

# **Assessing Private Pension Plans**

**by**

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## Introduction

It is well known that, as a result of the unique combination of declining fertility and increasing longevity, the world is aging. As for the OECD countries, this demographic shock is caused mainly by the post-war “baby boom” generation heading for retirement. Certainly, Canada is also one of these OECD countries, which are undergoing age structure changes.

The old age dependency ratio of Canada, which refers to the ratio of the number of elderly (aged 65 and over) to the population of working age<sup>1</sup> (between 15 and 64), is 18.45 percent<sup>2</sup> now, expected to be 33.62 percent by 2026<sup>3</sup> and nearly 40 percent by 2035, and then remain at this level.<sup>4</sup> This upcoming demographic shift means a heavier burden of pensions and health care on society in the future years. Thus, the pension may become an important issue in the context of population aging.

In this paper, I focus on assessing private pension plans. Because private pension plans play an important part of the Canadian pension system. This importance is represented by the two points: the great deal of contributions to private pension plans and the quickly ascending place of private pension plans in providing income of the elderly in recent years. Due to these two significant phenomena, I intend to investigate what macroeconomic effects of private pension plans would bring and if the private pension plans can offset some of the negative fiscal impacts expected with population aging.

The structure of this paper is the followings. In the first part, I discuss the

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<sup>1</sup> Some writers use ages 0—17 or 0—20 as the age span for the younger group. To be conserved, we use 0—14 in this paper.

<sup>2</sup> Statistics Canada, CANSIM II, table 051—0001, last modified: 2003-09-11.

<sup>3</sup> Statistics Canada, CANSIM, table 052—0001, last modified: 2003-09-11.

<sup>4</sup> Hviding, K. and M. Mérette (1998).

most important macroeconomic issues associated with population aging. I intend to discuss them in relationship with pension plans. The second part, which is divided into two sections, discusses pension issue in more details. The first section of the second part describes the current retirement income system in Canada. The private pension plans in both Canada and the U.S. are described in the second section. The third part reviews the fiscal and more general economic effects of deferred-taxes, the key issue about private pension plans. The discussion will focus on the effects on labor market, saving and fiscal balance. Part four is a brief conclusion.

## Part I Macroeconomic Issues of Aging

### 1. Impacts on Private Saving<sup>5</sup>

There are three different theories of savings: the “life-cycle” hypothesis, the “precautionary motives” hypothesis and the “bequest” hypothesis. The expected impact of aging on private saving differs according to these three theories of savings.

First, the “life-cycle” hypothesis, the most prevailing one of these three theories, implies that households are assumed to save until retirement after which they dissave. Consequently, the aging populations are likely to lead to a lower private savings ratio. Under the “life-cycle” hypothesis, a rise in life expectancy would lead individuals to save more during their working years in order to maintain consumption over a longer retirement period, and so generate higher aggregate private savings. On the contrary, a decline in population growth due to lower fertility would leave individual savings profiles unchanged, but lead to lower aggregate savings as the proportion of the low-saving elderly in the population increases.<sup>6</sup>

For the moment, the large cohort of “baby-boomers” is currently in its high-earning and high-saving years, swelling total private savings. As this cohort moves into retirement in the early decades of the twenty-first century, it will be replaced by significantly smaller cohorts of savers. It is generally, though not universally, expected that private savings will tend to fall, possibly steeply.

The study of Larmer (2002) supports the life cycle theory. She finds that as in the case with senior families, unattached persons experience a certain depletion of their assets as they age. The non-financial assets tend to reduce in size as

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<sup>5</sup> In this section, I discuss the impacts on private saving, as well as household saving.

<sup>6</sup> Sturm, P.H. (1983).

unattached seniors move into the oldest (80+) group. For instance, oldest seniors tend to sell their house or car.

The empirical evidences to support of “life-cycle” model can be sorted into two scenarios according to the degree of effects of aging on the private savings: strong, and weak (or even opposite) effects.

Firstly, in the early studies, Masson and Tryon (1990) use the pooled-time series estimation across the major industrial countries, then obtained an estimate suggesting that an increase of one percentage point in the dependency ratio causes a commensurate fall in the savings ratio. Kohl and O’Brien (1998) obtained a similar outcome. In the U.S, Auerbach and Kotlikoff (1993) report that when the baby Boomers became adults, the net national saving rate (defined as one minus the fraction of private consumption plus government purchases in the net national product) was approximately 14.5 percent. As the falling fertility rate began showing its effect, the savings rate fell to about 12 percent. In the 1980s, that rate was only 7.2 percent. The changes in the saving rates are consistent with the life-cycle model. Disney (1996) regresses the household savings rate on the age dependency ratio using the pooled data of 19 OECD countries from 1977 to 1992. From Figure A1 in appendix, we see a simple scattergram of net household saving rates and age dependency ratio. Although there is a high degree of variation, it is apparent that there is a crude negative relationship between them.

At the opposite side, household survey evidence typically suggests only a weak or even positive effect of the dependency ratio on private savings rates. By using pooled time-series data of 21 industrial countries, Masson *et al.* (1995) provides further empirical support for a weak effect of dependency ratios on private savings rates according to which a one-percentage point rise in the

dependency ratio reduces the private savings rate by 0.14 percent.

The second of these three theories of savings is the “precautionary motives” hypothesis. It assumes that the motives of individuals to save include saving in the face of uncertain death, extraordinary health expenditures or income disruptions. Under this hypothesis, people tend to hold onto assets late into life in case of unexpected expenditures and, particularly, the possibility of expensive nursing or medical care. Borsch-Supan’s studies (1992), based on German income and expenditure surveys, offer an evidence for this hypothesis. He claims that wealth increases again after age 70 although it is declining between age 60 and 70. Thus, “70 age” is such a point that the very old have the highest saving rates among all age groups and accumulate wealth rather than decumulate it. The statistic result of Borsch-Supan shows that net savings at very old age (80 and above) are about 50 percent higher than at retirement.

The last theory, the “bequest” hypothesis assumes that individuals have a multi-generational time horizon and that they maximize not only their own utility but also those of family members, such as parents and children, giving rise to bequest motives. However, this theory suggests that private savings may not decline with population aging as seniors leave bequests to their children. Hence this theory is consistent with household survey evidence. Weil (1994) argues that, on the expectation of receiving receipt a bequest, the children will consume more (even though they would continue to be net savers out of their own income). Consequently, taking into consideration both seniors and children behavior, the net effect on private savings may be equivalent to the prediction of the life cycle hypothesis. His evidence from the US Panel Survey of Income Dynamics suggests that holding permanent income constant, families that receive a bequest increase

their consumption by 10.4 percent on average. Hence, even if the elderly do not dissave themselves, they lower the saving of the young via bequests, and hence private savings decline with aging.

In summing up, according to most empirical evidences for the “life-cycle” hypothesis, large elderly populations tend to depress saving rates. The empirical evidences for the “precautionary motives” hypothesis, reveal insignificant dissave, or even increased savings among the elderly groups. Finally, by taking consideration into both the elderly and the youngly behavior, based on the “bequest” hypothesis, Weil (1994) shows that private savings decline with aging.<sup>7</sup> Hence, generally speaking, aging tends to decrease private savings.

## **2. Impacts on Public Saving**

With the large cohort of baby boomer entering the retirement period and the smaller working force, most researchers claim that, both the higher public pension benefits and increased demand for health care services, which are two major components of public finance, will raise government expenditure. As early as 1988, OECD made the following depressing announcement: “Under existing regulations the evolution of public pension schemes is likely to put a heavy and increasing burden on the working population in coming decades. Such a financial strain may put intergenerational solidarity at risk.”<sup>8</sup> Table 1-1 reports the OECD projections for non-interest government spending in total GNP of 10 countries.

### **Table 1-1: Non-interest government spending as share of GNP**

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<sup>7</sup> See Weil (1994) for deeper discussion about the role of macro and micro data played in forecasting the saving rate in response to the changing demographics.

<sup>8</sup> OECD (1988), “Reforming Public Pensions”. Paris. p.102.



	Actual 1990	Projected 2028 pension only	Projected 2028 pensions and health
United States	31.4%	36.7%	38.9%
Japan	27.8%	35.0%	36.4%
Germany	40.9%	51.9%	51.9%
France	46.8%	54.3%	55.2%
Italy	42.5%	51.4%	51.9%
United Kingdom	33.2%	35.2%	35.9%
Canada	33.3%	38.6%	41.6%
Denmark	52.2%	56.9%	56.4%
Netherlands	46.4%	58.0%	60.3%
Sweden	54.0%	61.0%	62.1%

Source: OECD Economics Studies, No.12, Spring 1989

All these 10 OECD countries are expected to face pressure on government expenditure in different degrees, in consequence of the upcoming demographic change.

On the assumption of unchanged public policies, the direct effect of increased public pension commitments would progressively increase government deficits over time. By far, the largest effect would be for Japan where the pressure of pensions would lead to a progressive deterioration in government financial balances equivalent to 10 percent of GDP by 2050.<sup>9</sup> For other OECD countries, Disney (2000) argues that most public pension are in crisis, as their unfounded status will lead to unacceptable payroll taxes along the demographic shift.

On the other side, additional expenditures on public health care are also likely to occur, based on the evidence that the demand for health care service coming from the elderly is higher. In 1993, the ratio of health care spending on the elderly over the non-elderly for 1993 are estimated to be 3, 4.25 and 4.75 respectively for the European Union, the United States and Japan.<sup>10</sup> It is projected

<sup>9</sup> Turner, D, Claude Giorno and *et al* (1998).

<sup>10</sup> A further assumption should be made here. It is that abstracting from the age structure of the population, real per capita health costs rise in line with real wages costs and that there is otherwise constancy in the level of public health service provision.

that between now and 2050, public expenditure on health care will increase government deficits by nearly 2 percent of GDP in the United States and 3 percent in both Japan and European Union.<sup>11</sup>

Thus, in the absence of additional cuts on other components of government expenditure or increase in taxes, corresponding decrease in the public savings will likely take place.

### 3. Impacts on Investment

According to economic theory and empirical evidence, there is a strong relationship between the aged dependency ratio and the level of investment. For instance, in the neo-classical growth model of a closed economy, lower saving rates directly implies lower investment. At the empirical level, Feldstein and Horioka (1980) show that national savings and investment are highly correlated in many countries.

But aging populations imply that the growth rate of the labor force is going to slow down, if not becoming negative. Consequently, the need to invest in capital to equip adequately the new workers will be reduced. Which one of these two falls more is an open question.

Generally speaking, the imbalances in savings and investment are likely to be reflected in the movements of interest rates, exchange rates and international capital flows. Turner *et al* (1998) argue that the downward pressures on savings will exceed slightly those on investment, which will be reflected in a gradual rise in world interest rates up to 0.5 percentage point by 2050. However, Mérette (2002) claims that although the work done by Turner *et al* (1998) is a pioneer

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<sup>11</sup> Turner, D, Claude Giorno and *et al* (1998).

piece for the global case, their model does not capture correctly the age composition of the population. By using the proper life-cycle behavior model—“overlapping generations model”, for instance, the Ingenue Team (2001) obtains a contrary result. In many simulation exercises<sup>12</sup>, the drop in investment is larger than for savings, and consequently the interest rates decline.

#### **4. Summary**

Everything has two sides. On the impacts of aging on the macroeconomics, economists can be divided into two groups: an optimistic and a pessimistic one. The pessimistic economists argue that aging populations mean a smaller working force to support more nonworking group, a greater fiscal pressure that result in higher taxes and debt. Hence, the economic growth will slow down and a decline in living standard is likely to occur. The optimistics, on the contrary, argue that the aging population may not cause economic growth to decline, so the living standard may not drop either. With the increase of investment in human capital that may accompany population aging<sup>13</sup>, economic growth may in fact rise. Although government expenditure is expected to increase, it will be manageable. As for other OECD countries, pension programs in Canada may play an important role as to whether which one of the two scenarios will occur, and I now turn to this question.

## **Part II Pension Issues**

### **1 The Canadian Retirement Income System**

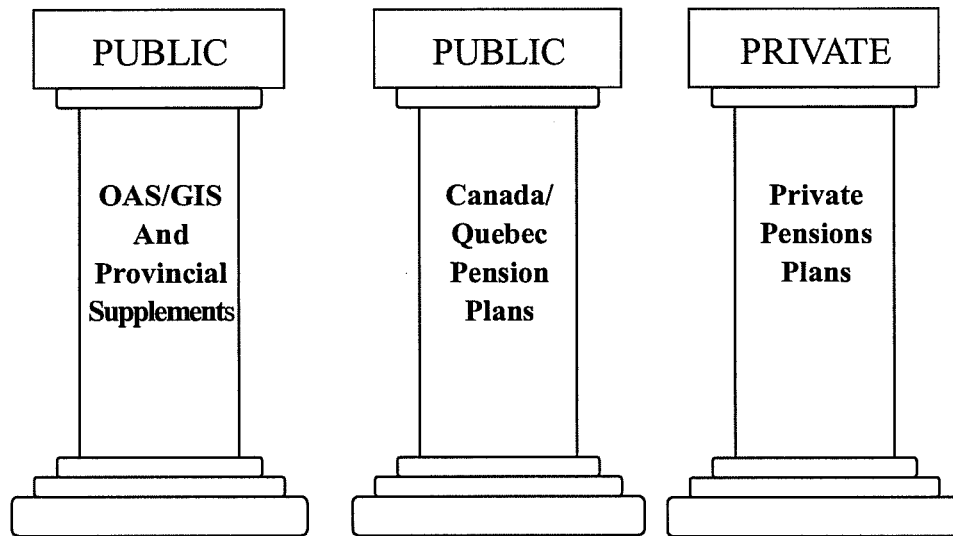
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<sup>12</sup> Aglietta, Michel, Regis Breton, Jachy Fayolle, Michel Julliard, Cyrille Lacu, Bronka Rzepkowski and Vincent Touzé(2001). Auerbach, Alan J, Laurence J. Kotlikoff, Robert P. Hage-mann and Nicoletti Giuseppe (1989).

<sup>13</sup> See Mérette (2002) for more details on this argument.

Canada's retirement income system is often described as a pyramid, divided into three layers.<sup>14</sup> In this paper I prefer to treat these three layers as three pillars as illustrated in Figure 2-1.

**Figure 2—1: Canada's Retirement Income System**



Source: edited from Figure 1 of Banting and Boadway (1997), "Reforming Retirement Income Policy".

The first pillar represents the Old Age Security (OAS), coming into effect in 1952, the income-related Guaranteed Income Supplement (GIS), which was established in 1967 and some provincial supplement benefits appearing shortly after the GIS. They are all financed by the governments, usually from general tax revenue. For the OAS and GIS, anyone who meets the residence requirement (ten years), whether he/she has contributed to the tax system or not, is eligible for benefits after the age of 65.

In the early time, the OAS was the principal source of retirement income for most elderly Canadians. It represents an intergenerational transfer from

<sup>14</sup> The base layer refers to the OAS/GIS, followed by CPP/QPP and private pension plan. Since, the private pension plans play a more and more important role in pension program in recent years, it is improper to treat them just as a simple top angle of a pension pyramid. They are at least as important as the other two public plans.

working-age people to retirees. In the decades that followed 1965, the balance between the OAS and the GIS gradually shifted, as the GIS was continually enriched in real terms, whereas the OAS maintained constant in real term. According to Banting and Boadway (1999), "As the outset of the new millennium, the first pillar will have completed its historical transition from the primary retirement income vehicle for most Canadians to a redistributive instrument designed to support the low-income elderly."<sup>15</sup>

The second pillar consists of the Canada Pension Plans (CPP) and Quebec Pension Plans (QPP).<sup>16</sup> They are also publicly run, but are occupational pension plans financed by employer contribution and payroll deduction from employees. Participation in the CPP and QPP are mandatory for persons employed by others. Self-employed persons can also participate by making the required contribution. The CPP and QPP supplements the basic income provided by the OAS and the GIS for those who have been employed for an aggregate of ten years or more. In fact, these two pension plans are "pay-as-you-go" (PAYG) programs (in which, mandatory payroll taxes are withheld from workers and those taxes are used to pay retirees). It means that in general, current benefits are funded by current contributions; in other words, today's workers support today's pensioners who were past contributors.

The last pillar is composed by the private pension plans, such as Registered Pension Plans (RPPs) and Registered Retired Savings Plans (RRSPs). The private pension plans are voluntary savings programs and sponsored by individual companies, groups of employer, unions, religious and charitable organizations and

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<sup>15</sup> Banting, Keith and Robin Boadway (1997), "Reforming Retirement Income Policy: The Issues", in the *Reform of Retirement Income Policy: international and Canadian perspectives*, edited by Banting and Boadway, School of Policy Studies, Queen's University, Kingston, Ontario, pp. 4.

<sup>16</sup> The Canadian Pension Plans operates generally in all provinces except Quebec. The CPP and QPP have identical contribution rates; operate in parallel with a broadly similar design.

other private sector employers. Under the Canadian Income Tax Act, workers may deduct contributions from taxable income to RPPs and RRSPs, subject to certain limits. Income earned by these two plans is tax-free while the withdrawals of savings from these plans are taxable. The table 2-1 summarizes the overall Canada's retirement income programs clearly.

**Table 2-1: Canada's retirement income programs**

<b>Sponsored or Administrated by</b>	<b>Program</b>	<b>Year introduced</b>
<b>Gouvernement</b>	Old Ade Security	1952
	---Guaranteed income Supplement	1967
	---Allowance and Allowance for Survivors (previously called Spouse's Allowance)	1975
	Canada and Quebec Pension Plans	1966
<b>Employer</b>	Registered pension plans	1800s: first plan 1919: recognized in tax legislation 1965: first regulatory legislation
	Group Registered Retirement Savings Plans	
	Other programs such as:	
	---Derfered profit sharing plans	1961
	---Retirement compensaiton affrangements	1987
<b>Individual</b>	Registered reitremet savings plans	1957

Source: Statistics Canada (2003), "Canada's Retirement Income Programs", Figure 1-1.

Today, the OAS and GIS intensively aim at supporting the poor elderly. The middle- and upper- income Canadians tend to seek additional income through occupational pensions (CPP/QPP) or private savings (RRPs/RRSPs).

In 2000, the Old Age Security (OAS) program cost the federal treasury over \$24 billion, up 43 percent from 1990, and the number of OAS recipients increase by about 42.5 percent from 1990. These changes are reported in the Table 2-2

below. As it can be seen in the table, the greatly increase in the expenditure of the Old Age Security program is mostly due to the change in the composition of the population: more and more baby boomers have retired in recent decades.

**Table 2-2: Number of beneficiaries and amounts paid, by Province**

	1980		1990		2000	
	Number 000	Amount \$'000,000	Number 000	Amount \$'000,000	Number 000	Amount \$'000,000
<b>OAS</b>	2323	5868	2989	12456	3721	18594
<b>GIS</b>	1220	2101	1318	3899	1353	4933
<b>Total</b>	3543	7969	4307	16355	5074	23527

Source: Calculated by author. The raw data is from Statistics Canada (2003), "Canada's Retirement Income Programs", Table2A-4.

On the other hand, the two other pension pillars benefit from an increase in contributions during 9 years. In 1999, over \$66 billion were invested to these three major retirement income programs (C/QPP, RPPs and RRSPs). This represents an increase of 65 percent from 1991 in current dollars and 47 percent in constant dollars. The largest percentage, 39 percent, went into RRSPs, followed by 32 percent to C/QPP, and 29 percent to the RPPs. From Figure 2-2, we can notice that the contributions to RRSPs go up steadily and quickly from \$12 billion in 1991 to \$26 billion in 1999, while the contributions to RPPs have not significant change significantly<sup>17</sup>.

As reported in Table A2- 2 in the appendix, the accumulated assets of these three selected retirement income programs now represent a massive financial wealth. At the end of 2000, almost \$1.16 trillion was accumulated in the three programs. Although RPP contributions have not been increasing, as have C/QPP and RRSP contributions, RPPs still accounted for over 70 percent of the total. The

<sup>17</sup> More detail data about contributions to these three programs see Table A2-1 in appendix.

steady increase in contributions to RRSPs helped to boost the amounts accumulated. From 1990 to 2000, assets in RRSPs grew by 159 percent (in current dollars), slightly more than the 148 percent increase for RPPs. Figure 2-3 shows clearly these trends.

Retirement income system provides a significant proportion of the income of the elderly. In 1999, private pension plan (largely from RPPs and RRSPs), Old Age Security, the Guaranteed Income Supplement and C/QPP all provide the elderly 76 percent of their total incomes, up from 65 percent in 1990. Much of the increase can be attributed to private pension plan income, which grew from 18 percent of total income in 1990 to 29 percent in 1999. Besides, almost 55 percent of those 65 and older receive private pension income in 1999, up from 38 percent in 1990.<sup>18</sup> Another significant change about income sources of the elderly is that the proportion of the OAS income in total income of the elderly decreases from 29.8 percent in 1990 to 26.9 percent in 1999, although the cost of Old Age Security programs increases significantly 43 percent from 1990. Figure 2-4 indicates the trends of the changes in the four main sources of the elderly's income.

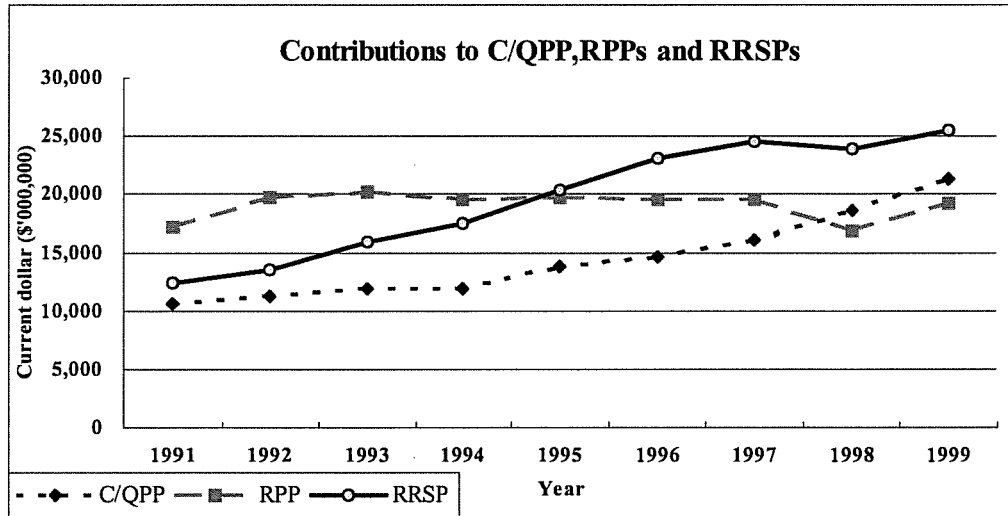
Summing up, broadly speaking, the second and third pillar pension programs have played a more and more important role in Canadian retirement income system. Furthermore, the growing-up status of these programs was mostly due to private pension plans, resulting from the considerable market value assets of RPPs, the great deal of contributions to the RRSPs and also the quickly ascending place of RRSPs in providing income of the elderly.

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<sup>18</sup> For detail data about distribution of income sources of the elderly and number of elder persons under these different income sources, see Table A2-2.

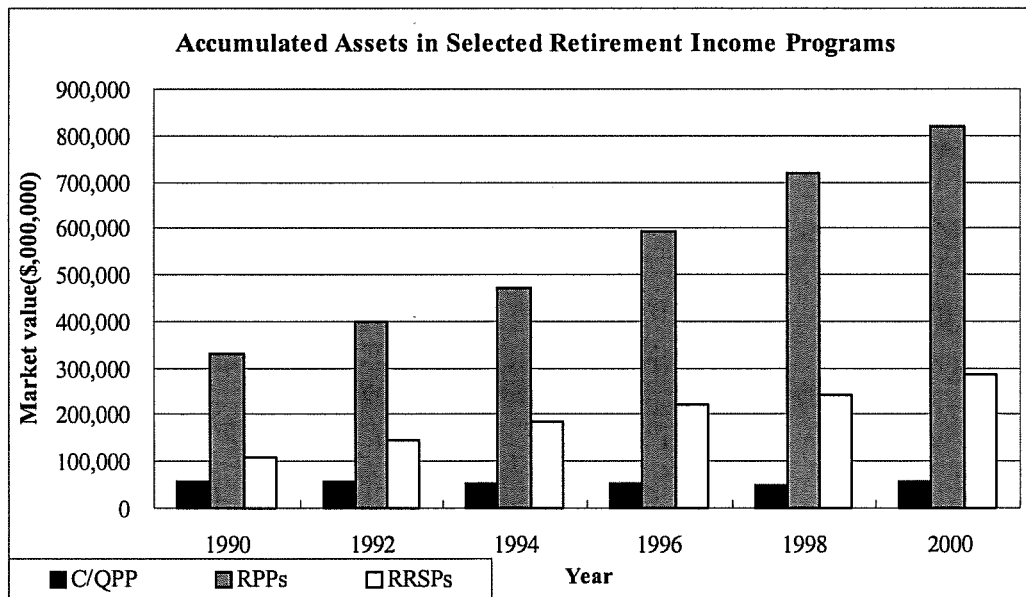


**Figure 2-2: Contributions to C/QPP, RPPs and RRSPs**



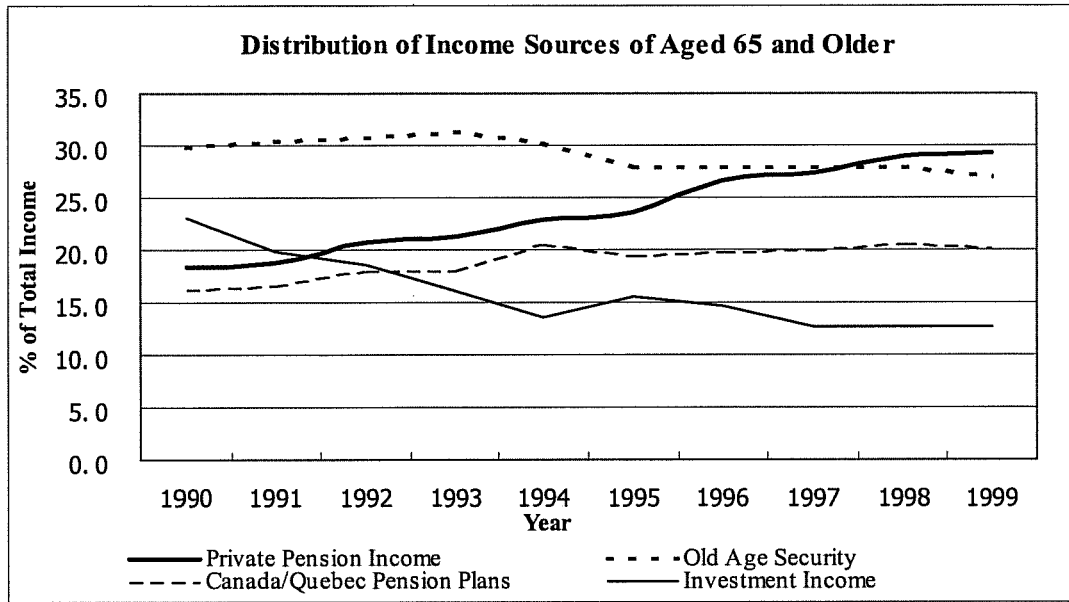
Source: Edited by author. The data is from Statistics Canada (2003), "Canada's Retirement Income Programs", Table 1-2.

**Figure 2-3: Accumulated assets in selected retirement income programs**



Source: Edited by author. Data is from Statistics Canada (2003), "Canada's Retirement Income Programs", Table 1-3.

**Figure 2-4: Distribution of income sources of aged 65 and older**



Source: Edited by author. The row data is from Statistics Canada (2003), "Canada's Retirement Income Programs", Table 1-4.

## 2 Private Pension Plan

### (1) Private pension plan in Canada

Privately managed pension schemes and individual retirement savings plans together make up the Canadian private pension system.

The former is often called occupational pension plans, employer-sponsored plans or registered pension plans (RPPs). Privately managed pension plans are plans sponsored by employer, labor unions, associations and professional organizations, first established in Canada in the late 1800's, and tax assistance that employer contributions to pension plan become deductible as business expenses has been provided since about 1917. Two years later, the Income Tax Act was amended, allowing employee contributions to be exempted from taxation. There was no limit of deductions for both employer and employee at that time. Registered pension plans, registered with the Canada Customs and Revenue Agency for tax purpose, as well as the federal or a provincial pension regulatory

authority, covered 40.6 percent of the paid workforce at the end of 2000, or just over 5.4 million workers.<sup>19</sup>

The latter one aims at individual. Under the RRSPs, individuals may deduct the amount of their contributions from taxable income each year. If an individual does not use up his or her RRSP contribution limit in a year, the unused contribution room is carried forward to future years. The carry-forward helps individuals who may go through periods where it is difficult to set aside amounts for retirement by allowing them to make larger contributions in later years when they are better able to save. Individuals may withdraw from their RRSP accounts at any time they want, while the withdrawal amount is subject to the regular taxation. At the end of 1999, the total amount contributed into RRSPs was \$28.6 billion, and average contribution was \$4,540. Over 6.3 million Canadian contributed to the 1999 tax year.<sup>20</sup>

## **(2) Private pension plan in the U.S.**

The U.S. retirement income system has three main components—Social Security, part of employer-sponsored pension plans and Individual Retirement Accounts (IRAs). Part of employer-sponsored pension plans and IRAs consist of private pension plans. The concept of private pensions has had a long history in the United States as well, with the first corporate pension plan established in 1875 by the American Express Company. The period of greatest growth for private pensions in the United States began after World War II. The private pension plans are all voluntary.

Among kinds of the employer-sponsored pension plans, 401(k) plans (named

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<sup>19</sup> The data is from Statistics Canada (2003).

<sup>20</sup> The data is from Statistics Canada (2003).

after the enabling section of the internal revenue code) are most popular and tax-deferred plans. In other words, the contributions to 401(k) plans are not counted as taxable income, and no taxes paid on accumulated interest until the funds are withdrawn, similarly with the RPPs and the RRSPs in Canada. Originally authorized in 1978, 401(k) plans began to grow rapidly after regulations were issued in the early 1980s. In 1984, active 401(k) participants numbered 7.5 million and aggregate contributions total \$16 billion. By 1998, active participants numbered almost 37 million, contributions were \$ 134 billion and total assets are \$1,540 billion.<sup>21</sup> A particular kind of employer-sponsored pension plan, especially for self-employed individuals and unincorporated businesses, named as Keogh plans, was introduced in 1962. According to Keogh plans, companies may establish tax-qualified pension plans whatever their corporate form. Hence, individuals who are self-employed may provide pension plans for themselves and their employee and contribution to Keogh plan is tax-deferred. Nonetheless, relatively few self-employed individuals have established Keogh plans. In 1987, only 5.6 percent of some 10 million self-employed workers reported that they had a Keogh plan. Most self-employed businesses hire few employees, however, so that this lack of pension coverage primarily affects business owners. Furthermore, firms frequently incorporate before they become successful enough to sustain a pension plan.

The IRAs were established in 1974, and at that time, only the workers who were not covered under employer-sponsored pension plan were eligible to make tax-deferred contributions to IRAs, and contributions were limited to \$1,500 per year. That limit was raised to \$2,000 through subsequent legislation. The 1981

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<sup>21</sup> United States Department of Labor. Pension and Welfare Benefits Administration. 1999. Private Pension Plan Bulletin, Abstract of 1995 Form 5500 Annual Reports. No.2 (Summer).

Economic Recovery Tax Act extended the IRA option to virtually all workers. Under the Tax Reform Act of 1986, however, couples and single workers earning more than specific amount were no longer allowed to contribute to an IRA with pre-tax dollars. In 1987, Congress imposed income limits on IRAs in an attempt to target low- and middle-income workers, whereas in fact the annual income limits are unfair to taxpayers with fluctuating income. At the end of 2002, individual retirement account assets total are roughly \$2.5 trillion.<sup>22</sup>

In summing up, there are some differences between IRAs and 401(k) plans. First, 401(k) plans are available only to employees of organizations that elect to sponsor such plans. Second, employee contributions to a 401(k) occur through regular payroll deductions, whereas IRA contributions can be made at the employee's discretion. Finally, employers can supplement employee contribution rates to a 401(k). Due to tax treatment on these private pension plans, RPPs, RRSPs in Canada and 401(k)s, IRAs and Keogh plans are called "tax-deferred" retirement saving plans, as well as "tax-preferred", "tax-favored" retirement saving plans.

### **(3) Objectives of private pension plans**

Although the timing and magnitude of the population aging varies across different countries and every country has its particular fiscal position, one general objective of private pension plan is to contain or reduce the growth in public pension costs and the burden on taxpayers. But, besides reduction of the cost of public old-age pensions, these plans try to stimulate saving rate and improve the

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<sup>22</sup> Boskin, Michael J. (2003).

adequacy rate of retirement income.

A. Increasing the rate of national saving

Public pensions that are unfunded, are believed to reduce saving; whereas, funded private pension system are believed to increase it. Moreover, according to the tax treatment of retirement income, contributions are tax deductible and investment income is not taxed as it accrues, so it means that the individual is encouraged to set aside money for his or her retirement, and hence private saving may increase. However the empirical evidences about effects of the private pension on private-sector saving, vary widely. I will discuss it at length in a later section.

B. Improving the adequacy of retirement income

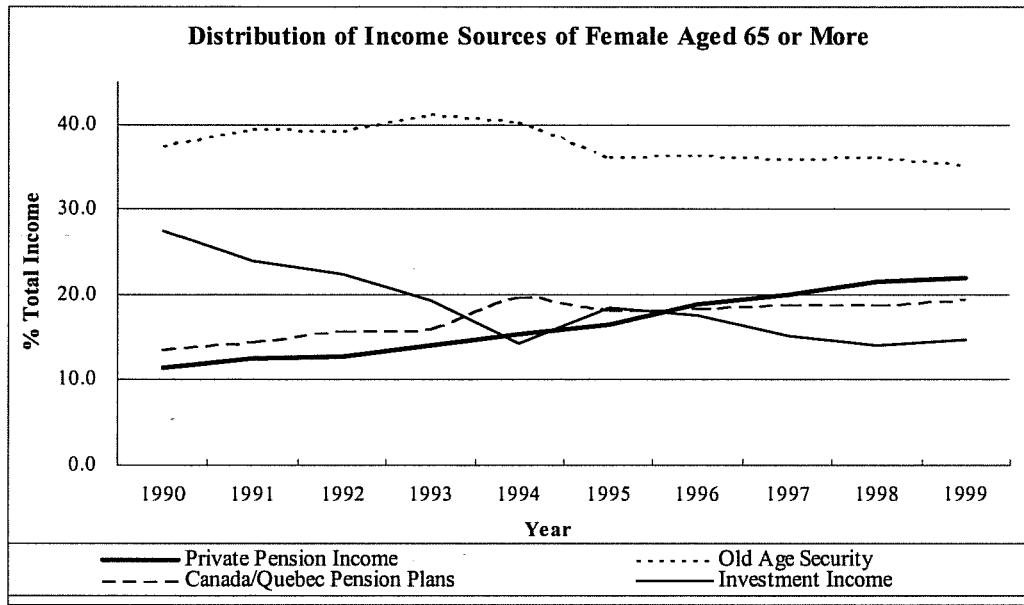
Improvements in adequacy of retirement income are desirable when limitations exist on earnings-replacement rates for higher earners or eligibility through means-tests. Furthermore, some particular groups such as women, who may be unintentionally disadvantaged in public programs, might benefit from enhanced private pension provisions.<sup>23</sup>

For the case of Canada, it is not difficult to obtain some evidences for the argument above. From figure 2-5, we can see that the private pension income

**Figure 2-5: Distribution of income sources of female aged 65 or more**

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<sup>23</sup> Duskin, Elizabeth (1992).

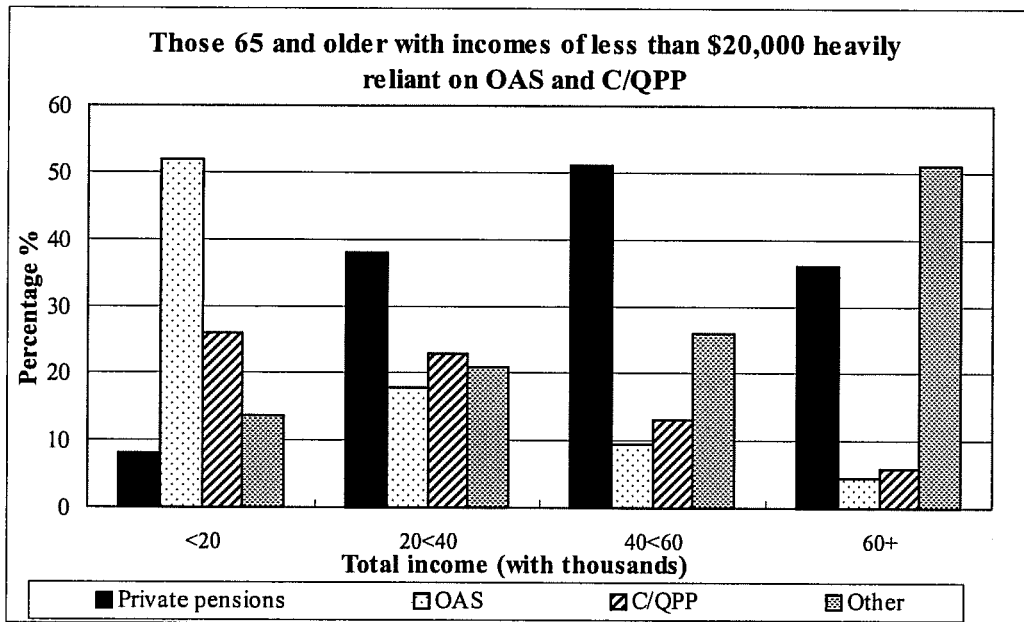


Source: Edited by author. The data is from Statistics Canada (2003), "Canada's Retirement Income Programs" Table 1-6.

becomes important for the female elderly only during the last decade; the proportion of the private pension income in the total income grows up both steadily and quickly, from 11.5 percent in 1990 to 22 percent in 1999. On the other hand, benefit from the OAS is still the primary source for the female elderly, although its proportion in total income declines slightly. The possible reasons are the relatively low earnings and less working-opportunities for females. Since the OAS only guarantees the basic retirement income, poorer the people are more likely they have to count on the OAS (see Figure 2-6).<sup>24</sup> The earnings of the elderly and the degree of their reliance on the OAS have a negative relationship: in general, when the earnings of the retired increase, the proportion of income from the OAS decreases. The same negative relationship exists between the earnings and the income from the C/QPP, which is also public pension plan.

**Figure 2-6: Pension plan and earning of the aged 65 and older**

<sup>24</sup> More detail data about income sources of female elderly is available in Table A2-4 in appendix.



Source: Edited by author. The data is from Statistics Canada (2003), "Canada's Retirement Income Programs" Chart 1-4.

This part briefly introduced the evolvement history of private pension plans, described the present status of private pension plans both in Canada and the U.S., and discussed the two objectives of private pension plans, such as increasing saving rate and improving the adequacy rate of retirement income. Practically, what role private pension plans play in context of aging? In the next part, I discuss this issue.

### **Part III Assessing private pension plan**

Private pension plans have wider economic effects, and these effects are central to the assessment of the overall role of private pension plan in the economy. This part firstly provides an overview of the economic effects of the private pension plan and focuses on their impacts on savings and public finance in the context of aging, using the experience of Canada and the United States.

#### **1 The impacts of private pension plan on the labor market**



There are several ways in which private pension plans can impact on the labor market. In particular, private pensions can affect labor mobility; productivity and work effort; retirement age; compensating wage adjustments; and the redistribution of wealth across age, sex and service cohorts. There are not much direct evidence of the impact on productivity and work effort, because of the difficulty in obtaining precise measurements of work effort and productivity. In comparison, there are many empirical evidences on the effects of private pension plan on labor mobility and on retirement age. Besides, there are also some evidences on the role of compensating wage adjustments and on the re-distributive effects of employer-sponsored pension plans. But, in this paper, the effects of compensating wage adjustments and wealth re-distribution will not be discussed.

### **(1) Labor mobility**

Substantial evidences show that workers who are covered by pension have lower turnover rates than uncovered workers, no matter he or she is young or old. In the United States, the data from the Survey of Consumer Finances indicate that the probability that an individual will remain in the same job over a five-year period is more than twice as high for covered than for uncovered workers. More direct evidence comes from the Current Population Survey in the United States in May 1983: men not covered by a pension plan had an average tenure of 6.91 years with their present employer, compared with 13.83 years for covered men, and women not covered by a plan had an average tenure of 5.77 years, compared to 10.42 years for covered women.

One explanation is that the prevalent type of private pension plan in North

America is defined-benefit pension plans, and these plans promise workers specific pension at retirement based on formulas that are frequently related to salary and years of service. Hence these plans mostly benefits to long-service workers. Thus, it is rational for workers, who are beneficiary of these plans, to serve one employer for a relative long time.

While the above explanation is related to employees' motivation, the other explanation is related to employers, who are sponsors of pension plan. Firms which sponsor pension plans tend to defer compensation to an employee late in the working life. These firms may effectively screen workers to attract those who are more inclined to make long-term commitments to a single employer. Alternatively, firms that sponsor pension plans may be more inclined to pay "efficient wage"-- wages above those prevailing in the marketplace, as a means of encouraging effort and enhancing worker productivity.<sup>25</sup> If this is true, covered employees will be less likely to quit, since they risk earnings only the market wage if their existing employment relationship is severed. In consequence, labor mobility is reduced.

However, not much is known about to what extent private pension plans, by reducing hiring and training costs and by enhancing work effort, enhance productivity.

## **(2) Retirement age**

Much of the analysis of the retirement incentives contained in private pension plans focuses on the decision to retire before the normal retirement age of 65. In the case of the U.S., Lazear (1982) suggests that pension wealth peaks at

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<sup>25</sup> Pesando, James E. (1992).

the date at which they first qualify for early retirement, and that pension compensation turns negative after this time. In other words, once an employee has qualified for early retirement, continuing to work involves an implicit tax in the form of forgone pension payments. That is why pension compensation may turn negative after a member has qualified for an early retirement pension.

In addition, provision concerning postponed retirement, which affect pension compensation after age 65, also have important incentive effects. Indeed, such provisions can serve as a strong distinctive to pursue work. In the case of Canada, there are four types of provisions for postponed retirement: firstly, the continued accrual of pension benefits, with no actuarial increase of previously accrued benefits; secondly, no further accrual, with an actuarial increase of previously accrued benefits; thirdly, continued accrual, with an actuarial increase of previously accrued benefits; lastly, no further accrual and no actuarial increase.

Pesando (1992) argues that the pension benefit accrued under the second case is equal to zero. Due to this reason, the second provision provides a natural benchmark against which to evaluate the alternatives. Table 3-1 reports the pension compensation between age 66 and 70 for a member of the defined-benefit plan for each alternative provision under two different assumptions about inflation rates.

**Table 3-1: Pension compensation as a percentage of salary under alternative provisions concerning postponed retirement**

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Age	Continued accrual; no actuarial increases	No further accrual; actuarial increases	Continued accrual; actuarial increases	No further accrual; no actuarial increases
No inflation				
66	-21	0	-2	-42
67	-22	0	-3	-41
68	-23	0	-4	-39
69	-24	0	-5	-38
70	-24	0	-6	-37
High inflation (10%)				
66	-5	0	30	-41
67	-6	0	30	-36
68	-6	0	30	-32
69	-7	0	29	-29
70	-7	0	29	-26

Source: Pesando, James E (1992), "The economic effects of private pensions", Table 8.2.

Under the fourth case, pension compensation is large and negative in both inflation scenarios. Under this kind of provision, if employee chooses postponed retirement, he or she forgoes the receipt of pension payments and receives nothing in return. Obviously, employee subject to this provision is less likely to continue on working. The "continued accrual and no actuarial increase" provision is not able to guarantee positive pension compensation. Under both zero inflation and high inflation, pension compensations at age 66 are negative: under zero inflation, compensation at age 66 equals to -21 percent of the member's salary; under high inflation, it is equal to -5 percent of salary. Similarly, continued actual and actuarial increase of previously accrued benefits is not sufficient to guarantee positive pension compensation as well. Pesando gives one explanation: because some representative pension plan is integrated with the Canadian Pension Plan, higher the pension benefits from the CPP, the lower the pension from the private pension plan, keeping other factors unchanged; without inflation, the year's maximum pensionable earnings rise faster than wages so that this integration offset the increase in value, thereby reducing the value of the private pension

benefit.

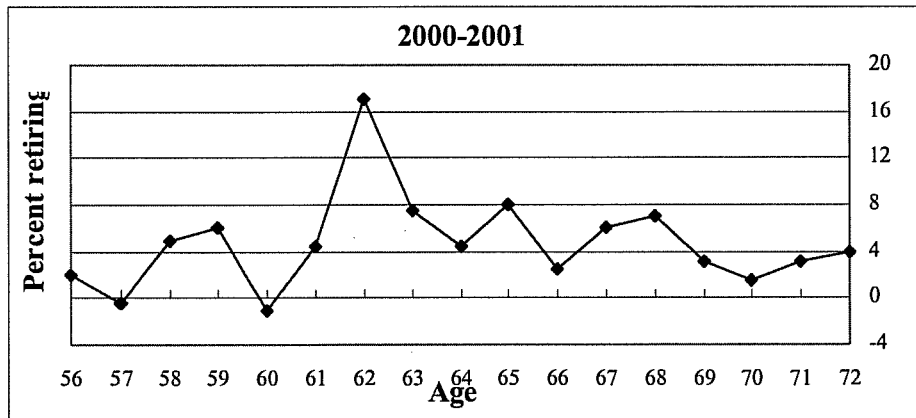
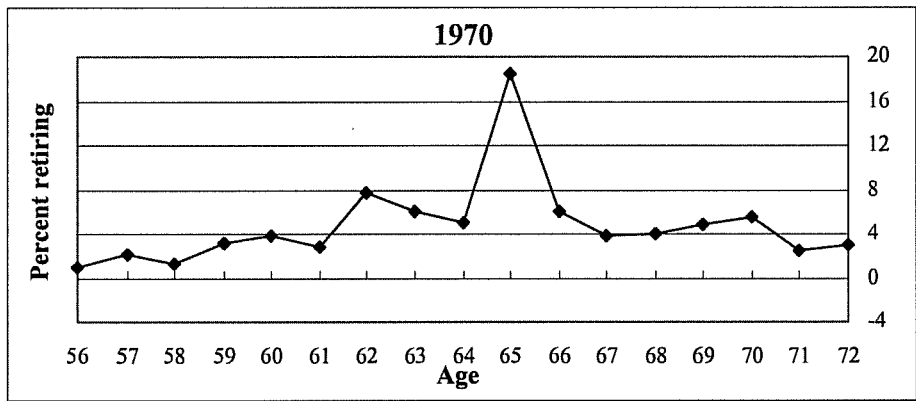
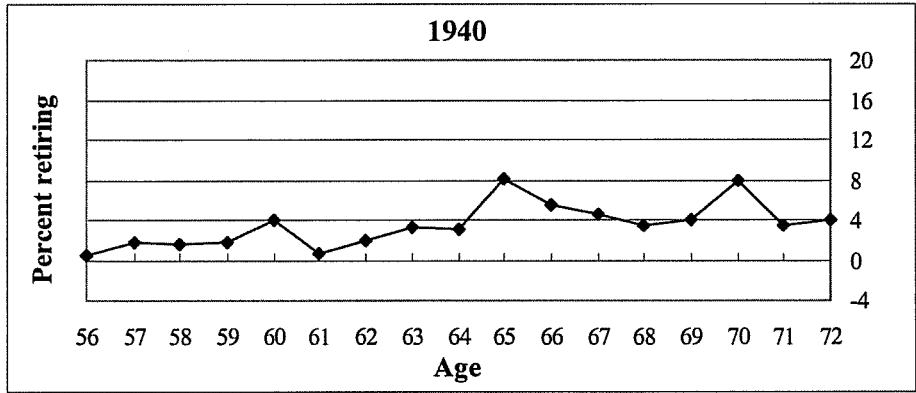
Although the work incentives embedded in postponed-retirement provision, as well as early-retirement provision, have been extensively studied, empirical research of the extent to which actual retirement decisions are influenced by these incentives are rather rare. To most economists, the incentives to early retirement contained in many private pension plans are real. The incentives are consistent with the actual strong and continuing trend towards early retirement. In the United States, for instance, the proportion of men aged 55 and older participating in the labor force was 64.1 percent in 1940, 52.7 percent in 1970, and 39.6 percent in 1985. Although the participation rate for women aged 55 and older increased until 1970, it has subsequently declined.<sup>26</sup> In addition, the most recent study about labor market incentives from Burtless and Quinn (2002) provide the evidence on early retirement in the U.S.. Figure 3-1 illustrates this trend in the U.S. labor market. The first panel shows the share of active workers retiring at a given age in 1940, shortly after Social Security was established. By 1970, the incentives in both Social Security and employer sponsored plans clearly produced a surge in the popularity of retirement at age 65. Since then, the availability of early retirement produced a surge in “age 62” retirements with a substantial drop in “age 65” retirement. In Canada, the participation rate for man aged 55-64 also decreases from 85.9 percent in 1961 to only 64.4 percent in 1990.<sup>27</sup>

**Figure 3-1: Percent of male workers retiring by age in the U.S., 1940-2001**

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<sup>26</sup> Lunsdaine, R.L. and D.A. Wise (1990).

<sup>27</sup> Statistics Canada (1990), “The Labor Force”, Catalogue No. 71-001, November.



Source: Burtless and Quinn (2002).

If the private pension plans encourage early retirement, it will definitely augment the negative impacts of aging populations. For instance, the actual size of working force will get smaller than what is expected and the effective old age dependency ratio will get worse than projected.

To summarize, both economic theory and empirical evidence indicate that private pension plans are associated with reduced labor mobility, have contributed to the trend towards early retirement, and have discouraged work beyond age 65. In addition, private pension plans undoubtedly favor certain types of employee relative to others. Apparently, private pension plans favor long-service employees and favor the male over female workers.

## **2 The Effect of private pension plans on private saving**

In the most basic form of the life-cycle model, individuals seek to allocate their resources so as to maintain a steady stream of consumption throughout their lifetime. To maintain such a stream, individuals save during their working years in order to finance retirement consumption. The pattern of saving over an individual's lifetime depends on the rates of return to saving, individual's preferences over present and future consumption, and the time profile of earnings.

Nonetheless, without market imperfections and deferred-tax treatment for private pension plans, private pension would not exert any net impact on private saving. Individuals would probably simply reduce their discretionary saving, dollar for dollar, for each increase in private pension contributions. However, in a capital market imperfection environment, liquidity constraints set limits on individuals' ability to borrow and hence in their ability to reallocate their future pension wealth to current consumption. So, contribution by individuals to private pension may exceed what individuals reduce from their discretionary saving in order to ensure enough retirement consumption.

In addition, private pensions are actually under deferred-tax treatment

(unlike Canadian, not all of private pensions of the U.S. are under deferred-tax treatment). Incomes used as contribution saved into deferred-tax retirement saving accounts are not taxable, but incomes not used as contribution to these pensions are taxable. When incomes are used to invest in buying stocks or funds under the deferred-tax pensions, individuals can earn the pre-tax rate of return on their pension saving, but only the after-tax rate of return on their non-pension savings. However, the higher return to pension saving exerts an ambiguous effect on the amount of personal saving. Due to the income effect, an individual can increase consumption in all period, both before and after retirement. This tends to reduce current saving. Because of the substitution effect, however an individual has an incentive to consume less now and to consume more in retirement, since current consumption has become more costly in terms of future consumption. This tends to increase current saving. In other words, individuals can accumulate enough to finance a target level of consumption during retirement at a lower rate of saving, but the higher return to saving may encourage individuals to plan for a higher level of consumption during retirement.

Econometric studies on the impact of private pension plan are rare. Some of studies suggest that private pension wealth has a large displacement effect<sup>28</sup> on saving. Kohl and O'Brien (1998) report that the displacement effect of private pension plans on saving perhaps is as much as 50 percent in the United States and Canada. In other words, private pension contributions reduce other savings on less a dollar-for-dollar basis. Among these studies, for the case of the United States, Hubbard (1986) reports total displacement effect of 16 percent only, and Gale (1995) reports a total displacement effect on non-pension saving for private

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<sup>28</sup> The displacement effect refers that pension saving lowers non-pension saving.



pensions of 50 percent. For the case of Canada, Discks-Mireaux and King (1984) find a displacement effect of 51 percent for private pension plans. Since there is no *priori* expectation for the sign of the effect of private pensions on private saving, the explanations on the displacement effect of private pension on saving are undetermined.<sup>29</sup> More research into this area is needed.

With the great development of tax-deferred retirement saving plans in private pension systems, the effects of tax-deferred private pension plans on saving are of more and more concerns. Kohl and O'Brien (1998) after reviewing a great deal of empirical studies on tax-deferred private pension plans (or saving accounts), conclude that as the incentive vehicle for retirement saving, in general, these pension plans do stimulate some new private savings, around 20 to 25 percent of total contributions according to the experiences from the United States, Canada, Denmark and the United Kingdom, but the specific effect varies sensitively to the design of the scheme, such as ceilings on contributions and limitations on eligibility and marginal tax rates. Here I only talk about the case of the U.S. and Canada.

In the United States, most studies of tax-deferred private pension plans have been conducted by two groups of authors—Gale, Engen and Sholz, on the one hand; and Poterba, Venti and Wise who, in various combinations, have arrived at opposite conclusions against the preceding group of authors. Gale, Engen and Sholz (1994) reported that tax-deferred saving accounts had little measurable effect on private saving. They inferred that higher saving in these accounts was mostly asset reallocation and that any positive saving effect was largely explained by the increase in income implied by the tax transfer involved. On the opposite

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<sup>29</sup> Kohl, Richard and P. O'Brien (1998).

side, Poterba, Venti and Wise (1995, 1996, 1998) find in nearly all of their studies that the sample population participating in these plans increased their total assets over time, and they also found that the savings of contributors tended to grow much more rapidly than those of non-contributors.

Poterba, Venti and Wise (1995), Sabelhaus and Ayotte (1999), Pence(2001) and Benjamin (2002) conclude that there is little displacement of saving to 401(k)s from other personal saving. Furthermore, Engelhardt (2000), claims that 401(k)s have stimulated saving significantly for lower-to-middle income households. It is noteworthy that almost at same time, Engen and Gale (2000) generalized the conclusion of Engelhardt. They find that the effects of 401(k)s on personal wealth vary significantly by earning levels. 401(k)s are more likely to represent additions to net wealth for low earners than for high-earning groups. Overall, between 0 to 30 percent of 401 (k) balances represent net addition to private saving.

For IRAs, Joines and Manegold (1995) show that around 20 to 25 percent of IRAs represent new private saving. The latest study by Attanasio and De Lieure (2002) concludes about 40 percent of the contributions to IRAs represent new household saving.

The number of empirical studies on effect of tax-deferred private pension plans for Canada is also limited. Carroll and Summers (1987), Jump and Wilson (1986) suggest that the jump in aggregate saving in the early 1970s in Canada relative to the United States was evidence that the Canadian RRSPs was generating new saving. Venti and Wise (1994) find from all of their tests that no evidence show RRSPs displace other type of private saving, thus they conclude that RRSPs increase private saving and present two reasons. Firstly, after the

introduction of RRSPs, saving rates in Canada rose; secondly, RRSPs-based saving rates didn't decrease when other types of saving declined.

However, Burbidge, Fretz and Veall (1997, 1998) criticize the above explanation from Carroll and Summers (1987) and Jump and Wilson (1986). They argue that RRSPs could not account for the differences in saving rate between two countries, while the change in financial assets and the change in financial liabilities actually accounted for much of variation of Canadian saving. In addition, Kohl and O'Brien (1998) point out a deficiency in the studies of Venti and Wise (1994), that although Venti and Wise have shown that there was no displacement effect with the existing saving, this does not imply there has been no displacement effect with new flows of saving, and thus conclusion that RRSPs caused an increased flow of saving is not fully convincing.

Besides the life-cycle model, there are additional possible channels through which private pension plans may induce net private saving. One scenario focuses on psychological issues of self-control and myopic consumption behavior, known as behavior saving models.<sup>30</sup> For some individuals, particularly those who earn lower incomes, pension contributions may represent "forced saving", or saving in excess of the level they would voluntarily choose. Other individuals may be "myopic" and simply fail to save adequately for retirement if not required to contribute to a pension plan. Individuals may assign greater risk to pension saving than to discretionary personal saving, and thus choose to reduce non-pension saving by less than the amount of the increase in pension saving. Generally speaking, the more imperfect is pension saving as a substitute for non-pension saving, the greater is the likelihood that private pension will increase

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<sup>30</sup> Thaler, Richard H. (1994).

net personal saving.

There is some evidence consistent with this view in the United States. Taxpayers are far more likely to contribute to an IRA if they owned money to the Internal Revenue Service (IRS) in excess of taxes withheld.<sup>31</sup> Obviously, taxpayers would rather write a check for \$2,000 to an IRS than a check for \$1000 to the IRS.

In summing up, both life-cycle and behavior saving models suggest that tax-deferred private pension plans at least have the potential to promote saving even in the short term, whereas, the evidences for that are different between the U.S and Canada. Generally speaking, empirical studies show that tax-deferred private pension plans stimulate private saving and induce certain new saving for the United States. However, such argument has not been proved for the case of Canada: there is no sufficient evidence to show tax-deferred pension plans can bring new saving.

### **3 The influence of private pension plan on tax revenue**

In the United States and Canada, pension plans, such as 401(k) plans, IRAs plans in the U.S. and RPPs, RRSPs in Canada, allow tax-deductible contributions and earnings accumulation free of tax. This tax treatment permits plan contributors to earn the pre-tax rate of return on funds contributed to the pension plan. In light of this favorable treatment, plan contributors face strong incentives to operate their plan in a tax-efficient manner. Thus, it is undoubted that tax treatment does encourage and assist private retirement saving. By contrast, the

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<sup>31</sup> Feenberg, Daniel R. and Jonathan Skinner (1989).

opinions about the influence of the tax-deferred pension plans on government tax revenue are greatly divergent. Before we discuss the influence of private pension plan on tax revenue, an important conception should be introduced: tax expenditure.

Tax expenditures are calculated on an annual basis and, in the case of pension plans, represent taxes that would have been paid on current pension contributions and trust-fund earnings less taxes paid by current retirees. In brief, tax expenditure is intended to measure how much the government spends annually to encourage pension savings, and from a budget perspective it provides some indication of how much revenue the government forgoes from the tax deference provided. In the extension of tax-deferred private pension plans, net tax expenditure is net cost of the tax exemptions, which are made up of the loss of revenue (tax relief on deduction for contribution and earned interest from pension plans) and a source of revenue (taxes on withdrawals from these pension plans).

In Canada, some analysts have advocated a reduction in RPPs and RRSPs contributions limits, if not the virtual elimination of the tax-free status afforded to income earned in these plans. According to Government of Canada Tax Expenditures accounts, the 1992 net tax expenditure from RPPs is \$8.3 billion and from RRSPs \$5.4 billion for a total of \$13.7 billion. These amounts increase in 1994, as the estimate net tax expenditure for RPPs was \$10.4 billion, and for RRSPs was \$6.7 billion for a total of \$17.1.<sup>32</sup> Given the federal deficit of over \$37 billion for the 1994-95 fiscal year,<sup>33</sup> it was tempting to advocate the elimination of tax assistance for retirement in order to accommodate the fiscal needs of the federal government.

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<sup>32</sup> Department of Finance (1997). More detail data see Table A3-1 in appendix.

<sup>33</sup> Department of Finance, <http://www.fin.gc.ca/news95/95-086e.html>.

Would reducing the contribution limits bring more tax revenue? Mintz and Wilson (1997) claim that “it would be oversimplistic to point out that the elimination of tax assistance for retirement purpose would increase personal income taxes by almost 15 percent, clearly at odds with an almost universally held ‘truism’, regardless of its validity, that income taxes are too high in Canada.”<sup>34</sup> Instead, according to their viewpoint, one could consider the trade-off of tax assistance for retirement income as price for a significant reduction in personal income tax rates. A move to broaden the annual income base in favor of lower personal tax rates might be argued by some to be good policy under the argument that it would be fair and efficient. However, the evaluation of these questions of fairness and efficiency in public policy debates are always more difficult than they might first seem. Still, the upcoming change in the composition of the population suggests that without changing the contribution limits, taxes on withdrawals from these deferred-tax private pension plans may bring some net revenue for government.

According to a simulation model developed by Mérette (2002), withdrawal taxation will increase very rapidly to reach around close to four percent of GDP after 2030 so that in a long run, the total net tax expenditures, which amounted to 3.5 percent of GDP in 1995, will become a net tax gain of close to two percent of GDP in 2024. This offsetting effect is based on the fact that withdrawals of these programs (here refer to RPPs and RRSPs) are fully taxed. In other words, the net cost to the government depends on the composition of the population. As Mérette points out in his paper:

“An aging population means lower growth in tax-deferred contributions and

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<sup>34</sup> Mintz, Jack M. and Thomas A. Wilson (1997), “Private Provision of Retirement Income: Tax Policy Issues”, in *Reform of Retirement Income Policy*, Banting K.G and R. Boadway ed., p.209.

accumulated assets. In contrast, taxable withdrawals will grow more rapidly. Thus the upcoming demographic trend toward an older population means significant reductions in the cost of these programs for the government. The programs may even become a net source of revenue.”<sup>35</sup>

The reasons why the net tax expenditures associated with private pension plans can be expected to decline, can be summarized as the following two points: firstly, RRSPs is not fully mature, so contributions to RRSPs will continue to rise. On contrast, RPPs contributions will be stable. In both cases, the withdrawals will rise more rapidly than contributions in the years to come, even on a per capita basis. Secondly, the demographic structure of population will contribute to the declining of net tax expenditures. The baby boomers are now in their 40s and 50s which is the period of life of high desire to save for retirement. After they retire and gradually run down their retirement savings, the government will recover the lost revenue of the early period.

In the U.S., Boskin (2003) claims that taxes on future withdrawals from the deferred-tax saving account, such as IRAs and 401(k)s, are large and important, and possibly have been underestimated, because the tax-deferred saving, which will be taxed at withdrawal as ordinary income, has been growing rapidly relative to other sources of income. After examining the several life-cycle budget effects of deferred-tax saving vehicles and their implications for the present value of taxes, he obtains this result: the underestimate of revenues from deferred taxes closes a significant fraction of the fiscal gaps projected by the Congressional Budget Office (CBO) and the Office of Management and Budget (OMB). This conclusion is undoubtedly an exciting research outcome to the government, the

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<sup>35</sup> Mérette, Marcel (2002), “The Bright Side: A Positive View on the Economics of Aging”, p.17.

policy maker. While, the fact is not so easy as Boskin considers.

Shortly after he publishes his point of view, Auerbach *et al* (2003) respond quickly that deferred-tax saving will not solve the fiscal problem. Virtually, Boskin's projections of revenue from tax-deferred accounts have only a very modest effect on the long-term fiscal outlook because almost all of the relevant revenue which results in the direct effects of tax-deferred saving accounts is already incorporated into the revenue projections that generate sizable fiscal gaps calculated by CBO and OMB. On the other hand, Boskin's projections include more than just the direct revenue implications of tax-deferred accounts; he also include indirect feedback effects associated with the impact of induced capital accumulation on revenues. By contrast, estimates of nation's long-term fiscal status calculated by CBO and OMB generally do not include feedback effects of tax-deferred accounts. Hence, Boskin's revenue projection and CBO and OMB's fiscal gap are not comparable directly.

To correct the drawbacks in Boskin's paper, Auerbach *et al* reassess the overall effect of tax-deferred accounts on the long-term fiscal outlook by two ways. First, they modify the fiscal gap for feedback effects, which include federal debt and interest payments and the taxes collected on interest payments on that debt, and the change in national saving and therefore the resulting change in the capital stock and taxes collected on the returns to capital. They find that incorporating the feedback effects due to additional revenue from retirement account withdrawals has only quite minor implications for the fiscal outlook over the 75 years. Table 3-2 shows two re-estimates of the fiscal gap assuming that revenues rise in the fiscal gap baseline to incorporate the difference between taxes on withdrawals in Boskin's model and in the baseline fiscal gap calculations. The



adjusted fiscal gaps in Table 3-2 are only very modestly different than the conventional fiscal gap estimates, with the difference around 0.2 percent of GDP overall time horizons when using Auerbach's estimated tax rates. On a permanent basis, the adjusted fiscal gap falls to 7.38 percent of GDP relative to the conventionally-based estimate of 7.55 percent. Through 2040, the fiscal gap declines to 2.07 percent on an adjusted basis, relative to a conventional estimate of 2.25 percent.

**Table 3-2: Effect of Retirement Plan Growth on Fiscal Gap Calculation (% of GDP)**

	Permanent	Through 2075	Through 2050	Through 2040
<b>Fiscal gap</b> (Conventional estimates)	7.55	4.55	2.99	2.25
<b>Adjusted for retirement plan</b>				
At 20% tax rate	7.38	4.38	2.81	2.07
At 28.7% tax rate	7.31	4.30	2.74	2.00

Source: Auerbach *et al* (2003), Table 1.

Second, they recalculate the net present value of revenues from tax-deferred saving accounts. The result is that the feedback effects are exaggerated in Boskin's conclusion, since three crucial parameters are overstated.<sup>36</sup> These three parameters are "the share of contributions to retirement accounts that represent net additions to national saving", "the effect of an increase in national saving on domestic investment" and "the tax rate on the income from increased investment". The results by recalculation from Auerbach *et al* are very different from Boskin's ones: feedback effects are far smaller than the \$11 trillion feedback effect contained in Boskin's \$12 trillion revenue estimate.<sup>37</sup>

<sup>36</sup> See appendix in the paper of Auerbach *et al* (2003) for the specific seasonings about why these three parameters are overstated by Boskin.

<sup>37</sup> Auerbach *et al* obtain \$1.2 trillion revenues through 2040, based on the assumption that 30 percent of

Generally speaking, Auerbach *et al* estimate that explicitly incorporating the additional taxes associated with retirement accounts would reduce the long-term fiscal gap by only 0.2 to 0.3 percent of GDP, a relatively minor change since the fiscal gap amounts to more than 7 percent of GDP, unlike the result obtained by Boskin that net revenue from tax-deferred saving accounts is over 5 percent of GDP in 2040 and almost 7 percent of GDP in 2050. Consequently, the overall budgetary effect of tax-deferred retirement saving accounts on fiscal status is modest for the United States.

The study on the budgetary effect of tax-deferred private pension plans in the U.S., which is pioneered by Boskin, extended and amended by Auerbach *et al* is greatly valuable. Measurement of the overall budgetary effect of tax-deferred private pension plan, all kind of effects must include direct and feedback effects. The direct revenue effects are the taxes lost on contributions and diverted saving, and the taxes collected on withdrawals, holding the overall rate of capital accumulation fixed. The feedback effects, which allow for changes in the size of the economy due to these policies, include the resultant effect of increases in the capital stock on revenues, changes in public debt on federal interest payments, and changes in taxes paid on those federal interest payments. According to the current available outcomes of research on the effects of tax-deferred retirement accounts in Canada, we know that these saving plans may bring offsetting effect on revenue, based on the calculation of net tax expenditure from tax-deferred private pension plans, which is composed by three element effects — “lost taxes on contributions”, “taxes collected on withdrawals” and lost taxes on earned interest from pension

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contributions to tax-deferred accounts represent net national saving. Under the 40 percent of contributions to tax-deferred accounts representing net national saving and some adjustments to other parameters, net present value of revenues from retirement plans only accounts for \$3.3 trillion through 2040, less than 30 percent of Boskin's base case estimate. Table A3-2 show these estimate data obtained by Auerbach *et al*.

plans which is included in the effect “lost taxes on diverted saving” (which is a wider concept than “lost taxes on earned interest from pension plans”).

If it is true that tax-deferred private pension plans can bring net revenue, in the context of aging, these schemes probably relieve some burden of public expenditure.

#### **4 Summary**

Private pension plans have wide economic effects, and these effects are central to the assessment of the overall role of private pension plans in the economy. This part of the paper has reviewed the economic effects of private pension plans on the labor market, on saving and public balances.

Both economic reasoning and empirical evidence indicate that private pension plans, especially the employer-sponsored pension plans, are associated with reduced labor mobility, with the trend towards early retirement, and with the reduction of incentives to work beyond age 65. It is possible that the “early retirement” strengthens the impact of population aging on the economy.

Theoretically speaking, there is no *prior* expectation on the impact of private pension plans on saving. Nonetheless, the life-cycle and behavior saving models suggest that tax-deferred private pension plans have the potential to promote saving in the short term. The empirical studies of tax-deferred private pension plans suggest that net saving increase by 20 to 25 percent of the total amount placed in these plans, depending on the specific features of these types of plans. The empirical evidence suggests the impact on saving is more significant for the U.S. than for Canada. In the context of aging, if deferred-tax pension plans do stimulate new savings, these plans can alleviate the downward pressure on

savings.

The research on the fiscal balance effects of tax-deferred private pension plan is an important good public finance issue. Any study on this issue should consider overall effects of tax-deferred pension plan, and hence include the effects on saving, capital stock, government debt, and so on. According to Auerbach *et al* (2003), the overall effect of tax-deferred retirement accounts on budget is modest and cannot close the fiscal gap in the U.S. even in the long term. Until now, no counterpart study for Canada is available. However, Mérette (2002) shows that net tax expenditure of tax-deferred saving plans will decline substantially in the decades to come.

In conclusion, tax-deferred saving plans have the potential of alleviating the fiscal burden expected with aging populations and hence, deserve further study.

## **Part IV Conclusion**

This paper briefly introduces the history of private pension plans both in Canada and the U.S., collects the new data to show the growing importance of the private pension plans in the pension system, and then provide an overview of effects of private pension plan, especially the tax-deferred saving plans, on labor market, saving and public finance. As a saving incentive vehicle, tax-deferred saving plans seemed to have stimulated saving in the United States. However, this is not valid for Canada. Furthermore, the large revenue expected from future withdrawals from these tax-deferred saving accounts may lighten the growing burden of public expenditure driven by aging problems in the long term, although these accounts would increase tax expenditures and lower government saving in the short term. The effects of private pension plan on saving and public finance

may cushion the impact of population aging in the long run. However, employers sponsored plans probably result in early- retirement trend, and therefore, this will cause a larger effective old age dependency ratio, which would augment the negative effect of aging on the economy.

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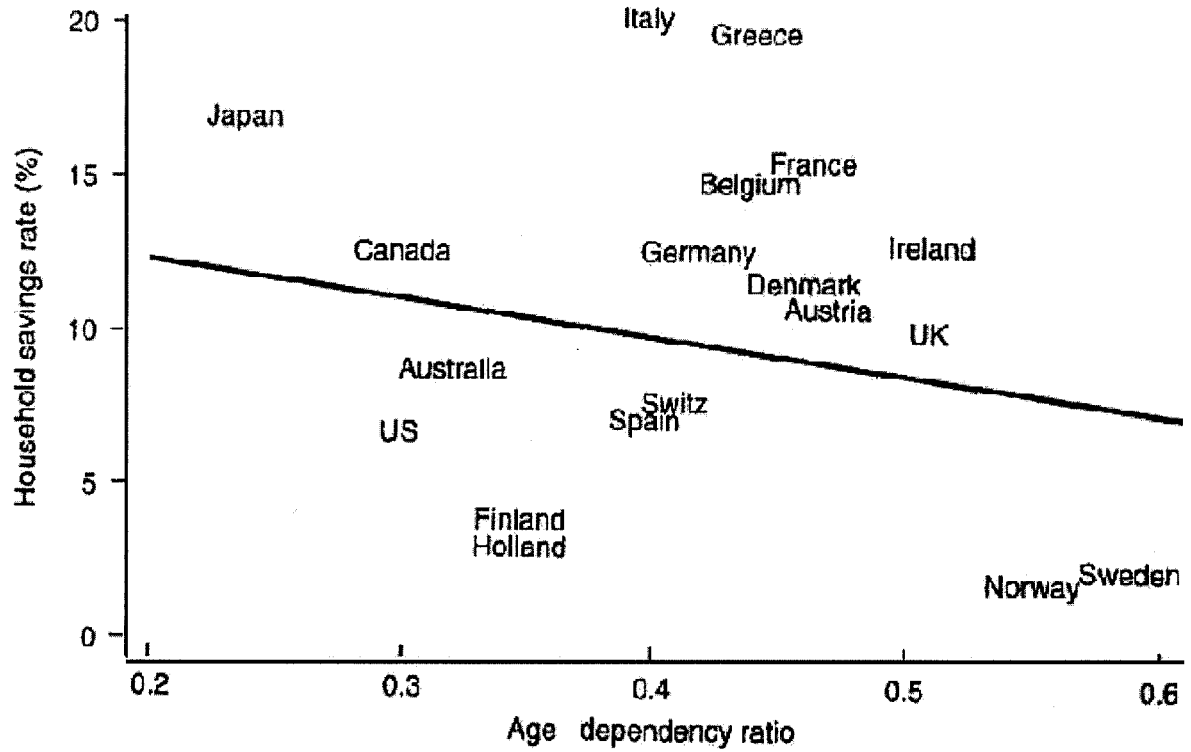
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## **Appendix**

**Figure A1: Household Savings Rate and Age Dependency Ratio:**

**19 OECD Countries, 1977-92**



Source: Disney, Richard (1996), "Ageing and Saving", Fiscal Studies  
Vol.17.No.2.pp.83-101.

**Table A2-1: Contributions to C/QPP, RPPs, RRSPs**

Year	C/QPP		RPP		RRSP		Total	
	\$'000,000	%	\$'000,000	%	\$'000,000	%	\$'000,000	%
1991	10,568	26.4	17,205	43.0	12,284	30.7	40,057	100.0
1992	11,224	25.3	19,678	44.3	13,533	30.5	44,435	100.0
1993	11,867	24.8	20,197	42.2	15,815	33.0	47,879	100.0
1994	11,857	24.2	19,631	40.1	17,478	35.7	48,966	100.0
1995	13,812	25.6	19,697	36.6	20,318	37.8	53,890	100.0
1996	14,604	25.4	19,636	34.2	23,155	40.3	57,395	100.0
1997	16,073	26.7	19,564	32.5	24,570	40.8	60,207	100.0
1998	18,601	31.3	16,853	28.4	23,924	40.3	59,378	100.0
1999	21,384	32.3	19,219	29.0	25,576	38.6	66,179	100.0

Source: Statistics Canada (2003), "Canada's Retirement Income Programs" Table 1-2.

**Table A2-2: Accumulated assets in selected retirement income programs, at December 31**

	1990		1992		1994		1996		1998		2000	
	\$,000,000	%	\$,000,000	%	\$,000,000	%	\$,000,000	%	\$,000,000	%	\$,000,000	%
<b>C/QPP</b>	54,997	11.1	56,916	9.4	54,354	7.7	51,590	5.9	49,394	4.9	56,594	4.9
<b>RPPs</b>	330,137	66.7	399,396	66.2	470,698	66.4	594,716	68.3	718,722	71.2	817,612	70.5
<b>RRSPs</b>	110,057	22.2	147,256	24.4	184,042	26.0	223,804	25.7	241,183	23.9	284,901	24.6
<b>Total</b>	495,191	100	603,568	100	709,094	100	870,110	100	1,009,299	100	1,159,107	100

Source: Re-arranged by author. The data is from Statistics Canada (2003), "Canada's Retirement Income Programs" Table 1-3.

Note: Assets are evaluated at market value where possible; in current dollars.

**Table A2-3: Income of Persons Aged 65 and Older, by Income Source**

Year	S1 \$'000,000	%	S2 \$'000,000	%	S3 \$'000,000	%	S4 \$'000,000	%	S5 \$'000,000	%	S6 \$'000,000	%	S7 \$'000,000	%	Total \$'000,000	%
1990	11,344	18.4	18,370	29.8	10,056	16.3	4,324	7.0	14,252	23.1	1,144	1.9	2,179	3.5	61,668	100
1991	11,710	18.8	18,982	30.4	10,343	16.6	5,725	9.2	12,385	19.9	949	1.5	2,260	3.6	62,356	100
1992	13,170	20.8	19,489	30.8	11,444	18.1	3,597	5.7	11,698	18.5	1,382	2.2	2,596	4.1	63,375	100
1993	13,694	21.3	20,154	31.3	11,576	18.0	5,313	8.3	10,364	16.1	918	1.4	2,271	3.5	64,290	100
1994	15,506	22.9	20,420	30.2	13,867	20.5	4,744	7.0	9,203	13.6	1,208	1.8	2,731	4.0	67,678	100
1995	17,075	23.5	20,278	27.9	14,063	19.4	5,431	7.5	11,331	15.6	1,724	2.4	2,687	3.7	72,590	100
1996	19,616	26.6	20,538	27.8	14,590	19.8	4,807	6.5	10,847	14.7	1,170	1.6	2,183	3.0	73,750	100
1997	20,735	27.4	21,088	27.8	15,153	20.0	5,366	7.1	9,549	12.6	1,482	2.0	2,392	3.2	75,764	100
1998	22,426	28.9	21,534	27.8	15,864	20.5	4,208	5.4	9,844	12.7	1,341	1.7	2,345	3.0	77,562	100
1999	23,633	29.2	21,750	26.9	16,298	20.1	5,164	6.4	10,306	12.7	1,464	1.8	2,321	2.9	80,936	100

Note:

S1 Private Pension Income      S3 Canada/Quebec Pension Plans      S5 Investment Income      S7 Other Government  
S2 Old Age Security              S4 Employment Income              S6 Other Income              Transfers

Source: Statistics Canada (2003), "Canada's Retirement Income Programs" Table 1-4.

**Table A2-4: Income of females aged 65 or more, by income source**

Year	S1 \$'000,000	%	S2 \$'000,000	%	S3 \$'000,000	%	S4 \$'000,000	%	S5 \$'000,000	%	S6 \$'000,000	%	S7 \$'000,000	%	Total \$'000,000	%
1990	3,374	11.5	10,967	37.5	4,015	13.7	1,258	4.3	8,012	27.4	567	1.9	1,052	3.6	29,274	100
1991	3,599	12.6	11,262	39.6	4,123	14.5	1,086	3.8	6,842	24.0	464	1.6	1,079	3.8	28,454	100
1992	3,756	12.8	11,573	39.4	4,630	15.7	1,082	3.7	6,599	22.4	601	2.0	1,161	3.9	29,402	100
1993	4,067	14.0	12,001	41.2	4,682	16.1	1,328	4.6	5,632	19.3	352	1.2	1,084	3.7	29,147	100
1994	4,634	15.4	12,119	40.3	5,968	19.8	1,128	3.8	4,303	14.3	560	1.9	1,367	4.5	30,080	100
1995	5,406	16.4	11,975	36.3	6,033	18.3	1,469	4.5	6,075	18.4	825	2.5	1,217	3.7	33,000	100
1996	6,313	18.8	12,202	36.4	6,178	18.4	1,291	3.9	5,888	17.6	590	1.8	1,054	3.1	33,516	100
1997	6,859	19.9	12,431	36.0	6,515	18.9	1,305	3.8	5,257	15.2	826	2.4	1,307	3.8	34,499	100
1998	7,552	21.6	12,691	36.3	6,942	18.9	909	2.6	4,895	14.0	747	2.1	1,187	3.4	34,922	100
1999	8,004	22.0	12,836	35.3	7,116	19.6	1,417	3.9	5,331	14.7	588	1.6	1,090	3.0	36,383	100

Note:

S1 Private Pension Income    S3 Canada/Quebec Pension Plans    S5 Investment Income    S7 Other Government

S2 Old Age Security    S4 Employment Income    S6 Other Income Transfers

Source: Statistics Canada (2003), "Canada's Retirement Income Programs" Table 1-6.

**Table A3-1: Personal income tax expenditure from RPPs and RRSPs**

	Estimates				Projection				
	1992	1993	1994	1995	1996	1997	1998	1999	
<b>RPPs</b>									
Deduction for contributions	4,990	5,025	4,890	5,180	5,490	5,820	6,170	6,540	
Non-taxation of investment income	7,865	8,610	9,540	10,260	10,915	11,580	12,250	12,930	
Taxation of withdrawals	-4,580	-4,930	-4,010	-4,490	-5,030	-5,630	-6,310	-7,065	
<b>Sub total</b>	<b>8,275</b>	<b>8,705</b>	<b>10,420</b>	<b>10,950</b>	<b>11,375</b>	<b>11,770</b>	<b>12,110</b>	<b>12,405</b>	
<b>RRSPs</b>									
Deduction for contributions	3,685	4,490	4,785	5,405	5,945	6,540	7,195	7,915	
Non-taxation of investment income	2,760	3,325	3,565	4,080	4,605	5,180	5,825	6,545	
Taxation of withdrawals	-1,000	-930	-1,620	-1,765	-1,930	-2,105	-2,300	-2,515	
<b>Sub total</b>	<b>5,445</b>	<b>6,885</b>	<b>6,730</b>	<b>7,720</b>	<b>8,620</b>	<b>9,615</b>	<b>10,720</b>	<b>11,945</b>	
<b>Total</b>	<b>13,720</b>	<b>15,590</b>	<b>17,150</b>	<b>18,670</b>	<b>19,995</b>	<b>21,385</b>	<b>22,830</b>	<b>24,350</b>	

Source: Department of Finance (1997), "Government of Canada Tax Expenditure".



**Table A3-2: Net Present Value of Revenues from Tax-deferred Accounts through 2040 (\$ trillion)**

	Total NPV revenue	Lost revenue on contributions	Lost revenue on diverted saving	Tax on withdrawals	Tax on new capital income	Reduction in interest payments	Tax on interest payments
<b>Panel 1</b>							
Boskin base case	11.8	-7.1	-1.2	9.1	6.7	5.5	-1.1
Base case except $a=0.5$	3.9	-7.1	-2.4	9.1	3.5	1.0	-0.2
Base case except $r=0.75$	8.0	-7.1	-1.2	9.1	4.4	3.5	-0.7
Base case except $a=0.5$ and $r=0.75$	2.4	-7.1	-2.4	9.1	2.3	0.6	-0.1
Same but $u1=0.2$ , $u2=0.2$ and $u3=0.19$	1.2	-5.0	-2.4	6.4	1.7	0.6	-0.1
<b>Panel 2</b>							
Base case except $a=0.4$	7.1	-7.1	-1.9	9.1	4.8	2.8	-0.6
Base case except $a=0.4$ and $r=0.75$	4.4	-7.1	-1.9	9.1	3.1	1.8	-0.4
Same but $u1=0.2$ , $u2=0.2$ and $u3=0.19$	3.3	-5.0	-1.9	6.4	2.4	1.8	-0.4

Source: Auerbach *et al* (2003), Appendix Table 5.

Note:

a—the share of contributions that is diverted from other saving

r—the share of increased national saving that becomes increased domestic investment

u1—tax rate on contributions

u2—tax rate on withdrawals

u3—tax rate on capital income