TAX-BASED SAVING INCENTIVES AND PUBLIC POLICY IN CANADA

by

G.C. Ruggeri

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*G.C. Ruggeri**

Abstract

This paper contains a survey of the Canadian and US literature on the saving effects of tax-assisted saving plans. The evidence presented in this paper suggests that these programs have little effect, in either direction, on both private and national savings. It is suggested that, from an economic efficiency perspective, a case can be made for the elimination of personal income tax breaks on capital income and the use of the additional revenue for a combination of lower tax burdens on business and labour income and increased public investment in human capital.

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* *Department of Economics, University of New Brunswick, P.O. Box 4400/Fredericton, N.B., E3B, 5E3, Tel: (506) 453-4828, Fax: (506) 453-4514, E-mail: ruggeri@unb.ca.* *The author is thankful to Vaughan Dickson for helpful comments.*

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G.C. Ruggeri

INTRODUCTION

Tax-based saving incentives, such as Individual Retirement Accounts (IRAs) and 401(k) accounts in the United States and Registered Pension Plans (RPPs) and Registered Retirement Saving Plans (RRSPs) in Canada, have become a large component of the government financial support to post-retirement living. The tax breaks by federal and provincial governments on these two programs amounted to $34 billion in 1997. They were equivalent to nearly three quarters of the direct cash payments to retirees under various federal and provincial programs.

These programs are part of a three-tier plan of assisted to Canadians in their post-retirement years: (a) non-contributory public pensions which include Old Age Security (OAS), the Guaranteed Income Supplement (GIS) and the Spouse's Allowance (SPA); (b) contributory public pensions in the form of the Canada and Quebec Pension Plan (CPP/QPP); and (c) tax incentives for private saving (RPPs and RRSPs). This three-tier plan rests on three policy principles. First individuals must help provide for their post-retirement years through forced saving out of their employment income (CPP/QPP). Second, they are encouraged to save through the provisions of tax preferences (RPPs, RRSPs). Finally, those who do not have the ability to save will receive financial support from the government. This three-tier plan is quite costly. In 1997 it required government expenditures of $80 billion in the form of direct cash payments and tax breaks.

From a public policy perspective, these programs can be viewed as serving two major purposes:(a) to stimulate private savings and (b) to increase the degree of financial self-sufficiency by retirees. The first purpose involves tax policy because it enlists the tax system in providing incentives to save. The second purpose is associated with pension policy because it is part of a package aimed at maintaining stable living standards after retirement.

Within the context of tax policy, tax-assisted saving plans can be viewed as part of the package of tax preferences aimed at the accumulation of wealth. This package includes, in addition to RPPs and RRSPs, the preferential treatment of capital gains and dividends in the personal income tax system, the lifetime capital gains exemption for farmers and small businesses and the non-taxation of capital gains on principal residences. The appropriate criterion for evaluating the tax policy implications of tax-assisted saving plans is economic efficiency which measures the distortions that taxation introduces in private sector decisions. This criterion is used to address the following questions: How effective are tax-assisted saving plans in raising private and national savings? What benefits do we get from potential increases in savings? What is the cost of generating these benefits? Are there cheaper and more effective ways of generating the same benefits? Within the context of pension policy, tax-assisted saving plans are treated as part of the package of public support for post-

retirement living which includes CPP\QPP benefits, OAS benefits and the associated GIS and SPA. For pension policy purposes, the appropriate criterion is equity in the distribution of the benefits. The evaluation of the pension aspects of tax-assisted saving plans addresses a different set of questions than the tax policy aspect. Why do we have so many programs aimed at the same objective? Are these programs well coordinated? Is there a simpler and more effective approach to pension policy?

This paper is confined to the tax policy side of tax-asisted saving plans. It provides an analysis of the major issues involved in measuring the saving effects of these programs and a survey of studies that develop estimates of those effects. Section I provides some historical background on the development of this three-tier plan of government support to Canadians in their post-retirement years. Section II identifies the channels through which tax-assisted saving plans may affect private savings. Section III surveys the literature in order to determine the magnitude of this potential effect. Section IV evaluates the effects of tax-assisted saving plans on public savings and national savings. Section V summarizes the results and discusses their policy implications.

I. HISTORICAL BACKGROUND

Canada has a long-standing tradition of government involvement in the provision of financial support to Canadians in their post-retirement years. Through time, the federal government in cooperation with the provinces has developed a comprehensive policy framework which includes three sets of programs. The first set contains non-contributory pensions in the form of the Old Age Security (OAS) pension and the associated Spouse's Allowance (SPA) and Guaranteed Income Supplement (GIS), all income-tested though with different formulas. OAS pensions are taxable under the personal income tax, but the GIS and SPA are not. The second set includes a pension based on compulsory contributions through a payroll tax, the Canada and Quebec Pension Plan (CPP\QPP). The third set contains various tax preferences incorporated in the personal income tax system. They include a special credit for age and for pension income and the preferential tax treatment of Registered Pension Plans (RPPs) and Registered Retirement Saving Plans (RRSPs). Provinces also offer financial assistance through separate programs such as GIS top-ups and various tax credits targeted at seniors. Under the Tax Collection Agreements, all provinces with the exception of Quebec automatically provide tax breaks for contributions to RPPs and RRSPs. Quebec provides similar tax assistance through its income tax system.

A. Public Pensions

1. Old Age Secutity. The federal OAS pension was introduced in 1952 as a replacement for the cost-sharing of provincial pensions. Cost-sharing arrangements were initiated in 1927 when the federal government passed the Old Age Pension Act. Under this act, the federal government offered to pay 50% of the cost of pensions provided by a province to Canadians 70 years of age and over. In 1931, the federal government increased its share to 75%. By 1936, all provinces had joined the cost-sharing arrangements. In 1951, the federal government obtained agreement from the provinces to amend the

British North America Act (BNA) by adding a section which authorized Parliament to "make laws in relation to old age pensions in Canada." The federal government used this new authority to introduce the Old Age Security Act in 1951. Beginning in 1952, the federal government paid pensions of $40 per month to Canadian residents 70 years of age and over. Unlike the cost-shared pensions, which were income-tested, the OAS was paid in full to all eligible Canadians. In addition, under the Old Age Assistance Act the federal government agreed to pay 50% of the cost of provincial pensions to Canadian residents 65-69 years of age. The eligibility age for receiving the OAS was lowered to 69 years in 1966, 68 in 1967, 67 in 1968, 66 in 1969 and 65 in 1970. In 1967 the federal government added the Guaranteed Income Supplement (GIS), an income-tested payment to low income seniors. An eligible pensioner was guaranteed a monthly payment of $105, $75 from OAS and $30 from GIS. In 1968 OAS pensions and the GIS were indexed to inflation to a maximum of 2% per year. In 1973 the Spouse's Allowance (SPA) was introduced. This is an income-tested pension payable to the spouses (aged 60 to 64) of GIS recipients. In 1985 the SPA was extended to eligible needy widows between the ages of 60 and 64. In 1989 the universality approach to the OAS was terminated. The OAS pension was clawed back at the rate of 15% of income in excess of $53,215. The 2000 Federal Budget announced that this value will now be indexed for inflation. In the first quarter of 1998 a Canadian eligible for the full OAS pension received $407 per month. For the same period, the monthly payment under the SPA was $722 for a recipient with husband and $797 for a widow. The GIS was $484 for singles and $634 for couples. A single senior relying only on OAS and GIS benefits would receive in 1998 approximately $10,700 of tax-free income, since the amount of the taxable OAS is less than the amount eligible for the personal credit. A couple would receive approximately $17,400.

2. Canada Pension Plan. The compulsory, contributory pension plan known as the Canada Pension Plan (CPP) was introduced in 1965 after lengthy negotiations with the provinces. Starting on January 1, 1966 it was financed through compulsory contributions from workers between the ages of 18 and 69 at the rate of 1.8% of pensionable earnings, matched by equal contributions from employers. Beginning in January 1967, benefits were paid to retired participants at age 68. The eligibility age was reduced to 67 years in 1968, 66 years in 1969 and 65 years in 1970 and subsequent years. Benefits were indexed to the Consumer Price Index (CPI), but not exceeding 2% per year. In 1968 benefits were extended to widows and orphans and in 1970 disability benefits were added. CPP pensions are taxable under the personal income tax, but contributions are eligible for a 17% federal credit plus the corresponding provincial credit (prior to 1988 contributions were deductible in calculating taxable income). Full indexing to the CPI was introduced in 1974. Starting in 1987 there were a number of increases in the contribution rate for the purpose of improving the financial stability of the program. The combined contribution rate, which initially was set at 3.6% of pensionable earnings (divided equally between employee and employer), stood at 5.6% in 1996. Under the reform of 1998, which transformed the CPP from a pay-as-you go program to a fully funded program, contribution rates will increase in stages until they reach 9.9% in 25 years. The benefits have also increased over time. The maximum annual pension, which was $520 in 1970 ($2,200 in 1993 dollars) is currently $8,664 ($7,800 in 1993 dollars).

B. Tax-Assisted Saving Plans.

In addition to providing direct financial assistance to seniors, the federal government offers preferential treatment under the personal income tax for two sets of saving programs. Under the Tax Collection Agreements (TCA), all provinces with the exception of Quebec parallel the federal tax relief at about 50 cents per dollar of federal tax break, on the average. Quebec offers its own tax relief for the same programs. The first set of tax-assisted saving plans includes Registered Pension Plans (RPPs) and Deferred Profit-Sharing Plans (DPSPs), referred to simply as RPPs in the rest of the paper. These are employer-sponsored saving plans which involve contributions from both employer and employees. Although they are optional for the employer, they become compulsory for the employee when they form part of the total compensation package. They are overwhelmingly of the defined benefit type which means that they promise a specified level of pension benefits, usually expressed as a percentage of earnings times the number of years of employment. The second set of plans includes Registered Retirement Saving Plans (RRSPs). These plans allow voluntary contributions from individuals, subject to an annual limit, and are largely of the money purchase type where the level of the potential pension or annuity depends on the amount of accumulated assets.

1. RPPs.

Company-sponsored pension plans, commonly known as Retirement Saving Plans or RPPs, are the oldest form of support for post-retirement living having passed the century mark. Even before the Pension Fund Societies Act was enacted in 1887, some companies had already established a pension plan for their employees. The Income Tax Act provided a tax preference for contributions to such plans almost from its birth. In 1919 a section was added which provided a deduction for the amount deducted from employee's wages and placed into a pension fund for employees. In 1936 the amount of the deduction was limited to $300 per year. The deductibility of contributions to RPPs by employers and employees has continued ever since and currently represents one of the major tax preferences, in terms of revenue foregone, in the personal income tax.

Although more and more employers introduced RPPs over time, only a fraction of workers is involved in these plans. A recent study by Maser (1995) found that "in any single year from 1991 to 1993, one-third of taxfilers participated in RPPs." (P. 16). Maser also found that participation in RPPs by income group has an inverted U-shape. It is very low at the bottom end of the wage income scale, increases with income up to $60,00 and then declines as income increases. This pattern is explained by three main factors. First, low income workers are likely to be employed by companies that do not offer such plans. Second, a larger portion of high income taxfilers than the rest are likely to be self-employed and are not eligible for such programs. Finally, some eligible high income taxfilers may find it advantageous to opt for a compensation package that excludes RPPs so that they can use the extra income for contributions to RRSPs. This option would be preferable by employees who plan to retire earlier than the date of receipt of RPP pensions.

2. RRSPs. These plans were introduced in 1957, thus preceding the CPP/QPP) by a decade, as a

means of encouraging individuals to save for retirement. Under these plans, contributions are voluntary, but are subject to a limit, and are deductible from taxable income. Earnings on those contributions accumulate tax-free, but both principal and accumulated earnings are taxed at the time of withdrawal. As pointed out by Horner and Poddar (1992, p. 7) " where the taxpayer is in the same tax bracket when benefits are withdrawn as when contributions were made, the tax benefit is equivalent to the provision of a tax-free investment return on an asset purchased out of after-tax dollars."

Table I.1. RRSP CONTRIBUTION LIMITS

Year of Policy Change	Individuals with RPPs		Individuals without RPPs	
	% of Earned Income	Maximum,$	% of Earned	Maximum, $
1957	10	1,500	10	2,500
1972	20	2,500	20	4,000
1976	20	2,500	20	5,500
1986	20	3,500	20	7,500
1991	18	11,500 - PA	18	11,500
1997	18	13,500 - PA	18	13,500

Note: PA is the pension adjustment which reflects the amount saved in RPPs.

As shown in Table I.1, contribution limits have changed through the years and from the outset incorporated a differentiation between those with and those without RPP eligibility. The limits were set at a lower level for the latter to take into the consideration the tax benefits accorded to RPPs. At the inception of the program, annual contributions were limited to 10% of earned income to a maximum of $1,500 for individuals with RPPs and $2,500 for those without. In 1972, the limit as percent of earned income was doubled to 20 for both types of contributors. The dollar limit was raised to $2,500 for those with RPPs and $4,000 for those without. In 1986 the dollar limits were raised again to $3,500 and $7,500 respectively for the two categories of contributors; however, the limit as percent of earned income remained at 20. A major reform, which will be discussed in some details below, was introduced in 1991 for the main purpose of providing a closer integration of RPPs and RRSPs. As a result of this reform, the contribution limit as a percentage of earnings was reduced to 18, but the dollar limit was raised to $11,500 for those without RPPs and to $11,500 minus a sum called pension adjustment (PA) for the rest. The dollar limit was se to increase over time to $15,000, but in the 1996 budget it was frozen at $13,500 until 2003. One major feature of RRSPs is the carryover of contributions. Limited to one year prior to 1992, the carryover was extended progressively and now has no time limit.

The 1991 reform of tax-assisted saving plans integrated RRSPs and RPPs by applying a uniform limit to both defined benefit plans and money purchase plans. As explained in detail in Horner and Poddar (1992), which serves as the main source for the discussion that follows, that integration is achieved through three steps. First, a target pension eligible for tax assistance is selected. Second,

this target pension is used as a basis for determining a comprehensive annual contribution limit to all tax-assisted saving plans. Finally, the dollar limit on an individual's annual contribution to RRSPs is calculated by subtracting from the comprehensive limit an estimate of the saving in RPPs.

The target pension is determined with the objective of helping middle-income Canadians maintain levels of consumption after retirement similar to those in pre-retirement. Because income needs are lower after retirement due to lower income and payroll taxes, reduced saving needs and the absence of work-related expenses, it is generally considered that 70% of gross income is sufficient for maintaining continuity of consumption levels in post-retirement. Since the programs of direct financial assistance provide at least 70% of the financial needs of low-income seniors, the programs of tax-assistance can be viewed as the application of the universality principle to government support for stable post-retirement standard of living for all Canadians. Under the existing package, all Canadians are eligible for financial support after they reach age 65. Some receive cash payments while others receive benefits through tax breaks. As pointed out by Horner and Poddar, this target corresponds to a pension of 2 % of year of service for an individual with 35 years of employment. Therefore, the reform of the programs of tax-assistance for retirement savings retained as a target pension 2% of the average of the best three years of earnings.

The dollar limit is determined by selecting the maximum level of earnings which will receive full coverage of the 2% tax assisted pension. This limit was set in the 1992 federal budget at $1,722 per year of service, amounting to $60,000 for the maximum contribution period of 35 years and was frozen until 1996 when it represented approximately 2.5 times the average wages. Thereafter it was indexed to changes in an index of average wages and salaries.

Defined benefit and money purchase plans are related in the new system by a single standardized pension cost factor which determines a comprehensive contribution limit for money purchase plans equivalent to the maximum pension limit of 2% of earnings (maximum $1,722). After considerable debate, the standard pension cost factor selected was 9 and was based on the assumption that contributions represent a constant proportion of annual earnings, the CPI increases at 3.5% per year, earnings grow at an annual rate of 5%, assets yield a 7% rate of return, and pension benefits are indexed to changes in the CPI minus 1% and include survivor benefits equal to 60% of the pension. A standard pension cost factor of 9 translates the annual pension target of 2% of earnings (maximum $1,722 per year of service) into a comprehensive contribution limit of 18% of earnings with a maximum of $15,500 per year. Because of the potential revenue losses, the $15,500 limit was phased out gradually starting from an initial limit of $11,500 in 1991 and is currently frozen at $13,500.

Given the standard pension cost factor, the annual limit for RRSP contributions can be calculated by subtracting from the comprehensive limit an amount representing savings in RPPs, called pension adjustment (PA) . The value of PA for benefits accrued under a defined benefit RPP is calculated as

PA = 9 x (benefit entitlement) - 1,000

where the benefit entitlement is the value of annual benefits earned in the case where the contributor belonged to a fully-vested plan and retired at the age of 65.

The RRSP contribution limit for individuals without RPP is the standard 18% of earned income. For individuals who also contribute to employer-sponsored RPP, the limit on RRSP contributions is the standard amount minus the PA.

Table I.2. DIMENSIONS OF GOVERNMENT SUPPORT FOR POST-RETIREMENT, 1997

Program	Cost,	$Billion	% of Total
		Narrow Definition	Broad Definition
A. Cash Payments			
OAS, GIS, SPA	21.8	27.0	
CPP\QPP	28.0		
Provincial Programs	2.0	2.5	
Subtotal	46.4	57.5	53.4
B. Tax Preferences for RPPs and RRSPs			
RPPs	18.8	23.3	
RRSPs	15.4	19.2	
Subtotal	34.2	42.5	39.4
C. Total, Narrow Definition (A + B)	80.6	100.0	92.8
D. Other Tax Preferences for Wealth Accumulation	6.3		7.2
E. Total, Broad Definition (C + D)	86.9		100.0

The programs of financial support to Canadians in their post-retirement years described above have grown to represent a large share of government spending. As shown in Table I.2, direct payments through OAS, GIS, SPA, CPP/QPP and various provincial programs amounted to $46 billion in 1997. The federal component alone at $44 billion represented over three-quarters of total federal

transfer payments to persons. Indirect transfers to seniors in the form of tax breaks for RPPs and RRSPs contributed an additional $34 billion for a total of $80 billion. Since the indirect transfers through RPPs and RRSPs represent over 40% of the total, ignoring the tax preference side would grossly underestimate the contribution of the fiscal system to the well being of Canadians during their post-retirement years.

One may argue than in general sense, all programs aimed at stimulating wealth accumulation provide support for post-retirement living. People generally save to smooth consumption over their lifetime, to guard against unforeseen shocks to their income stream and to provide bequests to their kin. In all these cases, savings are generated by reducing current consumption in order to increase spending power in the future, especially after retirement from the labour force. Accordingly, Table I.2 includes in the broad definition of government support items such as the non-taxation of capital gains on owner-occupied housing and the $500,000 lifetime capital gains exemption for farmers and owners of small businesses. These additional items, however, add only $6 billion to the total cost and do not alter significantly the relationship between direct cash payments and indirect transfers delivered as tax breaks.

II. TAX-ASSISTED SAVING PLANS AND PRIVATE SAVINGS : THEORETICAL ASPECTS

This section evaluates the theoretical arguments underpinning the relationship between tax assistance for saving and changes in private saving behaviour. In this context, RPPs and RRSPs are treated as part of the program of personal income tax preferences for the accumulation of wealth. Since the strength of the connection between tax preferences for wealth accumulation and support for post-retirement living varies among programs, it may be useful to briefly discuss these programs before analysing their impacts on private savings.

A. Personal Income Tax Preferences for Wealth Accumulation

1. *Dividends.* Income from dividends receives special treatment under the personal income tax (PIT) because of the partial integration of personal and corporate income taxes which dates back to 1970. Under the current approach to income tax integration, taxable dividends include cash dividends plus an arbitrary estimate of the corporate income tax that may have been borne by those dividends (the gross-up amount), but are eligible for a tax credit equal to the gross-up amount. The combined federal-provincial gross-up amount is on average 20% of cash dividends and represents an approximation of the total corporate income tax rate on small businesses. This tax preference is available only to dividends paid by Canadian corporations and, therefore, creates a bias in favour of domestic companies. This approach provides only partial income tax integration as evidenced by the fact that the revenue loss from this tax preference - an estimated $1.3 billion in 1997 for federal and provincial governments combined - is substantially less than the amount of CIT revenue collected from domestic corporations and distributed to Canadian residents.

2. *Capital Gains.* Capital gains became taxable in Canada in 1972 as part of tax reform introduced

in response to the recommendations of the Carter Commission which called for a comprehensive personal income tax base. The taxation of capital gains, however, is mitigated by a variety of special tax preferences. First, capital gains are taxable only on their realized values. Investors can postpone indefinitely the taxation of capital gains by ensuring that the assets that generate these gains are not sold. Taxpayers may also have the flexibility of averaging marginal tax rates over their lifetime by realizing capital gains when they are in a lower tax bracket. They can increase the tax-value of this flexibility by borrowing in periods of high marginal tax rates, thus making maximum use of the deductibility of interest, to purchase a growth asset which can be disposed during periods of lower marginal tax rates. Although there are no estimates of the value of these tax preferences, they do tend to reduce the effective rate on capital gains. Second, only 75% of capital gains are included in taxable income. This implies that the tax rate on capital gains in each tax bracket is only three-quarters of the regular rate. This tax break is similar in magnitude to the one for dividends. If the PIT and CIT were treated as totally separate taxes, the PIT tax preferences for dividends and capital gains could be viewed as providing a 25% tax break. The tax break on capital gains was enriched by the 2000 Federal Budget which lowered the inclusion rate from three-quarters to two-thirds. Third, farmers can claim a lifetime capital gains exemption of $500,000. A similar exemption is available to owners of small businesses. These large exemptions ensure that many farmers and owners of small businesses pay no tax on the increase in the value of their business assets. Finally, capital gains on the sale of owner-occupied residences escape taxation entirely. They bear neither a personal income tax burden nor estate and inheritance taxes (which no longer exist in Canada). These three tax preferences provide substantial benefits to the recipients of capital gains. Combined they accounted for a revenue loss of $4.7 billion in 1997, more than three times the tax break for dividends.

Although wealth accumulation through instruments other than these two tax-assisted saving plans may serve the purpose of maintaining stable living standards after retirement, the tax breaks it receives are not directly aimed at retirement objectives. Instead, these breaks serve primarily the purposes of integrating personal and corporate income taxes, encouraging home ownership, providing incentives for small businesses and supporting family farms. Therefore, the effect of these programs on private savings will not be analyzed in this paper.

3. *RPPs and RRSPs.* The accumulation of financial wealth within these two programs receives the largest share of tax breaks. At $34 billion in 1997, the revenue foregone was nearly six times the revenue loss from the tax breaks on dividends and capital gains. Contributors to these programs may benefit in two ways. First, they accumulate earnings free of income taxes. Second, they may receive windfall gains if the marginal tax rates on the amounts withdrawn through pensions, annuities, or lump-sum amounts is lower than the tax rate at the time contributions were made.
Of the two tax-assisted saving plans, only RRSPs offer the potential for stimulating private savings. For employees covered by RPPs, these plans represent a form of force saving. Only for workers who would have voluntarily saved less than the combined employer and employee contribution do RPPs stimulate private savings and they do so through compulsion rather than through the higher after-tax rates of return they provide. Therefore, the analysis of the saving implications of tax-assisted saving plans will be confined to RRSPs.

B. RRSPs and Private Savings: Theoretical Aspects

RRSPs are front-loaded tax-assisted saving plans. They provide a tax break on contributions and the associated earnings in exchange for the taxation of both principal and accumulated earnings at the time of withdrawal. For a contributor, the tax benefit depends on the marginal tax rate (MTR) at the time of the contributions and during the pre-withdrawal period when earnings are accumulated tax-free. The cost depends on the MTR at the time of withdrawal. The magnitude of the tax benefit is also affected by the limit on contributions. Therefore, which income groups may benefit from RRSPs and which may not depends on the relationship between the two sets of marginal tax rates and on the relationship between the desired level of saving and the contribution limit.

1. Which Groups May Increase Their Saving Rate

For the purpose of determining who is more likely to change saving behaviour in response to RRSPs it is helpful to divide potential contributors into three groups: those with low income, those with savings in excess of the contribution limit, and others.

Low income Canadians do not benefit from RRSPs for a variety of reasons. Canadians are guaranteed a minimum standard of living at age 65 through the combination of OAS and GIS plus provincial assistance, where it applies. They may also be entitled to CPP benefits depending on their contributions during their working years. For some of them, supplementing government income with some form of private savings is either financially impossible or would exact sacrifices incommensurate to the potentially small addition to income after retirement that it would provide. Those low income Canadians who are able and willing to save a portion of their pre-retirement income are discouraged to do so, especially in tax-sheltered instruments such as RRSPs, because of the high marginal tax rates (MTR) that they face at age 65. If they contributed to RRSPs during their working years they would face a combined federal-provincial MTR of about 25%, which means that they would receive a tax refund of 25 cents per dollar of contribution and would also save 25 cents per dollar of income generated by those contributions. However, after retirement at age 65 they would face MTR in excess of 50% on both principal and accumulated earnings because the clawback of the GIS alone is 50%. With a MTR of 25% at the time of contributions and over 50% at the time of withdrawal, the low income consumer is worse off placing his savings in RRSPs instead of keeping them unsheltered. Canadians with low earnings throughout their working life cannot benefit from RRSPs even when they have a positive propensity to save.

Taxpayers in the income group with desired savings in excess of their RRSP limits have an incentive to make full use of RRSPs, but in this case tax-sheltering has no influence on their saving behaviour. As shown by Ragan (1994), these taxpayers have already maximized their RRSP contributions and the additional funds that may be available for saving, such as the tax refund on the contributions, will earn the after-tax rate of return. Their consumption-saving decision, therefore, is based on the after-tax rate of return with or without RRSPs. For these taxpayers, RRSPs are strictly equivalent to a transfer payment, no different in nature from OAS or GIS. The amount of this transfer can be quite large depending on the effective limit faced by the contributor and the length of the period when

contributions are made. In the case when contributions of the maximum $13,500 are made for 30 years, they earn a before-tax rate of return of 8% per year and the contributor faces a 50% marginal tax rate both at the time of contributions and withdrawals, tax-sheltering will provide the equivalent of a lump-sum transfer of $433 thousand which can continue generating before-tax rates of return, though on a declining balance after age 68. If the contributor dies at age 85, this transfer is equivalent to an annuity of over $20,000 per year, twice the combined value of OAS and GIS benefits for a single senior and at least one third higher than the OAS plus GIS for a couple.

The only group which has the opportunity to alter its saving habits in response to the presence of RRSPs includes those taxpayers who have the means and desire to save and whose desired level of savings is less than the effective contribution limits that would apply to them. The strength of their saving response depends on a variety of factors, as discussed in the next section.

2. Motivation for Saving

The extent to which RRSPs affect the propensity to save of contributors with desired savings below the RRSP limit depends on their motivation for saving. Despite voluminous research on this subject ((for a recent survey see Browning and Lusardi (1996)), we remain hampered by "the relative ignorance that still surrounds the reasons why households save." (p. 1799). This view is echoed by Hubbard and Skinner (1996) who believe that "economists are just beginning to realize how little is understood about consumption and saving behaviour." (p. 89). The discussion that follows, therefore, presents potential motives for saving, as suggested by various authors, rather than firm explanations of saving behaviour. For analytical purposes, it is useful to distinguish the situation where agents make decisions in the absence of uncertainty from the case where agents face uncertainty with respect to factors that may affect their saving behaviour. It will also be important to distinguish motives that involve saving responses to changes in rates of return and motives that do not involve rates of return. This distinction is particularly relevant for the purpose of the tax policy aspect of tax-assisted saving plans because the potential saving effect of these plans is delivered through increases in the after-tax rate of return.

a. No Uncertainty

i. *Providing for Retirement.* One of the major reasons why people save is to accumulate financial assets which are capable of supporting the desired level of consumption after they have retired from the labour force. This is the only type of saving allowed in the simplest life-cycle models. In these models, a worker chooses between current consumption and future consumption, attained through saving, according to a plan that maximizes his lifetime utility. In the simplest case, they know with certainty when they will retire from the labour force, when they will die, how much they will earn in each year while they are employed, how much they will earn on their savings, as well as the details of the government spending and taxation affecting them. They have no plans to leave bequests and no intention of providing their kin with funds to help pay for a future higher tax burden if the government runs a deficit. The last dollar of the accumulated assets is spent at the very end of the

known lifespan. This motive for saving is part of a more general model which assumes that individuals try to maximize utility over their lifetime. In this case, as pointed out by Browning and Lusardi (1996, p. 1800), "agents will not want expenditure to be worth more (in discounted utility terms) in one period than in any other....Thus agents seek to equalize the marginal utility of money from one period to the next and between now and the distant future." This behaviour leads to "smoothing" of consumption through borrowing at young age, saving during the bulk of the working years and dissaving after retirement.

Individuals may provide for their retirement in a manner that does not fully equalize the marginal utility of money in different periods. For example, they may simply target a certain standard of living after retirement and save for the purpose of attaining that goal. When they reach the level of wealth consistent with that goal they stop saving. If they continue working after reaching the desired level of wealth we may call them target savers. If they have strong preferences for leisure and exit the labour force we can call them target consumers. The implications for saving are the same: in both cases individuals will save until they have reached the target level of wealth. In the case of target consumers, however, any factor that affects the attainment of the target wealth may also have implications for the labour supply ((Ruggeri and Yu (1998)).

In the simple lifecycle approach to the retirement motive, the main channel of influence for saving behaviour is the rate of return. Changes in rates of return, as caused, for example, by the availability of tax-assisted saving plans, produce two effects on the incentives to save. They increase the price of current versus future consumption thus providing an incentive to increase savings (substitution effect). They also increase the amount of income that will be received from a given amount of saving thus reducing the need to save as much as before (income effect). It cannot be determined a priori which effect will prevail and how large is the difference between the two effects. When individuals provide for the needs of post-retirement through non-optimizing behaviour, tax-assisted saving plans may actually produce perverse effects on personal savings. For example, individuals who behave as target savers or target consumers will need a lower rate of saving to achieve their target level of wealth when rates of return are raised by the introduction of tax-assisted saving plans.

Even in the absence of uncertainty there may be reasons for saving other than smoothing lifetime consumption and providing for one's needs after retirement. Major non-retirement reasons for saving in the absence of uncertainty, aside from avarice, involve a desire to help others, preferably but not exclusively individuals related by blood. Whether this motivation is economic in nature or simply a response to a biological imperative, as it may be in the case of bequests to blood kin, is the subject of a different debate. For the purpose of this study it suffices that the motivation, whatever its nature may be, generates economic effects by influencing saving behaviour. Two major channels can be identified for expressing concerns for the wellbeing of others in a manner that affects saving behaviour.

ii. *Bequests and Inter Vivos Transfers.* Transfers among individuals can take a variety of forms. It may take place among living people (inter vivos) or it may occur at the death of the donor (bequest). In the first instance, the transfer is voluntary and need not involve a transfer of assets.

For example, the donor can set up a trust in the beneficiary's name, he can contribute to a registered education fund in the beneficiary's name, he can pay the educational bills of the beneficiary directly, or donate a house as a wedding present. In the second instance, transfers may be intended or involuntary. Intended bequests involve a deliberate decision to reduce current consumption in order to accumulate some wealth for the benefit of a third party. Involuntary bequests are simply the residual of accumulated wealth which could not be spent during the donor's lifetime.

The presence of transfers among individuals influences both the way we measure savings and the impact of various government programs. For example, the transfer of some bonds and stocks involves a shift in the ownership of financial wealth. However, the payment of bills for the acquisition of human capital is treated as an expenditure. The acquisition of an equivalent value of human capital is not recorded as in increase in assets. So an inter vivos bequest of equal amount may be recorded as a transfer of wealth, leaving total assets unchanged, or an expenditure which reduces total assets. On the policy side, these transfers affect the effectiveness of public policies aimed at retirement. For example, the implications of raising the saving rate through tax breaks will be different whether savings are entirely consumed later in life by the person making the saving or whether they are passed on to future generations. A detailed analysis of voluntary transfers in the US was performed by Gale and Scholtz (1994). Using detailed information on inter vivos transfers by household type they found that at least 20% of wealth in the US is made up of voluntary transfers. When bequests are included, the two types of transfers account for 51% of net worth accumulation. This percentage is even higher if the payment of college expenses is treated even partly as an inter vivos transfer.

It is not clear whether these transfers motive generates savings that are responsive to changes in rates of return. Inter vivos transfers may take largely the form of sharing of current income. As such, they would affect savings largely through the income channel. Intended bequests may be viewed by the donor as part of maximizing behaviour, where the utility of the recipient somehow is incorporated in the utility function of the donor. In this case, bequests are also responsive to changes in rates if return. Involuntary bequests, on the other hand, are likely to be independent of changes in rates or return. Even when they involve unspent lifecycle savings, they are the result of optimizing behaviour but are not directly involved in that type of behaviour.

ii. *Ricardian Equivalence*. In this case, individuals save in order to provide future generations with additional income necessary to pay for the higher taxes required to pay for the cost of financing the national debt. As pointed out by Johnson (1994) in his assessment of this principle for Canada, "the Ricardian equivalence proposition....means that the non-government sector chooses the same level of consumption regardless of the government sector's current choice between taxes and deficits to finance spending." (p. 81). By realising that today's deficit involves higher taxes tomorrow, individuals make provisions for these future taxes, payable by them and future generations, through appropriate adjustments to their savings rates. This saving motivation is associated with government deficit financing and is relevant for the analysis of saving behaviour only during periods of deficit financing. Since it is strictly related to the sources of government financing of current expenditures, it is not directly affected by changes in rates of return.

2.Uncertainty and Precautionary Savings

Agents may face uncertainty with respect to income, family status, lifespan and government policies. These various forms of uncertainty can potentially affect the motivation for saving. In the face of uncertainty, individuals will save, in addition to the amount slated for retirement or for bequests, an amount which serves as a buffer against unforeseen developments. The precautionary motive has become an increasingly important explanation of saving behaviour in the theoretical literature. On the empirical side, the significance of this saving motive is measured by the inclusion of a source of risk among the list of explanatory variables. The empirical evidence produced so far contains mixed results. Some studies, such as those by Skinner (1988) and Dyan (1993) produce no evidence of a precautionary motive. Other studies, such as those by Carroll (1992), Carroll and Samwik (1995a and 1995 b) and by Kazarosian (1996) find that the precautionary motive explains a large portion of wealth holdings. The magnitude of this effect is likely to vary among different individuals and different stages of the lifecycle. As pointed out by Browning and Lusardi (1996) "the Carroll and Samwick results suggest that the precautionary motive is strong for younger households who are not wealthy. The low level of consumption of young people who have good lifetime prospects also seems to us to argue for a substantial precautionary motive. On the other hand,...wealthy households...are unlikely to be subject to a significant precautionary motive." (p. 1838).

Saving for precautionary purposes is a response to uncertainty about income streams, consumption needs and length of lifespans. As such their magnitude is affected by factors other than rates of return, especially the degree of uncertainty. Engen (1994) found that this type of saving is not very responsive to rates of return. Carroll's (1992) buffer-stock model predicts an interest elasticity of savings close to zero.

3. Factors Affecting Saving Behaviour

Given that people have several motives for saving one expects that saving behaviour will be affected by a variety of factors. The discussion below serves as a reminder that rates of return, the factor through which tax-assisted saving plans generate their potential effects on personal savings, are only one of a number of determinants of savings and not necessarily the most significant one.

i. *Income*. The importance of income as a determinant of the level of savings rests on solid theoretical and empirical foundations. The relation between current consumption (and savings as a residual) and current income was emphasized by Keynes (1936). The precautionary motive for saving also includes an important role for income. For example, Carroll's buffer stock theory of saving implies the existence of a target wealth\income ratio. Since wealth is accumulated through savings, such a target rate involves higher savings for higher income levels. Empirical studies support the positive relationship between income and saving, though not necessarily parallelism of annual paths. For example, Avery and Kennickell (1991) found that the top income decile of families accounts for the overwhelming proportion of total savings in the US. Bosworth, Burtless and Sabelhaus (1991) found that the first and second quintiles have negative savings while the top quintile has the highest savings.

ii. *Uncertainty.* For a given level of lifetime income, the corresponding amount of saving will be affected by the degree of uncertainty in the stability of the annual income flow. Studies of the precautionary saving motive provide evidence of a strong positive relationship between uncertainty about the path of income and the level of precautionary savings. For example, Kazarosian (1996) found that " a doubling of uncertainty increases the ratio of wealth to permanent income by 29 percent." This effect may be stronger when uncertainty extends beyond income to issues such as lifespans and health care needs. The effect of uncertainty by itself is unrelated to rates of return. However, for a given level of lifecycle saving, the greater is the associated amount of precautionary savings due to uncertainty the lower is the overall rate of response of saving to changes in the rate of return. Models of lifecycle saving behaviour, such as Summers (1981) and Fullerton and Rogers (1993) found values of the interest elasticity of saving in excess of 1. When an average degree of prudence was introduced in those types of models, as was done by Engen and Gale (1996), the interest elasticity of savings fell to a range between 0.26 and 0.39.

iii. *Demographics.* When the unit of measurement is the household rather than the individual, empirical studies shows that the saving rate is affected by demographics. For example Avery and Kennickell (1991) and Bosworth, Burtless and Sabelhaus (1991) found that " saving rates are higher for married couples with no children and lower with households with children, while lone parents have the lowest saving rate in the population."

iv. *Public and Private Pensions*

When people save only for retirement, changing part of a worker's compensation from current wages to future pension benefits has no effect on savings and wealth because increases in pension wealth would be offset by reductions in non-pension wealth. As noted by Feldstein (1978, p. 279) "if the switch of compensation from wage income to future pension benefits leaves a worker's lifetime budget constraint unchanged, the rational and unconstrained individual does not alter his lifetime consumption plans...". In this case, there would be a complete offset between pension and non-pension wealth and the net effect would be a change in the composition of a given level of total wealth. In reality, this result may be modified by a variety of factors.

First, public pensions may induce earlier retirement by providing a steady income stream after a pre-determined age. To the extent that individuals retire earlier, they must save more during their working years to maintain the desired level of consumption for a longer post-retirement period. This retirement effect works in the opposite direction of the wealth effect mentioned earlier. Second, contributory public pensions incorporate a deferral of taxes. This implicit tax break raises the rate of return on savings through public pension compared to ordinary savings. The effect of this higher rate of return on private saving is ambiguous. If pension saving is inframarginal, then the higher rate of return will have only a wealth a effect which will tend to reduce overall saving. If pensions serve as the marginal form of saving, then the higher rate of return will have both income and substitution effects operating in opposite directions. Third, the provision of public pensions may increase workers' awareness about the need to save for retirement (Cagan, 1965)) thus stimulating private saving. Along the same lines, Katona (1965) suggests that public pensions make the attainment of a reasonable standard of living after retirement an achievable goal thus stimulating private savings.

In the absence of public pensions, workers may find the present cost of providing a decent standard of living prohibitive; public pensions may make this goal attainable through increased private saving.

As mentioned earlier, individuals save for reasons other than retirement, such as for precautionary savings or the provision of bequests. Precautionary savings are in the form of stocks of assets kept for a rainy day; as such they are poor substitutes for public pensions which provide a steady stream of income. Similarly bequests are wealth transfers which depend on the donor's total wealth and not its form. If higher pensions do not alter total wealth but only its composition, the amount of saving for bequests should not be affected by public pensions ((Samwick (1994), Bernheim (1991)).

Empirical studies do not offer a general consensus on the effect of pensions on private savings. For example, Cagan (1965) and Katona (1965) found that pensions actually stimulate private savings. Munnell (1974), Kotlikoff (1979), Blinder, Gordon and Wise (1980) and Venti and Wise (1994) found no effect. Munnell (1976) estimated that approximately 62% of pension wealth is offset by reductions in other savings. Offsets of between 11% and 27% were found by Avery, Elliehausen and Gustafson (1986), Samwick (1994), Hubbard (1986) and Dicks-Mireaux and King (1984). After reviewing the theoretical and empirical literature, Gale (1995) concluded that " previous empirical research understates the offset between pension wealth and non-pension wealth due to a series of systematic biases....Correcting for the biases yields high levels of offset relative to the previous literature." (p. 28). The degree of offset, however, is not equal for all groups in the population. The highest offsets are found among individuals who have a good knowledge of financial matters, have little demand for precautionary savings, and higher tastes for saving. The other groups show little or no offset. These results suggest that private savings could be increased through reforms of the pension system which reduced benefits for the groups with the highest offset and expanding the coverage for the other groups.

5. *Other Government Programs*

The amount of saving required to maintain a selected standard of living after retirement depends also on the extent to which needs are met by publicly provided services. One of the major needs of individuals as they age is health care. If governments provide universal health care, as is done in Canada, and finance these expenditures through general revenue, individuals pay higher taxes during their working years to help finance health care spending for those who have already retired, but need to save less because future workers will pay for their health care needs. In this case a reduction in private savings is matched by an increase in public savings. Private savings may also be affected by public funding of education. If parents find themselves responsible for financing their children's education, then they must save more in countries where public funding of education is limited and less where education is publicly funded.

6. *Rates of Return*

The rate of return plays the predominant role in private saving behaviour in lifecycle models where individuals act to maximize lifetime utility. Even in the simplest case where individuals have full information, are not subject to uncertainty or liquidity constraints, and have no bequest motives, changes in rates of return have ambiguous effects on private savings. On the one hand they make future consumption less expensive because they requires giving up a smaller amount of current consumption, thus inducing a substitution in favour of saving (substitution effect). On the other hand, they increase the amount of wealth that can be accumulated with a given level of annual savings, thus reducing the required level of savings needed to achieve a certain level of consumption in the future (income effect). Which effect will prevail cannot be determined a priori.

Empirical studies have been unable to settle the issue of which effect is likely to prevail. Some studies have found a substantial response. For example, Wright (1964) estimated interest elasticities of .18, Boskin (1978) estimated a value of .4, Gylfason(1981) found a value of .3 and Makin (1987) estimated a value of .39. Other studies failed to uncover a response of savings to changes in rates of return. David and Scadding(1974) concluded that the interest elasticity of saving may be close to zero. Blinder (1975) estimated an elasticity of .03 while Howrey and Hymans (1978) found no significant interest rate effect. Similar results were obtained by Bosworth(1984), Montgomery (1986), Baum (1988) and Blinder (1987). Economists which investigate the economic effects of various public policy options have concluded that savings are likely to respond to changes in rates of return but that this response is weak.

E. Summary of Findings

RRSPs are a major component of a large package of tax preferences for wealth accumulation. Because of their structure, which includes a limit on contributions, and their interactions with other programs of public support and their clawback rates, they potentially affect the saving behaviour only of individuals with desired savings below the contribution limit. They may affect the saving rate of these individuals by increasing the after tax rate of return. Even individuals in this group have a variety of motivations for saving, not all responsive to changes in the rate of return. In theory, RRSPs may have a strong positive effect on private savings or may have no effect at all. The fact that the saving effect of RRSPs is confined to a portion of the population and the general consensus that savings are not very responsive to changes in rates of returns indicates that the only channel through which tax-assisted saving plans may generate an economic impact is not a powerful one. Only careful empirical investigations can determine what kind of bang for the buck is delivered by tax-assisted saving plans. For a review of those studies we will now turn to Section III.

III. RRSPs AND PRIVATE SAVINGS: EMPIRICAL EVIDENCE

A. Methodological Issues

Tax assisted saving plans (TASPs) stimulate private savings only when contributions are financed by reducing consumption or increasing the labour supply. They do not raise private savings when

contributions are financed by reducing other assets or by increasing debt. Moreover, when private savings increase because the tax refund generated by contributions is saved, there is a corresponding reduction in public savings and there is no net change in national savings.

Determining empirically the extent to which tax-assisted saving plans affect private savings is not an easy task. In addressing this issue, researchers have focussed on comparisons of changes in savings and assets rather than analysing changes in consumption. This approach raises a variety of difficult methodological issues.

What is Included in the Definition of Saving and Wealth. The effect of TASPs on private saving is usually measured by comparing the savings and the stock of assets of households who contribute to those plans and households who do not contribute or the change in saving and assets of the same households over time. In order to ensure that what is being captured is a change in net saving or assets and not just a shift of assets from non-sheltered to sheltered instruments, it is important to use the most comprehensive definition of assets and wealth. This means that comparisons should be made by including not only financial assets, but also home equity, the value of other real estate holdings, equity in a proprietorship, and the value of pension entitlements.

Netting out Debt. Assets, including those acquired through contributions to tax-sheltered saving instruments, are not always acquired with cash, but often involve debt financing. The net worth is not the amount of the assets owned by an individual or a household, but the gross amount minus the associated debt. An extra dollar of tax-sheltered assets financed entirely through an extra dollar of debt represents a zero increase in net saving. The issue of debt financing is an important one given the inducement provided by financial institutions to borrow funds for financing TASP contributions and the tax-deductibility of the interest on that borrowing which existed in Canada until the 1991 reform.

Heterogeneity of Agents. As pointed out by Poterba, Venti and Wise (1996), "The key impediment to determining the saving effect of IRA and 401 (k) plans is saver heterogeneity." (p.92). Saving behaviour may differ among households for a variety of reasons. Low levels of income may preclude the opportunity for saving, high effective marginal tax rates after retirement may discourage saving and so may the expectation of bequests and inheritances. Some consumers have more stable jobs and\or more certain streams of income, thus requiring lower precautionary savings. And some households are just more thrifty than others because of factors such as family indoctrination and even religious belief. Moreover, those who have a stronger propensity to save tend to save more in all forms, both sheltered and non-sheltered from taxation. Therefore, a simple comparison of the saving patterns of those who contribute to RRSPs and those who don't would likely lead to misleading conclusions .

Taxable versus Non-Taxable Assets. Savings placed in non-sheltered instruments do not generate tax deductions and earn taxable returns, but the accumulated assets represent after tax balances . Savings placed in front-end loaded TASPs such as RRSPs are tax deductible (up to a limit) and earn tax-free returns, but both principal and accumulated earnings are subject to tax at the marginal rate

prevailing at the time of withdrawal. Therefore, comparing the financial assets of contributors and non-contributors is like comparing apples and oranges. For a given saving rate among two different savers, the financial assets of contributors must be higher by the amount of the deferred tax in order to provide the same after-tax income. Difficult as it may be to calculate the value of the deferred taxes, ignoring them may introduce potentially large biases in the results.

Changes in Financial Market Conditions. When the analysis involves comparisons that span over a certain period of time, as is done when the saving behaviour of different cohorts is compared, the results are affected by changes in rates of return. The stock market has yielded higher rates of return in the period following the introduction of tax-assisted saving plans and real interest rates were higher in the 1980s and the first part of the 1990s that their historical averages. If two cohorts had the same income and saving rate over the same period of time, the cohort saving in the more recent period would have larger accumulated assets even in the absence of TASPs. Failure to make the necessary adjustments for the different rates of return would lead to the incorrect conclusion that the more recent cohort saved more because of the availability of tax assisted saving plans.

Policy Changes. Comparisons spanning a period of time are also influenced by changes in policy. These changes are not limited to the structure of RRSPs bur extend to any factors that affect saving behaviour. As suggested by the discussion in an earlier section, these changes include changes in pension plans, changes in transfer payments to seniors, changes in coverage and availability of health care, and changes that alter the degree of uncertainty about the stability of the pattern of lifetime earnings.

Accounting for all these factors is a difficult task. At the same time, ignoring their effects will bias the results and may yield misleading conclusions. In the following discussion, a variety of studies will be reviewed and evaluated in light of the foregoing discussion. The bulk of the empirical studies has been done for the US programs. Those studies are reviewed first because the methodology used was later employed in studies of the Canadian RRSPs.

B. US Studies

The main concern of those involved in the research on the saving effects of tax-assisted saving plans was how to control for the different patterns of savings among different households. Since, as pointed out by Poterba, Venti and Wise (1996), "no method, other than a perfectly randomized, controlled trial, can control for every possible type of heterogeneity" (p. 93), researchers have used, as an alternative, a variety of approaches. Under all approaches, the fundamental question being addressed is: does saving in tax-assisted saving plans represent net new saving or simply a shift of existing assets from non-sheltered to sheltered forms? This question is addressed by comparing changes in saving or assets estimated through one of three approaches: (1) by tracing the saving pattern of the same set of households over time using panel data; (2) by comparing the saving or assets of different households for the same period; and (3) by comparing the saving pattern of cohorts who reach the selected age range at different times . Some researchers have also explored non-economic channels through which TASPs may affect private saving behaviour, such as

psychological factors and the influence of promotional programs by financial institutions. A selected list of both sets of studies will be reviewed with a view to determining whether they lead to some consensus on the saving effects of tax-based saving incentives.

1. Following the Same Households over Time

In this approach, the effect of tax-assisted saving plans on private saving is estimated by following the same households over time through the use of panel data. There are some variations to this approach. In one variation, Venti and Wise (VW, 1992) used data from the Survey of Consumer Finances (SCF) for 1983 and 1986 to identify the changes in the financial assets of the same households as they accumulated IRA assets. If non-sheltered assets did not change or changed less than sheltered assets, this result could be taken as an indication that there was no substitution between the two and that the increase in the latter represented net saving.

VW found that households that made IRA contributions in 1983 (the first year after IRA became available to all employees) had median assets of $12,075, most of them ($11,075) in unsheltered instruments. By 1986, unsheltered assets increased by 26.4% to $14,000 while IRA assets rose sixfold to $7,000 resulting in a doubling of total assets in three years. Since unsheltered assets rose at a rate in excess of "what would be expected from changes in age, income and rate of return", VW concluded that the increase in IRA assets represented net new saving and not a substitute for unsheltered saving.

As pointed out by Engen, Gale and Scholtz (EGS, 1996), these estimates suffer from four major shortcomings. First, the authors use a very narrow definition of assets. Second, they use the gross value of those assets, thus ignoring the possibility that increases in wealth were partly financed though debt. Third, their estimates are based on a comparison of after-tax unsheltered assets and pre-tax sheltered assets. Finally, the influence on saving behaviour of changes in economic conditions are not taken into account. An idea of the quantitative effects of these factors is provided in the calculations discussed below.

VW confine their analysis to changes in financial assets. However, total net worth includes also home equity, the value of other real property, equity in businesses, funds in pension plans (including the value of social security entitlements) and even the value of durable goods and art collections. By using a narrow definition of assets, VW show that the average value of these assets in 1983 was quite small and that the increase in their values after the introduction of the IRA plan was quite large. EGS (1996) show that by simply adding housing equity and netting out debt would raise the median net assets of IRA contributors to $51,220 in 1983. The value of those assets rose by $13,677 or 26.7% to $64,897 in 1986. IRA contributions rose by $6,250 during the same period. However, this amount represents a pre-tax value which includes the deferred tax liability. If this tax liability is eliminated by using a conservative tax rate of 25%, the increase in IRA assets is reduced by $1,562 and net assets increase by $12,115. If the assets held in 1983 yielded a 6% rate of return - the rate assumed by EGS - they would have resulted in an increase of $9,784 leaving $2,331 in additional saving over the three years, or $730 per year. Since these households had gross income

of about $36,000 on average over the three years, this additional saving represents a saving rate of 2.0% of gross income and about 2.7% of disposable income (assuming an average tax rate of 25%). It would seem that the additional saving can be explained by factors other than IRAs, thus suggesting that IRAs had no effect on private savings. This type of calculation cannot be interpreted, of course, as proof that IRAs do not influence saving behaviour. Rather, it serves as reminder that the type of analysis incorporated in studies like those of VW can lead to opposing conclusions thus shedding little light on the issue.

Venti and Wise (1995) repeated the exercise by using panel data from the Survey of Income and Program participation (SIPP) for the years 1984 and 1985. They found that those households who started contributing to IRAs in 1985 reduced unsheltered saving by only $193 while increasing their IRA assets by $2,413. They conclude that, since the drop in unsheltered assets represents only a small fraction of the IRA contributions, there is no substitution between the two types of assets and IRA contributions represent new saving. This study suffers from the same shortcomings of the 1992 study. The saving effects of IRA are exaggerated by the comparison between post-tax changes in unsheltered savings and pre-tax IRA assets, the use of a very narrow definition of assets (bank accounts, bonds and stocks), and the omission of all persons over the age of 60 who actually represent a large portion of IRA contributors. For this group, sheltered savings may be a better substitute for unsheltered savings than for younger contributors because they do not face a tax penalty on their withdrawals.

Panel data where used also by Joines and Manegold (1995). This study differs from those by Venti and Wise in three major respects. First, the data are for taxpayers and are taken from the IRS-Michigan tax panel. Second, although the tax data follow a random sample of the same taxpayers since 1979, the authors compare the saving patterns of new contributors, those who became eligible as a result of the 1981 changes to the IRA program, with old contributors, those who contributed both before and after the changes. Finally, whereas Venti and Wise tried to find out how much of IRA saving represented new saving, Joines and Manegold tried to determine by how much saving increased in response to an increase in the contribution limit. They addressed this question by estimating the changes in total financial assets of the two types of contributors between the pre-reform period of 1979-81 and the post-reform period of 1982-85. Their results indicate that a dollar's increase in the contribution limit induced a net saving increase of 26 cents.

As pointed out by Engen, Gale and Scholtz (EGS,1996), the estimates by Joines and Manegold of the saving effects of IRAs may be exaggerated for two main reasons. First, the sample used in the regressions excludes contributors over 65. This group represents 12% of contributors and may find IRA contributions a good substitute for unsheltered savings because it does not incur a penalty on withdrawals. Second, and most important, they use a narrow definition of assets and ignore the possibility that the additional IRA contributions may have been financed through debt. EGS (1996) using the same data set show that contributors on the average increased their non-mortgage debt by $2,400 over the period under consideration, almost double the $1,350 increase for non contributors. This difference does not necessarily imply that IRA contributions were financed through debt, but suggests that the balances of contributors may be substantially overstated when debt financing is

ignored. Making the appropriate adjustments for these two methodological shortcomings would reduce the estimates derived by Joynes and Manigold. Whether the reduction would be sufficiently large to invalidate their conclusions is an empirical questions which has not been answered yet.

2. Comparing Different Households

In these types of studies, the saving effects of TASPs are estimated by comparing the assets of different groups of households in a given year. In order to minimize heterogeneity of saving behaviour, households are separated into groups which are expected to have very similar propensities to save, controlling for variables such as age, education, marital status and income. The effect of factors that operate over time, such as changes in rates of return and changes in government policy, are eliminated by restricting the comparisons to a single year.

A recent example of this approach is represented by the study of Poterba, Venti and Wise (PVW,1995) which addresses the question of whether 401(k) contributions represent new saving or simply a shift from other forms of saving. These authors performed two sets of exercises. In the first exercise, they compared the assets of households eligible for the 401(k) plans with the assets of non-eligible households. In the second exercise, they divided households into homogeneous saver groups and compared the changes in their assets over time. In both exercises, only financial assets are taken into consideration and they are divided into four categories: total financial assets, 401(k) assets, IRA assets, and other financial assets. The second exercise will be discussed later because it uses the same method as cohort analysis.

In the first exercise, heterogeneity is addressed by separating households into those who can contribute to 401(k) plans and those who can't and each category is subdivided into seven income groups to maintain similarity of saving behaviour. The crucial assumption in this exercise is the exogeneity of 401(k) eligibility. As P-V-W put it "eligibility is determined by employers" (p. 10), therefore, "eligibility is random with respect to saving behaviour,". (p. 12). Under this assumption the saving effect of 401(k) is determined by comparing the assets of the two categories of households by income group. "If there is no saving effect, 401(k)-eligible families should have similar net worth but lower non-401(k) assets than non-eligible families" (p. 10).

PVW performed the required comparison for three years, 1984, 1987 and 1991. The 1984 comparison was done for the purpose of determining whether there was heterogeneity of savers since this year is close to the inception of the program. They show that in 1984, in each income group, eligible and non-eligible households had the same level of financial assets. They interpret this result as an indication that "families that were newly eligible for a 401(k) exhibited about the same previous saving behaviour as families that were not eligible." (p. 14). The estimates for 1991, however, show that eligible households had substantially larger total assets than non-eligible households and that these differences were statistically significant for all but the lowest income group. However, the differences in non-sheltered assets between the two categories of households were small in all income groups. The authors interpret the unchanged relationship in other assets and

the large differences in sheltered assets as an indication that 401(k)s did not crowd out unsheltered savings and that the increased assets represented new saving.

Interpreting the results of PVW's exercise it is important to evaluate the implications of a number of factors not incorporated in their analysis. First, the comparison between the two groups of savers includes both pre-tax and after-tax assets which biases the difference in assets between eligible and non-eligible savers. As mentioned earlier, tax-sheltered assets incorporate a deferred tax liability which must be netted out in order to provide a consistent comparison with unsheltered assets. An idea of the magnitude of this effect is provided in Table III-1 which shows the differences in assets with and without the adjustment for the deferred tax liability.

Table III.1. CONDITIONAL MEAN ASSET BY 401(K) ELIGIBILITY AND INCOME, 1991: UNADJUSTED AND ADJUSTED FOR DEFERRED TAXES

	Income in $000s						
Assets by Eligibility Status	<10	10-20	20-30	30-40	40-50	50-75	>75
Personal Income Tax Rate on Tax-Sheltered Assets	5	15	20	25	30	35	40
Families Eligible for 401(k)							
Unadjusted	6106	12036	14081	18640	29517	44502	80436
Adjusted	5944	11011	12863	16403	25183	37571	66861
Families Ineligible for 401(k)							
Unadjusted	5312	8044	10501	18464	22792	24028	71114
Adjusted	5258	7809	10127	17661	21443	22032	66716
Difference							
Unadjusted	794	3992	3580	176	6725	20474	9322
Adjusted	685	3202	2736	- 1258	3740	15539	145

Based on Table A-1 in PVW. Assets are calculated as the sum of the components shown in Table A-1 in order to maintain consistency with the components.

The tax adjustment performed in Table III-1 is a simple one. It applies a rough estimate of the marginal tax rate that would apply to the sheltered assets if they were entirely withdrawn, thus becoming taxable. As shown in this table, the results changes substantially when the deferred taxes are included in the calculations. Of the six income groups for which PVW found a statistically significant difference in assets, in one group (income of $30-40 thousand) the difference becomes negative; in another group (40-50), it is cut in half and in another (over 75) it is reduced to nearly zero. The results for this last group deserve some further elaboration. This group is likely to be the one where households have total annual savings in excess of the contribution limits. As discussed earlier, theoretical analysis shows that in this case TASPs do not generate a substitution effect between present and future consumption, therefore TASPs cannot generate net savings. The adjusted results are consistent with this theoretical conclusion. When deferred taxes are taken into consideration, families eligible for 401(k) have the same financial assets as ineligible families, implying that their saving behaviour is not affected by TASPs. Measuring accurately the magnitude of deferred taxes is more complicated than the simple exercise presented in Table III-1. Given the potentially large effect on the results, however, ignoring deferred taxes in the comparison introduces a bias which may be large enough to invalidate the conclusions.

Second, the assumption of exogenous eligibility is questionable for a variety of reasons. It is true that "eligibility is determined by employers." However, employers as rational agents will introduce such programs only if they expect them to have a positive effect on labour productivity, effective labour costs and ultimately profits and rates of return. It is not in the interest of firms to offer new programs that employees do not want. There is some evidence to that effect. In a survey of employers conducted by Buck Consultants (1989), nearly two-thirds of respondents cited 'perceived employee interest" as a reason for introducing 401(k) programs. Firms may also use these programs as a means of reducing turnover costs. Some firms offer a certain degree of matching of employee contributions, but only if employees make maximum contributions; moreover, the employer's portion of the contribution becomes vested in the employee only after a selected number of years. Since an employee will lose the employer's contribution by quitting before the firm's determined deadline, it is in the employee's interest to select a level of contributions and attachment to the firm that maximizes his total compensation package, including the employer's 401(k) contribution. If this pattern results in contributions which exceed the employee's desired level of annual saving, the 401(k) will affect the timing of saving, but may not influence their level over the lifetime. Comparisons of assets of eligible and ineligible households for a given year may pick up some of this timing effect and interpret it as an increase in savings. The comparison between the two categories of families may also be biased by the narrow definition of assets. For example, Engen Gale and Scholtz, (1994) find that, when assets include pensions, eligible households have more non-401(k) wealth than do ineligible households. A study by Bernheim and Garrett (1995) also suggests that eligibility may be positively correlated with higher tastes for saving. Also, in selecting the homogeneous groups PVW use cash income as one of the control variables. However, for a given cash income, a household with an employer contribution to a 401(k) has more total compensation than the household without 401(k) plans. Therefore, the former is expected to have more savings.

Third, PVW's study (and also the other studies on the saving effects of 401(k)s discussed in the next section) ignore the potential substitution between 401(k)s and existing pension plans and implicitly assume that firms would not offer any other type of pension plan in the absence of 401(k)s. As pointed out by EGS (1996), various forms of pension plans at the firm level were quite common prior to the introduction of 401(k)s and still represent a substantial portion of pension assets. A popular plan was a thrift plan which was financed by tax-deductible contributions from employers and non-deductible contributions by employees. EGS (1996) suggest that a large share of 401(k) assets would had existed even in the absence of this plan because the funds have been deposited in the alternative plans they replaced. Additional evidence on this type of pension plan substitution is provided by Andrews (1992), Papke, Petersen and Poterba (1993) and Buck Consultants (1989). The assumption that firms would not offer any pension plans other than 401(k)s is highly questionable. The popularity of supplemental pension plans prior to the introduction of 401(k)s suggests that pension plans at the firm level are a component of the total compensation package that employees find valuable. Profit-maximizing firms would find it in their interest to introduce such plans, especially when the cost to them (or the adjustment in wages in the case of full backward shifting in the long-run) is reduced by the deductibility of their contributions. These plans may also help firms attract employees with long-term planning horizons, as evidence by their interest in such saving plans, and a stronger labour force attachment which may also be associated with a stronger firm attachment, thus reducing turnover costs. All the potential flaws in the PVW analysis do not necessarily imply that 401(k) have no effect on savings. They suggest, however, that the claims made by the authors may not be warranted.

3. Comparing Cohorts Over Time

This approach measures the saving effect of TASPs by comparing the financial assets of cohorts, a group of people who belong to a certain age group, who reach the selected age at different times during a given period and, therefore, have different length of exposure to TASPs. This approach was used recently by Venti and Wise (VW, 1996). They compared the financial assets of cohorts of age 60-64 - standardized for income, education and marital status - who reached that age in 1984 and 1991, respectively. They found that, for contributors and non-contributors combined, the younger cohort, that reaching the specified age in 1991, had larger total financial assets than the older cohort and that the difference was entirely accounted for by changes in sheltered assets. The 60-64 cohort of 1991 had mean financial assets of $50,419 compared to $42,250 for the 1984 cohort. The difference of $8,169 was almost equal to the increase in sheltered assets which, at $14,156 for the younger cohort, were $9,398 higher than for the older cohort. The authors interpreted this difference as evidence that TASPs were effective in raising personal savings.

A cohort-type analysis was also performed by PVW (1995) in their second exercise. They selected homogeneous groups of families in terms of saving behaviour through successive cross-section selections and calculated the changes in their financial assets from 1984 to 1991. The different groups of "like families" were selected with respect to the length of their exposure to 401(k) plans. Th effect of 401(k)s was measured by checking whether "longer exposure results in greater savings". In their exercise, PVW compared a typical person of a given age, say 40, in 1984 with a typical

person of the same age in 1987 and 1991, where typical was determined by a variety of attributes in addition to age (such as income, family status and education). The first typical person has two years of exposure to 401(k)s, the second person five years and the third one nine years. In PVW's view, if 401(k)s have no effect on saving, but are simply a transfer of assets, total financial assets of the three typical persons should be the same in all three periods. The underlying assumption is that similar persons of similar age would save the same amount. If 401(k)s stimulate saving, then unsheltered assets should be the same in each period, but sheltered assets should be greater for the typical person in 1991 than for that in 1984.

For PVW the key test of the saving effect of 401(k) is the change in unsheltered assets. Their analysis shows that the value of these assets was roughly the same for the typical person in 1984, 1987 and 1991, whether or not the typical person was eligible for 401(k) plans and whether or not he contributed to an IRA. Sheltered assets, however, were substantially higher for the 1991 group than the 1984 group. PVW interpret these results as indication that there is no substitutability between 401(k) and unsheltered savings and that the 401(k) contributions represented new saving.

The fundamental methodological problem with the cohort approach is its extreme assumption that unsheltered financial assets of given cohorts or "like families" would have remained unchanged through time. This assumption in effect eliminates all other factors that may have influenced the saving pattern of these like households in different time periods and assigns to 401(k) effect generated by other factors. The simple statement by PVW (1996) that they find it "unlikely" that younger cohorts may have a higher propensity to save than older cohorts is not sufficient. The proper comparison in this type of analysis should be between the actual assets of younger cohorts, correctly measured, and the assets that would have been accumulated in the absence of tax sheltering. As shown below, when the analysis incorporates a variety of factors which may influence the value of the accumulated assets and which were not accounted for by cohort studies, one may reach the opposite conclusions than the authors. In what follows, the analysis applies to the Venti and Wise results, but its implications extend to the PVW results as well.

First, the difference in assets between the two groups analyzed is exaggerated by the comparison of pre-tax and post-tax values, as is the case with all these types of comparisons. If we converted all the assets in their after-tax values using an average tax rate of 25%, the difference between the financial assets of the younger and older cohorts in the Venti and Wise study would be reduced to $5,910.

Second, the stock market boom of the 1980s and 1990s and the higher real rates of interest during the same period raised the overall rate of return for the younger cohort. The assets of the younger cohort were affected by the higher rates of return in the 1984-91 period compared to pre-1984 years in two ways: by accumulating the balances existing in 1984 at a higher rate and by providing a stronger incentive to save in the 1984-91 period. An illustrative example will provide an indication of the potential magnitude of these effects. If the older cohort saved an equal amount per year for 20 years and earned an average after-tax rate of return of 5%, it would accumulate the average amount recorded in the VW study by saving about $100 per month. Let us assume that the younger cohort maintained also the same saving pattern. It would accumulate assets at the 5% rate of return up to

1984 and thereafter the accumulated balance plus the new saving would earn a higher rate of return. Let us assume, as an example, that the after-tax rate of return during the 1984-91 period increased to 8%. These extra 3 percentage points in the rate of return over the 1984-91 period would be more than sufficient to explain the entire $5,910 difference in after-tax assets between the two cohorts. Put is differently, each percentage point increase in the after-tax rate of return after 1984 would explain more than one-third of the difference in assets noted by VW. TASPs are supposed to stimulate private saving by raising the rates of return. With an average tax rate of 25%, the increase in the rate of return is 1.7 to 2.7 percentage points for after-tax rates of return of 5% and 8%, respectively. This means that the difference noted by VW would be explained entirely by the saving effect of increases in rates of return of less than 3 percentage points. If we combine the effect of the higher rates of return on the accumulated assets to 1984 with the post-1984 effect of the saving rates, even an increase as small as one percentage point would explain the different noted by VW.

There are additional factors explaining the difference in assets between the two cohorts, as noted by EGS (1996). First, the data for 1984 exclude balances in 401(k) plans for that year and balances in thrift plans. As in the case of the PVW comparison between eligible and ineligible households discussed earlier, some of the difference in tax-sheltered savings may simply reflect the understatement of the 1984 balances and a shift from savings in thrift plans to 401(k)s. Second, as pointed out by Feldstein (1980), Summers (1981) and Poterba (1984), the decline in inflation and marginal tax rates in the 1980s reduced the attractiveness of investment in real property. Therefore, some of the difference in the financial assets of the different cohorts may be due to a shift from real to financial assets on the part of the younger cohort. Third, there was an increase in mortgage and other debt during the 1984-91 period suggesting that a portion of the difference in assets may be due to different levels of debt by the two cohorts. Finally, pension reform in 1983 reduced the Social Security benefits and the proportion of workers covered by a defined benefit plan dropped. The younger cohort may have found it necessary, on the average, to rely more heavily on private savings to offset the reduction in private and public pensions. The magnitude of all these factors on the observed differences in assets between younger and older cohorts is still an unresolved empirical question. We know, however, that they can potentially explain the entire difference.

When comparing cohorts or "like families" over time, the positive biases identified above may be counteracted by the negative bias that may be created by what Berheim (1994) calls "dilution". This term refers to the situation where households have different tastes for saving which results in those with stronger tastes accessing TASPs, such as 401(k) plans, at an earlier stage. Over time, as those with weaker propensities to save join the plans, the propensity to save by the entire pool of savers is "diluted" as the average taste for saving falls. The issue of "dilution" is a complex one and contains three major aspects which must be empirically proven. First, although the hypothesis of dilution among those eligible for 401(k) plans is theoretically plausible, there is no conclusive evidence of its presence. If tastes for saving are revealed through participation in TASPs, then one would expect that the proportion of workers eligible for 401(k) plans would decline over time as more and more workers with lower saving tastes join the pool of eligible workers. An analysis conducted by Bassett, Fleming and Rodrigues (1996), however, shows that this proportion rose from 57% in 1988 to 65% in 1993. This increase may be explained by a combination of self-selection and

progressive income taxes. High savers find 401(k)s very attractive because of the matching contribution by employers (Ippolito, 1993). These workers tend to stay longer with firms that sponsor these plans. Low savers, on the other hand, do not find these plans attractive and may prefer firms that provide a package of compensation which offers higher wages, which can be transformed into current consumption, rather than saving plans which postpone consumption. This self-selection may be intensified by the progressive rate structure of the personal income tax. Employer contributions offer a component of compensation which does not attract tax and accumulates tax free. The equivalent in cash would attract immediate income tax. The progressive structure of statutory and effective rates ensures that higher income workers benefit most from this tax preference, and these are the people with the higher saving rates. Second, even if there was dilution among the eligible population, what matters for the comparison performed by PVW is the relative degree of dilution between eligible and ineligible households. Again there is no evidence that there has been a relative reduction in the taste for saving among eligible households. Chang (1996) and Fernandez (1992), for example, found that workers with low taste for saving frequently liquidate their 401(k) accounts on leaving a firm, perhaps after the vesting deadline. This action would reduce the potential dilution effect among eligible workers and increase it among ineligible ones. Finally, even if there is evidence of absolute and relative dilution, it should be shown that it is significant enough in magnitude to affect the results of the comparisons performed by PVW. Nonetheless, this issue serves as a reminder of how complex are the issues involved in determining empirically the saving effects of TASPs.

The foregoing discussion suggests, however, that, when all factors are taken into consideration, one may derive opposite conclusions from the same results. In the case of the cohort studies reviewed above, since the differences between the older and younger cohorts or "like families" can be more than explained by factors other than the availability of and exposure to TASPs, one may interpret the results as suggesting that tax assistance for savings has no effect on private savings.

C. Special Issues

1. Different Conclusions from the Same Data

Evaluating the empirical evidence on the saving effects of TASPs is made more complicated when different authors derive different results from the same data. One such case involves two studies on the saving effects of IRAs.

In the VW (1992) paper discussed in an earlier section, the authors used data from the 1983 and 1986 Survey of Consumer Finances (SCF) to evaluate the changes in assets by contributor households. They found that the increase in IRA was not associated with a reduction in other assets and concluded that IRA saving was totally net new saving. Gale and Scholtz (GS, 1994) applied a more formal model to the same data to determine the saving effect of raising the contribution limit. GS derive a saving function under the assumption that agents maximize a utility function based on lifetime consumption. Although individuals are attracted to the higher returns from IRAs, they do not consider them perfect substitutes for other savings because they face uncertain incomes and because early withdrawals involve a penalty. The degree of substitubility increases with age as total

assets reduce the risks associated with uncertain incomes and the time for withdrawals without penalty draws nearer. A major feature of the models is that it allows savings to differ between contributors and non-contributors. While VW assume that, in the absence of IRAs, households contributing the limit amount would have saved as much as households who did not contribute at all, GS assume that limit contributors over a three year period would have saved as much as other contributors. Estimating this more general model leads to the conclusion that raising IRA limits has negligible effect on personal and national savings.

The differences in results from the same data remain even after a debate between the authors of the two papers. PVW (1996) argue that GS results are very sensitive to the sample used. They replicated the GS model using different samples from the same data and found large variations in the results depending on which families were included in the sample. In a follow-up paper EGS (1996) address the criticisms to their approach, provide some additional estimates and show that the original result still holds.

Another case where different conclusions are reached from the same data arises in connection with the exogeneity of 401(k) contributors. PVW (1995) use a sample from SIPP data to estimate regressions which shows that households eligible and ineligible for 401(k) plans have very similar levels of non-401(k) financial assets, controlling for income, age, education and marital status. Engen, Gale and Scholtz (1994), using a similar sample from the same dataset, but a longer list of explanatory variables find higher non-401(k) assets, net financial assets and net worth than non-eligible families. Therefore, from the same dataset one group of researchers find that eligible and ineligible households have the same propensity to save, in the absence of tax-sheltering instruments, while another group finds that eligible households have stronger tastes for saving suggesting that eligibility is not exogenous. According to the first group, any difference in financial assets between eligible and ineligible households represents entirely new saving. According to the second group, part of the difference simply represents differences in tastes for saving.

A different example involves the use of tax data. Joines and Manegold (1995) used data from the IRS-Michigan Tax Panel to compare the saving behaviour of groups who contributed to IRAs before and after the 1981 rule changes with that of groups that contributed only after 1981. They concluded that a portion of IRA contributions represented new savings. Engen, Gale and Scholtz (1994) estimated similar regressions by using a different extract from the same panel data and found a much smaller saving effect.

2. The Home Equity Effect

A debated issue involves the potential substitution of home equity with tax-sheltered financial assets. Although both vehicles offer tax breaks, they differ considerably in terms of liquidity. The research by Engen and Gale (1995) provides evidence of substitution between those two types of assets. Their study concluded that the increase in the financial assets of people eligible for or participating in 401(k) plans was partly explained by a reduction in home equity. Poterba, Venti and Wise (1996) also analyzed this issue and found no evidence of such on offset.

D. Studies Using Explicit Utility Functions

A major shortcoming of the studies reviewed so far is the failure to incorporate a model of saving behaviour. For example, the various papers by Venti and Wise do not contain an explicit model of intertemporal choice, make no allowance for uncertainty and do not include the penalty for early withdrawal in the agent's choice. Exceptions to this approach are the studies by Engen and Gale (1993), and Engen, Gale and Scholtz (1994). These authors use a stochastic life-cycle simulation model to estimate the effect of different government policies on saving behaviour. In their model, agents maximize lifetime utility by making choices between present and future consumption and between conventional and tax-assisted saving instruments. They face a lifetime budget constraint and uncertain future earnings and mortality. Their simulation results indicate that tax-assisted saving plans may raise the steady-state saving rate in the long-run. However, in the short-run, the introduction of these tax-preferred saving instruments reduce both private and national savings, because a portion of the contributions to these plans involve a shift from existing taxable assets rather than a reduction in consumption.

A more general simulation model has been recently used by Imrohoroglu, Imrohoroglu and Joines (1998). They used an applied general equilibrium model containing overlapping generations of individuals with lifespans of 85 years (but enter the model at age 21) facing uncertainty about mortality, employment and income paths. They supply labour inelastically and they save through conventional and tax-preferred assets for the purpose of smoothing consumption through their lifetime and for precautionary purposes. All tax-preferred assets are assumed to be of the IRA type and these assets are modelled in details to incorporate all their institutional features. Their results show that when an IRA with a contribution limit equivalent to 11 percent of labour income per employed worker is introduced approximately 9 percent of contributions would constitute incremental saving. This increase in saving represents a steady-state effect which will materialize in the long-run. As pointed out by the authors, the short-term effect is likely to be much smaller because during the transition a portion of the contributions will be financed through a shift from existing taxable assets.

E. Non-economic Factors

Some authors have stressed that tax-assisted saving plans stimulate private savings through non-economic channels. Feenberg and Skinner (1989), for example, have suggested that IRAs may stimulate private savings by providing the gratification of an up-front refund and the satisfaction of receiving a refund from the IRS rather than sending a check. They argue that this behaviour is reinforced by the advertsising campaigns of financial institutions which stress the benefits of deductibility. The importance of advertising has also been stressed by Carroll and Summers (1987) and Venti and Wise (1989). The last authors also stressed the role of IRAs as vehicles of saving discipline. They argue that some potential savers are prone to procrastination and that the annual contribution event may force them into a more disciplined approach because a contribution missed means a refund lost. Again, advertising may reinforce this discipline function of IRAs by emphasizing the need for long-term planning for retirement and the benefits of annual savings.

Although psychological factors cannot be dismissed out of hand simply because they do not fit the economist's definition of rationality, they do not necessarily work in the direction of raising the potential effectiveness of TASPs. Encouraging self-discipline may simply help families organize their saving plans over their lifetime rather than increase the total amount saved. If this effect serves to simply bring forward savings that were planned for the future and if TASP contributors have higher tastes for saving than non-contributors, than this intertemporal rearrangement would show up as a positive difference between contributors and non-contributors, leading to incorrect conclusions. In practice, this effect may not be significant because most IRA contributions were made at the limit and by individuals with large non-IRA assets (Gale and Scholtz, 1990). This suggests that contributors had decided to save at least the IRA contribution amount even in the absence of IRAs. The advertising campaigns of financial institutions stress the benefits of the deduction of contributions and of tax-free accumulation, but do not stress the future tax liability. Therefore, it is possible that contributors develop a myopic view of TASPs, by treating sheltered assets as after-tax balances and adding them up to calculate total wealth. This myopic view, which we noted also in a number of the studies reviewed in previous sections, would lead to overconsumption as a response to an overstated view of total assets. In this case TASPs would reduce rather than increase private savings. The same effect may be generated by advertising which stresses the potential use of the tax refund for current consumption. An example of this type of advertising is found in an article which appeared in The Ottawa Citizen (2 August, 1996) under the heading "Let the taxman pick up the tab for your holiday." The article promotes the following plan: place $4,000 in RRSPs, borrow $1,920 for a vacation, claim a tax refund of $1,920 on your contribution (assuming a combined federal-provincial personal income tax rate of 48%) and pay the loan with the refund. Non-economic factors my play a role in how potential savers respond to TASPs. However, whether they raise of reduce savings or whether their effects are significant in magnitude is unproven.

F. An Alternative Approach

An alternative approach to the evaluation of the saving effect of TASPs has been proposed by Merette and Ruggeri (2000). This approach is based on the main feature of front-loaded TASPs such as Canada's RRSPs, namely, the deductibility of contributions in exchange for the taxation of principal as well as accumulated earnings at the time of withdrawal. In general, contributors must save a portion of the tax refund on contributions in order to help pay for the deferred tax liability at the time of withdrawal. Whether contributors save more or less than this amount determined whether TASPs generate an increase or decrease in private savings. Therefore, the saving effect of TASPs can be revealed by the proportion of the tax refund that is saved. (s).

Merette and Ruggeri derived the general expression for the effective rate of return on a dollar contributed to a TASP as

$$(1)\ Rt = (1 - m + sm)(1 + r)^t$$

where m is the marginal tax rate, which is assumed to remain constant, r is the real before tax rate

of return, s is the proportion of tha tax refund which is saved and to is the length of time the contributions are kept tax-sheltered.

By contrast, the effective rate of return on a dollar saved in unshektered form is

$$(2)\ R = [1 + r(1 - m)]^{t}$$

The estimated value of s serves the purpose of revealing the saving response of taxpayers to TASPs through a comparison of R and Rt, given the assumption that TASPs affect saving by increasing effective rates of return. If the value of s estimated from empirical studies of the use of tax refunds results in Rt greater than R , this indicates that TASPs provide and incentive to save. If the estimated value of s leads to a value of Rt lower than R, it indicates that TASPs serve as incentives to consumption.

Using estimates of s derived by Souleles (1999) for the United States, Merette and Ruggeri show that RRSPs may stimulate private savings only for individuals who plan to keep the funds tax-sheltered for a long time. For holding periods less than 10-15 years, RRSPs serve as a subsidy to consumption. In either case, however, the effect is likely to be quite small because the difference between Rt and R is quite small. Merette and Ruggeri conclude that the tax breaks for RRSPs are effectively transfer payments to the contributors, which are overwhelmingly in the middle and upper income classes.

G. Canadian Studies

The research on the saving effects of RRSPs in Canada is notable for the scarcity of empirical studies. This is surprising, especially when compared to the voluminous literature for similar programs in the US, since RRSPs have been in place longer and have always been more generous than IRAs.

The earlier studies were motivated by the desire to explain the increase in the Canadian saving rate relative to the US rate that took place in the late 1970s and early 1980s. Jump and Wilson (1986) "examined and rejected" the hypothesis that this saving rate differential was caused by the more generous tax incentives in Canada. In their words "The tax incentives - the $1,000 Investment Income Exclusion, RHOSPs and higher limits for RRSPs - can be argued to be more akin to lump-sum tax reductions than schemes for effectively increasing after-tax returns to savings at the margin...it is not obvious that these measures offer tax shelters that do not already exist in other forms. Finally, even if the tax measures have provided incentives for higher personal saving, they have been probably been blunted or completely offset by the higher government deficits or increases in other taxes necessary to finance them." (p. 181). The relationship between Canadian and US saving rates was examined by Carroll and Summers (1987) with the use of econometric techniques. Noting that " macroeconomic variables cannot explain the bulk of the relative movements in US and Canadian savings rates" (p. 254), they repeated their estimation hy adding variables that would capture the effect of tax preferences for private savings. They found a statistically significant positive coefficient which indicated a strong effect of tax preferences on personal savings and concluded that

"differences in tax structures....appear to be important factors explaining the divergent behaviour of the American and Canadian private savings rates." (p. 249).

Although this study does not support the view that IRAs stimulate private saving, especially since the IRA variable was not statistically significant in separate regressions for the US, it suggests that RRSPs did have an effect on the Canadian personal saving rate.

Carroll and Summers' inference about the effectiveness of RRSPs may not be warranted, for a number of reasons. First, as pointed out by Sabelhaus (1997), the two saving series used by Carroll and Summers are not compatible because the US data do not include the value of government employee pension funds. When Sabelhaus adjusts the US saving rate for an estimate of the government pension funds, the gap between the Canadian and US saving rates is reduced in half. Second, the sample used by Carroll and Summers ended in 1985 shortly after the peak in the saving rate differential. Extending the series to the early 1990s, as is done by Sabelhaus with the adjusted US data, shows a reversal of the 1975-85 pattern and a return towards the pre-1975 relationships. Carroll's and Summers' sample was dominated by the unusual, and still not fully explained, hump in the difference between Canadian and US personal saving rates. Moreover, this reversal of trends occurred during a period when the US policy reduced the generosity of the IRA program while Canada increased the generosity of RRSPs. Third, the analysis by Carroll and Summers does not take into account differences in public pension policy in the two countries. As discussed earlier, the level of public pensions is a major determinant of saving behaviour because the need to save in order to maintain a given standard of living before and after retirement is reduced as the generosity of public pensions increases. A comparison of public pension policy in Canada and the US by Sabelhaus (1997) shows that the different policies in the two countries help explain part of the saving rate differentials. His calculations "suggest that Americans may save less because Social Security replaces more income and reaches further into the income distribution than Canadian public pensions do, and, combined with a decrease in effective tax rates at retirement, reasonable rates of consumption replacement can be achieved with low to modest saving."(p. 269). The amount of financial assets needed to maintain a stable consumption pattern before and after retirement also depends on the tax rates faced by retirees. It is the net stream of after-tax income that determines the consumption level and not the gross income. The federal personal income tax structures are very similar in the two countries. They both have three rate brackets and the three statutory rates are very similar in magnitude. However, the state and local income taxes, though varying considerable, are lower on average than the provincial rates, primarily because the Canadian provinces have larger spending obligation in education and health care. As a percentage of federal income taxes, the average non-federal income taxes represent about 30% in the US and about 50% in Canada. US retirees require a smaller level of wealth to generate the same net annual consumption level than their Canadian counterparts, although part of the difference in income tax liabilities may be offset by higher health care costs. Fourth, the period when the saving differential between the two countries exploded is the period when there were very high mortgage rates. These high rates were more punitive for Canadian homeowners and prospective homeowners because, unlike the US, mortgage interest is not deductible. Some existing homeowners with upcoming mortgage renewals were forced to save as much as possible in the short-term in order to reduce the principal to a level generating

monthly payments at the higher interest rates that were not unbearably higher than the current payments. Prospective homeowners were also induced to increase their savings in order to raise the downpayment so that they could meet the requirement of financial institutions in providing a mortgage with sustainable monthly payments. Finally, in 1974 the personal income tax in Canada was indexed for inflation. This move produced a substantial reduction in the tax burden on capital income which had large inflationary components. Indexing in a high inflation environment was equivalent to a major reduction in effective tax rates for people with income increases tracking inflation. The resulting increase in the real rate of return compared to the pre-indexed system should have raised personal savings if savings respond to changes in rates of return, a necessary condition for tax-based saving incentives to stimulate private savings.

The conclusions of the Carroll and Summers study have been also rejected by Burbidge, Fretz and Veall (1998). They analyze the pattern of Canadian and US saving rates and of RRSP contributions and present the following observations. The Canadian saving rate jumped in the 1970s, but RRSPs had been available since 1957 and contributions rose steadily since inception. After reaching a peak in 1982, the Canadian saving rate and its differential from the US rate began falling while RRSP contributions continued to rise, partly in response to increased contribution limits. The authors point out that "RRSP contributions are not well correlated with either the magnitude or timing of changes in Canadian saving rates" (p. 260) and concluded that "RRSPs cannot reasonably account for the differences in the aggregate saving rates between the two countries." (p. 259).

Another set of studies is a series of papers prepared for the federal department of Finance. Wise (1984) evaluated the implications of raising contribution limits. He concluded that a 57% increase in limits would result in a 28% increase in contributions. Gupta, Venti and Wise (1992), evaluated the effects of the seven-year carry-forward of unused RRSP contributions. They concluded that this new provision would raise average contributions by about two-thirds over the long-run. Venti and Wise (1995) used cohort analysis to estimate the effects of RRSPs on private savings. They obtained results similar to those for IRAs in the US. They found that RRSP contributions were not substitutes for other assets, the younger (1992) cohorts had substantially larger assets than older (1969) cohorts and that the difference was largely due to higher RRSP assets.

All the above studies employed the methodology used by Venti and Wise for the US which was discussed in some details in previous sections. Therefore, they suffer from the same methodological shortcomings discussed previously. With respect to the cohort study by Venti and Wise, however, it worth noting that the bias in their results cause by the comparison of pre-tax and post-tax assets is magnified in Canada by the higher marginal and average tax rates for the combined federal and provincial personal income tax.

A study mentioned by Ragan (1996) suggests that the results for RRSPs in Canada will parallel the results for IRAs in the US, if conducted with the same methodology. Ragan refers to a study which has not yet been published and in which he was involved. This study used the Gale and Scholtz methodology and reached similar results. According to Ragan, this study shows that "An increase in the RRSP limits leads to an increase in household saving and a larger reduction in government

saving for a net result of an overall reduction in national saving. The implication is that the elimination of RRSPs would *reduce* household saving but would actually *increase* national saving." (p. 66).

Additional information on the saving implications of RRSPs is provided by Burbidge and Davies (1995). They do not measure directly the saving effects of RRSPs, but provide some useful information on the assets composition of Canadians households including assets held in RRSPs. Burbidge and Davies reach the following conclusions:

1. Most of the wealth accumulation by Canadian households is tax-sheltered because of the plethora of programs aimed at eliminating the taxation of wealth.

2. Canadians have responded to these tax incentives by placing their assets in tax-sheltered forms "about two-thirds of personal wealth is fully-sheltered from PIT in the Canadian system". (p. 25)

3. Tax incentives seem to affect primarily portfolio composition. "Savings have been channelled more and more into the few remaining fully sheltered forms, fleeing assets which are increasingly exposed to taxation." (p. 25).

4. "Between 1977 and 1984, families at all stages of the life cycle substituted RRSPs for deposits in financial institutions." (p. 28).

These authors do not measure the share of RRSP assets due to substitution and the share due to new saving. Their results, however, are in stark contrast to those of Venti and Wise (1995) who found no substitution.

F. Summary of Findings

The empirical studies on the saving effects of TASPs contain a wealth of information on the level and composition of assets by similar or different families in different periods, but do not provide any more conclusive evidence than the theoretical investigations. As discussed earlier, the structure of TASPs such as Canada,s RRSPs combined with the structure of public pension programs and personal income tax rates ensures that TASPs generate a substitution from future to present consumption only for middle income families whose desired annual savings are below the contribution limits. Even for this group, the saving effects of TASPs are not unambiguous. To the extent that personal saving is driven by precautionary motives, the higher rates of returns from TASPs may reduce rather than increase saving. Even for life cycle savings, the direction of the effect is not uncontroversial because the higher rates of return generate both income and substitution effects which operate in opposite directions. In theory, therefore, TASPs may increase, decrease or leave private savings unchanged.

This inconclusive result is not resolved by empirical studies. What we find is a set of studies which conclude that TASPs are effective in raising personal savings and another set stating that they have little or no effect. So we are left with conflicting conclusions, even from studies using the same database, and the diverging opinions of experts. Gravelle (1991) believes that "Conventional economic theory and evidence strongly suggests that IRAs were not effective savings incentives." (p. 134). Poterba, Venti and Wise are convinced that TASPs are very effective in rasing private saving; Engen, Gale and Scholtz are convinced that these are very ineffective saving incentives e; Hubbard and Skinner (1996) suggest "that there is good reason to believe that the truth lies somewhere between the extremes of no new saving and all new saving" (p. 71); Bernheim (1994) remains unconvinced by the evidence in both sets of studies and believes that "the jury on saving incentives is still out." (p. 153); Slemrod (1994) agrees with the view that "saving incentives have not appreciably increased, and may have reduced, national saving", (p. 166); and Ragan is "doubtful that (TASPs) increase national saving" and believes that TASPs "impose significant costs and produce little in the way of benefits." (p. 88). My own reading of the literature leads me to the conclusion that even if TASPs have a positive effect on personal saving this effect is likely to be small both in absolute magnitude and in relation to the large subsidy they receive from the tax system.

As pointed out by Hubbard and Skinner (1996), a major reason for the conflicting conclusions from empirical studies is that "economists are just beginning to realize how little is understood about consumption and saving behaviour, and in particular about the wide variation in saving behaviour among people who are of similar age, education and income." (p. 89). Until we gain a better understanding of the saving behaviour of different socio-economic groups and obtain uncontroversial evidence from empirical studies that use a comprehensive concept of saving and assets, take into account deferred tax liabilities, deal effectively with heterogeneity of savers, and incorporate changes in economic conditions and relevant public policy, we must remain skeptical about claims that TASPs are effective instruments for raising personal savings.

IV. RRSPs, PUBLIC SAVINGS AND NATIONAL SAVINGS

The previous section concluded that RRSPs may stimulate private savings, but this potential effect is likely to be small. Whatever expansion of personal savings may follow the introduction of tax-assisted saving plans, the extra private savings do not come free but may carry a price in the form of lower public savings. To have the potential to generate beneficial effect on economic activity, RRSPs must stimulate national savings not just private savings. This result will materialize only when the potentially negative effect on public savings is more than offset by the potentially positive effect on private savings.

The notion that increased private savings through tax-assisted saving plans are paid for in the form of lower public savings is widely accepted. It seems logical that there should be a cost to the public purse if a certain private activity is subsidized by the government. Perhaps because this conclusion seems so obvious little effort has been made to explore the public saving side of tax-assisted saving

plans. The conventional wisdom on this subject has been recently challenged by Feldstein (1995. Feldstein argues that an increase in personal savings would result in an increase in the capital stock and would generate additional corporate income tax revenue. The total increase in government revenue may be sufficient to offset the revenue loss from the tax break on tax-assisted saving plans. Feldstein reached this conclusion by simulating the saving behaviour of a single taxpayer and then extending the conclusions to the economy as a whole. In Feldstein's exercise, the taxpayer makes an IRA contribution at the beginning of each year from age 45 to 64. The accumulated funds are withdrawn in 15 constant annual amounts starting at age 65. He assumes that only 20% of the IRA contribution (called the diversion rate) is diverted from savings that would have been made in the absence of IRAs and that IRA contributions are entirely invested in corporate equity. He also assumes that there is a real equity premium of 8 percentage points resulting from a pre-corporate tax rate of return on equity of 10% and a real interest rate (the cost of funds to the government) of 2%. Using several values for the marginal rates of personal and corporate income taxes, Feldstein concludes that "the revenue loss associated with IRAs either is much smaller than has generally been estimated or is actually a revenue gain." (p. 475).

A similar exercise was performed by Ruggeri and Fougere (1997). Their analysis shows that Feldstein's results represent an extreme case based on four special assumptions: (a) a closed economy without income tax integration, (b) full investment of savings in corporate equities, (c) a very low diversion rate, and (d) a very large difference between the pre-tax rate of return on equity and the cost of funds to the government. The first assumption ensured that any additional savings were translated into a higher capital stock and generated full corporate and personal income taxes. The connection between domestic saving and investment would not materialize in a small open economy and the potential corporate income tax revenue would be offset by reductions in personal income taxes if corporate and personal income taxes are integrated as is done in Canada. The second assumption exaggerates the impact of the additional savings on the capital stock by assuming that all the extra funds go to corporate equity. Since the government initially runs a deficit to finance the tax breaks, in a closed economy part of the savings will go towards the purchase of government bonds. The low diversion rate automatically assumes that tax-assisted saving plans have a strong effect on personal savings, an assumption not supported by most of the recent empirical investigations. The large difference between rates of return on equity and interest rates minimizes the cost of deficit financing to the government and maximizes the benefits of private savings. Ruggeri and Fougere used the same taxpayer as Feldstein and the same basic parameters. They show that tax-assisted saving plans will increase government debt if the diversion rate is more in line with empirical results and the differential between equity and debt financing is reduced by 1.5 percentage points. Their general conclusion is that "the tenets of conventional wisdom that TASPs reduce government revenue are likely to hold, but that the magnitude of the effect may not be large." (p. 143).

Estimates of the effect of tax-assisted saving plans on government revenue using simulations were also derived by Engen and Gale (1993) and Engen, Gale and Scholtz (1994) and their results are summarised in Engen, Gale and Scholtz (1996). According to their estimates "public saving is negative for many years after saving incentives are introduced. Annual public saving eventually turns

positive as the funds are cashed in, but the public debt is immediately and permanently higher with the incentives than without. Corporate tax payments are not considered, but if they had been, revenues would have fallen further in the short and medium term as national saving fell, before rebounding in the long-term" (p. 134).

B. RRSPs and National Savings

The effect of tax-assisted saving plans on national savings is the combination of the effects on private and public savings. The limited number of studies on the public saving effect suggest that, if we discount cases that use extreme assumptions, this effect may be positive or negative, but is likely to be small in magnitude. The studies on the private saving effects are more numerous and more controversial. As discussed in the previous section, the conclusions range from strong saving effects to no effect at all. Some authors ((see, for example, Hubbard and Skinner (1996)) take the middle road and believe that "the truth lies somewhere between the extremes of no new saving and all new saving." (p. 74). My own reading of the literature leads me to the conclusion that tax-assisted saving plans such as Canada's RRSPs have little impact on private, public and national savings.

C. What Benefits Do We Get From These Programs ?

Whether or not one believes that these programs are effective vehicles for raising private or public savings, it is useful to explore the benefits that they may create and the costs associated with them. Some cost-benefit calculations on the effectiveness of tax-assisted saving plans were recently performed by Hubbard and Skinner (1996). In the first example, these authors focussed on the relationship between TASPs and capital accumulation. This exercise, therefore, applies to a closed economy where , as a condition of equilibrium, an increase in national savings will result in a higher capital stock. Although this example does not apply to Canada, which can be more realistically characterized as a small open economy, it will still provide some useful insights into the economic effects of these programs. Hubbard and Skinner use as measure of relative benefits of IRAs the ratio of the change in capital accumulation per dollar of IRA contribution to the change in net revenue per dollar of contribution. In their calculations they make the following assumption. An individual makes an IRA contribution at age 50 and cashes the accumulated amount at age 72. At the time of the contribution he faces a marginal tax rate of 36%, thus receiving a 36 cent refund per dollar of contribution, receives a tax break of 32 cents per dollar of income generated by the contribution and enjoys a 60% exclusion rate for capital gains, and pays 28% on the amount withdrawn. Total savings are allocated 29% to equity and 71% to a combination of short-term and long-term bonds. Equities yield a rate of return of 9.35% and bonds 5.55%. The contributor is assumed to save all the refund plus an additional amount induced by the tax break on savings. Hubbard and Skinner present estimated benefit-cost ratios for several values of the net saving. Their results show that there is no increase in capital accumulation if the contributor increases its saving by 12.4 cents per dollar of contribution (in addition to saving the entire tax refund). For smaller values of the net additional saving, there will be a reduction in capital accumulation and for higher values there will be an increase. For example, is the contributor adds 26 cents to its savings for each dollar of IRA

contribution, the value preferred by Hubbard and Skinner, the capital stock will increase by $1.21. A recent study by Imrohoroglu, Imrohoroglu and Joines (1998) estimated that "approximately 9 percent of IRA contributions constitutes incremental saving.)p. 765). In this case, a $1 dollar revenue loss of government revenue from IRA contributions would lead to less than a $1 increment in net capital accumulation.

The main tax policy rationale for tax-assisted saving plans is that they reduce the distortions in the consumer choices between present and future consumption. Hubbard and Skinner evaluated this aspect of TASPs by using the assumptions listed for the previous experiment and their preferred net private saving increase of 26 cents per dollar of contribution. This means that the contributor will reduce his current consumption by 26 cents. At the end of the 22 year period, this reduction in current consumption will allow extra consumption of 94.5 cents. In the absence of IRAs, the consumer would be indifferent between consuming 26 cents today or saving this amount, letting it grow at the after-tax rate of return, and then consume 70.2 cents at the end of the 22 year period. Therefore, the IRA program under the assumption used by Hubbard and Skinner, provides a gain of 24.3 cents (94.5 - 70.2) in extra consumption in the year 2020. This gain to the individual, however, is not a free lunch because it is made possible by the loss of government revenue. Hubbard and Skinner estimate that the tax loss, accumulated to the year 2020, amounts to 55.6 cents per dollar of contribution. If this loss of revenue is recovered through higher rates of distortionary taxes and the deadweight loss of these taxes is 30 cents per dollar of revenue ((Ballard et al. (1995)) the efficiency cost of the increased private consumption is 72.3 cents (55.6 x 1.3) which exceeds substantially the net gain in consumption. As Hubbard and Skinner point out " the saving incentive would fail the cost benefit test judged solely on reducing tax distortions."(p. 87). The tax break for savings would fail the benefit-cost test even if it was financed by non-distortionary taxation. In fact, according the calculations by Hubbard and Skinner, this tax break would pass the benefit test on reducing tax distortions only if it was financed through a reduction in government spending which had provided benefits of less than 75.7 cents per dollar of expenditure.

The results of this second case are important for the analysis of the efficiency effects of RRSPs because the reduction in the intertemporal consumption decision is the only beneficial effect of tax-assisted saving plans in a small open economy. In this context, a tax-induced increase in the rate of return on capital income does not create jobs and does not increase output and income. It just increases the total lifetime private consumption of individuals, but it does so at a cost in higher tax rates or lower public consumption. This conclusion will be recalled later when the results of this study are summarized and their policy implications are evaluated.

V. CONCLUSIONS

Registered Retirement Saving Plans (RRSPs) have been a fixture of the Canadian system of taxation and financial support for post-retirement for over thirty years and exceed in longevity both the Guaranteed Income Supplement (GIS) and the Canada Pension Plan (CPP). Annual contributions to these plans have increased rapidly since their inception and they exceed individual contributions

to Registered Pension Plans (RRSPs). The accumulated stock of assets in RRSPs is approaching half a trillion dollars and the tax break they received in 1998 is estimated at over $15 billion.

These plans serve two major objectives. First, they provide financial assistance for post-retirement through the tax system to middle and high income Canadians to balance the direct financial assistance provided to low income Canadians. Second, they are aimed at providing incentives to save to middle and high income Canadians in order to help them maintain continuity of consumption levels after retirement. This paper focussed on the second objective. The review of the theoretical and empirical evidence shows that there is no conclusive evidence that RRSPs stimulate either private of national savings. Theoretical analysis suggests that incentives to save will be provided only for contributors with savings below the contribution limits. Even for those contributors, the effect of RRSPs on saving depends on their motivation for saving because some forms of savings, such as precautionary savings, are insensitive to changes in the rate of return. Empirical studies run the full spectrum of results. Some authors find strong effects on private savings while other authors find no effect at all. My own reading of the literature leads me to the conclusion that these programs have little effect, in either direction, on both private and national savings.

RRSPs deliver most of their tax benefits to middle and high income Canadians. A recent study by Akyeampong (2000), shows that the participation rate in the RRSP programs has a strong positive relationsjhip to the contributor's income. Less than 10% of eligible contributors with income below $15,000 contributed to RRSPs during 1991-97 compared to over 30% for those with income of $45,000 and over 80% for those with income over $75,000. The avegage contribution is also positively related to income. The above study shows that in 1997 taxpayers with income over $80,000 contributed on average more than twice the amount contributed by taxpayers with income of $50,000. The latter group, in turn, contributed on average about three times the amount contributed by taxpayers with income below $20,000. The lack of evidence that RRSPs stimulate either private or national savings and the concentration of contributions, and associated tax benefits, in the middle and upper income ranges suggest that this program is effectively a transfer payment to middle and high income Canadians which parallels the direct transfers provided to low income Canadians through the Old Age Security programs.

In a small open economy, where the link between domestic saving and domestic investment is severed, the only economic effect of the tax breaks on RRSP contributions is to increase the contributors' utility by reducing the distortions in the choice between present and future consumption. However, for a given level of public spending, these tax breaks are paid for through higher rates of distortionary taxes which, in turn, increase distortions in decisions about the allocation of resources. It seems that the current tax system gives preference to taxpayers' decisions about the allocation of lifecycle consumption than to labour supply, investment and job creation.

Ruggeri and Vincent (1998), analyzed tax-assisted saving plans together with all other tax preferences within the framework of personal income tax reform. They suggested that eliminating these programs and using the additional revenue for acrosss the board rate reduction would improve both equity and efficiency. If we view these programs and part of a package of tax preferences for

returns on capital income, we should suggest that the additional revenue be used to reduce the tax burden on business. Since, in a small open economy, private investment cannot be stimulated by providing tax incentives to private savings, we must use a more direct approach such as lower business tax rates or investment tax credits. One may argue, however, that if a major objective of government policy is to stimulate investment there is no apparent reason why we should target only private investment. In the new economy, knowledge-based activities are increasingly becoming the driving force behind renewed economic growth. Governments already play a significant role in the delivery and subsidization of knlowledge through a variety of public institutions. A knowledge-based economy may require a greater public role in this area. From an economic efficiency perspective, therefore, one can make a case for the elimination of personal income tax breaks on capital income and the use of the additional revenue for a combination of reduced tax burdens on business and increased government investment in human capital.

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