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VISION

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When can we retire?

By Fred Vettese, Chief Actuary

In the [last Vision](#), we saw how a glut in the labour force caused retirement ages to fall but that a looming shortage of workers will eventually compel us to work longer. The question is, how much longer? We will try to answer this question both in terms of when we can afford to retire and when the economy wants us to retire. Ultimately, the two approaches need to synchronize.

An actuary will say we can retire when we have saved enough. That is true for an individual and, eventually, it will also be true for the country because we cannot pass the cost of our pension programs onto a future generation forever. By knowing how much Canadians are prepared to save and what level of retirement income they hope to attain, the actuary can calculate the age at which we can collectively afford to retire.

Of course, individuals can and will continue to retire at a wide range of ages from under 50 to over 80, but for the sake of simplicity we will assume that everyone retires at the same age. We will also assume that everyone, except for lowest-income households, contributes the same constant percentage of pay and has the same retirement income target as a percentage of final pay. As for the bottom 40% of households by income level, we will assume they contribute only half as much as a percentage of pay and that they have a higher retirement income target. The specific question we will try to answer is:

What is the earliest age that we can all afford to retire with an acceptable level of pension, without creating a burden for the next generation?

We know the answer is probably higher than 62, even though that is our current average retirement age. As we saw in the last *Vision*, our economic and demographic environment will likely be less benign in the near future.

ONE COMPREHENSIVE NATIONAL PLAN

In place of OAS, GIS, the Canada/Quebec Pension Plan, and the various tax-assisted retirement vehicles that make up the third pillar, imagine that we had just one comprehensive pension plan that met all our retirement needs. This idea makes it easier to see the relationship between the aggregate savings rate, retirement income and retirement age.

Besides, if we find we cannot afford one efficient plan that meets all of our needs, we will not be able to afford the miscellaneous assortment of plans we have now with all of their gaps and overlaps.

The comprehensive plan would be fully funded by contributions from employees plus matching contributions by employers. We will leave the government out of it since ultimately employees and employers pay the government's share through taxes. Our process for coming up with the sustainable national retirement age involves:

- fixing the contribution rate at the highest level we think is sustainable on a long-term basis;
- setting a reasonable retirement income target; and
- identifying the earliest retirement age at which our contribution rate produces the target retirement income.

HOW MUCH ARE WE PREPARED TO CONTRIBUTE?

Currently, employers and employees each contribute 4.95% of pay toward the Canada Pension Plan (except in Quebec where it is a little higher) but this is only on earnings up to the average national wage, which is about \$50,000. As a percentage of total pay, it would be less than 4.95%. We are also contributing indirectly to OAS and GIS in the form of income taxes; that indirect contribution is equivalent to about 1% of pay¹. Finally there is the amount we contribute into pension plans and RRSPs. For most of us, this will range from 0% to 12% of pay, with the upper end of that range applying to members of some public sector pension plans and to self-employed professionals who are saving through RRSPs. If we combine all the pieces, the vast majority of us are putting aside less than 10% of pay on average toward retirement saving, ignoring the employer portion. Those who are younger, work in small businesses, are raising families or paying off a mortgage, are contributing even less.

¹ Personal taxes represent about 20% of our total income while expenditures on OAS and GIS total a little over 5% of total government expenditures. Multiplying these suggest 1% of our pre-tax income is earmarked for OAS and GIS.

With this background, it is safe to assume that the highest savings rate that the average household would be able to maintain for an entire career is 12% of pay and perhaps only half that for the lowest 40% of households by income level. We will further assume the maximum that employers can contribute on behalf of their employees is also 12% of pay. This is admittedly a stretch since many smaller employers in the private sector contribute nothing toward their employees' retirement now, apart from the mandatory CPP/QPP contribution. Smaller businesses in particular would argue that a 12% contribution rate could bankrupt them. Hence, the maximum combined contribution rate could be as high as 24% of pay, but could very well be lower.

SETTING THE RETIREMENT INCOME TARGET

Next, we need to set our retirement income target. The conventional wisdom is that the target should be 70% of pay or even higher but this cannot be true, except for low-income households. We touched on this in previous *Visions* in which we showed the neutral target is usually considerably less than 70%².

For now, let us assume that a reasonable retirement income target is 50% of final pay in the final year of work. The 50% target may seem low, but keep in mind that many of life's biggest expenditures—mortgage payments, child raising, retirement saving itself—fall away by the time we retire.

We will use a target of 90% for the lowest quintile of Canadian households by income level (i.e. the bottom 20%) and a 75% target for the next lowest quintile. These higher targets reflect the existing reality that lower-income Canadians often receive more pension from government sources than they previously earned in a year as employment income and they usually need it. We will still call our overall plan the "50% Plan" for convenience.

COST OF THE 50% PLAN

The next step is to determine the cost of the 50% Plan at each retirement age between 60 and 70 until we find the earliest retirement age at which the cost is 24% of pay or less. Determining the cost of pensions for all Canadians under one common plan requires a very sophisticated computer model that takes into account our current demographics, future improvements in mortality, immigration patterns, labour force participation rates, unemployment rates, fertility rates, inflation, the behaviour of the capital markets and so on. Fortunately, this model has already been built for us—it is the valuation system used for the Canada Pension Plan. The valuation model is robust enough to be able to assess whether the Canada Pension Plan will be sustainable at the current contribution rate over the next 75 years. For the curious, our methodology is described in the Appendix.

Using this model, we can calculate the approximate total cost if pensions were to start at any age between 60 and 70. Table 1 shows the result:

Table 1
COST OF A 50% PLAN

Retirement Age	Total Cost
60	28% of pay
61	26%
62	24%
63	22%
64	21%
65	20%
66	18%
67	17%
68	17%
69	16%
70	15%

² See our [September 2010](#) and [January 2011](#) Visions.

The results in Table 1 are a little daunting but not outside the realm of possibility. A 24% contribution rate enables us to retire by age 62 on a 50% pension. By coincidence, this is the average age of retirement right now although we are contributing much less than 24% of pay to make that happen. If we feel 24% is simply too much to set aside, Table 1 tells us that a 20% contribution rate lets us retire by 65. If we drop the contribution rate further to 16% (8% employee, 8% employer), the corresponding retirement age is 69.

The high cost of retirement should not be too much of a surprise. As we learned in the last *Vision*, the capital markets will probably give us lower returns in the future, plus we are living longer (see the sidebar “How long can we expect to live?”). Moreover, remember that our model assumes the current generation is shouldering the total cost for itself rather than passing some of it along to the next generation.

OUR BUFFER

We might be able to contribute a little less than 24% of pay and still retire by age 62. Two things make this possible. The first is that we do have other assets that are convertible into retirement income. We introduced the concept of Pillar 4 assets in the [April 2010 Vision](#). Pillar 4 assets include equity in the home or other real estate, equity in a business, inheritances, bank accounts etc. These assets are used extensively by current retirees to make up for shortfalls in regular pension income from the three traditional pillars that form our retirement income system. There is no reason to think this will change.

Another reason we can save less is because our calculations conservatively assumed that pensions would be fully indexed to changes in the CPI after retirement. The need for fully indexed pensions is rarely challenged but perhaps it should be. An 80-year-old who is no longer traveling extensively, buying furniture, maintaining two cars or frequently dining out is almost certainly consuming less than a new 62-year-old retiree. While the 80-year-old will have higher health care costs, most of those costs are borne by the state, not the individual.

3 From Statistics Canada Catalogue 62-202-X

CAN CANADIANS SAVE 12% OF PAY?

The table below shows the annual expenditures for a third quintile household. Third quintile means they earn more than the bottom 40% of earners but less than the top 40%—they are right in the middle.

EXPENDITURES FOR A TYPICAL WORKING PERSON³

Expenditures on	Third Quintile (\$)
Food	7,206
Shelter	13,110
Household operation	3,160
Household furnishings	1,573
Clothing	2,350
Transportation	8,645
Health care	1,930
Personal care	1,039
Recreation	3,186
Tobacco and alcohol	1,597
Education	748
Miscellaneous	1,411
Total current consumption	45,955
Personal taxes	8,517
Personal insurance and pension plan contributions	3,407
Gifts of money	1,361
Total expenditure	59,240

From the table, we can imagine how a given individual earning \$60,000 might be diligent enough to reduce consumption and save 12% of pay but it is hard to see *everyone* making the sacrifices this would entail. Expenditures would need to be pared down across the board resulting in a significantly lower standard of living.

Statistics from Canada and other countries show that the age group with the highest savings rate are those age 80 and over. Based on this logic, it should be enough to index pensions to reflect only part of the change in CPI, such as 50%. If we did this, pensions would be significantly less expensive. We could make an attempt to incorporate these points in our cost estimates but instead we will leave the costs in Table 1 as is and know our estimate may be a little conservative.

COST OF A 70% PLAN

Most of our public sector pension plans and some larger private sector plans are based on the 70% target and assume all the retirement income will come from the traditional three pillars, not from Pillar 4 assets. When you do the math, though, you find that a target of 70% is virtually unattainable if one is relying on RRSPs or equivalent capital accumulation vehicles to get to that number. This is the conclusion from Table 2, which shows the cost of a fully indexed 70% Plan:

Table 2
COST OF A 70% PENSION

Retirement Age	Total Cost
60	36% of pay
61	33%
62	30%
63	28%
64	27%
65	25%
66	24%
67	22%
68	21%
69	20%
70	19%

Realistically, everyone in the country is not going to start saving at a 30% rate in order to retire at age 62 with a 70% pension. Either we insist on a 70% target but settle for retirement closer to age 70 or we fix retirement at age 62 and reduce our target income to something closer to 50%. Or, more likely, we will do a bit of both.

HOW LONG CAN WE EXPECT TO LIVE?

The chief actuary for the Canada Pension Plan projects that over the next 70 years the life expectancy for Canadian males who have reached age 65 will increase from age 83 to a little over age 87. For females age 65, it is expected to increase from age 86 to nearly 90! Assuming no change in the current average retirement age, men would eventually be spending 25 years of their lives on average as retirees, women 28. It appears that with longer life comes better health along the entire age spectrum in retirement. In 1966 for example, 35% of males who reached age 65 could expect to die within ten years. By the year 2075, the tables used for the CPP indicate the percentage dying within ten years will fall to just 10%.

Over the past century, medical advances and general improvements in the quality of life have increased life spans by nearly 30 years. This represents one of the biggest triumphs of the twentieth century and there is every indication that it is going to continue for the foreseeable future.

Life expectancy is not always used consistently. You might hear that male life expectancy in Canada is 78, but then you also hear that a 65-year-old male can expect to live until 83. These seemingly contradictory statements are both true. The difference is that the first is measured from childbirth and the second is measured from 65 by which time the individual has already avoided dying for 65 years. Since 1900, life spans from birth have increased by a phenomenal 27 years for males and 31 years for females.

This gives rise to the enduring myth that before 1900 people used to live only until 50 or so. This is not how it works. Since antiquity, there have always been people who lived until very advanced ages and have been productive up until the very

end. Sophocles was still writing plays at 91. Plato completed his last work around age 81. On a less grand scale, my own grandfather was born in 1885 and died at age 91. His father was born around 1840 and died at 93. Neither was considered exceptional in the village where they lived. Even before 1900, if one could find a way to survive until age 70, it wasn't at all unusual to live until one's 80s or 90s. The trick was surviving until 70. When Bismarck introduced pensions in Germany in 1889, fewer than 5% of Germans would survive to that age. The biggest hurdles to reaching old age included infant mortality and childbirth for women, but once those hurdles were crossed, the prospects for a long life were reasonably good.

For the first 70 years of the twentieth century, most of the increase in life spans was the result of improved survival rates of children whereas, since then, most of the improvement has taken place at the more advanced ages⁴. This was a turning point since it means that, for the first time, new retirees can expect to enjoy significantly more years of retirement than someone of similar age could expect in 1970. For instance, a male age 65 in 1970 had only a 25% probability of collecting pension for 20 years. For a current 65-year-old, that probability has nearly doubled. This is one big reason why pensions have become considerably more expensive.

AN ECONOMY-BASED PERSPECTIVE

We are actuaries, not economists. It is worth hearing what others say about the economic case for later retirement. In a commentary published by the C.D. Howe Institute⁵, Peter Hicks suggests that the average retirement age will rise by a little more than five years between 2010 and 2031. This would take the retirement age to 67 or so. Among the various arguments in support of this trend, the rise in retirement age would stabilize the "producer-consumer ratio", which is the ratio of time actually spent at work producing goods and services to time spent not working. The prediction by Mr. Hicks matches up nicely with our own actuarial calculations above which show we will have a much easier time saving for retirement if we kept on working a few years longer.

We cannot resist making our own rough economic calculation to see if it is consistent with that of Mr. Hicks. In the last *Vision*, we noted that the last actuarial valuation report of the CPP estimated that we will add a net 3.1 million people to the labour force over the next thirty years. Since this is three million workers fewer than we added in the last thirty years, it suggests a hefty shortfall, though the extent of the shortfall may be less than three million because of productivity improvements and possibly slower economic growth in the future. It is impossible to determine the true shortfall with any precision, but as a guess, it could be in the vicinity of two million. As it happens, if everyone in their sixties postponed their retirement age by about four years, this would add about two million people to the workforce by 2040. A postponement of four years would raise the average retirement age from 62 to about 66. We caution this calculation is simplistic, but it does nevertheless support the forecast of a retirement age of 66 in the not-too-distant future.

⁴ Canada Pension Plan Mortality Study, July 2009

⁵ Commentary no. 345, published in 2012; Peter Hicks is a former Assistant Deputy Minister in several federal government departments.

TIME TO CHANGE THE PARADIGM

A half century ago, we worked nearly five years for every year spent in retirement, and even then many of our elderly were poor. Today, we work only 1.6 years on average for each year spent in retirement and demand a much better lifestyle. Is it any wonder that this is not going to be sustainable, especially given the demographic and economic headwinds we are about to face? When there are many workers to support relatively few retirees, no retirement program seems too extravagant, especially when the cost of those programs is expressed on a pay-as-you-go basis. Unfunded pension programs, like OAS and GIS or like C/QPP before 1997, eventually start rising as a percentage of GDP as the population matures.

If we wish to continue retiring at age 62, we need to set aside an exorbitant amount—24% of pay—for a seemingly modest retirement income—50% of final pay. This message is consistent with the litany of stern warnings from various sources that we will face a retirement crisis unless we start saving more. Maybe we are looking at this problem the wrong way. As we saw in the last *Vision*, the economy needs us to work longer and retire later. Rather than saving more so that we can keep retiring early, we may be better off saving the same percentage as we do now, or even less, and reconciling ourselves to retiring later.

Our economic needs should match up with our retirement aspirations. By targeting retirement at age 66, say, and then saving appropriately for that age, we have a win-win situation. From a national perspective, we will improve the economic well-being of the country and from an individual perspective, we will be able to save less and still retire with a decent pension, albeit not at an early

age. Not everyone will regard this as a win-win scenario because not everyone wants to work longer. This vision of the future can be a lot more palatable though if those last few years of work entail shorter, more flexible hours albeit with lower compensation.

Baby boomers need not worry too much. They can continue to retire early without saving large amounts, especially if they are prepared to use their Pillar 4 assets. The need to lower our expectations (by raising our retirement age) will become more evident in another decade or so, assuming our forecast for lower unemployment rates, house prices that grow more slowly, longer life spans and lower investment returns all come to fruition.

MESSAGE FOR EMPLOYERS

For employers with defined benefit (DB) pension plans, we suggest taking a hard look at the early retirement provisions in those plans and also at total compensation strategy. Subsidized early retirement is appropriate only because many employers in fact do not want their workers to stay much beyond 62. Some private sector DB plans and a growing number of public sector plans are coming to the conclusion that early retirement subsidies need to be cut back.

Compensation for aging workers has a tendency to become too pricey over time as pay and benefits continue rising even when output does not. The easy way out for employers is to turn a blind eye to declining productivity and induce older workers to retire—either by enhancing pension benefits or providing a severance award—when the mismatch becomes too difficult to ignore. The challenge is to realign the compensation package with productivity for aging workers on an ongoing basis so that employers still want to retain the services of older workers well into their sixties.

Appendix

Using the CPP engine to calculate the cost

While the 50% Plan involves a different level of pension and a different starting age than the CPP, the adjustments we need to make determine the cost of the 50% Plan are relatively straightforward. The cost of the CPP is 9.9% split equally between the employer and employee. Part of that cost is needed to fund past service benefits since there was a time when the plan was less well funded than it is today and we will be playing catch-up for decades to come. The cost to pay for CPP benefits that are being earned in each future year is closer to 6% of pay. This contribution rate pays for a pension benefit starting at 65 equal to 25% of the average CPP earnings ceiling in the final five years before retirement. This is not how we want to express the pension under the 50% Plan, though. We want to express the pension as a percentage of final year's pay because that is how retirement targets are usually defined and that is how we set the target for the 50% Plan. To get to that number means making adjustments to the CPP formula to reflect periods of low or no earnings, an earnings base of final year's pay instead of final average five years, and use of actual pay that reflects increases due to merit and promotion, something the CPP does not take into account.

Once we have made all the adjustments, we find that a contribution of 6% of pay made over a career buys a pension at age 65 of about 19% of final year's pay. Funding a pension of 50% of final year's pay would therefore require a contribution of about 15.3% of pay throughout one's career. This is the cost if every Canadian paid his or her own way, but remember that lower-income Canadians currently pay for very little of their pension as most of their pension comes from OAS and GIS which are paid out of general tax revenues. We therefore have to adjust the costs to reflect that higher-paid Canadians subsidize the lowest-paid. We will assume that the bottom 40% of households by income level are paying just half the cost of their pension while the other half of the cost is covered by the contribution made by the top 60% of households. Whether or not one perceives this as unfair, this is essentially how our retirement system works now.

OTHER PUBLICATIONS BY MORNEAU SHEPELL

PUBLICATION	WHAT IT IS	FREQUENCY
<i>60 Second Survey</i>	A quick (4-question) survey on a pension or benefits topic of current interest; results are sent a week later	4-6 times a year
<i>News & Views</i>	Description of recent pension and benefits developments	Monthly
<i>30,000 Feet</i>	A companion to News & Views, briefly summarizing developments most likely to have lasting implications	Quarterly
<i>Vision</i>	In-depth analysis of a major pension or benefits issue of long-term significance	2-4 times a year
<i>Universe</i>	Survey of pooled fund investment returns	Quarterly
<i>CICA Accounting Survey</i>	Survey of economic assumptions used for accounting purposes by 100 Canadian public companies	Annual
<i>Statistics</i>	Compendium of pension and benefits statistics	Annual
<i>Morneau Shepell Handbook</i>	Reference manual on pensions and benefits, published by CCH	
<i>Summary of Pension Legislation</i>	On-line detailed summary of differences in pension legislation by jurisdiction (published by CCH)	

