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A New Pension Plan for Canadians

Assessing the Options

Keith Horner

The author compares the features and effects of various pension reform options and concludes that a new, national, mandatory, defined-benefit plan, such as an enrichment of the Canada and Quebec Pension Plans, would provide the greatest benefits to plan participants and the economy.

L'analyse comparative de trois options de réforme du système de pension révèle que c'est la mise en œuvre d'un régime national obligatoire à prestations déterminées (en élargissant, par exemple, le Régime de pensions du Canada et le Régime de rentes du Québec) qui assurerait un meilleur revenu de retraite aux adhérents et serait le plus avantageux pour l'économie.

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Summary

Over the past 40 years, Canada's retirement income system has provided satisfactory pension incomes for growing numbers of retirees and dramatically reduced poverty among seniors. Despite this performance, however, pressure is increasing for reform. As many as 25 to 30 percent of today's modest- and middle-income workers are not saving enough to avoid a significant drop in their living standards at retirement. And current trends — increasing longevity and an aging population, lower expected rates of return on investment, declining coverage of employer-sponsored registered pension plans (RPPs) and weaknesses in RRSP saving — are expected to exacerbate these shortfalls.

In response to these trends, diverse groups have proposed introducing some form of new government-sponsored pension plan to strengthen the system. In this study Keith Horner assesses some of these proposals. He first examines plan design issues that would arise depending on the type of plan selected. He then sets out three illustrative pension plans with the same contribution structures and compares their net effect on retirement saving and future retirement income, their labour market implications and their interaction with existing pension and savings plans, in particular, the recently introduced tax-free savings accounts.

The options examined are a mandatory defined-benefit (DB) plan and two defined-contribution (DC) savings plans, one mandatory and the other voluntary. Horner's proposed DB plan entails a modest expansion of the Canada and Quebec Pension Plans that would raise the benefit rate from 25 to 40 percent of earnings up to $48,300, and from 0 to 25 percent of earnings between $48,300 and $96,600. Combined employer/employee contribution rates would be 3.6 percent of earnings below $48,300 and 6 percent above.

Based on his comparative analysis, Horner concludes that the DB option would provide somewhat higher benefits per dollar of contribution than would the DC options. Because DB plans enable risk pooling among age cohorts, they can achieve higher investment returns through longer investment horizons and slightly greater exposure to risk. A DB structure would also provide participants with more secure and predictable benefits than would the DC plans.

The author also points out that a mandatory, government-sponsored plan of either type (DB or DC) would be better than single-employer RPPs, as it would not hamper labour mobility or encourage early retirement. These positive effects would be greater under a DB plan that would likely replace existing single-employer RPPs.

The main concern with mandatory plans is that the contributions required could have negative employment effects, particularly among lower-income earners. This is why Horner proposes a plan of modest scale. He also suggests measures to limit the contribution rate increases for lower-income workers.

Résumé

Le système de revenu de retraite du Canada a procuré depuis 40 ans un revenu de pension satisfaisant à un nombre croissant de retraités tout en réduisant considérablement la pauvreté chez les personnes âgées. Mais il n'en est pas moins urgent de le réformer. Car à l'heure actuelle, 25 à 30 p. 100 des travailleurs à revenu faible et moyen épargnent trop peu pour éviter dès leur retraite un recul significatif de leur niveau de vie. Et ce manque à gagner devrait s'aggraver sous l'effet de plusieurs tendances : longévité accrue, vieillissement démographique, taux de rendement des investissements inférieurs aux prévisions, moindre couverture des régimes de pension agréés (RPA) d'employeur et maigres cotisations aux REER.

Pour faire face à ces tendances, différents groupes recommandent aux gouvernements de renforcer le système en créant, sous une forme ou une autre, un nouveau régime de pension. Keith Horner analyse ici certaines de ces propositions, cernant tout d'abord leurs problèmes de conception. Puis, il élabore trois régimes types ayant la même structure de cotisation, et compare leur effet net sur l'épargne-retraite et le futur revenu de retraite, leur incidence sur le marché du travail et leur interaction avec les régimes de retraite et d'épargne existants, notamment les nouveaux comptes d'épargne libres d'impôt.

Les trois options évaluées consistent en un régime de retraite à prestations déterminées (PD) obligatoire et deux régimes à cotisations déterminées (CD), l'un obligatoire, l'autre facultatif. Le régime à PD que l'auteur propose nécessiterait une légère expansion du Régime de pensions du Canada et du Régime de rentes du Québec en vue d'augmenter le taux de prestation de 25 à 40 p. 100 pour les revenus inférieurs à 48 300 dollars et de 0 à 25 p. 100 pour les revenus de 48 300 à 96 600 dollars. Les taux de cotisation combinés employeur-employé s'élèveraient à 3,6 p. 100 des revenus de moins de 48 300 dollars et à 6 p. 100 des revenus supérieurs.

Selon cette analyse comparative, le régime à PD offrirait des prestations un peu plus élevées par dollar de cotisation que les deux régimes à CD. Parce qu'ils permettent la mise en commun des risques entre cohortes d'âge, les régimes à PD assureraient un meilleur rendement en favorisant des horizons d'investissement plus longs et un niveau d'exposition au risque un peu plus élevé. De plus, ils offriraient à leurs adhérents des prestations plus sûres et plus prévisibles qu'un régime à CD.

Keith Horner estime aussi qu'un régime obligatoire mis en place par les gouvernements, qu'il soit à PD ou à CD, serait préférable à un RPA à employeur unique puisqu'il n'entraverait pas la mobilité de la main-d'œuvre et n'inciterait pas les travailleurs à prendre une retraite anticipée. Ces deux avantages seraient plus importants sous un régime à PD, qui pourrait remplacer les RPA à employeur unique existants.

La principale crainte liée aux régimes obligatoires concerne les possibles effets négatifs qu'auraient les cotisations requises sur l'emploi, surtout chez les travailleurs à faible revenu. C'est pourquoi l'auteur propose un régime d'échelle modeste et des mesures limitant l'augmentation des taux de cotisation pour ces travailleurs.

A New Pension Plan for Canadians: Assessing the Options

Keith Horner

Despite the strong performance of Canada's retirement income system over recent decades, pressure is increasing for its reform. Canada's system relies more heavily than most on saving in private pension and savings plans, and many observers have concerns about the continuing adequacy and effectiveness of this saving. Private pension coverage has been in steady decline; long-standing pension plans are threatened by slow growth in contributions, fast growth in benefits and a decline in investment returns; and voluntary saving in individual plans is showing increasing weakness as an alternative.

Commissions in four provinces have called not only for improvements to the regulatory framework for private pension plans but also for governments to initiate the development of new large-scale, low-cost pension plans.[1] Groups including the C.D. Howe Institute (Ambachtsheer 2008), the Canadian Labour Congress (CLC 2009) and the Alberta-British Columbia Joint Expert Panel on Pension Standards (Alberta-BC JEPPS 2008) have put forward specific proposals for such new plans.

In this study I assess some of these proposals. After outlining the current retirement income system I then summarize the case for reform. As part of this analysis, I consider the potential longer-term effects of the recently introduced tax-free savings account (TFSA), and I conclude that it will create problems that strengthen the case for reform. I then review a list of pension plan design issues in order to narrow down the number of possible options. These design issues include major structural choices — plan type (defined benefit [DB] or defined contribution [DC]), mandatory or voluntary participation, and contribution and benefit structures — as well as issues relating to the treatment of saving in existing pension plans, the regulatory treatment of a new plan, the locking in of funds, plan start-up and other matters.

In order to assess possible reform options, I set out three illustrative plans for comparison: (1) a DB plan such as a modest expansion of the Canada and Quebec Pension Plans (CPP/QPP), (2) a mandatory DC savings plan and (3) a voluntary DC savings plan. To facilitate the comparison, I give the three options the same contribution structure. In each case, I estimate contribution flows and net new savings levels, taking into account likely participation rates under the voluntary option as well as offsetting reductions in contributions to existing pension and savings plans. Finally, I compare other important features and effects of the three plans, including the level and security of the retirement benefits, the labour market effects and the interaction with the anticipated TFSA effects. In the conclusion I review the key points of my analysis, in particular the advantages of a mandatory defined-benefit pension plan in providing greater retirement income security for modest- and middle-income Canadians, and my suggestions for addressing its main drawbacks.

The Current Retirement Income System

Canada has a three-pillar retirement income system designed to provide a basic income guarantee for seniors and to encourage workers to replace a sufficient portion of their earnings with pension income to avoid a significant drop in their living standards at retirement.

Pillar 1 provides a basic income guarantee for seniors through the Old Age Security (OAS) and Guaranteed Income Supplement (GIS) programs. OAS is paid to all seniors (age 65 and over) who meet residency conditions. The benefit is currently $526.85 per month (April-June 2011). This taxable benefit is reduced by 15 percent of net income above a level of $67,668. In December 2010, 4.8 million seniors received OAS benefits. The GIS has current maximum monthly benefits of $665.00 for singles and $439.13 for each spouse in a couple. Benefits are reduced by 50 cents for each dollar of income apart from OAS, phasing out at total annual income levels (including OAS) of about $22,282 for singles and $33,720 for two-pensioner couples. In December 2010, GIS benefits were paid to about 1.63 million people, or 33.8 percent of Canadian seniors (HRSDC 2011). OAS and GIS benefits are indexed quarterly to increases in the consumer price index (CPI).

In pillar 2, the Canada and Quebec Pension Plans (CPP/QPP) provide earnings-related benefits as a further source of earnings replacement. These are contributory plans with a contribution rate of 9.9 percent of earnings between $3,500 and the year's maximum pensionable earnings (YMPE, set at $48,300 in 2011). Employers and employees each contribute 4.95 percent; self-employed workers pay the full 9.9 percent. The benefit rate is 25 percent of updated average earnings (up to the YMPE) from age 18 to retirement, with allowance for some years of low earnings to be dropped from the average. The YMPE is adjusted each year to reflect the increase in the average wage. Benefits in pay are indexed annually to increases in the CPI. Individuals may begin receiving CPP/QPP retirement benefits at age 60, but benefit levels are reduced by 0.5 percent for each month between the age at which a person begins receiving benefits and age 65. Between 2012 and 2016, the benefit-reduction factor will increase gradually to 0.6 percent for each month below age 65. CPP/QPP benefits, including survivor and disability benefits, were paid to 7.3 million people in December 2010, of whom 5.3 million were receiving retirement benefits (HRSDC 2011).

Pillar 3 consists of private pension and savings plans that allow additional earnings replacement. They include employer-sponsored registered pension plans (RPPs) and deferred profit-sharing plans (DPSPs), individual registered retirement savings plans (RRSPs) and, since 2009, TFSAs. Federal and provincial/territorial governments in Canada regulate registered plans and provide favourable tax treatment

Table 1: Contributions and benefits under retirement income plans and programs, Canada, 2008 ($ billions)

Plan/program	Contributions	Benefits
Old Age Security	n/a	25.9
Guaranteed Income Supplement	n/a	7.4
CPP/QPP	45.4	37.6
Registered pension plan (RPP)	41.8	56.3[1]
Registered retirement savings plan (RRSP)	31.7	n/a
Total	118.9	127.2

Sources: OAS, GIS and CPP/QPP: HRSDC (2009); RPP: Statistics Canada, Cansim table 280-0026; RRSP: CRA (2008), tables 11 and 12.
[1] The CRA table combines income from RPPs and RRSPs.
n/a = not applicable

to encourage their use. About 5.9 million Canadians belonged to RPPs in 2008, and 6.3 million contributed to RRSPs. With many RPP members also contributing to RRSPs, the total number that year saving in RPPs, RRSPs or both was close to 9.2 million.

Table 1 summarizes the contribution inflows to, and benefit outflows from, the plans or programs in our retirement income system in 2008. The inflows and outflows are substantial, representing about 8 percent of GDP. Benefits from pillar 3 plans currently account for 44 percent of the total, with OAS/GIS accounting for 26 percent and the CPP/QPP 30 percent.

The Case for Reform

By and large, the system has performed well up to now. The proportion of seniors with incomes below the after-tax low-income cutoffs was 5.8 percent in 2008, having declined by 60 percent since 1985 and by 80 percent since 1977 (Statistics Canada CANSIM table 2020802). Pension payments from the CPP/QPP and from RPPs and RRSPs have grown dramatically during this time, leaving fewer seniors dependent on the basic OAS/GIS benefits. The increasing role of private pension and savings plans, along with the move in 1997 to pre-fund a growing share of CPP/QPP benefits, has made the system less vulnerable to the challenge of an aging population than others dominated by purely pay-as-you-go (PAYGO) public pension plans.[2]

The growing volume of pension income from the CPP/QPP, RPPs and RRSPs has also produced satisfactory earnings-replacement rates for many middle- and higher-income earners, encouraging a trend to earlier retirement. Among individuals earning over $30,000, who clearly need to supplement public pension benefits with RPP/RRSP saving to obtain satisfactory earnings-replacement rates, 73 percent of CPP/QPP contributors saved in an RPP, an RRSP or both in 2008. Among those earning over $40,000, the proportion was 77 percent (CRA 2008, table 12).

However, several studies suggest that many individuals and families are not saving enough to avoid a significant drop in their living standards at retirement.[3] Basing my analysis on household savings patterns in 2006, I estimate that 28 percent of modest-income earners and 29 percent of middle-income earners are not saving enough to attain consumption levels in retirement equal to 90 percent of their pre-retirement consumption (Horner 2009b).[4] (I define modest-income earners as those with 2006 earnings from $25,000 to $60,000, and middle-income earners as those with earnings of $60,000 to $100,000. Assuming a 60/40 earnings split for two-earner couples, the corresponding ranges for couples would be $40,000 to $100,000 and $100,000 to $167,000.) The modest- and middle-earnings groups are the primary target for questions of retirement savings adequacy. Those at lower earnings levels have little need to save for retirement, because OAS/GIS and CPP/QPP benefits are sufficient to replace a high proportion of their earnings; those at higher earnings levels may be constrained by the RPP and RRSP limits and are likely to have the means to supplement their RPP/RRSP saving with saving in other forms.

Studies also find that individuals without RPP coverage are the group most likely to have inadequate retirement savings. However, due to data limitations, most of these studies focused on those in late career, so they could not assess whether today's younger workers are likely to attain the same earnings-replacement rates as earlier cohorts.

More troubling than current savings shortfalls are several trends in our retirement savings system or its environment that threaten its continuing ability to provide a satisfactory level of retirement income security for Canadians. These trends underlie the findings of two recent studies, Moore, Robson, and Laurin (2010) and Wolfson (2011), that project strong increases in retirement income inadequacy. They include increasing longevity and an aging population, the prospect of lower rates of return on savings, an anticipated decline in the role of OAS and an ongoing decline in RPP coverage. Even though these trends point to a growing reliance on voluntary saving in individual plans (RRSPs), RRSP saving has been declining, and there are growing concerns about the effectiveness of this saving. The introduction of TFSAs might be seen as at least a partial response. However, analysis in this study suggests that, as they are currently designed, TFSAs will have negative consequences for the retirement income system. Any reform of the pension system should address these consequences.

Increasing longevity and population aging

Since the framework of Canada's retirement income system was established in the mid-1960s, the average life expectancy at age 65 has increased by five years or about one-third. In the *Actuarial Report (25th) on the Canada Pension Plan,* the Chief Actuary projects a continuation of this trend in the decades to come (Office of the Chief Actuary 2010, 91).[5] Increasing longevity adds directly to the cost of the pensions promised in public pension plans and in DB RPPs. In the same way, it increases the contribution level required to attain a given level of annuity income in RRSPs and DC RPPs.[6] Increasing and uncertain longevity has added to the cost and riskiness of DB plan sponsorship, discouraged the provision of RPPs and contributed to a worldwide shift from DB to DC plans.

The effect of increasing longevity on the age structure of the population has been compounded by the aging of the baby boom generation, those born between 1946 and 1966. Between 1971 and 2010, the population of seniors increased from 15.2 percent to 22.5 percent of the working-age population (aged 20-64). The Chief Actuary projects the percentage to nearly double to 41.8 percent by 2030 and to reach 48.0 percent by 2075. With the aging of the population, the levels of both pension benefit payouts and pension plan assets have risen strongly in relation to the level of contributions. As a result, the financial health of DB plans is much more vulnerable to adverse investment results, since it now takes a considerably bigger and more sustained contribution increase to make up for a funding deficit than in the past.

These problems have been exacerbated by a trend toward shorter careers among men, resulting from their later entry into the labour force (with more years spent in education) and earlier retirement. (However, the early-retirement trend has reversed since the mid-1990s.) Shorter careers increase demands on the retirement income system, as higher levels of saving are needed to replace earnings at retirement. Strong labour force growth among women has not fully offset these trends, since women's earnings also need replacement at retirement.

Lower investment returns

The past 30 years have seen slow wage growth and historically high investment returns, but demographic projections suggest that these conditions will be reversed in the years to come.

A dramatic decline in the rate of growth of the working-age population is occurring now and will continue through 2030. This population grew by over 2 percent per year in the 1970s and by over 1 percent per year since 1980. Over the next 10 years, however, it will grow by only 0.45 percent per year, and in the 2020s its growth will be negligible — 0.01 percent per year. This will make labour scarce relative to capital, which is expected to create upward pressure on wage rates, while depressing investment returns.[7]

Slow wage growth coupled with high investment returns made it easier to meet earnings-replacement targets and made DC plans look more attractive to employees than DB plans with their fixed benefits. The anticipated reversal of these forces has already begun to raise the cost of meeting earnings-replacement targets. Jumps in the present value cost of pension promises produced by downward revisions in the long-term rates of return have created large deficits in DB RPPs and have required major increases in employer contributions. The increased pension costs resulting from lower investment returns may be tempered to some extent in the future as labour scarcity encourages increased labour force participation, including later retirement.

Declining role of OAS

Because OAS benefits are price indexed by law, they will play a declining role in earnings replacement as real wages increase over time — that is, as wages grow faster than prices. This has not been an issue to date because the average real wage did not surpass its 1977 level until 2007. Real wage growth has been positive for the past few years, though, and, assuming slower growth in the labour supply, the Chief Actuary projects that real wage growth will average about 1.2 percent per year over the next 30 years (Office of the Chief Actuary 2010, 22).

To see the effects of this trend, consider the case of a worker with earnings equal to the YMPE ($48,300 in 2011), and assume that she needs retirement income equal to 60 percent of earnings to maintain her standard of living in retirement. Based on 2011 values, OAS and CPP/QPP benefits will replace 37 percent of her earnings, leaving her with 23 percent to cover with private pension income. Now assume that her earnings grow by 1.2 percent per year more than inflation over the next 30 years. This would reduce the proportion of her earnings replaced by OAS and CPP/QPP from 37 percent to 33 percent and increase her target private pension substantially, from 23 percent to 27 percent of earnings.

Periodic ad hoc increases in the benefit rate could counter the declining contribution of OAS benefits. Over the past 40 years, however, the pattern of government action has been to maintain or improve the anti-poverty effectiveness of the OAS/GIS income guarantee by enriching the GIS benefit while leaving the real value of OAS unchanged. While this approach economizes on OAS/GIS program costs, it leaves middle-income earners with an earnings-replacement challenge that will grow significantly over time. It also expands the scope of the disincentive effects on work and saving associated with the 50 percent tax-back rate on GIS benefits.

Declining RPP coverage

RPP coverage among men has declined steadily over the past three decades — from 55 percent of employees in the late 1970s to 41.4 percent in 2007.[8] Coverage in the private sector

explains much of this trend, declining from 45 percent in the late 1970s to 31.9 percent in 2007. Public sector coverage is much higher but has declined as well in recent years from 95 percent in 1995 to 86.3 percent in 2007. Among female employees, RPP coverage increased in the early 1990s but then fell back and has since been stable at about 40 percent. Because self-employed and unemployed workers are not active pension plan members, RPP coverage of the total labour force is lower than the coverage of employees — 32.1 percent as opposed to 40.5 percent for men and women together in 2007. The effects of the decline in RPP coverage have been offset to some extent by the growth in the labour force participation of women. For example, the growth in two-earner families has helped maintain the proportion of families where at least one spouse has an RPP (Morissette and Ostrovsky 2006).

Several factors have combined to produce the drop in RPP coverage. Employment has shifted toward types (e.g., part-time and self-employment) and sectors (e.g., small business and high technology) where RPP coverage has always been low. Greater longevity and population aging have increased the costs and risks of pension plan sponsorship for employers, leading more employers to discontinue their RPPs or convert them from DB to DC plans. Trends away from employer sponsorship of DB pension plans in other jurisdictions have added to the pressures on Canadian employers to limit pension costs and risks. For example, Munnell and Sass (2007, 30) report that among employees with pension coverage in the United States, the proportion in DB plans declined from 85 percent in 1980 to 37 percent by 2004.

These trends seem unlikely to be reversed, so we can expect a continuing decline in RPP coverage. Nearly two-thirds of employees without pension coverage work for small employers, defined as those with fewer than 100 employees (Horner 2009a, 431). It appears unrealistic and undesirable to expect such employers to sponsor RPPs, especially DB plans. They are poorly placed to undertake the risk and responsibility of plan sponsorship. There is also evidence that the performance of small plans is hampered by their lack of economies of scale and administrative and investment expertise. For example, Munnell et al. (2006) show that, in the United States, DC 401(k) pension plans have substantially lower rates of return on assets, net of expenses, than DB plans, which are generally much larger. Rates of return in both types of plan increase significantly with the size of the plan. Where employees of small employers have pension coverage, it is generally through industry-wide plans run by unions that limit the employer's role to making negotiated contributions to the plan.

In principle, private initiatives to create new large-scale, multi-employer plans serving small employers and their employees could counter the decline in RPP coverage. For example, the Ontario Expert Commission on Pensions (2008) has proposed allowing large existing pension plans, such as the Ontario Teachers' Pension Plan, to provide administrative and investment services to smaller plans. To date, however, there is little evidence of interest in such ideas among small employers.

Declining RRSP and RPP saving

Up to the mid to late 1990s, aggregate RRSP saving grew strongly enough to offset the decline in RPP coverage and raise the total rate of retirement saving. Between 1995 and 2007, though, the RRSP contribution rate declined from 5.53 percent of earnings to 4.69 percent. This drop was spread across age and income groups (CRA 2008 and other years, table 2).[9]

Part of this decline is explained by a shift to other forms of saving, such as home ownership and contributions to registered educational savings plans (RESPs). Home equity rose as a share of household net worth between 1999 and 2005 (Statistics Canada 2006, 14, 18), and RESP contributions jumped following the introduction of the Canada Education Savings Grant in 1998 (Horner 2009a, 429). At the same time, the incidence of RRSP withdrawals by working-age Canadians (taken here as those under age 60) also increased. Net of these withdrawals, the RRSP savings rate fell from 4.25 percent of earnings in 1995 to 3.77 percent in 2007.

Over the same period, aggregate RPP saving, measured as the sum of Pension Adjustment (PA) amounts, also declined, from 4.96 percent of earnings to 4.10 percent. Thus, the combined RPP-plus-RRSP saving rate fell by 1.34 percentage points from 1995 to 2007, from 9.21 percent of earnings to 7.87 percent.[10]

Problems with individual plan saving

Recent studies raise several questions about the effectiveness of voluntary saving by individuals. To be effective in providing adequate retirement incomes, individual saving needs to be timely, sufficient in scale and well invested in savings vehicles in which the investment returns are not compromised by high administration costs. US studies of the use of 401(k) plans suggest that individuals tend to shy away from complex savings choices (how much to save, what choice of investments), leading to non-participation, deferral of savings and under-saving.[11] Contributors often seem to be satisfied with the simple fact of plan participation and overestimate the retirement income that can be derived from a modest level of contributions (Choi et al. 2001).

There is evidence as well that individuals choose poorly in market timing and in the allocation of assets among broad investment classes and the selection of individual investments. When they rely on the professional services of mutual fund managers or investment advisers, they pay substantial fees with no commensurate increase in gross returns relative to passively invested assets (Jog 2009). The result is low returns on individually invested savings. In the United States, Munnell et al. (2006) found average returns on saving in individual retirement accounts (IRAs) of 3.8 percent per annum, compared with rates of 6.6 percent and 5.6 percent for DB pension plans and 401(k) plans.

There is a flip side to the pessimistic findings regarding individual saving decisions. Employees faced with complex choices often rely on the advice or implicit guidance of their employer. The most important example of this concerns plan participation. When employees are automatically enrolled in a plan but allowed to opt out, participation rates are much higher than when they must choose to participate — one example shows a jump from 49 percent to 86 percent (Madrian and Shea 2001).

Other research suggests that automatic enrolment has considerably greater effects than contribution matching by employers. In a study of six plans, Beshears et al. (2007) found drops in participation of only 5 to 11 percentage points, from an average base level of 89 percent, when contribution matching by employers at a 50 percent rate was eliminated. These participation rate effects are much lower than those found for automatic enrolment. Since employer contribution matching effectively increases the rate of return on employee contributions in

much the same way as a saver's tax credit or government matching grant does, this evidence is relevant to the assessment of such options.

This research has two main implications. First, it may be unwise to count on voluntary individual saving to fill a growing earnings-replacement gap created by the declining role of OAS and by falling RPP coverage. Moreover, enriching savings incentives for individual savers may have only modest effects. Second, the findings regarding behaviour under automatic enrolment and other default options can be used as a guide to program design. Automatic enrolment is already used in New Zealand's KiwiSaver plan; a default option has been suggested to reduce administration costs and improve investment returns under Australia's compulsory Superannuation plans; and these two features are also found in the National Employment Savings Trust (NEST) program, scheduled to be introduced next year in the United Kingdom.[12]

The future effects of TFSAs

With tax advantages that can be considerably greater than those of RPPs and RRSPs, TFSAs provide another attractive option for individual saving. I shall argue, however, that growing use of TFSAs will have the side effect of greatly increasing the reliance of seniors on public pension benefits, particularly the GIS, increasing the fiscal burden of these benefits and making the retirement income system less sustainable.

A TFSA may be likened to an RRSP in which the tax advantage is "back-loaded" rather than "front-loaded." RRSP contributions are tax deductible, but withdrawals must be included in taxable income. In contrast, with a TFSA there is no tax deduction for the contribution and no taxation of amounts withdrawn. In both types of plan, no tax is paid on investment income as it accrues in the plan.

The attractiveness of saving in a TFSA as opposed to an RRSP (or RPP) depends on the tax rates facing the saver in the years when the contribution is made and when the proceeds are withdrawn. Where the tax rates are the same, the two types of plan are equally attractive. Where the tax rate is lower when benefits are paid out of the plan than when the contributions were made, RRSP saving provides a higher rate of return than TFSA saving. Where the reverse is true, TFSA saving provides the higher rate of return.

In these comparisons, the tax rates that must be considered include not just the rates applicable under income and payroll taxes, but also tax rates that are implicit in the loss of income-tested benefits as income rises. For a lower-income senior, for example, an additional dollar of RRSP income may lead to a 50-cent reduction in GIS benefits, while the tax-free income from a TFSA has no effect on GIS benefits. For potential GIS recipients, this means that the effective tax rate when benefits are paid out in retirement will generally be higher than that before age 65, when the contributions were made, so TFSA saving will be more attractive than RPP or RRSP saving.

While this feature of TFSAs can help to reduce the disincentive to save caused by the income testing for GIS benefits, it does so by expanding eligibility for the GIS and other income-tested

benefits to a potentially much broader group of seniors. If this effect were large enough, it could compromise the principle of targeting income assistance to those without other resources. It could also undermine measures to limit the fiscal burden of an aging population.

How many savers are likely to prefer TFSA saving to RPP or RRSP saving, and how big an effect might the shift to TFSAs have on future GIS costs? These questions are investigated in appendix A, using a model of household saving over the life cycle developed in Horner 2009b.

The model is very simple and stylized in some respects. For example, it assumes that each household saves a constant fraction of earnings each year for 35 years before retirement and then receives the proceeds in the form of a price-indexed annuity over the next 20 years. With such simplifications, however, the model can be very detailed in its treatment of all the provisions in the tax and pension benefit systems that affect the rate of return on saving. Thus, it is well suited to comparing the advantages of retirement saving in TFSAs as opposed to RPPs or RRSPs.

To obtain estimates of potential aggregate effects, the model results were first obtained for individual households at various earnings levels within six family types (see appendix A) and two home-tenure categories (owner and renter). The results were then aggregated based on a distribution of households, with primary earners aged 30 to 64, across corresponding earnings bands within the six family types. The distribution was obtained from the income tax family file for 2006.

The key results are as follows:

- About one-quarter of households, with the lowest earnings, have no incentive to save for retirement because public pensions alone allow them to maintain their living standards in retirement.
- Among the other three-quarters of households who do need to save for retirement, almost 60 percent would be better off saving solely in TFSAs. This includes all those with 2011 family earnings up to between $76,000 and $85,000, depending on family type. This population includes over half of RPP members and over half of RRSP contributors.
- Because those saving in TFSAs have no taxable pension income other than OAS and CPP/QPP benefits, they pay no income taxes in retirement, and they qualify for substantial levels of GIS and other income-tested tax credits. Under these assumptions, the proportion of seniors who pay income tax is projected to decline from over 50 percent to about 25 percent, and the cost of the GIS program is projected to rise by 84 percent.

Three important caveats must be noted about these results. First, they assume 100 percent take-up of TFSA saving by those for whom it is the best choice. Second, they ignore the fact that RPP members are not in a position, at least in the short term, to switch to TFSA saving. A move away from RPP to TFSA saving could happen only gradually. Third, as applied here, the model considers only savings choices — RRSP or TFSA — made at the start of a career; it does

not address, for example, the case of a household in mid-career, with a substantial existing accumulation of RPP or RRSP assets. Thus, the results — the estimated effects on tax liabilities and GIS costs — must be viewed as potential impacts that could be realized only after a lengthy transition period.

Nevertheless, the results have several implications. First, the high returns from TFSA saving as compared to RPP and RRSP saving for many modest- and middle-income earners suggest that some employers will be pressed to terminate or reshape their existing RPPs or DPSPs. In addition, a voluntary DC pension plan option that did not accommodate TFSA contributions would likely suffer from low take-up. Second, governments should take these projected longer-term fiscal consequences of the current TFSA rules into account when assessing pension reform options. In particular, the retirement income generated under options that mandate additional saving in non-TFSA form would displace GIS benefits and so could reduce the potential adverse fiscal effects of TFSA saving.

How strong is the case for reform?

Allowing and encouraging workers to maintain their living standards in retirement is not nearly as firm a policy goal as that of providing a basic minimum income guarantee. Perhaps then, the evidence of significant under-saving by 25 percent to 30 percent of modest- and middle-income earners should be considered simply as a reflection of varying preferences and consumption choices among individuals rather than as a policy problem.

Some issues deserve attention as we assess this viewpoint. To begin with, are attractive options for retirement saving truly available to most workers? As noted above, under-saving is concentrated among those whose options are limited to individual RRSPs or small-employer pension plans characterized by relatively high administration costs and low net rates of return. This is a major motivation for the large-scale savings plans proposed in Canada and the United Kingdom.

Also, how much paternalism should there be in the system — what balance between compulsory pensions provided by public plans, quasi-compulsory pensions provided by employers and voluntary saving? Forced saving according to an inflexible schedule imposes welfare costs that we must take into account. Note, though, that Canada's public pensions (OAS, GIS and the CPP/QPP) provide earnings-replacement rates well below the Organisation for Economic Co-operation and Development (OECD) average for all those earning more than 60 percent of the average wage. They replace about 25 percent of earnings as opposed to the OECD average of 55 percent at 1.5 times the average wage, and 20 percent as opposed to 50 percent at twice the average wage. For workers earning above the average wage, Canada's replacement rates are below those provided by the United States Social Security program as well: 25 percent as opposed to 32 percent at 1.5 times the average wage, and 20 percent as opposed to 29 percent at twice the average wage (Whitehouse 2009, figure 7). Canada relies more on employer-sponsored and individual saving than other countries do.

Moreover, the earnings replacement provided by OAS benefits is projected to decline substantially as CPI-based adjustments fall behind average wage increases. As well, the long-term decline in RPP coverage has reduced the role of quasi-compulsory saving in employer-sponsored plans.

Thus, the balance in Canada's retirement income system has been shifting and continues to shift significantly away from the provision of mandatory and quasi-compulsory pensions to voluntary saving. At the same time, there is growing evidence that saving in large-scale, professionally managed plans that involve at least some degree of paternalism (e.g., through automatic enrolment) yields results that are superior to voluntary saving in retail plans.

In summary, today's younger workers face a retirement income system that will provide much less income security than yesterday's system, with its growing public pension benefits and relatively high RPP coverage, has provided to today's seniors. Increasing longevity and anticipated low investment yields will further challenge the provision of retirement income to younger workers.

Reform Options

Recent proposals

A variety of proposals have been advanced for new government-sponsored plans aimed at strengthening Canada's retirement income system. They are outlined below and more fully described and compared in Baldwin (2010). Given the significant problems identified with individual retirement saving, this study focuses the analysis on these types of proposals.

In a C.D. Howe Institute Commentary, Ambachtsheer (2008) proposed a DC plan with a contribution rate (employer plus employee) of 10 percent of earnings over $30,000. The plan would feature automatic enrolment of employees at this default contribution rate but permit both employers and employees to opt out or choose another contribution rate.

The Alberta-BC JEPPS (2008) also proposed a DC plan. This plan would be voluntary for employers but compulsory for the employees of participating employers. The JEPPS suggested contribution rate options of 3 percent, 6 percent and 9 percent of pay, but indicated that additional flexibility could be provided — allowing plans with employer contributions only, for example.

New DB plans have also been proposed. CARP, or the Canadian Association of Retired Persons (2009), proposed a new universal pension plan modelled on the CPP. The Canadian Labour Congress (CLC 2009) proposed a doubling of the CPP benefit rate from 25 percent to 50 percent of earnings up to the current YMPE. The Federal Superannuates National Association (FSNA 2007) proposed raising the CPP benefit rate to 70 percent of earnings and raising the YMPE to the same level as the earnings limit on which DC contributions to RPPs may be made — $127,611 in 2011. In an options paper, the British Columbia Ministry of Finance (British Columbia 2010) considered three more CPP/QPP enrichment variants: BC-1 — doubling the benefit rate to 50 percent and doubling the YMPE (for 2011, an increase from $48,300 to $96,600); BC-2 — leaving the benefit rate at 25 percent but doubling the YMPE; and BC-3 — leaving the benefit rate at 25 percent but increasing the YMPE by 50 percent (to $72,450 in 2011). Finally, for purposes of analysis, Wolfson (2011) presents an option that provides an additional CPP/QPP benefit of 40 percent of earnings between one-half of the YMPE and twice the YMPE.

These proposals share several features. Their aim is to provide a large-scale, low-cost pension plan that could address the current problems of low pension coverage among employees of smaller employers and the high cost and limited effectiveness of individual plan saving. Though created by government, the proposed plans would be administered at arm's length, particularly with regard to the investment of plan assets. Governments would have no responsibility to make up any plan deficits (under the DB versions) or compensate plan members in any way in the event of adverse investment outcomes. Benefits, in DB plans, would be fully funded, and years of employment before plan start-up would not count toward the calculation of benefits.[13] In other respects, the plans differ widely.

Plan design issues

Before selecting illustrative reform options for assessment, it is useful to consider, at least in a preliminary way, a checklist of issues regarding plan design.

Type of plan: DC or DB?

The choice between a DC and a DB plan is probably the most fundamental choice. Three points deserve mention at the outset. First, the assumption of no government backstopping in the event of plan deficits means that the classic form of a DB plan — one that provides predetermined benefits for the plan member with investment risk being absorbed by the employer — is not an option.[14] Moreover, a slowly growing contributor population means that fluctuations in the plan's funding status must be addressed by adjustments to both benefit and contribution levels.[15] Thus, the DB options may be seen as target-benefit plans, in which the prescribed benefit is expected to be provided but is not guaranteed, rather than pure DB plans. Such plans are not new. The CPP legislation currently provides for possible benefit adjustments in response to a funding shortfall, and many existing DB RPPs have some degree of benefit conditionality.

Second, by providing uniform contribution and benefit rates for plan members of differing ages and with differing life expectancies, DB plans involve some degree of cross-subsidization. If participation in such a plan were voluntary, the plan would be exposed to adverse selection. That is, high take-up by those with above-average costs for their defined benefit would drive up the required contribution rate, making the plan unattractive to the average prospective member.[16] Consequently, DB options really make sense only with mandatory participation.

Third, because their contribution costs are based on the assumption of plan membership over a career, DB plans do not work as well as DC plans in handling intermittent participation and the transfer of benefits between plans. Thus, a DB option would be most effective if it were national in coverage, like the CPP/QPP.

Mandatory or voluntary participation?

The terms of participation are the second critical choice. Mandatory plans are more effective in ensuring at least a certain level of retirement savings, but voluntary plans provide individuals with greater flexibility to adapt their savings levels to their preferences and situations. The Alberta-BC JEPPS (2008) concluded that, to avoid "employment leakages" to neighbouring regions, a mandatory plan should be national in scale.[17]

Contribution and benefit structure

The proposals advanced to date with regard to the structure of contributions and benefits vary widely in scale and structure. Ambachtsheer's (2008) Canadian supplementary pension plan (CSPP) bases contributions on earnings over a $30,000 floor; the JEPPS plan would allow a variety of contribution structures. The DB options range from one that more than doubles the existing CPP/QPP benefit rate to ones that provide new benefits only to those earning above the YMPE.

There are three points to make here. First, under voluntary DC options, the question of allowable contribution levels is of secondary importance; the main issue is whether a default contribution rate should be specified in order to influence savings behaviour.

Second, while a DC plan contribution rate based on earnings above a floor level, as under the CSPP proposal, could target contribution requirements on those who need private pension income, it may not serve well as a replacement for existing RPPs that cover all employees.

Third, as noted above, mandatory DC and DB options impose welfare costs on some participants by restricting choice in the level and timing of saving and ignoring differences in desired savings levels among participants. Some individuals might be better off paying down mortgage or consumer debt in a year than contributing to a pension plan. Others might find it more advantageous to invest in a small business or in further education. Some individuals may save less than others because they plan to retire later. Concern over the welfare costs of ignoring the differences in individual tastes and circumstances was one factor that led the United Kingdom Pensions Commission (United Kingdom 2005, 154) to reject a mandatory earnings-related pension plan even as it rejected a purely voluntary approach. This is a difficult issue, as there is a clear trade-off between the welfare costs of a mandatory plan and its unrivalled effectiveness in providing retirement income security.

Moreover, the issue is complicated by the fact that income-tested benefits like the GIS already distort the choices of modest-income earners, reducing the net rate of return on their savings and thus discouraging them from saving. The prospect is for strongly expanding OAS and GIS costs as the population ages, particularly when TFSA saving allows increased GIS eligibility. Like health care, OAS and GIS benefits are not pre-funded, so their costs will impose a substantial tax burden on tomorrow's workers. Covering modest-income workers in a mandatory contributory pension plan would limit this future tax burden by reducing their reliance on unfunded, income-tested GIS benefits.

In summary, the contribution and/or benefit rates under mandatory plans should be designed to provide (together with OAS and the CPP/QPP) less than full consumption replacement, leaving room for voluntary private saving. The room left should be greater for middle- and higher-income earners than for modest-income earners, though, because the GIS discourages saving by the latter group.

Relationship with existing pension plans

The relationship of a new pension plan to existing RPPs will depend on the nature of the new plan. If it were a voluntary DC plan, its main purpose would be to offer a better vehicle for

pension saving. Employers would be free to use this option or continue with their existing plans. Under a mandatory DC or DB plan, the question of whether an exemption should be provided for members of existing RPPs comes down to which benefits are "better," those under the new plan or those under the existing RPPs.

If the new plan were a mandatory DC plan, or an automatic enrolment plan with a default contribution rate but giving members the ability to opt out, an exemption from the new plan would likely be provided for those with existing RPPs that provide comparable savings opportunities. This is the policy adopted for the automatic enrolment plan that will begin operating next year in the United Kingdom (United Kingdom 2006).

If the new plan were a mandatory national DB plan, on the other hand, there are good arguments for providing no exemptions, leaving RPP sponsors to adjust the benefit and contribution rates in their plans to reflect the benefits provided under the new plan. This was the approach taken when the CPP and QPP were introduced. Benefits under the new plan would be more secure than RPP benefits because they would be fully portable in Canada. Replacing a portion of the benefits now provided under RPPs with fully portable ones under a new national plan would also reduce the barriers to labour mobility created by the existing DB RPPs. One disadvantage of a reduction in benefit levels under existing RPPs would be an increase in RPP administration costs per unit of benefit. This could lead some employers to cancel their plans. For most employers, though, the increased administrative cost burden should be outweighed by the advantage of a reduction in the cost and risk of their plans.

Regulatory treatment

Regulatory issues to be resolved in establishing a new plan include the tax treatment of contributions and benefits, whether savings under the new plan should count against the RPP/RRSP limits, and whether other tax and benefit regulations should apply to the plan. Because the aim of the new plan would be to complement, or substitute for, saving in RPPs and RRSPs, it seems logical that it should receive the same tax treatment — deductible contributions and taxable benefits — as those plans, be included under the same limits as they are, and be subject in a similar way to other regulations. Some choices, though, may depend on the type of plan.

As noted above, a voluntary DC plan such as the CSPP proposal would likely have to provide a TFSA-like option — with nondeductible contributions and non-taxable benefits — to attract significant contributions from modest- and middle-income earners. If it did not, they would be better off saving in TFSAs because of the exclusion of TFSA withdrawals in determining eligibility for the GIS and other income-tested benefits.

A mandatory DC or DB plan, in contrast, could have as one objective to displace potential TFSA saving in order to limit the future costs of GIS and other income-tested benefits and to maintain a broad income tax base in the growing population of seniors. If so, the plan should, like RPPs and RRSPs, have deductible contributions and taxable benefits, with no option for TFSA-like treatment.

Savings under mandatory plans could be included under the RPP/RRSP limits or, following the example of the CPP/QPP, could be ignored. Excluding these savings from the limits, though, would represent a substantial, largely redundant increase in the tax deferral limits.

Most other tax and benefit regulations, while appropriate to voluntary plans, would not be relevant to the administration of savings under a mandatory government-sponsored plan.

Inclusion of the self-employed

The self-employed should be eligible for, or covered by, a voluntary or mandatory plan. As under the CPP/QPP, the self-employed would be responsible for employer-plus-employee contributions under a mandatory plan.

Locking in, annuitization and interplan transfers

Under a mandatory DB plan, with contribution or benefit rates set at a level that leaves room for additional RPP/RRSP saving to meet consumption-replacement targets, it makes sense to provide benefits in annuity form without pre-retirement access. The CPP and QPP provide pre-retirement benefits to survivors of plan members and to plan members with severe disabilities, however, and there would likely be demand for parallel benefits under a new CPP/QPP-type plan. Under a voluntary DC plan, the pressures for access to funds before retirement would be greater, because the plan would compete for contributions with RRSPs and TFSAs that do provide such access. Locking in all contributions until retirement would discourage participation in the plan and so would likely be ineffective in generating higher retirement income levels (Horner 2008b). The mandatory DC option is an intermediate case. It could be treated in the same manner as a DB plan. Alternatively, contributions could be locked in with limited, predefined exceptions as are currently available under pension benefits legislation.

Regarding the form of post-retirement withdrawals under DC options, Ambachtsheer (2008, 265) proposes that his DC plan include a default annuity purchase process that starts for each participant at age 45 and aims at annuitizing 50 percent of the participant's assets by age 65. Participants would have the right to opt out. This process would reduce the consequences of adverse annuity prices at the time of retirement or, if the plan permitted a registered retirement income fund (RRIF) withdrawal approach, of large investment losses in retirement or late career. The annuity approach seems sensible, though the strong preference of Canadians for RRIFs as opposed to annuities may make it a tough sell if the choice is voluntary. With regard to interplan transfers — for example, from RRSPs to a new plan — these would appear to make sense under DC options but not under a DB plan. The case for allowing transfers out of a large-scale DC plan to RPPs or RRSPs is weaker because of the advantages of saving in a large-scale, low-cost plan.

Administration and governance

As noted above, the various proposals made to date share the feature of government sponsorship but keep the investment function at arm's length from government so that it is directed purely to advancing the interests of plan members. For services such as investment, accounting and communications, the agency created to administer the plan could hire staff or contract for services with the private sector. Investment choices are fundamental to any pension plan option, but a DB

option involves additional dimensions of plan stewardship such as how to balance the interests of retirees and younger and older workers in amending benefit and contribution schedules to respond to the emergence of a large funding deficit. In its options paper, the British Columbia Ministry of Finance suggests that it may be preferable for a DB plan to maintain the CPP governance structure under which fiduciary responsibility rests with federal and provincial ministers rather than an appointed board of trustees (British Columbia 2010). Thus, while a DB plan could operate as a stand-alone plan, it might better be set up as a second tier of the CPP (and QPP, if Quebec acted in concert).

Plan start-up

With a voluntary DC option, the main tasks following the decision to proceed are to elaborate the plan terms and operating procedures, set up the administrative body and systems, and begin communications with prospective participants. A mandatory or automatic enrolment plan would need to build in additional lead time to minimize the disruption of employee compensation agreements. Sponsors of DC plans would also need time to determine precisely what groups of RPP members might be exempt from the contribution requirements. Under a DB option, the sponsors of existing RPPs would need time to decide what adjustments to make to these plans. In introducing new retirement savings rules in the United Kingdom, with automatic enrolment in employer-sponsored plans or in the new National Employment Savings Trust (NEST) for workers without employer plans, the government proposed the scheme in 2006, enacted the associated legislation in 2008 and will start plan operations as planned in 2012.

Transition

It must be emphasized that only younger workers would see the full benefits of any of the proposed options in their retirement incomes. Among those now nearing retirement age, retirement incomes would be bolstered by only a few years of DB accruals or contributions to a DC plan.

Beyond this general point, a specific issue arises with the implementation of a DB plan. The full-funding cost of benefits for such a plan is based on contributions over a full career. The cost of a benefit accrued in a single year of participation by someone aged 64 at the inception of a new plan could be over 50 percent higher than the full-career cost. Consequently, to avoid forcing younger workers (and tomorrow's workers) to pay more than the full cost of their own benefits, a new DB plan must either promise lower benefits to mid-career participants or charge them higher contribution rates for the same benefits that younger workers get. The CPP and QPP provide a precedent. When they were introduced, they included a crude transition measure that reduced benefits to those nearing retirement in the early years of the plan.

Assessing the Options

Having narrowed down the range of choices in plan design, I will now set out three illustrative pension plan options for closer analysis. First, I examine their net effect on retirement saving, taking into account the likely rate of participation under a voluntary DC plan and the anticipated effects of all three options on existing savings levels in RPPs and RRSPs. I then assess the options in terms of the level and security of the retirement income they

should produce, their effects on labour mobility and labour supply, and their complexity for participants. Finally, I examine their ability to help reduce the adverse fiscal effects of a future large-scale shift from RRSP to TFSA saving.

Three illustrative pension plan options

The three options to be analyzed and compared are a CPP/QPP enrichment plan (or equivalent stand-alone DB plan), a mandatory DC plan and a voluntary DC plan. The DB plan provides a benefit of 15 percent of earnings up to the YMPE (or increase in the CPP/QPP benefit rate from 25 percent to 40 percent) plus a benefit of 25 percent of earnings between one and two times the YMPE. The contribution rates assumed necessary to fund the benefits are 3.6 percent of earnings (1.8 percent each for employers and employees) from $3,500 to the YMPE and 6.0 percent (3 percent and 3 percent) of earnings from the YMPE to two times the YMPE.[18] In order to facilitate comparison, the mandatory and voluntary DC options have the same contribution schedule as the DB plan.

Table 2 shows the scale of this CPP/QPP enrichment option (called "Horner" in the table) in comparison with those of the recent DB plan proposals mentioned earlier: the CLC, the FSNA and the Wolfson proposals, and the three BC options.

Table 2: Benefit rates under selected CPP/QPP enrichment proposals, by YMPE range (percent)

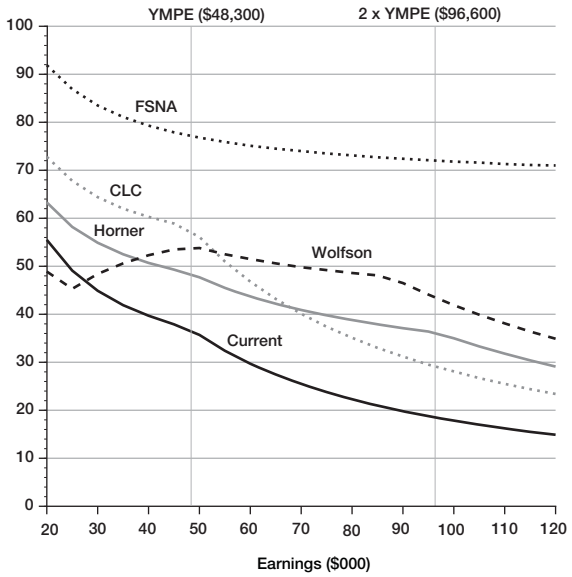
YMPE range	0 – 0.5	0.5 – 1.0	1.0 – 1.5	1.5 – 2.0
Proposals				
BC-3	0	0	25	0
BC-2	0	0	25	25
Horner	15	15	25	25
CLC	25	25	0	0
BC-1	25	25	25	25
Wolfson	0	40	40	40
FSNA	45	45	70	70

Note: Proposals are ranked from the least to the most generous benefits.

The Horner DB plan provides lower benefits and contributions up to the YMPE than the CLC or FSNA proposals, but higher than the BC-2 and BC-3 options. It provides higher benefits than the Wolfson proposal at low earnings levels, and lower benefits at higher earnings levels. I selected the plan structure in an attempt to balance the benefits of higher saving in a cost-effective plan against the welfare costs of forced over-saving among some individuals or families.

At earnings of $45,000 (close to the average wage in 2011), pre-tax OAS and CPP/QPP benefits currently replace 38 percent of pre-retirement earnings. When fully phased in, the Horner DB plan would increase this replacement rate to 52 percent, assuming no deterioration in OAS levels in relation to wages; as shown in figure 1, the replacement rate would be 49 percent if one assumes, as discussed earlier, that over the 20 years to 2031 the price indexation of OAS benefits will reduce their value by almost 21 percent relative to wages. Depending on family type and whether the family home is owned or rented, a gross replacement rate between 50 percent and 75 percent is needed to provide consumption continuity at retirement (Horner 2009b). Thus, under this CPP/QPP enrichment plan, public pensions would provide close to full consumption replacement for those earning up to the average wage, but would leave

Figure 1: Pre-tax earnings replacement rates from OAS income and QPP/CPP benefits, current system and selected reform



Source: Author's calculations using 2011 OAS and CPP/QPP parameters for a single individual.
Note: The replacement rates under the reform options include a 21 percent reduction in the OAS benefit level relative to earnings, which is anticipated to occur over the next 20 years.

progressively more room for supplementary retirement saving through RPPs, RRSPs and TFSAs as earnings increase to and beyond the average wage.

Doubling the CPP/QPP benefit rate, as proposed by the CLC, would increase the replacement rate to 59 percent at earnings of $45,000, even after allowing for the decline in OAS. While the higher CPP/QPP benefits under this option would more effectively displace GIS benefits and thus do more to address the potential problems stemming from TFSA saving, the option would impose significant welfare costs on many modest-income earners by mandating excessive rates of retirement saving for them. The proposed 70 percent benefit rate proposed by the FSNA would impose even higher welfare costs on a larger population.

In line with the earlier discussion of plan design issues, the DB plan is assumed to be national in scope and universal in coverage. RPP sponsors are expected to respond by integrating their plan benefits with those under the new DB plan. Integration with the enriched CPP/QPP benefits implies reductions in existing RPP benefits that are typically in the range of 33 to 40 percent.[19]

The mandatory DC plan should probably be national in scope as well, but would not be intended to displace benefits under existing RPPs, or at least under DB RPPs. Accordingly, the enabling legislation would define "exempt RPPs" whose members and contributing employers would be exempt from participation in the new plan. (In estimating contribution flows under the plan, though, it is assumed that some RPP sponsors would respond by terminating their RPPs.)

For purposes of comparison, the voluntary DC plan is assumed to be national in scope and government sponsored, although neither of these features is necessary. While there is no need to exempt members of particular RPPs, the contribution flows are based on the assumption that members of exempt RPPs under the mandatory DC option would not participate in a voluntary plan. The option also follows the Alberta-BC JEPPS approach of having voluntary participation by employers but, as under RPPs, compulsory participation by employees of employers who participate.[20]

Effects on retirement saving

To show how the options would operate and how effective they might be in bolstering retirement saving, table 3 compares estimated contribution flows under the three options. (The

Table 3: Contribution flows under the three pension plan options (billions of dollars)

	CPP/QPP enrichment	Mandatory DC	Voluntary DC
Total contributions	20.3	11.6	7.2
RPP offset	-9.8	-1.4	-1.3
RRSP limit offset	-2.2	-2.2	-1.2
Additional RRSP offset	-1.7	-1.7	-1.1
Net savings	6.6	6.3	3.6
Savings gap reduction	3.3	3.1	1.5
Target efficiency (%)[1]	50	49	41

Source: Author's calculations based on data for 2006 from CRA (2008), tables 11 and 12.
[1] Savings gap reduction as a percentage of net savings.

CPP/QPP enrichment option is represented by its contributions as if it were a DC plan.) As well as total contributions under the plans, the table includes estimates of offsetting reductions that should be expected to RPP and RRSP saving. It also suggests how effective the options might be in reducing savings gaps or shortfalls from target earnings-replacement levels.

The estimates are based on a data set described in appendix B. Like the data used in appendix A, this data set is derived from taxation data for 2006. Because of the focus on the possible responses to a new plan by RPP sponsors and RRSP savers, however, the data here are organized by individual rather than by household, and table 3 measures savings adequacy against the simpler benchmark of pension income equal to 50 percent of pre-retirement earnings. The estimates involve a number of assumptions regarding possible behavioural responses by individuals and employers. Thus, they should be taken as simply suggesting rough relative magnitudes for the three options.

The main assumptions underlying the estimates and points to note about them are as follows:

- Individuals with reported Pension Adjustment (PA) amounts in excess of a threshold were assumed to belong to "exempt RPPs." As they do not participate in the DC plans, this explains the much lower total contributions under the mandatory DC option as compared to the DB option.
- The total contribution level under the voluntary DC option depends on the participation rate. As noted above, members of "exempt RPPs" are assumed not to participate. Among other employees, the assumption is that take-up (via employer participation) is 55 percent. Among the self-employed, it is 20 percent. Ten percent of the population is treated as self-employed.
- Under the DB option, all RPPs are assumed to reduce their benefits by the amount of the CPP/QPP enrichment. This explains the high RPP offset for this option.
- Under the two DC options, it is assumed that employers terminate some less-generous RPPs covering a small minority of RPP members. This results in the RPP offset for these options. In the voluntary DC case, only where members of such RPPs participate in the new plan are their RPPs terminated.
- In some cases under all three options, the total of the PA (net of any offset), the RRSP contribution and the contribution to the new plan exceeds the RRSP limit. The limit offset reduces the RRSP contribution to correct for this.
- The RRSP offset refers to RRSP contribution reductions by participants in the new compulsory or voluntary plans. The assumption made is that two-thirds of plan participants with

RRSP contributions will reduce those contributions, and the amount of the reduction in each case will be the lesser of the new contribution and two-thirds of the RRSP contribution. This assumption is based on the judgment that, mainly because contributions to the new plan are locked in (under each of the options), they are imperfect substitutes for the RRSP contributions. Accordingly, the offset should be only partial.

- Savings gaps for individuals are calculated by comparing actual RPP and RRSP savings levels with the savings needed to obtain a target pension income level (including benefits under OAS, GIS and the existing CPP/QPP) of 50 percent of earnings. About 23 percent of the population of CPP/QPP contributors has a non-zero savings gap, and the aggregate of the shortfalls in 2006 amounts to $10.0 billion. The savings gaps are recalculated with each option in place to obtain the savings gap reductions. Comparing the savings gap reduction with the net savings under the plan provides a target efficiency measure of how focused an option's effects are on those with savings gaps.

Three results deserve highlighting. First, despite the identical contribution structures under the three options — 3.6 percent of earnings up to the YMPE and 6 percent of earnings from one to two times the YMPE — the total contribution flows are vastly different. The DB option supplants benefits in RPPs, while the DC options do not. Which approach is best depends on whether the CPP/QPP enrichment is seen as providing "better" pension benefits than RPPs. Another consideration is whether employers would be happy to continue running the somewhat smaller, less risky RPPs that would result from integration with the enriched CPP/QPP benefits.

Second, the effectiveness of the voluntary DC plan in raising savings levels depends critically on the rate of employer participation in the plan. The 55 percent take-up assumption (20 percent for self-employed workers) could well be too high.

Third, though they may be under- or overestimated, the savings offsets through terminated RPPs and reduced RRSP contributions are important. Thus, the gross amount of contributions under a new plan is not a good measure of how successful the plan is in increasing net retirement saving.

The initial aggregate savings gap of $10 billion may appear quite low, and the effects of the new pension plans quite small. Some comments: First, note that the savings gap is estimated for 2006 and would be about 15 percent higher if adjusted for subsequent earnings increases. Second, the target pension of 50 percent of pre-retirement earnings on which the savings gaps are based is a modest one. As noted in appendix B, it corresponds on average to a target of 90 percent consumption replacement at retirement. With regard to the savings gap reductions resulting from the introduction of the new pension plans, more detailed results indicate that the mandatory plans are quite effective in reducing savings gaps among modest- and middle-income earners (those with 2006 earnings in the $25,000-$60,000 and $60,000-$100,000 ranges). For example, the DB plan (CPP/QPP enrichment) option reduces the aggregate savings gap of modest-income earners by over 70 percent and that of middle-income earners by about 49 percent. The gap for low earners is already zero; that for high earners is large but arguably

not a policy problem, because high earners tend to have substantial assets outside of RPPs and RRSPs. The effects of the mandatory DC option are similar.

The estimates in table 3 suggest that a voluntary DC plan would be considerably less effective than the other options in generating new net savings or reducing the savings gap. This suggests that the Pooled Registered Pension Plans (PRPPs) proposed by finance ministers last December should be seen only as complementary to other measures to improve retirement income levels. (Also, the proposed PRPPs may not have sufficient scale and sufficiently low administration costs to offer a real improvement over current savings options.) In contrast, the net effects of the mandatory DB and DC options are quite similar. Thus, in evaluating the options, it is important to examine their other features and effects.

Level and security of retirement benefits

Perhaps the key difference between the DB option and the two DC options is the fact that DB plans allow a degree of risk pooling between age cohorts. Because of swings in investment returns over time, the retirement income levels achieved by different age cohorts of DC plan members are variable and quite uncertain.[21] A life cycle investment strategy could be used to limit this uncertainty. Under such a strategy, an age cohort's investments are gradually shifted toward less risky investments — with less equity and more debt — as the cohort nears retirement, and some assets may be progressively annuitized as well.

Under a DB plan, the pooling of risks between cohorts can reduce the dispersion and uncertainty of outcomes. A temporary investment shock may not require adjustments to contribution or benefit levels. A severe or prolonged adverse investment swing can be addressed by contribution and benefit adjustments that spread the pain over the whole population of current and retired workers. The benefit adjustments would normally take the form of a reduction in the rate of benefit indexation. If larger benefit adjustments were needed, they could involve a reduced rate of wage indexing of initial pension levels under an updated career average benefit formula like that of the CPP/QPP.[22] In the event of a swing back to a strong funding position, benefits could be increased to make up for previous shortfalls from full indexing.

With inter-cohort risk pooling, a DB plan can adopt a longer investment horizon than a DC plan, accepting somewhat more risk (e.g., an investment portfolio with more equity and other illiquid assets and less shorter-term debt) in order to obtain a higher investment return. The life cycle investment approach used by DC plans may thus be seen as a second-best strategy necessitated by the absence of inter-cohort risk-pooling opportunities. (Note that the estimates reported in table 2 do not take into account the ability of the DB option to generate higher investment returns and pension income than the DC options.) Cui, de Jong, and Ponds (2005) and Blommenstein et al. (2009) employ simulation analysis based on streams of variable investment returns to analyze the relative advantages of different pension plan designs in delivering benefits to populations of plan members. When they take into account the security and predictability of benefits as well as the average level, both studies find that a DB plan in which both contribution and benefit levels are adjusted to respond to funding shocks delivers the best performance.[23]

Two qualifications are important regarding the benefits of risk pooling. Hamilton (2009) points out that adverse investment results can persist for a long time. For example, the average real return earned by Canadian pension funds throughout the 1970s was very close to zero. If such experience were repeated, unpleasant adjustments to contribution and benefit levels could be required for a sustained period of time. Second, Ambachtsheer (2005) has argued that risk-pooling arrangements are easily undermined by decisions that break the risk-sharing deal — generally to the disadvantage of younger and future generations that have little or no say in the governance of the current plan. Using a possibly transitory surplus to enrich early-retirement benefits would be an example. One might respond that the history of the CPP/QPP over 40-plus years gives reason for optimism that a national DB plan can be sustainable. Investment performance has become important for the CPP/QPP only in recent years, however, and, except for the market crash of 2008, the investment environment has generally been benign during this time. Thus, these arguments suggest that conservatism remains important in the governance of a national DB plan, and that plan sponsors should take care not to overestimate the potential gains from intergenerational risk pooling.

Gunderson and Wilson (2009), in arguing that the policy focus should be on DC plans, point to several instances where DB plans are more risky for plan members than DC plans. These include the risk of a loss of pension benefits associated with

- unemployment or a change of jobs;
- insolvency of the sponsor of an underfunded plan; or
- costly litigation over plan surpluses or deficits.

They also point to the portfolio risk involved in having retirement income assets, as well as employment income, depend on the continuing financial health of the employer. In assessing these points, the key thing to note is that they apply to DB plans sponsored by single employers and are not relevant to an economy-wide plan like a CPP/QPP enrichment.

Another possible advantage of a DB option is that the defined retirement benefit, when added to existing benefits under OAS and the CPP/QPP, may encourage additional saving by making consumption-replacement targets appear closer and more attainable. Evidence of this behaviour has long been noted (Cagan 1965) and may be seen in the propensity of RPP members to supplement their pension saving with RRSP contributions. Among modest- and middle-income earners under age 65, 55 percent of RPP members also contributed to RRSPs in 2008. This is nearly as high as the 59 percent RRSP contribution incidence among CPP/QPP contributors who were not RPP members. In these income groups, the RPP members contributed 70 percent as much on average as did those saving in RRSPs alone (CRA 2008, table 12). These savings patterns are explained partly by the fact that RRSP savings and locked-in RPP savings are imperfect substitutes; they are unlikely to be explained purely by a tendency of high savers to choose occupations where pension coverage is high.

Labour market effects

Employer-sponsored DB pension plans can distort employee choices and so have harmful effects on the labour market. By basing benefits on final average earnings, and by providing

highly discounted termination benefits to employees who leave the employer before retirement age, they create barriers to labour mobility. By providing generous pension benefits at age 60 or earlier, they encourage early retirement and discourage later retirement and phased retirement. DC plans do not have these drawbacks. Plan members who change jobs keep the full amount of their vested DC benefits. In addition, the pension levels obtainable from a DC plan generally increase each year that the receipt of benefits is deferred. Thus, DC plans do not deter worker mobility or discourage older workers from continuing to work.

A national DB plan based on the current CPP/QPP design, however, would share these positive labour market attributes. Benefits would be completely portable within Canada under such a plan, providing no penalty for changing jobs. Moreover, the plan would not encourage early retirement in the way that DB RPPs often do. For example, the updated career average structure of CPP/QPP benefits means that an additional year of work at a lower earnings level would not reduce pension benefits, as it often does in a DB RPP, where the pension is based on an average of earnings in the final years of work. In addition, the recently increased actuarial adjustments for commencing CPP/QPP benefits before or after age 65 will significantly reduce the incentive to begin receiving benefits early.[24] In fact, the labour market effects would be significantly more positive under a new DB plan than under the DC options. The reason for this is that the new non-distortionary DB plan would displace benefits under existing single-employer RPPs (which discourage labour mobility and reward early retirement), while the DC plans likely would not.

Another issue is the possible negative labour supply effects of higher compulsory contributions, particularly among low-wage earners. In theory, there is no problem so long as the contributions buy retirement benefits at a fair price. Workers then see the contributions as valuable disbursements rather than as payroll taxes. However, this will often not be the perception, particularly among those for whom the retirement benefits will displace GIS benefits. This is a problem for mandatory DB and DC plans alike.

Changes to the structure and tax treatment of CPP/QPP premiums could help to address this issue by moderating premium increases for low- and modest-income earners. Two options could be considered. One applies only in the case of the new DB (CPP/QPP enrichment) plan and would modify its contribution schedule. The other would restructure a portion of the existing CPP/QPP premiums.

The first option is based on the observation that there already exists a degree of redistribution within the CPP/QPP because, while benefits are based on all earnings up to the YMPE, contributions are paid only on earnings above the Year's Basic Exemption (YBE) of $3,500. This feature could be enhanced under a new DB plan by basing contributions on earnings above a higher YBE. For example, instead of an employer-plus-employee contribution schedule of 3.6 percent of earnings between $3,500 and the YMPE, and 6.0 percent of earnings between the YMPE and two times the YMPE, the same benefits could be funded with rates of 4.1 percent on earnings between $10,000 and the YMPE, and 6.8 percent of earnings between the YMPE and two times the YMPE.

This would lower contribution rates, *calculated on full earnings*, at lower earnings levels, while raising them modestly for higher earners. For example, at earnings of $20,000, the contribution cost of the new plan would drop from 3.2 percent to 2.0 percent of full earnings, while at earnings of $70,000, the cost would increase from 4.1 percent to 4.3 percent of full earnings.

The second option is based on the observation that while a contribution rate (employer-plus-employee) of about 6 percent would be sufficient to fund the existing CPP/QPP benefits earned in a year, the current premium rate is 9.9 percent. This means that contributions corresponding to about 4 percent of covered earnings currently fund "legacy costs" — costs related to the benefits going to older workers and current retirees who contributed less than 6 percent of earnings during all or part of their careers. As these legacy costs are not associated with benefits currently accruing under the CPP/QPP, no strong logic demands that they be financed with a payroll tax on earnings below $48,300. They could just as well be financed from broader tax bases such as the GST or the personal income tax. A simpler change, though, would be to reprofile the legacy-cost portion of the CPP/QPP contribution, spreading it across all earnings (above the $3,500 minimum) rather than just earnings up to the YMPE. This would allow the 4 percent "legacy-cost contribution rate" to be reduced to about 2.5 percent, reducing the current employer-plus-employee premium rate on earnings up to the YMPE from 9.9 percent to 8.4 percent. For those earning up to the YMPE, the contribution rate reduction of 1.5 percentage points would offset over two-fifths of the 3.6 percent contribution rate required under the mandatory DB or DC options.[25]

The downside of these changes is that either one would raise taxes and increase marginal tax rates on earnings above the YMPE. These negative effects could be reduced, although with a significant revenue cost to governments, by once again providing a full tax deduction for employee CPP/QPP premiums rather than a tax credit at the bottom-bracket tax rate. The current tax treatment of CPP/QPP saving is anomalous. When income is deferred from one year to another, the normal tax treatment is either to provide a full tax deduction for the income set aside and tax the proceeds fully when they are received (as for RPPs and RRSPs) or to reverse this pattern of taxation and deductions (as for TFSAs). With only a partial tax exemption on the income set aside (through the bottom-bracket tax credit for employee contributions) but full taxation of the benefits, the tax treatment of CPP/QPP involves a degree of double taxation of the deferred income. This anomaly would be highlighted by the introduction of a CPP/QPP enrichment, or mandatory DC plan, with fully deductible employee premiums.

Complexity

In general, DB plans are more complex and less easy to understand for plan members than are DC plans. Moreover, the probable need for a transitional structure of contributions or benefits for current older workers under a DB plan adds complexity, as does the fact that the DB option would lead to benefit adjustments under existing RPPs.

The complexity introduced by a DB option is easy to overstate, however. The government already provides CPP/QPP contributors with statements of their projected benefits at retirement, and these statements could be amended to include benefits under a new national DB

plan (or CPP/QPP enrichment). This information provides a fairly simple basis for plan members to assess the need for supplementary retirement savings.

Implications for TFSA effects

By increasing pre-funded pension incomes among modest-income earners, a mandatory DB or DC plan could limit a potentially large increase in future GIS costs associated with the growing use of TFSAs. According to my estimates, a shift from RRSP to TFSA saving could increase GIS costs by as much as 84 percent over the long term (see appendix A). A simulation of the DB option using the same model shows that the displacement of GIS benefits by additional CPP/QPP income would reduce this GIS cost increase to 45 percent. The effect of introducing the mandatory DC option would be about the same. In contrast, introducing a voluntary DC plan would have little effect on future GIS costs, because the plan would be unattractive to modest-income earners unless contributions to it were made eligible for TFSA treatment.

While introducing a new mandatory DB or DC pension plan with deductible contributions and taxable benefits would reduce the adverse fiscal effects of TFSAs, additional measures may be warranted. One approach would be to change the way that TFSA saving affects eligibility for the GIS and other income-tested benefits. Eligibility for these benefits is based on the tax filer's net income (equal to total income less deductions and found on line 234 of the tax return). Without changing the basic tax treatment of TFSA saving (contributions are nondeductible and withdrawals nontaxable), it would be possible to require that 50 percent of TFSA contributions be subtracted from, and 50 percent of the withdrawals be included in, net income.[26] Simulation results suggest that this rule change would further reduce the GIS cost increase from 45 percent to 21 percent.

The current policy of including TFSA contributions in, and excluding TFSA withdrawals from, net income follows the logic of TFSA taxation and also helps counter the disincentive to save caused by the high tax-back rates under GIS and other benefits for seniors. However, it completely undermines the purpose of income testing the GIS and other benefits, which is to focus resources on those with limited private income. Excluding 50 percent of TFSA contributions from, and including 50 percent of TFSA withdrawals in, net income would provide a reasonable middle ground. It would ensure a positive rate of return on TFSA saving even for those anticipating GIS benefits while helping to avoid the excessive reliance on GIS that may be expected if no policy change is made.[27] Introducing the 50 percent contribution exclusion along with the 50 percent benefit inclusion would ensure that those using TFSAs for short-term savings purposes were not treated unfairly.

Conclusion

As it has developed over the past 40 years, our three-tier retirement income system has provided satisfactory pension incomes for a rapidly growing population of retirees and has led to a dramatic reduction in poverty among Canadian seniors. Yet a substantial number of today's workers, 25 to 30 percent of modest- and middle-income earners, are not saving enough to avoid a significant drop in their living standards at retirement. Current trends — increasing longevity and an aging population, lower expected rates of return on investment, declining earnings replacement from OAS, declining coverage of employer-sponsored RPPs and weaknesses in RRSP saving — are expected to exacerbate these shortfalls.

TFSAs will provide an attractive savings vehicle for many workers but, in doing so, they can be expected to further undermine pension coverage and to result in greatly increased reliance by future seniors on the GIS and other benefits meant to be claimed by those without significant levels of private retirement income.

Diverse groups have proposed introducing some form of new government-sponsored pension plan to strengthen the system. These proposals include DB and DC plans and either mandatory or voluntary participation. Under a DB plan, benefits would be fully funded. Both benefits and contributions would be subject to adjustment as needed, to cope with funding shortfalls. Governments would not backstop the benefit promises.

A number of plan design issues arise, depending on the type of plan that is selected. Because of adverse selection and the difficulty of dealing with interrupted participation, a DB plan would be successful only if it were mandatory and national in scope. A mandatory DC plan should also have national coverage to avoid regional employment shifts induced by its contribution cost. Voluntary DC plans could be regional, so long as they were large enough to benefit from economies of scale.

A mandatory DB plan would be much larger than a mandatory DC plan with the same contribution structure, because the former would almost certainly replace benefits provided under existing RPPs, while the latter would likely exempt RPP members from its contribution requirements. Under a voluntary DC plan, the contribution flow would be further reduced by incomplete take-up. The level of net new saving associated with the introduction of a new plan would also depend on the extent of offsetting reductions in RRSP contributions.

To avoid imposing unfair costs on younger workers, a new DB plan would likely require transition provisions involving benefit rates that decline (or contribution rates that increase) with a participant's age at plan start-up.

A DB plan structure should provide somewhat higher benefits per dollar of contribution than a DC plan, because risk pooling among age cohorts enables the DB plan to achieve higher investment returns through a longer investment horizon and the acceptance of slightly more risk. The benefits provided to participants under a DB plan should also be more secure and predictable than those derived from a DC plan.

Both the mandatory DC and DB options would have better labour market effects than single-employer RPPs. They would neither inhibit labour mobility nor encourage early retirement. The positive labour market effects would be greater under the DB plan, since, rather than exempting RPP members from participation, it would replace benefits under existing single-employer RPPs.

The main drawback of mandatory plans, under both the DB and the DC options, is that they impose welfare costs on some participants who would be better off with greater choice regarding the level and timing of their retirement saving. The proposed DB plan benefit structure of 15 percent of earnings below, and 25 percent of earnings above, the YMPE was chosen as a

reasonable trade-off between these costs and the benefits of greater retirement income security. The employment effects of higher contribution rates at low earnings levels could be partially offset either by employing a higher YBE than the current $3,500 under the new plan or by reprofiling the existing CPP/QPP contribution structure to spread the legacy costs of the plans over earnings both above and below the YMPE. Restoring a full tax deduction for CPP/QPP premiums paid by employees would reduce the costs of the contribution reprofiling to higher-income workers.

By boosting retirement incomes, a mandatory DB or DC plan would limit projected increases in the cost of the GIS and other income-tested benefits associated with a switch from RRSP to TFSA saving among modest- and middle-income earners. These cost increases could be further reduced by modifying the income tax rules to exclude 50 percent of TFSA contributions from, and include 50 percent of TFSA withdrawals in, net income as used in calculating eligibility for income-tested benefits.

When we take the various plan features and effects into account, it appears that the greatest benefits to participants and to the economy would come from the introduction of a national DB plan, such as an enrichment of the CPP/QPP, provided that the scale of the new plan leaves most participants with room for individual choice in the level and timing of their saving.

Voluntary DC plans could play a useful role as supplements to a national DB plan of modest scale. These plans could be sponsored by provincial governments and administered by arm's-length bodies. Alternatively, they could be administered by existing larger RPPs, as proposed by the Ontario Expert Commission on Pensions (2008, 185), or by financial institutions, as proposed for PRPPs. The key point is that they be large enough in scale and low enough in cost that they provide a clear advantage over the current options available to small employers and their employees, and to the self-employed.

Appendix A: Modelling the Future Effects of TFSAs

This appendix outlines a life cycle model of household saving and then applies it to compare the attractiveness of saving in a TFSA relative to saving in an RRSP or RPP for households of different types at different earnings levels. The results are then weighted by the numbers of Canadian households by earnings level, family type and home tenure to estimate the size of the population for whom retirement saving in a TFSA is preferable to saving in RPPs and RRSPs. The model results are also used to estimate the potential long-term effects of TFSA use on GIS costs and income tax revenues.

The model

In the life cycle model used here, each household chooses the level of annual retirement saving that will yield the same level of consumption after retirement as before. The required level of saving depends on the benefits available under public pension programs as well as the level of taxes before and after retirement. For each household, the consumption-balancing level of saving is determined twice — once assuming that all retirement savings are held in RRSPs (or RPPs) and again with all savings held in TFSAs. The preferred savings vehicle is the one that provides the household with the highest level of lifetime consumption.

Six family types are considered: singles, one-parent families, one- and two-earner couples (without children) and one- and two-earner two-parent families. Within each family type, the model distinguishes between renters and homeowners, with savings through home ownership reducing the required amount of retirement savings. For each family type/home tenure category, the model is applied at 31 different earnings levels: from $20,000 to $160,000 at $5,000 intervals, and at $175,000 and $250,000.

The model is based on tax parameters and public pension benefit levels for Ontario. The illustrative results presented in table A1 are based on tax and benefit parameters for 2011. Specific assumptions made in developing the model are as follows:

1. The savings accumulation period is 35 years, from age 30 to 64, and the retirement period is 20 years, from age 65 to 84.
2. Contributions are made and benefits received at year-end. Inflation is 2 percent, the real rate of return on saving is 3.5 percent, and each saver's real wage grows at the same rate as the average wage: 1 percent per annum.
3. Retirement income from RPPs, RRSPs or TFSAs is always received as a price-indexed life annuity.
4. The savings rate is a constant percentage of earnings over the accumulation period.
5. Dollar limits on RPP, RRSP and TFSA contributions are not taken into account. (They affected only about 5 percent of households in 2006 and have increased since then.)
6. Income tax brackets and credits are implausibly but conveniently wage indexed before retirement and price indexed thereafter.
7. For homeowners, 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" that forms part of consumption and is spread over the pre- and post-retirement periods. In the aggregate estimates, a tabulation from Statistics Canada's 2005 Survey of Financial Security was used to determine the incidence of home ownership within family type and earnings groups.

8. CPP/QPP benefits are assumed to commence at age 60 — the typical age of benefit commencement for modest- and middle-income earners — rather than 65. The benefits are subject to an actuarial reduction of 36 percent. For computational purposes, benefits received before age 65 are treated as being received in even amounts over the 35-year savings period.

These assumptions allow the analysis to be greatly simplified, with one single tax/transfer calculation applying to all pre-retirement years and another to all post-retirement years.

For a single individual, for example, consumption at 64 =
Earnings

- *Plus*: Pre-65 CPP/QPP benefits
- *Plus*: imputed rent from home ownership (for homeowners)
- *Less*: retirement savings
- *Less*: home-ownership savings (for homeowners)
- *Less*: work-related expenses (taken as = $300 + 3% of earnings)
- *Less*: payroll taxes (CPP/QPP and Employment Insurance)
- *Less*: federal and provincial income taxes
- *Plus*: GST credit and provincial credits.

Consumption at 65 =
Private pension income

- *Plus*: CPP/QPP benefits
- *Plus*: OAS benefits, net of the clawback
- *Plus*: GIS benefits
- *Plus*: imputed rent from home ownership (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, based on the assumed real rate of return on savings, that summarizes the conversion of 35 years of contributions, plus investment income, into a 20-year, price-indexed annuity.

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

1. 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.
2. Single parents and couples with children are assumed to have two children. Deductible child-care expenses equal to $1,500 plus 5 percent of earnings, as well as federal and provincial child benefits, are assigned to single parents and two-earner couples with children.

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 Universal Child Care Benefit 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 100 percent consumption-replacement target on the parents' own consumption levels, as distinct from the combined consumption levels of the parents and their children.

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 a family-size equivalence scale of 1.00 for a single person, 1.85 for a single parent with two children, 1.62 for a childless 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)] = 0.6969. For a two parent, two-child family, a parallel calculation yields the target $C_{65}/C_{64} = 0.8121$.

With this framework, I determine numerically the level of retirement saving that equates family-size-adjusted consumption at age 64 and age 65.

Simulation results

The workings of the simulation model are illustrated in table A1 for the case of a single renter with earnings of $70,000. The results of achieving 100 percent consumption replacement at retirement are compared for saving in an RRSP and a TFSA.

The first point to note in the table is that the levels of both RRSP and TFSA saving are just enough to equalize pre- and post-retirement consumption levels. The second key point is that TFSA saving provides a higher level of lifetime consumption than RRSP saving: $44,572 per year compared to $44,126.

Table A1 : Pre- and post-retirement consumption under RRSP and TFSA saving for a single renter earning $70,000.

RRSP		TFSA	
Pre-retirement		**Pre-retirement**	
Earnings	70,000	Earnings	70,000
CPP/QPP (pre-65)	1,053	CPP/QPP (pre-65)	1,053
Work expenses	-2,400	Work expenses	-2,400
CPP/QPP, EI premiums	-3,004	CPP/QPP, EI premiums	-3,004
Income taxes	-11,391	Income taxes	-14,580
RRSP contribution	-10,132	TFSA contribution	-6,497
Consumption	44,126	Consumption	44,572
Post-retirement		**Post-retirement**	
OAS	6,322	OAS	6,322
CPP/QPP	7,373	CPP/QPP	7,373
GIS	0	GIS	4,294
RRSP income	38,975	TFSA income	24,992
Income taxes	-8,940	Income taxes	0
Tax credits[1]	396	Tax credits[1]	1,591
Consumption	44,126	Consumption	44,572

Source: Author's calculations based on tax and benefit levels for an Ontario resident for 2011.
[1] Tax credits include the GST credit and Ontario refundable tax credits. The pre- and post-retirement levels are for ages 64 and 65, with the age 65 amounts expressed in the dollars of age 64. Amounts for younger/older ages would be modified by wage/price growth.

The higher lifetime consumption with TFSA saving arises not because TFSAs encourage additional saving. In fact, the level of saving is lower with TFSAs than RRSPs. For an RRSP saver, the amount actually saved — that is, set aside from current consumption — is equal to the RRSP contribution less the amount

returned through the income tax deduction. As the value of the tax deduction (not shown in the table) is $3,189, net saving by the RRSP saver is $6,943, which is higher than the $6,497 saved by the TFSA contributor.

What the gain in lifetime consumption — $446 per year for 55 years in this case — measures is the additional government subsidy provided for saving in a TFSA as compared to an RRSP. Before retirement, the TFSA saver loses the $3,189 in annual benefits provided through the RRSP tax deduction, but the gains in higher benefits and lower taxes after retirement outweigh this. These annual gains include $4,294 in GIS benefits, $1,195 in tax credits and $8,940 in lower income taxes, for a total of $14,429.

Simulations at different earnings levels for the single renter show that TFSA saving provides superior results to RPP/RRSP saving for those with earnings up to $85,545.[28] When we look at the 12 family type/home tenure categories, the earnings levels at which RPP/RRSP saving becomes more attractive than TFSA saving range from $76,621, for a two-earner, two-parent renter family ($77,903 if they are homeowners), to $85,545 for the single renter ($84,881 for a single homeowner). In every case where TFSA saving is more attractive than RPP/RRSP saving, the retired TFSA saver receives substantial amounts of GIS and refundable tax credits while paying no income tax.

These simulation results are based on the assumption that CPP/QPP benefits commence at age 60. This reflects the choice of most modest- and middle-income earners today. Moreover, comparing the reported simulations with ones that assume that CPP/QPP benefits start at age 65 shows that the introduction of TFSAs increases the incentive to begin receiving CPP/QPP benefits at age 60. (This is true even though the simulations take into account the scheduled increase in the actuarial adjustment factor from 6 percent to 7.2 percent per year.) Because payouts from TFSAs, unlike those from RPPs and RRSPs, do not reduce eligibility for GIS benefits, saving in TFSAs makes it possible to increase GIS benefits by starting to receive CPP/QPP benefits before age 65.

The simulations also assume that choices are not constrained by contribution limits. In most cases, the current TFSA limit of $5,000 per year is sufficient to accommodate the contribution levels predicted by the model for all those for whom TFSA saving is preferred. (Note that a contribution limit of $5,000 for 47 years from age 18 to 64, with carry-forward of unused room, equates to an annual contribution limit of $6,714 for a 35-year savings period.) However, the limit is ignored in the few cases where the current contribution limit would interfere with the choice to save only in TFSAs.

Aggregate estimates

Applying the simulation results to a distribution of Canadian households by family type, home tenure and earnings level provides aggregate estimates of potential TFSA use. The distribution is derived from the T1 family file of taxation data for 2006.[29] For more detail, see Horner 2009b. The estimates are based on simulations with 2006 tax and transfer parameters, with some parameters modified to incorporate structural changes since 2006 — a 2007 increase in GIS benefits as well as federal and Ontario tax rate reductions and tax credit increases.

The results indicate that about one-quarter of households are best off with no retirement savings. Public pension benefits alone provide them with full consumption replacement in retirement. Among the remaining three-quarters of households, about 60 percent would gain from having all their retirement savings in TFSAs. They have earnings above the levels where zero savings is best but below the TFSA/RRSP boundary levels noted above — for example, 2011 levels of $77,903 for two-earner, two-parent homeowner families and $85,545 for single renters. This population includes over half the population of current RPP members and over half that of RRSP contributors.

It must be emphasized that these are potential population estimates. Many current RPP members cannot quit their plans or would sacrifice employer contributions if they could quit them. Moreover, the incentive to choose TFSA saving for retirement is not the same for someone in mid-career with a substantial existing accumulation of RPP/RRSP assets as it is for a younger worker without those assets. The estimates do provide a guide to the future, though, as constraints can be relaxed over time. For example, employers will likely be pressed to offer their modest- and middle-income employees group TFSAs rather than RPPs.

As noted above, all households that could achieve higher lifetime consumption levels through TFSA saving do so because they pay no income taxes in retirement and qualify for substantial levels of GIS and other income-tested benefits. All their private pension income takes the form of TFSA benefits that are tax exempt and excluded from net income in determining eligibility for income-tested benefits. The levels of GIS benefits provided to individuals with above-average earnings is surprisingly high — $4,292, for example, for singles with 2011 earnings of up to about $85,000.

Assuming a shift to TFSA saving by all those who would benefit from it, the GIS program could potentially extend benefits to over half the population of seniors (up from about one-third now). This is reflected in an estimated aggregate annual GIS cost that is 84 percent higher than the cost with no TFSA use.[30] Costs would increase similarly for the GST credit and provincial refundable credits.

Based on the result that those whose financial assets are all held in TFSAs would pay no tax, the income tax liabilities of seniors are also estimated to fall by close to 20 percent, with a drop of 54 percent in the number of seniors subject to income tax. (Over half of senior tax filers currently pay income taxes.)

The prospect of ballooning benefit costs and declining tax revenues among seniors takes on greater importance when population aging is taken into account. The Office of the Chief Actuary (2008) projects that GIS costs will increase modestly from 0.47 percent of GDP in 2006 to 0.62 percent by 2030. This projection is necessarily based on current law, however, which is not a realistic basis for looking well into the future. It assumes ongoing price indexing of both OAS and GIS benefits in the face of projected real wage growth of over 30 percent between 2006 and 2030. This implies a 24 percent reduction in the basic income guarantee for seniors in relation to average wage levels, a result that would undo the gains made over the

past decades in reducing the incidence of low income among seniors. With this decline in benefits relative to wages, the proportion of seniors receiving GIS is projected to fall from 35.8 percent in 2006 to 30.4 percent in 2030.

Horner (2008a) provides more realistic projections involving a more modest decline in GIS take-up due to the continuing maturation of the CPP/QPP, RPPs and RRSPs. Assuming real wage increases in *both* OAS and GIS benefits (effected through ad hoc adjustments), the rising proportion of seniors in the population increases the GIS cost from 0.47 percent of GDP to 0.90 percent of GDP. Under the more likely assumption that cost increases are limited by leaving the OAS benefit fixed in real terms and adjusting only the GIS benefit maximums to maintain the program's anti-poverty effectiveness, the cost of the GIS would rise to 1.42 percent of GDP in 2030. Using these two projections as a base, I find that an 84 percent increase in GIS costs would amount to either 0.75 percent or 1.19 percent of GDP.

Beyond the purely fiscal considerations is a political economy issue. Will an aging population, facing rising costs of health care and public pensions, find it acceptable that many middle-income seniors pay no income taxes while drawing benefits intended to help those with few other resources? Such considerations likely explain why Jonathan Kesselman, one of the main proponents of a TFSA for Canada (Kesselman 2009, 557), has warned: "In particular, the federal government's commitment that TFSA holdings will not be considered in any federal benefit programs is likely to cause future problems that should be addressed sooner rather than later."

Appendix B: Data for Contribution Flow Estimates

The contribution flows were estimated using a synthetic microdata file based on taxation statistics for 2006. Because these data are based on information for individuals rather than households, they are more appropriate for estimating flows that depend on individual savings levels in RPPs and RRSPs than the data set used in appendix A. This appendix describes the construction of the data file and the use of the data to estimate savings gaps.

Construction of the microdata file

Tables 11 and 12 in the CRA's "Final Statistics" (CRA 2008) provide information on RPP and RRSP saving by individuals by income level and age group (under 45, 45-64 and 65+). RPP saving is represented by the Pension Adjustment (PA) reported by RPP members on their tax returns, and RRSP saving reflects actual contributions. Table 11 divides RPP/RRSP members or contributors into three groups: RPP members without RRSP contributions, RRSP contributors not in pension plans and RPP members who also made RRSP contributions in the year. Within these groups, the table provides numbers of individuals by the level of their PAs (seven ranges, from $1-1,000 to $10,000+) and of their RRSP contributions (also seven ranges). Table 12 reports the number of CPP/QPP contributors by age and income group. Subtracting the number of individuals with a PA or an RRSP contribution, or both, from the number of CPP/QPP contributors allows the identification of numbers of non-savers with earnings over the CPP/QPP minimum of $3,500. The populations of non-savers and RRSP-only savers are subdivided into groups of employed and self-employed workers based on information from table 3 in the CRA statistics, which provides information on the income profile of tax filers reporting self-employment income.

This information was used to construct a synthetic microdata file: a list of individuals, each with a set of characteristics — for example, frequency in the population, employed vs. self-employed, age group, earnings level (derived from their income group), PA amount and RRSP contribution amount. For each individual, projected levels of OAS, GIS and CPP/QPP benefits were calculated, as well as a "savings gap."

Calculation of savings gaps

First, a rough measure of savings adequacy was constructed; it was based on an admittedly arbitrary target pension of 50 percent of earnings. The level of annual RPP/RRSP savings needed to provide the target pension was calculated for each individual in the file. (As in appendix A, this assumes a constant rate of RPP/RRSP saving over a 35-year career and that individuals have no financial assets outside RPPs and RRSPs.) The savings gap was then determined as the difference, if positive, between this required savings level and the sum of the individual's PA and RRSP contribution. In calculating the level of RPP/RRSP savings needed to fund the target pension, the projected levels of OAS, GIS and CPP/QPP benefits were taken into account. For this purpose, GIS benefit levels were calculated assuming enough RPP/RRSP savings to achieve the 50 percent earnings-replacement level. This was necessary to avoid underestimating the savings gaps by ignoring the reduction in GIS benefits that occurs as private pension income increases.

These savings gaps are calculated much more crudely than in Horner 2009b and appendix A. While the economic assumptions used are the same in the two sets of estimates, the appendix A analysis is based on families rather than individuals, so that GIS benefit levels can be properly calculated and consumption levels before and after retirement can be explicitly compared. In addition, different family types are distinguished, and savings through home ownership are taken into account. Nevertheless, the proportion of the population of individuals with non-zero savings gaps in this analysis is very similar to the proportion of households that Horner (2009b) found to be saving too little to replace 90 percent of pre-retirement consumption — 22.8 percent as opposed to 22.2 percent.

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Notes

1 See Ontario Expert Commission on Pensions (2008), Alberta-BC JEPPS (2008) and Nova Scotia Pension Review Panel (2009).

2 For any given set of pension benefits provided under a PAYGO program, the increasing ratio of pensioners to contributors in an aging population raises the contribution cost of the benefits. For example, prior to the 1997 reform of the CPP, the PAYGO contribution rate (employer and employee combined) was forecast to rise from its 1996 level of 5.6 percent of covered earnings to 14.2 percent by 2030. Questions were raised about the fairness of asking post-baby-boom generations to continue financing CPP benefits at that cost and about the willingness of those generations to do so. The reform included benefit restrictions and a move to pre-fund a portion of future benefits by accelerating the schedule of contribution rate increases. Together, these measures have resulted in a contribution rate of 9.9 percent that is projected to be adequate to fund benefits over the long term. For details of the reform and its effect on CPP contribution rates, see Office of the Chief Actuary (1997). For assessments of the sustainability of Canada's retirement income system as compared to others, see Whitehouse (2009) and OECD (2007, 2009, and 2011).

3 Studies by the Canadian Institute of Actuaries (1995), Finance Canada (2003), Statistics Canada (2001), Lise (2003) and LaRochelle-Côté, Myles, and Picot (2008) are reviewed in Horner (2009a).

4 A post-retirement consumption level of 90 percent or more of the pre-retirement level was taken as meeting the government objective of avoiding a significant drop in living standards at retirement. This measure of savings adequacy needs to be distinguished from the commonly cited target of replacing 70 percent of earnings with pension income. Horner (2009b) shows that the pre-tax-income replacement rates needed to equate pre- and post-retirement consumption levels vary according to earnings level, family type and whether the family home is rented or owned. On average across family types in the modest-earnings range, a 90 percent consumption replacement rate corresponds to a target pension of about 57 percent of pre-retirement income.

5 Between 1966 and 2010, life expectancies from age 65 increased from 13.6 to 18.8 years for men and from 16.9 to 21.6 years for women. The Chief Actuary projects these life expectancies to increase to 20.6 and 22.7 years by 2025.

6 A DB pension plan is one that promises a specific level of pension income for each year of pensionable service. Often the benefit is defined as a percentage of earnings, but it may also be a flat dollar amount. Under defined-contribution (DC) plans, the contributions are specified, and the pension income depends on the contributions and the investment income accumulated on them.

7 Ketil Hviding and Marcel Mérette (1998), for example, obtain this result using simulations of the demographic shifts with an overlapping-generations, general-equilibrium model of the Canadian economy. They also consider the extent to which the effect might be diluted by the export of Canadian capital to developing countries with younger populations.

8 This coverage rate rose slightly in 2008 and 2009, to 41.6 percent and 43.5 percent, and other coverage rates rose in parallel. These increases are almost certainly transitory, as they reflect employment declines that have had a greater effect on employees without RPP coverage than on RPP members. Similar temporary coverage increases occurred during the recessions of the early 1980s and 1990s. All coverage percentages are calculated from employment and RPP membership numbers provided in Statistics Canada's CANSIM tables 2820012 and 2800008.

9 It dropped again to 4.20 percent in 2008. However, contributions for 2008 were likely depressed by the financial crisis. RRSP contribution levels for 2009 are likely to provide evidence of a diversion of savings into TFSAs.

10 A PA amount is a measure of a plan member's level of saving in an RPP or DPSP in a year; it is used to determine the plan member's RRSP limit. For DC plans, it is simply the sum of employer and employee contributions; for DB plans, it is calculated based on pension benefits accrued by the plan member in the year. RPP saving is measured by reported PA amounts rather than total employer and employee contributions, because employer contribution rates were inflated in 2007 by "catch-up" contributions needed to reduce plan funding deficits. These catch-up contributions are not associated with the accrual of additional pension benefits. To make the measures consistent between the two years, I adjusted the 1995 PA total upwards by $340 per reported PA to reflect a change in the calculation of PAs for members of DB RPPs that took effect in 1996.

11 US 401(k) plans are employer-sponsored DC plans. However, employees usually choose their contribution levels as elective deferrals from their cash compensation, and the plans typically offer employees a menu of investment choices.

12 See Marier (2010) for a useful summary. See also St. John and Littlewood (2006) and Gibson and Le (2008) on New Zealand. The effects of automatic enrolment under KiwiSaver will emerge only gradually, since it applies only to new hires, not existing employees. For Australia, see Fear and Pace (2008) and Sy (2008). See also United Kingdom (2006).

13 Wolfson (2011) leaves open the possibility of incorporating intergenerational transfers through less than full funding of promised benefits.

14 Is it realistic to assume no government backstopping of a DB plan sponsored by government? Support for the assumption is provided by the 1998 reforms of the CPP and QPP in which benefits were reduced and contribution rates increased to ensure plan sustainability. Additional support comes from CPP provisions that provide for automatic contribution and benefit adjustments, unless overridden by federal and provincial governments, in the event of significant underfunding of the plans. In any event, the issue of "no backstopping" may not be that important in a plan that covers almost all workers and benefits most retirees in the country. Whether adjustments are made inside the plan or through additional funding from tax revenues, the issue remains one of fairness in allocating the burden of adjustment among age and income groups in the population.

15 When a DB plan's contributor population is growing quickly, as with plans in the 1970s, the level of contributions is high relative to the level of benefits. In these circumstances, modest adjustments to contribution rates are generally sufficient to offset the effects of adverse investment experience. With slow growth in the number of contributors, however, the level of contributions is smaller relative to the levels of benefits and plan assets, so contribution rate adjustments may not be sufficient to address poor investment performance. For example, the Ontario Teachers' Pension Plan (OTPP) had the following aggregate flows for 2010: contributions, $2.7 billion; benefits, $4.5 billion; investment income, $13.3 billion. In the admittedly extreme year of 2008, investment income, including realized and unrealized gains and losses, was –$19.0 billion. Even large contribution rate increases would be insufficient to compensate for investment swings much larger than the level of total contributions. (Figures are taken from the OTPP Web site, http://www.otpp.com/.)

16 The cost of a defined benefit tends to be above average for older plan members, because of the shorter-than-average period during which their contributions can accumulate interest, and for members with above-average life expectan-

cies. Life expectancies are generally greater for women than men and also vary positively with earnings level. In principle, a voluntary plan could be designed with an array of required contribution rates based on these cost factors. In practice, however, such a plan would be very difficult to design and to explain to prospective plan members.

17 Whether employers or employees bear the cost of a compulsory contribution or payroll tax depends on supply and demand conditions. It is usually assumed that in the longer run, employees bear the cost of both employer and employee contributions to plans like the CPP. Employment could "leak" out of a province if employers bear some or all of the cost of the new contributions, if employers perceive that they will bear contribution costs or if employees bear the costs but some respond by leaving the province.

18 The Office of the Chief Actuary (2010, 72) estimates a current service contribution cost of 6.3 percent of earnings for the CPP. This estimate is up from 5.85 percent in the previous valuation owing to a reduction, from 4.2 percent to 3.9 percent, in the assumed real rate of return on plan assets over the long term. The contribution rate of 6 percent assumed in this study could be lower if survivor and disability benefits were not increased in step with the retirement benefits.

19 Assuming that full benefits under the new plan would be earned over a 35-year career, the *annual* benefit accrual rates would be about 0.4 percent (= 15%/35) of earnings up to the YMPE and 1.3 percent (= 25%/35) of earnings above the YMPE. For anyone with earnings up to the maximum under the new plan (i.e., twice the YMPE), these benefit accrual rates are about one-third those provided under a 2 percent plan whose benefits are integrated with the CPP/QPP. Such a plan has accrual rates of about 1.3 percent of earnings to the YMPE and 2 percent of earnings above the YMPE. The benefits provided under the new plan would offset a somewhat higher fraction of existing RPP benefits in plans with lower benefit rates.

20 Other options include (1) default participation, at a specified contribution rate, by employers, with the right to opt out, and (2) default participation by employees with compulsory matching by employers of employee contributions. The latter approach is taken in the UK system that will come into force next year. It combines the advantages of automatic enrolment with the inducement of matching employer contributions. The minimum contribution rate for employees is 5 percent of pay above a threshold of £7,475. Thus, with a 3 percent compulsory employer contribution, the default matching rate is 60 percent. (Lower minimum employee and employer contribution rates apply for the first two years under the new system.) Neither of the Canadian DC plan proposals (the CSPP and the JEPPS plan) followed the UK lead in denying employers the ability to opt out, perhaps because of concern with the possibility of disadvantaging local employers where the plan covers only one region of the country. Thus, the UK approach may be seen as quite close to a mandatory DC option, one that might need to be national in scope and that should achieve a higher take-up rate than the more strictly voluntary option considered here.

21 If benefits were funded from a single contribution made at age 30, for example, then the asset level at age 65 would be equal to $C_{30}(1+r_{30})(1+r_{31})\ldots(1+r_{64})$ where r_a is the rate of return at age a. In this case, the timing of investment yield swings — close to retirement or not — would be of no consequence; the accumulation would depend only on the geometric mean of the annual rates of return. In practice, though, retirement-age assets are the product of a stream of annual contributions that grow in level over time, plus the accumulated interest on them. Consequently, asset levels at retirement are affected much more by investment swings close to retirement than by earlier ones. The result is wide swings over time in the level of assets at retirement produced by any given stream of contributions. If plan members were given choices among investment portfolios, as is often the case in DC plans, this would introduce additional variation in the retirement incomes obtained by plan members for any given stream of contributions.

22 In the CPP/QPP, pensions in pay are indexed to changes in prices, but benefits accrued to date by contributors, but not yet in pay, are based on an average of the contributor's earnings over his or her whole career, with the average being adjusted each year by the change in the average wage. Modifying the updating of accruing benefits would affect initial pension levels.

23 As noted earlier, Munnell et al. (2006) provide evidence of higher annual rates of return on investment in DB than 401(k) plans (DC plans) in the United States — 6.6 percent as opposed to 5.6 percent over the period studied. Using Statistics Canada information on plan assets and annual revenues and expenditures for trusteed pension plans (CANSIM tables 2800005 and 2800006), I estimated average annual rates of return for DB plans and DC plans of 9.0 percent and 7.9 percent respectively for the period 1992 to 2008. Unfortunately, it was not possible to separate the effect of differences in plan *scale* (DB plans are larger) from the effect of plan *type* using these data. (Trusteed plans are ones in which benefits are paid out of plan assets held in trust for plan members rather than from sources such as insurance contracts or government consolidated revenue funds. They account for about four-fifths of all RPP assets.)

On another note, Blommenstein et al. (2009) observe that it is also possible to obtain the benefits of such a hybrid plan by starting with a DC design and building in DB features. One such feature is the provision of self-insured annuities with inflation adjustments that are conditional on investment performance and mortality experience under the plan. Another is the adjustment of contribution rates based on plan investment performance.

24 Those expecting to receive GIS benefits will still have an incentive to begin receiving CPP/QPP benefits early. The prospective decline in GIS benefits when CPP/QPP benefits increase through the actuarial adjustment reduces the net value of that adjustment. (See Milligan and Schirle 2008.) This effect would be diminished by the introduction of a CPP/QPP enrichment, however, as it would reduce the population expecting to receive GIS benefits.

25 Diamond and Orszag (2005) propose a similar re-profiling of legacy costs under US Social Security.

26 It must be admitted that the proposed rule change would add complexity to the TFSA and to the tax return. For example, 50 percent of the TFSA contribution would have to be subtracted from net income and then added back to taxable income. Conversely, 50 percent of the withdrawal would have to be added into net income and then subtracted in determining taxable income. While somewhat complex, such "in-and-out" adjustments are already found in the tax return. For example, benefits under the social assistance, workers' compensation and GIS programs are currently included in net income and then subtracted in determining taxable income.

27 As an example, consider a contribution held for 20 years before withdrawal of the proceeds. Assume a real rate of return of 3.5 percent per year over this period. Under the current TFSA rules, the after-tax rate of return on saving is unaffected by tax rates and benefit reduction rates; it is simply 3.5 percent. Now consider an RRSP saver who has a first-bracket tax rate of 20.5 percent when the contribution is made and who faces the 50 percent benefit reduction rate under GIS when the proceeds are withdrawn. The RRSP saver's after-tax rate of return is given by the expression

$$100\% * \left[(1.035) \left(\frac{1 - 0.500}{1 - 0.205} \right)^{1/20} - 1 \right]$$

which yields a rate of 1.1 percent. With a 50 percent exclusion of the TFSA contribution from, and 50 percent inclusion of the benefit in, net income, the after-tax rate of return on TFSA saving would be given by the same expression with the numerator of the fraction replaced by 1 - 0.750 and the denominator by 1.000. The after-tax real rate of return on TFSA saving would now be 2.2 percent. If the TFSA saver were subject to any benefit reductions when the contribution was made (e.g., under the Canada Child Tax Benefit or the GST credit), the rate of return on TFSA saving would be slightly higher than 2.2 percent.

28 This estimate is based on a linear interpolation of the TFSA vs. RRSP lifetime income ratios at earnings levels of $80,000 and $85,000.

29 As the tax data include no information on home tenure, households by family type and earnings level were divided into owners and renters based on a home-ownership profile taken from Statistics Canada's 2005 Survey of Financial Security.

30 To estimate the 84 percent increase in GIS costs, life cycle model estimates of GIS benefits were first obtained for households by family type and earnings level based on the level of RPP/RRSP saving needed to equate pre- and post-retirement consumption levels. Corresponding GIS benefit levels were then calculated assuming TFSA-only saving for all households for whom it is advantageous. Finally, total GIS costs were obtained for the two cases by aggregating the household GIS benefit levels across the 2006 distribution of households aged 30-64 by family type and earnings group. While the absolute GIS cost estimates so obtained would not be good estimates of GIS costs in any particular future year, the ratio of the two estimates should provide a reasonable estimate of the potential increase in GIS costs from a switch from one saving regime to the other. The same methodology was applied in estimating the change in income tax liabilities resulting from a switch to TFSA saving.

References

Alberta-BC JEPPS (see Alberta-British Columbia Joint Expert Panel on Pension Standards)

Alberta-British Columbia Joint Expert Panel on Pension Standards. 2008. *Getting Our Acts Together: Pension Reform in Alberta and British Columbia*. Victoria and Edmonton. Accessed March 28, 2010. http://www.finance.alberta.ca/publications/pensions/pdf/2008_1125_jepps_final_report.pdf

Ambachtsheer, K. 2005. "DB Plans under Siege: Can They Survive?" Discussion paper presented at the "Pension Plan Design, Risk and Sustainability" Workshop, International Centre for Pension Management, Joseph L. Rotman School of Management, University of Toronto, May 31-June 1. http://www.rotman.utoronto.ca/ICPM/details.aspx? ContentID=92

———. 2008. "The Canadian Supplementary Pension Plan (CSPP): Towards an Adequate, Affordable Pension for All Canadians." C.D. Howe Institute. Commentary no. 265. Accessed March 28, 2010. http://www.cdhowe.org/pdf/commentary_265.pdf

Baldwin, B. 2010. *Pension Reform in Canada: A Guide to Fixing Our Future Again*. IRPP Study 13. Montreal: Institute for Research on Public Policy.

Beshears, J., J.J. Choi, D. Laibson, and B.C. Madrian. 2007. "The Impact of Employer Matching on Savings Plan Participation under Automatic Enrolment." National Bureau of Economic Research. Working Paper no. 13352.

Blommenstein, H., P. Janssen, N. Kortleve, and J. Yermo. 2009. "Evaluating the Design of Private Pension Plans: The Costs and Benefits of Risk Sharing." OECD Working Papers on Insurance and Private Pensions, no. 34.

British Columbia. 2010. Ministry of Finance. "Options for Increasing Pension Coverage among Private Sector Workers in Canada." Report prepared for the Steering Committee of Provincial/Territorial Ministers on Pension Coverage and Retirement Income Adequacy. Accessed June 20, 2010. http://www.fin.gov.bc.ca/pension_plan_options_paper.pdf

Cagan, D. 1965. *The Effect of Pension Plans on Aggregate Saving*. National Bureau of Economic Research.

Canada Revenue Agency. 2008 (revised 2009). "Final Statistics — Sample Data 2008 Edition (2006 tax year)." Accessed June 22, 2011. http://www.cra-arc.gc.ca/gncy/stts/gb06/pst/fnl/menu-eng.html

Canadian Institute of Actuaries. 1995. *Troubled Tomorrows — The Report of the Canadian Institute of Actuaries Task Force on Retirement Saving*. Ottawa: Canadian Institute of Actuaries.

Canadian Labour Congress. 2009. "Security, Adequacy, Fairness: Labour's Proposals for the Future of Canadian Pensions." Accessed March 28, 2010. http://www.canadianlabour.ca/news-room/publications/security-adequacy-fairness-labour-s-proposals-future-canadian-pension

CARP. 2009. "Time for a Universal Pension Plan." Accessed March 28, 2010. http://www1.carp.ca/PDF/Universal%20Pension%20Plan%20FINAL.pdf

Choi, J.J., D. Laibson, B.C. Madrian, and A. Metrick. 2001. "Defined Contribution Pensions: Plan Rules, Participant Decisions, and the Path of Least Resistance." National Bureau of Economic Research. Working paper no. 8655.

CLC (see Canadian Labour Congress)

CRA (see Canada Revenue Agency)

Cui, J., F. de Jong, and E. Ponds. 2005. "The Value of Intergenerational Transfers within Funded Pension Schemes." Discussion paper presented at the "Pension Plan Design, Risk and Sustainability" Workshop, International Centre for Pension Management, Joseph L. Rotman School of Management, University of Toronto, May 31-June 1.

Diamond, P.A., and P.R. Orszag. 2005. "Saving Social Security." *Journal of Economic Perspectives* 19 (2).

Fear, J., and G. Pace. 2008. "Choosing Not to Choose: Making Superannuation Work by Default." The Australia Institute, Discussion Paper 103.

Federal Superannuates National Association. 2007. "November 1, 2007 Submission to the Ontario Expert Commission on Pensions." Accessed June 21, 2011. http://www.bpm-magazine.com/pension_commissions.html

Finance Canada. 2003. "Background Information on the Tax Treatment of Savings and Tax Pre-paid Savings Plans (TPSPs)." Personal Income Tax Division, mimeo, November 21.

FSNA (see Federal Superannuates National Association)

Gibson, J., and T. Le. 2008. "How Much New Saving Will KiwiSaver Produce?" University of Waikato, Department of Economics, Working Paper 03/08.

Gunderson, M., and T. Wilson. 2009. "Encouraging Small and Medium Sized Firms to Participate in Pension Plans." Report prepared for Advocis: The Financial Advisors Association of Canada. Accessed March 20, 2010. http://link.advocis.ca/pdf/Pension-Study-se11-09.pdf

Hamilton, M. 2009. "Investment and Longevity Risks." Paper prepared for the Research Working Group on Retirement Income Adequacy. Ottawa: Department of Finance. Accessed June 20, 2011. http://www.fin.gc.ca/activity/pubs/pension/ref-bib/hamilton-eng.asp

Horner, K. 2008a. "Savings Incentives and OAS/GIS Costs." *Canadian Public Policy* 34S: 119-35.

———. 2008b. "Should Retirement Savings Accounts Be Locked In?" Paper presented at the 64th Congress of the International Institute of Public Finance, Maastricht, The Netherlands, August 23. Accessed March 28, 2010. http://editorialexpress.com/conference/iipf64/program/iipf64.html#39

———. 2009a. "Approaches to Strengthening Canada's Retirement Income System." *Canadian Tax Journal* 57 (3): 419-59.

———. 2009b. "Retirement Saving by Canadian Households." Paper prepared for the Research Working Group on Retirement Income Adequacy. Ottawa: Department of Finance. Accessed June 20, 2011. http://www.fin.gc.ca/activty/pubs/pension/ref-bib/horner-eng.asp

HRSDC (see Human Resources and Skills Development Canada)

Human Resources and Skills Development Canada. 2009. "The CPP & OAS Stats Book 2009." Accessed March 23, 2010. http://www.servicecanada.gc.ca/eng/isp/statistics/statmain.shtml

———. 2011. "Income Security Program Information Card." Accessed April 5, 2011. http://www.servicecanada.gc.ca/eng/isp/statistics/rates/infocard.shtml

Hviding, K., and M. Mérette. 1998. "Macroeconomic Effects of Pension Reform in the Context of Aging: OLG Simulations for Seven OECD Countries." OECD Working Paper no. 201. Paris: OECD.

Jog, V. 2009. "Investment Performance and Costs of Pension and Other Retirement Savings Funds in Canada: Implications on Wealth Accumulation and Retirement." Paper prepared for the Research Working Group on Retirement Income Adequacy. Ottawa: Department of Finance. Accessed June 20, 2011. http://www.fin.gc.ca/activty/pubs/pension/ref-bib/jog-eng.asp

Kesselman, J.R. 2009. "Policy Forum: Tax-Free Savings Accounts in a Consumption-Based Personal Tax." *Canadian Tax Journal* 57 (3): 533-62.

LaRochelle-Côté, S., J. Myles, and G. Picot. 2008. "Income Security and Stability during Retirement in Canada." Statistics Canada, Analytical Studies Branch Research Paper Series, catalogue no. 11F0019 — no. 306.

Lise, J. 2003. "Is Canada's Retirement Income System Working?" Finance Canada, Working Paper 2003-02.

Madrian, B.C., and D.F. Shea. 2001. "The Power of Suggestion: Inertia in 401(k) Participation and Savings Behavior." *Quarterly Journal of Economics* 116 (4): 1149-87.

Marier, P. 2010. *Improving Canada's Retirement Saving: Lessons from Abroad, Ideas from Home*. IRPP Study 9. Montreal: Institute for Research on Public Policy.

Milligan, K., and T. Schirle. 2008. "Improving the Labour Market Incentives of Canada's Public Pensions." *Canadian Public Policy* 34 (3).

Moore, K.D., B. Robson, and A. Laurin. 2010. "Canada's Looming Retirement Challenge: Will Future Retirees Be Able to Maintain Their Living Standards upon Retirement?" C.D. Howe Institute. Commentary no. 317.

Morissette, R., and Y. Ostrovsky. 2006. "Pension Coverage and Retirement Savings of Canadian Families, 1986 to 2003." Statistics Canada, Analytical Studies Branch, Working Paper no. 286.

Munnell, A.H., M. Soto, J. Libby, and J. Prinzivalli. 2006. "Investment Returns: Defined Benefit vs. 401(k) Plans." Center for Retirement Research at Boston College, An Issue in Brief, 52.

Munnell, A., and S.A. Sass. 2007. "The Labor Supply of Older Americans." Center for Retirement Research at Boston College, Working Paper 2007-12.

Nova Scotia Pension Review Panel. 2009. *Promises to Keep*. Halifax, Nova Scotia: Nova Scotia Pension Review Panel. Accessed June 20, 2011. http://www.gov.ns.ca/lae/pensionreview/docs/PensionReviewPanelFinal.pdf

OECD (see Organisation for Economic Co-operation and Development)

Office of the Chief Actuary. 1997. *Canada Pension Plan: Sixteenth Actuarial Report, September, 1997*. Accessed April 5, 2011. http://www.osfi-bsif.gc.ca/osfi/index_e.aspx?DetailID=499

———. 2008. *Actuarial Report (8th) on the Old Age Security Program, as at 31 December 2006*. Accessed June 20, 2010. http://www.osfi-bsif.gc.ca/osfi/index_e.aspx?DetailID=500.

———. 2010. *Actuarial Report (25th) on the Canada Pension Plan, as at 31 December 2009*. Accessed April 5, 2011. http://www.osfi-bsif.gc.ca/osfi/index_e.aspx?DetailID=499

Ontario Expert Commission on Pensions. 2008. *A Fine Balance: Safe Pensions, Affordable Plans, Fair Rules*. Toronto: Ontario Expert Commission on Pensions.

Organisation for Economic Co-operation and Development. 2007. *Pensions at a Glance: Public Policies across OECD Countries, 2007 Edition*. Paris: OECD.

———. 2009. *Pensions at a Glance 2009: Retirement Income Systems in OECD Countries*. Paris: OECD.

———. 2011. *Pensions at a Glance 2011: Retirement Income Systems in OECD and G20 Countries*. Paris: OECD.

St. John, S., and M. Littlewood. 2006. "Does KiwiSaver Improve the Unique New Zealand Mix of Retirement Policies?" Paper presented at the 14th Australian Colloquium of Superannuation Researchers: Choice in Retirement Funding, UNSW, Sydney, Australia, July 20-21.

Statistics Canada. 2001. *The Assets and Debts of Canadians: Focus on Private Pension Savings*. Catalogue no. 13-596.

———. 2006. *The Wealth of Canadians: An Overview of the Results of the Survey of Financial Security, 2005*. Catalogue no. 13F0026MIE — no. 001.

Sy, W. 2008. "Towards a National Default Option for Low-Cost Superannuation." Australian Prudential Regulation Authority, Working Paper, 18 August.

United Kingdom. 2005. Pensions Commission. *A New Pension Settlement for the Twenty-First Century*. The Stationery Office.

———. 2006. Department for Work and Pensions. "Personal Accounts: A New Way to Save." Accessed March 28, 2010. http://www.dwp.gov.uk/policy/pensions-reform/

———. 2010. Department for Work and Pensions. "Workplace Pension Reforms Review." Accessed September 2010. http://www.dwp.gov.uk/policy/pensions-reform/workplace-pension-reforms/

Whitehouse, E. 2009. "Canada's Retirement-Income Provision: An International Perspective." Paper prepared for the Research Working Group on Retirement Income Adequacy. Ottawa: Department of Finance. Accessed September 17, 2010. http://www.fin.gc.ca/activty/pubs/pension/ref-bib/whitehouse-eng.asp

Wolfson, M. 2011. *Projecting the Adequacy of Canadians' Retirement Incomes: Current Prospects and Possible Reform Options*. IRPP Study 17. Montreal: Insitute for Research on Public Policy.

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