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Rethinking Limits on Tax-Deferred Retirement Savings in Canada

Since 1990, the Factor of Nine has limited retirement saving in defined-contribution pension plans and RRSPs. With people living longer and investment returns low, the Factor needs a major update – and should perhaps disappear altogether.

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The Study In Brief

Tax rules limiting the amount of tax deferral available to Canadians in various retirement saving vehicles need some measure of equivalency among them. Since 1990 this measure has been the Factor of Nine, based on the proposition that saving 9 percent of annual earnings will let a person buy a retirement annuity equal to 1 percent of pre-retirement income.

A quarter century later, the flaws in the Factor of Nine are glaring and the case for change is compelling. The Factor of Nine is the result of calculations based on one particular type of defined-benefit pension plan operating under one specific set of demographic and economic circumstances. It is a crude measure. It neglects features that can make wealth accruals under different defined-benefit plans larger or smaller. It affects people of different ages differently. And it is badly out of date.

People are living longer and – even more important – yields on investments suitable for retirement saving are very low. These changes have raised the cost of obtaining a given level of retirement income. The unchanged factor specifying equivalency puts people saving in money-purchase arrangements such as defined-contribution pension plans and RRSPs at a major disadvantage relative to people in defined-benefit plans.

Three types of reforms could alleviate problems with the Factor of Nine:

- Update the assumptions underlying the Factor of Nine to reflect current economic and demographic realities; doing that would raise the current annual tax-deferred savings limit from its current 18 percent to a number around or even exceeding 30 percent.
- Level the playing field for tax-deferred saving by refining the factors so that they escalate with age and/or reflect differences in pension plan design.
- Replace the current annual tax-deferred saving limits for defined-contribution pension plan participants and RRSP savers with more generous regimes: either index unused contribution room for inflation or, more farsightedly, establish an inflation-indexed lifetime tax-deferred savings limit that will permit all savers to achieve pension wealth equal to that of participants in relatively comprehensive defined-benefit plans.

Inaction over another quarter century would be unconscionable. Canadians continue to live longer. Slower world growth and high saving will likely depress real returns for decades. Taxes deferred when people save for retirement get paid once people are retired. Canadians who do not participate in public-sector pension plans should have more opportunities to save, and unfair tax treatment should not stand in their way.

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Canadian income-tax rules limit the retirement wealth Canadians can accumulate without paying current income taxes.

Retirement saving vehicles that let savers defer tax operate differently: defined-benefit pension plans promise specific payments in retirement; defined-contribution pension plans specify annual contributions; and contributions to Registered Retirement Savings Plans are largely at the discretion of the individual saver, with retirement income depending on the amount saved. Tax rules limiting tax deferral therefore need some measure of the equivalency of saving in each of these vehicles. Since 1990 this measure has been the Factor of Nine (the Factor), based on the proposition that saving 9 percent of annual earnings will let a person buy a retirement annuity equal to 1 percent of pre-retirement income.

The Factor of Nine is the result of calculations based on one particular type of defined-benefit pension plan operating under one specific set of demographic and economic circumstances. It is a crude measure. It neglects features that can make wealth accruals under different defined-benefit plans larger or smaller. It affects people of different ages differently. And it is badly out of date. People are living longer nowadays, and – even more important – yields on investments suitable for retirement saving are very low. These changes have raised the cost of obtaining a given level of retirement income, and the unchanged factor specifying equivalency puts people saving in money-purchase arrangements, such as defined-contribution pension plans and RRSPs, at a major disadvantage relative to people in defined-benefit plans.

Three types of reforms could alleviate problems with the Factor of Nine:

- Update the assumptions underlying the Factor of Nine to reflect current economic and demographic realities; that would raise the current annual tax-deferred savings limit from its current 18 percent to a number around or even exceeding 30 percent.
- Level the playing field for tax-deferred saving by refining the factors so that they escalate with age and/or reflect differences in defined-benefit plan design.
- Replace the current annual tax-deferred saving limits for defined-contribution pension plan participants and RRSP savers with more generous regimes: either index unused contribution room for inflation or, more transformatively, establish an inflation-indexed lifetime tax-deferred savings limit that will permit all savers to achieve pension wealth equal to that of participants in relatively comprehensive defined-benefit plans.

More suitable calculations of annual pension accruals and support for higher tax-deferred saving – either annually or over a lifetime – would help all Canadians accumulate sufficient savings to better maintain their living standards in retirement.

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The Factor of Nine: Introduction and History

Why the Factor of Nine Exists

Numerous retirement-oriented saving arrangements exist in Canada. Some people participate in defined-benefit (DB) pension plans with relatively comprehensive benefits; others participate in DB plans with relatively basic benefits. Some participate in defined-contribution (DC) pension plans; others in Registered Retirement Savings Plans (RRSPs).[1]

DB plans, on the one hand, and DC plans and RRSPs, on the other, differ in one critical respect. DB plans promise a specific annuity in retirement. People saving in DC plans and RRSPs – often termed Capital Accumulation Plans (CAPs) – will get in retirement whatever the assets in their plans can cover. Because Canada's *Income Tax Act (ITA)* exempts some retirement saving from income tax the saver would otherwise owe in the year the income is earned and saved, these different arrangements pose a challenge. The *ITA* needs some measure of equivalency between annual accruals of wealth in DB plans and annual contributions to CAPs.

That's the logic behind the "Factor of Nine." As the result of a calculation of how much saving in a CAP would provide an annuity equal to the pension wealth a participant in a DB plan accrues during a year, the Factor of Nine links the limits on tax deferral in the two types of arrangements.

How the Factor of Nine Works

The implicit benchmark for limits on tax-deferred retirement saving in Canada is a hypothetical DB plan. Members in this hypothetical plan can accrue, without paying income tax in the year of accrual, a maximum annuity of 2 percent of earnings – an amount that, over 35 years, would yield a pension equal to 70 percent of pre-retirement earnings. The Factor of Nine postulates that financing an annuity equal to 1 percent of earnings requires saving 9 percent of earnings each year over a 35-year career. So applying the Factor of Nine to the maximum annuity of 2 percent of earnings means that DC plan members and RRSP holders can make tax-deferred contributions equal to nine times that amount: 18 percent of earnings.

The upper limits on accruals or contributions on which retirement savers can defer tax also follow this nine-to-one ratio. For 2017, the dollar cap on the annuity a member of a DB plan can accrue in a year is $2,914. The dollar cap on contributions to a DC plan is nine times as much: $26,230. The cap on RRSP contributions rises with the limit on DC plan contributions, but with a one-year lag: the 2017 cap on RRSP contributions is $26,010.[2] Table 1 shows current and recent contribution limits on annual tax-deferred retirement saving.

As a notional measure of equivalency of accruing pension wealth in different vehicles, the Factor of Nine also affects people who participate in more than one arrangement. It determines, for example, the RRSP contributions a member of a DB plan can make. The *ITA* prescribes a Pension Adjustment (PA), which reduces RRSP contribution room by the deemed value of retirement benefits earned in the previous year, multiplied by nine (the Factor), minus $600 – which adds back a small amount of contribution room in recognition of the fact that not all DB plans have the ancillary benefits assumed by the Factor.[3] And the Factor of Nine affects

1 Other types of plans exist: Target Benefit or Shared-Risk Pension Plans and Deferred Profit-Sharing Plans. For simplicity, this essay focuses mainly on DB and money-purchase (DC and RRSP) registered plans. The discussion can be extrapolated to other types of pension and savings arrangements.

2 Limits increase annually in line with the average industrial wage (CANSIM, series V1558664).

3 For DC plans, the PA is simply the contributions made by or on behalf of the plan member. Special rules apply to certain plan designs.

Table 1: Limits on Annual Tax-Deferred Retirement Savings ($)

Year	Defined-Benefit Pension Accrual Limit	Maximum Pension Adjustment for Defined-Benefit Provision	Defined-Contribution Plan Limit*	RRSP Contribution Limit
2017	2,914.44	25,630	26,230	26,010
2016	2,890.00	25,410	26,010	25,370
2015	2,818.89	24,770	25,370	24,930
2014	2,770.00	24,330	24,930	24,270
2013	2,696.67	23,670	24,270	23,820
2012	2,646.67	23,220	23,820	22,970

* Under the Factor of Nine, this is nine times the Defined-Benefit Pension Annual Limit.

Source: Canada Revenue Agency.

people who switch from one type of plan to another during their careers.

Factor of Nine Assumptions

The Factor of Nine is not new. It was first proposed by the federal government in 1984, implemented in 1990, and has remained unchanged since then.

To recap, the number nine in the factor reflects calculations showing that contributions of 9 percent of earnings over 35 years will fund an annuity equal to 1 percent of a person's preretirement earnings. This means that, with the maximum accrual in a DB plan being an annuity equal to 2 percent of earnings, a DB participant with 35 years of service can accrue an annuity equal to 70 percent of final earnings. The equivalent maximum annual saving in a CAP is nine (the Factor) times two (the maximum accrual per year in a DB plan), or 18 percent of earnings.

The calculations that underlie the Factor of Nine require many assumptions. Some are about the DB pension plan serving as the benchmark, notably:

- retirement at age 63 with a full pension after 35 years of pensionable service;
- an annuity based on the average of the final five years' earnings;
- benefits indexed to inflation at a rate equal to the increase in the Consumer Price Index (CPI) less 1 percent; and
- a survivor benefit equal to 60 percent of the pension.

The demographic and economic assumptions underlying the Factor of Nine are also critically important, notably:

- life expectancies from the 1971 mortality tables;
- annual nominal investment returns of 7 percent, with 4 percent annual inflation, yielding a real return of about 3 percent; and
- annual salary increases of 5 percent.

The Factor of Nine attracted criticism from early on for establishing a very uneven playing field (see, for example, Canadian Institute of Actuaries 1995; Slater 1997). As the next sections document,

using a single number creates many important and unfair differences among people saving in the various types of vehicles, and it is particularly disadvantageous for participants in CAPs.

One Number Does Not Fit All DB Plans

The hypothetical DB plan underlying the Factor of Nine resembles few actual plans in Canada. Moreover, the differences between the hypothetical plan and actual plans are big enough to mean that, accepting for the moment that the economic and demographic assumptions underlying the Factor of Nine are reasonable, it understates the amount of saving required to fund more comprehensive DB plans and overstates the saving needed for more basic ones.

Most public-sector DB plans provide more comprehensive benefits than the Factor of Nine formula anticipates. They typically offer full retirement benefits before age 63, often using an age-plus-service formula: a 90-point formula, for example, would permit unreduced early retirement at age 60 after 30 years of service. Public-sector plans also typically offer bridge benefits during the period before a participant becomes eligible for Old Age Security and the Canada or Quebec Pension plans. (Bridge benefits do not figure in the calculations in this E-Brief, however, because they apply only when the base benefit is less than 2 percent, and the calculations here assume a 2 percent benefit.) Although some more comprehensive plans are flexible or shared-risk plans, with indexation of benefits to inflation contingent on the state of their funding, most have historically indexed benefits fully, and many commit unconditionally to full indexation. They also commonly provide joint and survivor benefits at no cost to the individual participant.

By contrast, most private-sector DB plans promise more basic benefits than anticipated by the Factor of Nine. Many offer full pensions only after age 63: participants who start benefits earlier get less. Bridge benefits are not common in private-sector plans. Contractual inflation protection is rare. And while federal and provincial laws require joint and survivor benefits unless the participant's spouse waives them, private-sector plans typically provide lower primary benefits as an offset.

Although the Factor of Nine does take the annual benefit accrual rate of each plan into account, it overlooks the differences just listed. If a relatively comprehensive and a relatively basic DB plan used the same accrual rate – for example, the 2 percent of final earnings typical of more comprehensive plans – and both had the same normal retirement age of 65, the Factor of Nine would treat them as identical. The PA would reduce the RRSP contribution room of participants in each equally, even though participants in the relatively basic plan accrue much less retirement wealth each year.

Nine is Too Low for Current Demographic and Economic Realities

A bigger problem is that the demographic and economic assumptions underlying the Factor of Nine are way out of date. The longer a person lives, and the lower the returns on investments funded by retirement saving, the more a person must save to achieve a given annual amount in retirement. Changes since the establishment of the Factor make the number nine too low – which puts the majority of Canadians who save for retirement in CAPs at a major disadvantage.

Increased Longevity

Looking first at longevity, Canadians are living longer and life expectancy continues to increase. The Factor of Nine uses life expectancy based on 1971 tables, by which a typical 60-year-old Canadian male

Table 2: Life Expectancy for 60-Year-Old Canadians, Various Projections

	In 2016		In 2040	
	Male	Female	Male	Female
1971 life expectancy projections (GAM 71)	18.8	23.5	Same	
Latest Canadian Institute of Actuaries expectations (CPM)	26.8	29.3	28.1	30.5
CPP (Canadian population)	25.5	28.0	27.0	29.5

Notes: GAM 71 is the 1971 Group Annuity Mortality Table; CPM is the Canadian Pensioner Mortality Table (CPM2014) combined with a two-dimensional mortality improvement scale (CPM-B); CPP (Canadian population) is from the CPP actuarial report, December 31, 2012.

was projected to live to age 79.[4] Today's projections have the typical 60-year-old male living to age 86.

Moreover, modern actuarial projections – unlike the static 1971 life tables – take account of the fact that each cohort of Canadians has been living longer. This dynamic approach suggests that historical estimates are increasingly inappropriate the further ahead we look. By 2040, the latest mortality tables from the Canadian Institute of Actuaries anticipate, 60-year-old males will live almost a decade longer than the 1971 tables indicated, and 60-year-old women will live seven years longer (Table 2). For a given retirement age, the resulting extension of the retirement period materially raises the savings needed to achieve a given annual income in retirement.

Lower Returns on Pension-Appropriate Assets

Changes in economic circumstances relevant to the assumptions underlying the Factor of Nine are even more important. Critically, the 3 percent real return assumed in the Factor of Nine calculations far exceeds recent and projected yields on investments that produce cash flows secure and predictable enough to back decades of retirement (Table 3). The federal government's real-return bond was yielding about 0.7 percent at the time of writing, and real returns on the bonds of most advanced-economy national governments are between 0 and 1 percent. The highest real-return assumption that seems realistic in today's environment, even for investors willing to take some liquidity and investment risk, might be 1 percent (Ambler and Alexander 2015).

These lower yields mean it now takes much more saving than in previous years to earn a dollar of retirement income. Dodge, Busby, and Laurin (2010) use the example of a median-income earner who aims to retire at age 65 after 35 years of work and to buy an annuity that replaces 70 percent of pre-retirement income. The saving rate this person needs with a real return of 1 percent on saving during working life is five percentage points higher than it would be with a real return of 3 percent. Lower the yield used in calculating the annuity by the same margin, and the saving rate rises at least

4 The Factor of Nine calculations used male life expectancies (for spouses, the assumption was that the spouse was the same age). This E-Brief therefore references male life expectancies here and throughout. Because the gap between (shorter) male life expectancies and (longer) female life expectancies has narrowed over time, the distortion from using male figures only for more up-to-date calculations has lessened. Calculations for women, however, would show that up-to-date factors would be even higher than those that follow.

Table 3: Real Returns on Investment (percent)

Assumed in Factor of Nine	3.0
Government of Canada real-return bond yield, average, most recent 60 months	0.6
Government of Canada real-return bond yield, November 2017	0.7
Estimate based on economic growth and supply and demand for investable funds (Ambler and Alexander 2016)	1.0
Consensus Economics forecast for 2018 (10-year Government of Canada bond yield minus CPI), March 2017	0.2
Private-sector forecast average from 2017 federal budget (10-year Government of Canada bond yield minus CPI, 2017-21)	0.4

Source: Author's compilation.

Table 4: Tax-Deferral Limits for an Individual Leaving a Comprehensive Plan

Age	Annual Pension	Annuity Factor	Commuted Value	8517 Factor	Tax-Deferral Limit	Amount Subject to Immediate Taxation
35	$12,000	18.2	$218,400	9.0	$108,000	**$110,400**
45	$30,000	20.9	$627,000	9.0	$270,000	**$357,000**

Source: Ontario Teachers Pension Plan.

two percentage points further. So a benchmark calculated for a 3 percent return environment will be nowhere close to what is needed in an environment where real returns are 1 percent or less.

Evidence of a Problem: Transfer Values

For a stark illustration of the Factor of Nine's uneven treatment of different tax-deferred arrangements, consider a person who leaves a job with a DB plan and chooses to transfer the retirement wealth accrued in that plan – the commuted value – to another arrangement, such as a Locked-In Retirement Account (LIRA). The amount this person can transfer without paying current tax is subject to limits (typically termed the "8517 limits" in reference to the applicable regulations under the *ITA*) that, for people under age 50, reflect the Factor of Nine.

A person under age 50 in a relatively comprehensive DB plan as described above who chooses to transfer the commuted value of her pension benefits to a LIRA would face the situation summarized in Table 4. If she is 35 years old and has accrued pension entitlements equivalent to a $12,000 annuity at retirement, the commuted value of her pension would be more than $218,000. The 8517

limit would allow her to continue deferring taxes on only $108,000 of that amount. Her transition from the advantaged position of a DB plan member to the harsher environment of CAP savers would oblige her to pay current income taxes on the rest. If she is 45 years old and has accrued a $30,000 annuity, her pension's commuted value would be $627,000. That is much more pension wealth than a CAP saver can accumulate. The 8517 limit would allow her to defer taxes on only $270,000 and oblige her to pay tax on the balance of $357,000.

This example shows why people speak of "golden handcuffs" – the tax penalty exacerbates the tendency for DB pensions to freeze people in one job even when their productivity might be higher in a different one. It also illustrates the stark difference between the *ITA*'s generous treatment of wealth accruals in relatively comprehensive DB plans and its harsh treatment of saving in CAPs.

A further noteworthy feature of the 8517 limits is that, unlike most applications of the Factor of Nine, they recognize that achieving a dollar of income in retirement costs more as a person gets closer to retirement. The factors behind the 8517 limits rise after age 49 – for example, for someone age 55, the figure is 10.4. Many CAP savers back-load their retirement saving because of other obligations earlier in life, such as education, servicing mortgages, and raising children. Older people have a shorter period to earn investment returns and need to save more for each dollar of income they hope to enjoy in retirement. But the annual limits on tax-deferred saving in CAPs are the same for everybody.

More Evidence of a Problem: Contribution Rates in More Comprehensive Plans

For further evidence that achieving retirement income like that anticipated by the Factor of Nine costs more nowadays, we need only look at contribution rates in major Canadian DB and shared-risk plans. Although public-sector accounting standards still allow public-sector pension plans in Canada to use (higher) assumed rates of return rather than (lower) actual market yields in discounting their liabilities, many plans have changed their funding policies to reflect the current lower-investment-return environment. They have also updated their longevity assumptions and increased their contributions as the average age of their working participants has risen.

Table 5 lists a number of major public-sector DB and shared-risk plans in Canada, noting some of the ancillary features of these relatively comprehensive plans and showing their contribution rates – for employees only, since that is what the participants in these plans are typically aware of, and for employers and employees together, which is relevant for this comparison.[5] Even with the assumption of investment returns higher than would be prudent for an individual CAP saver, these plans require funding at rates that typically exceed 18 percent, and often by a considerable margin.[6]

In many of these plans, the principle that participants and the plan sponsor (often the relevant government acting on behalf of taxpayers) share risks exposes both sides to funding shortfalls arising from changing circumstances, including longer life expectancies and lower investment returns. A rule

5 These plans pay lower benefits over the range covered by the Canada Pension Plan. They therefore levy lower contributions on earnings below the CPP's Yearly Maximum Pensionable Earnings (YMPE) and higher contributions on earnings above it. The YMPE was $55,300 in 2017.

6 The federal public service plan assumes real returns close to 4 percent. A fair-value estimate of the annual accruals of wealth in these plans, using the real-return bond yield as a discount rate, suggests that an appropriate contribution rate to fund these plans would be 50 percent of pay or more (Laurin and Robson 2017).

Table 5: Employee Contribution Rates for Major Canadian Pension Plans

Plan	Key Ancillary Features	Member Contribution Rate Below / Above YMPE (*percent*)	Total Employer and Employee Contribution Rate Below / Above YMPE (*percent*)
Federal Public Service Pension Plan (pre-2013 members)	Fully indexed; unreduced benefits at age 60 or age 55 with 30 years of service; bridge benefit	9.05 / 11.04	19.22 / 23.71
Federal Public Service Pension Plan (post-2012 members)	Fully indexed; unreduced benefits at age 65 or age 60 with 30 years of service; bridge benefit	7.86 / 9.39	16.86 / 19.98
HOOPP	Ad hoc indexing; unreduced benefits at age 60 or age 55 with 30 years of service; bridge benefit	6.9 / 9.2	15.6 / 20.8
OMERS	Fully indexed; unreduced benefits at 90 points or age 55 with 30 years of service; bridge benefit	9.0 / 14.6	18.0 / 29.2
OMERS – Police Officers and Firefighters	Fully indexed; unreduced benefits at 85 points or age 50 with 30 years of service; bridge benefit	9.2 / 15.8	18.4 / 31.6
BC Teachers' Pension Plan	Conditional indexation; unreduced benefits at age 60 or 90 points; bridge benefit	12.5 / 14.0	25.31 / 28.31
Ontario Teachers' Pension Plan (OTPP)	Conditional indexation; unreduced benefits at 85 points; bridge benefit	11.5 / 13.1	23.0 / 26.2

Sources: Official information on respective plans' websites. Employer contribution to the federal Public Sector Pension Plan is estimated from the latest actuarial report on the Plan (OCA 2015).

related to the Factor of Nine creates a challenge for them because the *ITA* limits contributions by active participants to either 9 percent of the member's compensation (half of 18 percent) or $1,000 plus 70 percent of the member's PA, whichever is less. These plans can and do get waivers of this limit on the employee contribution rate, one condition of the waiver being that members will fund no more than half of the benefits being provided. The Factor of Nine therefore operates to limit the exposure of plan participants to the rising cost of their pensions – which lessens their awareness of the value of their benefits and tends to increase the burden on taxpayers.

Updating the Factor: What Values Might Make Sense?

One possible reaction to the discussion thus far would be to say that the hypothetical plan underlying the Factor of Nine is too rich a benchmark for retirement saving. It is easy to think of situations where trying to replace 70 percent of pre-retirement earnings makes no sense, especially if the saving

Table 6: How Modern Mortality Affects Saving Factors

	Factor of Nine Model	Comprehensive Plan	Basic Plan
1971 life expectancy projections (GAM 71)	9.0	10.7	5.6
Latest Canadian Institute of Actuaries expectations (CPM)	10.9	13.0	7.1

Note: Because the plans have different retirement ages – 63 for the Factor of Nine model, 60 for the comprehensive plan, and 65 for the basic plan – but the calculations presume 35 years of service in each case, these comparisons imply different ages of entry: 28, 25, and 30, respectively.

Table 7: How Lower Yields Affect Saving Factors

Real Yield (percent)	Factor of Nine Model	Comprehensive Plan	Basic Plan
3	9.0	10.7	5.6
2	11.7	14.3	7.1
1	15.3	18.9	9.0
0	20.0	25.1	11.4

Source: Aon Hewitt.

required would make a person's consumption while working lower than it will be in retirement. But the fact that it makes no sense for some people does not mean that others who would like to aim high in retirement – as participants in public-sector plans are doing – should face policy obstacles.

In Defence of Generous Tax Deferral on Retirement Saving

To start with, while the concept of limits on tax-deferred saving is familiar to Canadians, its justification rests on an extreme presumption: that the ideal tax system would tax all accruals to net worth as they occur, and that allowing people to defer tax on saving and returns on saving is a tax preference. This presumption is not widely shared among tax experts, and the purported ideal system is not to be found anywhere in the world. Many types of current income, including implicit rent on owner-occupied housing, the value of home production, and unrealized capital gains, as well as at least some retirement saving and returns on it, are typically not part of the personal income-tax base anywhere, including Canada.

An ideal that would command at least as much support among tax experts is a consumption tax, which would exclude all saving from the tax base until it is drawn down and spent. By that standard, taxing any income saved for retirement (including investment returns on previous retirement saving) is wrong-headed, and any measure that removes more of it from the personal income-tax base is good.

While tax deferred on accumulations of pension wealth reduces current government revenue, moreover, that tax will eventually be paid. On the

Table 8. Circumstances and Saving Factors, Then and Now

	Factor of Nine	Current Circumstances
Economic Circumstances (percent)		
Nominal rate of return	7.0	3.0
Salary scale	5.0	3.0
CPI	4.0	2.0
Real rate of return	3.0	1.0
Plan Design		
Factor of Nine	9	20
Comprehensive plan	11	25
Basic plan	6	15

Note: All scenarios use 50 percent male unisex for mortality tables (CPM), with male spouses being three years older than female spouses.

reasonable assumptions that the average tax rates at deferral and payment are the same, and that the discount rate to convert those future payments to a present value is the rate of return on retirement saving, the cost of the deferral to governments is zero (Robson and Laurin 2014).

As a practical matter, moreover, making Canada's tax treatment of retirement saving in various forms fairer will mean some mix of more generous treatment for people currently disadvantaged and more restrictive treatment for people currently advantaged. Achieving fairness by improving the treatment of people currently disadvantaged is attractive on many grounds, not least that it is likelier to happen because the policymakers who must initiate the change currently enjoy favourable treatment for their relatively comprehensive pension plans. Even if they are reluctant to extend that treatment to other people, they would presumably prefer extending it to losing it themselves.

If we accept the relatively comprehensive DB plan benchmark underlying the Factor of Nine calculation, then, the next question becomes: What new factor would mitigate the current uneven treatment of people saving for retirement in different vehicles?

Updating the Factor for Modern Longevity

To begin with, the Factor needs updating to allow for the fact that Canadians nowadays can expect to live longer and to need retirement income for more years.

Table 6 shows the saving factors (percentage of pre-retirement income needed to fund one percent of replacement income in retirement) for the plan underlying the Factor of Nine under its historical assumption and with today's mortality. It also shows the equivalent numbers for the relatively comprehensive DB plan and the relatively basic plan.

As with the examples earlier, all three plans offer a benefit of 2 percent of the average of the participant's final five years' earnings multiplied by pensionable service, with normal retirement at age 65. The relatively comprehensive plan offers unreduced early retirement at the later of age 60 and 30 years of service, complete CPI indexation of benefits, and a 60 percent joint and survivor form of

pension at no cost to the individual. The basic plan offers none of these. As the table indicates, increases in longevity have had a material impact on the contribution rates required to fund these plans – an impact that the unchanged Factor of Nine neglects.

Much more important is the decline in the returns available on investments that are suitable for backing retirement income. The sensitivity of the same three plans to changes in the assumed real rate of return on saving appears in Table 7. The current low-for-long environment has dramatically increased the amount of saving required to achieve the target replacement income.

Although longevity and real returns are the most critical determinants of how much saving a person needs to hit her or his retirement-income target, updating the Factor of Nine also involves consideration of lower inflation rates and lower nominal increases in wages and salaries. Table 8 rounds out the exercise. Its first column compares the key assumptions in the Factor of Nine and their implications for saving factors in the comprehensive and basic DB plans; and its second column shows assumptions more appropriate for the current day and their implications for the saving factors in all three plans.

As discussed already, the results in the first column show that while the Factor of Nine was, naturally, consistent with the assumptions underlying it, applying those same assumptions to the different parameters of more comprehensive and more basic plans reveals that the comprehensive plan gave its participants an average accrual of pension wealth larger than the Factor of Nine's hypothetical plan, while the basic plan gave its participants an annual accrual that was smaller. To extend the comparison using numbers relevant to many retirement savers, people using DC plans or RRSPs would need to save 18 (the 9 in the factor times 2) percent of their annual incomes to obtain an annuity equal to the 2 percent of earnings available in the Factor of Nine's plan, but 22 (the adjusted factor of 11 times 2) percent of annual earnings to match the benefits available in the comprehensive plan, and 12 (the adjusted factor of 6 times 2) percent of earnings to match the benefits of the basic plan.

The second column in Table 8 shows the results with mortality, return, salary, and cost-of-living assumptions more appropriate for today. Notable among them is a real rate of return of 1 percent – a value reflecting a compromise between the higher returns still widely expected in the coming decades and the lower actual yields currently available on low-risk investments. The benchmark plan underlying the Factor of Nine calculations would now require some 40 (the updated factor of 20 in the table times 2) percent of annual earnings to fund. Even the basic plan is worth, and would cost, 30 (the updated factor of 15 times 2) percent of earnings. And the comprehensive plan is worth, and costs, 50 (the updated factor of 25 times 2) percent of earnings.

Another way to think about the updating challenge is to ask what real rate of return would validate the Factor of Nine with the updated assumptions about every other variable. The answer: the plan assumed by the Factor of Nine would need a real return, after expenses, of close to 4 percent – throughout a participant's working years *and* during retirement – to make $9 of tax-deferred saving finance, on average, $1 of pension income. This real return is *higher* than the 3 percent real return underlying the Factor of Nine. Even though real yields are now lower than the Factor of Nine model assumes, the implicit real returns that underlie current limits on tax deferred saving are now higher – a perverse policy.

Alleviating the Disadvantage for CAP Savers

The Factor of Nine arguably produces an even worse saving disadvantage for CAP savers than these updated factors suggest. Advocates for DB plans emphasize that people in DC pension plans and RRSPs typically incur higher risks and higher costs than DB plan participants do. A DB plan can pool longevity risk across cohorts, which DC

plans cannot. To the extent that these differences are material, they would justify more generous tax treatment of saving in DC plans than in DB plans. RRSP savers cannot pool longevity risk at all unless they buy annuities and face higher retail costs during both their accumulation and decumulation years – circumstances that, likewise, would justify more generous treatment.

Another fundamental problem is market fluctuations. Tax rules do not prevent DB plans from increasing contributions to offset capital losses in a downturn – indeed, sponsors *must* cover deficits. By contrast, CAP savers cannot contribute extra funds after the market turns against them – the PA and contribution limits operate on an annual basis, with no recognition of past setbacks. That asymmetry alone means the DB member has a greater likelihood of receiving the desired benefit.

Fixing the Factor

All these considerations point the same way: toward more generous tax deferral on accruals of retirement wealth in DC pension plans and RRSPs[7] – treatment that, incidentally, would bring Canada more in line with other countries that similarly limit tax-deferred retirement saving.[8]

Raising the Factor

If the model plan underlying the Factor of Nine was widely representative, a reasonable response would be to update the factor for current conditions along the lines reflected in the second column of Table 8. The result would be a factor of 20 – plus some premium, say a couple of percentage points, to compensate CAP savers for their higher costs and inability to top their plans up after market reversals. But the model plan is not representative: with DB coverage in the private sector having shrunk, most DB plans are public-sector plans of the relatively comprehensive type.

If fairness among different Canadians saving for retirement is a compelling objective – which most Canadians would probably say it is – and if public-sector pension plans continue to offer early retirement, some kind of indexation, and other ancillary benefits, the factor should be 25 or more. The annual limits on the share of earnings participants in DC pension plans and RRSPs can set aside should be not 18 percent but 50 percent, and the dollar limits should be more than $70,000 annually.

Such a change would alleviate the problem faced by participants in relatively basic DB plans whose PAs shrink their RRSP room even though their plans are less comprehensive than assumed in the Factor of Nine. A more ambitious reform would establish more than one factor for different DB plans, varying depending on such key variables as early retirement options and inflation protection.

Regularly Reviewing the Factor

If real yields on safe investments stay below 1 percent, even a factor of 25 or so will not be enough.

7 Although the province of Ontario will not now proceed with the Ontario Retirement Pension Plan (ORPP), the proposed plan's threshold for a DC pension plan to be judged generous enough to exempt its participants from the ORPP implies a factor much higher than nine. Under the proposed ORPP rules, a DC plan would have needed to have contributions (employer plus employee) of 8 percent of pay to earn an ORPP exemption. The ORPP was to replace 15 percent of earnings after 40 years of participation, making the annual accrual of wealth in the ORPP 0.375 percent (15 percent divided by 40 years). The factor that would make an 8 percent DC contribution equal to 0.375 percent is 21.3.

8 The United States does not treat individual savings arrangements (401Ks) generously, although it does have a catch-up provision for older contributors, and its tax-deferred contribution limit for defined-contribution pension plans is US$53,000. In the United Kingdom, contributions to Self-Invested Personal Pension (SIPP) plans are capped at £40,000. Australia caps voluntary contributions to superannuation funds at A$30,000, with an additional A$5,000 available to those over 49 years of age. The Netherlands has no limits on tax-deferred contributions.

Conversely, if real yields rise again, 25 might appear excessive. A system of annual limits on tax-deferred saving should have regular review, in the light of updated information on both longevity and investment returns. Only then can CAP savers and DB pension plan participants stay on a roughly equal footing when it comes to opportunities for tax-deferred saving.

The Transformative Alternative: A Lifetime Limit

What about the problem that the amount of saving required for a given income target increases as people approach retirement? Uniform annual limits ignore this reality, giving more contribution room than people need when they are young (and typically less able to use it), and less contribution room than they need when they are old (and typically more able to use it). One option would make factors a function of the saver's age. Just as the 8517 limits are higher for older people, saving limits for older CAP savers could be higher – which would further reduce the tax penalty for DB plan participants who switch jobs.

As for older CAP savers whose nest-eggs suffer in market downturns, an alternative or complementary change would be renewals of contribution room following losses – a mechanism that would be useful for DC plan participants and RRSP savers alike. Indexing unused contribution room for inflation is another change that would help CAP savers – RRSP savers in particular – who do not use their maximum room early in life, when other priorities take precedence, but could use more room later on, when both their ability to save for retirement and their need to do it is higher.

One drawback of establishing different factors for different DB plans and adjustments for ages would be added complexity in a system that even professionals already find hard to navigate. Employers and plan administrators should be able to calculate pension adjustments without inordinate effort, and individual savers should not find the system mystifying.

As noted already, unlimited tax-deferred saving is not objectionable on a tax-policy basis – indeed, it already exists in the Netherlands – and removing limits altogether would dramatically simplify the system, making any equivalence factor unnecessary. If that is too extreme, an appealing alternative to annual limits would be a lifetime limit. Pierlot and Siddiqi (2011) proposed an inflation-indexed limit, which would have started at $2 million – the amount they calculated as equivalent to the pension entitlement accumulated by the average federal public servant, who enjoys a very comprehensive DB plan, at retirement.[9]

Further declines in yields on high-quality investments since Pierlot and Siddiqi did their work would make the equivalent today larger. Updating the limit would be a matter of converting, as discussed, the maximum accrual for DB plans into a CAP equivalent, using a factor of 25 or so that reflects modern estimates of longevity and realistic returns on investment. For example, applying the 2017 maximum DB accrual of $2,914.44 to a 35-year contribution period and multiplying by 25 yields a limit around $2.5 million.

The change looks radical for people used to thinking in terms of annual limits, but it would be easy to understand. It would permit a dramatic simplification of the system. And it has the

9 Pierlot (2008) suggested a lifetime limit of at least $1 million; benchmarking federal public servants and updating for circumstances subsequently made a number of at least $2 million appear more reasonable. The United Kingdom established a $1.5 million lifetime limit, with inflation adjustment, in 2006. Budgetary pressure recently led the UK government to propose cutting the lifetime limit to $1 million – a controversial proposal, given increased longevity and lower investment returns. At recent exchange rates, that lower amount would be equal to about $1.6 million in Canadian dollars.

potential to put all Canadians participating in tax-deferred retirement saving arrangements on a more equal footing and to improve opportunities for millions who could use more savings room.

Time to Act

With the flaws in the Factor of Nine so glaring and the case for change so compelling, readers might reasonably ask why the factor has not changed since its establishment in 1990. Many answers are possible: demographic changes are gradual; the reality of lower returns on high-quality investments has been slow to sink in; more often than not since 1990 the federal government has been hungry for revenue to cover deficits; with so much RRSP contribution room already going unused, giving people more opportunity to save looks pointless; populism inclines governments to raise taxes rather than cutting them; and policymakers typically have comprehensive DB plans, so the Factor of Nine is not much of a problem for them.

Whatever the explanation for inaction over the past quarter century, inaction over another quarter century would be unconscionable. Canadians continue to live longer. Slower world growth and high saving will likely depress real returns for decades. Taxes deferred when people save for retirement get paid once people are retired.

Unfair tax treatment should not exacerbate the gap between richer public-sector compensation and poorer private-sector compensation. And even if much of the additional room does not get used – in which case concerns about immediate impact on government revenue are less – the benefit for people who are getting close to retirement and would like to achieve comfort closer to what members of relatively comprehensive DB plans enjoy will still be considerable.[10]

With anxiety about security of retirement as high as it is, obsolete tax laws should not be making things worse. Higher factors that improve the tax situation of Canadians in less comprehensive DB plans or CAPs, indexation of unused CAP contribution room, or, ideally, an indexed lifetime limit established using an appropriately high factor would provide Canadian workers with the opportunity to save sufficient tax-deferred amounts to achieve retirement security – a laudable goal.

10 Laurin (2014) parses the data on unused RRSP room and concludes: "[N]early half of employed workers who potentially should at least be contributing to an RRSP did so in 2013, and they contributed more than 10 percent of earnings on average, a much higher figure than broad average statistics would lead us to believe. And both RRSP average participation rates and contribution rates increase with age, such that more than 60 percent of average- to high-income earners aged 45 and older contributed to their RRSP, at average contribution rates in various income groups ranging from 8 to 17 percent of earnings for RRSP-only contributors. Therefore, RRSP utilization may still be lower than some would consider socially optimal, but not to the extent widely believed …"

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