but also because projections on such assumptions gave a good indication of costs for the plan as it had been originally contemplated and allowed more valid comparison with the estimated costs of new proposals.

A key feature of the assumptions underlying the main tables of financial estimates of the two preceding actuarial reports was that (except for a short transition period) the gap between the annual increase in average earnings and that of the Consumer Price Index, was assumed to remain constant at $2\frac{1}{2}\%$.

In the light of recent experience in Canada this assumption was conservative. For the twenty-five years ending in 1973 the compound average annual rate of increase in real earnings (as measured by the difference between increases in average earnings and the Consumer Price Index) was 2.90%; the corresponding figures for the ten years and five years ending in 1973 were 2.80% and 3.10%, respectively.

There is, of course, no guarantee that the level of annual increases in real earnings will be maintained above the assumed rate. In the United States, the experience between 1950 and 1965 apparently was very close to our assumed rate of $2\frac{1}{2}\%$. However, it appears to have been substantially and progressively lower since that time, and fears have been expressed by some observers that the long term trend in the difference between annual increases in earnings and prices may lie somewhere between 1% and $1\frac{1}{2}\%$.

Notwithstanding the fact that these fears cannot be ignored as entirely unrealistic, in view of the Canadian experience and the absence of any clear trend it seemed reasonable to continue the use of the assumption of $2\frac{1}{2}\%$ per annum increases in real earnings for purposes of the main financial estimates in this report (quite apart from the necessity of

retaining the assumptions of the preceding report for purposes of subsection 116(2) of the Act). However, as for the preceding report, we have prepared auxiliary fund projections on a lower assumption as regards increases in real earnings, which may be found in Appendix A.

Assumptions other than economic assumptions and all the procedures used are consistent with and for practical purposes identical with those used in Statutory Actuarial Report No. 2, and thus the tables in the body of the report together with those in the appendices should be sufficient to make all the comparisons contemplated in subsection 116(2) of the Act.

Projections are shown for each year from 1974 to 1985, inclusive, and for each fifth year thereafter to the year 2025, inclusive. This is more than sufficient to satisfy the requirements of subsection 116(1) for a periodic report as at December 31, 1973. The three types of projections shown in section III as well as in the appendices are

- (a) fund projections (including benefits and expenses, amounts of contributions at stipulated rates and net cash flow to the provinces),
- (b) amounts of benefits (classified by type of benefit) and expenses, and
- (c) benefits and expenses expressed as percentages of contributory earnings (pay-as-you-go contribution rates).

It will be noted that, as in the preceding report, the fund projections are developed on three different assumptions regarding levels of contribution rates.

Fund A

This fund assumes that contributions continue indefinitely at the present rate of 3.6% of contributory earnings, which results in three phases in the development of the fund.

During the initial phase contributions are greater than the amounts required for payment of benefits and expenses. This excess constitutes the cash flow to the provinces which gradually decreases but remains positive. The fund increases by this excess as well as by investment earnings; however, since investment earnings are funds flowing from the provinces which are returnable to them in the form of new loans, they do not affect the net cash flow. The first phase ends at Critical Point (1) when current benefits and expenses are equal to current contributions and the cash flow to the provinces becomes nil.

During the second phase, in addition to contributions an increasing part of the interest earnings of the fund would be required to meet the payment of benefits and expenses. While the fund would continue to grow from the accumulation of interest not required for current expenditures, the funds available to the provinces in the form of new loans would now be less than the interest payments required from them, so that the net cash flow to the provinces would be negative.

The third phase in the development of the fund begins at Critical Point (2) when all of the current interest as well as current contributions would be required to meet current expenditures. During this phase an increasing proportion of the loans would have to be repaid by the provinces in order to meet current expenditures and the fund would decrease until at Critical Point (3) it would be exhausted.

After Critical Point (3) the projections indicate negative fund accumulations and Fund A would then obviously be inoperative unless new sources of funds were introduced.

Fund B

This fund is identical with Fund A during the initial phase. However, at Critical Point (1) when the cash flow to the provinces becomes zero, it is assumed that the contribution rate will begin to be increased to a level sufficient to meet current expenditures.

Under this assumption, the reversal of the cash flow in Fund A would be avoided. Interest payments by the provinces would never be used for purposes of expenditures, and thus would be continually returnable to the provinces in the form of new loans and would result in an ever increasing fund.

Fund C

This fund is identical with Fund A during the first two phases. However, at Critical Point (2) when contributions plus interest earnings of the fund are equal to current expenditures, it is assumed that the contribution rate will begin to be increased to levels such that contributions plus interest earnings will continue to be equal to expenditures on a current basis.

Under this assumption, the loans made to the provinces up to Critical Point (2) would be continued in perpetuity. However, in contrast to Fund B, interest payments by the provinces would be used for purposes of paying benefits and expenses.

The fund would evidently remain constant at the maximum value for Fund A.

The three different types of fund projections are given in order to demonstrate the progress of the fund and contribution rates under three relatively simple assumptions regarding levels of contributions. Clearly, each one has significantly different economic implications and a few comments seem in order at this point.

As noted, the assumption underlying Fund A is unacceptable, if benefits are to be supported by contributions. In theory, "Fund A" might be made viable by raising contribution rates to the pay-as-you-go level once the fund becomes exhausted, but such a discontinuity hardly commends itself, and in any event the rapid depletion of the fund would seem difficult to rationalize.

Fund B might appear attractive from the point of view of cash flow to the provinces. However, it might not be easy to explain the significance of an ever increasing fund which had no effect on the rates of contributions.

Of the three alternatives presented, Fund C may appear the most acceptable, since it involves a gradual movement toward pay-as-you-go contribution rates while maintaining a reasonable balance in the fund.

Needless to say, some other alternative may commend itself. Moreover, if, for example, it were decided to adopt the policy implicit in Fund C, a schedule involving less frequent changes in contribution rates would likely be preferable and could be designed to approximate a theoretically appropriate scale which, in any event, would be subject to adjustments indicated by experience and changing expectations.

II. SUMMARY OF 1974 AMENDMENTS PROPOSED IN BILL C-19

1. The retirement test and the earnings test are to be eliminated. (The retirement test is the requirement that persons between ages 65 and 70 be retired from regular employment in order to be eligible to receive a retirement pension. The earnings test and other features of the existing plan are described in Appendix D.)
2. Differences in conditions of eligibility for benefits based on the sex of the contributor are to be removed. That is to say, widowers, orphans and children of disabled female contributors are to be eligible for benefits based on the same formulae as used for widows, orphans and children of disabled male contributors.
3. The amount of the Year's Maximum Pensionable Earnings for the year 1976 and subsequent years is to be equal to 112.5% of the Y.M.P.E. for the preceding year but not more than the quantity $52(I_{z-1})(I_{z-3} + I_{z-2} + I_{z-1}) \div (I_{z-4\frac{1}{2}} + I_{z-3\frac{1}{2}} + I_{z-2\frac{1}{2}})$ where I_{z-1} is the average of the Industrial Composite (Statistics Canada; average weekly wages and salaries) for the twelve months ending June 30 in the preceding year. Once the Y.M.P.E. is linked to the Industrial Composite in this manner, the latter formula is to be continued and the former increase of 12.5% per annum is to be abandoned. The rounding (if necessary) to the next lower multiple of \$100 is to be retained, but any reduction in the Y.M.P.E. because of the operation of the formula is to be ruled out.
4. The Year's Basic Exemption is to be changed from 12% to 10% of the Y.M.P.E. for 1975 and subsequent years.
5. A special provision applying to persons with self-employed earnings is to be eliminated. Persons whose salaries and wages are less than the Year's Basic Exemption and whose total earnings (salaries, wages and self-employed earnings) are less than approximately one and one-third times the Y.B.E. are not required to contribute under the existing plan but are to be required to contribute under the proposed plan.

III. MAIN TABLES OF FINANCIAL ESTIMATES

This section contains the following tables:

	<u>Table</u>	<u>Page</u>
(a) Fund projections		
Existing plan	1	10
Plan proposed in Bill C-19	2	11
Comparison of Existing and Proposed Plans		
Fund A (existing contribution rates)*	3A	12
Fund B (increasing forever)*	3B	13
Fund C (levelling at maximum of Fund A)*	3C	14
(b) Benefits and expenses of administration (split by major category)	4	15
(c) Benefits and expenses as percentages of contributory earnings (split as in b)	5	16

The principal assumptions underlying these projections are described in Appendix E (page 55).

A number of auxiliary fund projections based on different assumptions are given in Appendix A (page 22).

Additional tables of "benefits and expenses of administration" showing more detailed breakdowns than Table 4 and similar tables on "reasonable stability" assumptions are given in Appendix B (page 28).

Additional tables of "benefits and expenses expressed as percentages of contributory earnings" showing more detailed breakdowns than Table 5 and a table similar to Table 5 on "reasonable stability" assumptions are given in Appendix C (page 33).

* See pages 5-7 for specifications applicable to each fund.

Table 1

Existing Plan

Fund Projections

(Fund in billions of dollars, other dollar figures in millions, contribution rate as per cent of contributory earnings)

Calendar Year	Benefits and Expenses \$ (1)	Fund A			Fund B			Fund C				
		3.6% Contribution Rate			Cash Flow to Provinces Decreases until Zero			Cash Flow to Provinces Decreases until Negative and Equal to Interest on Fund				
		Contributions \$ (2)	Cash Flow to Provinces \$ (3)	Fund \$ (4)	Contribution Rate % (5)	Contributions \$ (6)	Cash Flow to Provinces \$ (7)	Fund \$ (8)	Contribution Rate % (9)	Contributions \$ (10)	Cash Flow to Provinces \$ (11)	Fund \$ (12)
1973												
1974	453	653	6.6	3.60	1,106	653	6.6	3.60	1,106	653	6.6	3.60
1975	575	666	9.0	3.60	1,241	666	9.0	3.60	1,241	666	9.0	3.60
1976	728	605	10.2	3.60	1,333	605	10.2	3.60	1,333	605	10.2	3.60
1977	900	549	11.5	3.60	1,448	549	11.5	3.60	1,448	549	11.5	3.60
1978	1,089	496	12.8	3.60	1,585	496	12.8	3.60	1,585	496	12.8	3.60
1979	1,295	428	14.1	3.60	1,723	428	14.1	3.60	1,723	428	14.1	3.60
1980	1,516	342	15.5	3.60	1,858	342	15.5	3.60	1,858	342	15.5	3.60
1981	1,737	286	16.8	3.60	2,024	286	16.8	3.60	2,024	286	16.8	3.60
1982	1,975	227	18.2	3.60	2,201	227	18.2	3.60	2,201	227	18.2	3.60
1983	2,230	160	19.6	3.60	2,389	160	19.6	3.60	2,389	160	19.6	3.60
1984	2,505	82	21.0	3.60	2,587	82	21.0	3.60	2,587	82	21.0	3.60
1985	2,801	-8	22.4	3.61	2,801	0	22.4	3.60	2,793	-8	22.4	3.60
1990	4,681	-775	28.7	4.31	4,681	0	31.0	3.60	3,907	-775	28.7	3.60
1995	7,256	-1,865	31.5	4.85	7,256	0	42.6	3.60	5,391	-1,865	31.5	3.60
2000	10,663	-3,146	28.3	5.11	10,663	0	58.4	4.13	8,614	-2,049	31.5	4.13
2005	15,179	-4,602	16.1	5.17	15,179	0	80.1	4.47	13,130	-2,049	31.5	4.47
2010	21,656	-6,949	-11.5	5.30	21,656	0	109.8	4.80	19,607	-2,049	31.5	4.80
2015	31,900	-11,704	-69.9	5.69	31,900	0	150.5	5.32	29,851	-2,049	31.5	5.32
2020	47,646	-20,280	-189.2	6.27	47,646	0	206.3	6.00	45,597	-2,049	31.5	6.00
2025	70,677	-33,797	-418.0	6.90	70,677	0	282.8	6.70	68,628	-2,049	31.5	6.70

Assumptions on page 55.

Table 2

Proposed Plan

Fund Projections

(Fund in billions of dollars, other dollar figures in millions, contribution rate as per cent of contributory earnings)

Calendar Year	Benefits and Expenses \$ (1)	Fund A			Fund B			Fund C				
		3.6% Contribution Rate			Cash Flow to Provinces Decreases until Zero			Cash Flow to Provinces Decreases until Negative and Equal to Interest on Fund				
		Contributions \$ (2)	Cash Flow to Provinces \$ (3)	Fund \$ (4)	Contribution Rate % (5)	Contributions \$ (6)	Cash Flow to Provinces \$ (7)	Fund \$ (8)	Contribution Rate % (9)	Contributions \$ (10)	Cash Flow to Provinces \$ (11)	Fund \$ (12)
1973												
1974	466	639	6.6	3.60	1,105	639	6.6	3.60	1,105	639	6.6	6.6
1975	615	640	8.9	3.60	1,255	640	8.9	3.60	1,255	640	8.9	8.9
1976	814	572	10.1	3.60	1,385	572	10.1	3.60	1,385	572	10.1	10.1
1977	1,037	499	11.4	3.60	1,536	499	11.4	3.60	1,536	499	11.4	11.4
1978	1,285	411	12.6	3.60	1,696	411	12.6	3.60	1,696	411	12.6	12.6
1979	1,555	323	13.8	3.60	1,878	323	13.8	3.60	1,878	323	13.8	13.8
1980	1,844	196	15.0	3.60	2,039	196	15.0	3.60	2,039	196	15.0	15.0
1981	2,127	89	16.1	3.60	2,216	89	16.1	3.60	2,216	89	16.1	16.1
1982	2,430	-30	17.2	3.64	2,430	0	17.2	3.60	2,400	-30	17.2	17.2
1983	2,753	-161	18.2	3.82	2,753	0	18.3	3.60	2,592	-161	18.2	18.2
1984	3,101	-308	19.1	4.00	3,101	0	19.6	3.60	2,793	-308	19.1	19.1
1985	3,476	-473	19.9	4.17	3,476	0	20.9	3.60	3,003	-473	19.9	19.9
1990	5,845	-1,637	21.3	5.00	5,845	0	28.9	3.80	4,447	-1,398	21.5	21.5
1995	9,028	-3,220	14.9	5.60	9,028	0	39.8	4.73	7,630	-1,398	21.5	21.5
2000	13,178	-5,063	-4.1	5.85	13,178	0	54.5	5.23	11,780	-1,398	21.5	21.5
2005	18,679	-7,254	-41.7	5.89	18,679	0	74.7	5.45	17,280	-1,398	21.5	21.5
2010	26,678	-10,780	-109.5	6.04	26,678	0	102.4	5.72	25,280	-1,398	21.5	21.5
2015	39,631	-17,912	-233.8	6.57	39,631	0	140.4	6.34	38,233	-1,398	21.5	21.5
2020	58,863	-29,542	-459.3	7.23	58,863	0	192.5	7.06	57,465	-1,398	21.5	21.5
2025	86,732	-47,272	-854.9	7.91	86,732	0	263.9	7.79	85,334	-1,398	21.5	21.5

Assumptions on page 55.

Table 3A

Fund A Projections
3.6% contribution rate
 (Fund in billions of dollars, other dollar figures in millions, contribution rate as
 per cent of contributory earnings)

Calendar Year	Existing Plan				Proposed Plan			
	Benefits and Expenses (1)	Contributions (2)	Cash Flow to Provinces (3)	Fund (4)	Benefits and Expenses (5)	Contributions (6)	Cash Flow to Provinces (7)	Fund (8)
1974	453	1,106	653	7.7	466	1,105	639	7.7
1975	575	1,241	666	9.0	615	1,255	640	8.9
1976	728	1,333	605	10.2	814	1,385	572	10.1
1977	900	1,448	549	11.5	1,037	1,536	499	11.4
1978	1,089	1,585	496	12.8	1,285	1,696	411	12.6
1979	1,295	1,723	428	14.1	1,555	1,878	323	13.8
1980	1,516	1,858	342	15.5	1,844	2,039	196	15.0
1981	1,737	2,024	286	16.8	2,127	2,216	89	16.1
1982	1,975	2,201	227	18.2	2,430	2,400	-30	17.2
1983	2,230	2,389	160	19.6	2,753	2,592	-161	18.2
1984	2,505	2,587	82	21.0	3,101	2,793	-308	19.1
1985	2,801	2,793	-8	22.4	3,476	3,003	-473	19.9
1990	4,681	3,907	-775	28.7	5,845	4,208	-1,637	21.3
1995	7,256	5,391	-1,865	31.5	9,028	5,808	-3,220	14.9
2000	10,663	7,516	-3,146	28.3	13,178	8,115	-5,063	-4.1
2005	15,179	10,578	-4,602	16.1	18,679	11,425	-7,254	-41.7
2010	21,656	14,706	-6,949	-11.5	26,678	15,899	-10,780	-109.5
2015	31,900	20,196	-11,704	-69.9	39,631	21,719	-17,912	-233.8
2020	47,646	27,365	-20,280	-189.2	58,863	29,321	-29,542	-459.3
2025	70,677	36,880	-33,797	-418.0	86,732	39,460	-47,272	-854.9

Assumptions on page 55

Table 3B

Fund B Projections

Cash Flow to Provinces Decreases to Zero
(Fund in billions of dollars, other dollar figures in millions, contribution rate as per cent of contributory earnings)

Calendar Year	Existing Plan					Proposed Plan				
	Benefits and Expenses \$ (1)	Contribution Rate % (2)	Contributions \$ (3)	Cash Flow to Provinces \$ (4)	Fund \$ (5)	Benefits and Expenses \$ (6)	Contribution Rate % (7)	Contributions \$ (8)	Cash Flow to Provinces \$ (9)	Fund \$ (10)
1974	453	3.60	1,106	653	7.7	466	3.60	1,105	639	7.7
1975	575	3.60	1,241	666	9.0	615	3.60	1,255	640	8.9
1976	728	3.60	1,333	605	10.2	814	3.60	1,385	572	10.1
1977	900	3.60	1,448	549	11.5	1,037	3.60	1,535	499	11.4
1978	1,089	3.60	1,585	496	12.8	1,285	3.60	1,696	411	12.6
1979	1,295	3.60	1,723	428	14.1	1,555	3.60	1,878	323	13.8
1980	1,516	3.60	1,858	342	15.5	1,844	3.60	2,039	196	15.0
1981	1,737	3.60	2,024	286	16.8	2,127	3.60	2,216	89	16.1
1982	1,975	3.60	2,201	227	18.2	2,430	3.64	2,430	0	17.2
1983	2,230	3.60	2,389	160	19.6	2,753	3.82	2,753	0	18.3
1984	2,505	3.60	2,587	82	21.0	3,101	4.00	3,101	0	19.6
1985	2,801	3.61	2,801	0	22.4	3,476	4.17	3,476	0	20.9
1990	4,681	4.31	4,681	0	31.0	5,845	5.00	5,845	0	28.9
1995	7,256	4.85	7,256	0	42.6	9,028	5.60	9,028	0	39.8
2000	10,663	5.11	10,663	0	58.4	13,178	5.85	13,178	0	54.5
2005	15,179	5.17	15,179	0	80.1	18,679	5.89	18,679	0	74.7
2010	21,656	5.30	21,656	0	109.8	26,678	6.04	26,678	0	102.4
2015	31,900	5.69	31,900	0	150.5	39,631	6.57	39,631	0	140.4
2020	47,646	6.27	47,646	0	206.3	58,863	7.23	58,863	0	192.5
2025	70,677	6.90	70,677	0	282.8	86,732	7.91	86,732	0	263.9

Assumptions on page 55

Table 3C

Fund C Projections
Cash Flow to Provinces Decreases until Negative and Equal to Interest on Fund
 (Fund in billions of dollars, other dollar figures in millions, contribution rate as per cent of contributory earnings)

Calendar Year	Existing Plan					Proposed Plan				
	Benefits and Expenses \$ (1)	Contribution Rate % (2)	Contributions \$ (3)	Cash Flow to Provinces \$ (4)	Fund \$ (5)	Benefits and Expenses \$ (6)	Contribution Rate % (7)	Contributions \$ (8)	Cash Flow to Provinces \$ (9)	Fund \$ (10)
1974	453	3.60	1,106	653	7.7	466	3.60	1,105	639	7.7
1975	575	3.60	1,241	666	9.0	615	3.60	1,255	640	8.9
1976	728	3.60	1,333	605	10.2	814	3.60	1,385	572	10.1
1977	900	3.60	1,448	549	11.5	1,037	3.60	1,536	499	11.4
1978	1,089	3.60	1,585	496	12.8	1,285	3.60	1,696	411	12.6
1979	1,295	3.60	1,723	428	14.1	1,555	3.60	1,878	323	13.8
1980	1,516	3.60	1,858	342	15.5	1,844	3.60	2,039	196	15.0
1981	1,737	3.60	2,024	286	16.8	2,127	3.60	2,216	89	16.1
1982	1,975	3.60	2,201	227	18.2	2,430	3.60	2,400	-30	17.2
1983	2,230	3.60	2,389	160	19.6	2,753	3.60	2,592	-161	18.2
1984	2,505	3.60	2,587	82	21.0	3,101	3.60	2,793	-308	19.1
1985	2,801	3.60	2,793	-8	22.4	3,476	3.60	3,003	-473	19.9
1990	4,681	3.60	3,907	-775	28.7	5,845	3.80	4,447	-1,398	21.5
1995	7,256	3.60	5,391	-1,865	31.5	9,028	4.73	7,630	-1,398	21.5
2000	10,663	4.13	8,614	-2,049	31.5	13,178	5.23	11,780	-1,398	21.5
2005	15,179	4.47	13,130	-2,049	31.5	18,679	5.45	17,280	-1,398	21.5
2010	21,656	4.80	19,607	-2,049	31.5	26,678	5.72	25,280	-1,398	21.5
2015	31,900	5.32	29,851	-2,049	31.5	39,631	6.34	38,233	-1,398	21.5
2020	47,646	6.00	45,597	-2,049	31.5	58,863	7.06	57,465	-1,398	21.5
2025	70,677	6.70	68,628	-2,049	31.5	86,732	7.79	85,334	-1,398	21.5

Assumptions on page 55

Table 4
Benefits and Expenses of Administration
(in millions of dollars)

Calendar Year	Existing Plan				Proposed Plan			
	Retirement Pensions (1)	Disability Pensions* (2)	Survivors' and Death Benefits (3)	Total** (4)	Retirement Pensions (5)	Disability Pensions* (6)	Survivors' and Death Benefits (7)	Total** (8)
1974	162.1	90.6	169.4	452.8	165.0	92.4	178.1	466.2
1975	223.1	109.7	208.0	575.3	236.1	113.8	230.2	615.0
1976	315.1	130.5	245.5	728.2	367.0	135.7	272.5	813.7
1977	422.1	152.7	284.8	809.8	518.1	159.2	317.1	1,037.1
1978	542.9	176.1	326.2	1,089.2	688.8	184.3	364.7	1,284.9
1979	676.1	200.5	370.4	1,295.0	876.2	211.0	415.6	1,555.0
1980	820.5	225.7	417.8	1,515.6	1,077.5	239.1	470.3	1,843.5
1981	964.3	249.2	467.4	1,737.2	1,270.5	267.2	527.8	2,127.1
1982	1,119.4	273.2	520.9	1,974.5	1,476.4	296.6	589.8	2,429.5
1983	1,286.9	298.0	578.5	2,229.7	1,697.3	327.0	657.3	2,753.5
1984	1,468.3	323.8	640.7	2,504.5	1,935.1	358.4	730.3	3,101.4
1985	1,664.8	350.6	708.0	2,801.0	2,191.8	390.9	810.0	3,476.1
1990	2,920.6	511.1	1,141.3	4,681.5	3,827.1	571.7	1,329.2	5,845.0
1995	4,659.0	715.4	1,732.0	7,256.1	6,033.3	798.7	2,034.2	9,027.7
2000	6,861.4	1,023.8	2,569.0	10,662.9	8,747.7	1,140.2	3,064.3	13,177.7
2005	9,686.4	1,494.0	3,705.2	15,179.4	12,275.2	1,656.7	4,429.4	18,678.5
2010	13,773.5	2,189.4	5,284.2	21,655.6	17,507.9	2,413.2	6,315.9	26,678.5
2015	20,783.2	3,054.9	7,501.2	31,900.0	26,728.0	3,352.6	8,947.1	39,630.7
2020	32,105.3	4,127.3	10,652.9	47,645.6	40,864.2	4,508.2	12,676.6	58,863.3
2025	49,198.2	5,305.2	15,149.6	70,677.2	61,864.2	5,792.1	17,980.1	86,732.3

* Includes pensions for children of disabled contributors

** Includes expenses of administration

Assumptions on page 55

Table 5
Benefits and Expenses of Administration
 expressed as
Percentages of Contributory Earnings

Calendar Year	Existing Plan				Proposed Plan			
	Retirement Pensions (1)	Disability Pensions* (2)	Survivors' and Death Benefits (3)	Total** (4)	Retirement Pensions (5)	Disability Pensions* (6)	Survivors' and Death Benefits (7)	Total** (8)
1974	.53	.29	.56	1.48	.54	.30	.58	1.52
1975	.65	.32	.61	1.67	.68	.34	.65	1.76
1976	.85	.35	.66	1.97	.95	.36	.71	2.11
1977	1.05	.38	.71	2.24	1.21	.37	.75	2.43
1978	1.23	.40	.74	2.47	1.46	.39	.78	2.73
1979	1.41	.42	.79	2.71	1.68	.41	.81	2.98
1980	1.59	.44	.81	2.94	1.90	.43	.83	3.25
1981	1.72	.45	.82	3.09	2.06	.44	.85	3.46
1982	1.83	.44	.86	3.23	2.21	.44	.89	3.64
1983	1.94	.45	.87	3.36	2.36	.46	.91	3.82
1984	2.04	.44	.89	3.49	2.49	.46	.94	4.00
1985	2.15	.45	.91	3.61	2.63	.47	.98	4.17
1990	2.69	.48	1.06	4.31	3.27	.49	1.14	5.00
1995	3.11	.48	1.15	4.85	3.74	.49	1.26	5.60
2000	3.29	.48	1.23	5.11	3.88	.51	1.35	5.85
2005	3.30	.51	1.26	5.17	3.87	.52	1.40	5.89
2010	3.37	.54	1.31	5.30	3.96	.55	1.44	6.04
2015	3.70	.54	1.34	5.69	4.43	.56	1.48	6.57
2020	4.22	.54	1.41	6.27	5.02	.55	1.55	7.23
2025	4.80	.52	1.47	6.90	5.64	.52	1.64	7.91

* Includes pensions for children of disabled contributors
 ** Includes expenses of administration

IV. OBSERVATIONS AND CONCLUSIONS

1. As indicated in the introduction, the main tables of financial estimates contained in this report are based on one set of assumptions which are described in Appendix E.
2. The economic assumptions underlying the tables in the preceding section continue the hypothesis implicit in the two preceding reports of constant differentials after 1975 of (a) $2\frac{1}{2}\%$ between the annual rate of increase in average earnings and the annual rate of increase in the Consumer Price Index and (b) $3\frac{1}{2}\%$ between the rate of interest on new investments and the annual rate of increase in the Consumer Price Index. If actual experience in the long term reveals greater differentials, the operation of the Plan will generally be somewhat more favourable than anticipated; if actual differentials turn out to be smaller, the reverse will be true. The first of these differentials was discussed at some length in the introduction. A comparison of fund projections for the Proposed Plan with certain of the auxiliary tables of fund projections in Appendix A will indicate the possible effect of different values for these assumed differentials. For example, if the differential between increases in earnings and prices should be $1\frac{1}{2}\%$ rather than $2\frac{1}{2}\%$, long term costs for the proposed plan may be higher than indicated in the projection by about $\frac{3}{4}\%$ of contributory earnings (see Tables 2 and 7 or columns (2) and (3) of Table 6). The effect of interest earnings on contribution rates is not likely to be significant; however, it may have a significant effect on the cash flow (see Tables 2 and 8).
3. Although, as indicated in Appendix E, the demographic assumptions were selected to produce reasonably realistic populations of contributors and beneficiaries, substantial variation of experience from the assumed bases could occur. For example, a major breakthrough in medical science could result in an unexpectedly high increase in the amounts of retirement

pensions payable, although this should be partially offset by a reduction in widows' and orphans' pensions. On the other hand, a return to higher fertility rates or a substantial increase in the level of net immigration would tend to result in relatively lower costs and higher fund accumulations than indicated by the projections toward the last decade of this century and beyond.

4. Long-term projections in terms of dollar amounts, obviously, depend very heavily on the underlying economic assumptions. The higher the assumed rates of increases in average earnings, etc., and the longer the period, the more difficult it becomes to interpret the results in relation to current values. On the other hand, costs expressed as percentages of contributory earnings are much easier to assimilate and use as a meaningful guide to expected changes in levels of cost.

5. A temporary levelling out of costs expressed as percentages of contributory earnings may be noted about the beginning of the twenty-first century, as a result of low fertility rates in the depression of the 1930s. Thereafter, the costs are seen to increase again; however, they are expected to reach a maximum about the year 2030 and then return again to the level attained in 2025.

6. In the long run, contribution rates for the proposed plan may be seen to be higher by about 1% of contributory earnings than those for the existing plan. An increase in cost of about .8% of contributory earnings is attributable to the proposed elimination of the earnings and retirement tests; however, the increase may be slightly over-estimated because of a probable small understatement of retirement benefits between ages 65 and 70 for the existing plan. If the Year's Basic Exemption were not revised from 12% to 10% of the Year's Maximum Pensionable Earnings, long term contribution rates for the proposed plan would be higher by about $\frac{1}{4}$ % of contributory earnings; on the other hand, they would be lower by about half that amount, if the equalization of survivor benefits by sex were not adopted.

7. Columns (1) and (2) in Table 6, which follows, show some of the highlights of the main tables in section III as well as some ratios showing the relationship of the accumulated funds at various points to annual expenditures (benefits and expenses of administration). Examination of these ratios appears more useful than the examination of dollar amounts in any attempt to evaluate the significance of fund accumulations from the point of view of the Canada Pension Plan.

8. The figures in column (3) of Table 6 reflect the auxiliary projections in Table 7. A comparison with column (2) indicates the effects of the relatively less favourable economic assumption of a $1\frac{1}{2}\%$ instead of a $2\frac{1}{2}\%$ gap between increases in earnings and prices.

9. In considering the effect of proposals for amendments, some observers do not find it entirely satisfactory to compare series of increasing contribution rates, because the incidence of increases in costs may vary from year to year. As additional measures of comparison we have, therefore, calculated two types of level contribution rates, which are shown under item (7) in Table 6. Both rates are such as to produce a zero fund at the end of the year 2025; however, rate (a) makes use of the existing fund while rate (b) ignores it.

Table 6

Comparative Summary of Projections

	<u>Main Estimates</u>		<u>Auxiliary Estimate*</u>	
	<u>Existing Plan</u>	<u>Proposed Plan</u>	<u>Proposed Plan</u>	
	<u>(1)</u>	<u>(2)</u>	<u>(3)</u>	
(1) Year provincial cash flow becomes zero (Fund B) or negative (Funds A and C)	1985	1982	1982	
(2) Year Fund A reaches maximum and Fund C is stabilized	1995	1989	1987	
(3) Year Fund A is exhausted	2009	2000	1997	
	(\$ billions)			
(4) Projected fund in year (2)				
Fund A and C	31.5	21.5	19.7	
Fund B	42.6	27.1	23.5	
	(% of Contributory Earnings)			
	<u>Year</u>			
(5) Projected Fund B contribution rate	1985	3.61	4.17	4.38
	1995	4.85	5.60	6.04
	2005	5.17	5.89	6.46
	2015	5.69	6.57	7.21
	2025	6.90	7.91	8.68
(6) Projected Fund C contribution rate	1985	3.60	3.60	3.60
	1995	3.60	4.73	5.25
	2005	4.47	5.45	6.06
	2015	5.32	6.34	7.00
	2025	6.70	7.79	8.56
(7) Level contribution rate to 2025				
(a) using 1973 fund		4.40	5.13	5.58
(b) ignoring 1973 fund		4.75	5.45	5.91
	(ratios)			
(8) Ratio of Fund B to annual expenditures	1985	8.0	6.0	5.6
	1995	5.9	4.4	4.0
	2005	5.3	4.0	3.6
	2015	4.7	3.5	3.2
	2025	4.0	3.0	2.7
(9) Ratio of Fund C to annual expenditures	1985	8.0	5.7	5.2
	1995	4.3	2.4	2.0
	2005	2.1	1.2	1.0
	2015	1.0	0.54	0.45
	2025	0.45	0.25	0.21

Note: See pages 5-7 for description of funds and comments

* On assumption that annual increases in Consumer Price Index are 1% higher than for Main Estimates, and that gap between earnings and price increases is narrowed from 2½% to 1½% (based on Table 7).

10. The gradually increasing rates exhibited in the projections of costs expressed as percentages of contributory earnings suggest that the most orderly way of guiding the Canada Pension Plan Investment Fund toward an agreed level would be to raise contribution rates gradually in a series of steps. However, for the proposed plan with current contribution rates, the fund appears unlikely to begin its decline until some years after 1985. Accordingly, it may be somewhat premature to enact a schedule of specific contribution rates which might be adjusted several times in the light of actual experience before coming into effect.

Respectfully submitted,



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April 10, 1974.

Appendix A

Auxiliary Fund Projections

This appendix contains five tables based on economic assumptions that differ from those underlying the main estimates.

Tables 7 to 10 relate to the proposed plan and may be compared with Table 2 in order to examine the following:

Table

- | | |
|----|--|
| 7 | Reduction in gap between annual increases in earnings and prices from $2\frac{1}{2}\%$ to $1\frac{1}{2}\%$ |
| 8 | Increase in yield on new investments from $6\frac{1}{2}\%$ to $7\frac{1}{2}\%$ |
| 9 | Economic assumptions 1% above those underlying Table 2 |
| 10 | Economic assumptions 2% below those underlying Table 2 ("reasonable stability") |

Table 11 relates to the existing plan and reflects what in the preceding report were referred to as "reasonable stability" assumptions; it may be compared with Table 1 to examine the effect of different levels of inflation or with Table 10 to examine the effect of the proposed amendments under reasonably stable conditions.

Table 7

Proposed Plan

Assumptions as for Table 2, except 4% annual increase in prices*

Auxiliary Fund Projections
(Fund in billions of dollars, other dollar figures in millions, contribution rate as per cent of contributory earnings)

Calendar Year	Fund A				Fund B				Fund C						
	3.6% Contribution Rate				Cash Flow to Provinces Decreases until Zero				Cash Flow to Provinces Decreases until Negative and Equal to Interest on Fund						
	Contributions (2)	Cash Flow to Provinces (3)	Fund (4)	Contribution Rate (5)	Contributions (6)	Cash Flow to Provinces (7)	Fund (8)	Contribution Rate (9)	Contributions (10)	Cash Flow to Provinces (11)	Fund (12)	Contribution Rate (9)	Contributions (10)	Cash Flow to Provinces (11)	Fund (12)
	Benefits and Expenses (1)														
1973	\$ 466	\$ 639	\$ 6.6	3.60	\$ 1,105	\$ 639	\$ 6.6	3.60	\$ 1,105	\$ 639	\$ 6.6	3.60	\$ 1,105	\$ 639	\$ 6.6
1974	615	640	7.7	3.60	1,255	640	7.7	3.60	1,255	640	7.7	3.60	1,255	640	7.7
1975	819	566	10.1	3.60	1,385	566	10.1	3.60	1,385	566	10.1	3.60	1,385	566	10.1
1976	1,051	485	11.4	3.60	1,536	485	11.4	3.60	1,536	485	11.4	3.60	1,536	485	11.4
1977	1,309	387	12.5	3.60	1,696	387	12.5	3.60	1,696	387	12.5	3.60	1,696	387	12.5
1978	1,592	286	13.7	3.60	1,878	286	13.7	3.60	1,878	286	13.7	3.60	1,878	286	13.7
1979	1,897	143	14.8	3.60	2,039	143	14.8	3.60	2,039	143	14.8	3.60	2,039	143	14.8
1980	2,198	17	15.9	3.60	2,216	17	15.9	3.60	2,216	17	15.9	3.60	2,216	17	15.9
1981	2,522	-122	16.8	3.78	2,522	0	16.9	3.60	2,400	-122	16.8	3.60	2,400	-122	16.8
1982	2,870	-277	17.7	3.99	2,870	0	18.1	3.60	2,592	-277	17.7	3.60	2,592	-277	17.7
1983	3,245	-452	18.5	4.18	3,245	0	19.3	3.60	2,793	-452	18.5	3.60	2,793	-452	18.5
1984	3,651	-647	19.1	4.38	3,651	0	20.6	3.60	3,003	-647	19.1	3.60	3,003	-647	19.1
1985	6,235	-2,026	18.5	5.33	6,235	0	28.5	4.24	4,956	-1,279	19.7	5.25	4,956	-1,279	19.7
1986	9,746	-3,938	7.8	6.04	9,746	0	39.2	6.04	8,467	-1,279	19.7	5.25	8,467	-1,279	19.7
2000	14,364	-6,249	-19.5	6.37	14,364	0	53.7	6.37	13,085	-1,279	19.7	5.80	13,085	-1,279	19.7
2005	20,498	-9,073	-71.7	6.46	20,498	0	73.7	6.46	19,219	-1,279	19.7	6.06	19,219	-1,279	19.7
2010	29,355	-13,456	-163.8	6.65	29,355	0	101.0	6.65	28,076	-1,279	19.7	6.36	28,076	-1,279	19.7
2015	43,519	-21,800	-327.3	7.21	43,519	0	138.5	7.21	42,240	-1,279	19.7	7.00	42,240	-1,279	19.7
2020	64,565	-35,243	-615.6	7.93	64,565	0	189.8	7.93	63,286	-1,279	19.7	7.77	63,286	-1,279	19.7
2025	95,129	-55,669	-1,110.4	8.68	95,129	0	260.3	8.68	93,850	-1,279	19.7	8.56	93,850	-1,279	19.7

* Annual increase in earnings: 5½%, Interest on new investments: 6½%

Table 8

Proposed Plan Assumptions as for Table 2, except 7.5% interest on new investments*

Auxiliary Fund Projections (Fund in billions of dollars, other dollar figures in millions, contribution rate as per cent of contributory earnings)

Calendar Year	Fund A			Fund B			Fund C			
	3.6% Contribution Rate			Cash Flow to Provinces Decreases until Zero			Cash Flow to Provinces Decreases until Negative and Equal to Interest on Fund			
	Contributions (2)	Cash Flow to Provinces (3)	Fund (4)	Contributions (6)	Cash Flow to Provinces (7)	Fund (8)	Contribution Rate (9) %	Contributions (10)	Cash Flow to Provinces (11)	Fund (12)
	Benefits and Expenses (1)	\$	\$	\$	\$	\$	%	\$	\$	\$
1973	466	639	6.6	1,105	639	6.6	3.60	1,105	639	6.6
1974	615	640	7.7	1,255	640	7.7	3.60	1,255	640	7.7
1975	814	572	8.9	1,385	572	8.9	3.60	1,385	572	8.9
1976	1,037	499	10.2	1,536	499	10.2	3.60	1,536	499	10.2
1977	1,285	411	11.4	1,696	411	11.4	3.60	1,696	411	11.4
1978	1,555	323	12.7	1,878	323	12.7	3.60	1,878	323	12.7
1979	1,844	196	13.9	2,039	196	13.9	3.60	2,039	196	13.9
1980	2,127	89	15.1	2,216	89	15.1	3.60	2,216	89	15.1
1981	2,430	-30	16.3	2,430	0	16.3	3.60	2,400	-30	16.3
1982	2,753	-161	17.5	2,753	0	17.5	3.64	2,430	-30	17.5
1983	3,101	-308	18.6	3,101	0	18.6	3.82	2,753	-161	18.6
1984	3,476	-473	19.7	3,476	0	19.7	4.00	3,101	-308	19.7
1985	5,845	-1,637	20.7	5,845	0	20.7	4.17	3,476	-473	20.7
1990	9,028	-3,220	23.2	9,028	0	23.2	5.00	5,845	-1,637	23.2
1995	13,178	-5,063	18.5	13,178	0	18.5	5.60	9,028	-1,738	23.2
2000	18,679	-7,254	1.4	18,679	0	1.4	5.85	13,178	-1,738	23.2
2005	26,678	-10,780	-34.9	26,678	0	-34.9	5.89	18,679	-1,738	23.2
2010	39,631	-17,912	-103.7	39,631	0	-103.7	6.04	26,678	-1,738	23.2
2015	58,863	-29,542	-234.5	58,863	0	-234.5	6.57	39,631	-1,738	23.2
2020	86,732	-47,272	-478.9	86,732	0	-478.9	7.23	58,863	-1,738	23.2
2025			-918.3		0	-918.3	7.91	86,732	-1,738	23.2

* Annual increases 5½% for earnings, 3% for prices

Table 9

Auxiliary Fund Projections

(Fund in billions of dollars, other dollar figures in millions, contribution rate as per cent of contributory earnings)

Calendar Year	Fund A				Fund B				Fund C			
	3.6% Contribution Rate				Cash Flow to Provinces Decreases until Zero				Cash Flow to Provinces Decreases until Negative and Equal to Interest on Fund			
	Contributions (2)	Cash Flow to Provinces (3)	Fund (4)		Contributions (5)	Cash Flow to Provinces (7)	Fund (8)		Contributions (10)	Cash Flow to Provinces (11)	Fund (12)	
Benefits and Expenses (1)	\$	\$	\$	%	\$	\$	\$	%	\$	\$	\$	\$
1973	466	639	6.6		3.60	639	6.6		1,105	639	6.6	
1974	615	640	7.7		3.60	640	7.7		1,255	640	7.7	
1975	816	572	8.9		3.60	572	8.9		1,388	572	8.9	
1976	1,046	501	10.2		3.60	501	10.2		1,547	501	10.2	
1977	1,304	412	11.4		3.60	412	11.4		1,717	412	11.4	
1978	1,590	324	12.7		3.60	324	12.7		1,914	324	12.7	
1979	1,902	203	13.9		3.60	203	13.9		2,105	203	13.9	
1980	2,217	97	15.1		3.60	97	15.1		2,314	97	15.1	
1981	2,559	-23	16.4		3.60	0	16.4		2,536	-23	16.4	
1982	2,932	-160	17.5		3.63	0	17.5		2,772	-160	17.5	
1983	3,340	-318	18.7		3.81	0	18.7		3,022	-318	18.7	
1984	3,785	-499	19.7		3.98	0	19.7		3,285	-499	19.7	
1985	4,824	-1,876	20.7		4.15	0	20.7		3,285	-499	20.7	
1986	7,009	-3,874	22.4		5.00	0	22.4		5,004	-1,696	22.6	
1987	10,883	-6,413	14.7		5.59	0	14.7		9,187	-1,696	22.6	
1988	16,675	-9,654	-10.0		5.85	0	-10.0		14,979	-1,696	22.6	
1989	24,791	-15,027	-62.5		5.90	0	-62.5		23,095	-1,696	22.6	
1990	37,131	-26,188	-162.9		6.05	0	-162.9		35,436	-1,696	22.6	
1991	57,801	-45,153	-356.6		6.58	0	-356.6		56,105	-1,696	22.6	
1992	89,948	-75,620	-725.4		7.23	0	-725.4		88,252	-1,696	22.6	
1993	138,824		-1,403.7		7.91	0	-1,403.7		137,128	-1,696	22.6	

* Annual increase 6½% p.a. for earnings, 4% for prices; 7½% interest on new investments

Table 10

Proposed Plan
 *Economic assumptions 2%
 below those for Table 2

Auxiliary Fund Projections
 (Fund in billions of dollars, other dollar figures in millions, contribution rate as
 per cent of contributory earnings)

Calendar Year	Benefits and Expenses (1) \$	Fund A			Fund B			Fund C			
		3.6% Contribution Rate			Cash Flow to Provinces Decreases until Zero			Cash Flow to Provinces Decreases until Negative and Equal to Interest on Fund			
		Contri- butions (2) \$	Cash Flow to Provinces (3) \$	Fund (4) \$	Contri- butions (6) \$	Cash Flow to Provinces (7) \$	Fund (8) \$	Contri- bution Rate (9) %	Contri- butions (10) \$	Cash Flow to Provinces (11) \$	Fund (12) \$
1973				6.6							
1974	466	639	6.6	1,105	639	3.60	1,105	639	1,105	639	6.6
1975	614	640	8.9	1,254	640	3.60	1,254	640	1,254	640	8.9
1976	807	566	10.1	1,373	566	3.60	1,373	566	1,373	566	10.1
1977	1,017	489	11.3	1,506	489	3.60	1,506	489	1,506	489	11.3
1978	1,243	401	12.4	1,644	401	3.60	1,644	401	1,644	401	12.4
1979	1,481	270	13.5	1,751	270	3.60	1,751	270	1,751	270	13.5
1980	1,726	122	14.5	1,848	122	3.60	1,848	122	1,848	122	14.5
1981	1,949	22	15.4	1,971	22	3.60	1,971	22	1,971	22	15.4
1982	2,177	-82	16.2	2,177	0	3.74	2,177	0	2,095	-82	16.2
1983	2,412	-191	16.9	2,412	0	3.91	2,412	0	2,221	-191	16.9
1984	2,655	-307	17.6	2,655	0	4.07	2,655	0	2,349	-307	17.6
1985	2,910	-432	18.2	2,910	0	4.23	2,910	0	2,478	-432	18.2
1990	4,411	-1,259	18.9	4,411	0	5.04	4,411	0	3,550	-862	19.1
1995	6,170	-2,206	14.1	6,170	0	5.60	6,170	0	5,308	-862	19.1
2000	8,163	-3,110	2.5	8,163	0	5.82	8,163	0	7,301	-862	19.1
2005	10,499	-4,067	-16.8	10,499	0	5.88	10,499	0	9,638	-862	19.1
2010	13,619	-5,472	-47.3	13,619	0	6.02	13,619	0	12,757	-862	19.1
2015	18,404	-8,300	-97.3	18,404	0	6.56	18,404	0	17,542	-862	19.1
2020	24,857	-12,427	-179.1	24,857	0	7.20	24,857	0	23,996	-862	19.1
2025	33,327	-18,110	-308.6	33,327	0	7.88	33,327	0	32,466	-862	19.1

* Annual increase 3½% for earnings, 1% for prices; 4½% interest on new investments

Appendix B

Detailed Benefits and Expenses

The four tables in this appendix are designed to allow an examination of the cost of the various benefits in detail. (For costs expressed as per cent of contributory earnings see Appendix C.)

Tables 12 and 13 are based on the assumptions underlying the main tables and in fact show the projections for the existing and proposed plans that were condensed into Table 4.

Tables 14 and 15 are analogous to Tables 12 and 13 but are based on economic assumptions 2% lower ("reasonable stability").

Table 11

Existing Plan

*Economic assumptions 2% below those for Table 1

Auxiliary Fund Projections

(Fund in billions of dollars, other dollar figures in millions, contribution rate as per cent of contributory earnings)

Calendar Year	Fund A				Fund B				Fund C			
	3.6% Contribution Rate				Cash Flow to Provinces Decreases until Zero				Cash Flow to Provinces Decreases until Negative and Equal to Interest on Fund			
	Benefits and Expenses (1)	Contributions (2)	Cash Flow to Provinces (3)	Fund (4)	Contributions (5)	Cash Flow to Provinces (7)	Fund (8)	Contribution Rate (9)	Contributions (10)	Cash Flow to Provinces (11)	Fund (12)	
1973	\$	\$	\$	\$	%	\$	\$	%	\$	\$	\$	
1974	453	1,106	653	6.6	3.60	653	6.6	3.60	1,106	653	6.6	
1975	574	1,234	659	7.7	3.60	659	7.7	3.60	1,234	659	7.7	
1976	720	1,315	595	9.0	3.60	595	9.0	3.60	1,315	595	9.0	
1977	880	1,416	537	10.2	3.60	537	10.2	3.60	1,416	537	10.2	
1978	1,052	1,538	485	11.4	3.60	485	11.4	3.60	1,538	485	11.4	
1979	1,235	1,634	400	12.6	3.60	400	12.6	3.60	1,634	400	12.6	
1980	1,427	1,744	318	13.8	3.60	318	13.8	3.60	1,744	318	13.8	
1981	1,613	1,865	252	15.0	3.60	252	15.0	3.60	1,865	252	15.0	
1982	1,808	1,990	182	16.1	3.60	182	16.1	3.60	1,990	182	16.1	
1983	2,011	2,119	108	17.3	3.60	108	17.3	3.60	2,119	108	17.3	
1984	2,224	2,250	26	18.4	3.60	26	18.4	3.60	2,250	26	18.4	
1985	2,447	2,382	-65	19.5	3.70	0	19.5	3.60	2,382	-65	19.5	
1990	3,754	3,035	-719	20.5	4.45	0	20.5	3.60	3,035	-719	20.5	
1995	5,313	3,825	-1,489	24.3	5.00	0	24.3	3.95	4,194	-1,120	24.3	
2000	7,106	4,863	-2,243	24.4	5.26	0	24.4	4.43	5,986	-1,120	24.9	
2005	9,189	6,203	-2,986	19.9	5.33	0	19.9	4.68	8,069	-1,120	24.9	
2010	11,893	7,868	-4,025	10.2	5.44	0	10.2	4.93	10,773	-1,120	24.9	
2015	15,902	9,813	-6,089	-6.7	5.83	0	-6.7	5.42	14,782	-1,120	24.9	
2020	21,547	12,049	-9,498	-36.3	6.44	0	-36.3	6.10	20,427	-1,120	24.9	
2025	28,990	14,767	-14,223	-88.6	7.07	0	-88.6	6.79	27,871	-1,120	24.9	
			-176.7	-176.7			-176.7					

* Annual increase 3½% for earnings, 1% for prices; 4½% interest on new investments

Table 12

Benefits and Expenses of Administration
(In millions of dollars)

Existing Plan

Calendar Year	Retirement Pensions (1)	Disability Pensions			Widows' Pensions		Orphans' Benefits (4)	Death Benefits (5)	Expenses of Administration (6)	Total (7)
		Flat Rate (2a)	Earnings Related (2b)	Children's Benefits (2c)	Flat Rate (3a)	Earnings Related (3b)				
1974	162.1	25.5	48.3	16.8	41.8	67.4	38.8	21.4	30.7	452.8
1975	223.1	29.7	61.1	18.9	50.3	84.3	47.4	26.0	34.5	575.3
1976	315.1	33.9	75.8	20.8	58.6	103.2	53.1	30.6	37.0	728.2
1977	422.1	38.1	92.2	22.4	67.1	124.6	57.6	35.5	40.2	899.8
1978	542.9	42.2	110.0	23.9	75.6	148.6	61.4	40.6	44.0	1,089.2
1979	676.1	46.3	128.9	25.3	84.2	175.4	64.7	46.1	47.9	1,295.0
1980	820.5	50.4	148.6	26.7	92.8	205.3	67.7	52.0	51.6	1,515.6
1981	964.3	54.2	167.0	28.0	100.9	238.2	70.2	58.1	56.2	1,737.2
1982	1,119.4	58.0	186.0	29.2	109.0	274.7	72.5	64.7	61.1	1,974.5
1983	1,286.9	61.8	205.7	30.5	117.3	314.9	74.6	71.7	66.4	2,229.7
1984	1,468.3	65.7	226.3	31.8	125.7	359.2	76.6	79.2	71.9	2,504.5
1985	1,664.8	69.6	247.9	33.1	134.3	407.8	78.5	87.4	77.6	2,801.0
1990	2,920.6	92.6	375.2	43.3	182.5	725.3	94.9	138.6	108.5	4,681.5
1995	4,659.0	117.0	542.7	55.7	228.8	1,174.6	116.8	211.8	149.7	7,256.1
2000	6,861.4	152.3	803.5	68.0	292.0	1,824.5	137.2	315.3	208.8	10,662.9
2005	9,686.4	202.2	1,211.5	80.3	366.6	2,711.1	161.8	465.7	293.8	15,179.4
2010	13,773.5	269.0	1,825.3	95.1	470.0	3,945.4	190.5	678.3	408.5	21,655.6
2015	20,783.2	340.3	2,599.7	114.9	606.8	5,681.5	229.1	983.8	561.0	31,900.0
2020	32,105.3	414.7	3,572.4	140.2	767.4	8,179.6	279.9	1,426.0	760.1	47,645.6
2025	49,198.2	480.0	4,654.8	170.4	943.3	11,803.5	341.4	2,061.4	1,024.4	70,677.2

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Table 13
Benefits and Expenses of Administration
(in millions of dollars)

Proposed Plan

Calendar Year	Retirement Pensions (1)	Disability Pensions			Surviving Spouses' Pensions		Orphans' Benefits (4)	Death Benefits (5)	Expenses of Administration (6)	Total (7)
		Flat Rate (2a)	Earnings Related (2b)	Children's Benefits (2c)	Flat Rate (3a)	Earnings Related (3b)				
1974	165.0	25.5	48.3	18.6	44.1	71.3	41.3	21.4	30.7	466.2
1975	236.1	29.7	61.1	23.0	55.9	95.0	53.3	26.0	34.9	615.0
1976	367.0	33.9	76.3	25.5	65.0	116.4	59.9	31.2	38.5	813.7
1977	518.1	38.1	93.6	27.5	74.2	140.6	65.3	37.0	42.7	1,037.1
1978	688.8	42.2	112.8	29.3	83.5	168.1	69.8	43.3	47.1	1,284.9
1979	876.2	46.3	133.6	31.1	92.8	198.9	73.8	50.1	52.2	1,555.0
1980	1,077.5	50.4	155.9	32.8	102.1	233.5	77.5	57.2	56.6	1,843.5
1981	1,270.5	54.2	178.7	34.3	110.9	272.2	80.7	64.0	61.5	2,127.1
1982	1,476.4	58.0	202.7	35.9	119.7	315.3	83.6	71.2	66.7	2,429.5
1983	1,697.3	61.8	227.7	37.5	128.8	363.2	86.4	78.9	72.0	2,753.5
1984	1,935.1	65.7	253.6	39.1	138.1	416.0	89.1	87.1	77.6	3,101.4
1985	2,191.8	69.6	280.4	40.9	147.8	474.4	91.8	96.0	83.4	3,476.1
1990	3,827.1	92.6	424.6	54.5	204.3	859.2	113.2	152.5	116.9	5,845.0
1995	6,033.3	117.0	611.6	70.1	257.0	1,401.9	141.6	233.7	161.3	9,027.7
2000	8,747.7	152.3	902.2	85.7	334.9	2,211.6	168.4	349.4	225.4	13,177.7
2005	12,275.2	202.2	1,353.0	101.5	420.6	3,202.4	198.9	517.5	317.4	18,678.5
2010	17,507.9	269.3	2,024.0	119.9	538.3	4,792.6	233.7	751.3	441.6	26,678.5
2015	26,728.0	340.5	2,867.2	144.9	691.3	6,890.6	281.2	1,084.0	603.3	39,630.7
2020	40,864.2	414.9	3,916.3	177.0	868.7	9,902.1	343.7	1,562.1	814.5	58,863.3
2025	61,864.2	480.4	5,096.7	215.0	1,062.1	14,253.3	419.1	2,245.6	1,096.1	86,732.3

Assumptions on page 55

Existing Plan

*Economic assumptions 2% below those for Table 12

Table 14

Benefits and Expenses of Administration
(in millions of dollars)

Calendar Year	Retirement Pensions (1)	Disability Pensions			Widows' Pensions		Orphans' Benefits (4)	Death Benefits (5)	Expenses of Administration (6)	Total (7)
		Flat Rate (2a)	Earnings Related (2b)	Children's Benefits (2c)	Flat Rate (3a)	Earnings Related (3b)				
1974	162.1	25.5	48.3	16.8	41.8	67.4	38.8	21.4	30.7	452.7
1975	222.8	29.6	61.0	18.9	50.2	84.2	47.3	26.0	34.3	574.3
1976	311.8	33.4	75.0	20.6	57.6	102.0	52.6	30.5	36.5	720.1
1977	413.6	37.0	90.2	21.8	64.9	121.6	56.1	35.2	39.3	879.8
1978	526.5	40.3	106.2	22.8	71.9	143.1	58.6	40.0	42.7	1,052.2
1979	648.7	43.4	122.6	23.7	78.7	166.5	60.6	45.0	45.4	1,234.8
1980	778.4	46.3	139.2	24.5	85.2	192.0	62.2	50.2	48.4	1,426.5
1981	904.5	48.8	153.8	25.2	91.0	219.6	63.3	55.4	51.8	1,613.3
1982	1,036.8	51.2	168.1	25.8	96.4	249.5	64.0	60.7	55.3	1,807.8
1983	1,175.9	53.4	182.3	26.4	101.7	281.6	64.6	66.3	58.9	2,011.0
1984	1,322.2	55.6	196.5	27.0	106.8	316.2	65.0	72.0	62.5	2,223.8
1985	1,476.4	57.7	210.6	27.6	111.8	353.2	65.4	78.1	66.2	2,447.0
1990	2,383.2	69.6	283.0	32.7	137.8	579.3	71.6	112.9	84.3	3,754.3
1995	3,465.4	79.7	366.6	38.1	156.6	863.5	79.9	157.3	106.2	5,313.4
2000	4,636.4	94.1	487.3	42.2	181.2	1,230.8	85.1	213.3	135.1	7,105.5
2005	5,937.5	113.3	664.9	45.2	206.2	1,671.5	91.1	286.6	172.3	9,188.7
2010	7,652.3	137.2	906.4	48.5	239.8	2,214.9	97.1	378.3	218.6	11,893.2
2015	10,466.3	157.2	1,170.6	53.1	280.6	2,897.8	105.9	497.5	272.6	15,901.7
2020	14,642.9	173.6	1,455.8	58.8	321.7	3,788.3	117.3	653.4	334.7	21,546.5
2025	20,302.9	182.3	1,722.8	64.8	358.5	4,962.8	129.7	856.4	410.2	28,990.3

* Annual increases 3½% for earnings, 1% for prices; interest on new investments 4½% P.a.

Table 15

Benefits and Expenses of Administration
(in millions of dollars)

Calendar Year	Retirement Pensions (1)	Disability Pensions			Surviving Spouses' Pensions		Orphans' Benefits (4)	Death Benefits (5)	Expenses of Administration (6)	Total (7)
		Flat Rate (2a)	Earnings Related (2b)	Children's Benefits (2c)	Flat Rate (3a)	Earnings Related (3b)				
1974	165.0	25.5	48.3	18.6	44.1	71.3	41.3	21.4	30.7	466.2
1975	235.8	29.6	61.0	22.9	55.8	94.9	53.2	26.0	34.8	614.1
1976	364.6	33.5	75.9	25.2	63.9	115.0	59.3	31.0	38.1	806.5
1977	509.8	37.0	92.3	26.8	71.8	137.1	63.6	36.4	41.8	1,016.7
1978	669.6	40.4	109.8	28.0	79.4	161.3	66.6	42.1	45.7	1,243.0
1979	839.9	43.6	128.0	29.1	86.7	187.7	69.1	47.9	48.6	1,480.6
1980	1,016.3	46.5	146.3	30.1	93.7	216.4	71.2	53.8	51.3	1,725.7
1981	1,172.4	49.0	162.3	30.9	100.0	247.8	72.7	58.9	54.7	1,948.7
1982	1,332.0	51.4	178.0	31.7	105.9	281.8	73.9	64.0	58.2	2,176.8
1983	1,496.4	53.7	193.4	32.4	111.7	318.5	74.8	69.2	61.7	2,411.7
1984	1,667.2	55.9	208.6	33.2	117.4	357.8	75.7	74.6	65.2	2,655.5
1985	1,845.6	58.0	223.7	34.0	123.0	399.9	76.5	80.3	68.8	2,909.9
1990	2,903.2	70.2	297.8	41.2	154.2	655.5	85.5	115.9	87.6	4,411.1
1995	4,145.2	80.3	384.4	48.0	175.9	967.5	97.0	161.1	110.1	6,169.5
2000	5,452.2	94.9	510.0	53.2	207.8	1,381.7	104.5	218.0	140.3	8,162.7
2005	6,948.2	114.1	696.0	57.1	236.6	1,863.5	111.9	293.4	178.7	10,499.5
2010	9,005.3	138.1	946.7	61.1	274.6	2,460.5	119.2	386.8	226.3	13,618.5
2015	12,508.8	158.2	1,219.5	67.0	319.7	3,212.1	130.0	507.6	280.6	18,403.6
2020	17,381.8	174.8	1,514.1	74.2	364.2	4,194.1	144.1	664.9	345.3	24,857.3
2025	23,929.2	183.6	1,791.9	81.7	403.7	5,486.2	159.3	868.9	422.7	33,327.0

* Annual increases 3½% for earnings, 1% for prices; interest on new investments 4½%

*Economic assumptions 2% below those for Table 13

Proposed Plan

Appendix C

Benefits and Expenses
expressed as
Percentages of Contributory Earnings

This appendix contains three tables.

Tables 16 and 17 are based on the assumptions underlying the main tables and simply show the percentages in Table 5 for the existing and proposed plans in greater detail and thus allow an examination of the relative impact of the various benefits on rates of contribution.

Table 18 is based on economic assumptions 2% below those underlying the main estimates ("reasonable stability"). It is analogous to and may be compared with Table 5 in order to examine the effect of different levels of inflation on rates of contribution.

Table 16

Benefits and Expenses of Administration
expressed as
Percentages of Contributory Earnings

Existing Plan

Calendar Year	Retirement Pensions	Disability Pensions			Widows' Pensions		Orphans' Benefits	Death Benefits	Expenses of Administration	Total
		Flat Rate	Earnings Related	Children's Benefits	Flat Rate	Earnings Related				
	(1)	(2a)	(2b)	(2c)	(3a)	(3b)	(4)	(5)	(6)	(7)
1974	0.53	0.08	0.16	0.05	0.14	0.22	0.13	0.07	0.10	1.48
1975	0.65	0.09	0.18	0.05	0.15	0.24	0.14	0.08	0.10	1.67
1976	0.85	0.09	0.20	0.06	0.16	0.28	0.14	0.08	0.10	1.97
1977	1.05	0.09	0.23	0.06	0.17	0.31	0.14	0.09	0.10	2.24
1978	1.23	0.10	0.25	0.05	0.17	0.34	0.14	0.09	0.10	2.47
1979	1.41	0.10	0.27	0.05	0.18	0.37	0.14	0.10	0.10	2.71
1980	1.59	0.10	0.29	0.05	0.18	0.40	0.13	0.10	0.10	2.94
1981	1.72	0.10	0.30	0.05	0.18	0.42	0.12	0.10	0.10	3.09
1982	1.83	0.09	0.30	0.05	0.18	0.45	0.12	0.11	0.10	3.23
1983	1.94	0.09	0.31	0.05	0.18	0.47	0.11	0.11	0.10	3.36
1984	2.04	0.09	0.31	0.04	0.17	0.50	0.11	0.11	0.10	3.49
1985	2.15	0.09	0.32	0.04	0.17	0.53	0.10	0.11	0.10	3.61
1990	2.69	0.09	0.35	0.04	0.17	0.67	0.09	0.13	0.10	4.31
1995	3.11	0.08	0.36	0.04	0.15	0.78	0.08	0.14	0.10	4.85
2000	3.29	0.07	0.38	0.03	0.14	0.87	0.07	0.15	0.10	5.11
2005	3.30	0.07	0.41	0.03	0.12	0.92	0.06	0.16	0.10	5.17
2010	3.37	0.07	0.45	0.02	0.12	0.97	0.05	0.17	0.10	5.30
2015	3.70	0.06	0.46	0.02	0.11	1.01	0.04	0.18	0.10	5.69
2020	4.22	0.05	0.47	0.02	0.10	1.08	0.04	0.19	0.10	6.27
2025	4.80	0.05	0.45	0.02	0.09	1.15	0.03	0.20	0.10	6.90

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Table 17

Benefits and Expenses of Administration
expressed as
Percentages of Contributory Earnings

Proposed Plan

Calendar Year	Retirement Pensions	Disability Pensions			Surviving Spouses' Pensions		Orphans' Benefits	Death Benefits	Expenses of Administration	Total
		Flat Rate	Earnings Related	Children's Benefits	Flat Rate	Earnings Related				
	(1)	(2a)	(2b)	(2c)	(3a)	(3b)	(4)	(5)	(6)	(7)
1974	0.54	0.08	0.16	0.06	0.15	0.23	0.13	0.07	0.10	1.52
1975	0.68	0.09	0.18	0.07	0.16	0.27	0.15	0.07	0.10	1.76
1976	0.95	0.09	0.20	0.07	0.17	0.30	0.16	0.08	0.10	2.11
1977	1.21	0.09	0.22	0.06	0.18	0.33	0.15	0.09	0.10	2.43
1978	1.46	0.09	0.24	0.06	0.18	0.36	0.15	0.09	0.10	2.73
1979	1.68	0.09	0.26	0.06	0.18	0.39	0.14	0.10	0.10	2.98
1980	1.90	0.09	0.28	0.06	0.18	0.41	0.14	0.10	0.10	3.25
1981	2.06	0.09	0.29	0.06	0.18	0.44	0.13	0.10	0.10	3.46
1982	2.21	0.09	0.30	0.05	0.18	0.47	0.13	0.11	0.10	3.64
1983	2.36	0.09	0.32	0.05	0.18	0.50	0.12	0.11	0.10	3.82
1984	2.49	0.08	0.33	0.05	0.18	0.54	0.11	0.11	0.10	4.00
1985	2.63	0.08	0.34	0.05	0.18	0.57	0.11	0.12	0.10	4.17
1990	3.27	0.08	0.36	0.05	0.18	0.73	0.10	0.13	0.10	5.00
1995	3.74	0.07	0.38	0.04	0.16	0.87	0.09	0.14	0.10	5.60
2000	3.88	0.07	0.40	0.04	0.15	0.98	0.07	0.15	0.10	5.85
2005	3.87	0.06	0.43	0.03	0.14	1.04	0.06	0.16	0.10	5.89
2010	3.96	0.06	0.46	0.03	0.13	1.09	0.05	0.17	0.10	6.04
2015	4.43	0.06	0.48	0.02	0.11	1.14	0.05	0.18	0.10	6.57
2020	5.02	0.05	0.48	0.02	0.10	1.22	0.04	0.19	0.10	7.23
2025	5.64	0.04	0.46	0.02	0.10	1.30	0.04	0.20	0.10	7.91

Assumptions on page 55

*Economic assumptions 2%
below those for Table 5

Table 18

Benefits and Expenses of Administration
expressed as
Percentages of Contributory Earnings

Calendar Year	Existing Plan				Proposed Plan			
	Retirement Pensions	Disability Pensions**	Survivors' and Death Benefits	Total***	Retirement Pensions	Disability Pensions**	Survivors' and Death Benefits	Total***
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1974	0.53	0.29	0.56	1.48	0.54	0.30	0.58	1.52
1975	0.65	0.33	0.62	1.68	0.68	0.34	0.65	1.76
1976	0.85	0.36	0.66	1.97	0.96	0.36	0.71	2.12
1977	1.05	0.38	0.70	2.24	1.22	0.37	0.74	2.43
1978	1.23	0.39	0.73	2.46	1.47	0.39	0.78	2.72
1979	1.43	0.42	0.77	2.72	1.73	0.41	0.81	3.04
1980	1.61	0.44	0.81	2.94	1.98	0.44	0.85	3.36
1981	1.75	0.44	0.83	3.11	2.14	0.45	0.88	3.56
1982	1.88	0.44	0.85	3.27	2.29	0.45	0.91	3.74
1983	2.00	0.44	0.87	3.42	2.43	0.45	0.92	3.91
1984	2.12	0.44	0.90	3.56	2.56	0.46	0.96	4.07
1985	2.23	0.45	0.92	3.70	2.68	0.45	0.99	4.23
1990	2.83	0.46	1.06	4.45	3.32	0.47	1.15	5.04
1995	3.26	0.47	1.19	5.00	3.76	0.46	1.28	5.60
2000	3.43	0.46	1.26	5.26	3.89	0.47	1.37	5.82
2005	3.45	0.49	1.31	5.33	3.89	0.48	1.41	5.88
2010	3.50	0.49	1.33	5.44	3.98	0.51	1.44	6.02
2015	3.84	0.51	1.38	5.83	4.46	0.51	1.48	6.56
2020	4.38	0.50	1.47	6.44	5.03	0.51	1.55	7.20
2025	4.95	0.48	1.54	7.07	5.66	0.48	1.63	7.88

* Annual increases $3\frac{1}{2}\%$ for earnings, 1% for prices; interest on new investments $4\frac{1}{2}\%$ p.a.

** Includes pensions for children of disabled contributors

*** Includes expenses of administration

Appendix D

MAIN PROVISIONS OF THE EXISTING PLAN

1. Coverage

In general, the Canada Pension Plan which came into force on January 1, 1966, applies to virtually all paid members of the labour force in Canada (both employees and self-employed persons) between the ages of 18 and 70, other than persons in the province of Quebec who are covered by the Quebec Pension Plan. Persons with annual earnings less than the "basic exemption" are the main exception.

2. Definition of Terms Relating to Earnings

Four terms relating to the earnings of contributors that are used frequently in this report are defined and described below.

Year's Maximum Pensionable Earnings (Y.M.P.E.)

"Year's Maximum Pensionable Earnings" for any year means the upper limit above which annual earnings are not subject to contributions in that year.

For 1966 and 1967, the Y.M.P.E. was \$5,000. Beginning in 1968 it was adjusted upward in steps of integral hundreds of dollars in accordance with increases in the "Pension Index", reaching \$5,600 in 1973. It was fixed at \$6,600 and \$7,400 for 1974 and 1975, respectively. After 1975, the Plan provides for the Y.M.P.E. to be adjusted (upward or downward) in steps of integral hundreds of dollars in accordance with changes in the "Earnings Index".

Year's Basic Exemption (Y.B.E.)

"Year's Basic Exemption" for any year means the amount of annual earnings below which earnings are not subject to contributions. It is calculated as 12% of the Y.M.P.E. for the year (rounded if necessary to the nearest lower multiple of \$100).

A person with salary and wages in any year greater than the Y.B.E. is required to contribute under the Plan on all earnings between the Y.B.E. and the Y.M.P.E.

A person with salary and wages lower than the Y.B.E. is required to contribute under the Plan, provided that the total of his self-employed earnings and salary and wages are about one-third (or more) greater than the Y.B.E. For example, for 1973, when the Y.B.E. was \$600 and the Y.M.P.E. was \$5,600, a person with salary and wages below \$600 was required to contribute on earnings between \$600 and \$5,600 provided that his total earnings were \$800 or more; if such a person had total earnings of less than \$800 he was not eligible to contribute under the Plan.

Contributory Earnings

"Contributory earnings" for any year means the earnings of a contributor on which contributions are payable, i.e., earnings between the Y.B.E. and the Y.M.P.E. for that year.

Pensionable Earnings

"Pensionable earnings" for any year means all earnings of a contributor up to the Y.M.P.E., provided that required contributions have been made in that year, multiplied by the ratio that the average Y.M.P.E. for the year when a retirement pension or other earnings-related benefit becomes payable under the Act and for the two preceding years bears to the Y.M.P.E. for the year in which the contributions were made.

3. Automatic Adjustment Features

Several elements of the Plan are subject to automatic adjustment in accordance with changes in specified indices. These elements include

- (a) the Year's Maximum Pensionable Earnings and, dependent thereon, pensionable earnings upon which all earnings-related benefits going into payment are based and the upper limit on the amount of death benefit,
- (b) the Year's Basic Exemption and, dependent thereon, the minimum amount of total earnings (including earnings from self-employment) necessary for a person with salary and wages below the Y.B.E. to contribute under the Plan,

- (c) the flat-rate component of a disability pension,
- (d) the flat-rate component of a widow's (or a disabled widower's) pension,
- (e) the flat-rate benefit for orphans and children of disabled contributors,
- (f) all monthly benefits in payment.

Annual adjustment of all elements subject to automatic adjustment depend on changes in the Pension Index constructed as described in the next following paragraph, with two exceptions. First, annual adjustments of the contributory earnings limits after 1975 depend on changes in an Earnings Index constructed as described in the second following paragraph; (adjustments for 1974 and 1975 are as described earlier in this appendix). Secondly, the monthly amount of any earnings-related benefit that emerged prior to 1974 equals the initial monthly amount multiplied by the Pension Index for the year of payment and divided by the average of the Consumer Price Indices for the twelve months ending with June of the year preceding the year of emergence.

For 1967, the Pension Index was computed as the average of the Consumer Price Indices for Canada for the twelve months ending with June 1966. For each year from 1968 through 1973, it was computed as the average of the CPI's for the twelve months ending with June of the preceding year or 1.02 times the Pension Index for the preceding year, whichever was the lesser. (In practice, the latter formula was always applicable.) The Pension Index for 1974 equals the average of the CPI's for the twelve months ending with June 1972, multiplied by the average of the CPI's for the sixteen months ending with October 1973, and divided by the corresponding average for the sixteen months ending with June 1972*. The Pension Index for 1975 and later years equals the average of the CPI's for the twelve months ending with October of the preceding year in each case, except that the Pension Index for the preceding year will be retained if the calculated increase is less than 1%.

* The Pension Index for 1974 is defined differently in the Act, but it is used in such a way as to produce the same benefit amounts as the procedure described here.

The Earnings Index is computed as the average of employees' average annual earnings, determined by the Department of National Revenue, for the eight consecutive years ending with the year two years prior to the year for which the Earnings Index is to apply, divided by the corresponding average for the first eight years of operation of the Plan.

4. Earnings Test

Any retirement pension that commences at an age less than 70 is subject to the operation of an earnings test until age 70 is reached. The earnings test is such that the annual retirement pension of a contributor is reduced by \$1 for each \$2 of earnings in excess of approximately 18% of the Y.M.F.E. and is reduced further by \$1 for each \$2 of earnings in excess of approximately 30% of that limit.

5. Retirement Pensions

Upon application, a retired contributor between the ages of 65 and 70 or any contributor over age 70, becomes entitled to a retirement pension. (A contributor in receipt of a disability pension becomes entitled to a retirement pension on attainment of age 65.) After a retirement pension becomes payable or, in any event, after age 70 a contributor is not eligible to contribute under the Plan. Thus, except for the operation of the "earnings test" and adjustment of the amount of pension in payment in accordance with changes in the Pension Index, the amount of pension is fixed at the time the pension first becomes payable.

In general, the initial amount of retirement pension payable to a contributor is based on the whole history of his Pensionable Earnings from January 1, 1966, or from attainment of age 18, if later, until the year in which the pension commences. Subject to the operation of the earnings test, "full" pensions are available after December 31, 1975, when the transitional ten years end.

Retirement pensions in payment are subject to automatic adjustment in accordance with changes in the Pension Index.

A convenient formula for determining the initial amount of retirement pension involves the use of an "average earnings ratio", as follows:

Formula for Retirement Pension

Initial Amount of Annual Pension

This amount is equal to 25% of the average of the Y.M.F.E. for the three years ending with the year in which pension commences, multiplied by the "average earnings ratio" which is determined as follows:

<u>Date Pension Commences</u>	<u>Years in Contributory Period</u>	<u>Formula for Average Earnings Ratio</u>
Before 1976	irrelevant	Total of recorded "annual earnings ratios" divided by 10 less the number of years when disability pension payable
1976 & later		Average of a number of the highest "annual earnings ratios", such number being the <u>greater of</u>
	less than 10	(a) the number of years in the contributory period or (b) 10 less the number of years when disability pension payable
	10 or more	(a) 10 or (b) 85% of the years in the contributory period

The "annual earnings ratio" referred to above is the ratio of "unescalated pensionable earnings" to the Y.M.F.E. in a calendar year. Unescalated pensionable earnings for a year are the actual earnings of a contributor up to the Y.M.F.E., provided that required contributions have been made. (It should be noted that if no contributions are made during a calendar year, the "annual earnings ratio" for that year is zero; and for any year in which a contributor's earnings exceed the Y.M.F.E., the ratio is one.)

The "contributory period" for purposes of retirement pensions is the number of years from January 1, 1966, (or from attainment of age 18, if later), to age 65, less the number of years, if any, during which a disability pension is payable.

Examination of the above formula will make it clear that, in addition to the exclusion from the benefit calculations of the whole period during which a disability pension is payable, certain lowest recorded annual earnings ratios will normally be excluded from the benefit calculations by reason of contributions made after age 65 and by reason of the 15% "drop-out" provision; however, the drop-out must not reduce the total number of years to less than ten.

The following three examples are given to illustrate the operation of the benefit formula. For all examples, it is assumed that until 1975 the value of the Y.M.F.E. will be as described in the definition and that thereafter the Earnings Index will increase in accordance with the economic assumptions described in Appendix E to this report.

- (a) Suppose that a person aged exactly 60 on January 1, 1966, has annual earnings of \$4,000 for each of the first two years, receives an increase of \$600 every second year and that he elects to have his pension commence at age 68, that is, on January 1, 1974.

Initial amount of annual pension

= Average earnings ratio x average of the Y.M.F.E. for the three years ending with the year in which pension commences x 25 per cent,

$$= \frac{1}{10} \left(2 \times \frac{4,000}{5,000} + \frac{4,600}{5,100} + \frac{4,600}{5,200} + \frac{5,200}{5,300} + \frac{5,200}{5,400} + \frac{5,500}{5,500} + \frac{5,600}{5,600} \right)$$

$$\times \frac{1}{3} (5,500 + 5,600 + 6,600) \times 0.25$$

$$= 0.7331 \times 5,900 \times 0.25$$

$$= \$1,081.32$$

- (b) Suppose that a person aged exactly 45 on January 1, 1966, contributes continuously up to and including the year in which he attains age 69, and that he elects to have his pension commence at age 70. The pertinent details relating to his pensionable earnings and the calculation of his pension are shown in the schedule below.

<u>Year</u>	<u>Year's Maximum Pensionable Earnings</u> \$	<u>Age of Contributor</u>	<u>Unescalated Pensionable Earnings</u>	<u>Annual Earnings Ratio</u>
1966	5,000	45	3,000	0.6000
1967	5,000	46	3,000	0.6000
1968	5,100	47	3,600	0.7059
1969	5,200	48	3,600	0.6923
1970	5,300	49	4,200	0.7923
1971	5,400	50	4,200	0.7778
1972	5,500	51	4,800	0.8727
1973	5,600	52	4,800	0.8571
1974	6,600	53	5,400	0.8182
1975	7,400	54	5,400	0.7297
1976	7,900	55	6,000	0.7595
1977	8,500	56	6,000	0.7059
1978	9,100	57	6,300	0.6923
1979	9,800	58	6,600	0.6735
1980	10,400	59	6,900	0.6635
1981	11,100	60	6,900	0.6216
1982	11,800	61	7,500	0.6356
1983	12,500	62	7,800	0.6240
1984	13,200	63	7,800	0.5909
1985	14,000	64	8,400	0.6000
1986	14,700	65	9,000	0.6122
1987	15,600	66	9,000	0.5769
1988	16,400	67	9,000	0.5488
1989	17,300	68	9,000	0.5202
1990	18,300	69	7,500	0.4098
1991	19,300	70		

For this employee, the number of "highest" annual earnings ratios to be taken into account in calculating the average earnings ratio is seventeen (85% of the number of years from age 45 to age 65).

Average earnings ratio

$$= \frac{12.2343}{17}$$

$$= 0.7197$$

Initial amount of annual pension

$$= 0.7197 \times \frac{1}{3} (17,300 + 18,300 + 19,300) \times 0.25$$

$$= \$3,292.63$$

- (c) Suppose that an immigrant who arrives in Canada in 1975 and commences work on January 1, 1976, is of exactly the same age and has exactly the same earnings history for the period from 1976 to 1986, inclusive, as the person described in (b) above, and that he elects to have his pension commence at age 66. For this contributor, the number of "highest" annual earnings ratios to be taken into account in calculating the average earnings ratio is also seventeen, but six of these annual earnings ratios must be zero since there is a record of pensionable earnings for only eleven years.

Average earnings ratio

$$\begin{aligned} &= \frac{7.1790}{17} \\ &= 0.4223 \end{aligned}$$

Initial amount of annual pension

$$\begin{aligned} &= 0.4223 \times \frac{1}{3} (14,000 + 14,700 + 15,600) \times 0.25 \\ &= \$1,558.99 \end{aligned}$$

6. Disability Pensions

A contributor aged less than 65, who becomes disabled within the meaning of the disability provisions of the Plan, is entitled to a disability pension, under the following conditions:

<u>Number of calendar years in contributory period</u>	<u>Number of calendar years for which contributions must have been made</u>
Less than 10	5
10 to 30	5 of last 10, and in total at least 1/3 of the number of calendar years in the contributory period
30 or more	5 of last 10, and in total at least 10

The "contributory period" for purposes of disability pensions is the number of years from January 1, 1966, (or from attainment of age 18, if later) to the date of commencement of the disability pension, except for any calendar years during the whole of which a disability pension was previously payable.

Disability pensions commence in the fourth month after the month of disablement and are payable until age 65 or until death or recovery from disability at an earlier age. Unlike retirement pensions, disability pensions are not subject to a gradual build-up to "full" benefits during the ten years ending December 31, 1975.

Disability pensions in payment like retirement pensions are subject to automatic adjustment in accordance with changes in the Pension Index.

The amount of pension payable is composed of two parts, namely, a flat-rate part depending only on the year in which the disability pension is payable, and an earnings-related part depending initially only on the pensionable earnings record of the contributor to the date of commencement of the disability pension. The initial flat-rate part is determined as \$25 per month adjusted in accordance with the increase in the Pension Index from 1967 to the year in which the disability pension commences (for example, \$33.76 for pensions payable in 1974). The initial earnings-related part is equal to 75% of an earnings-related pension calculated in the manner described earlier for retirement pensions, except that the contributory period ends at the date of commencement of the disability pension and that, both before and after December 31, 1975, the number of years to be taken into account in determining the "average earnings ratio" is as follows:

<u>Years in Contributory Period</u>	<u>Number of highest "annual earnings ratios" used in calculating average earnings ratio</u>
Less than 10	years in contributory period
10 or more	greater of 10 or 85% of the number of years in contributory period

The following three examples are given to illustrate the determination of the initial amount of a disability pension. For all examples, it is assumed that the Y.M.F.E. will be as used for purposes of the preceding examples of retirement pensions, and that the flat-rate component of the disability pension, which is \$33.76 for 1974, will continue to increase in accordance with the economic assumptions described in Appendix E to this report.

- (a) Suppose that a person aged exactly 55 on January 1, 1966, has annual earnings of \$5,000 for each year from 1966 to 1973, inclusive, and that a disability pension becomes payable to him in January, 1974.

Initial amount of annual pension

$$\begin{aligned} &= 33.76 \times 12 + 0.75 \left\{ \frac{1}{8} \left(2 \times \frac{5,000}{5,000} + \frac{5,000}{5,100} + \frac{5,000}{5,200} + \frac{5,000}{5,300} \right. \right. \\ &\quad \left. \left. + \frac{5,000}{5,400} + \frac{5,000}{5,500} + \frac{5,000}{5,600} \right) \times \frac{1}{3} (5,500 + 5,600 + 6,600) \times 0.25 \right\} \\ &= 405.12 + 1,052.76 \\ &= \$1,457.88 \end{aligned}$$

- (b) Suppose that a person aged exactly 45 on January 1, 1966, has the same history of earnings from 1966 to 1980, inclusive, and, consequently, the same annual earnings ratios for those years, as the person described in example (a) for retirement pensions above and that a disability pension becomes payable to him in January, 1981. For this contributor, the number of "highest" annual earnings ratios to be taken into account in calculating the average earnings ratio for the earnings-related part of his pension is 12.75 (that is, 85% of the number of years from age 45 to age 60).

Average earnings ratio

$$\begin{aligned} &= \frac{9.5750}{12.75} \\ &= 0.7510 \end{aligned}$$

Initial amount of annual pension

$$\begin{aligned} &= 44.80 \times 12 + 0.75 \left(0.7510 \times \frac{1}{3} (9,800 + 10,400 + 11,100) \times 0.25 \right) \\ &= 537.60 + 1,469.14 \\ &= \$2,006.74 \end{aligned}$$

- (c) Suppose that a person aged exactly 18 on January 1, 1976, has annual earnings of \$4,200 in 1976 increasing by \$600 each year to 1980, inclusive, and that a disability pension becomes payable to him in January, 1981.

Initial amount of annual pension

$$\begin{aligned} &= 44.80 \times 12 + 0.75 \left\{ \frac{1}{5} \left(\frac{4,200}{7,900} + \frac{4,800}{8,500} + \frac{5,400}{9,100} + \frac{6,000}{9,800} + \right. \right. \\ &\quad \left. \left. + \frac{6,600}{10,400} \right) \times \frac{1}{3} (9,800 + 10,400 + 11,100) \times 0.25 \right\} \\ &= 537.60 + 1,148.95 \\ &= \$1,686.55 \end{aligned}$$

In addition to the normal disability pension described above, benefits may be payable to the children of disabled contributors.

7. Benefits to Children of Disabled Contributors

An unmarried child of a disabled male contributor or a disabled female contributor who wholly or substantially maintained the child at the time she became disabled is entitled to a benefit provided the child

- (i) is under age 18, or
- (ii) is aged 18 or over but under age 25 and has been attending school full-time and substantially without interruption since attainment of age 18 or the time of the contributor's disability, whichever occurred later.

The initial amount of pension payable in respect of each of the first four children is equal to the initial flat-rate benefit payable to the disabled contributor (i.e., \$25 per month adjusted in accordance with changes in the Pension Index from 1967 to the year in which the disability pension commences); one-half that amount is payable in respect of each child in excess of four. However, only one child's benefit is payable in respect of each child, even if both parents are disabled contributors.

8. Survivors' Benefits

(a) General

A widow, a "dependent" disabled widower or an orphan may become entitled to a survivor's pension. For entitlement to such a pension, the deceased contributor must have made contributions during the lesser of

- (i) ten calendar years, or
- (ii) one-third of the number of calendar years in which contributions could have been made, but not less than three years.

By the expression "calendar years in which contributions could have been made" is meant all calendar years after 1965 or from age 18, if that age is attained after 1965, to the date of death if death occurs before age 65 or, otherwise, to the later of attainment of age 65 or cessation of contributions, except for any calendar years during the whole of which a disability pension was payable.

A widow may become entitled to a widow's pension by reason of having dependent children, being disabled or simply being over age 35 at widowhood. The amount of pension payable to a widow who becomes entitled to a widow's pension for more than one reason is the largest to which she is entitled for any one of such reasons.

A widow (or a disabled widower) may become entitled to both a survivor's pension and either a disability pension or a retirement pension. However, the total annual amount of the two pensions cannot initially exceed an amount equal to 25% of the average of the Y.M.P.E. for the three years ending with the year in which the later of the two pensions commences (that is, except in the transitional period ending December 31, 1975, an amount equal to the maximum retirement pension applicable for that year).

A widow's (or a disabled widower's) pension is suspended during any period of remarriage.

Like disability pensions and unlike retirement pensions, survivors' pensions are not subject to a gradual build-up to "full" benefits during the ten years ending December 31, 1975.

Survivors' benefits in payment like retirement and disability pensions are subject to automatic adjustment in accordance with changes in the Pension Index.

(b) Widows' Pensions

(i) Definition of "widow with dependent children"

A "widow with dependent children" means a widow who wholly or substantially maintains an unmarried child of the deceased contributor, where the child is

- A. under age 18,
- B. aged 18 or over but under age 25 and has been attending school full-time and substantially without interruption since attainment of age 18 or the time of the contributor's death, whichever occurred later, or
- C. aged 18 or over and is disabled, having been disabled without interruption since attainment of age 18 or the time of the contributor's death, whichever occurred later.

(ii) Widows aged between 45 and 65 at widowhood

A widow aged between 45 and 65 at the death of her "contributor" husband is entitled to a widow's pension, whether or not she has dependent children or is disabled.

The amount of pension payable is composed of two parts, namely, a flat-rate part depending only on the year in which the widow's pension is payable and an earnings-related part depending initially only on the pensionable earnings record of the contributor to the date of his death. The initial flat-rate part is determined as \$25 per month adjusted in accordance with the increase in the Pension Index from 1967 to the year in which the death of the contributor occurs. The initial earnings-related

part is equal to $37\frac{1}{2}\%$ of an earnings-related pension based on the contributor's pensionable earnings record, calculated as at the date of the contributor's death or commencement of his age retirement pension, whichever is the earlier, except that, in the latter case, the calculated pension is adjusted in accordance with the increase in the Pension Index from the year in which the contributor's age retirement pension became payable to the year of his death. In general, the amount of the contributor's earnings-related pension is calculated in the manner described earlier for retirement pensions, except that the "contributory period" ends at the date of death or at age 65, whichever is the earlier, and that, both during and after the ten-year transitional period ending December 31, 1975, the number of years to be taken into account in determining the "average earnings ratio" is,

- A. if the number of years in the contributory period is less than ten, the number of years in the contributory period, or
- E. if the number of years in the contributory period is ten or more, the greater of ten or 85% of the number of years in the contributory period.

(iii) Widows aged less than 45 at widowhood, without dependent children and not disabled

A widow without dependent children and not disabled, age 35 or less at the death of her "contributor" husband, is not entitled to a widow's pension.

A widow without dependent children and not disabled, aged more than 35 but less than 45 at the death of her "contributor" husband, is entitled to an amount of pension, calculated as described in (ii) above, reduced by $1/120$ th of such amount for each month that her age, at the date of death of the contributor, is less than 45.

(iv) Widows aged less than 45 at widowhood,
with dependent children

A widow aged less than 45 at the death of her "contributor" husband, with dependent children, is entitled to a widow's pension calculated as described in (ii) above.

If a widow in receipt of a widow's pension is aged less than 45 and not disabled at the time she ceases to be a "widow with dependent children", the amount of her pension is discontinued or reduced in the manner described in (iii) above in accordance with her age at the time she ceased to be a "widow with dependent children" except that, for the purpose of determining such age, a non-disabled child attending school after age 18 is deemed not to be a child.

(v) Disabled widows

A widow aged less than 65 is entitled to a disabled widow's pension, if she either is disabled at the date of death of the contributor or becomes disabled at a later date.

The disabled widow's pension is payable from the month following the month in which the contributor dies or from the month following the month in which the widow is disabled, whichever is the later. The initial amount of pension is calculated as described in (ii) above, except that, in the case where the widow becomes disabled subsequent to the death of the contributor, the pension so calculated is adjusted in accordance with changes in the Pension Index from the year in which the contributor died to the year in which disability occurs. The calculated initial amount of pension is subject to the limitation on the maximum initial amount payable in respect of dual pensions, as explained in (a) above.

(vi) Widows aged 65 or over

At age 65, or upon widowhood at a later age, a widow who is not then in receipt of an age retirement pension or to whom such a pension does

not become immediately payable, is entitled to an amount of pension equal to 60% of an earnings-related pension* based on the pensionable earnings record of her "contributor" husband.

At the time that a widow becomes entitled to both a widow's pension and a retirement pension or to either one if she is then in receipt of the other, the total amount of pension is equal to the greater of

- A. 60% of the widow's own retirement pension plus 60% of an earnings-related pension* based on the pensionable earnings record of her "contributor" husband, or
- F. 100% of the widow's own retirement pension plus 37½% of an earnings-related pension* based on the pensionable earnings record of her "contributor" husband,

subject to the limitation on the maximum initial amount payable in respect of dual pensions, as explained in (a) above.

(c) Disabled Widowers' Pensions

A widower of any age who was wholly or substantially maintained by his "contributor" wife before her death is entitled to a disabled widower's pension, if he is disabled at the time of death of the contributor.

The initial amount of pension payable to a disabled widower aged less than 65 is determined in the manner described for widows' pensions in (b)(ii) above. The initial amount of pension payable to a disabled widower at age 65 or after is determined in the manner described for widows' pensions in (b)(vi) above.

(d) Orphans' Benefits

The provision for orphans' benefits are analogous to those described earlier for children of disabled contributors.

* An earnings-related pension, calculated as described in (ii) above, adjusted, where applicable, in accordance with changes in the Pension Index from the year in which the contributor died to the year in which the widow attains age 65 or the year in which a retirement pension becomes payable to her while she is in receipt of a widow's pension.

For purposes of orphans' benefits, an "orphan" means an unmarried child of a deceased male contributor or of a deceased female contributor who wholly or substantially maintained the child immediately before her death, where the child is

- (i) under age 18, or
- (ii) aged 18 or over but under age 25 and has been attending school full-time and substantially without interruption since attainment of age 18 or the time of the contributor's death, whichever occurred later.

The amount of pension payable in respect of each of the first four orphans is \$25 per month adjusted in accordance with changes in the Pension Index from 1967 to the year in which the benefit is payable; one-half that amount is payable in respect of each orphan in excess of four. However, only one orphan's benefit is payable in respect of each child, even if both deceased parents were contributors, and furthermore a child may not simultaneously receive both an orphan's benefit and a child of disabled contributor's benefit.

9. Death Benefits

A lump-sum benefit is payable to the estate of a deceased contributor who made contributions in at least the minimum number of calendar years required for entitlement to a survivor's benefit.

The amount of benefit is equal to,

- (a) in respect of a contributor to whom a retirement pension was not payable at the time of death, one-half of the annual amount of an earnings-related pension calculated in the manner described for retirement pensions, except that the deceased contributor's contributory period ends at the date of death or at age 65, whichever is the earlier, and that there is no reduction by reasons of death occurring within the ten-year transitional period ending December 31, 1975, or
- (b) in respect of a contributor to whom a retirement pension was payable at the time of death, one-half of the annual amount of pension payable in the year of death, adjusted to exclude any reduction that may have arisen by reason of commencement of pension within the ten-year transitional period ending December 31, 1975, or by reason of application of the earnings test,

subject to the limitation that the amount of benefit cannot exceed 10% of the Y.M.P.E. applicable in the year of the contributor's death.

10. Contributions

No person who is under age 18 or over age 70, or who has earnings less than the minimum required for contribution purposes or who is in any specifically excluded class is eligible to contribute. Also, no contributor to whom a retirement pension or a disability pension is payable is eligible to contribute.

For those who are eligible, contributions in any year are required in respect of all earnings between the basic exemption and the maximum pensionable earnings for that year.

The rate of contribution as respects earnings subject to contributions which has been in effect since the inception of the Plan is 1.8% of salary and wages for each of employees and their employers and 3.6% of self-employed earnings.

Appendix E

PRINCIPAL ASSUMPTIONS UNDERLYING FINANCIAL ESTIMATES

1. General

For purposes of the preceding two reports it had been felt that the dramatic reduction in fertility rates in recent years and the apparently remote likelihood of a return to higher levels had removed one of the principal reasons for preparing estimates on two sets of demographic assumptions and, in fact, one set of what were regarded as reasonably realistic demographic assumptions was adopted.

Very little appears to have occurred that would lead us to change our basic approach at this time or substantially alter the various assumptions regarding future experience that were then adopted. Thus, the demographic assumptions used in developing the main estimates contained in the present actuarial report are, for practical purposes, identical with those used in connection with the actuarial reports as at December 31, 1969 and December 31, 1972.

For the reasons stated in the introduction, only one set of economic assumptions was used for purposes of the main tables of financial estimates in this report, so that these tables reflect only one combination of assumptions.

Of course, it will be realized that there will be differences between the various assumptions and actual experience and that actual results may well fall on either side of the projections contained in the main tables of financial estimates. Some additional projections which may help in measuring the effect of certain variations in economic factors are given in Appendix A.

2. Economic Assumptions

For practical purposes, the economic assumptions underlying the main tables of financial estimates are the same as those referred to as "Moderate Inflation" assumptions in the preceding two reports; they have the following characteristics for 1976 and later:

Annual increase in average earnings	5.5%
Annual increase in Consumer Price Index	3.0%
Annual rate of interest on new investments*	6.5%

The factors for 1974 and 1975 were somewhat higher, allowing for a slight grading from actual experience prior to 1974.

3. Population Projections

(a) General

The populations required for the Canada Pension Plan pertain to Canada excluding Quebec but including all members of the Canadian Forces and the Royal Canadian Mounted Police. The population projections used for purposes of the estimates are the same as those used for purposes of the preceding two reports. They were obtained by simple subtraction of

* Pursuant to sections 111 to 113 of the Canada Pension Plan, funds are invested in provincial obligations at interest rates comparable to the average yield on outstanding Government of Canada obligations of comparable maturity. The term to maturity is 20 years or such lesser period as may be fixed by the Minister of Finance for purposes of liquidity.

the projected populations for Quebec from the projected populations for all of Canada. However, provision for members of the Canadian Forces and the Royal Canadian Mounted Police was made in the development of participation rates given in section 4 of this appendix.

Populations were projected from the 1966 census up to the year 2025; this provides a period of fifty-two years from the effective date of this examination and more than satisfies the requirements of section 116 of the Canada Pension Plan, in respect of periodic actuarial reports.

Schedule 1 shows census and projected populations for selected years for Canada excluding Quebec.

Schedule 1

Census and Projected Populations for Canada excluding Quebec

Middle of Year	(in thousands)			Birth Rate per 1,000	% Proportion of population aged 65 and over to population aged 20 to 64
	Males	Females	Total		
1931	3,928	3,574	7,502	20.9	10.8
1941	4,228	3,947	8,175	20.6	12.7
1951	5,067	4,887	9,954	26.1	15.5
1961	6,587	6,392	12,979	26.1	16.4
1966	7,168	7,066	14,234	19.5	16.7
1970	7,590	7,523	15,113	17.2	16.5
1975	8,100	8,081	16,181	17.1	16.4
1980	8,716	8,736	17,452	18.3	16.6
1985	9,413	9,461	18,874	18.3	16.9
1990	10,125	10,198	20,323	17.0	18.1
1995	10,811	10,906	21,717	15.8	19.1
2000	11,481	11,597	23,078	15.3	19.0
2005	12,160	12,294	24,454	15.2	18.6
2010	12,864	13,015	25,879	15.2	18.6
2015	13,581	13,757	27,338	15.1	20.3
2020	14,292	14,504	28,796	14.8	22.7
2025	14,986	15,240	30,226	14.6	25.6

The projections are given in more detail in Schedules 6, 7 and 8 of this appendix following the description of the underlying fertility, mortality and immigration assumptions.

The column in Schedule 1 showing the birth rate per thousand of population is given merely as a matter of interest because it is a frequently quoted statistic. It is not a very meaningful measure since it reflects both fertility and the age distribution of the population and, of course, it is not used in the development of the population projections.

(b) Fertility

The fertility assumptions used for the projections of the population for All Canada as well as for Quebec were that fertility rates for 1970 and later would correspond to a gross reproduction rate of 1.05 (which is approximately equal to a net reproduction rate of one; i.e., every female born alive is assumed to bear one female child).

Schedule 2 shows the experience fertility rates for the years 1960, 1966 and 1972, as well as the rates used for 1970 and later in accordance with the above assumptions.

Schedule 2

Selected Fertility Rates

(Number of live births per 1,000 females in age group)

Female Age Group	<u>Recently Experienced Fertility Rates</u>						<u>Fertility Rates Assumed for 1970 and later</u>		
	1960		1966		1972		Canada excl. Quebec	Canada	Quebec
	All* Canada	Quebec	All* Canada	Quebec	All* Canada	Quebec			
15-19	59.8	33.3	48.2	25.4	38.5	17.9	47.4	35.2	20.0
20-24	233.5	199.6	169.1	150.2	119.8	94.1	130.6	131.8	123.2
25-29	224.4	220.5	163.5	161.2	137.1	124.7	142.6	126.2	131.1
30-34	146.2	158.2	103.3	105.6	72.1	69.9	73.1	79.7	86.8
35-39	84.2	100.3	57.5	62.3	28.9	29.6	28.6	43.3	50.7
40-44	28.5	37.3	19.1	22.2	7.8	8.4	7.5	14.3	18.1
45-49	2.4	3.7	1.7	2.4	0.6	0.7	0.5	1.3	1.9
Total	3895.0	3764.5	2812.0	2646.5	2024.0	1726.5	2151.5	2159.0	2159.0

* Newfoundland is excluded because of unavailability of statistics.

It may be seen from Schedule 2 that, notwithstanding the steady decline in fertility rates which has continued right through 1972, the total fertility rates assumed reflect, for practical purposes, the experience for 1972 in Canada outside the Province of Quebec.

Of course, it is possible that fertility rates will continue to drop and become stabilized at some level equivalent to a net reproduction rate of less than one. However, under such conditions it may not be unreasonable to expect that the relative size of the productive population will be maintained either through increased immigration or later retirements or a combination of such factors.

(c) Mortality

The method of introducing mortality assumptions into the population projections for all of Canada as well as for Quebec consisted of the calculation of five-year survivorship ratios for five-year age groups on the basis of the mortality rates of the 1955-57 and 1960-62 life tables as well as the mortality rates assumed for the year 2000 and later, the calculation of survivorship ratios for each intermediate five-year period by interpolation, and finally the application of these survivorship ratios to successive quinquennial populations.

Schedule 3 shows, for specimen ages, a comparison of mortality rates for all of Canada as well as for Quebec on the basis of the Canadian Life Tables 1955-57 and 1960-62 and shows the mortality rates assumed for the year 2000 and later.

Schedule 3

Comparison of Mortality Rates for Quebec and for All of Canada
(Annual deaths per 1,000 persons)

<u>Age</u>	<u>Life Tables 1955-57</u>		<u>Life Tables 1960-62</u>		<u>Rates Assumed for 2000 A.D. and later</u>
	<u>Province of Quebec</u>	<u>All Canada</u>	<u>Province of Quebec</u>	<u>All Canada</u>	
<u>Males</u>					
0	43.19	34.72	34.90	30.58	20.17
1	2.97	2.50	2.11	1.85	1.26
5	.97	.83	.93	.73	.54
10	.62	.57	.59	.50	.34
20	1.58	1.60	1.50	1.53	1.20
30	1.76	1.72	1.50	1.50	1.21
40	3.12	2.88	3.15	2.82	2.20
50	8.73	7.94	8.29	7.72	5.62
60	22.23	20.37	21.56	19.99	15.32
70	47.75	44.25	47.06	44.67	36.86
80	112.25	106.11	104.95	100.91	92.41
90	243.15	237.84	244.10	227.12	224.04
<u>Females</u>					
0	34.62	27.67	27.19	23.87	15.87
1	2.38	2.16	1.86	1.64	1.10
5	.76	.58	.67	.53	.30
10	.41	.37	.34	.29	.23
20	.61	.60	.55	.55	.41
30	1.07	.94	.82	.79	.69
40	2.29	1.94	1.93	1.74	1.46
50	5.17	4.75	4.63	4.36	3.20
60	14.26	11.91	12.27	10.64	7.57
70	33.60	29.55	31.60	27.74	22.16
80	96.51	87.17	86.85	79.41	69.16
90	213.49	198.89	234.59	207.08	192.33

(d) Immigration

The population projections were made on the assumption that the number of net immigrants to Canada was 100,000 for 1967 and that this number would increase at a compound rate of $1\frac{1}{2}\%$ per annum until the year 2000 and at a compound rate of 1% thereafter. The assumption was designed to produce a level of net immigration which would bear an approximately constant ratio to the population at any point in time. Schedule 4 shows the relationship of projected net immigrants and projected populations for three pivotal years.

Schedule 4

<u>Year</u>	<u>Population</u>	<u>Net Immigrants</u>	<u>% Ratio (2)÷(1)</u>
1975	22,757,000	112,649	0.495
2000	32,344,000	163,448	0.505
2025	41,924,000	209,611	0.500

It was further assumed that 23.5% of the net immigrants to Canada would take up residence in Quebec, that there would be an equal number of male and female net immigrants and that their age distributions would be as shown in Schedule 5.

Schedule 5

Distribution of Net Immigrants by Age Group

<u>Age Group</u>	<u>Males</u> %	<u>Females</u> %
0-4	6	5
5-9	11	10
10-14	12	11
15-19	10	11
20-24	9	11
25-29	10	11
30-34	11	11
35-39	11	10
40-44	4	4
45-49	2	2
50-54	2	3
55-59	2	2
60-64	3	2
65-69	3	3
70 & over	4	4

(e) Populations

In Schedules 6, 7 and 8 are shown for All Canada, Quebec and All Canada excluding Quebec, respectively, the 1966 census population and the projected populations for 1975 and every tenth year thereafter to the year 2025. The populations are shown distributed by sex and broad age groups.

Schedule 6

Populations for All Canada
(in thousands)

Middle of Year		Total	14 and under		15 - 19		20 - 39		40 - 59		60 - 64		65 - 69		70 and over	
			Number	Prop'n of Total	Number	Prop'n of Total	Number	Prop'n of Total	Number	Prop'n of Total	Number	Prop'n of Total	Number	Prop'n of Total	Number	Prop'n of Total
1966	Males	10,054	3,373	33.6	929	9.2	2,627	26.1	2,079	20.7	330	3.3	255	2.5	462	4.6
	Females	9,961	3,219	32.3	909	9.1	2,604	26.1	2,072	20.8	333	3.4	277	2.8	546	5.5
	Total	20,015	6,592	32.9	1,838	9.2	5,231	26.1	4,151	20.7	663	3.3	532	2.7	1,008	5.1
1975	Males	11,373	3,056	26.9	1,209	10.6	3,400	29.9	2,404	21.1	428	3.8	334	2.9	542	4.8
	Females	11,384	2,902	25.5	1,164	10.2	3,386	29.7	2,434	21.4	446	3.9	359	3.2	693	6.1
	Total	22,757	5,958	26.2	2,373	10.4	6,786	29.8	4,838	21.3	874	3.8	693	3.1	1,235	5.4
1985	Males	13,226	3,260	24.6	994	7.5	4,600	34.8	2,710	20.5	530	4.0	418	3.2	714	5.4
	Females	13,322	3,098	23.3	948	7.1	4,512	33.9	2,762	20.7	585	4.4	482	3.6	935	7.0
	Total	26,548	6,358	24.0	1,942	7.3	9,112	34.3	5,472	20.6	1,115	4.2	900	3.4	1,649	6.2
1995	Males	15,164	3,728	24.6	1,166	7.7	4,701	31.0	3,543	23.4	581	3.8	525	3.5	920	6.0
	Females	15,321	3,541	23.1	1,111	7.3	4,584	29.9	3,615	23.6	617	4.0	597	3.9	1,256	8.2
	Total	30,485	7,269	23.8	2,277	7.5	9,285	30.5	7,158	23.5	1,198	3.9	1,122	3.7	2,176	7.1
2005	Males	17,003	3,819	22.5	1,341	7.9	4,776	28.1	4,733	27.8	688	4.0	546	3.2	1,101	6.5
	Females	17,212	3,626	21.1	1,278	7.4	4,653	27.0	4,759	27.7	763	4.4	626	3.6	1,505	8.8
	Total	34,215	7,445	21.8	2,619	7.7	9,429	27.6	9,492	27.7	1,451	4.2	1,172	3.4	2,606	7.6
2015	Males	18,916	4,177	22.1	1,345	7.1	5,478	28.9	4,856	25.7	1,018	5.4	795	4.2	1,249	6.6
	Females	19,181	3,967	20.7	1,282	6.7	5,334	27.8	4,867	25.4	1,086	5.6	917	4.8	1,728	9.0
	Total	38,097	8,144	21.4	2,627	6.9	10,812	28.4	9,723	25.5	2,104	5.5	1,712	4.5	2,977	7.8
2025	Males	20,780	4,549	21.9	1,493	7.2	5,809	28.0	4,990	24.0	1,191	5.7	1,046	5.0	1,702	8.2
	Females	21,144	4,321	20.4	1,423	6.7	5,658	26.8	4,991	23.6	1,262	6.0	1,179	5.6	2,310	10.9
	Total	41,924	8,870	21.2	2,916	7.0	11,467	27.3	9,981	23.8	2,453	5.8	2,225	5.3	4,012	9.6

Schedule 7

Populations for Quebec
(in thousands)

Middle of Year	Total	14 and under		15 - 19		20 - 39		40 - 59		60 - 64		65 - 69		70 and over		
		Number	Prop'n of Total %	Number	Prop'n of Total %	Number	Prop'n of Total %	Number	Prop'n of Total %	Number	Prop'n of Total %	Number	Prop'n of Total %	Number	Prop'n of Total %	
1966	Males	2,886	995	34.5	284	9.8	796	27.6	565	19.6	84	2.9	63	2.2	98	3.4
	Females	2,895	949	32.8	282	9.7	807	27.9	576	19.9	91	3.1	71	2.5	120	4.1
	Total	5,781	1,944	33.6	566	9.8	1,603	27.7	1,141	19.8	175	3.0	134	2.3	218	3.8
1975	Males	3,273	882	26.9	356	10.9	1,033	31.6	675	20.6	112	3.4	88	2.7	128	3.9
	Females	3,303	835	25.3	344	10.4	1,039	31.5	698	21.1	120	3.6	99	3.0	168	5.1
	Total	6,576	1,717	26.1	700	10.7	2,072	31.5	1,373	20.9	232	3.5	187	2.8	296	4.5
1985	Males	3,813	958	25.1	274	7.2	1,347	35.3	796	20.9	145	3.8	112	2.9	181	4.8
	Females	3,861	909	23.5	261	6.8	1,324	34.3	829	21.5	162	4.2	131	3.4	245	6.3
	Total	7,674	1,867	24.3	535	7.0	2,671	34.8	1,625	21.2	307	4.0	243	3.2	426	5.5
1995	Males	4,353	1,070	24.6	338	7.7	1,336	30.7	1,052	24.2	166	3.9	147	3.4	244	5.6
	Females	4,415	1,017	23.0	322	7.3	1,298	29.4	1,084	24.6	182	4.1	173	3.9	339	7.7
	Total	8,768	2,087	23.8	660	7.5	2,634	30.0	2,136	24.4	348	4.0	320	3.7	583	6.6
2005	Males	4,843	1,076	22.2	381	7.9	1,351	27.9	1,363	28.1	210	4.3	158	3.3	305	6.3
	Females	4,918	1,024	20.8	363	7.4	1,311	26.7	1,373	27.9	236	4.8	184	3.7	427	8.7
	Total	9,761	2,100	21.5	744	7.6	2,662	27.3	2,736	28.0	446	4.6	342	3.5	732	7.5
2015	Males	5,335	1,168	21.9	375	7.0	1,540	28.9	1,358	25.5	296	5.5	235	4.4	364	6.8
	Females	5,424	1,110	20.5	357	6.6	1,497	27.6	1,357	25.0	315	5.8	275	5.1	511	9.4
	Total	10,759	2,278	21.2	732	6.8	3,037	28.2	2,715	25.2	611	5.7	510	4.8	875	8.1
2025	Males	5,794	1,262	21.8	413	7.1	1,605	27.7	1,389	24.0	331	5.7	298	5.1	497	8.6
	Females	5,904	1,199	20.3	394	6.7	1,561	26.4	1,384	23.5	349	5.9	336	5.7	681	11.5
	Total	11,698	2,461	21.0	807	6.9	3,166	27.1	2,773	23.7	680	5.8	634	5.4	1,178	10.1

Schedule 8

Populations for Canada Excluding Quebec
(in thousands)

Middle of Year	Total	14 and under		15 - 19		20 - 39		40 - 59		60 - 64		65 - 69		70 and over	
		Number	Prop'n of Total	Number	Prop'n of Total	Number	Prop'n of Total	Number	Prop'n of Total	Number	Prop'n of Total	Number	Prop'n of Total	Number	Prop'n of Total
			%		%		%		%		%		%		%
1966 Males	7,168	2,378	33.2	645	9.0	1,831	25.5	1,514	21.1	246	3.4	192	2.7	363	5.1
Females	7,066	2,270	32.1	627	8.9	1,797	25.4	1,497	21.2	243	3.4	206	2.9	427	6.1
Total	14,234	4,648	32.7	1,272	8.9	3,628	25.5	3,011	21.2	489	3.4	398	2.8	790	5.5
1975 Males	8,101	2,174	26.8	853	10.5	2,367	29.3	1,730	21.4	316	3.9	246	3.0	414	5.1
Females	8,082	2,067	25.6	820	10.1	2,347	29.1	1,735	21.5	326	4.0	260	3.2	525	6.5
Total	16,183	4,241	26.2	1,673	10.4	4,714	29.1	3,465	21.4	642	4.0	506	3.1	935	5.8
1985 Males	9,412	2,302	24.5	720	7.6	3,253	34.5	1,915	20.3	385	4.1	306	3.3	533	5.7
Females	9,461	2,189	23.1	687	7.3	3,188	33.7	1,933	20.4	423	4.5	351	3.7	690	7.3
Total	18,873	4,491	23.8	1,407	7.5	6,441	34.1	3,848	20.4	808	4.2	657	3.5	1,223	6.5
1995 Males	10,810	2,658	24.6	828	7.7	3,366	31.1	2,491	23.1	415	3.8	378	3.5	676	6.2
Females	10,907	2,524	23.2	789	7.2	3,286	30.1	2,531	23.2	435	4.0	424	3.9	917	8.4
Total	21,717	5,182	23.9	1,617	7.4	6,652	30.7	5,022	23.1	850	3.9	802	3.7	1,593	7.3
2005 Males	12,160	2,743	22.6	960	7.9	3,425	28.2	3,370	27.7	478	3.9	388	3.2	796	6.5
Females	12,294	2,603	21.2	915	7.4	3,342	27.2	3,386	27.5	528	4.3	442	3.6	1,078	8.8
Total	24,454	5,346	21.8	1,875	7.7	6,767	27.7	6,756	27.6	1,006	4.1	830	3.4	1,874	7.7
2015 Males	13,581	3,008	22.2	970	7.1	3,937	29.0	3,498	25.8	722	5.3	560	4.1	885	6.5
Females	13,757	2,857	20.8	925	6.7	3,837	27.9	3,510	25.5	771	5.6	642	4.7	1,216	8.8
Total	27,338	5,865	21.5	1,895	6.9	7,774	28.4	7,008	25.6	1,493	5.5	1,202	4.4	2,101	7.7
2025 Males	14,986	3,287	21.9	1,080	7.2	4,204	28.1	3,601	24.0	860	5.7	748	5.0	1,206	8.1
Females	15,240	3,122	20.5	1,029	6.7	4,097	26.9	3,607	23.7	913	6.0	843	5.5	1,629	10.7
Total	30,226	6,409	21.2	2,109	7.0	8,301	27.4	7,208	23.8	1,773	5.9	1,591	5.3	2,835	9.4

4. Participation Rates

These rates are required for purposes of estimating the number of contributors and beneficiaries and were derived from a comparison of the records of contributors for 1966 and 1967 with populations from the 1966 census and projections for 1967. In the case of females in age group 25 to 64 some provision was made for the trend toward higher participation in the labour force.

The element of unemployment was not introduced explicitly into the calculations. The effect of unemployment is, of course, reflected in average earnings, and variation in unemployment was not thought to have a significant effect on the financial projections. The rates used for purposes of the main tables of financial estimates are shown in Schedule 9.

Schedule 9

Participation Rates

Age Group	to 1974 %	1975 to 1984 %	1985 & later %
<u>Males</u>			
18-19	65	64	64
20-24	100	99	99
25-34	100	100	100
35-49	93	93	93
50-59	87	87	87
60-64	78	78	78
65-69	53	53	53
<u>Females</u>			
18-19	46	43	43
20-24	66	64	64
25-29	44	46	50
30-49	36	39	43
50-59	36	39	43
60-64	25	27	30
65-69	13	13	13

5. Modified Average Earnings

For purposes of estimating contributions and pensionable earnings on which earnings-related benefits are based, modified average earnings were developed which could be applied to the participating populations. Modified average earnings take account only of earnings up to the Year's Maximum Pensionable Earnings and ignore all earnings of persons who are precluded from participation because their earnings are below the Year's Basic Exemption. Sample values of modified average earnings are shown in Schedule 10. They were derived from the 1966 and 1967 experience of contributors, taking into account changes in earnings levels experienced to 1973 and assumed subsequent changes in accordance with the economic assumptions described at the beginning of this appendix as well as the Year's Maximum Pensionable Earnings, and the Year's Basic Exemption.

Schedule 10

Modified Average Earnings
(used for Main Tables of Financial Estimates)

<u>Age Group</u>	<u>Year</u>	<u>Existing Plan</u>			<u>Proposed Plan</u>		
		<u>1975</u>	<u>2000</u>	<u>2025</u>	<u>1975</u>	<u>2000</u>	<u>2025</u>
		<u>Y.M.P.E.</u>					
	<u>Y.B.E.</u>	800	3,700	14,300	700	3,700	14,100
<u>Males</u>							
18-19		3,592	13,825	52,864	3,563	13,850	52,891
20-24		5,615	22,450	85,841	5,592	23,614	90,179
25-34		6,643	27,509	105,188	6,626	30,943	118,169
35-49		6,765	28,166	107,697	6,750	32,058	122,425
50-59		6,528	27,062	103,477	6,513	30,515	116,534
60-64		6,194	25,486	97,451	6,177	28,123	107,399
65-69		5,439	21,789	83,314	5,417	22,979	87,755
<u>Females</u>							
18-19		2,843	11,297	43,196	2,781	11,363	43,396
20-24		4,419	17,663	67,537	4,346	18,106	69,145
25-29		4,911	19,801	75,713	4,841	20,505	78,306
30-59		4,797	19,384	74,120	4,732	20,168	77,019
60-64		4,783	19,393	74,152	4,722	20,288	77,480
65-69		4,260	17,024	65,094	4,189	17,435	66,584

The values in Schedule 10 are indicative of the earnings assumed for purposes of the main tables of financial estimates as well as those of the auxiliary tables based on the same assumptions regarding increases in average earnings.

6. Contributions and Expenses of Administration

- (a) Contributory earnings, calculated as the product of Modified Average Earnings less Year's Basic Exemption, and projected populations, were adjusted upwards to allow for overpayments.
- (b) Under the existing plan, contributions are payable on self-employed earnings only if earnings exceed one and one-third times the Year's Basic Exemption. The proposed plan provides for the removal of this restriction. However, no account was taken of this restriction or its removal in the estimates for either plan.
- (c) The contribution rates assumed in the fund accumulations were applied to contributory earnings to estimate contributions.
- (d) Costs of administration were assumed to be at the level of 0.1% of contributory earnings.

7. Retirement Benefits

(a) For 1974 it was assumed that

- (i) a person who did not commence to contribute on January 1, 1966, or who ceased to contribute after that date will not subsequently contribute;
- (ii) the probabilities of being a contributor at pertinent ages are as follows:

<u>Age Last Birthday</u>	<u>Males</u>	<u>Females</u>
56-59	0.87	0.36
60-64	0.78	0.25
65	0.73	0.18
66	0.57	0.14
67	0.52	0.12
68	0.44	0.10
69	0.36	0.08

- (iii) a worker will elect to take his pension as soon as possible after ceasing to contribute.

(b) For the period beginning in 1975 it was assumed that

- (i) earnings dropped out pursuant to the "15% drop-out" provision would be zero for females and one-half of their maximum value for males,
- (ii) the proportion of available benefits not payable between ages 65 and 70 because of delayed retirement or the earnings test would be 50% for males and 25% for females for the existing plan, and 10% for males and 5% for females for the proposed plan.

8. Disability Benefits

(a) For the purpose of estimating amounts of flat-rate benefits the assumed proportions of total populations insured for disability benefits were as shown in Schedule 11.

Schedule 11

Proportions of Total Population Insured for Disability Benefits

	<u>22-24</u> %	<u>25-29</u> %	<u>30-34</u> %	<u>35-39</u> %	<u>40-54</u> %	<u>55-59</u> %	<u>60-64</u> %
Males	40	95	95	95	90	85	85
Females							
1975	20	45	40	35	35	35	30
2000	19	53	48	43	43	43	39
2025	19	53	49	44	44	44	39

(b) Disability prevalence rates were assumed in accordance with Schedule 12.

Schedule 12

Disability Prevalence Rates
(Males and Females)

<u>Age Group</u>	<u>1975</u> %	<u>1980</u> %	<u>1985</u> %	<u>1990</u> %	<u>1995</u> %	<u>2000 & later</u> %
22-24	0.05	0.05	0.05	0.05	0.05	0.05
25-29	0.12	0.14	0.14	0.14	0.14	0.14
30-34	0.30	0.36	0.38	0.38	0.38	0.38
35-39	0.50	0.62	0.68	0.70	0.70	0.70
40-44	0.82	1.00	1.08	1.13	1.15	1.15
45-49	1.17	1.45	1.57	1.64	1.67	1.69
50-54	2.19	2.73	2.96	3.08	3.15	3.18
55-59	3.54	4.46	4.82	4.98	5.08	5.13
60-64	6.14	8.09	8.74	9.02	9.21	9.30

(c) For purposes of estimating amounts of earnings-related benefits

(i) it was assumed that the proportions insured shown in Schedule 11 would not be applicable because the insured population will generally have higher earnings than the uninsured population, and consequently somewhat higher proportions were required. The following were used:

<u>Males</u>	<u>Females</u>		
	<u>1975</u>	<u>1980 and 1985</u>	<u>1990 and later</u>
95%	70%	75%	80%

(ii) for the valuations of the original plan, contained in Actuarial Reports Nos. 1 and 2, all benefits in payment in a given year were assumed to be at the level of payments emerging in that year;

(iii) for the present valuation of the existing and proposed plans all benefits in payment in a given year were calculated so as to bear a proper ratio to all benefits in payment as previously estimated for the original plan.

9. Pensions to Children of Disabled Contributors

(a) The "proportions insured for disability benefits" shown in 8(a) above, the "disability prevalence rates" shown in 8(b) above, and the "distribution of fathers and mothers of new born children" described in 11(a) below, were assumed to be applicable.

- (b) For the existing plan, the assumption was retained that aggregate benefits, for male and female contributors combined, could be adequately estimated by assuming that no payments would be made in respect of female disability pensioners, that no payments would be made for children over age 18, and that all children under age 18 of male disability pensioners would be entitled to benefits (i.e., no reduction was made for an aggregate number of children in excess of four, or for non-payment of benefits because of marriage of children).
- (c) For the proposed plan, benefits in respect of male contributors were assumed to equal 98% of the aggregate benefits estimated for the existing plan. Benefits in respect of female contributors after the effective date of the amending legislation were estimated using similar techniques to those employed in estimating aggregate benefits for the existing plan except that (i) female rather than male factors were used, and (ii) a final adjustment factor of 0.95 was applied to total benefits in respect of female contributors to allow for the fact that a child cannot simultaneously receive benefits in respect of both of his parents.

10. Widows' and Widowers' Benefits

- (a) Proportions of participants married were derived from the 1961 census with some allowance for expected improvement in mortality. Sample values are as follows:

<u>Age</u>	<u>Proportions Married</u>					
	<u>Males</u>			<u>Females</u>		
	<u>1975</u>	<u>2000</u>	<u>2025</u>	<u>1975</u>	<u>2000</u>	<u>2025</u>
	%	%	%	%	%	%
20-24	30	30	30	59	59	59
25-29	70	70	70	84	84	84
30-34	82	82	82	88	88	88
40-44	88	88	88	87	88	88
50-54	87	88	88	80	82	82
60-64	83	85	85	67	71	72
70-74	76	80	81	46	52	54
80-84	58	62	64	23	28	29

- (b) Relative age distributions of husbands and wives were derived from 1961 census data.
- (c) For widows, rates of remarriage were assumed in accordance with the rates described in the paper "Remarriage Experience under the Pension Act of Canada" (Transactions of the Society of Actuaries, Volume XII), rates that are somewhat lower than those that have been actually experienced across Canada in more recent periods, and that consequently tend to result in some overstatement of widows' benefits. For widowers, rates of remarriage were developed from some rather scanty data available in the Vital Statistics publication and were adjusted so as to produce approximately the same proportionate overstatement in benefits as the rates used in the valuation of widows' benefits.

- (d) The effect of ineligibility for benefits because of an insufficient number of years of contributions was ignored.
- (e) Reductions or suspensions of pensions to widows or widowers below age 45 at widowhood were disregarded.
- (f) No reduction was made below age 65 for widows or widowers entitled to both a disability and a survivor's pension.
- (g) A final adjustment factor of 0.9 was applied to total widows' and widowers' benefits to adjust for the inherent conservatism of some of the above assumptions, as well as to allow for lighter mortality among married than unmarried males.

11. Orphans' Benefits

- (a) The distribution of fathers and mothers of new born children by age were based on data from Vital Statistics for 1958 to 1962 and 1966 to 1970, respectively.
- (b) For the existing plan the assumption was retained that aggregate benefits, for male and female contributors combined, could be adequately estimated by assuming that no payments would be made in respect of deceased female contributors, that no payments would be made for orphans over age 18 and that all children under age 18 of males who died after January 1, 1968, would be entitled to benefits (i.e., no reduction was made for uninsured males, for an aggregate number of orphans in excess of four, or for non-payment of benefits because of marriage of orphans).
- (c) For the proposed plan benefits in respect of male contributors were assumed to equal 98% of the aggregate benefits estimated for the existing plan. Benefits in respect of female contributors after the effective date of the amending legislation were estimated using similar techniques to those employed in estimating aggregate benefits for the existing plan except that (i) female rather than male factors were used, (ii) it was necessary to assume that only certain proportions of the female population would be insured for orphans' benefits, and (iii) a final adjustment factor of 0.95 was applied to total benefits in respect of female contributors to allow for the fact that a child cannot simultaneously receive benefits in respect of both of his parents. Sample value of the proportions of the female population insured for orphans' benefits are shown below:

Proportions of the Female Population insured for Orphans' Benefits

<u>Age</u>	<u>1975</u> %	<u>2000</u> %	<u>2025</u> %
20-24	57	63	63
25-29	62	72	72
30-34	50	70	70
40-44	39	67	69
50-54	39	65	67
60-64	33	57	66

12. Notes on Recent Experience

The following table shows ratios, for the years 1970 to 1973, of actual experience to amounts expected in accordance with projections on "Moderate Inflation" assumptions in the actuarial report as at December 31, 1969.

	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Contributions	.98	.98	1.02	1.01
Retirement Pensions	1.03	1.09	1.05	1.05
Disability Pensions (incl. children)	.18	.27	.54	.67
Survivors' and Death Benefits	.78	.77	.78	.78
Expenses of Administration	.90	.93	.92	.95
Total Benefits and Expenses	.81	.74	.82	.86
Fund at year end	1.00	1.00	1.02	1.02

Retirement pensions paid have been slightly but consistently above the amounts projected. This may be largely attributable to a slight underestimate of the amounts of pensions payable between ages 65 and 70. If this is the case, retirement pensions paid under the proposed plan may be expected to be even closer to the amounts projected.

Disability benefits first became payable during 1970 and it is a little early to draw any conclusions from the experience. Undoubtedly, substantial delays and omissions of applications occur because of the lack of familiarity with the program. Underutilization may also prevail if other existing disability benefit programs do not require beneficiaries to apply for Canada Pension Plan pensions.

With regard to survivors' benefits it would appear that the combination of assumptions used provides some margin of safety, but a substantial part of the gap between actual and expected payments is attributable to delays in application which may be expected to diminish with time.

As in the preceding report, the projections include no arbitrary adjustment to allow for the gap between actual and projected expenditures for benefits in the early years. On the other hand, rather high credibility was given to contribution statistics, and the substantial excess of contributions actually received over contributions expected on the basis of unadjusted projections was used for purposes of deriving adjustments to allow for overpayments.