THE AGING OF THE BABY BOOM
GENERATION AND ITS EFFECTS ON THE
LONG-TERM CONSEQUENCES OF SOCIAL INSURANCE

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Panelists: BERNARD DUSSAULT
               BARBARA A. PRICE*
               GORDON R. TRAPNELL
Recorder: CHRISTOPHER J. FOOTE

o   Discussion based on two American Council of Life Insurance studies
o   Prime life generation -- characteristics and attitudes of Americans aged
     50-64
o   The older baby boomers -- their potential as consumers
o   Long-range consequences of social insurance

MR. BARRY S. HALPERN: This session will present some information developed
under the direction of the American Council of Life Insurance. That study deals
with the implications of the aging of the baby boomers on the insurance
industry.

The Society's Committee on Social Insurance has encouraged some research into
the long-term costs of the United States and Canadian social insurance programs,
particularly as they were impacted by the demographic changes caused by the
aging of the baby boomers. The results of two separate studies, one covering
U.S. programs and the other covering Canadian programs, will be presented.

I think you will find the combination of these programs interesting and informa-
tive. Further, some results of the studies may be somewhat surprising.

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PANEL DISCUSSION

Our panelists are Barbara Price, who is here as a guest speaker. She is a
program director in the Strategic Research Department of the American Council
of Life Insurance. After Barbara, Gordon Trapnell will speak. Gordon, who is
president of Actuarial Research Corporation in Annandale, Virginia, will discuss
the U.S. social insurance programs. Gordon's counterpart for the Canadian
programs is Bernard Dussault, who is a director in the Division of the Office of
the Superintendent of Financial Institutions.

MS. BARBARA A. PRICE: Over the last several years the Strategic Research
Department of the American Council of Life Insurance (ACLI) has been involved
in several demographic studies and public attitude studies about population aging
and the baby boomers. I want to weave some of the findings together, into the
major theme of my presentation, which is the future financial vulnerability of the
baby boom generation.

First, let me use a little demographic data to draw a picture of baby boomers in
the 1980s. We've heard a lot about the baby boom generation, those 75+ million
Americans born from the years 1946 to 1964. Some of us here this morning are
part of it and some of us here helped produce it. One out of every three
Americans today is a baby boomer. What's so special about this group? Well,
baby boomers have always taken an active role in shaping society rather than
just reacting to it. Peter Franceses, president of *American Demographics
Magazine*, recently spoke at a conference sponsored by the ACLI and the Life
Insurance Research and Marketing Association (LIMRA). He described the
baby boomers as the ones who turned college campuses upside down in the late
1960s and 1970s. Baby boomers, as he described, liberated women from the
kitchen, sex from the bedroom, and pot from the jazz clubs. This generation,
who at one time didn't trust anyone over age 30, is now beginning to enter its
40s.

Some people look at the baby boom generation as two distinct groups, younger
boomers and older boomers. Most of the older boomers are leading settled lives.
Many of the younger group, who are still in their 20s, "are still looking for
spouses, houses and satisfying jobs," according to *American Demographics
Magazine*. The older group, of course, has more income and more economic
clout. The median income of young boomers is one-third lower than older boom-
ers. Also, older boomers have a distinct advantage in the housing market.

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The yuppie image of the baby boomer is largely a media myth. In 1985, households with incomes of $50,000 or more represented only 1 of 10 households led by persons age 25 to 34; and only 2 in 10 of those aged 35 to 44. But in the year 2000, the leading edge of the baby boom generation will be in its 40s and early 50s, a time in life, for many, characterized by affluence and achievement. It's usually the peak of one's working career and earnings. So, the next 13 years will be ones of greatly expanding income and asset accumulation for the first wave of baby boomers.

One mark of the baby boom generation, setting it apart from previous generations, is its fairly high level of educational attainment. Nearly one-half have been exposed to some college education, twice the proportion of the population that is age 55 and older. Also, the younger half of the baby boom is the first cohort in America to send its women to college in the same numbers as its men. Marketing people tell us that education, income and consumer behavior are all linked together. As the baby boom enters middle-age and start to worry about preparing financially for retirement and for financing their children's college education, it could mean a boom for the financial services businesses and the products that will meet the needs of the various baby boom market segments.

A few years ago, the ACLI sponsored a public opinion survey of baby boomers. The survey showed that baby boomers are fairly optimistic about their financial future. More than 8 in 10 baby boomers felt at least somewhat secure about their future, while more than 9 in 10 believed they have either a very good or a fairly good chance of achieving the "good life." Further, 2 in 3 members of this generation believe themselves to be better off financially than their parents were at the same age. However, some recent studies have indicated that this isn't necessarily true.

This financial optimism may be misplaced however, considering some of the changes in society that are bound to affect the baby boom and are bound to be affected by the baby boom in the decades ahead. Two demographic trends may be potential risks to the financial well being of baby boomers in the coming years. The first risk is high divorce rates and the second is lengthening life expectancy.

PANEL DISCUSSION

First, high divorce rates. Although the escalating divorce rates of the 1970s seem to be stabilizing a bit, the U.S. divorce rate is still among the highest in the world. Some population experts believe the older baby boomers may be at a higher risk of divorce than any generation before or after it.

The first marriages of almost one-third of married women in their mid to late 30s had already ended in divorce by 1985. Some recent studies suggest that this proportion could reach one-half. For these women, the risk of their marriage ending by divorce is greater than the risk of their marriage ending by death of the spouse.

Although most divorced people eventually remarry, the economic fortune of families when led by one parent is not as promising as when led by two. In fact, the effects of divorce can be fairly devastating. A University of Michigan study, following 5,000 American families through the late 1960s and into the 1970s, found women who were married at the beginning of the study and who divorced during the study posted the largest drop in family income.

Census Bureau data on the income of different types of families consistently show female-headed-family income to be much lower than the income of married-couple families. In 1986 for example, the latest figures available, indicate the median income of married couples was $31,100; and for female headed families it was $13,660, less than half. One in three U.S. families led by women in 1986 was in poverty.

The second demographic trend that will have a major impact on the baby boom generation is lengthening life expectancy. From 1954 to 1968 life expectancy in the U.S. hardly improved. This led some researchers to conclude that human beings were living as long as they were designed to live. Past gains in life expectancy were won by eliminating childhood diseases and infectious diseases. It was then thought no more gains could be expected. This point of view was logical, but it turned out to be wrong.

Since 1968, life expectancy has improved dramatically. A child born in 1968 could expect to celebrate his/her 70th birthday, while a baby born in 1986 can expect to live to be 74.9 years, a new record high. Some experts say life expectancy in the early 21st century could reach 80 years or more.

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Life expectancy for those reaching the golden years also is improving. If a person were lucky enough to make it to age 65 in the year 1900, and of course the odds were fairly slim that that would happen, that person could have expected to survive an average of 12 more years. In comparison, a 65-year-old today can expect to live another 16.7 years.

I think that living longer could have a negative impact on baby boomers. A major implication of increasing longevity and the growing elderly population for the life and health insurance business is the challenge we face to help Americans prepare for the financial consequences of living too long rather than dying too soon. To baby boomers, retirement age is really a long way down the road. It's hard for them to think beyond the everyday expenses of raising a family and paying for their mortgage, let alone putting away money for retirement years. Even as people get closer to retirement, there is evidence they may not be planning adequately for expenses.

For example, the ACLI did a study several years ago on the pre-retirement population, the prime-life group, those aged 50 to 64. We found that they tend to underestimate their cohort's life expectancy. We also know that despite a general optimism about their financial situation in retirement, one of this group's major concerns for the future is unexpected health problems wiping out their resources. The group grossly overestimate or are misinformed about what Medicare will and will not cover in later years, especially long-term care costs.

Experts in aging really don't agree about the effects of lengthening life expectancy on the health of the older population. Some experts feel the effects of aging will be postponed and in the future older people will be in better health. Others experts feel the elderly will suffer from chronic ailments of aging for a longer time before they die. One thing is certain however, more people of the baby boom generation will live into their eighth decade than any generation before them. This is a time of life when chronic ailments and functional disabilities of aging are prevalent and when health care costs are a major concern and a major expense.

We know the need for long-term care increases with age and that the risk of institutionalization dramatically rises after age 85. In 1985 the U.S. government took a survey of nursing homes and found a little more than 1% of people aged

65 to 74 were in nursing homes, compared to 6% of those between 75-and 84-years-old. Twenty-two percent of people 85 and over were in a nursing home, 1 out of 4 women, and 1 out of 7 men.

This old population of those 85 and older is growing dramatically. The increases among the very old in the next few decades will really pale in comparison with the increases the U.S. will face during the fourth decade of the 21st century when baby boomers reach that age.

Actually many baby boomers are in double jeopardy of being financially unprepared for the costs of long-term care and they don't know it. Baby boomers face these costs for themselves and for their aging parents. Some will even be caught in the squeeze of helping their parents at the same time they're paying their children's college education. Most baby boomers, today, have both parents living and by the time the baby boomers reach their late 60s, an estimated one-third of the women will still have one surviving parent.

Today, the cost of long-term care is borne by a combination of three sources in the U.S., Medicare, Medicaid, and the personal finances of the elderly themselves. Private long-term care insurance is still in its infancy. In 1984, only $3 million of the $32 billion spent for nursing home care came from private insurers. Health insurers are experimenting with combinations of traditional types of insurance such as disability, health and annuities to create new products that would appeal to different groups in the long-term care marketplace.

Our research at the ACLI indicates that the public is fairly receptive to the idea of long-term care insurance. A 1986 survey found that 8 in 10 persons thought it is very important for the elderly to have health insurance for a nursing home or for a private nurse. Two-thirds of the public said they would be willing to share the cost of such insurance with their employer. As people become increasingly aware of the financial realities of long-term care, the pressure is sure to increase for long-term care insurance. Long-term care is a hot topic right now.

The stage is set for the aging of the baby boom generation. The forces are already in motion. The public policy debate on how society and its institutions can accommodate this "pig in the python" will continue for some time and will

certainly have an impact on the life and health insurance business as employers and as providers of financial security products and services.

MR. GORDON R. TRAPNELL: My concern is with the financing of social insurance benefits for aging baby boomers. I will present some preliminary results from a study being conducted by the Society Of Actuaries' Social Insurance Sub-Committee. The objective was to add up the costs of the different social insurance (SI) programs in specific future years. By doing this we can show the complete legacy that we are bequeathing to our children and grandchildren.

One problem faced is the need for consistent measures to compare and add up the costs of the different programs which arises because programs have different financing bases and legal implications. We have used a simple measure of the outlays in the programs to taxable payroll even though the taxable payroll is the legal basis only for the Old-Age, Survivors, and Disability Insurance (OASDI) Program.

Nearly all the past discussions of financing social insurance have centered on whether, within the specific framework of a particular closed system, the earmarked revenues and interest will support the outlays as measured by the well known Trowbridge Average Actuarial Balance method. This method uses the arithmetic average of the excess of the income to the program over the cost, expressed as a percent of payroll.

This method has dominated the discussions of the financial status of the trust funds and hence by inference, the financial soundness of the OASDI programs. The long-range OASDI actuarial balance, averaged over the 75-year period 1987-2061, is -0.61%. Since this deficit is less than 5%, the system is said to be in close actuarial balance, i.e., it is well financed.

As a side remark, this actuarial concept of a close balance for a long-range program, such as the Social Security program, is one of the real success stories in influencing public discussions of the financing of social insurance. The politicians have proved willing to put actual tax increases into the law for future years, and sometimes present years, in order to show close actuarial balance. Further, nearly all of the tax increases scheduled for recent years have actually

taken effect. In the early days the program went for 10 or 15 years without a single scheduled tax-rate increase taking effect.

Preoccupation with a single measure such as the actuarial balance obscures other aspects of the program. For example, it is not well known that the projection furnished in the Trustee's Report, which most actuaries regard as the real projection, shows the cost of the OASDI program rising from 10.89% of covered payroll in 1987 to 15.85% of covered payroll in 2060, a 46% increase. (see Exhibit I.) At this time there would be a deficit of 2.69% of covered payroll, or 17% of the overall cost.

If we project the Hospital Insurance (HI) program for a full 75-year period with assumptions similar to those in the Trustee's Report, furnished by the Office of the Actuary of the Health Care Financing Administration, the cost will rise more than 100% to 6.76% of payroll in 2060, with a deficit of 3.86% of covered payroll, which is 57% of the total cost rate. Over the 75-year period, the deficit in the actuarial balance of the HI program would be 2.3% of payroll, or 44% of the average cost.

Further, the cost of these programs may be much higher than officially recognized. For example, over the 30-year period from 1956 to 1985, the average annual real wage growth was 0.9%. This postwar period represents one of the most prosperous and productive periods in our history, however, the OASDI Trustee's Report is based on the assumption that the real wage growth will be 1.5% per year over the full 75-year period. It appears the administration is confusing economic goals with actuarial assumptions.

Since 1973, the U.S. fertility rate has been at about 1.8 children per woman, but the Trustee's Report persists in using a fertility assumption of 2.0, again for the entire 75-year period. I believe that the changes in the culture and career patterns of women in our society provide every reason to expect the fertility rate to remain at or around 1.8.

Without getting into why optimistic assumptions tend to be incorporated into cost estimates that are supervised by politicians and which are politically sensitive, we have prepared alternate projections based on what we regard as more realistic assumptions. We have assumed the real wage growth will be 1% annually, that

Percent
of
taxable
payroll

Comparison of projected cost rates and income rates for the United States OASDI program, based on the 1987 Trustee's Report alternative II-B assumptions
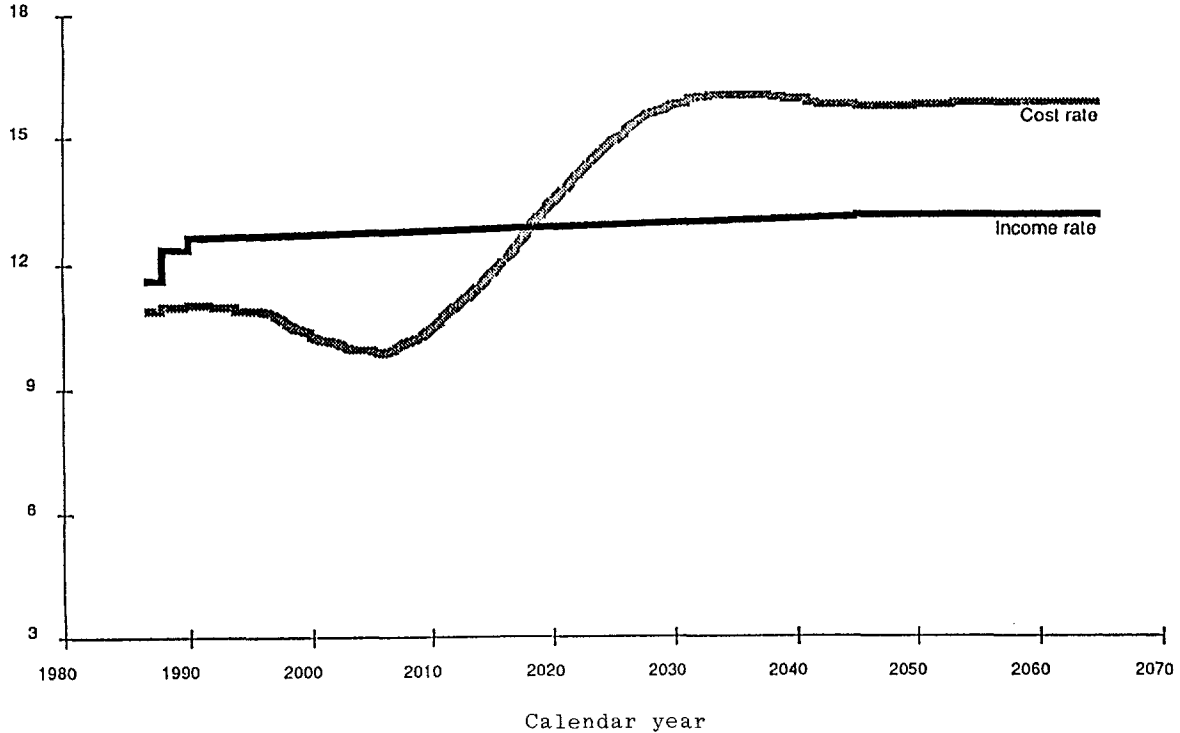

Calendar year

the fertility rate will be 1.8, and that the immigration rate will approximate the levels experienced over the last 10 to 20 years (this ignores the implications of the recent immigration bill).

Under these assumptions, the 75-year average cost of the OASDI and HI programs is 20.71% of payroll versus 18.71% under the assumptions in the Trustee's report. Further, these realistic assumptions increase the 2060 cost to 27.4% of covered payroll, versus 22.6%. There would be a deficit at this time of 11.3% of payroll or 41% of the cost rate. The implications are the same if you consider either of these programs separately. The cost of the OASDI program under these assumptions is shown in Exhibit II for comparison with Exhibit I.

If we continue to finance these programs on a "pay-as-you go" approach, payroll taxes of 27-28% would be required in the years 2050 to 2060. This is not the whole story. The various SI programs represent a long-term commitment that cannot easily be dropped without undermining faith in all of the promises of the federal government. The history of beneficiary groups, whether veterans, farmers, or student loan recipients tends to reinforce the notion that these programs will never be cut back dramatically.

But, what are the long-range implications of financing these programs, particularly the supplementary medical insurance program (i.e., Part B of Medicare) and the long-term care portion of the Medicaid program? We could also consider the Supplemental Security Insurance program (SSI), although that is generally a program for poor people, whereas I would classify Medicare Part B and the long-term care portion of Medicaid as being for middle-class people and is generally less subject to the political pressures that tend to keep social insurance programs alive.

Using the same long-run economic assumptions, we have projected the cost of Part B will rise from 1.6% of payroll to 4.5% of payroll by 2060. The Medicaid program will increase from 2.1% to 3.9% of payroll over the same time.

This next chart (Exhibit III) shows what happens when you add up the elements of our social insurance programs. However, we have excluded the SSI, Veterans, military, and civil service retirement programs which also would be much

Comparison of projected cost rates and income rates for the United States OASDI program, based on assumptions of 1.8 fertility rate and 1.0% real earnings

THE AGING OF THE BABY BOOM GENERATION

EXHIBIT II
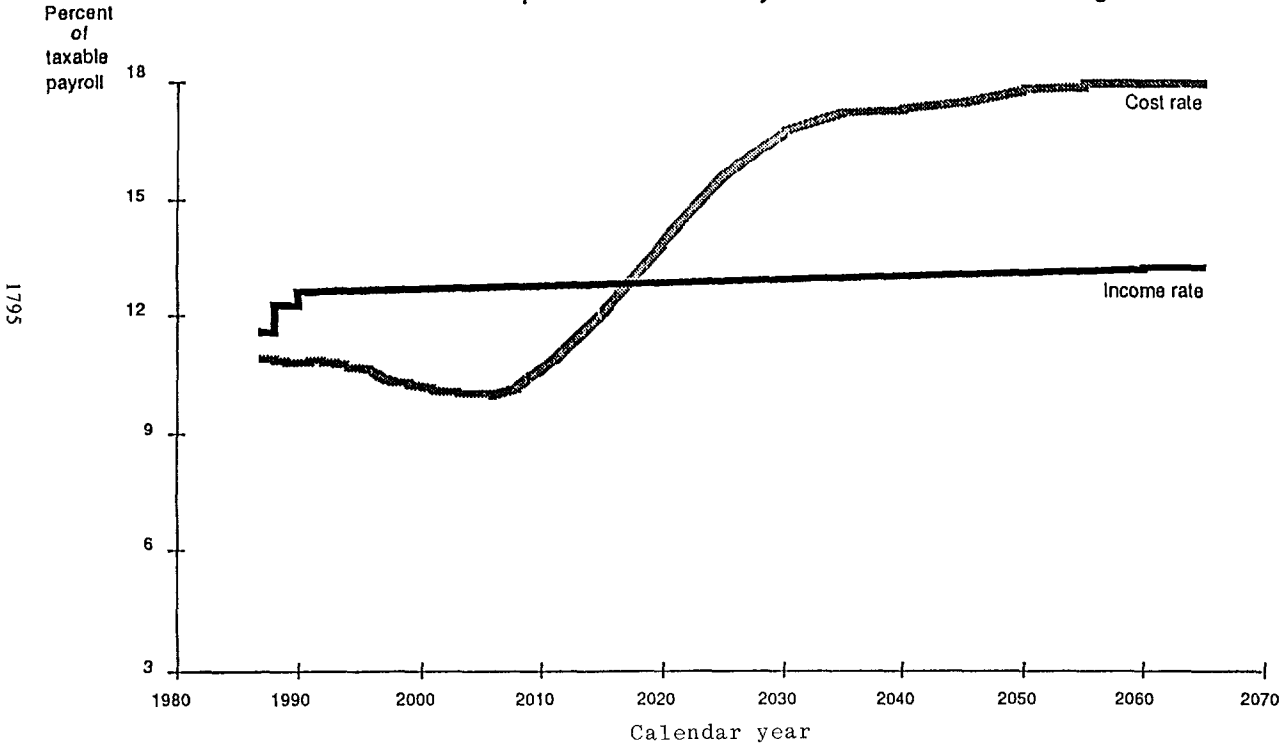
Projected cost of United States social security programs,
based on assumptions of 1.8 fertility rate
and 1.0% real earnings

Percent
of
taxable
payroll

Calendar year

EXHIBIT III

Medicaid

SMI

HI

DI

OASI
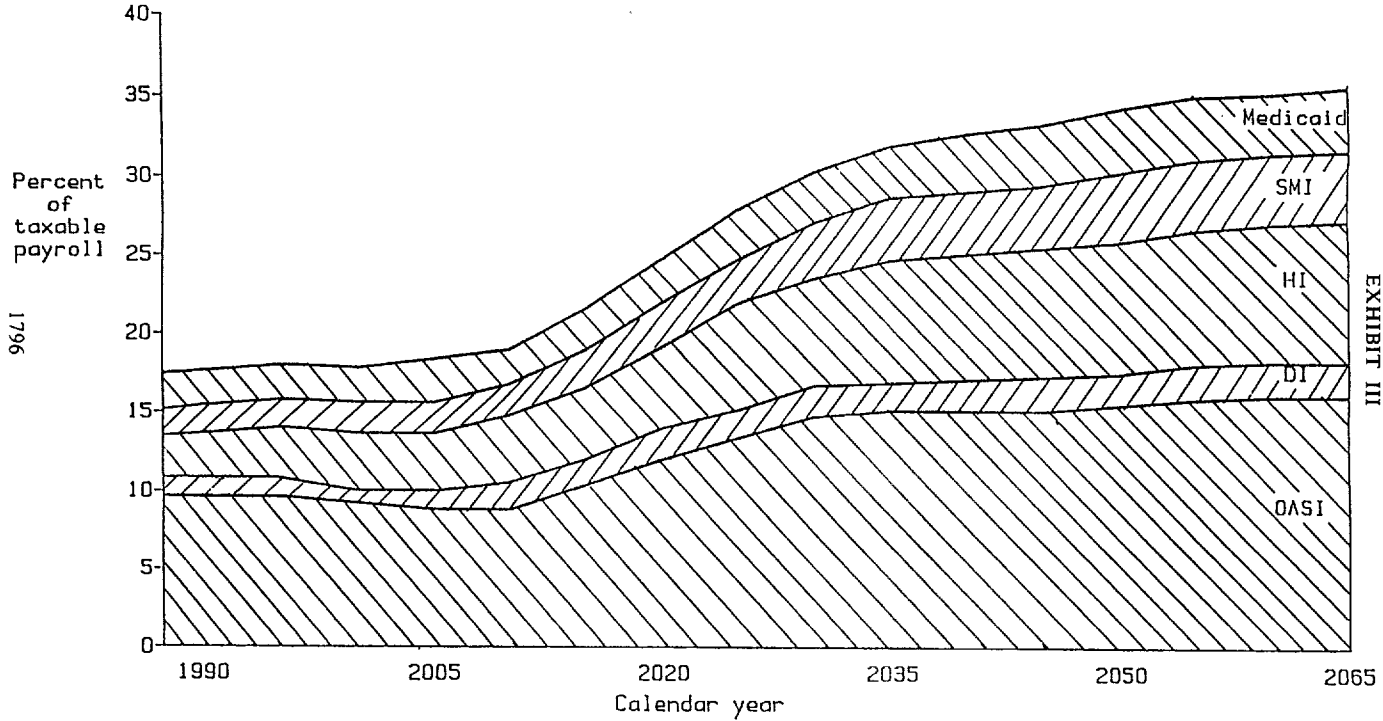
more expensive to finance in the future. Here you see the dramatic increase in the total cost of these programs over the 75-year period.

The problem is that today's politicians promise benefits which will be funded tomorrow. The politicians have it both ways, they get to promise the benefits without having to worry about raising taxes to pay for them. The conclusion to be drawn from this discussion is that the revenue must be found to pay our social insurance benefits. It doesn't matter whether the tax revenue pays for current benefits or whether the revenue covers the debt incurred for benefits paid in prior years. The total amount of taxation, required to pay the benefits in each of those years, is the same.

In measuring the national debt and establishing the federal government's budget, prefunding social insurance programs is exactly offset by reductions in other, current tax income. In other words, politicians have been able to reduce other taxes because the SI programs have a current excess of taxes over benefits.

The reverse will occur in later years when these programs are "defunding," i.e., when the programs are using past accumulated balances from the trust fund to finance SI programs. Benefits, in those years, will exceed the programs' revenues. The difference could come from other taxes or from further borrowing, but somehow the money must be found to pay the benefits in those years.

Our study is not complete. We are still struggling to find the most appropriate way to measure the cost of these programs. This discussion has centered on covered payroll as that measure, which is only appropriate for the OASDI program, since the other programs do not use the definition of covered payroll. However, covered payroll may still be used to get an idea of the level of required taxes. Another and perhaps more appropriate measure may be the cost of these programs relative to the Gross National Product (GNP).

MR. BERNARD DUSSAULT: I would like to present a study that has been conducted under the auspices of the Canadian section of the Society of Actuaries Committee on Social Insurance. This study looks at the projected costs of Canadian social security programs and examines how, under alternate

demographic and economic scenarios, they could be affected by the retirement of the baby boom generation and by the population aging process.

Until now, the only social insurance programs in Canada whose long-range costs had been projected were the Canada and Quebec Pension Plans (CPP and QPP). In the last CPP Statutory Actuarial Report, the cost of this program, on a pay-as-you-go basis, was projected to increase from 4.76% of contributory earnings in 1987, to more then 11% by 2025. Many individuals believe this cost can easily be met, often pointing to the cost of social insurance programs in other countries that are higher. One example in the U.S. is OASDI.

Our concern is that, when the cost of other social insurance programs also is taken into account, the projected increase in cost will be much higher. Although there are no proposals for slowing down the projected increases in costs, we believe that the potential increase in the cost of the Canadian social insurance programs needs to be generally recognized and its implications studied. The projections, required to be prepared in the federal Office of the Superintendent of Financial Institutions, should be a good starting point for people to think about how they would like these programs to operate in the future.

Before presenting the results of this study, I wish to lay some groundwork by covering the programs which were studied and stating some of our methods and assumptions. The Committee on Social Insurance was particularly interested in including those programs having a U.S. counterpart whose future cost is likely to be significantly greater than their present cost. Thus, our emphasis is on those programs that pay benefits to the elderly and those programs whose unit costs are expected to increase faster than wages. The programs covered by this study are consequently the following:

> C/QPP: Canada Pension Plan and Quebec Pension Plan
> OAS: Old Age Security
> GIS: Guaranteed Income Supplement
> SPA: Spouse's Allowance
> HEALTH: Federal-provincial health services programs

The programs excluded represent significant aspects of broad social policy. However, our time and available resources did not allow analysis of all the

programs. We hope this omission will be overcome by future activity of the Committee on Social Insurance and of other interested parties. The programs not covered at this time are the Family Allowance, Unemployment Insurance, Workers' Compensation, and Social Assistance.

Actuaries will appreciate that the cost estimates of this study are based not on predictions, but on assumptions of what could reasonably be expected to happen to the variables involved in the calculations, namely fertility, migration, mortality, annual rate of increase in earnings, annual rate of benefit indexing, and eligibility or participation rates.

For purposes of uniformity and simplicity, the costs of all programs are shown as percentages of total employment earnings. These earnings were projected using the same methods as for CPP actuarial reports. For C/QPP, using total employment earnings results in lower costs than actual C/QPP contribution rates since the contributory earnings exclude earnings below the Year's Basic Exemption and above the Year's Maximum Pensionable Earnings (YBE and YMPE).

There also are two other factors causing differences between the costs shown for C/QPP in this study and those shown in Table 10 of CPP Actuarial Report #10 (as of December 31, 1985). First, the assumed annual rate of increase in the Consumer Price Index is 4% for C/QPP benefit indexing purposes in this study while it is 3.5% under CPP Actuarial Report No. 10. Second, the target population for purposes of all estimates in this study is total Canada while it excludes Quebec under CPP Actuarial Report No. 10.

Our projection methods for OAS benefits match those used in the CPP actuarial report, as these benefits are comparable to some of the flat-rate benefits provided by C/QPP.

GIS and SPA are income tested programs but their benefits were, for practical reasons, projected by relying primarily on patterns of eligibility (utilization) rates experienced from 1979 to 1986. Broadly speaking, such experience patterns were extrapolated until the year 2010, after which time utilization rates were assumed to be constant. Year 2010 was chosen partly because it is the year which CPP and QPP would almost have matured.

PANEL DISCUSSION

The expected increase in the number of employer-employee pension plans and other less important factors also will affect eligibility to GIS/SPA for a period of time extending after 2010. Since experience on GIS/SPA is available for only a short period of time, 1979 to 1986, the extrapolation of GIS/SPA utilization rates after year 2010 was deemed to be too arbitrary and not conservative enough.

Our study of the health programs is not as extensive as we would like. Further, refinements must be made to the input data, particularly in the per capita costs by province and by age to the health-care inflation and utilization estimates.

For the purpose of this panel discussion, we chose assumptions to be as uniform as possible with those used in the presentation on the U.S. programs. The chart lists the assumptions used in this study. Note that there are no assumptions for investment earnings as costs are presented on a pay-as-you-go basis.

Projected costs can be greatly affected, at least in the long run, by variable levels of migration including age distribution of migrants, improvement in life expectancy, and fertility. However, fertility is the sole area where the range of reasonable variations has a significant impact on projected costs. Ultimate fertility assumptions retained for our main estimates correspond to a level higher than experienced in the last fifteen years. Fertility assumptions are still much lower than the level experienced by the Canadian population at the end of the baby boom period in 1964. Later in this discussion, I will comment on the overall effect of expected decreases in mortality rates. However, fertility remains the only demographic assumption presented on both a main and alternative basis.

The results are very sensitive to variations in the rate of increase in earnings and the benefit indexing rate, with the gap between these two rates being the dominant influencing factor. We have decided to set the earnings rate of increase at 5% and to vary the benefit indexing rate to obtain a gap between those two rates of +1% as the main assumption for all programs and 0% as an alternate assumption for non-earnings related programs (e.g., OAS, GIS, SPA and health). This might be seen to correspond to a conservative scenario and was chosen with respect to the health programs; but for the OAS, GIS and SPA programs which provide periodic inflation adjustments to rates of benefits, the zero gap was selected because of probable ad hoc changes to these programs intended to keep benefits in line with earning levels.
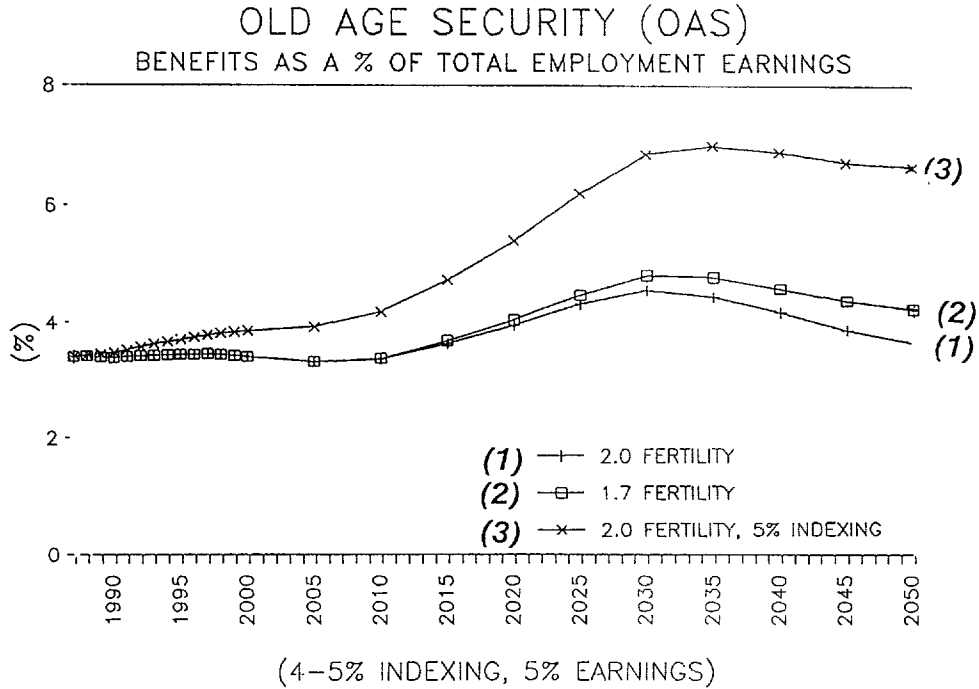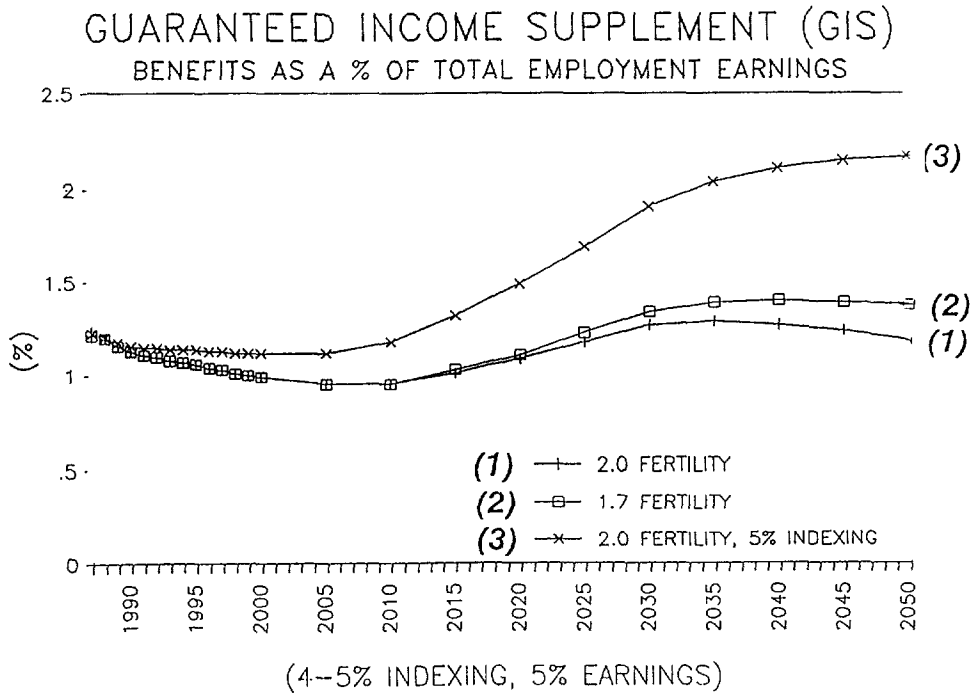
THE AGING OF THE BABY BOOM GENERATION

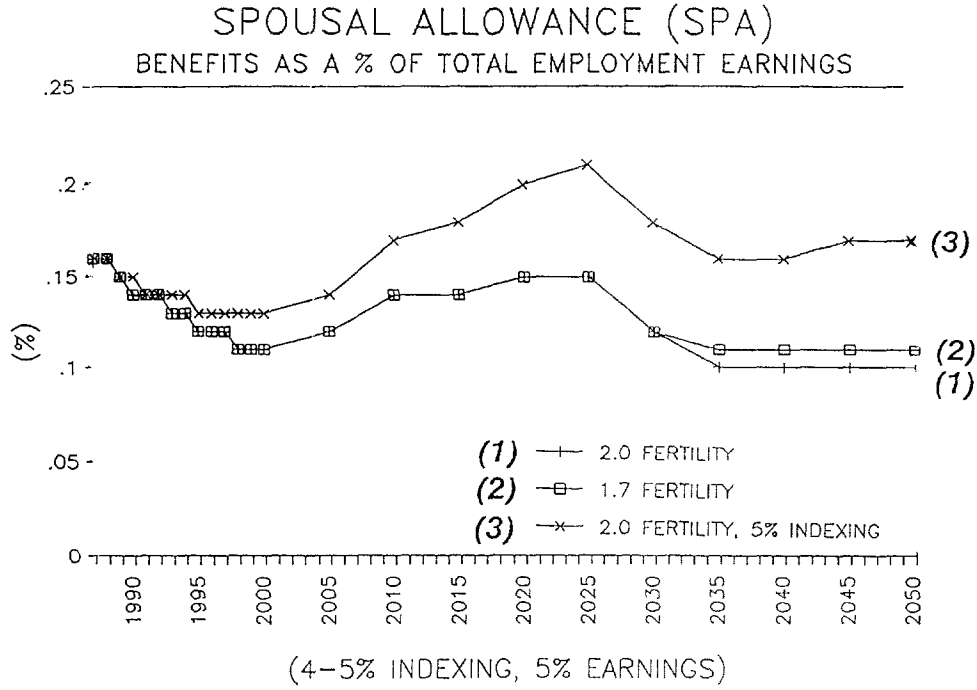|	MAIN	ALTERNATE
Fertility:	Gross reproduction rate of 2.0 reached in 2010, constant thereafter	1984 actual level (1.6855) assumed constant
Net Immigration:	A constant 0.302% of total Canadian population	No alternate
Mortality:	1981 Canadian Life tables with improvements until year 2050	No alternate
Earnings:	5%	No alternate
Indexing:	4%	5% for all but C/QPP 6% for HEALTH
Utilization:	Constant 1986 levels for OAS and HEALTH; Extrapolated trends for C/QPP, GIS and SPA	No alternate

A second alternate assumption, for health programs, of a negative gap of 1% was selected as a "worst" scenario. In the long run, this is not too realistic but was selected for purposes of simplicity when comparing results with those based on a 0% gap.
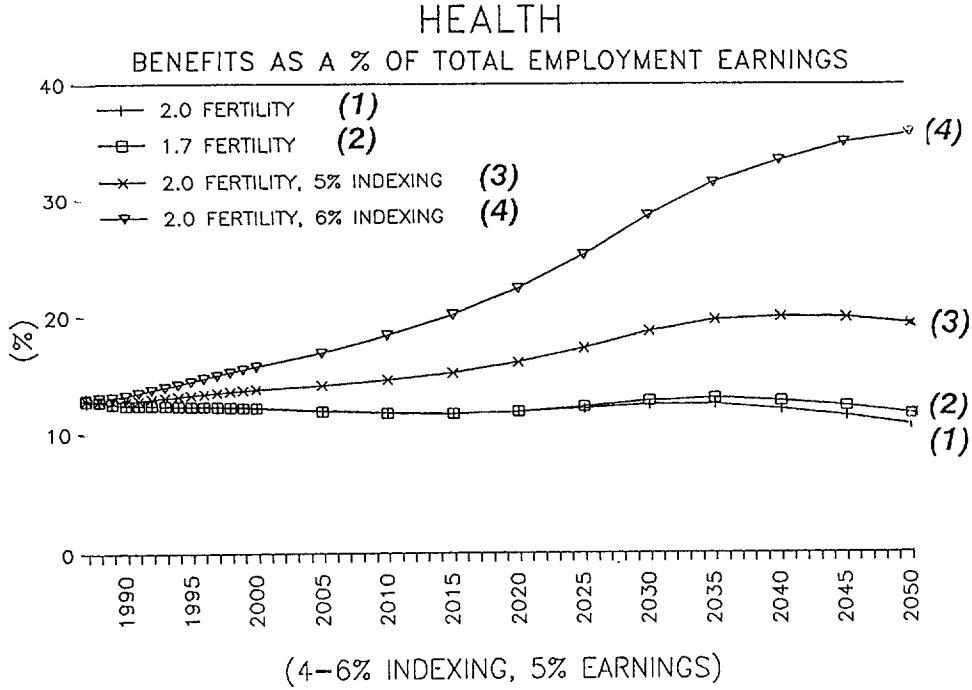
The results of this study show that for programs such as OAS, GIS and SPA, future costs would increase only if benefits are indexed to earnings (see line 3 in Exhibits IV, V and VI). For GIS and SPA however, the assumed decreasing rates of utilization have a partial, but still significant offsetting effect. The results also show that a 1% gap between earnings and indexing would almost neutralize the effect of the population-aging on these three programs (see lines 1 and 2 in Exhibits IV, V, and VI).

These conclusions also would hold true for health programs, if the annual increase in the price of health services was decreased to 4%. Even if health programs encompass all ages, the cost is greatly affected by the elderly because of the higher health costs they normally experience. For health programs therefore, future costs are expected to increase, if the annual increase in health unit costs is greater than the annual increase in earnings, or if utilization rates increase, or a combination of both. (See Exhibit VII for projections for the health programs.)

OLD AGE SECURITY (OAS)
BENEFITS AS A % OF TOTAL EMPLOYMENT EARNINGS

(1) —+— 2.0 FERTILITY
(2) —▫— 1.7 FERTILITY
(3) —✕— 2.0 FERTILITY, 5% INDEXING

(4-5% INDEXING, 5% EARNINGS)

GUARANTEED INCOME SUPPLEMENT (GIS)
BENEFITS AS A % OF TOTAL EMPLOYMENT EARNINGS

(1) —+— 2.0 FERTILITY
(2) —□— 1.7 FERTILITY
(3) —✕— 2.0 FERTILITY, 5% INDEXING

(4—5% INDEXING, 5% EARNINGS)

SPOUSAL ALLOWANCE (SPA)

BENEFITS AS A % OF TOTAL EMPLOYMENT EARNINGS

(1) —+— 2.0 FERTILITY
(2) —⊟— 1.7 FERTILITY
(3) —✕— 2.0 FERTILITY, 5% INDEXING

(4-5% INDEXING, 5% EARNINGS)

EXHIBIT VII

HEALTH

BENEFITS AS A % OF TOTAL EMPLOYMENT EARNINGS

(4—6% INDEXING, 5% EARNINGS)

The results also show that the cost of programs providing earnings related benefits, like C/QPP, is expected to rise appreciably until year 2050 even if the gap between earnings and benefit indexing is positive (see Exhibit VIII). Actually, C/QPP costs will rise, until about 2035, after which time they stabilize subject to some fluctuations caused by past variations in fertility levels.
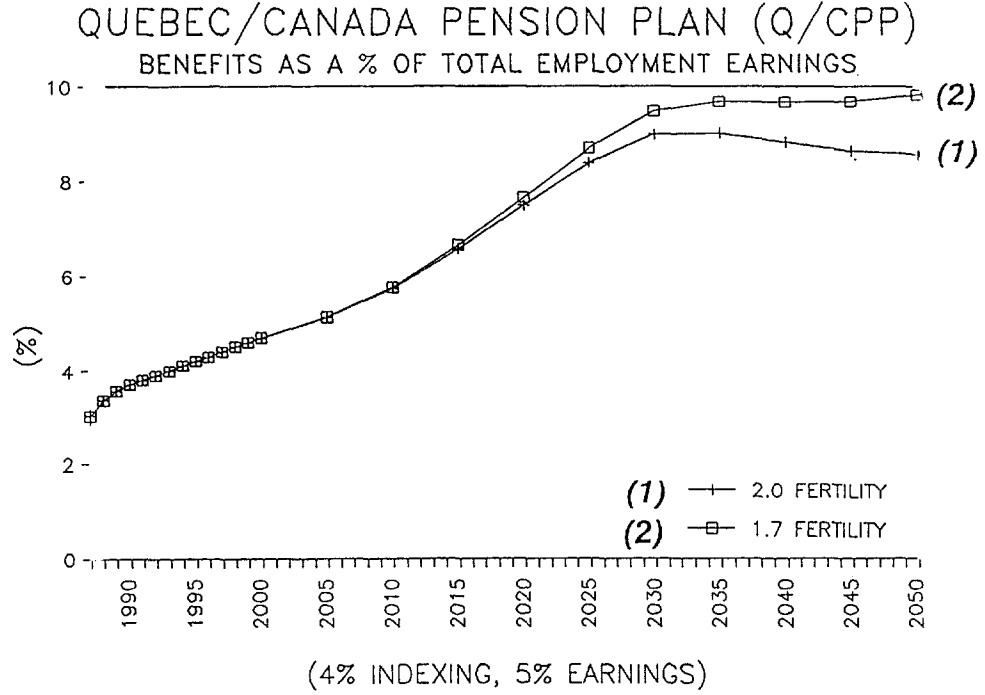
As opposed to the OAS, GIS, SPA and health programs which are exclusively of a "flat-rate" type, CPP and QPP are mostly earnings-related programs. A positive gap between earnings and indexation generally does not result in a decreasing cost pattern for earnings-related programs. However, a larger gap will cause a lower level of costs for earnings-related benefits. For C/QPP, expected future increases are, until about 2010, caused partly by its maturing process (i.e., larger proportions of persons over age 65 become eligible for retirement and survivor benefits).
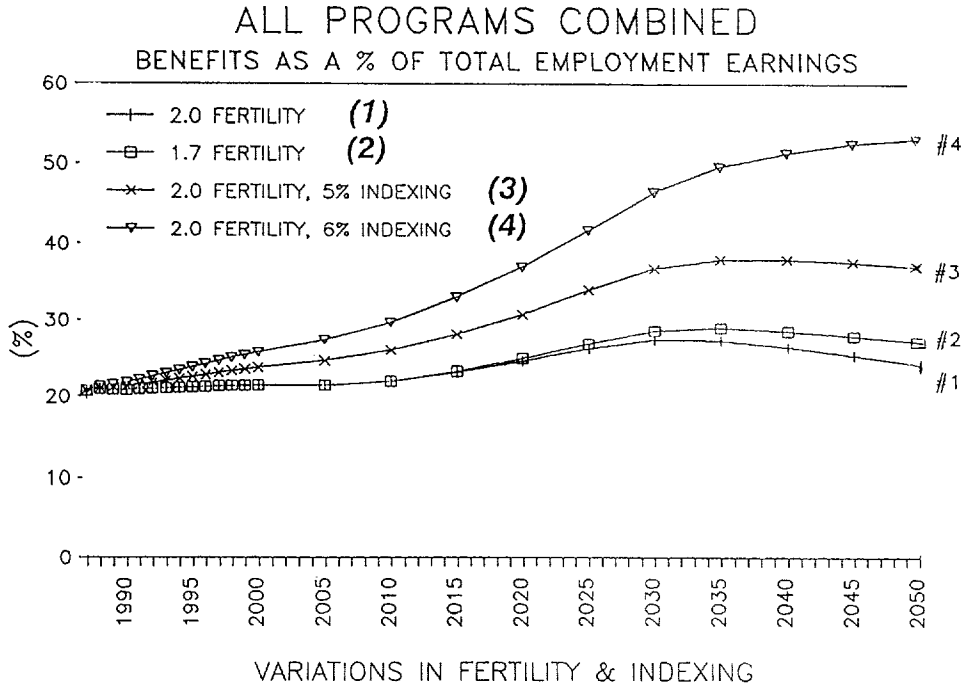
Apart from the maturing process of C/QPP programs, the main reason for the projected increase in the combined cost of all programs under the 0% gap assumption is the aging of the population (see line 3 in Exhibit IX). For programs that pay benefits primarily to the elderly, the projected aging of the population causes cost increases until about 2035. Thereafter, costs show minor fluctuations resulting from actual past or assumed future fertility levels. This projected aging of the population results from the assumptions made with respect to life expectancy and fertility.

We have estimated the effect on OAS costs of the assumed improvements in life expectancy under the 0% gap assumption. The chart below shows the OAS cost in 2050 projected with and without mortality improvements (also see Exhibit X). For more insight into its relative value, this effect is then compared with that of
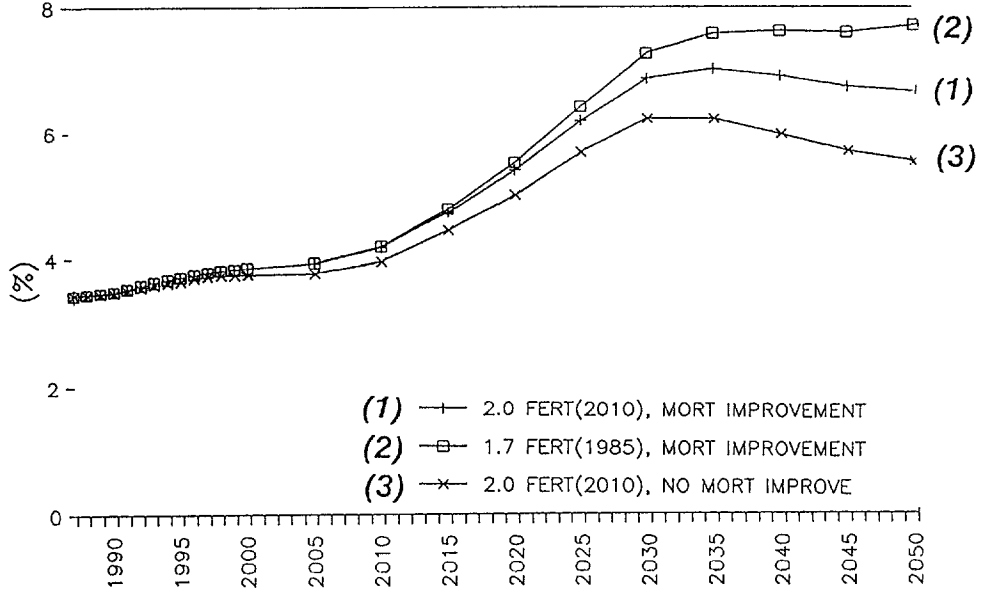
DEMOGRAPHIC ASSUMPTIONS		OAS COST FOR 2050	RELATIVE INCREASE
MORTALITY IMPROVEMENT	FERTILITY	2050	
		%	%
NO	2.0 (2010)	5.55	
YES	2.0 (2010)	6.67	20.2
YES	1.7 (1985)	7.71	25.6

QUEBEC/CANADA PENSION PLAN (Q/CPP)

BENEFITS AS A % OF TOTAL EMPLOYMENT EARNINGS

(1) ──┼── 2.0 FERTILITY

(2) ──□── 1.7 FERTILITY

(4% INDEXING, 5% EARNINGS)

ALL PROGRAMS COMBINED
BENEFITS AS A % OF TOTAL EMPLOYMENT EARNINGS

—+— 2.0 FERTILITY *(1)*
—⊟— 1.7 FERTILITY *(2)*
—✕— 2.0 FERTILITY, 5% INDEXING *(3)*
—▽— 2.0 FERTILITY, 6% INDEXING *(4)*

VARIATIONS IN FERTILITY & INDEXING

MORTALITY IMPROVEMENT:
THE EFFECTS ON OAS COSTS

(1) —+— 2.0 FERT(2010), MORT IMPROVEMENT
(2) —▱— 1.7 FERT(1985), MORT IMPROVEMENT
(3) —✕— 2.0 FERT(2010), NO MORT IMPROVE

reducing the projected total fertility rate from 2.0 to 1.6855 (the actual fertility rate for Canada in 1984).
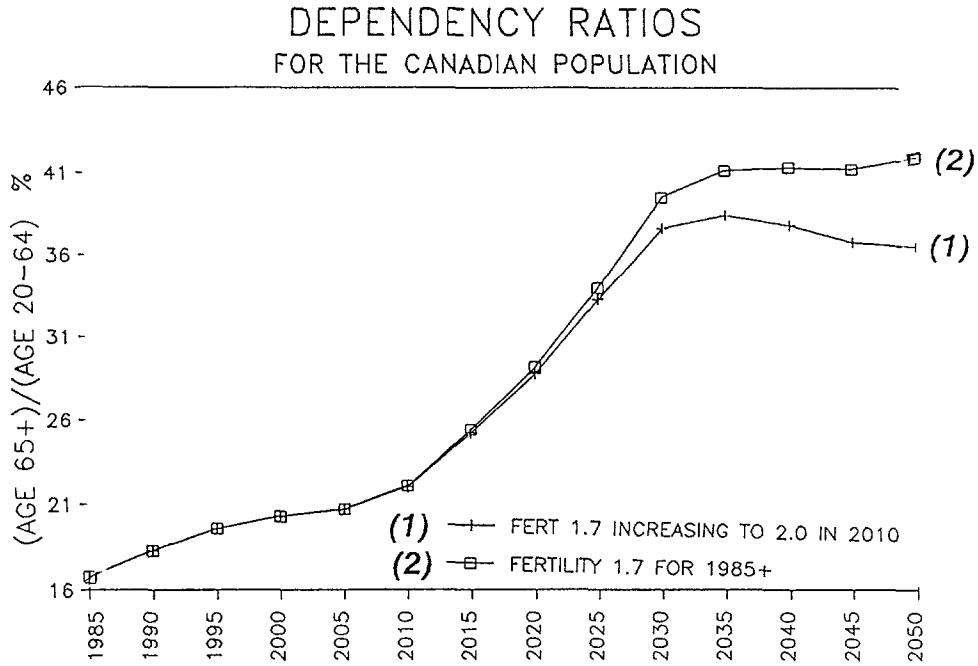
The important fluctuations and variations in past actual and future assumed total fertility rates for Canada are obviously the major cause, in conjunction with assumed levels of mortality and migration, for the particular pattern of age-dependency ratios over the years as shown in Exhibit XI. The pattern of age-dependency ratios reveals, among other things, that the population is expected to age from 1987 to 2050. The aging is caused by the assumed mortality improvements and the fertility assumptions which are much lower than the historical rates that have generated the current Canadian population. The gross fertility rate of 2.0 assumed for 2010 and later corresponds to a level of fertility lower than a net rate of 2.0 (i.e., taking into account the probability of surviving from birth to reproductive ages), which is the exact rate at which the population would become stationary assuming no migration and no improvement in longevity.
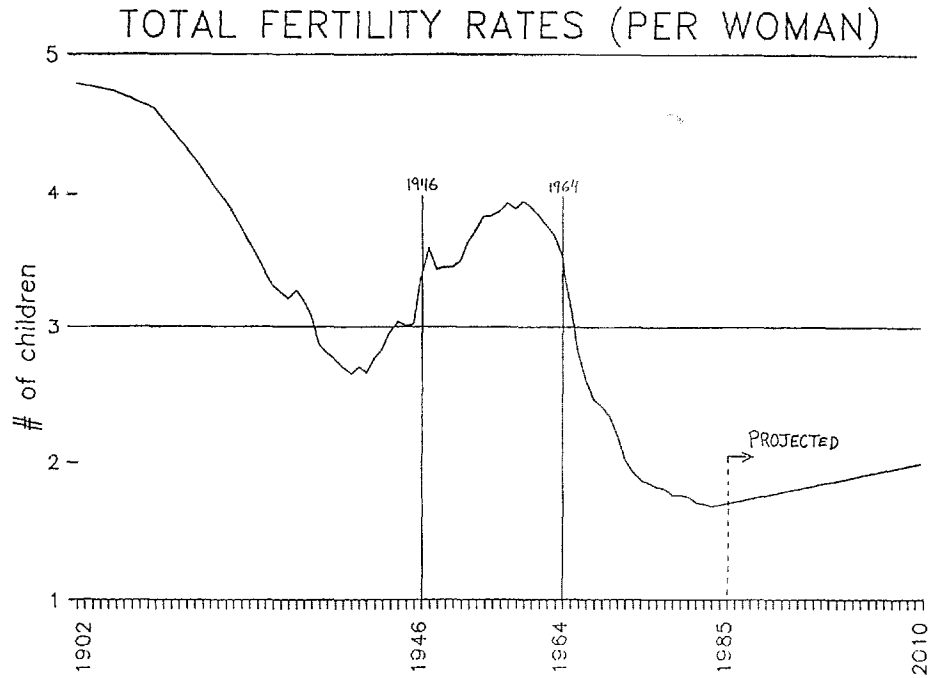
The increase in dependency ratios is subject to a hump for the period running from about 2030 to about 2050. Although it is widely understood that this hump is related to the baby boom, it also must be clearly realized that dependency ratios stabilize after 2050 at a level higher than any prevailing before the start of the hump. This is due to the fact that the baby boomers are not the only factor contributing to the aging of the population. Indeed, four fertility trends affecting projected age-dependency ratios can be identified and allocated to four time periods as follows:

 I) The pre-1946 years (fluctuating levels of fertility)
 II) The 1946-1964 baby boom (with a peak of 3.9 from 1957 to 1960)
III) The 1965-1984 baby bust (with a low of 1.6855 in 1984)
IV) The 1985 and later years (with an assumed plateau of 2.0 in 2010)

These trends are also displayed graphically in Exhibit XII.

Looking at costs only in the year 2035 could be misleading because these four trends interact, together with mortality improvements, to bring costs to a peak. Assuming a life span of 110 years and a minimum working age of 20, the

DEPENDENCY RATIOS
FOR THE CANADIAN POPULATION

(1) —+— FERT 1.7 INCREASING TO 2.0 IN 2010

(2) —▭— FERTILITY 1.7 FOR 1985+

TOTAL FERTILITY RATES (PER WOMAN)

dependency ratio for a given year is affected by the fertility rates experience or assumed for the 90-year period ending 20 years before the given year. Each of these four trends in fertility rates affects costs by duration.

Once the combined effect of all four fertility trends in each future year has been estimated, the specific effect of any given fertility trend, whether experienced or assumed, cannot be obtained easily because one would have to speculate as to what fertility rates would have been in the absence of the other three trends. Even if that were done, the computed specific effect of a given fertility trend like the baby boom would have to be adjusted at appropriate durations for:

I)   the wave effect of successive generations of boomers' descendants;

II) the additional effect the boom would also have, if it were interacting with the other fertility trends according to its particular duration. This adjustment would have to be somewhat arbitrary because the compounding effect of two interacting trends cannot be split simply between the two trends since these are not independent of each other.

The following exhibits are examples pertaining to the particular effect of some trends in fertility. For this purpose, the OAS program was chosen because of its flat-rate nature, which causes its cost to be almost proportional to dependency ratios. A 0% gap (earnings minus indexing) was retained so as to remove the decreasing effect on costs caused by a positive gap.

In Exhibit XIII, two OAS cost estimates are presented. The first estimate (line B) assumes an ultimate fertility rate of 2.0 and mortality improvement, while the second (line A) assumes a constant 3.0 fertility rate and no mortality improvement. A fertility rate of 3.0 was chosen partly because it corresponds to fertility experienced at the beginning and at the end of the baby boom period, just before the baby bust period, and partly because it also gives rise to ultimate age-dependency ratios quite comparable to those presently prevailing.

The cost difference between these two estimates for the year 2050 is 3.63% (6.67% minus 3.04%) and corresponds to the combined effect of the assumed mortality improvements and the assumed continued baby bust. This is an overestimate because it includes the interaction effect with the pre-1985 actual fertility rates.

FUTURE FERTILITY:
THE EFFECTS ON OAS COSTS

(B) —+— 2.0 FERT(2010), MORT IMPROVEMENT
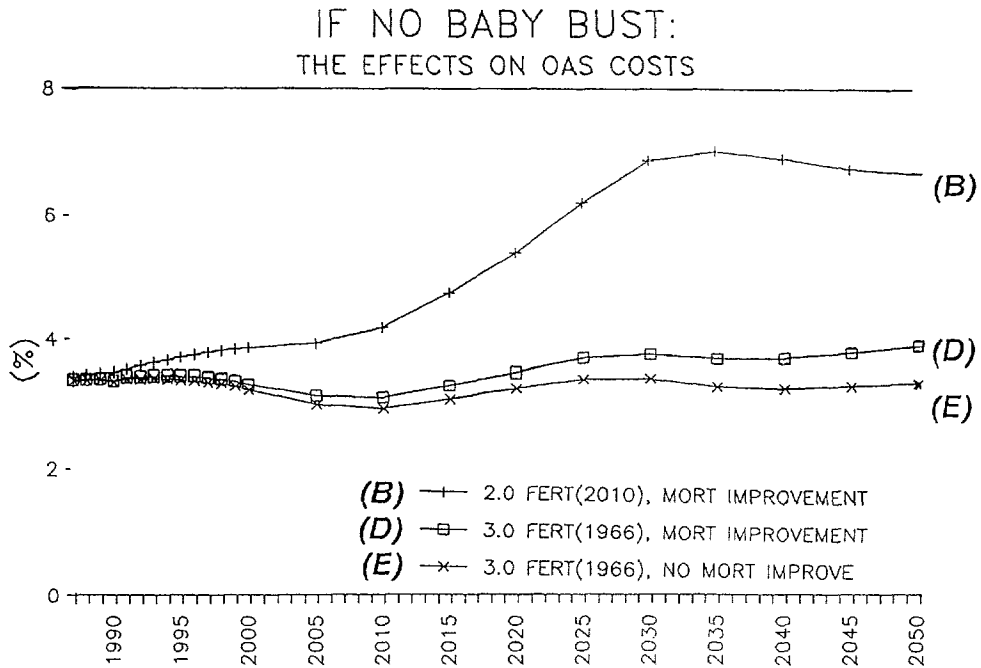(A) —▭— 3.0 FERT(1985), NO MORT IMPROVE
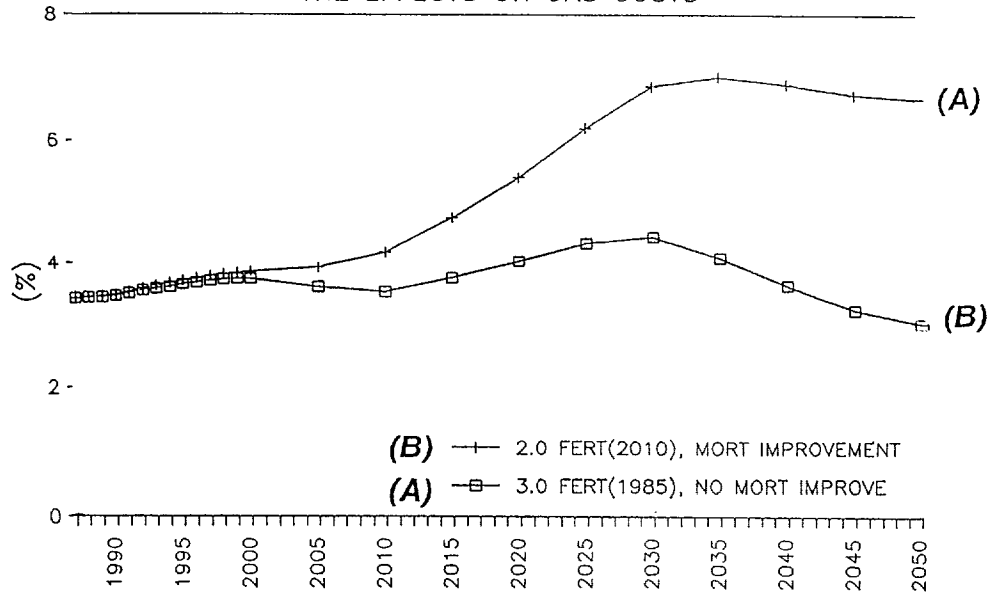
Line A also shows interesting indications of the overall effect on costs for all pre-1985 actual fertility rates. The highest projected cost would occur in 2030 at 4.43% and would represent an absolute increase of 1.01% from 1987. The cost increase, over that same period, in line B is 3.46%. Before allowing for the effects of interaction, these estimates indicate that pre-1985 fertility rates would account for about 30% of the cost increase expected by 2030.

In Exhibit XIV, line D reflects a hypothetical scenario where the actual 1965-1984 bust is removed and replaced by a constant fertility rate of 3.0. Comparing line D to B (line B is carried over from Exhibit XIII) indicates that the experienced bust, the assumed continued bust, and the interaction of these two factors with mortality improvements and pre-1966 fertility rates, account for a cost increase of 3.12% from 1987 to 2030. This difference accounts for about 90% of the overall cost increase in line B over the period from 1987 to 2030. This leaves an increase of 0.34% specifically attributable to mortality improvements and all pre-1966 fertility rates (and excluding any interaction).

In this same exhibit, the assumptions underlying line E are the same as for line D but without mortality improvements. This shows that before allowing for the effect of interaction, the pre-1966 fertility rates cause a cost increase of only 0.02% from 1987 to 2030. In other words, the pre-1966 fertility rates have practically no effect on cost from 1987 to 2030. In reality, baby boomers cause a cost increase by 2030 which just happens to be almost the same as that caused in 1987 by the comparable group of baby boomers born earlier in the century.

Rough estimates based on a simple model indicate that if the entire effect of interaction is allocated to the baby boom, then about 25% of the cost increase of 3.46% expected from 1987 to 2030 in line B would be attributable to the baby boom.

Finally, it remains to be seen whether these overall cost increases could be offset by reductions in family allowances and education expenditures resulting from the assumed low levels of fertility. On the other hand, the growing attention given to child day-care centers could eventually counterbalance these offsets.

IF NO BABY BUST:
THE EFFECTS ON OAS COSTS

(B) ──┼── 2.0 FERT(2010), MORT IMPROVEMENT
(D) ──▱── 3.0 FERT(1966), MORT IMPROVEMENT
(E) ──✕── 3.0 FERT(1966), NO MORT IMPROVE

THE AGING OF THE BABY BOOM GENERATION

MR. ROBERT J. MYERS: I regret that I must disagree with some points made by my long time friend and colleague, Gordon Trapnell.

The OASDI system is not currently being financed on a current-cost, or pay-as-you-go, basis -- although it should be. The actual situation is that extremely large fund balances will be built up in the next 3-4 decades and then gradually dissipated, until exhaustion occurs in about 2050. This is hardly pay-as-you-go financing! For more details on the actual and intended financing basis of OASDI, I would refer you to a report published at the beginning of this year by the Committee on Social Insurance of the American Academy of Actuaries.

As I have seen the situation, there has been no significant political pressure ever exerted on the actuaries of the Social Security Administration to have them change the assumptions against their best judgment.

As to the future course of the fertility rate, it is, of course, a matter of judgment and cannot be nearly as easily predicted as mortality rates. The fertility rate in both 1985 and 1986 was about 1.85 (not 1.80). I believe that a long-range assumption of a rate of 2.0 is reasonable. If the actual experience is lower, this will very likely be counterbalanced by higher immigration, either legal or illegal.

Mr. Trapnell rightly noted that most of the long-range deficit shown for the combined OASDI-HI program is due to HI. However, if HI has unfavorably high costs, the same problem will confront the nation for the working-age population. Further, any deficits or unfavorable experience for OASDI resulting from demographic causes can be readily solved by demographic means -- e.g., raising the Normal Retirement Age more than is provided in present law.

Mr. Trapnell stated that under the present method of financing OASDI, namely building up a large fund and then drawing it down, the disinvestment of the fund would require new taxes from the general taxpayer. This is not necessarily so, because this situation could be handled by the sale of new bonds to the general public.

Finally, Mr. Trapnell suggested that the investment of the trust-fund assets in government bonds was undesirable and ineffective. The alternative would be to

invest in the private sector, either in real property or in equities or debt
obligations. If this were done, the "cure" would be worse than the ailment!
The result would be either unwise use of funds to build an excessive number of
schools, hospitals, etc., or to buy such a large portion of the private sector as
to result in socialism by the backdoor method.

MR. TRAPNELL: Mr. Myers is correct in that the OASDI system is not on a
pay-as-you-go basis, and I apologize if I made that error. I meant to refer to
the practical effect of the current financing within the context of the unified
budget. According to the current financing, the program is currently building
up a fairly substantial trust fund which will be drawn down and ultimately
exhausted in the future.

However, I disagree with Mr. Myers about the implications of spending the trust
fund. The trust fund, built up by the excess of revenues over benefits, is not
invested in real assets but rather it is invested in the government's current
operations. The absence of this source of funds would require additional debt
or additional taxes for current operations. The practical result is a net drop in
current taxes which must be reversed sometime in the future.

The issue I'm raising here is much more an economic issue than an actuarial
issue. That is, where we will find the funds to pay the future benefits which
are supported by the trust funds?

Mr. Myers also takes me to task for suggesting that the trust funds might own
real assets. While I agree with the assertion that there could be problems, I
also believe given the proper educational background most people would not allow
the trust funds to be misappropriated in the ways he has suggested. Also, I am
driven to the conclusion that the trust funds should own real assets not because
it is ideal solution, but because other solutions have greater shortcomings.

MR. MICHEL PERREAULT: I am the valuation actuary for a very small insurance
company and I have done a lot of scenario testing of our asset liability position.
One major assumption made is that the general interest rate level in the economy
is not something the company can manage, but rather that it is set as an outside
parameter. In your studies you seem to be making a similar assumption about
the fertility rate. Is the next step in your process to bring forth

proposals to the government that would encourage a higher fertility rate? This is just the opposite of what has occurred in other countries, such as China, where the government has tried to reduce the fertility rate through a variety of programs. Is this something we're likely to see in the next few years?

MR. MYERS: I'm convinced that anything that moves as erratically as the fertility rate has moved over the last 100 years will not be easily controlled. I do think the fertility rate will go up through one means or another, perhaps through a change in national philosophy and psychology or possibly through tax means. The other factor which will play a role in the cost of these programs is the immigration rate. As I previously mentioned, I am convinced there's going to be more immigration in this country in the 1990s and early 2000s as the result of a labor shortage in this country.

MR. TRAPNELL: The immigration rate is one of the balancing items when you are preparing projections for the OASDI program. We generally look at current immigration trends and assume these trends will continue. This, of course, is possible when you are not limited to assuming what is legally possible under the present law.

In choosing fertility assumptions, it is quite common to pick a 2.0 fertility rate by default when the experience of the last 100 years doesn't give any clue for the future. The default is simply to assume that the population will reproduce itself. However, this 2.0 fertility rate runs contrary to the general experience within developed countries where prosperity and labor saving devices bring low birth rates. There is no reason to expect those trends to be reversed.

MR. HOWARD YOUNG: It seems to me that if we're going to discuss the extent to which these programs are a burden to people, then as Mr. Trapnell mentioned, the key question becomes, how does this cost relate to the productive income of the country in the future?

We encounter real problems when we put the cost in relation to payroll or to earnings. While it's true that earnings is the basis we now use to finance the program, I suggest we examine whether this is an appropriate basis. In recent years earnings in covered payroll has been a decreasing proportion of national income and projections show this trend will continue. Therefore, OASDI cost

projections would not show the same steep increases if measured against the total national income.

When we are analyzing alternate courses of action, what we must ask is how will these actions impact total Gross National Product and how will these impact the ability to pay the benefits. We ought to show measures, such as the proportion of the Gross National Product, which will go to the older portion of the population. Are we allocating a disproportionate amount to the older population or is our measure causing us to incorrectly conclude that such amount is disproportionate? The benefit cost figures I've seen show much more stability in relation to Gross National Product than to covered income.

Unless we believe that the number of workers has been the factor controlling the growth in the Gross National Product, then changes in fertility rates will not necessarily mean there will be more to go around; it may merely mean that we divide it up differently. The growth source in our productivity has not been the number of workers, but it has been social factors such as technological changes.