

Global aging and its impact on the financial markets
Presentation to the Retirement Committee of mouvement Desjardins
Office of the Chief Actuary, OSFI
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Let me introduce myself: I am Jean-Claude Ménard, Chief Actuary of the Canada Pension Plan and public sector pension plans. Thank you for inviting me here today to talk about the possible impact of global aging on financial markets, a truly vast and complex topic. Before I go any further, let me say just a few words about the organization to which I belong.

The mandate of the OSFI and the OCA (*Slide 3*)

The Office of the Superintendent of Financial Institutions (OSFI) is the primary regulator of federally regulated financial institutions and pension plans. To fulfil its mission to safeguard policyholders, depositors and pension plan members from undue loss, the OSFI administers a regulatory framework that contributes to the public's confidence in the financial system. The Office of the Chief Actuary (OCA) is responsible for providing actuarial services for the Canada Pension Plan (CPP), the Old Age Security (OAS) Pension, the Canada Student Loans Program, and pension and benefit plans provided to public sector employees.

Canadian retirement income security system (*Slide 4*)

To try to determine the impact of aging on financial markets, it is necessary to analyse the manner in which the various levels of the retirement income security system are funded in Canada. The Old Age Security (OAS) Pension is financed on a pay-as-you-go basis, which means there is no fund. The Canada Pension Plan (CPC), which is similar to the Quebec Pension Plan, is financed through a contribution paid in equal parts by the employer and employees. The contribution rate of 9.9% in 2003 will provide a capitalization level equal to approximately 25% of the Plan's liability within about 20 years. Lastly, private pension plans, also known as employer plans, and registered retirement savings plans (RRSP) are fully funded. Given these three main sources of income for citizens over 65 years, it is reasonable to say that the Canadian system is capitalized at 40% to 45% of future liabilities.

The Canadian retirement system with its approach of different capitalization methods at each level, has received high marks around the world. The inherent flexibility of a multi-level approach makes it easier to adapt the system to any major changes in the country's economy or demographics.

Population forecasts (Slide 5)

The actuarial reports for the Canada Pension Plan and the Old Age Security Pension are prepared every three years. The most recent reports were prepared as of 31 December 2000. The next chart shows the change in Canada's total population and in the so-called working age population, or the population between 20 and 64 years. This is what we see. On the one hand, it is predicted that Canada's population will continue to grow but at a slower pace than in the past -- at an average annual growth rate of about 0.5% between 2020 and 2040, compared with the growth rate of 1.3% over the past 40 years. On the other hand, while the average annual growth rate of 1.8% for the population between 20 and 64 years surpassed that of the total population in the last 40 years, it is highly likely that the inverse phenomenon will occur in future. Indeed, the anticipated growth will be only 0.1% compared with 0.5% for the total population for the period from 2020 to 2040. By itself, the relative stagnation of the working age population will put pressure on the labour market. Lastly, it is forecast that the growth in the population after 2025 will be due solely to net migration.

(Slide 6) This table shows the evolution of the net migration over the last 15 years ending in 2000. The average net migration in percentage of the population of Canada less Québec is 0.64% while it is 0.20% for Québec. This percentage is three times higher for Canada less Québec than for Québec. The CPP and QPP actuarial reports set the assumptions at 0.58% and 0.25% respectively for 2015 and thereafter.

(Slide 7) The impact of a net migration much less for Québec than for the rest of Canada has decreased the Québec proportion compared to the rest of Canada from time to time. While Québec has represented 29% of the Canadian population in 1966, this percentage is now 24%. If the historical trends continue in the future, Québec will represent only 19% of the Canadian population in 2050.

(Slide 8) The aging of the Canadian population can be shown both by the increase in persons over 65 and also in those over 80 years. Based on the most recent actuarial reports of the CPP and OAS, an increase of 150% for persons 65 and over and of 275% for persons 80 and older is expected over the next 50 years, as this chart shows. This means that there will be close to 10 million people over the age of 65 years in 2050.

(Slide 9) With an aging population in the future, what will be the projected cost of the public pension plans in percentage of the Gross Domestic Product? The following table shows the maturity of the Canada Pension Plan as well as the Québec Pension Plan where the cost increases from 0.9% of GDP in 1980 to 3.3% in 2020. The

maximum cost of the Old Age Security Program is projected to be 3.2% of GDP in 2030. In 2020, the cost would be as high as its historical level attained in 1993.

The change in mortality (*Slide 10*)

Whenever we are talking about the aging of the population, we have to analyse the evolution in life expectancy or the future drop in mortality rates. Crucial questions like "How long can we live?", "Can we live to be 100?", need to be asked. Some American scientists estimate that humanity, as we know it, began about 130,000 years ago. From then until the start of the last century, life expectancy remained relatively unchanged at about 45 years. Suddenly, in the space of a single century, we experienced an increase in life expectancy of about 30 years. Since then, there is every reason to hope that we will live even longer. Can this observed increase continue and especially, can it continue at a rate of even half what we have seen? Some analysts believe that future gains will be less because we are approaching certain limits where mortality rates by age are already low. These same analysts tell us that we have already won the easiest medical battles. To better understand past and future changes in life expectancies, let us take a look at what I call the probabilities of survival of a given cohort of people.

(Slide 11) The following graph shows the probability of survival for the cohort of men born in 1921, in 1996 and in 2050. A notable difference in the curves is the proportion of people living at 65 years. While there were only slightly more than 50% of the people living in the 1921 cohort, this percentage climbs to 80% for the 1996 cohort and to 90% for the 2050 cohort. The life expectancies for each of the cohorts are shown on the graph. Despite a major increase in life expectancy at birth, the age at death did not increase significantly. Few people live to be 110 years. A headline in the *Globe and Mail* stated that 70% of men are expected to die between 74 and 94. The same illustration for the 1921 cohort would have produced ages between 1 and 85 years. When we remove the 15% of the people in a cohort at the two extremities, that is, those who die prematurely and those who are the strongest, we get a better assessment of the costs associated with financing retirement. If we look at past change, it is reasonable to assume that mortality rates will continue to fall for the younger ages, but the challenge is quite different for people over 80 years. Using these figures, it can be said that it has never been easier to plan the retirement of a group of people or even you own retirement.

(Slide 12) The next chart presents the same information for women. Seventy per cent of women should die between 77 and 96 years of age, which is quite close to the figures for men. *(Slide 13)* Lastly, we looked at what improvements were necessary to achieve a life expectancy of 100 years, i.e. that half of the population would reach

this age. To achieve this result, the chart shows that it is necessary to eliminate virtually all mortality before age 65, and furthermore, that 90% of the cohort must still be alive at age 80 (presently this percentage is about 65% for women). There is one additional challenge that awaits us, that of pushing the age at death from 110 years to 120 years or even 130 years. We do not have the data to generate credible figures after 110 years. I recall that there were 13 people over the age of 110 living in Canada in July 2003, which we must admit, is itself quite remarkable.

Labour shortage? (Slide 14)

The next chart presents a demographic indicator of the expected labour shortage. It shows the ratio between people aged 60 to 64 years (those who reduce their hours of work or who leave the workforce) and those aged 20 to 24 years (those who are entering the workforce). It is true that retirement or entering the workforce can occur at other ages. However, I consider this to be the most reliable indicator. While the ratio was below 50% until the end of the 80s, it is now at 60%. This means that for every 6 people who leave, 10 people enter the workforce. Supply exceeds demand, expressed in economic terms. It is expected that this ratio will equal 1 around 2015. Moreover, as early as 2025, it is predicted that for every 13 people who leave, only 10 people will enter. Note as well the rapid growth in this ratio. For comparison purposes, I have added the same curve for the United States, our main trading partner. The trend is the same, although less pronounced.

(Slide 15) Along with the possible labour shortage, the next chart shows the historic upward trend in the participation rates of women in the labour market. Let me draw your attention to the considerable increase between 1976 and 1999, especially for the 25 to 55 age group. Despite the anticipated increase between 1999 and 2030, which is undoubtedly reasonable, there is the possibility that this participation will exceed the projections, when compared with the historical maximum rates for men. In my view, I would not be surprised to see participation rates for women exceeding those for men in the majority of age groups after 2020 in order to offset the anticipated labour shortage.

Global aging (Slide 16)

When analysing global aging, it is important to identify the indicators of aging. In my view, we need to look at three elements: the extent of the aging, the speed of the aging, and the change in the active population. Lastly, the effective retirement age cannot be overlooked in our analysis. The OECD reported that early retirement could have negative consequences on standards of living that are as significant as the aging itself. *(Slide 17)* To measure the speed of aging more effectively, the next chart shows

the number of years expected for the population aged 65 and over to move from 12% to 24% of the total population. Japan will experience this shift very quickly, in just 25 years. The absence of the United States should be mentioned since, according to their own projections and to those of the United Nations, it will never achieve the 24% threshold, at least not between now and 2050. We can say with relative certainty that the United States is the industrialized nation that will be least affected by the aging of its population.

(Slide 18) The next chart presents the survival curves for three groups, the least developed countries with a life expectancy of 50 years, the less developed countries with a life expectancy of 66 years and the more developed countries with a life expectancy of 76 years. Note the incredible and somewhat disturbing difference in the percentage of people still alive at age 65, ranging from 40% to 80%. The survival curve of Canadian males 1921 was added to the chart. While it is similar to the current survival curves for the least developed countries between ages 0 and 1, it is unfortunate and sad that the least developed countries currently have much higher mortality after age 30 than was the case in Canada some 80 years ago.

(Slide 19) The following table shows the past and future life expectancies of different countries including the most populous countries. Japan is the country with the highest life expectancy at birth while Zambia is the one with the lowest. Since 1980, the difference in the life expectancy at birth between the best and the worst country has actually increased from around 40 years to 50 years. According to the United Nations, it is expected that by 2050 the highest life expectancy will be experienced by Japan with 88 years and the lowest by Botswana at 44 years.

Impact on financial markets *(Slide 20)*

To try to answer the question about the impact on financial markets would require an exhaustive review of the literature on the subject. Over the past five years, there has been an impressive number of studies and research published on this topic. I have chosen to focus on three studies: the one published by Yale University (especially because it contradicted all the other studies that I had read on the subject), the one by Merrill Lynch and the one by the Center for Strategic and International Studies (CSIS). Note also the three books recently written by Robert Stowe England in 2002 for CSIS.

(Slide 21) The Yale University study, “Demography and Predictability of Stock Market” strays from the findings that are echoed in the vast majority of studies on this topic. It talks about the economic life cycle, developed long ago by Modigliani. The “economic” person borrows when he is young and beginning his career, invests for

retirement beginning in mid life and then divests at the time of retirement. In addition, the purpose of the study is to develop a reference framework to study the relation between changes in the demographic structure and the equilibrium of capital markets. The methodology used consists in dividing the American population of the 20th century into five 20-year cycles that alternated between an increase in births (1910, 1950 and 1990) and a decrease in births (1930 and 1970).

(Slide 22) Based on the thousands of correlations used throughout the study, the authors conclude with a chart showing the correlation between the MY ratio (Middle/Young), that is, people aged 40 to 49 years compared with those aged 20 to 29, and the Price/Earnings ratio observed in the United States during the last century. This correlation raised some questions for me, especially since the headline in the *New York Times* about the study was “16-Year slump? If so, blame it on the boomers”. In the authors’ defence, they have no control over the headlines that reporters chose to use. The study’s conclusion is simple. If you think this ratio is the best demographic indicator of future developments in the stock market, then do not invest in American stocks for the next 14 years (the first two years have already passed and supported the authors’ conclusions).

(Slide 23) I believe that the change in the ratio between those 40-59 years (savers) and those 20-39 years, as well as those 65 years and over (borrowers and divesters), is more significant. The next chart shows this change between 1950 and 2050. The ratio, such as the one between those 40-59 years and those 65 years and over, shows slight growth until about 2010 followed by a decline. However, this chart is very incomplete in that it shows only the demographic change of a small country such as Canada when compared to the world. If the United Nations’ projections are credible, and they are certainly as credible as the ones we generate, Canada, which represents 0.5% of the world’s population, will represent only 0.4% of that population in 2050. Should Canada’s demographic structure be considered when determining the impact of global aging on financial markets? In a solely Canadian context, yes. In a more global context, much less so.

(Slide 24) The second study is that by Merrill Lynch in October 2000, entitled “Demographics and Funded Pension System”. Four countries were analysed: Holland, the United Kingdom, the United States and Japan. The study looked at the change in future inputs (contributions) and outputs (benefits) of pension funds in these countries and their impact on the asset mix of these plans. After 2010, the number of people who become beneficiaries will increase dramatically and the net capital input, positive until then, will become negative. However, the next 5 to 10 years (remember it was released in October 2000) will see a high demand by pension plans for investments.

As for the asset mix, it is expected that retirement plans will hold fewer stocks and more fixed-income products in their portfolios.

(Slide 25) The third study was conducted by CSIS, the Center for Strategic and International Studies, entitled “Meeting the Challenge of Global Aging”. This study is the product of a commission co-chaired by Mr. Mondale, former Vice-President of the United States, by Mr. Hashimoto, former Prime Minister of Japan and by Mr. Pöhl, former President of the Bundesbank. The study includes almost thirty findings and the same number of recommendations. It is so relevant that it would merit a presentation all on its own. I have chosen two of its findings to share with you. If the participation rates of older workers do not increase over the years, every developed country could face a marked decrease in its labour force. This decline would significantly limit the economic growth potential of the countries in question. Canada has one of the highest levels of immigration among industrialized countries (when calculated as a percentage of its population) and current participation rates of men and women below historical highs could offset this finding. However, we must remember that Canada is and continues to be in competition with other countries when it comes to attracting skilled immigrant labour.

(Slide 26) The populations of Japan and the EU-15 are projected to decline over the next 50 years, while the populations of the United States and Canada will continue to grow, albeit at a slower rate.

(Slide 27) Although funded plans are better protected from demographic shocks, the transition from a pay-as-you-go plan to a fully funded plan can create a problem by requiring double payments by a single generation. In other words, a generation of workers must pay the retirement benefits promised to the previous generation while simultaneously saving for its own retirement. This can become an unsupportable burden. The Canadian retirement income system is in pretty good shape when we consider that future liabilities for the system as a whole are capitalized at about 40% to 45%.

(Slide 28) How should we or can we position ourselves in light of the aging of the world and Canadian population? First of all, the amendments to the Canada Pension Plan and the Quebec Pension Plan in 1998, including the increase in the contribution rate to 9.9% in 2003, significantly improved the Plans’ financial situation. It is forecast that this rate will be higher than the pay-as-you-go rate for the next 20 years, which will make it possible to achieve a 25% funding rate, or a level three times higher than in 1998. The next chart shows the demographic ratio of people aged 20 to 64 years to those over 65 years. From a ratio of 5 people of working age to every person over 65 years, we are moving to a ratio of 2.3 in 2050. The comparison of this

same indicator on a global scale shows a similar aging, in that the ratio shifts from 7 to slightly below 4. For the purposes of illustration, I have added the ratios of so-called “young” countries, that is, the countries of Asia, of Latin America and Mexico. The ratio falls from 10 to slightly less than 4. Financial analysts who associate a young labour force with strong economic growth will certainly be interested in looking at these regions to improve the future performance. Although this chart shows that other regions of the globe will also experience an aging of their populations, greater credibility needs to be given to the forecasts for the 2000-2025 period. During this time, the populations of Asian and Latin American countries are still much younger than that of Canada, thereby offering a potential for greater economic growth.

(Slide 29) The next chart shows the economic situation of the G-7 countries. According to the OECD, Canada was the only country with a budget surplus in 2002. Balancing the budget and taking steps to ensure that the percentage of the debt as a proportion of gross domestic product continues to decline are effective ways to ensure sustainable financing of the Old Age Security Pension funded from the government’s Consolidated Revenue Fund.

Future challenges *(Slide 30)*

As shown by the probabilities of survival, retirement is a reality for the vast majority of Canadians. In terms of probabilities, it is expected that about 93% of men and women will reach the age of 65 over the next 20 years. Not living to 65 years will become the exception. The anticipated aging will be more pronounced in Canada than in the United States, our main trading partner. Contrary to the other industrialized countries, Canada should not undergo a fall of its working population thanks in particular to future immigration. Lastly, the anticipated aging of the labour force and the labour shortage that may result will be one of the biggest challenges in the years ahead.

Thank you.

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