Retirement Saving by Canadian Households

Report for the
Research Working Group on Retirement Income Adequacy

Keith Horner

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Table of Contents

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1. Introduction and Summary

Private provision of retirement income, through registered pension plans (RPPs), deferred profit sharing plans (DPSPs) and registered retirement savings plans (RRSPs) is a large and growing component of Canada's retirement income system.[1] Unlike our public pension programs, this component of the system is highly diverse. It is also voluntary, relying on individual choice by workers and their employers. Its performance needs to be assessed from time to time.

This paper aims to contribute to such an assessment, examining savings levels among Canadian households and testing whether people seem to be saving enough to avoid significant drops in their living standards at retirement.

Section 2 begins by looking at the trend in the level of total contributions to RPPs and RRSPs and exploring the apparent disconnect between rising rates of RPP/RRSP saving and a personal sector savings rate that has fallen to very low levels since the early 1980s. One clarification is that RPP/RRSP contribution rates are not the same as savings rates because of the tax deductibility of contributions.

There are also problems with the National Accounts savings rate as a guide to wealth accumulation by households. It ignores wealth increases through capital gains, it ignores saving through the purchase of consumer durables, and it is distorted by inflation. When adjusted to overcome these problems, the personal sector savings rate, though volatile, is higher and has no significant downward trend. This is consistent with the view obtained from personal sector asset and debt trends. They show that, despite strongly growing levels of consumer debt, the net worth of households has grown appreciably over the long term. Even after last year's market crash, the ratio of total net worth to total earnings remains considerably higher than it was in the early 1990s or any time before that.

Section 3 sets the stage for a look at retirement savings patterns by developing benchmarks for savings adequacy. These benchmark savings rates, which vary by household or family type and across earnings levels, are derived from a simple model of consumption and savings over the lifecycle. The model is extremely simplified in some respects. For example, a 55-year adult lifespan is collapsed into two periods – before and after retirement at age 65. This simplification allows the model to be very detailed when it comes to representing the tax/transfer system and its effect in shaping savings needs and incentives.

The model is based on the hypothesis that people will seek to have the same level of consumption after retirement as before. In applying this idea, changes in family size are taken into account. Saving through homeownership is also taken into account.

The model yields savings rate benchmarks that tend to rise strongly with earnings, reflecting the diminishing role of public pension income as earnings rise, and that also vary quite widely according by household type (e.g., single vs. couple, homeowner vs. renter). The model also generates target replacement rates (i.e., ratios of total pre-tax

[1] In this paper, references to RPPs should be read to include DPSPs.

retirement income to pre-tax earnings) that vary quite widely as well – from about 75% for single renters to about 50% for two-parent homeowner families.

Section 4 examines the level and pattern of retirement savings in Canada in relation to the benchmark rates. The analysis is based on a family file of taxation data from the Canada Revenue Agency for the year 2006.

Overall, it appears that about 69% of Canadian households saved in RPPs and RRSPs at rates sufficient to fully maintain their consumption levels in retirement. About 78% of households met a lower target consistent with a 10% reduction in consumption at retirement (90% replacement rate).

At low earnings levels, the targets were met with little or no saving. Savings shortfalls were greater at modest and middle earnings levels and are greatest for high-income earners. The latter group is likely affected by the contribution limits but is also the most likely to have retirement savings outside of RPPs and RRSPs. Shortfalls from the benchmark rates were found particularly among those with the highest savings benchmarks – single individuals and two-earner couples without children.

Those in the modest and middle earnings groups are the main focus of policies relating to retirement saving. In these groups, 28% (modest earners) and 29% (middle earners) did not save enough to meet the 90% consumption replacement target.

Those saving for retirement in RRSPs alone were much more likely to fall short of the savings rate benchmarks than those belonging to RPPs. This is evident in comparisons of RPP-only and RRSP-only savers. It is exacerbated by the fact that RPP members were almost as likely as non-members to contribute to RRSPs.

Savings in financial assets held outside of RPPs and RRSPs are important among high earners, but taking them into account would have little effect on the estimated incidence of savings shortfalls among modest and middle earners.

Households with earnings (over $8,839) from self-employment have RPP/RRSP savings rates that are surprisingly similar to those of employed workers. Thus, low savings by this group (which accounts for about 8% of households at modest/middle earnings levels) contributes little to the savings shortfall incidence estimates. The value of business assets is substantial, but these assets are very unevenly distributed. Taking them into account would raise average wealth levels considerably, but would have a much smaller effect on the incidence of savings shortfalls among modest and middle earners.

Because of slow labour force growth, the rate of return on saving may be lower over the coming decades than in the past. A sensitivity analysis provides savings adequacy rates assuming a 2.5% rate of return. Under this hypothesis, the proportions of modest and middle earners falling short of the 90% consumption replacement targets would rise from 28% to 30% for modest earners and from 29% to 34% for middle earners. The effects are perhaps smaller than expected because the higher savings levels needed with a lower rate of return depress pre-retirement consumption levels and thus reduce the post-retirement consumption levels needed to maintain living standards.

Section 5 considers how much these results might be distorted by the focus on saving in a single year. Evidence is provided that there is considerable regularity in retirement

saving. People who belong to an RPP or contribute to and RRSP in one year tend to do so for a stretch of years.

A study by LaRochelle-Côté, Myles and Picot (2008) of the time path of after-tax income levels as people enter retirement provides information consistent with the savings adequacy results of Section 4.

Another study, by Ostrovsky and Schellenberg (2009), demonstrates that the savings gap between RPP and RRSP-only savers found in the 2006 data does not show up in the same way in retirement income levels. Even though RPP and RRSP saving may be reasonably consistent from year to year, the categories of RPP member and RRSP-only saver blur over a full career as people change jobs. Many RRSP-only savers have RPP wealth from earlier employment.

Section 6 concludes with some thoughts regarding developments likely to influence the future performance of the private savings component of our retirement income system.

Last year's market crash and the economic recession are too recent to be evaluated but will undoubtedly have longer-term effects. If the recession deepens, forced early retirements and other employment losses may be more important effects than the current financial losses.

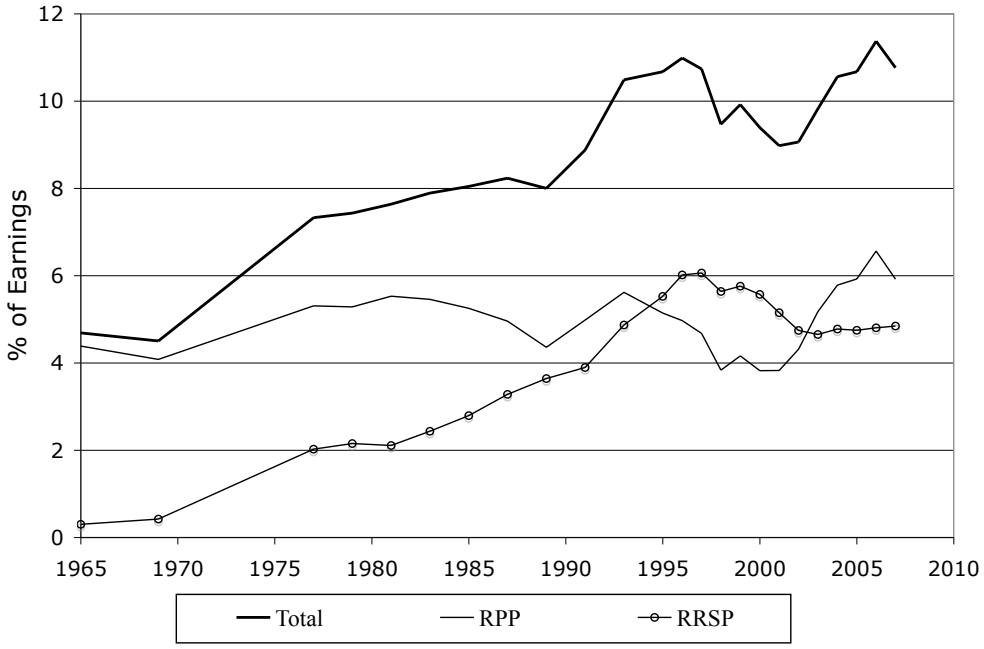
A continuation of the long-term decline in pension coverage would obviously have negative consequences, particularly given the evidence that RPP members save substantially more than RRSP-only savers.

The introduction of TFSAs, on the other hand, will make it easier for Canadians to maintain their consumption levels in retirement. TFSAs will not stimulate additional saving but will make retirement saving more effective by reducing the tax burden on retirement income. TFSAs are likely to be attractive to about 40% of households, those earning up to about $75,000 per year. The advantages of TFSA saving to households are reflected in some level of net fiscal cost to governments, mainly in the form of higher rates of GIS eligibility.

2. Trends in Retirement Saving and Household Wealth

In 2007, Canadians and their employers contributed $76 billion to RPPs and RRSPs. This represented almost 8.5% of their disposable income and about 10.8% of earnings reported for tax purposes. Moreover, contribution rates to retirement savings plans have risen steadily though unevenly for the past several decades (Figure 2.1).[2]

Figure 2.1 Contribution Rates to RPPs and RRSPs

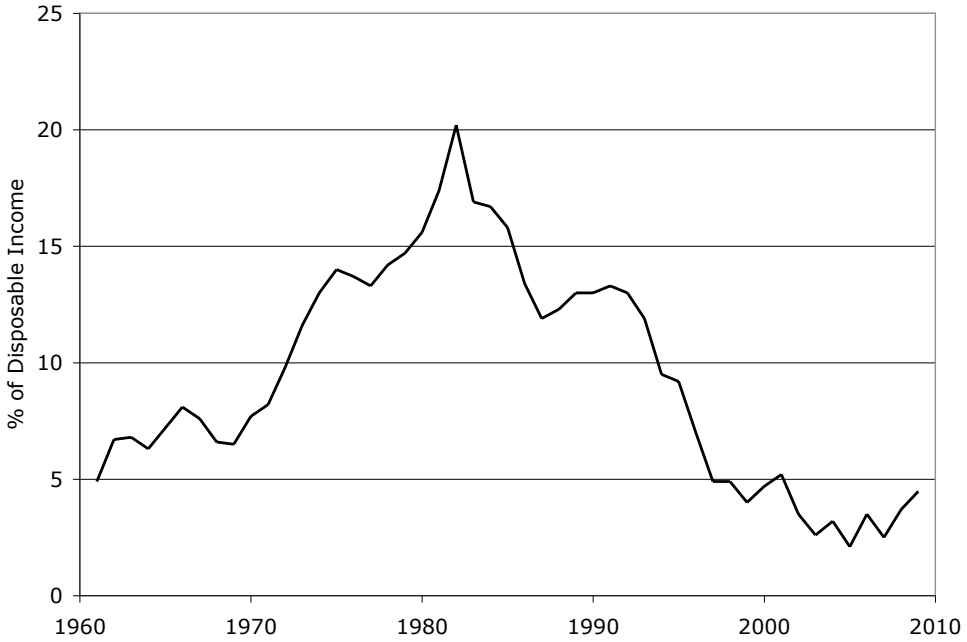


Sources: Cansim table 2800026 for RPP contributions; Canada Revenue Agency Income Statistics for earnings and RRSP contributions.

In contrast, the personal savings rate was only 2.5 in 2007, and as shown in Figure 2.2, this savings rate has been in steady and pronounced decline since the early 1980s.

[2] The decline in the RRSP contribution rate from 1997 to 2003 appears to have two main causes: (1) a shift to saving for children's education in registered educational savings plans (RESPs) following the enrichment of the tax advantages for such saving with the introduction of the Canada Education Savings Grant (CESG) in 1998, and (2) a shift in saving away from financial assets toward real estate following the bursting of the high technology bubble in 2000 (see Figure 2.4 below). Rising RPP contribution rates after 2001 likely reflect catch-up contributions made by sponsors of plans in deficit positions.

Figure 2.2 Personal Savings Rate



Sources: Cansim tables 3800019 and, for 2009 data, 3780009

These dramatically different pictures of the state of household saving raise questions. Which measure should we believe? Or, might they both be correct with the difference explained by massive dissaving, through growing use of consumer credit for example, offsetting increases in contributions to retirement plans?

2.1 Contribution and savings rates

Limitations of both measures go far to explain the differences. As introduction, consider that saving is both a setting aside of income for future use and an accretion of wealth. The growth of wealth may be described by the accounting identity

$$W_t = (1+i)W_{t-1} + E_t + Tr_t - T_t - C_t$$

in which W_t is wealth in year t, i is the rate of return on savings, E_t is earnings, Tr_t is income from government transfer programs, T_t is taxes and C_t is consumption. By rearranging terms, the level of savings, S_t, may be expressed both as the increase in wealth and the shortfall of consumption from disposable (i.e., after-tax) income.

$$S_t \equiv W_t - W_{t-1} = iW_{t-1} + E_t + Tr_t - T_t - C_t$$

The first point to note is that the contribution rate to RPPs and RRSPs is not the same as a savings rate. Consider an RPP or RRSP contribution of $5,000, for example. Because the contribution is tax deductible, the net cost to the contributor, and the net effect on consumption, is considerably less – $3,450, say, if the contributor faces a marginal tax rate of 31%. For someone with income of $60,000, this implies a retirement savings rate of 5.8% rather than 8.3%.

The personal savings rate in the National Accounts also has problems when used as a measure of changes in the wealth position (or saving) of Canadian households.

(1) Consumer durable expenditures are treated purely as consumption. In economic terms, though, they involve the purchase of assets that will provide consumption services over periods of several, or many, years and so should be treated mainly as saving rather than consumption.

(2) Because the income and expenditure accounts are aimed at measuring and classifying economic activity in a year, their definition of income excludes capital gains – an important component of household wealth increases.

(3) The National Accounts savings rate is distorted by inflation. Investment returns include an inflation premium. This premium increases measured savings and income despite the fact that it serves only to maintain the existing level of real wealth. Since its effect on the numerator of the savings rate (disposable income less consumption) is proportionally much greater than its effect on the denominator (disposable income), the inflation premium produces an upward bias in the measured savings rate. This source of bias is always present but has been particularly important during episodes of high inflation such as the early 1980s.

Using National Accounts balance sheet data for the personal sector, it is possible to derive a measure of saving that corrects for these three problems.

The first step is to deflate all the relevant flows and wealth levels by changes in the CPI to express them in constant dollars. This does not affect the savings rate, but it is important for the other adjustments. The relevant flows and levels are: savings (as per the income accounts), personal disposable income, net worth, and levels of consumer durables.

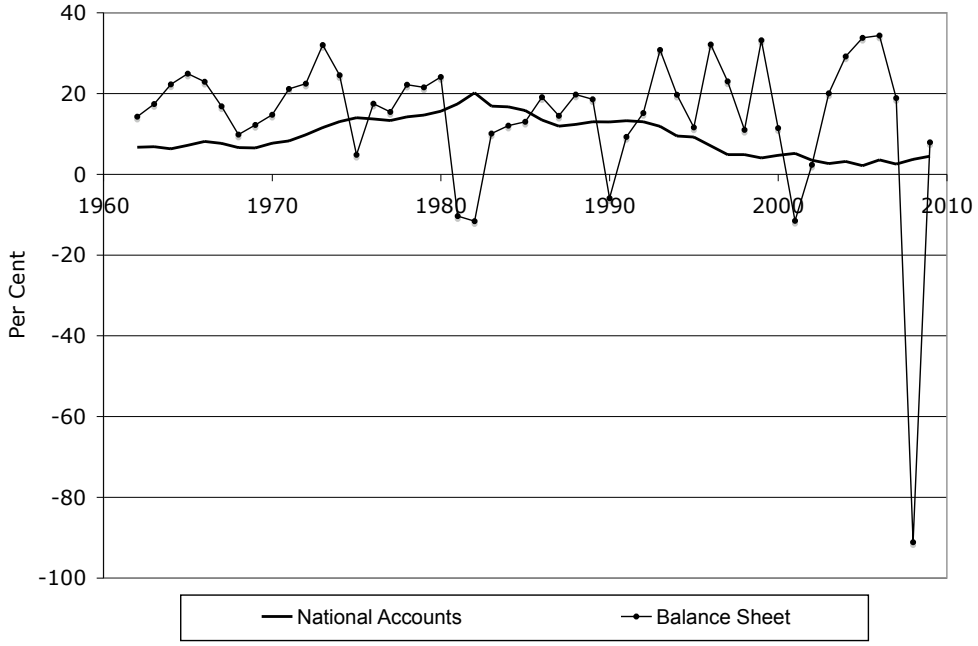
Second, annual levels of net saving in consumer durables are obtained by calculating the year-over-year changes in the stock of those assets.

Third, a simple measure of annual capital gains is created by subtracting from the annual change in net worth (measured on a market value basis) the sum of measured savings and consumer durable savings. These annual capital gains amounts are then added to disposable income to create an adjusted income measure (‘full disposable income’).

Finally, the savings rate is calculated as savings (equal to the change in real net worth) divided by full disposable income. This method follows that set out in Finance Canada (2000 and 2002).

The result is shown in Figure 2.3. The Balance Sheet savings rate is much more volatile than the National Accounts one, reflecting swings in asset values from year to year. However, over the longer term, the Balance Sheet rate is higher than the National accounts rate and exhibits no discernable trend (at least so long as 2008 is treated as an outlier).

Figure 2.3 Balance Sheet Savings Rate



Source: Author's calculations from data in Cansim tables 3780004 and 3780009.

2.2 Trends in household wealth

A similar picture is obtained by looking directly at how personal sector assets and debts have evolved over time. This is done in Figure 2.4 which shows the trends in (a) total assets, (b) total liabilities and (c) net worth [= (a) less (b)].

To correct for inflation, real wage growth and population growth, the asset and debt levels are expressed as ratios of earnings, here defined as wages, salaries and supplemental labour income plus net income from unincorporated business. Earnings are used here instead of disposable income since they are the relevant base for retirement saving. They exclude components such as investment income that do not cease at retirement and so do not need to be replaced to allow living standards to be maintained in retirement. Basing the ratios on disposable income rather than earnings, however, would have little effect on the trends.

Figure 2.4 shows that, despite the decline in the personal savings rate since it peak in 1982, the net worth of Canadian households has continued to grow. Moreover, the growth has occurred mainly since the savings rate started to decline.

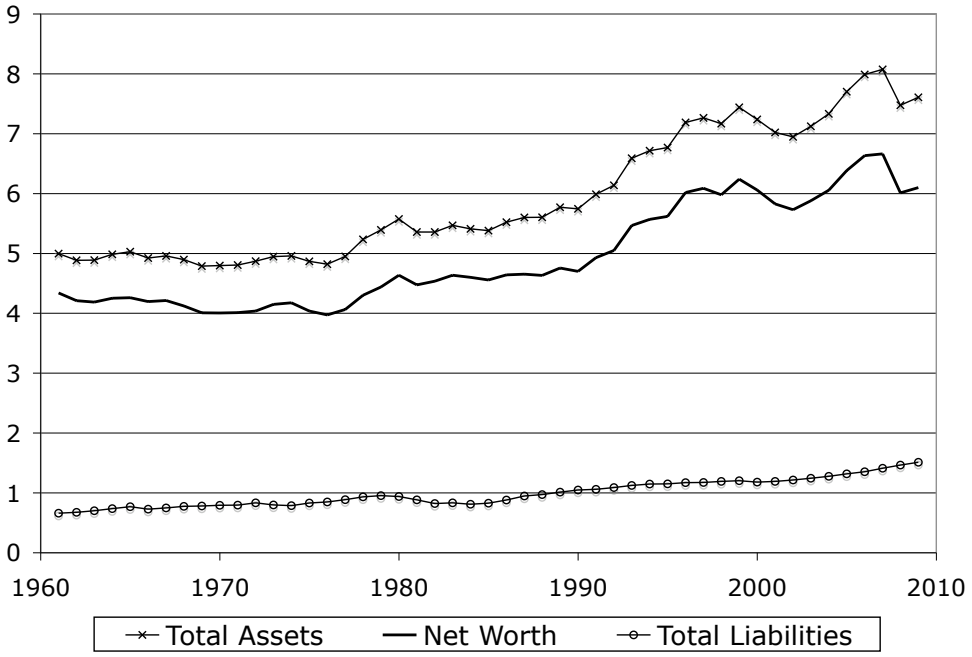
The bursting of the high technology bubble is reflected in a short-term decline in net worth from 6.24 in 1999 to 5.73 in 2002, and the effects of last year's market crash are plainly evident, with the June 2009 ratio of 6.10 remaining over 8% below the 2007 peak of 6.66.

Another point of interest concerns household debt. Total household liabilities (mainly mortgage debt and consumer credit) have indeed risen dramatically – from about 1.0 times earnings in 1980 and 1990 to over 1.5 times earnings today. But, because

household indebtedness is dwarfed by household assets, its strong growth has had relatively little impact on the growth net worth.

Figure 2.4 Growth of Household Assets and Debts

Ratio to Household Earnings

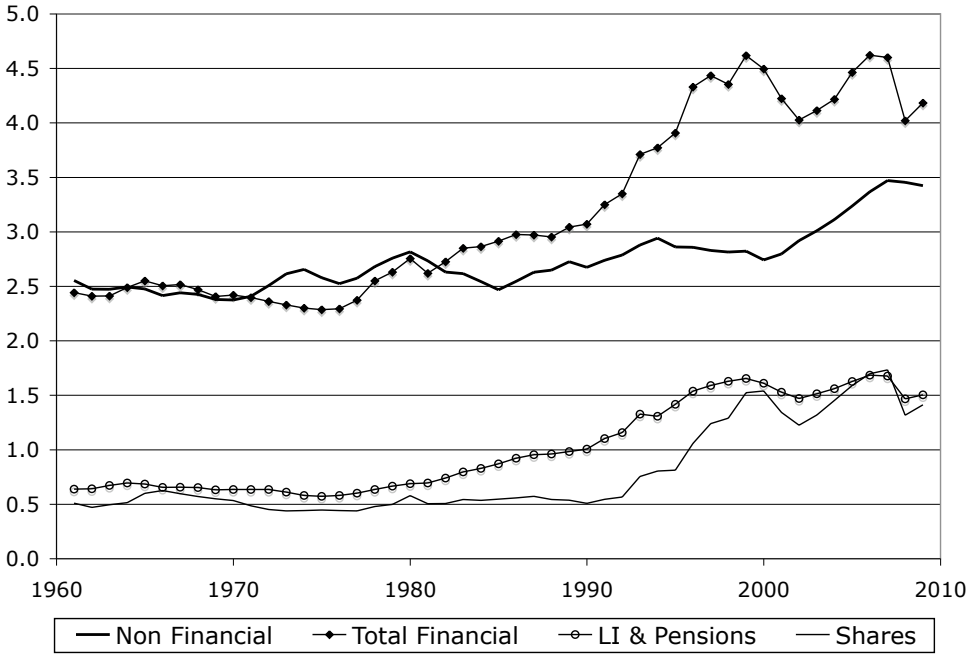


Sources: Cansim tables 3780009 and, for pre-1990 data, 3780004.
Note: the 2009 ratio is based on second quarter data.

Figure 2.5 shows how different asset classes contributed to the asset growth documented in Figure 2.4. In the top two lines of Figure 2.5, total assets are divided between non-financial assets (mainly residential structures and land) and financial assets. It is evident that financial assets contributed much more to the growth in net worth than did non-financial assets – until the collapse of the dot-com boom at least, when real assets began to appreciate faster than paper.

Within total financial assets, the two biggest categories are (a) life insurance and pensions and (b) shares. Deposits at banks and other financial institutions are a third important category, but these have grown only at the same pace as earnings. It is not possible in these data to identify assets held in RRSPs. However, RRSPs likely account for a majority of the holdings of shares. One observation is that the growth in pension assets has been considerably stronger than the growth in contributions portrayed in Figure 2.1. This reflects the increasing role of investment income, relative to contributions, as these plans have matured.

Figure 2.5 Growth in Selected Asset Categories
Ratio to Household Earnings



Sources: Cansim tables 3780009 and, for pre-1990 data, 3780004.
Note: the 2009 ratio is based on second quarter data.

The positive picture of household wealth accumulation in Figures 2.4 and 2.5 needs qualification in two respects. First, because wealth levels rise with age (at least up to retirement), population aging helps to produce an increasing wealth-to-earnings ratio. Second, it must be recognized that wealth is notoriously concentrated. Households with strong asset growth may not be the same ones that are becoming increasingly indebted.

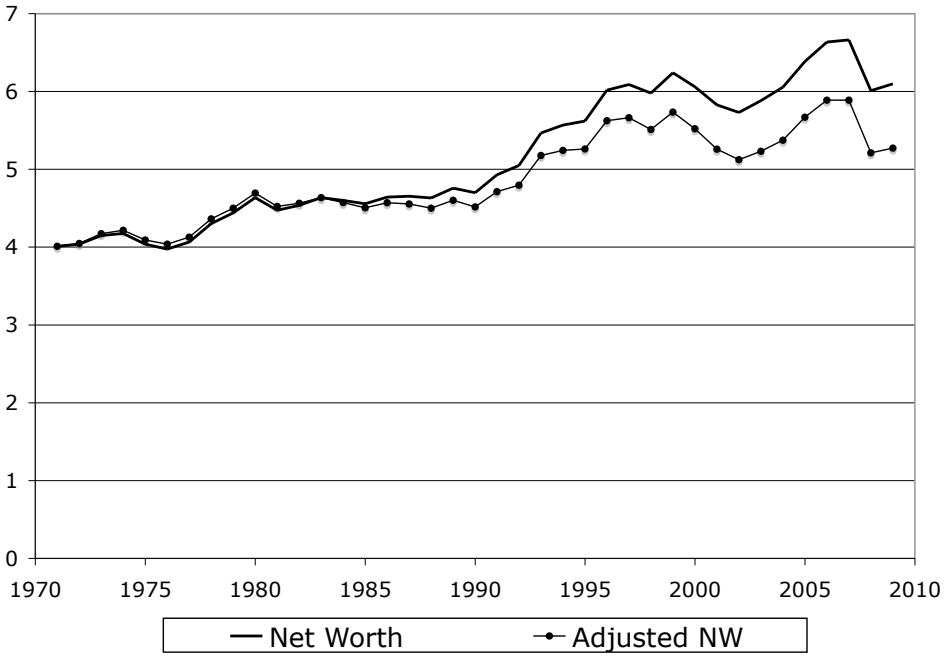
It is possible to roughly simulate the effect of population aging on aggregate wealth by assuming that age-specific wealth levels are held constant and only the age structure changes. For example, in 1999, those in the age groups 45-54, 55-64 and 65+ had average levels of net worth that were 36%, 83% and 34% above the average for all households, and the combined share of these group in the total adult population rose from 37.5% in 1971 to 49.8% in 2008.[3] In Figure 2.6, the trend in the ratio of net worth to earnings is adjusted by subtracting the amount of net worth growth calculated to be due to age structure changes.[4]

[3] The net worth averages by age are taken from Table 7.2 of Statistics Canada Catalogue 13-596 (2001).

[4] The age structure adjustment is made as follows. The 1999 age profile of net worth levels is multiplied by corresponding age group population weights for each year to obtain an aggregate net worth level for each year. An index is then created by expressing these net worth averages as ratios of the 1971 average. For example, the average for 2008 is 1.20 times the 1971 average. Finally, the 1971 ratio times the difference in the yearly index from 1.00 is subtracted from each year's base net worth-to-earnings ratio. For 2008, for example, the base net worth ratio is 6.01, up from 4.01 in 1971, and the corrected ratio is 5.21 [= 6.01 - 4.01 x 0.20].

Figure 2.6 Trend in the Net Worth-to-Earnings Ratio with an Age Structure Adjustment

Ratio to Household Earnings



Source: Figure 2.4 and calculations by the author.

These calculations suggest that population aging accounts for a good part of the increase in household wealth, relative to earnings, over the past 30 years. The adjusted wealth-to-earnings ratio (after last year's asset value declines) is currently higher than it was in the 1970s or 1980s but has changed little from the early 1990s.

Regarding the distribution of household wealth, Morissette and Zhang (2006) have shown that, since the mid-1980s, it has become more unequal, with a growing share belonging to high-income and high-wealth households. This trend is evident in the period between the asset and debt surveys of 1984 and 1999 and it has continued up to 2005, the year of the latest survey.[5] The main causes of the trend appear to be (a) historically high returns on existing wealth and (b) growing inequality in the earnings that support wealth accumulation.

Morissette and Zhang also showed that wealth ownership has become more concentrated among those in or nearing retirement. This trend was particularly strong in the 1984-1999 period but may have weakened since. Between 1999 and 2005, the growth in median and average net worth was strongest among those in the 35-44 age group.[6]

[5] The asset and debt survey was replaced by the Survey of Financial Security beginning in 1999.

[6] As in the earlier period, median and average net worth declined among those under age 35. Stagnant real wage levels among young workers appear to be a leading cause of this.

3. Benchmarks for Savings Adequacy

Because retirement savings needs vary dramatically across households according to their earnings level and family type, it makes no sense to explore savings patterns without some benchmarks indicating adequate savings levels.

The object of retirement saving is to maintain living standards in retirement by providing sufficient retirement income to replace earnings that cease at retirement. This is reflected in the second objective of government policy regarding retirement income security: to enable Canadians to avoid serious disruption of their living standards upon retirement (Finance Canada, 1989).[7] It also conforms to the findings of economic lifecycle models of consumption and saving. In these models, the diminishing marginal utility of consumption in any year drives utility maximizers to smooth the time path of their consumption by saving in high-income years and dissaving in others.

To achieve this earnings replacement goal, private pension income need not equal pre-retirement earnings because:

- Several charges against income are lower in retirement than before. Work-related expenses (e.g., work clothes, tools, transport, some meals away from home) are eliminated. Payroll taxes cease. Income taxes, in a progressive tax system that includes special tax credits for seniors, are lower after retirement. And, income no longer needs to be set aside for retirement;
- Public pensions (OAS/GIS and the C/QPP) provide a base level of retirement income; and
- For families with children, parents' pre-retirement consumption levels are reduced by the income devoted to the children's consumption.[8]

Canada's public pension plans provide progressively less earnings replacement as earnings rise. OAS provides a flat rate benefit (reduced for those with high retirement incomes). The GIS is income tested. And, for those with earnings above the maximum covered (the YMPE, about 1.08 times the average wage), C/QPP benefits replace a declining percentage of earnings. Consequently, retirement savings levels needed to maintain living standards are zero for those at low earnings levels but rise very sharply as earnings increase.

3.1 A stylized model of household saving

As a guide to the exploration of savings levels among Canadian households, benchmark savings levels are developed here based on a stylized lifecycle model of household consumption and saving.

In this model:

(a) The accumulation period is 35 years, from age 30 to 64, and the retirement period is 20 years, from age 65 to 84;

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[7] The first objective, to guarantee a basic minimum income for all seniors, relates principally to public pension provision rather than retirement saving.

[8] Couples must also expect family size to shrink on the death of a spouse. This unpleasant fact is ignored in the stylized model presented here.

(b) Contributions are made and benefits received at year-end. Inflation is 2%, the real rate of return on saving is 3.5%, and each saver's real wage grows at the same rate as the average wage – 1% per annum;

(c) Retirement income from RPPs, RRSPs or TFSAs is always received as a price-indexed life annuity;

(d) The savings rate is constant over the accumulation period;

(e) All saving is treated as RRSP saving that provides a tax deduction to the wage earner, and dollar limits on RRSP contributions are ignored;[9]

(f) The tax system is implausibly but conveniently wage indexed before retirement and price-indexed thereafter; and

(g) In cases where homeownership is considered, the value of the home (at age 64) is taken to be three times household earnings, the purchase is financed through 'constant-percentage-of-earnings' payments from age 30 to 64, and the full value of the home is realized in the form of 'housing services' (or imputed rent) contributions to consumption spread over the pre- and post-retirement periods.

These assumptions are designed to allow the analysis to be based on two sets of tax-transfer parameters – pre- and post retirement. For example, a worker whose income (net of deductible RRSP contributions) puts her halfway into the second tax bracket is assumed to remain at that point for the full accumulation period. The assumption of retirement at age 65 also ensures that measures like OAS/GIS and the age credit apply for the full retirement period and none of the accumulation period.[10]

For a single individual, for example, consumption at 64 =
Earnings
Less: retirement savings
Less: homeownership savings (for homeowners)
Plus: imputed rent from homeownership (for homeowners)
Less: work-related expenses (taken as = $300 + 3% of earnings)
Less: payroll taxes (C/QPP and EI)
Less: federal and provincial income taxes
Plus: GST credit and provincial credits.

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[9] In Section 6.4, however, the lifecycle model is used to examine which households would be better off saving with TFSAs and what the implications of the new savings vehicle might be for savings levels, retirement income adequacy and future public pension costs.

[10] As summarized in Engen, Gale and Uccello (EGU, 1999), there has been considerable discussion in the literature concerning whether and to what extent housing wealth should be taken into account in measuring savings adequacy. In their analysis, EGU provided cases with all, half or none of housing wealth included. The method adopted here takes all housing wealth into account but spreads its consumption over the whole lifetime – as if it were all received in the form of imputed rent or, alternatively, as if a reverse mortgage on the full home value were bought at age 30. As an alternative, it could be assumed that only part of the value of the home is spread over the full lifetime (as imputed rent), and a residual portion is received as a reverse mortgage over the retirement period alone. This would lower benchmark savings rates somewhat. This effect would be diminished, however, if a bequest motive were assumed so that only part of the residual portion is consumed over the lifetime. The current approach is simpler than these alternatives.

Consumption at 65 =
- Private pension income
- *Plus*: C/QPP benefits
- *Plus*: OAS benefits, net of the claw-back
- *Plus*: GIS benefits
- *Plus*: imputed rent from homeownership (for homeowners)
- *Less*: federal and provincial income taxes
- *Plus*: GST credit and provincial tax credits.

Private pension income is determined as the retirement savings level times a factor that summarizes the 35-year accumulation and conversion to a 20-year annuity.

For the purposes of provincial income taxes and tax credits, an Ontario resident is assumed. Although the model is applied to a sample of households for 2006, important changes tax-transfer changes introduced since then are taken into account. These include: increases in the GIS benefit maximums (beyond normal indexation) in 2006 and 2007; reduction in the first federal tax rate to 15%; introduction of the Universal Child Care Benefit (UCCB) and the $2,000 child tax credit; increases in the federal basic, spousal and age credits; the introduction of pension income splitting between spouses; the reduction (proposed for 2010) of the first Ontario tax rate to 5.05%, changes to surtax thresholds, and the enrichment of the Ontario sales and property tax credits. The levels of benefits and credits increased or introduced since 2006 are deflated to 2006 dollars.

Additional assumptions are required in the treatment of other family types.

For two-earner couples, a 60-40 split of earnings is assumed, but all saving is assumed to be done by the higher-income spouse.

Single parents and couples with children are assumed to have two children. For single parents and two-earner couples with children, deductible child care expenses equal to $1,500 plus 5% of earnings are assigned. Federal and provincial child benefits are also assigned.

To reflect the fact that child-related expenses do not extend over the full accumulation period, child care expenses are adjusted by the factor (10/35), the UCCB by the factor (6/35), and other child benefits by the factor (18/35). As well as recognizing the treatment of children in the tax-transfer system, this approach bases the consumption continuity target on the parents' own consumption levels.

With this framework, the adequacy analysis is carried out by determining, numerically, the level of retirement saving that equates family-size-adjusted consumption at age 64 and age 65. For singles and childless couples, family size is the same before and after retirement so consumption levels at age 64 and age 65 are simply equated. For parents, consumption continuity is based on the family size equivalence factor

$$F = (A + 0.7C)^{0.7}$$

taken from Scholz *et al* (2004). In this formula, A is the number of adults in the family and C the number of children. This factor is 1.00 for a single person and 1.85 for a single parent with two children, 1.62 for a couple and 2.35 for a two-parent, two-child family. For a single parent, the target ratio of post-retirement to pre-retirement consumption,

C_{65}/C_{64}, is 1.00/[(18/35)(1.85) + (17/35)(1.00)], which equals 0.6969. For the two parent, two-child family, a parallel calculation yields the target, $C_{65}/C_{64} = 0.8121$.

With savings levels determined by these consumption targets, one can calculate (a) required retirement savings rates and (b) target pension levels and earnings replacement rates. It must be emphasized, however, that these rates apply only to RPP/RRSP saving. In the case of TFSA saving, consumption continuity targets are met at lower gross savings levels and lower earnings replacement rates because the pension income is tax-free. This is an important reason for basing the savings benchmarks on an explicit analysis of consumption continuity rather than starting with existing ideas of target replacement rates. Also note that the RPP/RRSP savings benchmarks, although referred to as savings rates, are actually contribution rates rather than true savings rates. Benchmarking contribution rates is appropriate since retirement saving data identifies amounts contributed, not the after-tax cost of the contributions.

3.2 Benchmarks derived from the model

In the following pages, graphs of target savings rates and replacement rates are provided for a number of cases, as calculated from the household savings model. By replacement rate is meant the sum of public (i.e., from OAS/GIS and the C/QPP) and private pension income expressed as a percentage of earnings at age 64.

Five sets of graphs are provided:

- Single renter and single homeowner (Figures 3.1 and 3.2);
- Single-parent renter with two children (Figures 3.3 and 3.4);
- One-earner and two-earner homeowner couples (Figures 3.5 and 3.6);
- One-earner and two-earner two-parent homeowner couples (Figures 3.7 and 3.8); and
- The single homeowner as above and with a lower consumption replacement target of 90% (Figures 3.9 and 3.10).

These cases cover the largest segments of the Canadian working age population and provide insight into the effects of homeownership and child-related spending on target savings levels and replacement rates.

The purpose of the fifth comparison is to illustrate a second set of savings adequacy measures that can be used to give an idea of the ‘depth of savings shortfall’ among those not meeting the 100% consumption continuity target.

Figure 3.1 Target Savings Rate, Single Renter and Homeowner

RPP/RRSP Contribution Rate as a per cent of Earnings

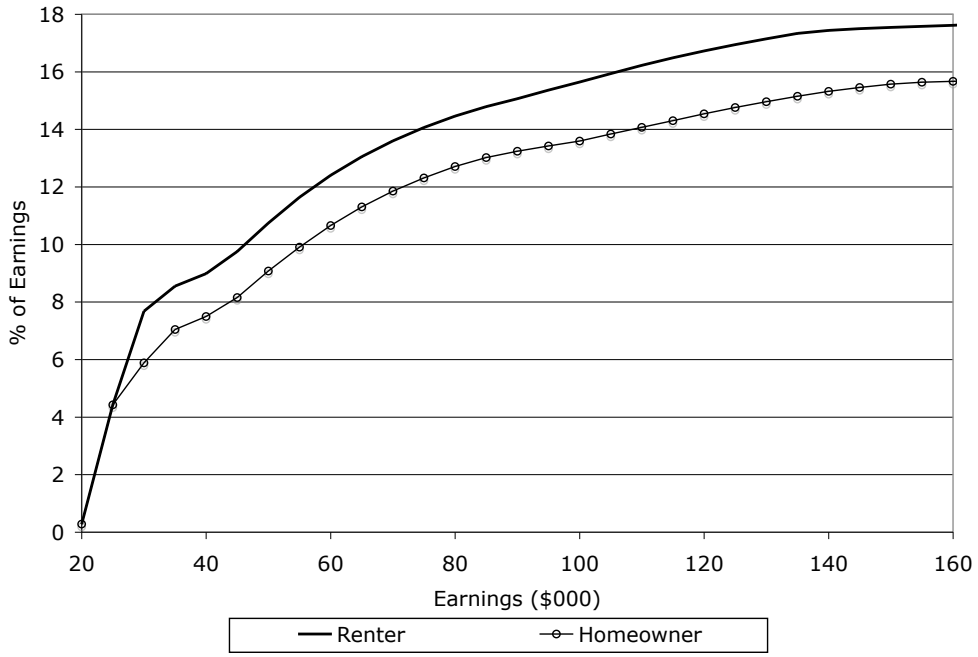


Figure 3.2 Replacement Rate, Single Renter and Homeowner

Total public and Private Pension level as a per cent of Earnings

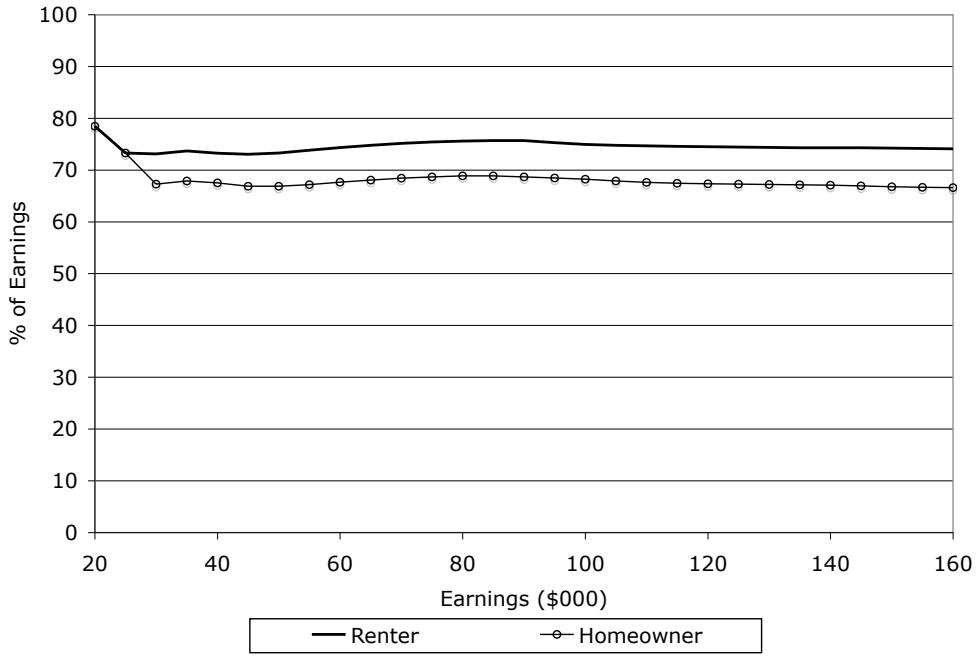


Figure 3.3 Target Savings Rate, Single Parent

RPP/RRSP Contribution Rate as a per cent of Earnings

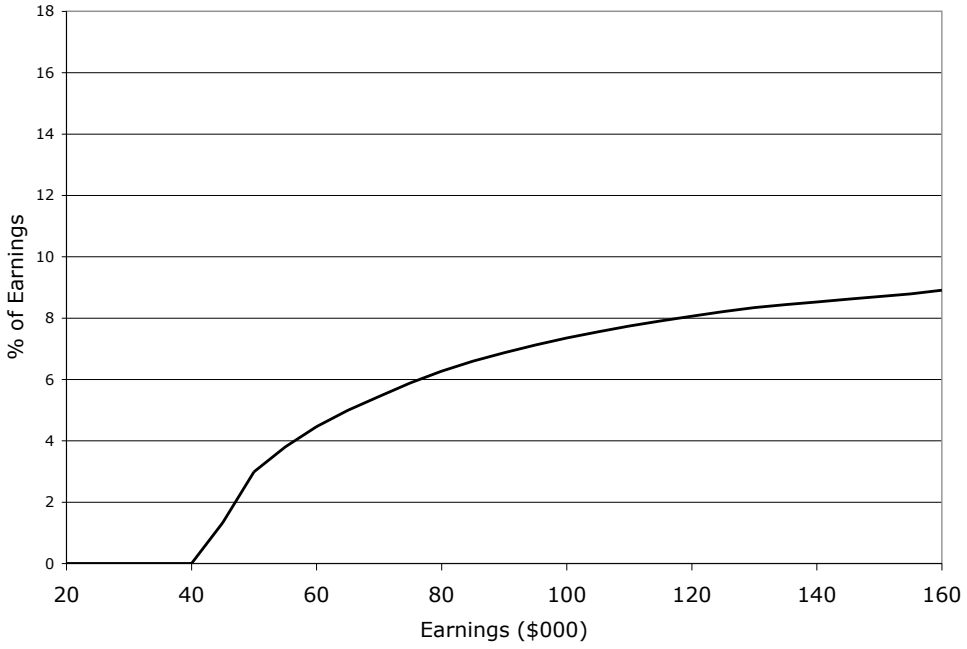


Figure 3.4 Replacement Rate, Single Parent

Total public and Private Pension level as a per cent of Earnings

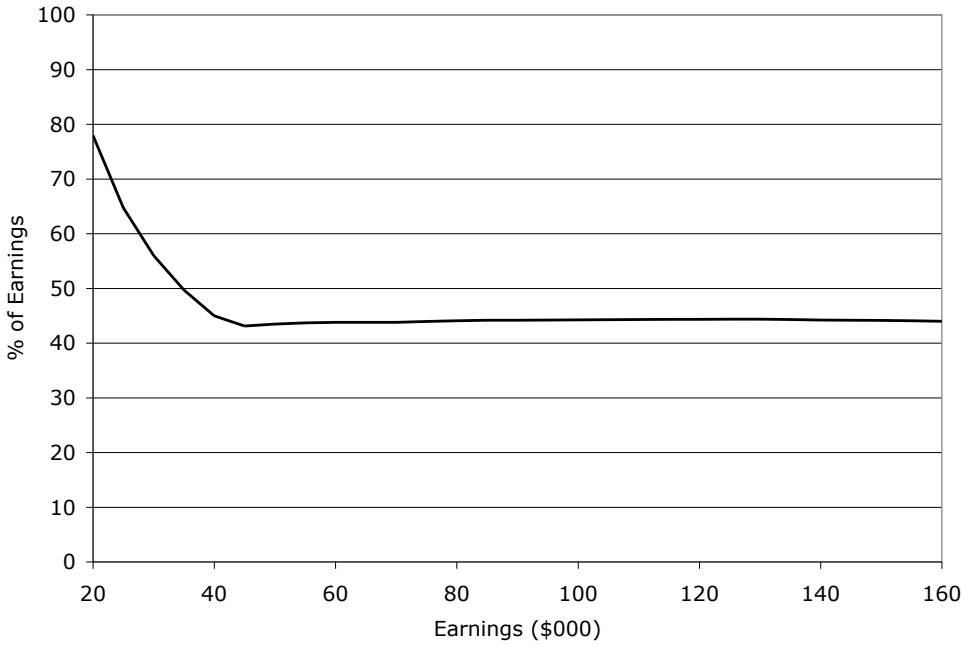


Figure 3.5 Target Savings Rate, 1- and 2-earner Couple

RPP/RRSP Contribution Rate as a per cent of Earnings

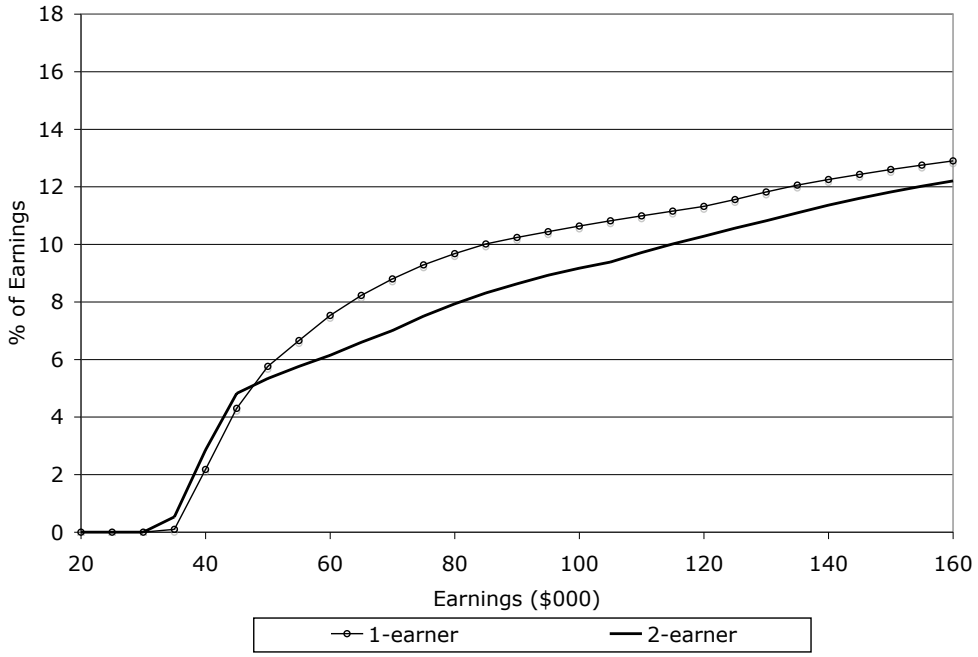


Figure 3.6 Replacement Rate, 1- and 2-earner Couple

Total public and Private Pension level as a per cent of Earnings

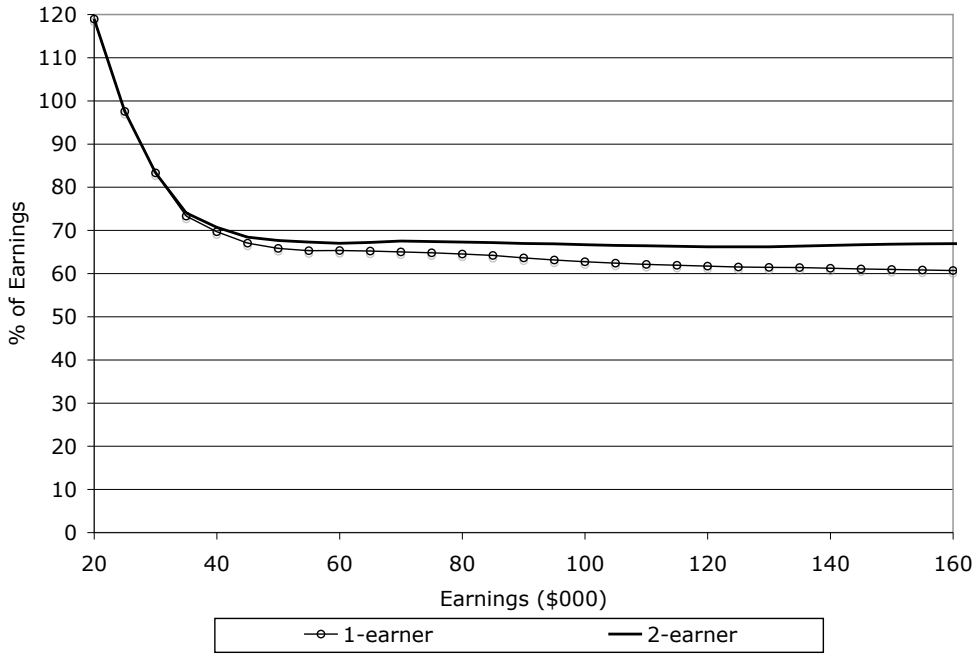


Figure 3.7 Target Savings Rate, 1- and 2-earner, 2-parent Family

RPP/RRSP Contribution Rate as a per cent of Earnings

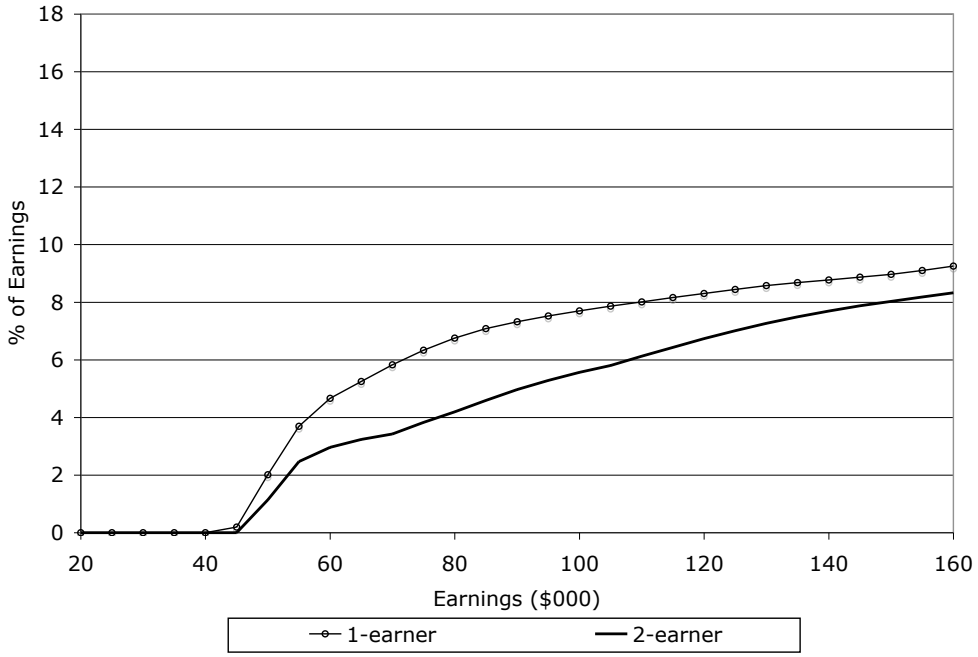


Figure 3.8 Replacement Rate, 1- and 2-earner, 2-parent Family

Total public and Private Pension level as a per cent of Earnings

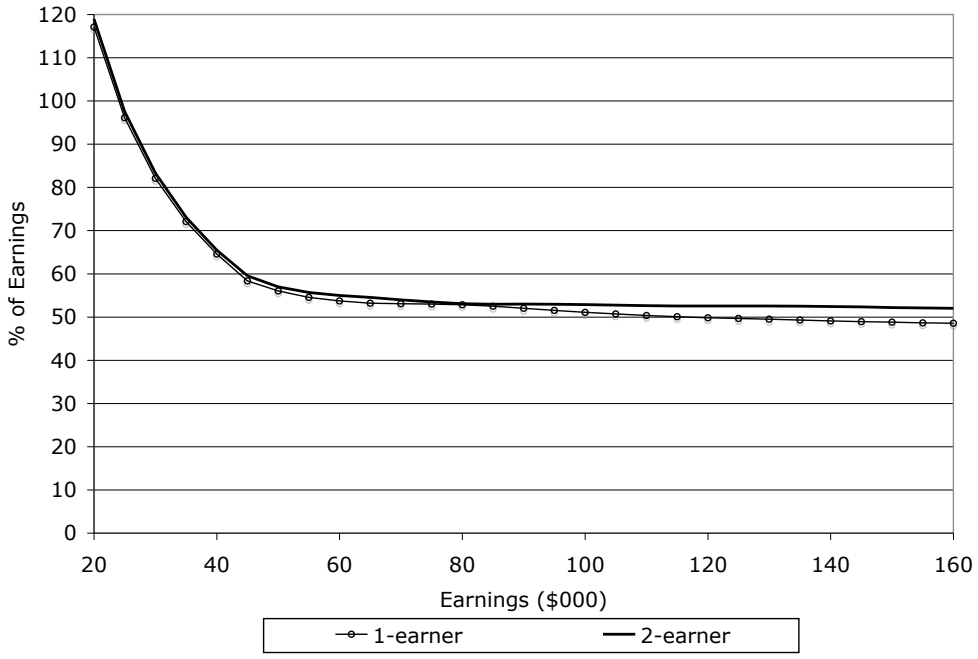


Figure 3.9 100% and 90% Savings Rate Targets, Single Homeowner

RPP/RRSP Contribution Rate as a per cent of Earnings

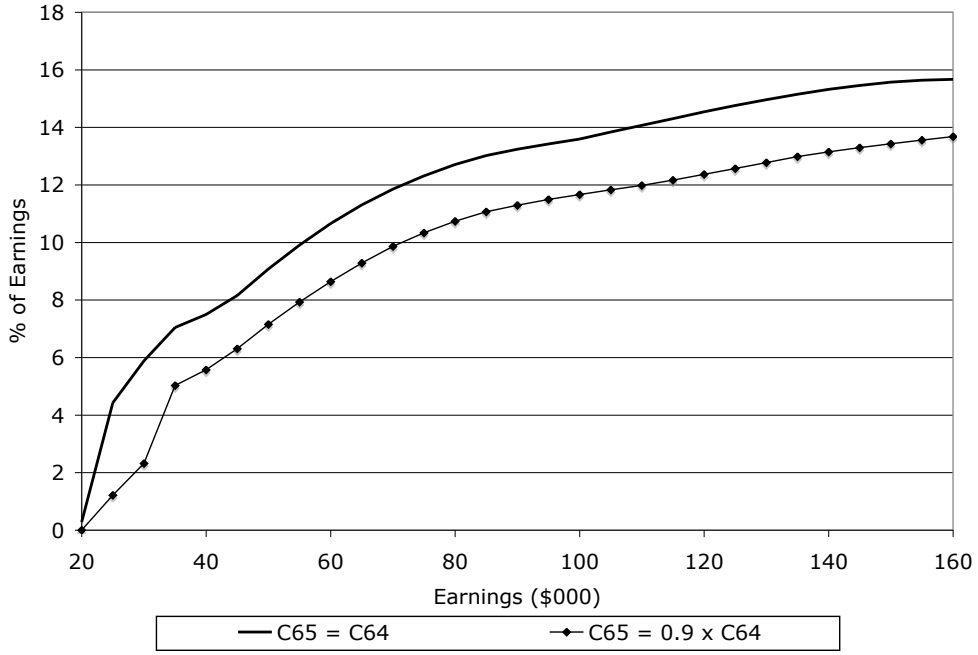
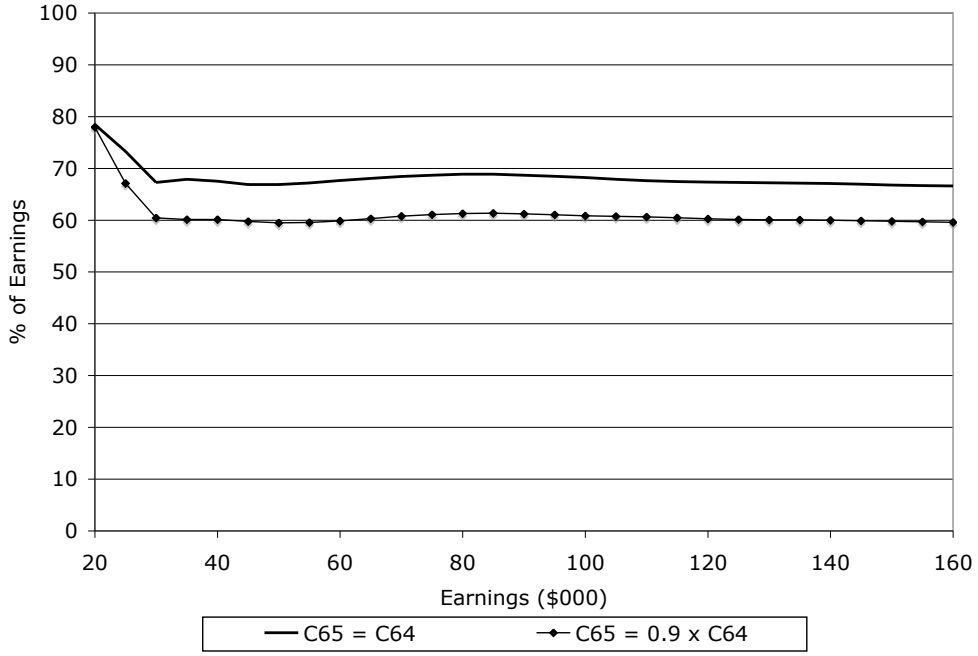


Figure 3.10 Replacement Rates for 100% and 90% Targets, Single Homeowner

Total public and Private Pension level as a per cent of Earnings



Some observations on these benchmarks. To begin with, the savings rates required for consumption continuity have the same general pattern in all cases. They are zero at low earnings levels (where public pensions provide full earnings replacement), rise quickly over the modest/middle earnings range and then rise more gradually over higher earnings levels. The fastest rise in required saving rates comes over an earnings range where private pension income replaces GIS benefits. The target pension levels or earnings replacement rates associated with these benchmark savings rates tend to be quite stable across earnings levels.

The effect of homeownership is demonstrated for a single individual in Figures 3.1 and 3.2. Over a broad range of earnings, homeownership reduces benchmark savings rates by two percentage points and earnings replacement rates by about seven percentage points.

The benchmark savings rates for single parents are much lower than for singles, rising above zero only at earnings of $40,000 and remaining below 8% even at earnings of $100,000. This mainly reflects child-related spending and the assumption that the parent will seek to replace only 'own consumption' after retirement.

For childless couples, consumption continuity requires savings rates that are higher than those of single parents but lower than those of singles. The benchmark savings rates are significantly higher for one-earner than two-earner couples, with nearly a two percentage point difference at household earnings of $80,000. One-earner couples pay more tax than two-earner couples on their earnings before retirement, which depresses their pre-retirement consumption and so lowers the savings rate they need to achieve consumption continuity. This difference is greatly outweighed, however, by the fact that two-earner couples earn C/QPP benefits on up to twice as much of their combined earnings as one-earner couples.

As was the case for single parents vs. singles, benchmark savings rates are considerably lower for two-parent families than for childless couples. At household earnings of $100,000, for example, the rates are 5.6% for a two-earner family with children and 9.2% for a two-earner childless couple. Again, the benchmark savings rates are higher for one-earner than two-earner couples.

This analysis also demonstrates that while the earnings replacement rates consistent with consumption continuity are fairly uniform across earnings levels (above a modest earnings level), they vary widely by family type and circumstance – from a high level of over 75% for a single renter to 67% for a two-earner homeowner couple, 55% for a single-parent renter and 53% for a two-parent homeowner family.

3.3 Comments on the model and parameters

Other choices could have been made in the design of this model and its parameterization. Comments are provided here on the rationale for some of the choices made and the effects on the benchmark savings rates of variations in some parameters.

100% CONSUMPTION REPLACEMENT (1). The idea of utility maximization that underlies lifecycle models could have been pursued, leading to retirement consumption targets that different from 100% of pre-retirement consumption. This approach was followed in the savings adequacy study by Scholz *et al* (2004) and also in my analysis of

the interaction between retirement savings and the cost of the OAS/GIS programs (Horner 2008).

In the solution of a lifecycle model with utility maximization, the relative size of optimal C_{65} and C_{64} are determined by the Euler condition which embodies trade-offs between (a) the consumer's preference for consumption now over consumption in the future, (b) the ability to increase total lifetime consumption through saving (or consumption deferral) at a positive after-tax rate of interest, and (c) the desire by risk averse consumers to avoid years of relatively low consumption. Factors (a) and (b) tend to offset each other except, for example, where high effective marginal tax rates produce negative rates of return on retirement saving.

Depending on how risk averse consumers are, factor (c) tends to diminish the effect of any imbalance between (a) and (b). A fairly typical set of assumptions might have a 3% rate of time preference, a 3.5% after-tax real rate of return on saving and a risk aversion parameter of 2. With these parameters, the optimal ratio C_{65}/C_{64} would be 1.0024 implying a level of C_{65} that is one-quarter of 1% higher than C_{64}. The 100% replacement target was chosen on the basis of simplicity, clarity and convenience.

100% CONSUMPTION REPLACEMENT (2). The target of full consumption continuity may be questioned for other reasons. If the lifecycle model were broadened to include leisure in the utility function, then the increased availability of leisure after retirement might allow people to smooth their marginal utilities over time while consuming somewhat less over retirement. If consumption and leisure were seen as complementary goods, on the other hand, then utility maximizers would want to increase their consumption levels after retirement.

A variant of this idea is that consumption is a joint product involving time as well as money. With more time, retirees can shop more carefully and effectively, thus meeting consumption needs at reduced expenditure levels. They can also substitute home production in meal preparation and household maintenance for expenditures on food and other goods and services.

These ideas have been examined as contributing solutions to what is known as the 'retirement consumption puzzle', the observation that expenditures (adjusted for changes in family-size) on the consumption of food and other non-durables follow a humped age profile with a decline around the age of retirement. As well as the substitutability of time for consumption expenditure, several other explanations have been put forward for this consumption profile. They include: a lack of foresight leading to failure to anticipate the size of income drops at retirement, a lack of commitment to saving even when income drops are correctly anticipated, and unplanned early retirement due to health problems.

Recent studies based on U.S. data (Hurst, 2008, Aguiar and Hurst, 2008, and Hurd and Rohwedder, 2008 – the former two studies based on synthetic panel data and the latter on true panel data), provide several interesting results regarding consumption drops at retirement:

- The drops found in the true panel data particularly are smaller than previous results, in the range of 1% to 6% on average;

- The biggest drops are found in the lowest quartile of the wealth distribution and are related to health shocks;
- The decline in work-related expenses is a significant factor. Expenditure items showing declines included nondurable transport and clothing and personal care – items that are inputs to market work;
- Food expenditures also declined slightly, giving some support to the substitutability of time for spending on meals;
- Spending on housing services did not decline; and
- Spending on entertainment increased, suggesting that time and spending are in fact complementary in certain cases.

This evidence casts some doubt on the materiality of the consumption puzzle and suggests that the inclusion of work-related expenses in the model may be sufficient to accord with the empirical findings. This allowance, set at $300 plus 3% of earnings, represents in most cases a drop of about 6% in observed spending at retirement in the model solution.

While 100% consumption replacement is taken as the base assumption in applying the model, results are also provided in all cases for a lower replacement target of 90%.

RETIREMENT AT AGE 65. The assumption of retirement at age 65 suffers from the obvious problem that it does not accord with the average age of retirement (although that age has been rising since the mid-1990s). As noted earlier, assuming retirement at age 65 is virtually necessary to make the model tractable, given that it aims to capture most of the complexity of Canada's tax-transfer system. For example, assuming retirement at 65 allows OAS/GIS and the age and pension credits to apply only in retirement.

However, there is another important reason for assuming retirement at age 65. Public policy discussions in many countries share the conclusion that, given increasing longevity, it makes no sense to encourage early retirement and may be necessary to actively encourage later retirement. In this context, benchmarks devised to guide policy should not be based on retirement before age 65.

SAVINGS FROM AGE 30. The assumption of a 35-year accumulation period, from age 30 to 64, is clearly arbitrary. It may exaggerate savings accumulations and earnings replacement rates if people start saving later or if they save at lower than average rates early in their careers.

One offsetting factor is that some workers do belong to RPPs and/or contribute to RRSPs before age 30. RPP/RRSP contributions by those under age 30 (with RPP contributions measured by pension adjustment (PA) amounts) accounted for 7% of total RPP/RRSP contributions made by those under age 65 in 2006. Another point is that some households may focus on savings in home equity first and shift more toward RPP/RRSP saving later. Assuming that both savings processes are spread evenly over the 35-year period would involve offsetting errors in this case.

For a two-earner homeowner couple, Figure 3.11 shows the increase in savings rates necessary to compensate for a shorter accumulation period of 30 years. For a couple with

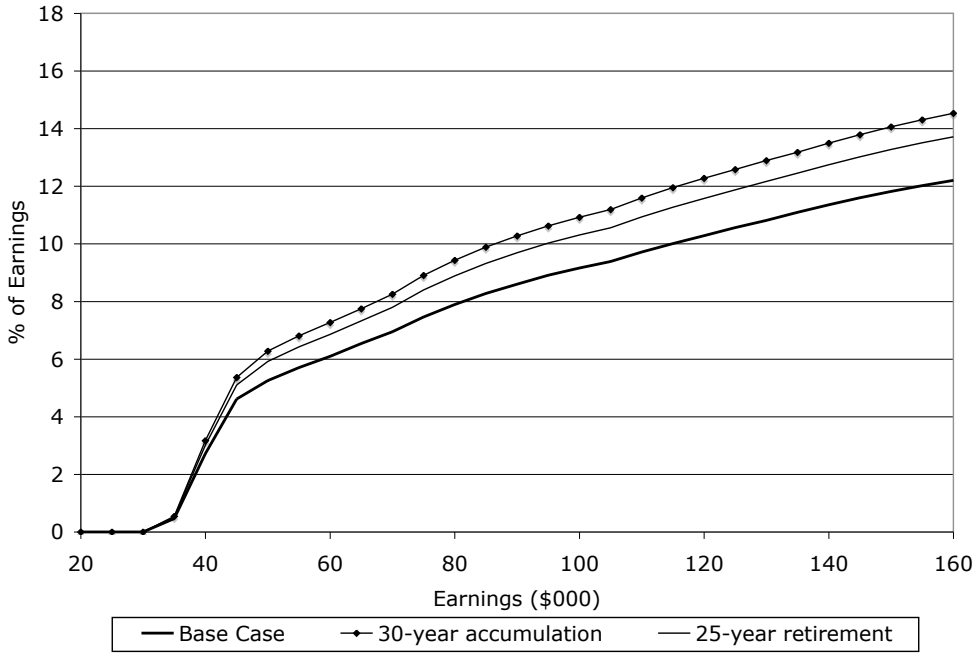
combined earnings of $100,000, for example, the savings rate needed for consumption continuity would increase from 9.2% to 10.9%.

INCREASED LONGEVITY. Similarly, the assumption of a 20-year retirement period, while consistent with current average male and female life expectancy at age 65, may understate future life expectancy. For example, a study by the Office of the Chief Actuary of Canada (July 2009) projects an increase in the duration of CPP benefit receipt by 2050 of 3.3 years for males and 2.3 years for females. Figure 3.11 shows the effect of a 5-year increase in the duration of the retirement period on benchmark savings rates for the two-earner homeowner couple. The effects are somewhat less than those of a 5-year shorter accumulation period – at earnings of $100,00, an increase in the savings rate of 1.1 percentage points (from 9.2% to 10.3%) as compared to 1.7 percentage points.

Figure 3.11 Effect on Benchmark Savings Rates of a Shorter Accumulation Period and a Longer Retirement Period

Two-earner homeowner couple

RPP/RRSP Contribution Rate as a per cent of Earnings



LOWER RETURN ON SAVINGS. The assumed real rate of return of 3.5% derives from an assessment of pension plan returns over a long period. See Carty and Pressman (1979). It is reasonable in relation to the long-term real rate of return of 4.2% assumed for CPP assets. Diverse holdings of retirement savings should not be expected to generate the same rate of return as a very large fund like that of the CPP.

In the 1980s and 1990s, pension plan assets earned better than a 3.5% return, but there is a risk that returns will be lower over the coming decades as slow labour force growth leads to a rising capital-labour ratio that depresses the return to capital (Hviding and Mérette, 1998, Horner, 2009).

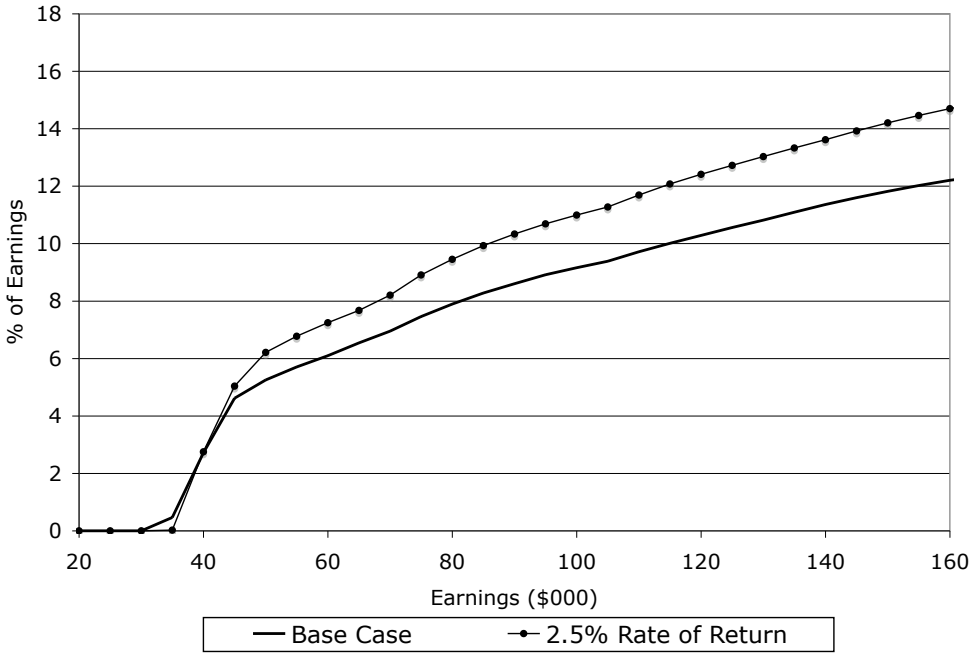
There is also evidence that rates of return can vary quite widely between pension plans and individual savings plans and even between larger and smaller employer-sponsored plans. Explanatory factors include economies of scale, investment fee differentials and differences in investment skill. In the US, Munnell *et al* (2006) found average returns on saving in individual retirement accounts (IRAs) of 3.8% per annum compared with rates of 6.6% and 5.6% for DB pension plans and 401(k) plans. Estimates for Quebec using a methodology similar to Munnell's suggest that the average annual rate of return on RRSPs from 1999 to 2005 was about 1.5% per annum as compared to a reported return of 6.7% for RPPs (Quebec, Régie des rentes, 2008). Sinha and Jog (2007) also found a 2 percentage point difference between the rates of return reported by equity mutual funds and those actually realized by investors trading in them.

Figure 3.12 shows, for the two-earner homemaker couple, the increase in the benchmark savings rates that result if a real rate of return of 2.5% per annum is assumed rather than 3.5%.

Figure 3.11 Effect on Benchmark Savings Rates of a 1% Lower Real Rate of Return on Savings

Two-earner homeowner couple

RPP/RRSP Contribution Rate as a per cent of Earnings



A lower rate of return on savings substantially increases the savings rates required to achieve consumption continuity. The size of the increase rises with earnings simply because high earners need larger pools of savings.

While the savings rate increase is substantial – from 9.2% to 11.0% at earnings of $100,000, for example, it is perhaps not as great as one would expect when considering the difference between asset accumulations at 2.5% and 3.5% after a lengthy holding period. The explanation is that the higher savings needed for consumption replacement

with a lower rate of return depresses pre-retirement consumption and so reduces the target level of private pension income. In the 2.5% return case, C_{64} and C_{65} are equated at a value of $63,730, about 3% lower than the base case value of $65,558.

In Section 4, the adequacy of household savings levels in 2006 is assessed with a 2.5% rate of return as well as the base case assumption of 3.5%.

DECLINING ROLE OF OAS. The analysis has assumed that OAS, GIS and the C/QPP will maintain their earnings replacement effectiveness in the future. Since the model assumes real wage growth of 1% per annum, the implicit assumption is that benefit levels under these programs will increase at the same rate as the average wage, at least up to retirement age.

This is a fair assumption for C/QPP benefits as the YMPE is indexed to the average wage. The future of benefit levels under OAS and GIS is less clear. In law, these benefit levels are indexed to prices, which would imply under our assumptions a 26% reduction in the benefit levels relative to earnings over the next 30 years. A look at the history of the programs over the last 40 years, however, shows that:

- ad hoc benefit increases have served to prevent the OAS/GIS minimum income guarantee from failing to keep pace with real wage growth (of which, admittedly, there has been little), and
- the adjustments have been made entirely through increases in the GIS maximums rather than OAS.

It seems reasonable to project this political outcome rather than a continuing decline in the anti-poverty effectiveness of the programs. Under this hypothesis, the benchmark savings rates may understate true savings needs for all those who do not expect to receive GIS benefits in retirement.

STATUS CHANGES BEFORE RETIREMENT. Tractability of the model requires that earnings grow at the same rate as the tax brackets and credits are indexed and that people do not shift among family types over time.[11] These two simplifications introduce offsetting errors.

Many earners, particularly at higher education levels will have age profiles of wages that embody faster growth than the 1% real growth in average wages assumed in the model. This means that for any given earnings level at age 64, they will have lower past earnings, lower past savings and lower future levels of private pension income than assumed in the model. This sort of effect has been found in unpublished simulations with Statistics Canada's LifePaths model that showed that many workers with pre-retirement earnings levels at or slightly above the YMPE would not qualify for full C/QPP benefits because of lower earnings levels when younger, or interrupted earnings histories.

On the other hand, many of those found in a given year in the populations of singles or childless couples will either have had children when younger or will go on to have children when older. As the savings rates required for consumption continuity are relatively low for those with children this biases the savings targets upwards.

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[11] As noted earlier, the part-career duration of child-related benefits and expenses is taken into account by spreading prorated amounts across the 35-year pre-retirement period.

4. Household Retirement Savings in 2006

The foregoing framework is now applied to examine the level and pattern of household retirement saving in Canada. The analysis is based on saving in a single year. Possible biases due to this approach are considered in Section 5. The nature of the data is first described, then general information on the household population and its retirement savings is provided. Finally, savings levels are assessed in comparison to the benchmark levels developed in the last section.

4.1 The data

The data are taken from the T1 family file prepared by the Canada Revenue Agency (CRA). This is based on a large stratified sample of tax returns with the added feature that information for both spouses in a couple is provided. The T1 file is the same as that used by the CRA in preparing its annual set of Income Statistics tables.

It should be noted that the concept of family available in these data differs from the Census family or Economic Family definitions used by Statistics Canada. For example, a person living with an adult child reports for tax purposes as a single person. Information on the presence of children comes only from parental claims of child benefits or child care expenses. As in Section 3, six family types are distinguished: singles, one-parent families, one- and two-earner childless couples, and one- and two-earner two-parent families. In assessing adequacy, the savings benchmarks developed for two-child families are applied to all families with children.

Earnings include employment income and net income from self-employment. For the purposes of this study, individuals (single or spouses) are treated as 'earners' only if they have earnings in excess of the federal basic personal amount ($8,839 in 2006).

There is no information on homeownership in the tax file. In applying the savings benchmarks to measure savings adequacy, populations by household type and broad earnings groups (as defined in Table 4.2 below) were divided into renters and homeowners based on data for the age 45-64 population in the 2005 Survey of Financial Security (SFS). The proportions of homeowners are set out in Table 4.1.

Table 4.1 Proportions of Homeowners by Earnings Group and Household Type

	Single	***1PF***	***Couple***	***2PF***
Earnings		*(%)*		
Low	40.3	46.6	72.5	78.7
Modest	58.0	75.6	90.2	93.0
Middle	69.9	89.0	95.8	100.0
High	42.0	84.5	99.9	100.0

Source: Tabulation from the Survey of Financial Security; population age 45-64.

1PF = single-parent family; Couple = couple without children; 2PF = two-parent family

Retirement saving is the sum of RPP and RRSP saving. RPP saving is measured as the Pension Adjustment (PA) amount, and RRSP saving as the RRSP contribution amount less any RRSP withdrawal. As it applies to defined benefit RPPs, the PA amount is an artificial measure of the combined employer-plus-employee contribution needed to fund benefits accrued in the year, calculated from pensionable earnings and the benefit formula. There is an argument that PAs tend to overstate RPP saving in the private sector where ancillary benefits are less generous than in the public sector and where workers who change jobs or become unemployed before retirement age more frequently lose benefits. The taxation data does not permit public and private sector employees to be distinguished, however, so no adjustments have been made to PA amounts.[12]

It should be noted that, for 2006 and other recent years, the PA measure of saving provides a much lower estimate of total RPP saving than actual aggregate contributions. The total of all PAs in 2006 amounted to $27.6 billion, less than two-thirds of total employer and employee contributions of $43.8 billion. The high level of contributions may be explained in good part by above-normal employer contributions needed to respond to plan deficits.

4.2 A profile of household saving

An advantage of this data source is that it permits savings patterns to be examined on a household or family basis, something that has not often been done in Canada.[13] Combining income and savings information for single individuals and single parents, on one hand, and couples and two-parent families on the other, does present a challenge, though, as their income distributions differ appreciably. To permit this information to be summarized compactly, separate earnings groupings are used for two types of household. They are defined in Table 4.2.

Table 4.2 Earnings Classifications

Earnings Groups	*Singles and 1-Parent Families*	*Couples and 2-Parent Families*
	($000)	
Low	0 - 25	0 - 40
Modest	25 - 60	40 – 100
Middle	60 - 100	100 – 166.7
High	100 +	166.7 +

[12] The T1 file has in the past had an industry identifier that could be used to separate public and private sector workers. This information is no longer considered sufficiently reliable to include on the file.

[13] A notable exception is the article by Morissette and Ostrovsky (2007) which examines how rising RPP coverage among women has mitigated the opposite trend among their spouses resulting in a more modest coverage decline when looked at on a family basis. It also looks at trends in the combined levels of RPP/RRSP saving by husbands and wives.

This classification is less random than it might seem. Reference to Figures 3.1, 3.3, 3.5 and 3.7 shows that in general, private retirement savings needs (for consumption continuity) are low or zero in the Low earnings range. Savings needs rise over the 'Modest' earnings range and plateau over the top two earnings ranges. Also, the top earnings range contains households who may be affected by the dollar limits on RPP and RRSP saving. The RRSP dollar limit was $18,000 in 2006, which, based on the 18%-of-earnings limit, covered earnings of $100,000 for a single earner. For a two-earner couple, with a 60/40 earnings split, it covered earnings of $166,667. As Low earners have little need to save and High earners are likely to have reasonably high levels of retirement income, the focus of a savings adequacy analysis should be on households in the Modest and Middle earnings ranges.

Table 4.3 shows how Canada's population of households was distributed by family type and earnings range. This population is limited to those (for couples, the older spouse) between ages 30 and 64.

Table 4.3 Households by Family Type and Earnings, 2006
Population Age 30 - 64

	Single	***1PF***	***Couple***		***2PF***	
			1-Earner	***2-Earner***	***1-Earner***	***2-Earner***
Number *(000)*	3,131	603	1,118	1,228	957	1,708
% age 45-64	55.4	26.5	82.9	81.0	36.7	47.0
Distribution *(%)*						
Low	39.7	48.6	57.7	8.1	50.7	6.8
Modest	41.8	41.0	33.5	52.4	40.2	53.3
Middle	14.7	9.0	5.8	29.2	6.5	30.3
High	3.8	1.5	3.0	10.2	2.6	9.6
Total	100.0	100.0	100.0	100.0	100.0	100.0
Av Earnings *($)*	39,309	30,627	51,711	107,514	53,944	106,309

1PF = single-parent family; Couple = couple without children; 2PF = two-parent family

The population of households headed by someone age 30-64 numbers 8.7 million. Singles account for about 36% of the total, two-parent families 30%, couples 27% and single-parent families 7%. About one-half of couples, and 60% of two-parent families, have two earners.

Singles are divided fairly evenly between the younger and older age groups (age 30-44 vs. 45-64) as are 2-earner families with children. Single-parents and 1-earner two-parent

families tend to be younger, while childless couples are concentrated in the older age group.

Overall, about one-third of households are in the Low earnings group that has little need to save to obtain consumption continuity. This is consistent with the fact that GIS benefits continue to be paid to over one-third of Canadian seniors. About 5.4% are in the High earnings group whose RPP/RRSP contribution rates may be constrained by the dollar contribution and pension benefit limits. The Modest and Middle earnings groups account for about 62% of this population of households.

Looking at the household types separately, we see that savings needs are lowest (i.e., the Low earner population biggest) among one-earner couples, one-earner two-parent families and single parents, and highest among two-earner families.

Table 4.4 Incidence of RPP and RRSP Saving, 2006

	Earnings Group				
	Low	***Modest***	***Middle***	***High***	***Total***
Single			*(%)*		
Non-saver	76.0	28.4	9.8	9.1	43.8
RPP only	8.2	23.2	23.2	14.3	16.9
RRSP only	12.9	23.9	21.4	41.3	19.8
RPP + RRSP	2.8	24.5	45.6	35.2	19.4
Total	100.0	100.0	100.0	100.0	100.0
Single Parent					
Non-saver	78.5	28.2	8.1	9.3	50.5
RPP only	11.8	30.1	31.1	14.7	21.1
RRSP only	7.5	19.7	17.3	38.2	13.8
RPP + RRSP	2.2	22.0	43.5	37.8	14.5
Total	100.0	100.0	100.0	100.0	100.0
1-Earner Couple					
Non-saver	67.0	16.3	9.3	12.1	45.0
RPP only	10.7	26.6	20.9	20.1	16.9
RRSP only	15.6	21.7	25.6	40.9	19.0
RPP + RRSP	6.7	35.5	44.1	26.9	19.1
Total	100.0	100.0	100.0	100.0	100.0

Table 4.4 Incidence of RPP and RRSP Saving, 2006 (continued)

	Earnings Group				
	Low	***Modest***	***Middle***	***High***	***Total***
2-Earner Couple					
Non-saver	53.9	15.0	3.5	3.9	13.7
RPP only	13.1	20.8	14.3	6.8	16.8
RRSP only	23.9	23.3	17.1	33.7	22.6
RPP + RRSP	9.2	41.0	65.1	55.7	46.9
Total	100.0	100.0	100.0	100.0	100.0
1-Earner 2PF					
Non-saver	68.1	20.0	8.8	6.9	43.3
RPP only	12.4	26.3	17.9	12.9	18.4
RRSP only	13.9	22.5	30.2	47.6	19.3
RPP + RRSP	5.5	31.2	43.1	32.6	19.0
Total	100.0	100.0	100.0	100.0	100.0
2-Earner 2PF					
Non-saver	58.0	15.9	3.7	3.5	13.9
RPP only	13.6	23.1	17.4	7.2	19.2
RRSP only	20.4	21.3	15.9	32.7	20.7
RPP + RRSP	8.0	39.7	63.1	56.6	46.2
Total	100.0	100.0	100.0	100.0	100.0
All Households					
Non-saver	71.4	21.2	6.1	5.9	34.3
RPP only	10.2	23.9	19.1	10.2	17.8
RRSP only	13.8	22.6	18.9	36.6	19.8
RPP + RRSP	4.5	32.4	55.9	47.3	28.1
Total	100.0	100.0	100.0	100.0	100.0

Table 4.4 provides the first information on savings patterns. For the six household types and four earnings ranges, it documents household participation in registered plan saving through RPP coverage and RRSP contributions. Households are classified as either: non-

savers, RPP members only (i.e., having no RRSP contribution in the year), RRSP contributors only, or savers in both RPPs and RRSPs in a year. (For two-earner families, no information is provided on whether more than one spouse is an RPP member or RRSP contributor.)

Looking at all household types together, the first observation that one might make is that RPP/RRSP participation seems to accord quite well with the savings needs framework developed in Section 3. Across the Low earnings group with low savings needs, 71% are non-savers. In contrast, nearly 80% of the Modest earnings group, and 94% of the Middle and High earner groups save in RPPs and/or RRSPs.

That being said, the level of non-participation remains fairly high among those in the Modest earner group. In this earnings range, it is not surprising that non-saver rates are highest among singles (28.4%) and single parents (28.2%).

Among savers in the Low earnings groups, RRSP saving is more prevalent than RPP saving. This may reflect the fact that voluntary RRSP contributions are not locked in to retirement age and so may be accessed in case of need. Furthermore, some RRSP contributions may be made expressly for early withdrawal under the Home Buyers Plan or the Lifelong Learning Plan.

In the Modest and Middle earnings ranges, it is striking that quite large fractions of the household populations saved in both RPPs and RRSPs in 2006 – 32% among the Modest earners, 56% among the Middle earners. Not surprisingly, these proportions were highest for couples and two-parent families where there are two possible participants.

4.3 Assessment of savings adequacy

Table 4.5 summarizes the evidence on savings adequacy provided by retirement savings patterns in 2006. It reports the percentages of households age 30-64, by family type and earnings range, whose saving rates exceed the 100% and 90% consumption continuity benchmarks defined in Section 3.

For the total population of households, 69% meet the 100% target ($C_{65} = C_{64}$), while 78% meet the less strict 90% benchmark ($C_{65} = 0.9 \times C_{64}$). These summary statistics, however, are not very informative. For one thing, most of those in the Low earnings range can achieve the targets without any need to save for retirement. On the other hand, many of those in the High earner group are constrained by the dollar limits on RPP/RRSP saving. They may well be achieving consumption continuity, but not by means of RPP/RRSP saving alone.

Thus, it is best to focus on the results for households in the Modest and Middle earnings ranges. In these earnings ranges, the aggregate results are similar, with 60% of Modest-earnings households (63% for Middle) exceeding the 100% benchmark and 72% (71%) exceeding the 90% benchmark. Overall, this analysis suggests that in the modest/middle earnings range about 40% of households are not saving enough for full maintenance of their pre-retirement consumption, and about 28% face significant shortfalls in their living standards.

Table 4.5 Per Cent of Households Meeting Savings Rate Benchmarks

	Single	*1PF*	*1E C*	*2E C*	*1E 2PF*	*2E 2PF*	*All*
	% saving enough for 100% consumption replacement						
Low	83	100	100	100	100	100	91
Modest	44	77	72	52	83	78	60
Middle	56	78	64	56	66	71	63
High	24	56	37	57	51	74	61
All	61	88	79	56	82	74	69
	% saving enough for 90% consumption replacement						
Low	95	100	100	100	100	100	97
Modest	52	91	86	71	94	96	72
Middle	65	82	71	66	72	78	71
High	35	63	45	67	57	79	68
All	71	94	86	68	88	82	78

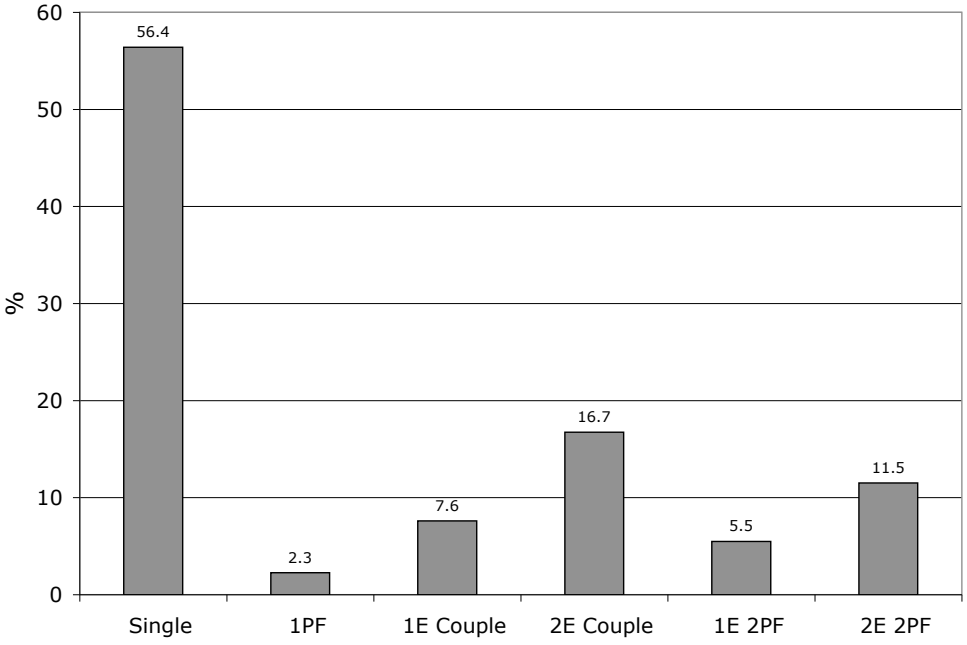
1PF = single parent family, 1E C = 1-earner couple, 1E 2PF = 1-earner two-parent family

Among family types in these middle earnings ranges, savings shortfalls from the 90% target are highest for singles (especially in the Modest earnings group) and, to a lesser extent, for two-earner couples. These results are not unexpected since the benchmark savings rates are considerably higher for singles and couples than the other family types. Also, older couples may be parents of children who have left home. By the logic of the consumption replacement model, they should be assigned the lower savings rate benchmarks of the two-parent family in recognition of the child-related expenses that have reduced their 'own consumption' consumption levels before retirement.

As well as having the highest rate of savings shortfalls, singles and two-earner couples make up the bulk of the population in the Modest and Middle earnings groups that do not meet the lower 90% consumption replacement target. As shown in Figure 4.1, households of these two types together account for nearly three-quarters of those with significant savings shortfalls.

Figure 4.1 Distribution by Household Type of Those Not Meeting the 90% Savings Rate Benchmark

Population in the Modest and Middle Earnings Groups



Another issue of policy interest concerns savings adequacy among RRSP-only savers compared to those who belong to RPPs. Table 4.6 provides the savings adequacy report card for the total population of households broken down into the categories: non-saver, RPP-only saver, RRSP-only saver and saver in 'Both' (RPP and RRSP). For the Modest and Middle earnings groups, Tables A.1 and A.2 in Annex A provide a breakdown of the results by family type.

Table 4.6 shows that, as must be expected, RPP members who also contribute to RRSPs are the most likely group to achieve consumption continuity. For all household types together, 82% of them exceed the 100% savings rate benchmark as compared to 72% for those saving in RPPs alone and 61% for those saving in RRSPs alone.

The 11 percentage-point difference between the proportions of RPP-only and RRSP-only savers that meet the 100% savings benchmark is also important. (For the 90% benchmark, the gap is 12 percentage points.) Tables A.1 and A.2 in Annex A show that among Modest earners, the gaps are biggest for singles and single parents, while among Middle earners the gaps are biggest for couples and two-parent families.

Table 4.6 Savings Adequacy by Type of Retirement Savings

	Non-Saver	*RPP only*	*RRSP only*	*Both*	*All*
	% saving enough for 100% consumption replacement				
Low	91	96	95	96	91
Modest	29	75	62	87	60
Middle	0	64	49	84	63
High	0	52	41	76	61
All	63	72	61	82	69
	% saving enough for 90% consumption replacement				
Low	98	99	98	98	97
Modest	46	86	74	92	72
Middle	0	77	59	90	71
High	0	63	50	83	68
All	73	82	70	88	78

This difference in savings levels between RPP-only and RRSP-only savers does not tell the whole story, because it ignores the role of RPP-plus-RRSP savers. Do workers without RPP coverage compensate by contributing more frequently, and at higher levels, than those who belong to pension plans?

The answer is mostly 'No'. From the incidence figures provided in the 'All Households' panel of Table 4.4, one can calculate that, among those in the Modest earnings range, the likelihood of being an RRSP contributor in 2006 was 57.5% for RPP members but only 51.2% for those without RPPs. Among those in the Middle earnings range, the RRSP-contributor proportions were almost as high for RPP members as for non-members – 73.6% for members and 75.6% for non-members.

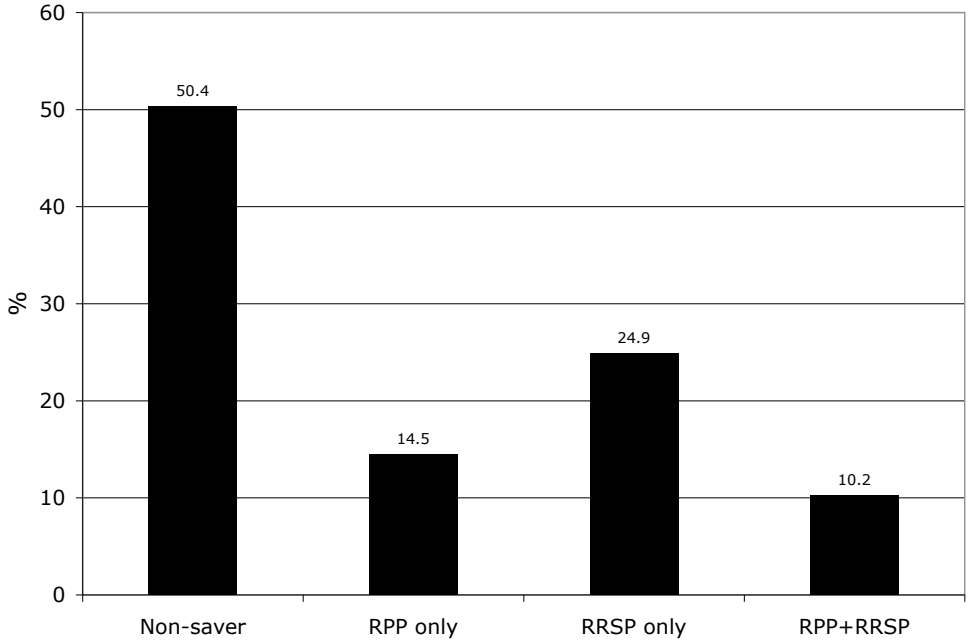
RRSP contributors who do not belong to RPPs do contribute more on average to RRSPs than do contributors who are RPP members. The difference is not great enough, however, to support the idea that RRSP-only contributors are achieving savings levels similar to those of RPP members. Table 12 in the CRA's Income Statistics for 2006 provides a basic indicator.[14] The average level of RPP savings (as measured by the PA) in 2006 was $5,188. The average RRSP contribution level among those without RPPs was $5,790. Among RPP members with RRSP contributions, the average RRSP contribution level was $4,157.

[14] See http://www.cra-arc.gc.ca/gncy/stts/gb06/pst/fnl/menu-eng.html

Figure 4.2 shows how those in the Modest and Middle earnings groups who do not meet the 90% consumption replacement target are distributed by saver category. Half of those with significant savings shortfalls had no RPP/RRSP savings in 2006; another quarter saved in RRSPs only.

Figure 4.2 Distribution by Saver Category of Those Not Meeting the 90% Savings Rate Benchmark

Population in the Modest and Middle Earnings Groups



This analysis lends support to the idea that RPP and RRSP saving are not pure substitutes, and that we cannot expect RRSP saving to fully fill the gap that will be left if RPP coverage continues to decline. This conclusion is consistent with old ideas, such as the hypothesis of Cagan (1965) that the provision of a base level of retirement income under a pension plan encourages supplementary saving by making pension income targets seem more attainable, as well as more recent suggestions that weaknesses in savings choices by individuals who rely on voluntary plans provide a potential role for 'soft paternalism' in retirement savings systems. Soft paternalism refers to ideas such as automatic enrolment in savings plans with default contribution levels and default investment options. See, for example, the seminal paper by Choi *et al* (2001).

The preceding analysis ignores three factors that may demand qualification of the results. First, households may have savings outside of registered plans and apart from homeownership that reduce their need for RPP/RRSP saving. Second, the relatively low savings levels among RRSP-only savers may be misleading because the group includes self-employed workers who are generally ineligible for RPP membership and who may focus their saving on their business investments. Third, as noted earlier there are risks that future rates of return, on all retirement savings or on RRSP saving in particular, could fall below the assumed rate of 3.5%.

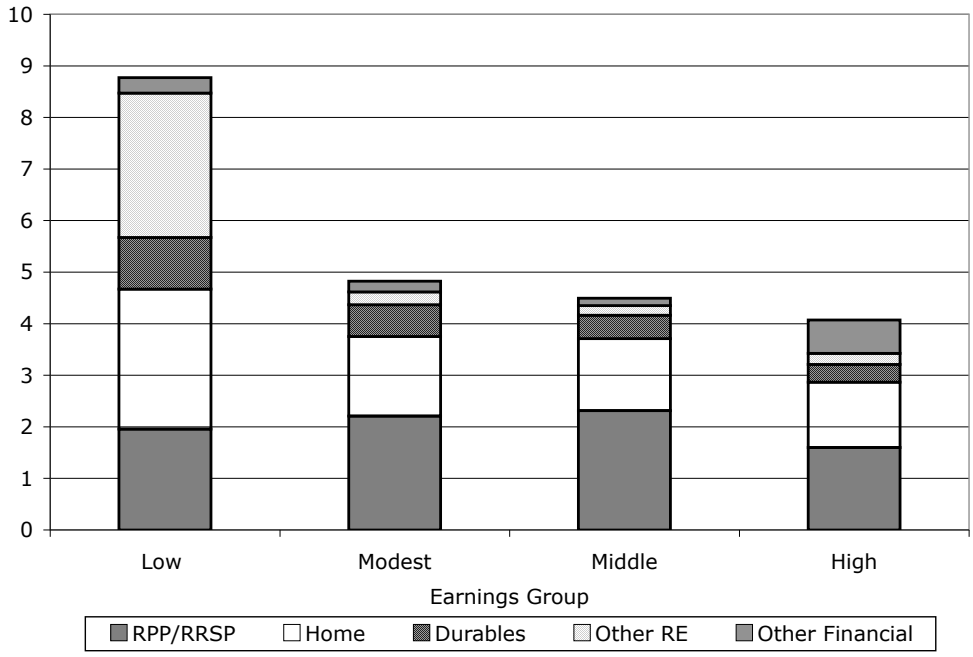
4.4 Other Assets

Figure 4.3 provides an idea of the relative importance of assets outside registered plans for those in the four broad earnings groups. Since the focus is on earnings replacement, the asset levels are expressed as ratios to earnings. The ratios are based on total asset amounts and total earnings in each group regardless of the distribution of assets within the group. The population is limited to those without business assets. The asset classes are as follows:

- RPP and RRSP assets,
- Home = value of principle residence less mortgage on it,
- Durables = 'other real assets',
- Other real estate = value of property less 'other mortgage', and
- Other financial = deposits plus other financial assets less non-mortgage debt.

Figure 4.3 Ratio of Assets to Earnings – Various Net Assets

Households without Self-Employment Income



Source: Tabulation from the 2005 Survey of Financial Security

In the Modest and Middle earnings groups, the picture is quite similar. Assets sheltered from taxation – RPP/RRSP assets, home equity and durables – account for over 90% of net worth. Other financial assets, net of consumer debt, account for 3%-4% of net worth. It may also be noted that, while deposits are very widely held, other financial assets are held by about 40% of Modest earners and 54% of Middle earners. And, judging by the

high ratios of average to median amounts, these assets are concentrated in relatively few hands.[15]

In the High earnings group, other financial assets are considerably more important, accounting for 12.5% of net worth. The dollar limits on RPP/RRSP saving provide one explanation for this.

These observations on the level and distribution of unsheltered financial assets suggest that taking them into account would have only a minor effect on the picture of whether Modest/Middle earners are saving enough for retirement. They do play a bigger role, though, among higher income earners affected by the RPP/RRSP limits.

4.5 Savings among the self-employed

If self-employed workers are more likely to invest in their businesses than save in RPPs or RRSPs, then their presence in the population may lead to a downward bias in the estimated proportions of households meeting the savings rate benchmarks. Also, since the self-employed are not permitted to sponsor RPPs for themselves, a preference for investment in their businesses over RRSP saving could distort the comparison of savings adequacy between RRSP-only savers and those with RPPs.

Annex B provides a profile of RPP/RRSP saving among the self-employed in 2006. From 2005 SFS data, it also provides evidence of the importance of 'other assets', including net business equity, parallel to that provided for employee households in Figure 4.3 above.

For the purposes of the RPP/RRSP saving profile, the self-employed are identified in the T1 data file as households with more than $8,839 (the basic personal amount in 2006) of net income from self-employment. Self-employment income includes professional, business, commission, farming and fishing income. In the age group 30-64, the self-employed, so defined, made up 9.4% of households. The earnings of the self-employed are less evenly distributed than those of employees, so the self-employed accounted for only 8.0% of households in the Modest and Middle earnings groups.

Table B.1 shows that, while RPP membership is substantially lower among the 'self-employed' households than those without self-employment income. For Modest earners, 31.9% (aggregating over the 'RPP-only' and 'Both' categories) of self-employed households saved in RPPs as compared to 58.4% of employee households. For Middle earners, the proportions were 43.5% and 77.6%. While the gaps are significant, it is the incidence of RPP membership among self-employed households that may appear surprising. There are two explanations. First, among couples, one spouse may be self-employed while the other is employed. Second, even among singles, many self-employed workers also have employment income. Overall, among self-employed households, self-employment income accounts for only 56.0% of total earned income in the Modest earnings group 52.4% in the Middle earnings group.

The incidence of RRSP saving was slightly higher among self-employed than employee households – 59.0% vs. 54.6% for Modest earners and 79.6% vs. 74.4% for Middle

[15] The means and medians for holders of other financial assets (before netting out debts) are: for Modest earners, $15,900 and $4,500, and for Middle earners, $39,000 and $13,000.

earners. Despite the partial compensation of higher RRSP participation, the proportions of non-savers (in RPPs and RRSPs) were higher for the self-employed than the employed – 30.3% vs. 20.4% and 12.5% vs. 5.6% for the two earnings groups.

Table B.2 compares RPP/RRSP savings rates for savers in self-employed and employee households for the four categories of saver. The last column of the Table summarizes the results, comparing the average savings rates across savers and non-savers together for the two populations. The differences are surprisingly small. Among Modest earners, the average savings rate is 8.5% for the self-employed and 8.8% for employee households; among Middle earners the rates are 11.8% and 12.3%. One reason why the differences are small is that contribution rates among RRSP-only savers are considerably higher for self-employed than employee households – 11.6% vs. 7.4% for Modest earners and 12.8% vs. 10.0% for Middle earners.

This profile has two implications for the savings adequacy estimates presented in Section 4.3. First, because the self-employed population is relatively small, because the incidence of RPP/RRSP saving is not that much lower among the self-employed than employees, and because the gap in contribution rates between the self-employed and employed is small, the presence of self-employed households is unlikely to have a material affect on the overall estimates of proportion of household meeting the savings rate benchmarks. Second, among RRSP-only savers, self-employed contributors have considerably higher savings rates than employees. Thus, the presence of the self-employed does not explain the relatively low proportions of RRSP-only savers that meet the savings rate benchmarks.

Annex Figure B.1 shows asset levels, as ratios of income, by earnings group for self-employed households. For these households, it shows that business assets are a very important component of total wealth, accounting for about 40% of it in both the Modest and Middle earnings groups. It is also evident that total wealth levels are much higher among self-employed than employee households. Even after subtracting business assets, self-employed households have higher net worth, on average, than employee households.

This information does suggest that, unlike the case of net financial assets among employee households, not taking into account other assets may understate the retirement preparedness of those with business assets. Another point here is that the proportion of households reporting business assets is over twice as high as the proportion of households with self-employment income (above $8,839) in the taxation data. However, care is needed in assessing the weight of this information because wealth, and business equity in particular, is extremely concentrated. For example, while average business equity values in 2005 were $197,000 and $402,000 for self-employed households in the Modest and Middle earnings ranges, the median values were $20,000 in both cases. Thus, most households reporting business equity had insignificant amounts of it.

4.6 The effect of a 2.5% rate of return

As noted in Section 3.3, the slow labour force growth projected for most OECD countries over the next two or three decades could put downward pressure on the return to capital and thus on the returns available on pension funds and RRSP savings. Another

suggestion is that lower rates of return should be assumed for savings in individual plans than for savings in larger-scale professionally invested RPPs.

Replicating the savings adequacy analysis of Section 4.3 with an assumed real rate of return of 2.5%, rather than 3.5%, permits the consequences of such outcomes to be considered. The results are summarized here. Detailed results parallel to those provided in Tables 4.5, 4.6, A.1 and A.2 are provided in Annex C. (No estimation has been carried out with lower returns on RRSP saving only, but the results of such a case may be inferred from the results presented by category of saver.)

In considering the results, note that the lower rate of return is assumed to apply to all saving, including that through homeownership. This explains what would seem to be a puzzling result – namely, that for some households in the Low or Modest earnings groups, the drop in the rate of return leads to a reduction in the benchmark savings rates and an improvement in estimated savings adequacy. What happens is that, for homeowners, the cost of financing the assumed home purchase rises. The extra cost reduces pre-retirement consumption and so reduces the target level of post-retirement consumption. Consequently, some households with RPP/RRSP savings needs at a rate of return of 3.5% no longer need to save in RPPs or RRSPs at the 2.5% rate.

Table 4.7 provides a summary comparison across earnings groups of the savings adequacy results with 3.5% and 2.5% rates of return.

Table 4.7 Savings Adequacy with 3.5% and 2.5% Rates of Return

Per cent saving enough to meet 100% or 90% consumption replacement targets

	100%			***90%***		
	3.5%	***2.5%***	***Change***	***3.5%***	***2.5%***	***Change***
Low	91	91	0	97	97	0
Modest	60	57	-3	72	70	-2
Middle	63	55	-8	71	66	-5
High	61	51	-10	68	60	-8
All	69	65	-4	78	75	-3

These results show that, as with the effect on benchmark savings rates portrayed in Figure 3.11, the effects of a lower rate of return increase markedly as the required savings rate increases – with the level of earnings and with the level of the post-retirement consumption target (i.e., 100% vs. 90% of C_{64}).

In the Modest earnings range, the impact on the savings adequacy results is not as large as might have been expected. This is partly the due to the increased homeownership savings assumed for a substantial portion of the group and partly due to the fact that, by

reducing pre-retirement consumption, any increase in savings reduces the level of post-retirement consumption required for consumption continuity. The effects of a lower rate of return do become quite significant, however, among those in the higher earnings ranges.

As RRSP savings account for somewhat over half of total RPP and RRSP saving, a rate of return reduction applying to RRSP saving only would have slightly more than half the effects shown in Table 4.7.

5. Evidence from Longitudinal Data

The preceding analysis has the key limitation that it uses savings patterns in a single year as the basis for judgments about pension accumulation and payout processes that last a full adult lifetime. Clearly, many people do not belong to an RPP for their full career or contribute a constant rate of earnings to their RRSPs. No data exists that would allow savings rates to be tracked over a full career, but there is beginning to be some evidence from longitudinal data on multi-year patterns in RPP membership and RRSP saving.

Regarding pension coverage, Drolet (2009) provides evidence from the Longitudinal Administrative Data base (LAD) maintained by Statistics Canada that of RPP members who reported a PA in both 2001 and 2002, 88.9% reported PAs in at least five of the preceding ten years, and 67.3% reported PAs in all ten years. For those who belonged to an RPP in either, but not both, of the years 2001 and 2002, the previous decade's participation rates were somewhat lower – 79.7% for at least five years and 58.4% for the full ten years.

The preceding evidence suggests that among RPP members, membership status is reasonably stable over time. On the other hand, Drolet also reports evidence that job tenure in general has been declining, particularly among men. Between 1987 and 2007, for example, the percentage of males age 35-44 who had been in the same job for over ten years declined from 40.5% to 30.9%.

With regard to the consistency of RRSP contributions over time, Table 5.1 presents data similar to Drolet's RPP data, though only for a five-year period. Across earnings ranges, it shows the percentages of tax filers who contributed to RRSPs at least once during the five-year period, 2002-2006, and at least three times during those years. The final column gives the probability of contributing for at least three years conditional on having contributed at least once in the period.

Table 5.1 Frequency of RRSP Participation over Five Years

	RRSP Contribution Probabilities, 2002 - 2006		
Earnings ($000)	***1+ Year(s)***	***3+ Years***	***Prob (3+ / 1+)***
15 - 25	61.8	39.1	63.3
35 - 45	71.0	51.2	72.1
45 - 55	76.5	58.5	76.5
55 - 65	79.8	63.4	79.4
65 -75	82.9	67.8	81.8
75 - 85	85.3	71.3	83.6
85 -95	87.9	74.8	85.0

Source: Tabulation, provided by the Department of Finance, of data from the longitudinal T1 file.

These statistics show, to begin with, that it is an exaggeration to assume that workers contribute every year to their RRSPs. On the other hand, it also shows that there is a considerable degree of consistency in RRSP usage. In the $65,000-$75,000 earnings range, for example, 81.8% of those who made at least one contribution in the five year period contributed for three years or more. Moreover, it should be noted that these statistics include those whose RRSP contributions are supplemental to saving in RPPs as well as those saving in RRSPs only. Finally, note as well that, because workers don't make RRSP contributions every year, some of the households shown as non-savers in the data analyzed in Section 4 will have contributed to RRSPs in other years.

LaRochelle-Côté, Myles and Picot (LMP, 2008) have used longitudinal tax data to provide evidence directly on the earnings replacement rates achieved by Canadians who have moved from the workforce into retirement over the past two decades. In the results they present, they focus on the cohort of individuals who were in the age group 54-56 in 1983, and they follow their income histories through to 2005. They base their replacement rates on after-tax family income, and, as they can track changes in family size over time, they use family-size adjusted income (equal to family income divided by the square root of family size).

This is a very valuable study, and it is worth reporting some results that are most relevant to this paper. Table 5.2 extracts information from Table 6 of the paper. It shows the distribution of replacement rates obtained by those age 69-71 (in 1998) who were in the bottom, middle and top earnings quintiles (Q1, Q3 and Q5) when they were age 54-56 in 1983.

Table 5.2 Distribution of After-tax Replacement Rates

After-tax income at age 69-71 as a % of after-tax income at age 54-56

Replacement Rate Range	**Distribution Across RR Ranges (%)**		
	Q1	**Q3**	**Q5**
< 40%	0.1	1.0	7.5
40% - 60%	1.4	23.3	28.7
60% - 80%	19.4	38.8	34.6
80% - 100%	28.1	21.4	14.8
100% - 150%	35.0	12.9	10.2
> 150%	16.0	2.6	4.2
Total	100.0	100.0	100.0

Source: LaRochelle-Côté, Myles and Picot (2008), Table 6, p. 29.

In interpreting these results, it must be recognized that the replacement rate concept used is intermediate between the standard concept, based on pre-tax incomes, and the consumption replacement targets used in the analysis in Section 4 of this paper. Table 5.3 presents calculations from the stylized lifecycle model that show how the three measures compare for those in the Modest earnings group, a group that compares closely with earnings quintile 3 in LMP. The calculations are averaged across the six household types, and across owners and renters within each household type.

Table 5.3 Comparison of Replacement Rates

Modest earners – average for all household types

Consumption	***After-tax Income***	***Before-tax Income***
	(%)	
100.0	75.2	63.6
90.0	69.2	56.8

The LMP results presented in Table 5.2 appear reasonably congruent with, but less positive than, the results of the savings adequacy analysis in this paper. For quintile 3 earners, a linear interpolation within the 60%-80% replacement rate range (into below 69.2%, between 69.2% and 75.2%, and above 75.2%) provides a rough estimate of the proportions not meeting the 100% and 90% consumption replacement targets. The results suggest that about 54% have not met the 100% benchmark and 42% are not meeting the 90% target. The corresponding figures for Modest earners in Section 4.3 of this paper are 40% and 28%.

For those in the bottom earnings quintile, most have achieved an 80% after-tax earnings replacement rate. Among those in Q5, replacement rates are lower, with 70.8% of families below 80% and 36.2% below 60%.

In another study based on the LAD file, Ostrovsky and Schellenberg (2009) compare the income levels at age 70-72 of individuals who either belonged, or did not belong, to an RPP when they were age 55-57 in 1991. They make this comparison separately for men and women by earnings quintile and supplement their tabular results with regression analysis to control for the effects of earnings levels, age of retirement, changes in marital status and other variables.

They present two very interesting summary findings. First, those without RPP coverage in their mid-50s were significantly more likely to still be working at age 70-72. Second, among those retired by age 70, pre-tax income replacement rates did not differ significantly between those who were, or were not, RPP members in their mid-50s.

Obviously, the first of these findings qualifies the second to some extent. Non-members of RPPs were less likely to feel that they had sufficient resources to retire by age 70.[16] Nevertheless, the second finding is an important one as it is at variance with the pattern

[16] Of course, some who continue working past age 70 may do so for reasons other than financial need.

of savings adequacy – lower among RRSP-only savers than among those with RPPs – found in the present analysis of savings in 2006.

The main explanation for this result must be that, despite Drolet's evidence of a degree of consistency in RPP membership from year to year, over a full career many workers are RPP members in some years and RRSP-only savers in others. The two categories become more blurred as the period of observation lengthens.[17] A second explanation is that, over the years 1980 to 2006, rates of return on typical savings portfolios were well above their longer-term average. This has favoured saving in defined contribution plans and RRSPs over that in defined benefit RPPs. A third factor that may have contributed to the result is that many RPP members, particularly in the private sector, often lose significant benefits when they change jobs or become unemployed.[18]

These explanations notwithstanding, some caution is required in interpreting the results. As noted above, RPP non-members are more likely than members to still be working at age 70. Also, the market incomes (i.e., incomes net of OAS/GIS, C/QPP and other government benefits) of retirees at age 70 who were not in RPPs at age 55-57 are found to be almost the same as those of former RPP members partly because the non-members have higher levels of investment income from other financial assets. But, the distribution of these assets is very skewed, so the comparison of average income levels may mask a result that more non-members than members end up with low incomes in retirement. In fact, the Ostrovsky and Schellenberg results provide evidence of this. Looking at the males in earnings quintiles two and three in their Table 2, for example, the average level of GIS benefits (a good indicator of low-income status) is about twice as high for non-members as for members of RPPs.

[17] Further evidence of this comes from Statistics Canada's assessment of savings adequacy based on the 1999 SFS (Statistics Canada, 2001). They found, for example, that many self-employed people had significant pension assets derived from earlier periods of employment.

[18] This is likely reflected in another finding of the Statistics Canada savings adequacy study cited above – that savings adequacy was surprisingly high among manufacturing sector employees, despite the relatively high incidence of pension coverage in the sector.

6. Savings Adequacy in the Future

Assessments of earnings replacement or savings adequacy generally focus mainly on those at or nearing retirement age. There is simply less information available to judge how well younger workers are likely to fare in the future in building adequate retirement incomes.

There are some trends or factors in the current environment that are likely to affect retirement income outcomes in the future. They deserve consideration and assessment. Three examples are (a) the effects of the 2008 stock market crash and economic recession, (b) the continuing decline in pension coverage, and (c) the introduction of the new savings vehicle, the tax-free savings account (TFSA).

6.1 Stock market crash and recession

It is too early to assess the longer-term effects of these shocks. As seen in the data on personal sector assets, there seems to have been a strong bounce-back in many asset values. It is clear, though, that the stock market crash has done serious and permanent damage to the retirement savings of many people. It has also made many employer-sponsored pension plans less viable, and so increased the likelihood of plan changes such as benefit cuts, conversion from defined benefit to defined contribution, or plan termination.

The economic shocks following the financial markets crash are still playing out, and it is difficult to determine how serious and long lasting the effects on employment may be. While our unemployment rate has jumped from 6.0% in 2007 to 8.6% in October, 2009, the labour market consequences of the crash have, so far, been less serious in Canada than in many other countries. Coile and Levine (2009) predict that forced early retirement, rather than workers' adjustments to financial asset losses (e.g., through delayed retirement), are likely to be the strongest effect of the current economic crisis.

6.2 Declining pension coverage

There has been a longstanding trend to lower pension coverage in Canada, at least among men. Drolet (2009) finds that declines in the rate of union membership in the labour force is the most important factor explaining the decline. Changes in employment composition towards sectors like 'other services' with low pension coverage are another important cause. There is no strong evidence to suggest that the trend to declining RPP coverage will not continue in the future. The effects of the current economic turmoil could accelerate it.[19]

The savings adequacy analysis of Section 4 showed significant differences in retirement savings rates between members of RPPs and those saving in RRSPs only. Thus, if the population of households used in that analysis were re-weighted to simulate the effects of a further decline in RPP coverage, the effect would be to lower the predicted proportion of households meeting the savings adequacy targets.

[19] RPP coverage rates have tended to rise temporarily during recessions, however, because workers without pensions are the most likely to become unemployed.

6.3 Introduction of the TFSA

The introduction of the new savings vehicle, the TFSA, is a more positive development for savings adequacy in the future.

The consumption continuity model used in Section 3 to develop savings adequacy benchmarks can be applied to investigate which households (which family types at what earnings levels) would be better off saving through TFSAs than RPPs or RRSPs. These results can be applied in turn to examine the potential effects of the new vehicle on the achievement of adequate savings rates, on aggregate levels of saving, and on future levels of public pension costs and tax revenues.

The key result of the lifecycle model analysis is that households of all types, over a certain range of earnings levels, would be better off saving through TFSAs than RPPs or RRSPs. Where individuals or families are better off saving with a TFSA, they can achieve a higher level of after-tax retirement income with the same level of saving as for RPPs/RRSPs. However, in the lifecycle model where the aim is to equalize pre- and post-retirement consumption, the result is that they will reduce their savings levels slightly, attaining higher consumption levels than with RPP/RRSP saving both before and after retirement.

The reason that TFSA saving is superior to RPP/RRSP saving for these households is that the retirement income is both tax-free and excluded from the income used to determine eligibility for GIS and income-tested tax credits. In fact, in the model solutions, those that are better off saving with TFSAs all share the characteristics that they have low or zero income tax liabilities in retirement and that they receive substantial benefit levels under the GIS. The net gain for the households from this result is offset to a considerable degree, though, by the fact that, since TFSA contributions are not tax-deductible, they pay higher taxes while working. Table 6.1 illustrates these points by comparing savings, consumption, income tax, GIS and refundable credit levels under the lifecycle model for TFSA and RRSP saving for a single renter with earnings of $70,000.

Table 6.1 Results of TFSA and RRSP Saving

Single renter earning $70,000

	TFSA	***RRSP***
	($)	
Contribution	6,207	9,520
Net saving (after tax deduction)	6,207	6,409
Consumption ($C_{65} = C_{64}$)	43,447	43,245
Fed + Prov income tax (age 30-64)	15,305	12,194
Fed + Prov income tax (age 65+)	224	9,621
GIS	2,268	0
GST credit and provincial credits	1,547	265

The key points from Table 6.1 are that, for the single renter earning $70,000, TFSA saving provides, as compared to RPP or RRSP saving:

- An increase of $202 per year, or 0.5%, in annual consumption;
- An increase in income tax while working of $3,111 per year;
- A drop in income tax after age 65 of $9,397;
- An increase in GIS benefits of $2,268: and
- An increase in other refundable tax credits of $1,282.

Note, though, that the tax increases experienced while working under the TFSA option extend over a longer period than the lower taxes and higher benefits in retirement. Also, they come earlier and so carry more weight when the fiscal effects are evaluated on a present value basis.

The households found to be better off saving with TFSAs are those with earnings up to about $62,000 for two-earner couples (with or without children) and $75,000 for singles, single parents and one-earner couples. Together, they account for 3.6 million households or about 40% of the population of households with heads age 30-64. While full take-up of TFSAs by those who would benefit from using them is unlikely, it is safe to predict that the introduction of the new vehicle will significantly alter savings patterns and have important effects on government revenues and program costs.

It is also likely that the attractiveness of TFSA tax treatment to a large segment of the population will result in pressure to allow TFSA tax treatment of some RPPs, or for the replacement of some pension plans by group TFSAs.

Annex A

Further Savings Adequacy Results

Table A.1 Per Cent of Households Meeting the 100% Savings Benchmark by Type of Retirement Savings

Modest- and Middle Earners by Family Type

	Non-Saver	*RPP only*	*RRSP only*	*Both*	*All*
			(%)		
Single					
Modest	0	62	42	82	44
Middle	0	48	41	80	56
1PF					
Modest	42	95	81	95	77
Middle	0	90	56	94	78
1E Couple					
Modest	39	88	81	92	72
Middle	0	67	49	85	64
2E Couple					
Modest	22	62	64	80	52
Middle	0	47	46	76	56
1E 2PF					
Modest	69	92	87	94	83
Middle	0	79	49	87	66
2E 2PF					
Modest	62	87	82	95	78
Middle	0	76	56	90	71
All					
Modest	29	75	62	87	60
Middle	0	64	49	84	63

1PF = single parent family, 1E C = 1-earner couple, 1E 2PF = 1-earner two-parent family

Table A.2 Per Cent of Households Meeting the 90% Savings Benchmark by Type of Retirement Savings

Modest- and Middle Earners by Family Type

	Non-Saver	*RPP only*	*RRSP only*	*Both*	*All*
			(%)		
Single					
Modest	0	77	54	89	52
Middle	0	66	48	87	65
1PF					
Modest	79	98	92	97	91
Middle	0	94	65	95	82
1E Couple					
Modest	71	95	90	96	86
Middle	0	78	57	90	71
2E Couple					
Modest	51	80	79	88	71
Middle	0	64	55	85	66
1E 2PF					
Modest	90	97	96	98	94
Middle	0	86	60	92	72
2E 2PF					
Modest	92	98	97	99	96
Middle	0	86	70	94	78
All					
Modest	46	86	74	92	72
Middle	0	77	59	90	71

1PF = single parent family, 1E C = 1-earner couple, 1E 2PF = 1-earner two-parent family

Annex B

RPP/RRSP Savings among the Self-Employed

Table B.1 Incidence of RPP/RRSP Saving: Self-Employed vs. Employees, 2006

Population age 30-64 by Earnings Group

	Non-Saver	***RPP only***	***RRSP only***	***Both***	***All***
Self-Employed	*(% Distribution)*				
Low	71.3	3.0	23.7	2.0	100.0
Modest	30.3	10.7	37.8	21.2	100.0
Middle	12.5	7.9	44.1	35.5	100.0
High	6.9	3.3	59.1	30.7	100.0
All	39.5	6.7	36.3	17.6	100.0
Employed					
Low	71.4	11.1	12.7	4.8	100.0
Modest	20.4	25.0	21.2	33.4	100.0
Middle	5.6	20.0	16.8	57.6	100.0
High	5.6	12.1	30.6	51.7	100.0
All	33.3	19.1	18.5	29.2	100.0

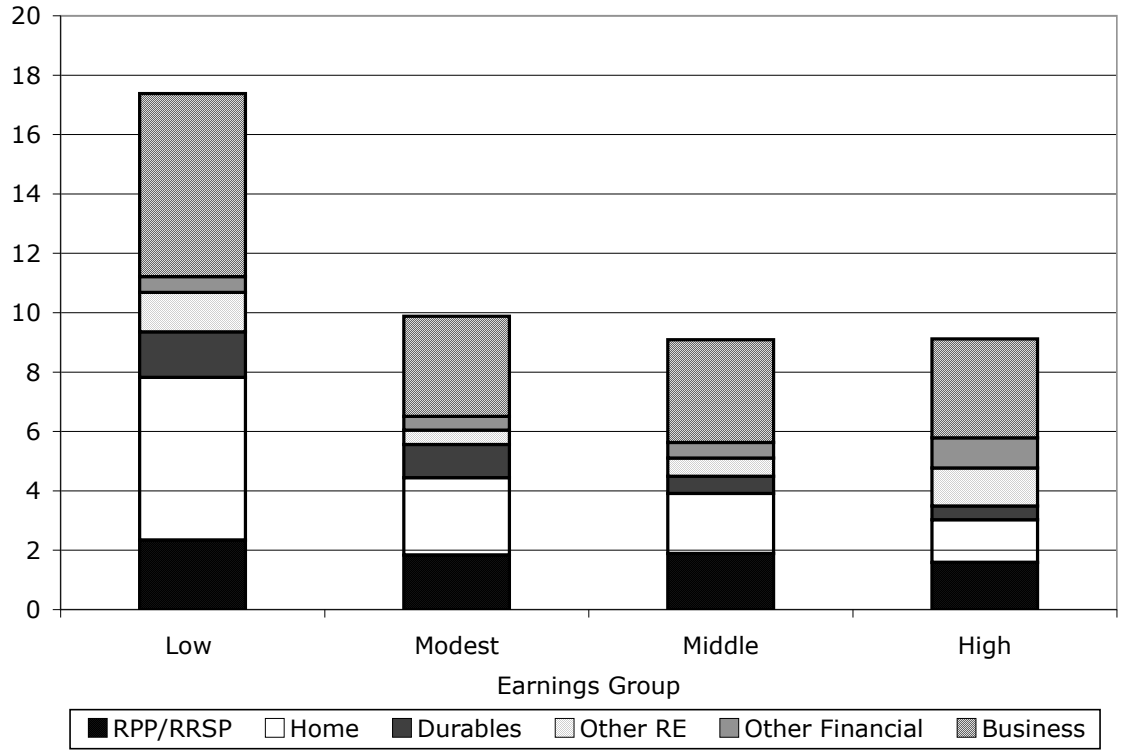
Table B.2 Rates of RPP/RRSP Saving: Self-Employed vs. Employees, 2006

Population age 30-64 by Earnings Group

	Non-Saver	***RPP only***	***RRSP only***	***Both***	***All***
Self-Employed	*(% of Earnings)*				
Low	0.0	6.8	13.8	18.4	3.8
Modest	0.0	7.2	11.6	16.0	8.5
Middle	0.0	7.6	12.8	15.5	11.8
High	0.0	4.4	7.2	8.6	7.0
All	0.0	6.0	12.3	18.1	8.1
Employed					
Low	0.0	14.1	12.8	29.5	4.6
Modest	0.0	9.0	7.4	15.1	8.8
Middle	0.0	9.9	10.0	15.0	12.3
High	0.0	6.3	7.9	9.5	8.1
All	0.0	9.5	9.7	20.0	9.4

Note: Percentages are based on estimated earnings in the saver category. E.g., the 6.8% savings rate of RPP-only savers in the Low earnings self-employed group is based on the earnings of those in the group that belong to RPPs but do not contribute to RRSPs.

Figure B.1 Ratio of Assets to Earnings – Various Net Assets
Households with Self-Employment Income



Source: Tabulation from the 2005 Survey of Financial Security

Annex C
Savings Adequacy Results with a 2.5% Rate of Return

Table C.1 Per Cent of Households Meeting Savings Rate Benchmarks

2.5% Rate of Return on Saving

	Single	*1PF*	*1E C*	*2E C*	*1E 2PF*	*2E 2PF*	*All*
	Per cent saving enough for 100% consumption replacement						
Low	82	100	100	100	100	100	91
Modest	37	78	74	50	87	78	57
Middle	39	75	57	47	61	68	55
High	11	47	26	43	42	67	51
All	54	88	78	47	82	70	65
	Per cent saving enough for 90% consumption replacement						
Low	95	100	100	100	100	100	97
Modest	48	90	85	70	94	96	70
Middle	54	79	66	60	69	76	66
High	20	36	36	57	50	74	60
All	66	84	84	62	87	80	75

1PF = single parent family, 1E C = 1-earner couple, 1E 2PF = 1-earner two-parent family

Table C.2 Savings Adequacy by Type of Retirement Savings

2.5% Rate of Return on Saving

	Non-Saver	*RPP only*	*RRSP only*	*Both*	*All*
	Per cent saving enough for 100% consumption replacement				
Low	91	96	95	96	91
Modest	34	66	58	81	57
Middle	0	50	42	76	55
High	0	39	32	66	51
All	65	61	56	74	65
	Per cent saving enough for 90% consumption replacement				
Low	98	99	99	99	97
Modest	46	82	71	90	70
Middle	0	68	54	85	66
High	0	53	41	75	60
All	73	76	66	83	75

Note: in the 100% consumption replacement case, the percentage of Modest-earner non-savers that meet the savings targets at a 2.5% rate of return on saving (34%) exceeds the corresponding percentage (29%) when the rate of return is 3.5%. The reason for this is that in the 2.5% rate of return case, homeowners have higher level of homeownership savings. This translates into lower pre-retirement consumption levels and lower savings targets. According, a higher proportion of households meets their targets without any need for RPP/RRSP saving.

Table C.3 Per Cent of Households Meeting the 100% Savings Benchmark by Type of Retirement Savings

2.5% Rate of Return on Saving

Modest- and Middle Earners by Family Type

	Non-Saver	*RPP only*	*RRSP only*	*Both*	*All*
			(%)		
Single					
Modest	0	44	35	73	37
Middle	0	16	31	62	39
1PF					
Modest	57	93	75	93	79
Middle	0	85	48	93	75
1E Couple					
Modest	57	83	77	89	74
Middle	0	56	43	79	57
2E Couple					
Modest	23	57	61	75	50
Middle	0	33	40	66	47
1E 2PF					
Modest	79	92	87	95	87
Middle	0	73	43	83	61
2E 2PF					
Modest	62	86	82	94	78
Middle	0	70	52	88	68
All					
Modest	34	66	58	81	57
Middle	0	50	42	76	55

1PF = single parent family, 1E C = 1-earner couple, 1E 2PF = 1-earner two-parent family

Table C.4 Per Cent of Households Meeting the 90% Savings Benchmark by Type of Retirement Savings

2.5% Rate of Return on Saving

Modest- and Middle Earners by Family Type

	Non-Saver	*RPP only*	*RRSP only*	*Both*	*All*
			(%)		
Single					
Modest	0	68	49	84	48
Middle	0	44	40	78	54
1PF					
Modest	79	98	89	96	90
Middle	0	91	57	94	79
1E Couple					
Modest	71	92	86	95	85
Middle	0	70	51	86	66
2E Couple					
Modest	51	78	77	86	70
Middle	0	54	50	80	60
1E 2PF					
Modest	90	97	96	98	94
Middle	0	83	56	90	69
2E 2PF					
Modest	92	98	98	99	96
Middle	0	84	68	93	76
All					
Modest	46	82	71	90	70
Middle	0	68	54	85	66

1PF = single parent family, 1E C = 1-earner couple, 1E 2PF = 1-earner two-parent family

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