

# II

## **Qualified Pension Plans and Health Care for the Elderly: The Perfect Macroeconomic Immunized Portfolio**

**Robert L. Brown, University of Waterloo**

**Presented at Retirement Implications of Demographic and  
Family Change Symposium  
Sponsored by the Society of Actuaries**

**San Francisco**

**June 2002**

## **Abstract**

Politicians and the public are all beginning to worry about how people will be able to afford the health care demands of an aging population, especially when the baby boomers retire.

Politicians are also worried about how much money is lost from tax revenues today because of the tax advantages offered in employer-sponsored Qualified Pension Plans (QPPs) and Individual Retirement Accounts (IRAs), including 401(k) plans. Under these schemes, contributions (for some plans, both employer and employee) within limits are tax-deductible and investment income accrues tax-free until the pension funds are taken as income. Thus, there is significant taxpayer participation in these schemes.

While it is true that these Qualified Plans cost the government tax revenues today, it is also true that the same schemes will create increased tax revenues for the government when the baby boomers retire and turn their pension assets into taxable retirement income.

This paper models the extent of the tax dollars being lost by the government today because of QPPs and IRAs, then goes on to project the extra revenue that will accrue to the government from these same pension plans when the baby boomers retire. It then points out that these extra pension income dollars of tax revenue will arrive at exactly the time that the baby boomers will need extra government support to pay for their increased health care delivery.

In short, this paper shows that it is possible to create the perfect macroeconomic immunized portfolio.

## **I. Introduction**

This paper is written by a Canadian academic, based on Canadian data. However, the results are completely transferable to the U.S. and are of immense importance. In particular, the paper presents an existing solution for how to pay for U.S. government-sponsored health care as its population ages (especially after the baby boomers retire).

This paper will show that the rate of aging of the Canadian population will exceed the rate of aging of the U.S. population. This is mainly true because the baby boom/baby bust demographic tidal wave in Canada (as explained in the next section) exceeded that experienced in the U.S.

Thus, any solution that can be found to create a synergy between pensions and health care in Canada could immediately be applied successfully in the U.S. We present such a solution in this paper, and suggest that it could be made to work equally as well in the U.S.

## **II. Population Aging**

This section of the paper explores the definition of the phrase "Population Aging". There are two components of Population Aging: enhanced life expectancy and shifting demographics.

It is well known that life expectancy in both Canada and the U.S. has improved remarkably this century, as illustrated in the following table:

**Table 1**

**Life Expectancy in Canada  
1931–1991**

<b>Year</b>	<b>At Birth</b>		<b>At Age 65</b>		<b>At Age 75</b>	
	<b>Male</b>	<b>Female</b>	<b>Male</b>	<b>Female</b>	<b>Male</b>	<b>Female</b>
1931	60.0	62.1	13.0	13.7	7.6	8.0
1951	66.3	70.8	13.3	15.0	7.9	8.8
1971	69.3	76.4	13.7	17.5	8.5	10.7
1991	74.6	80.9	15.7	19.9	9.6	12.5

Source: Statistics Canada, National Life Tables

Similar data are available for the U.S.

**Table 2**

**Life Expectancy in the United States  
1930–1990**

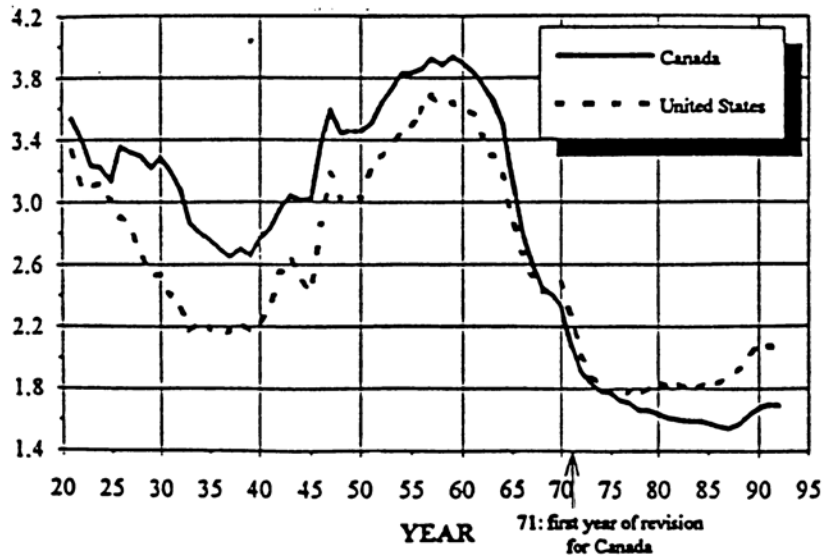
<b>Year</b>	<b>At Birth</b>		<b>At Age 65</b>	
	<b>Male</b>	<b>Female</b>	<b>Male</b>	<b>Female</b>
1930	59.8	61.1	11.7	12.8
1950	65.5	71.0	12.7	15.0
1970	67.1	74.7	13.0	16.7
1990	71.8	78.8	15.1	18.9

Source: United States, Bureau of the Census, National Life Tables

Clearly, all else being equal, if every member of society lives longer, then the population will age. Thus, enhanced life expectancy is an important part of the population-aging paradigm, but not the most important part.

What is more important, it turns out, are the dramatic demographic shifts that took place in Canada and the U.S. in the second half of this century. Both Canada and the U.S. experienced large increases in live births after World War II. This has become known as the post-war baby boom. One view of this phenomenon is provided by Figure 1, which shows the fertility rates for Canada and the U.S. for the period from 1921–1992.

**Figure 1**  
**Total Fertility Rates**  
**1921 to 1992**



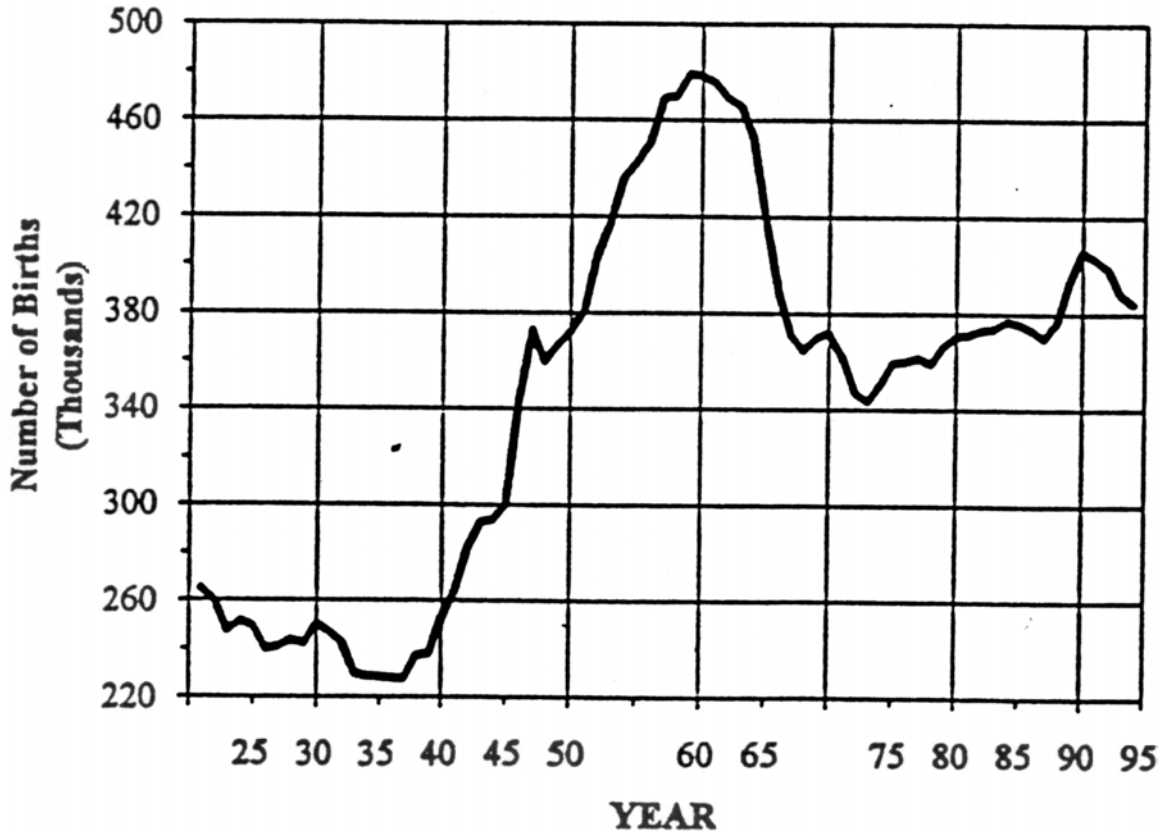
Source: Brown, 1997, p30

It may be inappropriate to call this phenomenon the post-war baby boom. Studying Figure 1, one can see that the immediate impact of the return of the soldiers from the war is obvious, but temporary. This paper takes the point of view that the real baby boom did not start until the early 1950s, and did not end until the mid-'60s.

Another representation of the same phenomenon can be found in the next two graphs, which present the number of live births in Canada and the U.S. in the twentieth century.

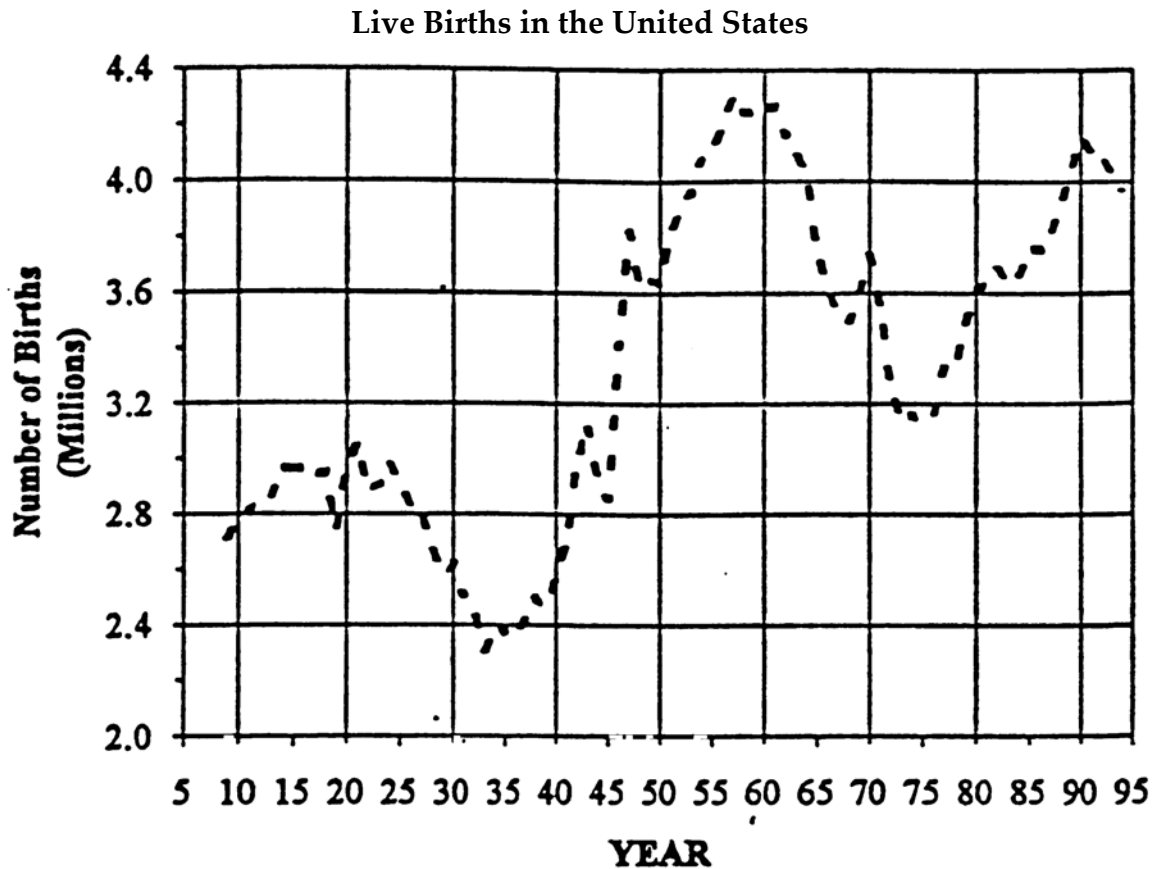
Figure 2

Live Births in Canada



Source: Brown, 1997, p225

Figure 3



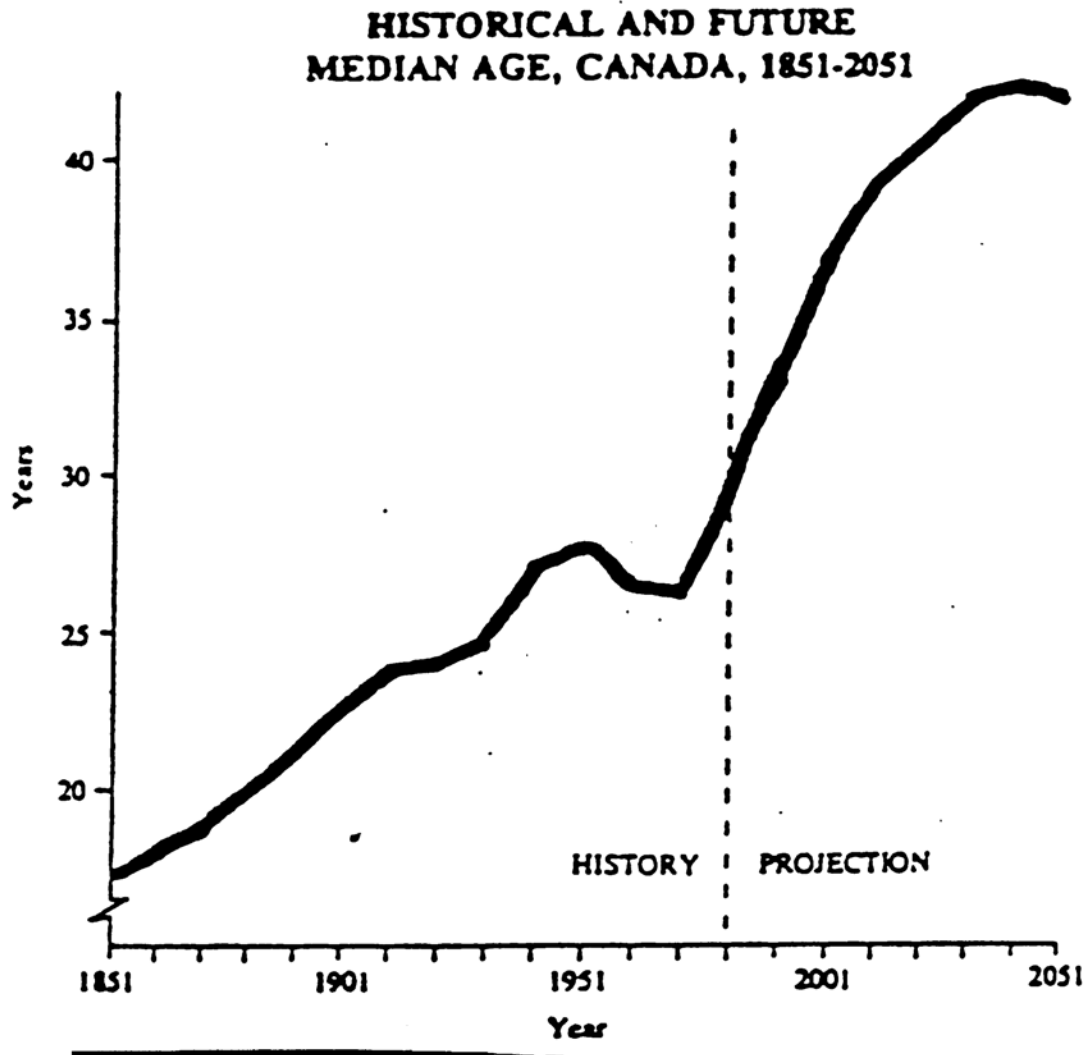
Source: Brown, 1997, p224

Once again, one can see that the baby boom did not really reach its full force until the good economic times of the 1950s. In fact, live births in Canada peaked in 1959; and in 1957, in the U.S. Thus, as this paper was presented in 2002, the largest birth cohort ever is turning age 45 in the U.S., not age 57 as one might assume using the indicator of post-war baby boom.

That is a summary of what is meant by population aging. An overall graphic image of population aging is captured in Figure 4 that follows.



Figure 4



Source: Foot, 1982, p125

One can see in this graph the rapid escalation of the median age. Canada's median age was 17 in the middle of the last century, and now it is 31. Canadians expect to reach a median age of around 42 by the middle of the twenty-first century. While enhanced life expectancy is an important part of this phenomenon—in Canada and the U.S.—shifting demographics are the true driving force.

This is proven in that the only time the median age in Canada has ever fallen was around 1952–1966, which corresponds to the baby boom years, as defined in this paper. Since 1966, the median age of the population has been

substantially driven by the baby boom generation. In conclusion, in Canada and the U.S., population aging has a lot more to do with shifting demographics than with improvement in life expectancy.

### III. An International Comparison

This study placed these demographic in Canada and the U.S. into an international perspective. Most nations have experienced remarkable improvements in life expectancy over the last half-century, especially those who have recently attained modern sanitation and medical practices, such as China. These same countries have seen significant drops in their fertility rates (at least since the mid-'60s). The result of enhanced life expectancy, combined with dropping fertility rates is a sharp rise in dependency ratios (defined here as the ratio of those aged 65 and over to the labor force aged 15–64), as seen in Table 3 and Figure 5.

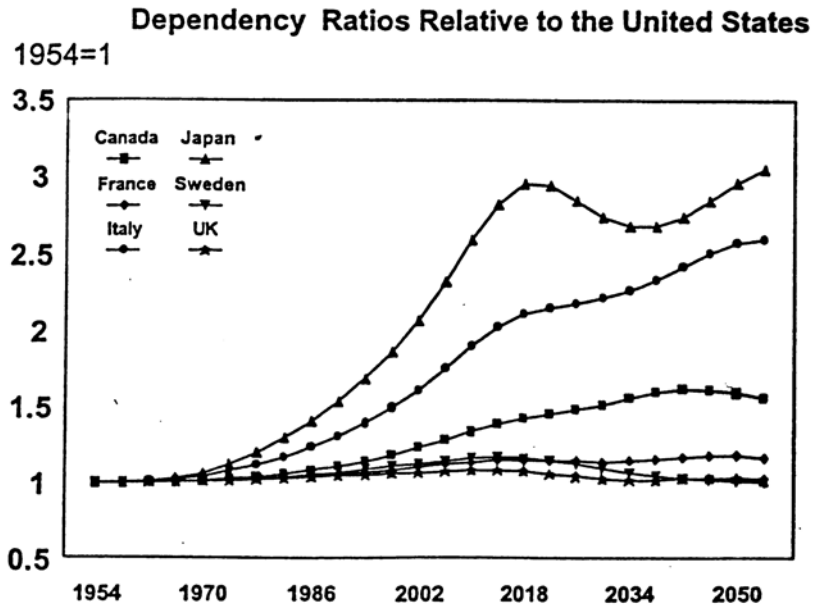
**Table 3**

**Growth in the Dependency Ratio  
(Ages 65+/Labour Force)  
2050/1996**

<b>Country</b>	<b>Total Growth (2050/1996)</b>
Japan	190%
Italy	170
Canada	130
France	100
United States	90
United Kingdom	60
Sweden	50

*Source: Fougere and Merette, 1998, p5.*

Figure 5



Source: *ibid*, p13

Returning the focus to the U.S., graphical evidence of this macro-population aging process can be seen in Figures 6 and 7 that follow.

Figure 6

U.S. Population 1995

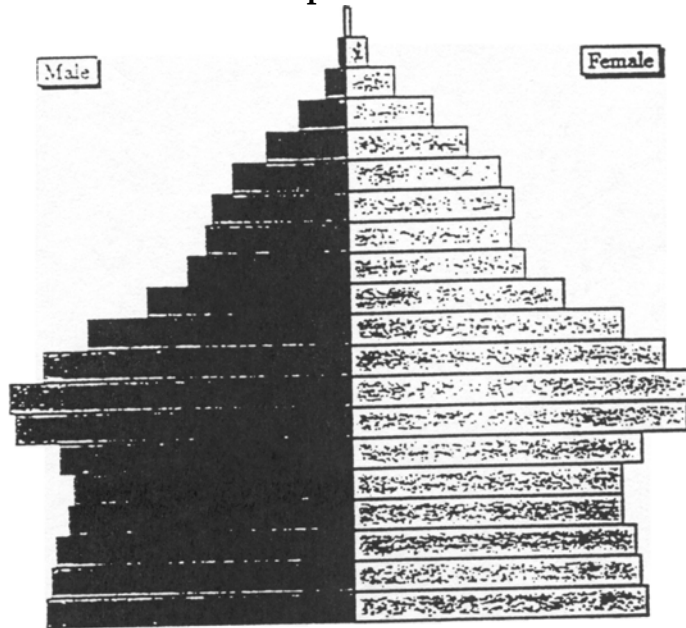
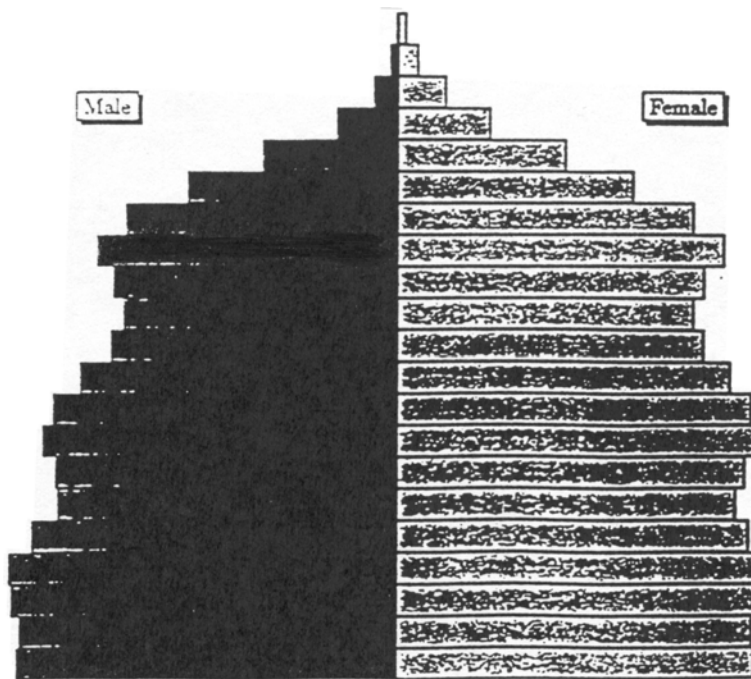


Figure 7

U.S. Population 2030



These graphs are known as population pyramids and show the number of people within each age group (females on the right and males on the left). In a stable population—one in which birth rates and death rates are constant year after year—these histograms would look like a pyramid; broad in the base, and because of mortality, working gradually to a peak at the top. Note that these are not the shapes presented in Figures 6 and 7.

Clearly, Canada and the U.S. are going through some rapid demographic changes. This is dramatically summarized in Table 4, which follows.

**Table 4**

**Distribution of Canadian Population by Age Group  
1956–2036**

<b>Age</b>	<b>1956</b>	<b>1976</b>	<b>1996</b>	<b>2016</b>	<b>2036</b>
Under 20	39.4	35.6	26.7	22.0	20.2
20-64	52.9	55.8	61.1	61.4	55.0
65+	7.7	8.6	12.2	16.6	24.8
75+	2.5	3.2	5.1	7.1	12.8
85+	0.4	0.7	1.2	2.2	3.8

Source: Denton, Feaver, and Spencer, 1998, p85/90

Thus, over the next thirty-five years, the percent of the population aged 65 and over will double, while the percent of the population aged 85 and over will more than triple. This has important implications for paying for health care, as will be discussed later.

Based on these data, the thesis of this paper is: If a solution to the payment of health care costs over the next half century can be found for the Canadian population described, then any such solution could be applied successfully in the U.S.

**IV. Registered Pension Plans (RPPs) and Registered Retirement Savings Plans (RRSPs) in Canada**

## A. Existing Plans and Coverage

**Table 5**

**Percentage of Tax Filers Participating in  
RPPs, DPSPs and RRSPs (1992)**

	<b>By Age Group</b>		<b>By Income Group</b>		
	Public Sector	Private Sector	Public Sector	Private Sector	
<25	41.0	20.0	<20,000	43.0	24.0
25-44	83.0	55.0	20-39,999	87.0	62.0
45-64	90.0	67.0	40-79,999	97.0	87.0
25-64	86.0	58.0	80,000+	99.0	92.0

Source: Canadian Institute of Actuaries 1995, Appendix D

In general, younger workers and females show lower levels of coverage. Also the level of public sector coverage greatly exceeds that in the private sector. Public sector employees represented about a quarter of the paid work force but almost half (46 percent) of the total RPP membership in 1999 (Statistics Canada, 2000a, 20).

One reason for this disparity of coverage is the fact that small employers tend not to offer pension plans to their employees, and most small employers are in the private sector. In 1992, fully 96 percent of the members of plans with fewer than 10 participants were employed in the private sector (Statistics Canada, 1994, 25).

The importance of RPPs and RRSPs is illustrated in Table 6.

**Table 6**

**Number of Contributors, Contributions (\$B), and Accumulated Assets:  
C/QPP; RPPs; RRSPs  
1998**

<b>Plan</b>	<b>Number of Contributors</b>	<b>Contributions</b>	<b>Accumulated</b>
<b>Assets</b>	<b>(,000)</b>	<b>(\$B)</b>	<b>(\$B)</b>
C/QPP	13,627	18.5	49.4
RPPs	5,091	16.9	644.4
RRSPs	6,122	<u>26.6</u>	<u>241.2</u>
Total		67.4	657.8

Source: Statistics Canada 2000,11/12.

**B. Tax Reform**

The federal government has decided that all forms of private pension schemes (including RRSPs) should operate on a level playing field when it comes to tax incentives. Prior to tax reform, workers not participating in employer-sponsored pension plans could not achieve the same level of retirement savings through RRSPs, because of the relatively low contribution limits.

The maximum pension the federal government allows in a registered, defined benefit plan is two percent of one's best earnings for each year of employment, or \$1,722.22 per year of employment, which ever is less. A person who worked 35 years for the same employer and qualified for the maximum benefit each year would get a pension of \$60,278 a year, upon retirement. To qualify for this, however, a person needs a best-earning year of \$86,111 or more (since 70% of \$86,111 = \$60,278). These limits have been frozen until 2003.

In 1976, when the upper limit on tax assistance for retirement savings was first established, it was about five times the average industrial wage (AIW). Tax reform in 1991 set the new limit at two-and-a-half times the AIW, and the 1996

deferral of the extension of these limits effectively means that the eventual cut-off will be at twice the AIW (Mercer, 1996).

For a defined contribution plan, the current maximum contribution allowed in a registered plan is \$13,500, or 18 percent of remuneration, which ever is less. These amounts are also frozen until 2003.

In his 1995 budget, Paul Martin scaled back the contribution level from \$15,500 to \$13,500, where it will remain frozen until the end of 2003. It is now scheduled to rise to \$14,500 in 2004, then to \$15,500 in 2005; a whole decade later than originally intended.

This is extremely important. Even if inflation only rises by two percent per annum, the decade deferral in the \$15,500 limit effectively decreases the ability to save for retirement by 22 percent in real terms.

If one participates in an employer-sponsored plan, the 18 percent/\$15,500 limit is reduced by a factor called a pension adjustment, which is the value of the contribution to the employer-sponsored pension plan. If that plan is a defined contribution plan, the value is the total contribution made (employer plus employee). If it is a defined benefit plan, the value is nine times the amount of increased benefit in that year. For example, if the benefit is 1.5 percent per year of service, the pension adjustment is 13.5 percent (9 times 1.5) and the maximum allowable contribution to an RRSP is 4.5 percent of earnings.

There are public policy issues around the level of tax incentives provided to private pension plans. Money contributed to a RPP/RRSP is tax-deductible (within limits) at the time of contribution. Hence, for a worker in the 40% tax bracket, a \$1 contribution to a RPP/RRSP only costs \$0.60, directly. Also, the investment income earned in a registered plan accrues tax-free until taken as income. Hence, workers earn the full gross rate of investment return (7% is assumed in this paper) during the life of the plan, not the after-tax rate. Leon Muszynski (1996, 121) goes so far as to ask why these plans should be called private when the level of public involvement by way of tax subsidization is so significant.

On the other hand, income from a RPP/RRSP is taxable at the time it is taken post-retirement (which may be at rates either lower or higher than before retirement, especially if Social Security clawbacks are included in the analysis).



### **C. Registered Pay-out Options**

The RRSP may be matured or annuitized at any time, except that the annuitant payments must commence or the funds must be transferred to an RRIF (explained shortly) prior to the end of the year in which the taxpayer turns 69.

Until 1978, the only form of retirement income that one could purchase from an RRSP was an annuity payable for life. This annuity could have a guaranteed period and could be designed to continue payments to the surviving spouse (last survivor annuity). The more guarantees included, the lower the initial income one receives per unit of RRSP fund.

In 1978, the government introduced two extra maturity options. The first was annuity-certain (i.e. payments do not depend on one's continued survivorship), payable until age 90, and the second was a special pay-out scheme called a Registered Retirement Income Fund (RRIF). This paper will not describe these options in any detail.

### **V. Public Policy Issues**

One of the reasons for the deferral in increasing the tax deductible RPP/RRSP contribution limits, and the ability to save for retirement is the government's perception that the tax incentives provided to RPPs and RRSPs cost them a lot of money. The tax deductibility of contributions is worth \$473 per \$1000 contribution for someone in the highest income bracket, but only worth \$269 to a taxpayer in the lowest bracket (National Council of Welfare, 1996, 43).

Table 7 shows Ministry of Finance estimates of the cost of RPP/RRSPs to the government in lost tax revenues. These estimates result from the fact that registered contributions are tax-deductible and investment income in a registered plan is not taxed until taken as income (most likely after retirement).

Table 7

Estimated Lost Tax Revenues from Registered Pension Plans (\$B)

1991–1995

Source	Year				
	1996	1997	1998	1999	2000
<b>Registered Pension Plans</b>					
Contributions deduction	4.9	4.9	5.0	5.1	5.2
Non-taxation of investment	9.0	8.1	7.3	8.0	8.7
Taxation of withdrawals	<u>-4.9</u>	<u>-5.5</u>	<u>-6.2</u>	<u>-6.9</u>	<u>-7.8</u>
<b>Net expenditures</b>	<b>9.0</b>	<b>7.6</b>	<b>6.2</b>	<b>6.2</b>	<b>6.0</b>
<b>Registered Retirement Savings Plans</b>					
Contributions deduction	5.9	6.4	7.0	7.7	8.1
Non-taxation of investment	3.5	3.4	3.3	3.9	4.4
Taxation of withdrawals	<u>-2.2</u>	<u>-2.5</u>	<u>-2.8</u>	<u>-3.0</u>	<u>-2.9</u>
<b>Net Expenditures</b>	<b>7.3</b>	<b>7.2</b>	<b>7.5</b>	<b>8.5</b>	<b>9.5</b>
<b>Total Tax Expenditure</b>	<b>16.3</b>	<b>14.8</b>	<b>13.7</b>	<b>14.7</b>	<b>14.5</b>

However, instead of looking at the tax incentives for RPP/RRSPs as tax expenditures, this paper argues that the government should view the monies accumulating in these funds as the perfect deferred tax asset. This is true because as the baby boomers retire, they will take their registered income out of their retirement plans, and pay income tax thereon, just when the government will need the money to pay for Social Security and health care for the now-aged baby boomers.

## VII. Qualified Plan Contribution Limits in the U.S.

(Aside: this section has been updated to reflect the Economic Growth and Tax Relief Reconciliation Act of 2001).

The U.S. income tax laws are quite favorable to the establishment of qualified pension programs. Employer contributions are deductible from

corporate taxable income as a business expense; investment earnings of a qualified pension plan are exempt from income taxation until benefits are paid out; and employer contributions are not taxable to employees as income in the years made. However, benefits are taxable in the hands of the recipient, when taken. Employee contributions generally must be made from after-tax income. At least 90 percent of all U.S. plans are non-contributory.

Contributions to and benefits received, under qualified plans, are limited by law. With respect to defined benefit plans, the plan must provide an annual benefit that does not exceed the lesser of (1) \$160,000 (adjusted annually for cost-of-living changes) or (2) 100 percent of the participant's highest average compensation for three consecutive years. (These limits are reduced if the participant has less than 10 years of plan participation, less than 10 years of service or retires prior to attaining the Social Security normal retirement age).

With respect to defined contribution plans, the annual addition to a participant's account may not exceed the lesser of (1) \$40,000 (adjusted annually for cost-of-living changes) or (2) 25 percent of the participant's covered compensation for the year.

No qualified plan may take into account compensation in excess of \$200,000 (beginning in 2002) to determine benefits or contributions (adjusted for cost-of-living). Additional requirements apply to top-heavy plans.

A profit-sharing plan is a type of defined contribution plan in which employer contributions are typically based on the company's profits in some manner. For profit-sharing plans, the deduction for employer contributions is limited to 15 percent of the aggregate participant payroll. Any one participant is eligible to receive a contribution up to the defined limit of 25 percent of salary, or \$40,000, whichever is lower.

For tax purposes, a Thrift Plan is a contributory profit-sharing plan. Employee contributions are from after-tax income. There are also Stock Bonus plans and Employee Stock Ownership plans, but these will not be discussed further here.

A 401(k) is an employee savings plan that allows for employee contributions on a pre-tax basis and for partial employer-matching contributions. The 401(k) employee contribution is considered to have been made by the

employer, therefore, it is not treated as part of the employee's taxable income for that year. The maximum contribution (salary reduction) permitted under 401(k) plans is \$11,000. This ceiling will increase by \$1,000 per year until it reaches \$15,000 in 2006. For subsequent years, indexation is to the cost-of-living. No withdrawals from 401(k) plans are allowed before age 59.5 (with some exceptions) without penalty taxation.

Under a regular IRA, anyone can contribute 100 percent of annual earned income to the IRA, up to a maximum of \$2,000 per year. The minimum age at which a distribution can be made without tax penalty is 59.5 (with some exceptions). A worker can also contribute up to \$2,000 a year (i.e., \$4,000 in total) to a spousal IRA. If the employee is covered under a qualified plan and his/her income exceeds \$50,000 (or \$80,000 for a married couple filing a joint return), then the ability to contribute a tax-deductible amount to an IRA disappears. However, investment income will still accrue, tax-free, until taken.

There are also Roth IRAs into which after-tax contributions may be made. However, they will not be discussed further here.

Additionally, there are simplified employee pension plans, which are similar to employer-sponsored IRAs, but have higher deduction limits. The contribution for each covered employee may not exceed the lesser of 15 percent of the employee's covered compensation, or \$40,000, compared to the maximum of \$2,000 with an IRA. SEPs have been widely used by self-employed persons.

No other qualified plans will be discussed here.

## **VI. Health Care and Economic Security**

Population aging will have its major impact on two government-sponsored economic security systems; namely, Social Security and health care. Analysis has shown that the impact on other support systems (e.g. education) is expected to be smaller. Both retirement income security and health care provide economic security; retirement income by providing a source of funds for retirement, and health care by removing a source of expense risk. It has been estimated that the incomes of elderly Canadians would need to be as much as one-third higher if they had to pay for the various services covered under public health insurance (National Council of Welfare 1984, 62).

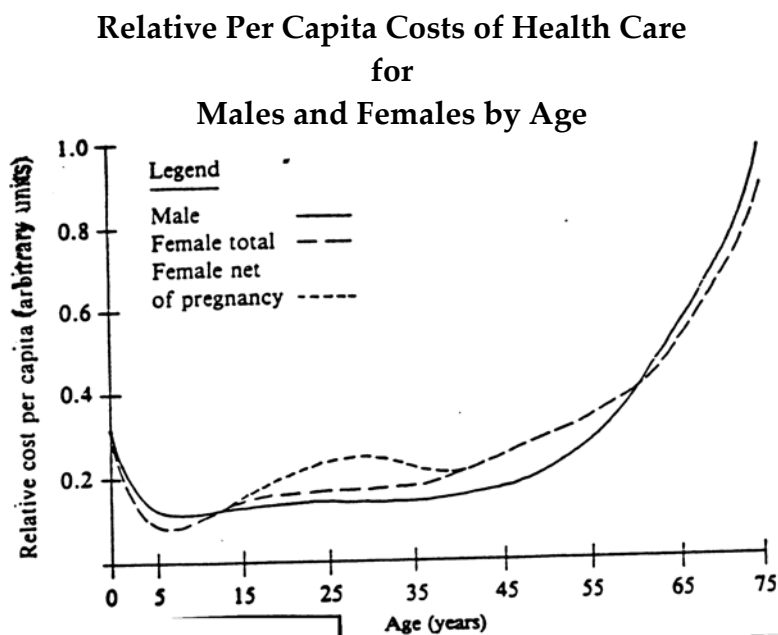
From this point on, this paper will only pursue a method to fund the rising cost of health care as the population ages. Social Security financing issues are a separate matter under OASDI and will not be analyzed further here.

Given the statistics on the aging of the Canadian population, as outlined previously (e.g. a 141 percent increase in the number of elderly persons in Canada by 2025), it is not surprising that health care costs are expected to rise. This is true especially since the old/old proportion of the population is growing faster than the young/old population (see Table 3), and it is the old/old who make the largest demand on the health care system (Barer et al, 1995, 201).

As shown in Table 4, the percent of the population aged 65 and over will nearly double in the next thirty-five years, and the percent of the population aged 80 and over will more than triple.

Age is one of the strongest determinants in predicting the need for health care services of a nation as can be seen in Figure 9, which follows. In Canada, people aged 65 and over made up 11.7 percent of the population in 1991/92, and 4.75 percent of the population was 75 and older. However, persons 65 and over accounted for nearly 60 percent of hospital inpatient days, and 40 percent of all days were provided to those 75 and over (Barer et al., 1995, p201).

**Figure 9**



Source: Marshall, 1987

Denton and Spencer (1995) modeled the shifting demographics in Canada, then applied constant (quinquennial) age-sex-specific health care cost data to the modeled population to determine what impact population aging will have on government expenditures for health care. Health care here includes hospital, medical, preventive and other health care costs, but only those paid for by the government. Denton and Spencer (1995, 178) present the following impact of population aging on government health care expenditures when per capita expenditures for each age-sex group are held constant (1986 = 100.0):

**Table 8**  
**Implied Health Care Expenditures (1986 = 100.0)**  
**1991–2041**

<b>Year</b>	<b>\$B</b>
1991	110.1
2001	131.3
2011	150.4
2021	175.7
2031	201.1
2041	214.6

% Increase (2041/1991): 94.9% (1.949)

Growth rate per annum\*: 1.4%

Source: Denton and Spencer, 1995, 178

\*Author's calculations.

Very similar projections were made by the Organization for Economic Cooperation and Development (OECD) in the late 1980s. It projected the rate of increase in public social expenditures between 1980 and 2040 (1980 was set equal to 100 in all countries) assuming constant real per capita expenditures by age within each program. The results follow in Table 9.

**Table 9**  
**Growth of Public Social Expenditures in the OECD**  
**1980–2040**  
**(1980 = 100)**

<b>Country</b>	<b>Health</b>	<b>Social Security</b>	<b>Total*</b>
Australia	240	288	207
Britain	121	130**	110
Canada	218	304	187
France	119	172	128
Germany	90	126	97
Italy	108	134	107
Japan	146	229	140
Sweden	117	123	109
United States	178	215	165

- Includes all social expenditures (e.g. education, unemployment)

\*\* Prior to legislative changes to SERPS

Source: Walker, 1990, 384

The increase in public expenditures captured in Tables 8 and 9 are those created purely by population aging. The projections assume a constant level of service and benefit delivery, with no improvement in the existing systems. That is, per capita costs by age and sex are carried as constants in the models.

If government revenues are finite, then how will these growing demands for health care funding be met? What should the public policy priorities be?

## **VII. A Macro-Economic Immune Portfolio**

The direction this paper now intends to go may be apparent. So far, this study has presented the problems that will be faced with being required to pay for health care as the population ages, and in particular, when the baby boomers age. Also, this paper has implied that the government is sitting on the perfect deferred tax asset in the form of RPP/RRSPs. That is true because the baby boomers will have to pay income taxes in full when they turn their Registered Savings into retirement income.

To model the impact of these two counteractive cash flows, the study created a model based on a number of assumptions. First, data were received from the Canada Pension Plan actuary that provided data as to the past since 1966 and expected future population in Canada. The model assumed (starting in 1966) that every Canadian aged 20–64 placed one dollar per annum into a RPP or RRSP. This created a loss of tax revenue to the government since the contributions were assumed to be tax-deductible in full, and the investment income grew tax-free (we ignored the potential impact of existing ceilings on contributions). Then, the model assumed that when the worker turned age 65, that retiree would buy an annuity at age 65, which would pay out retirement income from age 65 until death. All of these dollars, in turn, were fully taxable as income.

Both before and after retirement the model assumed a tax rate of 40 percent (about right for an average worker/retiree in Canada today) and an interest rate of 7 percent. That is, all assets grew at seven percent per annum pre-retirement, and the cost of the annuity was determined at seven percent. The latter assumption means that assets post-retirement grow at the full seven percent, which, in turn means that the government is not receiving tax revenue on the growth of the post-retirement investment income. The government only gets the income tax on the annuity cash flow.

One could argue (and the Canadian Department of Finance does) that this is a further "tax expenditure" (the non-taxation of annual investment income post-retirement). While this is technically correct, this paper does not agree with that argument post-retirement. The reason is that we feel strongly no government could pass tax legislation to tax post-retirement investment income embedded in RPP/RRSPs, once annuitized. That is, we believe there is no way that the government could ever realize this income.

To summarize, this paper does account for two types of "tax expenditure" pre-retirement: the tax deductibility of contributions (here, with no limit) and the non-taxation of investment income. Post retirement, it is assumed that there is no "tax expenditure", but that there is positive cash flow to the government in the form of income tax on the annuity payout.



This model produced the following output:

**Table 10**

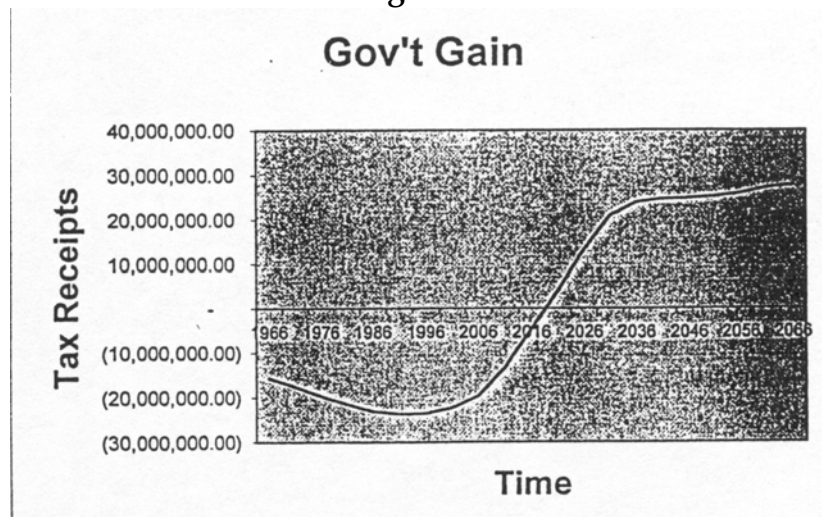
**Government Tax Expenditures and Gains  
from  
RPPs and RRSPs (millions of dollars)  
1991–2041**

<b>Year</b>	<b>Taxes Lost</b>	<b>Taxes Gained</b>	<b>Net Total</b>
1991	26.4	2.6	(23.7)
1996	28.2	4.7	(23.6)
2001	29.9	7.6	(22.3)
2006	31.6	11.9	(19.7)
2011	33.0	19.6	(13.3)
2016	33.7	29.0	(4.7)
2021	34.0	38.1	4.1
2026	33.8	47.0	13.1
2031	33.6	54.4	20.9
2036	33.9	57.8	23.9
2041	34.4	59.1	24.6

Each of these entries is actually the five-year total, beginning in the listed year. That is, the \$26.4 million of "taxes lost" in 1991 is actually the total dollars lost in the period 1991–1995, inclusive.

The net total government gain is displayed in Figure 10 from 1966–2066.

Figure 10



These numbers are model output based on the assumption that every Canadian aged 20–64 saves one dollar per annum. In the real world, however, some people save nothing, while others save to the limit imposed on them by legislation.

To attempt to turn these model numbers into real world numbers, this study compared the modeled government gains and losses in the period 1991–1995 to the actual taxes gained and lost in the same period, as listed in Table 7. Based on the resultant ratios, the paper estimated the "real world" net gain to the government for the years listed above. The results follow.

**Table 11**

**Estimated Net Government Gain**

<b>Year</b>	<b>(\$billion)</b>
1991	(14.9)
1996	(15.1)
2001	(14.6)
2006	(13.4)
2011	(10.5)
2016	( 5.7)
2021	( 0.2)
2026	5.4
2031	10.8
2036	14.3
2041	15.5

These numbers are one-year cash flows, not five-year totals, as in Table 10. That is, the 14.9 billion loss in 1991 is only for 1991.

The study searched for best estimates of future health care costs in Canada. These were found in work done by Denton and Spencer (1995), as previously cited. Denton and Spencer took age- and sex-specific health care costs from 1991 and applied those costs as constants to the future expected Canadian population. They estimated the following health care costs in their model:

**Table 12**  
**Estimated Health Care Costs**

<b>Year</b>	<b>(\$billion)</b>
1991	41.6
1996	45.9
2001	49.6
2006	53.2
2011	56.8
2016	61.3
2021	66.4
2026	71.3
2031	75.9
2036	79.2
2041	81.1

Source: Denton and Spencer (1995, p178)

The thesis of this paper is this: The government should not look at the temporary tax losses associated with RPP/RRSPs as problems. Rather, they should view these temporary losses as an investment toward deferred tax assets.

By deferring some tax income today, the government is creating a system that will guarantee increased tax revenues later, when they are needed to pay for health care for the baby boom. It is time to test the thesis. Will the increased tax gains from RPP/RRSPs help to pay for the health care of the baby boom?

The following table simply adds two numbers together for the years listed, namely the taxes gained or lost from RPPs and RRSPs and the current cost of health care. These numbers can be found in the previous two tables.

**Table 13**  
**Net Cost of RPP/RRSPs and Health Care**  
**1991-2041**  
**(\$billions)**

<b>Year</b>	<b>Net RPP/RRSPs</b>	<b>Health Care</b>	<b>Total</b>
1991	(14.9)	41.6	56.5
1996	(15.1)	45.9	61.0
2001	(14.6)	49.6	64.2
2006	(13.4)	53.2	66.6
2011	(10.5)	56.8	67.3
2016	( 5.7)	61.3	67.0
2021	( 0.2)	66.4	66.6
2026	5.4	71.3	65.9
2031	10.8	75.9	65.1
2036	14.3	79.2	64.9
2041	15.5	81.1	65.6

These are extremely exciting results. If one can accept the large number of assumptions behind the models, then RPP/RRSPs can create the perfect mirror-positive cash flow to the negative cash flow demands for health care funding. Thus, these two systems in total create a macro economic immune portfolio. None of the numbers were manipulated, nor were they derived by working backward from the desired answer and filling in the blanks.

There are, however, a number of caveats to stress. The model uses constant dollar "cost" assumptions. That is, for the RPP/RRSPs, each worker in the population puts a constant number of dollars in the system each year. The rise and fall of cash flows (and their direction to and from the government) are purely the result of population aging. Similarly, the health care costs are based on 1991 prices held constant and pushed through an aging population. There is no assumption of increased or decreased unit spending for health care in the model—only the impact of population aging.

What that means, at the end of the day, is that RPP/RRSP cash flow would have to grow (or decline) in tandem to the real per capita costs of health care for the portfolio to remain immunized. That is quite questionable at the moment. Governments (certainly both those in Canada and the United States) seem to be obsessed with the short-term tax losses associated with RPP/RRSPs (Qualified Plans in the U.S.), and they seem determined to put ever more stringent limits on a worker's ability to access these systems.

Were it possible to convince the politicians that these plans represent, in fact, the perfect deferred tax asset, then one might hope for a more enlightened attitude. However, as long as the life of a politician only lasts until the next election, these limits and ceilings are not likely to be liberalized.

## **IX. Translating the Canadian Model to the U.S.**

Having argued that RPP/RRSPs and Health Care funding can be combined into a macro-economic immune portfolio for Canada, how does that translate for the U.S.?

The aging population problem is much less extreme in the U.S. than in Canada. Thus, one might quickly conclude that the system of Qualified Plans that the U.S. needs to build an immune portfolio would be much smaller than the RPP/RRSP system needed in Canada. That conclusion, however, is false (at least if based on a demographic argument).

If the U.S. had a stable population, where the proportion of the population in any age group remained constant, then there would be no need to worry about the future. The level of taxation that exists today would be sufficient for the future. That is because there would be no population aging as we now know it.

The next smallest step toward population aging assumes that the elderly population grows by exactly one extra person in the next generation. That would be a small problem, but how big a Qualified-Plan system would need to be built to solve it? The answer is the same size as modeled above.

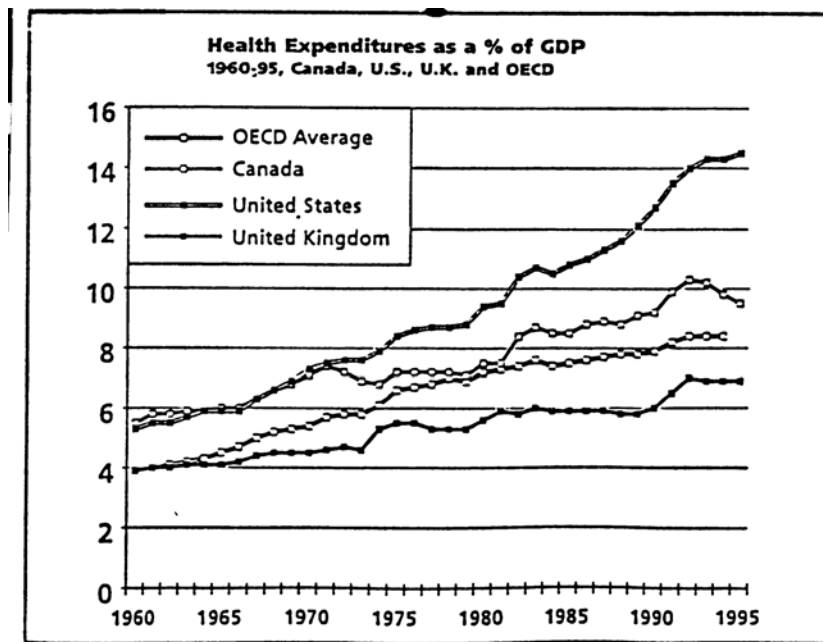
Why?

Well, while only enough new money to pay for one extra person is needed, the added Qualified Plan deferred income is only derived from that one extra person. Thus, all of the costs alluded to are marginal. Whether there is one extra elderly person or one million does not matter. It is necessary to have the size of Qualified Plan portfolio modeled above (ie. as RPP/RRSPs) to fund future health care in an aging population.

At least, that is the demographic reality. There is another reality, however, that must be factored. Canada spends about 9.5 percent of GNP on health care, whereas the U.S. spends about 15.5 percent. Of this, about 71 percent of the health care budget is paid for by the government in Canada while the comparable statistic in the U.S. is 41 percent. Thus, the Canadian government taxes away 6.7 percent of GNP (this percentage has been held fairly level over the last decade) and provides all Canadians with fairly acceptable (but basic) health care, at virtually no extra cost to the consumer.

In the U.S., the government takes 6.4 percent of GNP to provide its elderly (Medicare) and poor (Medicaid) with basic health care (with co-insurance and deductibles). This percentage continues to rise rapidly (see Figure 11). Thus, the Canadian model can be used virtually without modification to provide an indication of the size of Qualified Plan system the U.S. would need in order to create the immunized macroeconomic portfolio and pay for health care. An independent study of U.S. data could bear this prediction out.

Figure 11



Source: National Forum on Health, Synthesis Report, 1997, 12.

It would be preferable to model all of these systems using U.S. data rather than trying to do a second-tier translation of a Canadian study onto the U.S. landscape, but for the purpose of this paper, the size of the field has been defined.

## X. Conclusion

As stated in the introduction, governments in most developed nations are beginning to worry about how people will pay for health care in populations that are rapidly aging. In Canada and the U.S. this is particularly acute once the baby boomers reach the ages where health care demands explode.

The mathematics of this paper may be viewed as simplistic, and the assumptions wide and numerous. However, it builds the case that the macro-economic portfolio of RPP/RRSPs—with their attribute of deferred tax gains to the government, combined with growing demands for the funding of health care—can be seen as macro-economically immune. In fact, the exact people who



will be creating the need to find ever-increasing funding for health care are exactly the people who will create increased tax flows to cover the need.

A concerted effort at the public policy level is needed today to convince governments that RPP/RRSPs are not the pure tax drain that they are seen to be. Rather, they are the perfect deferred tax asset that will some day pay for increased demands for health care funding in an aging population.

## References

Barer, M. L., R.G. Evans, & C. Hertzman. 1995. "Avalanche or Glacier?: Health Care and the Demographic Rhetoric." *Canadian Journal on Aging*. 14 (2): 193–224.

Brown, R. L., 1997. *Introduction to the Mathematics of Demography, 3<sup>rd</sup> Ed.* Winsted, Conn.: Actex Publications.

*Creating a Healthy Fiscal Climate*. 1994. Ottawa: Ministry of Finance, Canada (October).

Canadian Institute of Actuaries. 1995. *Troubled Tomorrows*. Report of the Task Force on Retirement Savings. Ottawa (January).

Author, F.I. 1996. "Health Care Financing." *The Report of the Task Force on Health Care Financing*. February.

Denton, F. T., & B.G. Spencer. 1995. "Demographic Change and the Cost of Publicly Funded Health Care." *Canadian Journal on Aging*. 14 (2): (174–192).

Denton, F. T., C.H. Feaver, & B.G. Spencer. 1998. "The Future Population of Canada, Its Age Distribution and Dependency Relations." *Canadian Journal on Aging*. 17 (1): (83-109).

Foot, D. K. 1982. *Canada's Population Outlook*. Ottawa: Canadian Institute for Economic Policy.

Fougere, M., & M. Merette. 1998. *Population Aging and the Current Account in Selected OECD Countries*. Report 98-04, Ottawa: Department of Finance.

"Pensions in the Higher Wage Sectors? Decision Time for Plan Sponsors." 1996. *The Mercer Bulletin*. Toronto. 46 (9). (September).

Muszynski, Leon. 1996. "Myths and Delusions in the Retirement Income Security Debate." *Aging Workforce, Income Security, and Retirement: Policy and Practical Implications*. 12th Annual McMaster Summer Institute on Gerontology. Hamilton (June 7-9, 1995).

National Council of Welfare. 1984. *Sixty-Five and Older*. Ottawa, Canada: Minister of Supply and Services.

\_\_\_\_\_ 1996. *A Pension Primer*. Minister of Supply and Services (Summer).

National Forum on Health. 1997. *Canada Health Action: Building on the Legacy*. Final Report of the National Forum on Health. I & II. Ottawa, Canada: Minister of Public Works and Government Services.

Statistics Canada. *Life Tables, Canada and the Provinces*. Ottawa, Canada: Ministry of Supply and Services.

\_\_\_\_\_ 1994. *Pension Plans in Canada*. Minister of Industry, Science and Technology. Catalogue 74-401: Biennial, January 1, 1992

\_\_\_\_\_ 1996. *Canada's Retirement Income Programs: A Statistical Overview*. Minister of Industry. Catalogue 74-507-XPB: February.

\_\_\_\_\_ 2000a. *Pension Plans in Canada*. Ottawa, Canada: Ministry of Industry. Catalogue #74-401: Biennial, January 1, 1999.

\_\_\_\_\_ 2000b. *Perspectives on Labour and Income* Ottawa: Ernest B. Akyeampong. Catalogue # 75-001-XPE, 12 (1): 9-15 (Spring 2000).

Task Force on Inflation Protection for Employment Pension Plans. 1988. *Report*. Toronto, Canada: Queen's Printer for Ontario.

Walker, Alan. 1990. "The Economic 'Burden' of Aging and the Prospect of Intergenerational Conflict." *Aging and Society: The Journal of the Centre for Policy on Aging and The British Society of Gerontology*. Cambridge University Press. 10: (377-394