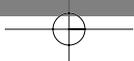
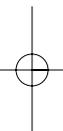


**PART I THE POLICY CHALLENGES**  
**POPULATION AGING**



## SOME ECONOMIC AND SOCIAL CONSEQUENCES OF POPULATION AGING

David K. Foot

Canada's population is aging: over the past 50 years, the median age of Canadians has risen from 27.2 to 38.8. Not surprisingly, aging is reflected in the growing share of seniors in the population, with those ages 65 and older increasing from 7.7 to 13.2 percent over the same period.

Population projections for the next 50 years show a continuation of these trends. Statistics Canada projects that by 2026, when many of the postwar baby boom generation — those born between 1947 and 1966 — will have become seniors, the median age of Canada's population will rise to 43.3 and the share of seniors will be 21.2 percent. By 2051, these numbers are expected to increase to 46.8 years and 26.4 percent, respectively. These projections include immigrants, who tend to be younger.

The first Canadian boomers will reach age 65 in 2012, marking the beginning of an accelerated aging trend. Between 2011 and 2031, when the last Canadian boomer reaches seniorhood, the median age will have risen by four years, almost as much as it did over the first 50 years of the twentieth century (five years).

Canada is not alone in experiencing population aging; this demographic trend has now become a well-recognized feature of all countries in the developed world and, increasingly, countries elsewhere. Currently, western European populations are aging more rapidly than Canada's, although each country's time path reflects its particular socio-economic and demographic history. Eastern Europe and southern Asia, including China, are also experiencing population aging, as are some countries in other parts of the world.

Is there a common characteristic that binds countries with aging populations? Although there are many determinants of population aging — such as better health and longer life expectancy — the common and most dominant characteristic is sustained below-replacement fertility. Replacement fertility requires that two parents replace themselves and, on average, contribute extra children to account for women who do not give birth — a figure of 2.1 children per woman is considered sufficient to sustain a population through internal growth. Yet fertility is below this rate in many countries: in Canada and western Europe, it is 1.5, while in eastern Europe and Japan, it is just 1.3

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(Population Reference Bureau 2006). In the developed world, only the United States has a replacement fertility rate of 2.1 children per woman, but even this is not sufficient to prevent the US population from aging as rising life expectancy increases both the median age and the share of seniors in the population. Even accounting for possible delayed child-bearing, which would increase these fertility numbers slightly, the effects of population aging in much of the world are inevitable. Population aging in Canada is thus part of a global trend, and many other countries are experiencing and discussing its economic and social consequences (Turner et al. 1998).

### The macroeconomic challenges

A useful framework to embed discussions of the consequences of population aging is the identity

$$Q = (Q/H) (H/E) (E/L) (L/W) (W/P) P, \quad (1)$$

where

- Q = real output,
- H = average hours per employee,
- E = number of employees,
- L = labour force,
- W = working-age population and
- P = population size.

This identity makes it clear that the annual output of any society can be broken down into productivity performance (measured as output per hour worked,  $Q/H$ ), the effort of employees (defined as average hours worked per year,  $H/E$ ), the employment rate ( $E/L$ , which is 1 minus the unemployment rate), labour force participation (the share of the adult population looking for work,  $L/W$ ), the share of the adult population in the total population ( $W/P$ ) and the size of the population ( $P$ ). Consequently, countries with better productivity, higher work effort, lower unemployment rates, higher participation rates, lower shares of children in the population and larger populations will produce more output.

Output growth is the sum of growth of each of these components. Therefore, growth in output declines when productivity growth slows, employee effort decreases, unemployment rises, participation falls, fertility rises and population growth slows. These are not unconnected influences: capital (human, natural, physical and social) has an influence on all components, as do the choices of individuals.

A common measure of material living standards is output per person (Q/P). Equation (1) can be rewritten as:

$$Q/P = (Q/H) (H/E) (E/L) (L/W) (W/P). \quad (2)$$

This identity shows that material living standards can be broken down into productivity performance, work effort, unemployment, labour force participation and the age structure of the population. Note that slower output growth does not automatically result in a decline in the material standard of living. So long as output growth exceeds population growth, even if both are negative, output per person increases. Countries with slower or even shrinking populations do not automatically suffer declines in material living standards.

This framework can be used to identify the role of population aging in determining output growth and material living standards, as well as to suggest some of the social implications of aging. The effects of aging on productivity performance are beyond the scope of this chapter, but they remain an area that is ripe for further research.

A second potential influence of population aging is on average hours worked, which varies with age over the lifecycle. Of particular relevance is the declining number of hours worked by older workers who may be semi-retired. The most important determinant of work effort, however, is the trade-off among work, family and leisure, which varies by country and community.

The third potential effect of aging is on the unemployment rate (and, hence, E/L). If younger workers are more likely to be unemployed than older workers, population aging can help reduce the unemployment rate. But if older workers are passed over in employment, the opposite will be true. Again, the more important determinant of unemployment is elsewhere — namely, the performance of the economy relative to its potential, which is also influenced by demographics.

The fourth potential effect of aging is more nuanced. An increase in the number of older people leads to a decrease in labour force participation, especially when the working-age population (W) is defined as the adult population — usually those ages 15 years and older (rather than the 15-to-64 age group that is used to calculate the demographic dependency ratio). The aging of the population leads to a larger share of the population in retirement, which depresses overall participation (L/W). Population aging can also result in more adults in the total population, however — thereby increasing W/P — which can increase economic growth and material living standards. Note that it is important to include seniors in W, since they constitute a potential source of labour force growth in aging populations.

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Finally, population size and growth directly influence output levels and growth, but not material living standards, except indirectly through the determinants in equation (2). Therefore, population policies — on immigration and fertility, for example — have important consequences for economic growth, but they affect material standards of living only indirectly.

### The sectoral challenges

Although this framework is useful in identifying the consequences of population aging for all sectors of the economy, it does not identify additional consequences for specific sectors. Population aging, in fact, can be expected to change the sectoral composition of the economy, because the requirements of older people differ from those of younger people. For example, younger people require more formal education, while older people require more health care. Aging populations, therefore, can be expected to lead to a reduced share of education and an increased share of health care in the economy's output (Foot and Gomez 2006). Many other examples abound throughout the economy in both the private and public sectors.

The effects of population aging can also be felt within sectors — for example, the move from gynecology to geriatrics within health care. Other examples might be less obvious — the move from running to walking or from inexpensive to luxury automobiles. Once again, age-based life-cycle analysis is useful in identifying these shifts and the likely effects on the products and services of all sectors of the economy (Foot and Stoffman 1996).

### The path ahead

In this chapter, I draw on two relevant theories related to population change to present an integrated framework for assessing the consequences of population aging on economic performance and social choice. First, I review demographic transition theory to establish a demographic foundation and to identify the transitions observed in populations and societies, including the transition to population aging. I then extend the theory to labour force growth and, using the above framework, to output growth and material standards of living. Second, I outline lifecycle theory as a means to introduce age and economic behaviour explicitly into the analysis. All of the determinants of economic output and material living standards — equations (1) and (2) — are potentially influenced by individual behaviour over the lifecycle. I then combine the two theories to identify and isolate the effects of population growth and aging on economic performance and social choice.

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With these theoretical foundations in place, I then review some consequences of population aging for economies and societies and identify some important challenges that this largely inevitable trend is generating. Although the challenges are global, each country faces its own particular demographic and behavioural patterns. As a useful illustration, I focus on the consequences for Canada over the 2006-26 period; since this period encapsulates the time during which the massive boomer generation retires, it provides a particularly poignant illustration of the challenges aging societies face.

I then identify three important consequences for detailed discussion, with particular attention on public policies. First, I consider population policies: population size and composition are the most obvious demographic effects of impacts on output and material living standards — of particular interest in Canada are fertility and immigration policies. Second, I examine the effects of population aging on the future workforce — the challenges posed by slower workforce growth (and possible decline) and the implications of population aging for retirement and pension policies. Of particular interest is ameliorating the effect of the retirement of the large boomer generation on Canada's economic (and social) performance. Third, I briefly review, through a demographic lens, the effects of population aging on the health care sector. Here, I limit attention to selective, demographically sensitive delivery, funding and staffing issues that have been ignored in the past. Managing the effects of aging boomers on a sector whose share of the economy will only increase as the population as a whole ages poses important economic and social challenges.

### DEMOGRAPHIC TRANSITION THEORY

**D**emographic transition theory, based on the historical development of societies over the past millennium, provides an explanation of the general evolution of human populations. The theory also provides a link between population growth and economic growth and development (including material living standards). It provides a further link between population growth and population aging and, therefore, a foundation for the issues I discuss in this chapter.

#### Population mathematics

In any society, population size is governed by four determinants, births (B), deaths (D), immigration (I) and emigration (E), according to the following identity:

$$P = P(-1) + B - D + I - E, \quad (3)$$

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where  $P(-1)$  is the population in the previous period (year). The difference between births and deaths,  $B - D$ , is the net natural change in the population, and the difference between immigration and emigration,  $I - E$ , is net migration. These differences can be positive or negative. For many countries, net migration is quantitatively small, so population change is determined primarily by net natural change. This is certainly true for the population of the world as a whole, which, of course, has zero migration.

To determine whether a population is increasing or decreasing, equation (3) can be rewritten to show population change:

$$P - P(-1) = B - D + I - E. \quad (4)$$

Population growth requires that change be positive, or that  $(B + I) > (D + E)$ . In the simple case where migration is negligible, this requirement becomes  $B > D$ ; that is, the number of births must exceed the number of deaths. If  $B = D$ , the population is stationary; otherwise the population will decrease in the absence of positive net migration.

Demographic transition theory, however, is usually expressed in terms of rates, rather than numbers, so it is useful to rewrite equation (4) in rate form. Thus, population growth ( $g$ ) is

$$(P - P(-1)) / P(-1) = (B - D + I - E) / P(-1), \quad (5)$$

which can be written in alternative notation as

$$g = \beta - \delta + \iota - \epsilon, \quad (6)$$

where  $\beta = B / P(-1)$ ,  $\delta = D / P(-1)$ ,  $\iota = I / P(-1)$  and  $\epsilon = E / P(-1)$ , respectively representing the birth, death, immigration and emigration rates for the population (usually measured as per thousand people).

Consequently, the population growth rate is the difference between the birth rate and the death rate plus the difference between the immigration rate and the emigration rate; that is, population growth is the rate of net natural change plus the net migration rate. Where net migration is zero (or quantitatively small), population growth is determined by the difference between the birth and the death rates. Note that this is positive, and the population is growing if the birth rate exceeds the death rate, and vice versa. Currently, the annual world birth rate is 21 per thousand and the

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death rate is 9 per thousand, so the world population growth rate is 12 per thousand, or 1.2 percent per year (Population Reference Bureau 2006). For countries with quantitatively significant annual net migration — such as Canada, at 7 per thousand — the net migration rate also must be included in determining population growth.

Table 1, which illustrates the dynamics of equation (6) in Canada over the 20<sup>th</sup> century, clearly shows that both the birth rate and the death rate have declined substantially, resulting in a slower rate of natural increase. Net immigration (the difference between  $\iota$  and  $\epsilon$ ) historically has been a much smaller contributor to overall population growth, but over the 1996-2001 period, for the first time, it accounted for a larger share of population growth than did natural increase (28.4 versus 20.8 per thousand).

**TABLE 1. SOURCES OF POPULATION GROWTH, CANADA, 1901-2001**

	Population change from previous period (g)	Births ( $\beta$ )	Deaths ( $\delta$ )	Net natural increase ( $\beta - \delta$ )	Immigration ( $\iota$ )	Emigration ( $\epsilon$ )	Net immigration ( $\iota - \epsilon$ )
1901-11	341.6	358.4	167.6	190.8	288.6	137.8	150.8
1911-21	219.4	324.7	148.5	176.2	194.3	151.1	43.2
1921-31	180.9	274.8	120.1	154.8	136.5	110.4	26.2
1931-41	108.9	221.1	103.3	117.8	14.4	23.2	-8.9
1941-51	186.1	276.9	105.5	171.4	47.6	32.9	14.7
1951-56	151.7	154.3	46.4	107.9	57.4	13.6	43.8
1956-61	134.1	146.9	42.7	104.2	47.3	17.3	30.0
1961-66	97.4	123.3	40.1	83.2	29.6	15.4	14.2
1966-71	77.6	92.7	38.3	54.5	44.5	21.3	23.1
1971-76	75.6	81.6	38.2	43.4	48.8	16.6	32.2
1976-81	62.7	77.6	35.9	41.7	32.9	11.9	21.0
1981-86	55.9	75.4	35.7	39.8	27.3	11.2	16.1
1986-91	74.3	74.1	36.2	37.8	44.6	8.2	36.4
1991-96	60.4	69.1	36.5	32.5	39.9	12.1	27.8
1996-2001	49.2	57.6	36.8	20.8	41.1	12.7	28.4

Source: Census of Population, various years, Statistics Canada.

Note: Because data after 1951 are presented as five-year totals, they are not strictly comparable to the ten-year total presented from 1901 to 1951.

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### The theory

Demographic transition theory is usually presented for the zero net migration case, where the sole determinants of population growth are birth and death rates. I use this simplification here, but the analysis can be easily extended to the non-zero migration case by including the immigration rate with the birth rate and the emigration rate with the death rate.

Current demographic transition theory identifies four stages of population and economic development. Under the theory, a population transitions from stage I through to stage IV over time, but the time spent in each stage can vary significantly depending on the particular population being considered. A country can even get trapped in one of the stages if conditions are not conducive for the next transition. The four stages are easily defined using equation (6) (with  $\iota - \epsilon = 0$ ):

Stage I: High  $\beta$  and high  $\delta$ , usually with small positive  $g$ ;

Stage II: High  $\beta$  and falling  $\delta$ , resulting in increasing  $g$ ;

Stage III: Falling  $\beta$  and low  $\delta$ , resulting in falling  $g$ ;

Stage IV: Low  $\beta$  and low  $\delta$ , usually with small positive  $g$ .

Recent historical events in some countries with advanced population aging suggest that it is now appropriate to identify an additional stage in the theory:

Stage V: Low  $\beta$  and increasing  $\delta$ , resulting in negative  $g$ .

The theory posits that, in its early years, a population — typically in a preindustrial society — experiences a high birth rate and a high death rate, resulting in slow population growth (stage I). The first demographic transition associated with economic development is a reduction in the death rate associated with improved health conditions — for example, better water quality and sanitation — which reduces the death rate, so that population growth increases (stage II). Continued economic development usually produces better and more widespread education for both males and females, resulting in more widespread family planning and opportunities for employment, which, in turn, reduces the number of children per family; the consequence is slower population growth (stage III). It is at this stage, with fewer children and with people living longer, that population aging typically sets in. The next stage of development retains good living conditions combined with good education, resulting in low death, birth and population growth rates (stage IV). Under these conditions, especially if the birth rate falls below the replacement rate, the speed of population aging increases. Canada is an example of a country at this

stage today. The continuation of below-replacement fertility and population aging ultimately results in an increasing death rate — because of the presence of more elderly people, whose mortality rates are high — and a decreasing population (stage V).

Demographic transition theory is a general description of typical or average population transitions, but there are variations and exceptions. For example, the theory does not encompass rising birth rates associated with the postwar baby boom in many countries, although it does describe the consequences. However, the postwar boom, while important, followed a period of population aging (in the 1930s) and was historically short lived, lasting between one and two decades, thus constituting a temporary, rather than permanent, transition in the population. Another exception might occur when economic development stalls or even reverses, resulting in a return to a previous stage. Some countries in eastern Europe, such as Russia, have experienced this situation recently as worsening economic conditions resulted in a decrease in life expectancy (especially for males) and a return to a higher death rate. Once again, time could prove this to be temporary.

Nonetheless, even with these exceptions, demographic transition theory provides a robust description of population change over time in many countries and a framework with which to identify population transitions in relation to economic development. In particular, it outlines the conditions for slower population growth and population aging that Canada and many other countries in the developed world are experiencing today.

### The consequences

The rise and fall of a population and, therefore, of population growth over time can be understood within this theoretical foundation, which clearly links population aging with slower population growth beyond stage II. Low birth and death rates produce fewer young and more seniors in a population, thereby increasing the average or median age. This is the definition of population aging.

Even reintroducing migration into the analysis does not fundamentally change the conclusions. Immigrants tend to be concentrated in the younger working ages and, while they might bolster population growth and counteract increases in a population's average age, the quantitative effect is invariably too small to reverse trends from domestic sources. This is true even of Canada, for example, which has one of the highest immigration rates in the world (Guillemette and Robson 2006), so it certainly applies to countries where migration is less quantitatively important.

Perhaps the best way to communicate the demographic consequences visually is through population pyramids, which summarize the age and gender structure of a

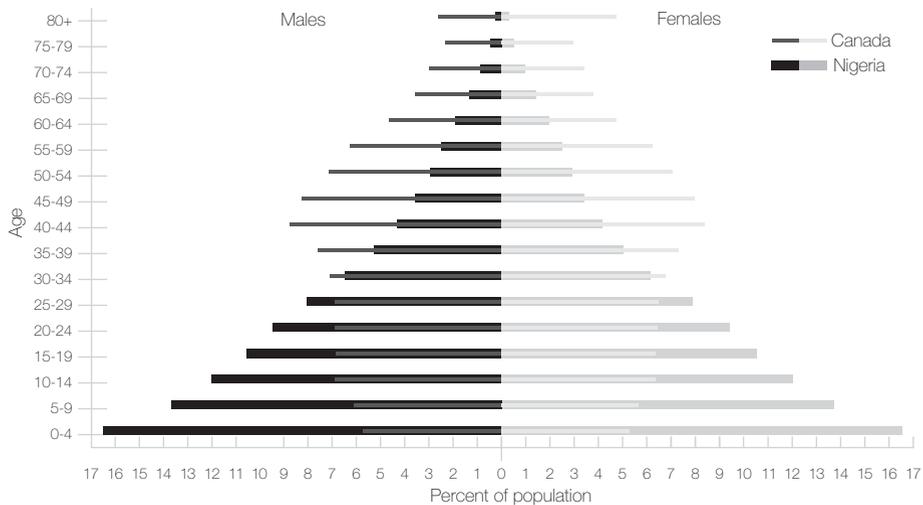
## Population Aging

population. Figures 1 through 4 show population pyramids of countries in each stage of demographic transition superimposed on that of Canada. A stage I population structure (exemplified by Nigeria; see figure 1) is characterized by a flat pyramid with a wide base of young people and very few in the upper ages. In stage II (illustrated by Pakistan; see figure 2), decreasing mortality results in more people in the upper ages, but continued high fertility ensures that the base remains wide, so that the associated population structure becomes a tall pyramid. In stage III (exemplified by Thailand; see figure 3), declining fertility causes the base of the pyramid to shrink, so that it gradually becomes a tall diamond, with the bulk of the population in the middle ages; this is the period of slower population growth and the beginning of population aging. Progression into stage IV (illustrated by Finland; see figure 4) moves the bulk of the diamond into the older ages, resulting in the appearance of almost an inverted pyramid with most people in the older ages and few people in the younger ages. As these seniors die and the population decreases (stage V), the pyramid likely will revert to a more cylindrical shape — although no country has yet been at this stage long enough to verify the typical shape of the population structure in practice. Although this transition process is widespread, its timing and the duration of each stage vary.

In summary, as a result of improving life expectancy and continuing low fertility, Canada and most other developed countries have moved through stage III and are becoming ensconced in stage IV of the demographic transition, which inevitably means slower population growth and population aging.

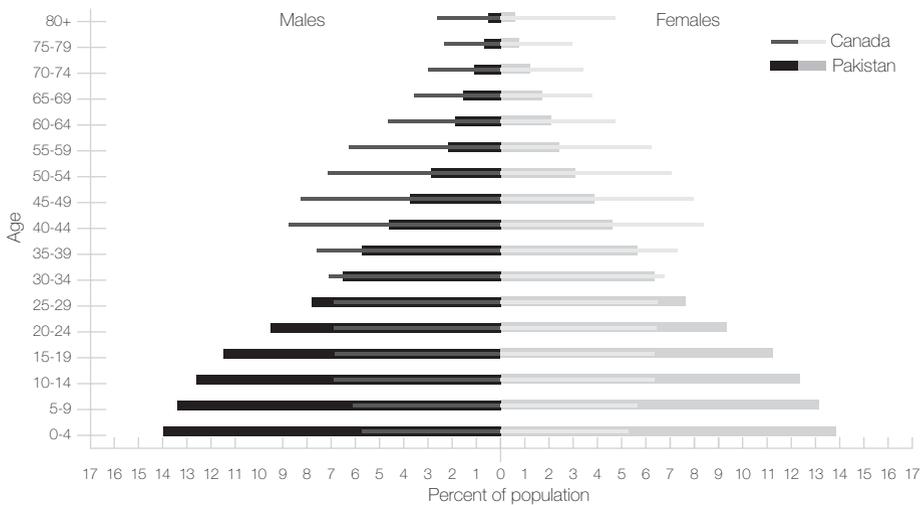
Is the demographic transition inevitable? Could the process that demographic transition theory describes be reversed without also reversing economic development? This appears to be very unlikely, for several reasons. First, increasing life expectancy results in a growing number of people at the older ages; when these people die, the death rate ( $\delta$ ) increases, which contributes to slower population growth. Second, feasible levels of immigration can alleviate, but not offset, the inevitable effect of a slowing natural rate of change of a population. Moreover, if an increase in the level of immigration does not at least match the population growth rate, the immigration rate ( $\iota = I / P(-1)$ ) will fall, contributing to slower population growth. Third, the only other way to increase population growth and counteract population aging is to increase fertility. Since demographic transition theory, however, posits an inverse relationship between fertility and education — especially female education — and since it is unlikely that a developed country would withdraw universal education, it would be very difficult to increase the birth rate. Indeed, to date, pro-fertility policies of many forms in many jurisdictions have had only a minimal permanent effect on fertility rates; in

**FIGURE 1. STAGE I POPULATION PYRAMID, NIGERIA, 2005**



Source: US Census Bureau, International Data Base.

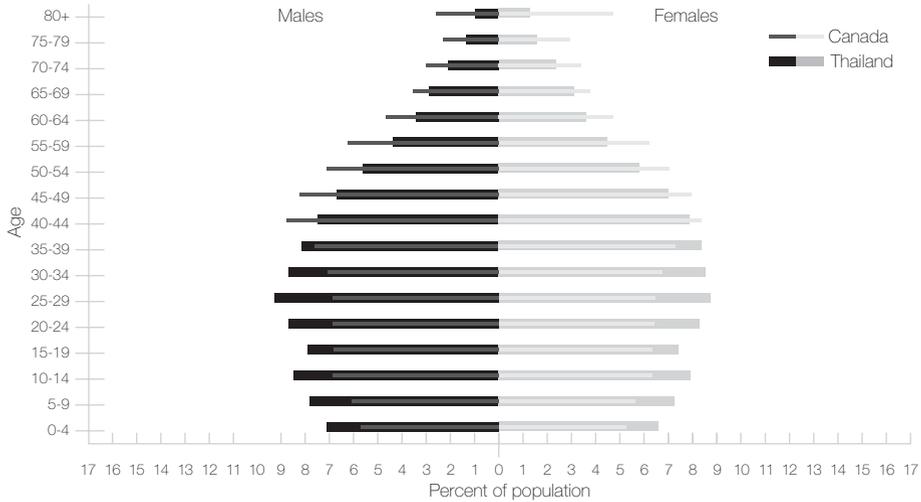
**FIGURE 2. STAGE II POPULATION PYRAMID, PAKISTAN, 2005**



Source: US Census Bureau, International Data Base.

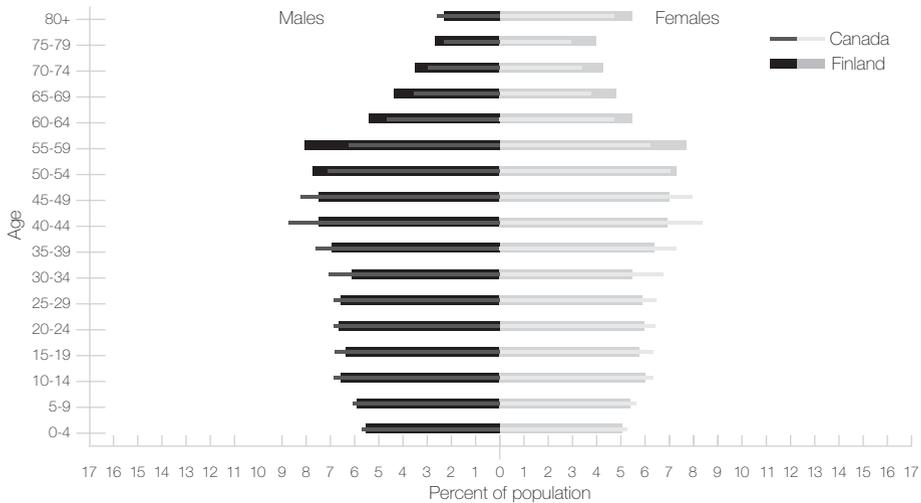
## Population Aging

**FIGURE 3. STAGE III POPULATION PYRAMID, THAILAND, 2005**



Source: US Census Bureau, International Data Base.

**FIGURE 4. STAGE IV POPULATION PYRAMID, FINLAND, 2005**



Source: US Census Bureau, International Data Base.

general, they seem to be able only to lessen future decreases. In practice, the long-run inevitability of demographic transition is entrenched.

Of particular relevance to economic growth is the growth of the labour force ( $L = (L/W) (W/P) P$  in equation (1)). Having more people available to work can result in more output (providing they are employed). Population growth, however, usually translates into labour force growth only with a time lag. In the zero immigration case of traditional demographic transition theory, population growth is generated by the birth rate, but since it takes time for infants to grow into adults, births do not contribute to labour force growth — and thus to economic growth — for about two decades. In the interim, changes in demographic structure contribute to lower material living standards (a decrease in  $L/W$  in equation (2)) as the same output is spread over more people. This phenomenon occurred over the 1950s and early 1960s in Canada with the temporary effects of the postwar baby boom. The lag is not as relevant, of course, when population growth comes from increasing immigration, since most immigrants are of working age and are eligible for employment.

Subsequently, the effect of the lag reverses when declining population growth does not get translated immediately into lower labour force growth, and so maintaining output growth and temporarily increasing material living standards. Over the period in which boomers entered the Canadian labour force — from the mid-1960s to the mid-1980s — Canada experienced a declining population growth rate even as a higher rate of labour force growth resulted in a temporary economic dividend. This demographic dividend having now evaporated, another transition looms as the boomers gradually retire, thereby reducing the labour force participation rate ( $L/W$  in equations (1) and (2)). Understanding this behavioural transition requires a further theoretical foundation, to which I devote the next section.

### LIFECYCLE THEORY

**L**ifecycle theory, with its particular emphasis on age, introduces economic and social behaviour into the analysis of the effects of population aging. The first formal use of the lifecycle approach in economics resulted from a puzzle concerning income and consumption. Although aggregate consumption expenditure appears to be proportionally related to aggregate income, the income profile of individual expenditure does not vary in the same way; rather, people use financial assets to smooth their expenditure by borrowing when young, repaying the loans in early middle age, then

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accumulating assets in later middle age to use in retirement when income falls. As a result, expenditure is proportional to permanent, not current, income.

Since its early application, lifecycle theory has permeated much decision theory in economics. Agents are presumed to have finite lifetimes over which they use capital markets to smooth revenue streams to match expenditure needs. A core premise of this research is the intertemporal budget constraint that requires the present discounted value of revenues from all sources to equal the present discounted value of expenditures (including inheritances) for all purposes over the lifetime of the agent. Lifecycle analysis also has been used in government decision theory, and has been extended to infinite horizon applications.

Applications of lifecycle theory in other disciplines have proved somewhat less pervasive. In sociology, it first found favour in gerontological analysis, where the life course is a foundation for understanding social behaviour and needs, especially among the senior population. This framework has since been incorporated into most other social analysis, and the theory is now a standard tenet of the discipline (Policy Research Initiative 2005).

### Lifecycle mathematics

Since most empirical applications in lifecycle theory use discrete data, the mathematical framework I present here uses discrete mathematics. (For continuous applications, replace the summation sign,  $\Sigma$ , with an integral,  $\int$ .)

The theory can be illustrated by using labour force participation as an example. Aggregate labour force participation ( $L/W$ ) is a weighted average of individual group (i) age-specific participation rates according to the following formula:

$$(L/W) = \Sigma_i (L/W)_i (W_i/W). \quad (7)$$

The age-specific participation rates of individual groups,  $(L/W)_i$ , are weighted by each group's share in the working-age population,  $(W_i/W)$ , to obtain the aggregate participation rate,  $(L/W)$ . (Equation (7) can easily be used to incorporate gender differences, and might need to be adjusted for groups, such as inmates of institutions, that cannot participate in the labour force.) Thus, the aggregate rate depends not only on individual behaviour, but also on the age structure of the working-age population. In this sense, changes in age structure are not just limited to the share of population of working age ( $W/P$ ) but potentially permeate many other determinants of aggregate economic performance.

If the age-specific participation rate does not vary by age, population aging has no effect on the aggregate participation rate. Once the participation rate varies with

age over the lifecycle, however, workforce aging can affect the aggregate participation rate even if age-specific behavioural rates remain unchanged. The same general conclusion also potentially applies to the rates of productivity ( $Q/H$ ), effort ( $H/E$ ) and employment ( $E/L$ ) in equations (1) and (2), although the weights are the respective shares of each group in total hours, total employment and the labour force. Nonetheless, population aging can affect the shares of each of these determinants.

### The theory

Lifecycle theory is important because economic and social behaviour changes with age over the lifecycle. The natural transitions from infancy through childhood into young adulthood bring changes not only in the human body but also in human needs. Expenditures and social behaviour change as the child grows, as do demands on educational and family support systems. Expenditures and needs change again when the young adult establishes a household and starts a family. Parenting is followed by grandparenting and retirement. Once again, economic and social behaviour changes as the adult transitions through the later stages of life. Many of these changes are precipitated by physical aging, which imposes constraints on individual choices. This changing economic and social behaviour over individual life transitions is the foundation for the importance of lifecycle theory in economic and social research.

The similarity between sequential societal demographic transitions and sequential individual life transitions provides a natural link between the demographic transition theory and the lifecycle theory. Since human lifetimes are much shorter than societal lifetimes, many individual behavioural changes occur within each stage of demographic transition. Nonetheless, the stage of demographic transition defines the societal context for individual decisions, and the aggregate of individual decisions determines the stage of demographic transition. For example, stages I and II are characterized by high birth rates, resulting in many children who need food and education but who are unable to participate as full workers in the economy. Stage III is characterized by fewer children and many workers, and by population aging. Stages IV and V lead to concerns about a lack of workers sufficient to support the requirements of the elderly.

### The consequences

Demographic change affects macroeconomic performance in a variety of ways. Besides the obvious effect that a larger population provides more workers and consumers, the age structure influences the proportion of adults available to work. In addition, the determinants of macroeconomic performance also include behavioural rates — for example, participation and employment rates — that, in turn, are

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influenced by the age structure of the population, so that lifecycle behaviour affects economic performance. For example, if workforce aging puts more weight on groups with lower labour force participation, then population aging will result in a reduction in the aggregate participation rate,  $(L/W)$ , in economic output and in material living standards even if individual age-specific behaviour remains unchanged.

Similarly, if employment rates fall (or unemployment rates rise) in the older age groups and more people enter these groups, the aggregate employment rate,  $(E/L)$ , will fall even if there is no change in the age-specific employment (or unemployment) rates. If older employees work fewer hours and more people enter these age groups, the aggregate effort,  $(H/E)$ , will decline even if there is no change in age-specific individual effort. In all of these cases, economic performance can suffer as a result of population aging even though age-specific behaviour remains unchanged.

The exact quantitative significance of each of these effects varies by country and over time. Nonetheless, in an aging population, the net effect of lifecycle behaviour is likely a reduction in economic performance and material living standards as the bulk of the population moves into older age groups — a situation that already characterizes Canada's population as well as those of many other developed countries. These effects will intensify as countries transition from stage III through stage IV. Thus, potential entry into a new stage V raises further concerns about the future of economies and, perhaps, even of countries, suggesting a multitude of economic and social issues.

## POPULATION POLICIES

**T**he future viability of countries is a major issue, especially for residents of those with a declining population. Japan and Russia have already reached this stage and a number of other countries — including Germany, Hungary, Italy, the Czech Republic and others in eastern Europe — are not far behind. The death rate is also closing in on the birth rate in Austria, Belgium, Greece, Poland, Portugal and Sweden (Population Reference Bureau 2006). A country with a decreasing market size not only potentially experiences diseconomies of scale in the provision of domestic output; it also gradually loses global importance from both economic and political perspectives and might even have more difficulty defending its sovereignty. In contrast, countries with growing populations are likely to take over global trade and affairs, with possible detrimental effects on those with decreasing populations. This scenario is increasingly becoming a reality for many countries in the developed world.

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Can population decrease be prevented? Unfortunately, much future population growth is already predetermined by the current age structure of the population. Demographers refer to this phenomenon as population momentum: if most of a country's population is over age 40, then the birth rate will be low and the death rate will rise, inevitably resulting in slower population growth. If most of a country's females are over age 40, even a successful fertility policy that changes individual fertility behaviour will not result in many new births because older women increasingly do not conceive and bear children, underscoring the effect of aging on lifecycle choices.

For a population to grow, births plus immigration must exceed deaths plus emigration. Population increase is achieved by increasing births and immigration and reducing deaths and emigration. Few countries today are willing to contemplate policies that restrict emigration, although such policies have been widespread in the past. Keeping someone against his or her wishes is not likely to produce a desirable outcome for the individual or the society, so democracies, especially, tend to eschew such a policy. Similarly, most countries do not have a direct policy to influence deaths, although better health care can certainly prevent early death. Nonetheless, one certainty of life is death, so any policy in this regard is likely to have, at best, a temporary effect on the death rate.

That leaves births and immigration as the main components of a population policy. As I noted earlier, widespread education is an important determinant of the transition from stage II to stage III when birth rates decline. Yet, since few people in developed societies would argue for the withdrawal of education, especially for females, as a way to increase the birth rate, other pro-fertility policies must be contemplated. These can be described generally as family-friendly policies that reduce the cost and time of bearing and raising children. Usually, they vary from baby bonuses and subsidized daycare to improved maternity and paternity leave, although other strategies that provide appropriate and/or subsidized housing have also been used. Even if such policies successfully change individual fertility behaviour, however, demographic momentum will limit their impact on the birth rate of an aging population.

That leaves immigration, which has been Canada's main population policy in the postwar years. It is important to recall that the population growth rate is determined by the immigration rate, not just the number of immigrants (see equation (6)), so that the number of immigrants must grow by at least the same rate as the total population, otherwise immigration will act as a drag on population growth. In all cases, however, more immigrants are better than fewer immigrants as far as population growth is concerned.

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### Immigration policy in Canada

In most years past, Canada's natural increase has contributed more to population growth than has net migration. This is about to change (Statistics Canada 2005). In the years ahead, a decreasing number of births and an increasing number of deaths will slow population growth and reduce the domestic contribution to population growth. Under these conditions, immigration policy takes on a renewed role in Canada's demographic and economic future. Immigration, however, might slow down future population aging, but cannot prevent it (Guillemette and Robson 2006).

The simple case for immigration as an economically supportive population policy is that, *ceteris paribus*, a higher level of immigration leads to higher levels of population and output growth; moreover, since most immigrants are of labour force age, there is no time lag in translating population growth into workforce growth as there is with pro-fertility policies.

This case, however, comes with many caveats. First, keeping the immigration level unchanged in a growing population reduces the immigration rate ( $\iota$  in equation (6)) and hence acts as a drag on population growth. For example, maintaining an annual intake of 250,000 immigrants while the population increases from 30 million (a rate of 8.33 per thousand) to 32.5 million (a rate of 7.69 per thousand) reduces annual population growth by 0.064 percent. To avoid this small negative effect, the immigration level could be linked to population growth. For maximum economic effect, however, immigration policy should be linked to the determinants of material living standards (see equation (2)). Within this framework, this means choosing immigrants who are

- / of working age, thereby contributing to  $W/P$ ;
- / likely to participate in the workforce, thereby contributing to  $L/W$ ;
- / likely to be employed, thereby contributing to  $E/L$ ;
- / hard workers, thereby contributing to  $H/E$ ; and
- / highly productive, thereby contributing to  $Q/E$ .

Of course, this is every employer's desirable potential worker, but there are many circumstances that impede an immigrant's ability to meet these requirements in Canada.

Canada's immigration policy for economic — as distinct from family and humanitarian — immigrants is based on a point system that appears to support each of these objectives, and is a sensible policy. Nonetheless, it has become clear that the policy intent and the realized outcomes have diverged for many immigrants to Canada

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over the past decade or more (Picot, Hou, and Coulombe 2007). In this regard, Canada's immigration system needs some retooling to maximize the economic benefit to immigrants and to the country.

First, under Canada's point system, the potential immigrant of working age receives maximum points, which satisfies the first requirement. Moreover, emphasis is on younger immigrants, who will live more of their lives in Canada and, therefore, will remain in the Canadian working-age population for a longer period, thus potentially contributing to output and material living standards for more years than would an older immigrant. This assumes that the immigrant does not emigrate sometime after arrival, so the likelihood of remaining in Canada is also a relevant consideration.

Second, the potential immigrant's willingness to actually enter the labour force — that is, to look for work — is desirable, and is assessed by the immigrant's past employment and the availability of work in Canada in the immigrant's chosen occupation. This satisfies the second requirement. Willingness to work and ability to work, however, might be quite different. Applying for work usually requires familiarity with the language of the workplace; thus, allocating points for proficiency in English or French is a supporting feature of Canada's immigration policy. However, since the workplace requires language proficiency in both oral and written form, inability in either one is likely to be detrimental to successful integration into the labour force. Accordingly, potential immigrants from countries in which neither English nor French is the first language would be at a disadvantage in their search for employment after arrival. Policies to remedy this disadvantage — such as English- or French-language training programs — would improve outcomes for immigrants and for the country.

The third issue is employability. The unemployment rate is higher in the immigrant population than in the general population, and considerably higher in some immigrant groups. There are many reasons for these outcomes, but a high unemployment rate (or low employment rate) does not contribute to material living standards for the immigrant or society. Policies to improve the employability of immigrants could range from eliminating discrimination in the workplace to building employment networks. Although a higher level of education — a core aspect of Canada's immigration policy — could improve employability, there are no guarantees, as many an immigrant can attest.

In fact, many immigrants have been blocked from employment in their chosen occupation by licensing authorities that refuse to recognize their professional or technical credentials and by employers who do not recognize their work experience. Health care workers, teachers, architects, engineers and many skilled trades have successfully blocked the entry of immigrants into occupations in which they have been

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trained and often have practised before coming to Canada. This has led to the incongruous policy of encouraging immigrants by giving them maximum points for education, then not allowing them to use their education in Canada's workplace after arrival. This policy must change. Every occupational licensing authority in Canada should be required to establish a procedure that allows immigrants to apply for certification through a timely, well-defined procedure of appropriate testing to ensure that their qualifications meet the current standards of the occupation. Moreover, each licensing authority should establish paths — such as apprenticeships and mentoring — through which immigrants can obtain the necessary qualifications with minimum dislocation of their careers. Such a policy might be limited, however, to immigrants whose occupations are in demand.

Work experience is more difficult to assess, but potential employers should be required to assess the foreign training and work experience of all job applicants, perhaps in consultation with the appropriate licensing or regulating authority.

An important example is health care. An aging population will need ever more health care workers, yet many immigrants with the appropriate training and experience are not working in that sector. They should be encouraged to become qualified to do so, for their benefit and that of Canada.

The fourth and fifth requirements (effort and productivity, respectively) are somewhat more difficult to access *a priori*. Both are dependent on good management skills to achieve the best results. This is true for all workers, not just immigrants. It is difficult to envision policies that are immigrant-specific in this context, with perhaps the exception of literacy, which is crucial for good productivity. The ability to read, understand and follow instructions, both oral and written, is often taken for granted. Increasingly, in an aging population, this is an issue for all workers: as new technologies and processes are introduced into the workplace, employers need to provide appropriate training and workers need to keep their skills up to current requirements. Literacy comprehension is even more difficult when the language of communication is not the immigrant's first language. Good literacy training in the workplace (and elsewhere) is essential if workers are to achieve their productivity potential, and good managers should be sensitive to the needs of workers when communicating in the workplace.

Finally, Canada's immigration strategy should be appropriate to the country's needs, both economic and demographic. On the economic front, however, this has not always been the case. From the 1950s through the 1980s, the immigration level generally varied inversely with the unemployment rate — when the unemployment rate rose, the immigration level fell, and vice versa. This relationship was broken in the

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early 1990s, when the immigration level was raised even as the unemployment rate increased (Foot 1994), making it difficult for immigrants to find jobs and placing them in direct competition with often-displaced Canadian workers. Canada is still paying for this misadventure, as unemployment has become entrenched among many who immigrated at that time, while domestic support for the immigration program suffered a setback. Thus, the national unemployment rate should remain a key determinant of Canada's immigration policy. Moreover, in considering the needs of employers, policy-makers should recognize that employers benefit from a higher unemployment rate because it limits wage increases and, therefore, increases profits.

On the demographic front, Canada's immigration policy has become even less supportive of the country's needs, even though such consideration is required under the *Immigration Act*. Although population growth appears to be taken into account in setting policy, there is no linking of the age structure of immigrants with that of Canada's population. People are most mobile when they are in their 20s — that is, after completing their education and before starting families (a lifecycle effect). Yet, because of administrative delays in processing applications, most immigrants to Canada are now between ages 25 and 35. Meanwhile, the children of the boomer generation — the so-called echo generation — are now in their teens and early 20s, so increasing the immigration level (or rate) now runs the risk of placing new immigrants in competition for employment with the boomers' children. This is unwise. The immigration level (or rate) should not be increased substantially until the middle of the 2010s, to enable the echo generation to become established in the workforce. By then, the declining birth rate of the 1990s will have reduced workforce growth and increased labour market shortages, with a consequent reduction in the unemployment rate.

As a postscript, one should note that, like many younger workers, immigrants are drawn to locate in Canada's major urban centres (another lifestyle effect). A general policy of requiring immigrants to settle in smaller communities is unlikely to be successful, but a carefully targeted policy of inviting immigrants in their early 30s with young families to settle in smaller communities could have better success.

## WORKFORCE POLICIES

**S**ince employees are people, demographic change has a major effect on labour force growth and, hence, on output growth. As I noted earlier, changing age structure also affects the labour force participation rate, the employment rate and,

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perhaps, work effort and productivity, which are the determinants of economic performance. An increasing proportion of older workers in the population has important implications for Canada's future economic and social outcomes.

The massive postwar boom resulted in the rapid growth of the working-age population during the 1960s and 1970s. This growth, supported by increasing female labour force participation, was reflected in rapid economic growth. Thereafter, the effect of the birth control pill (and female education) led to a baby bust during the late 1960s and 1970s, resulting in a working-age population that grew more slowly and, together with a slower-growing labour force participation rate, a consequent reduction in labour force growth over the 1980s and 1990s. Output growth slowed accordingly. Other factors — such as the labour force participation rate and productivity performance; (see equation (1)) — also played a part, but much of the reduction in output growth in Canada since the 1970s can be attributed to demographic change.

Will this trend continue, or is Canada about to experience another demographic transition? The answers are yes and yes! Demographic transition theory teaches that slower population growth is entrenched; so are slower workforce and output growth. Recall, however, that this does not automatically mean falling material living standards, but the massive boomer generation, which is now in the working-age population, is poised to enter its next life transition.

Currently, boomers are in their 40s and 50s. If they begin to retire at the average Canadian retirement age of 62, the oldest boomers, born in 1947, reaches age 62 in 2009 and age 65 in 2012. The retirement of this massive generation of workers over the 2010s and 2020s will lead to even slower workforce growth and, *ceteris paribus*, output growth. Significant long-run improvement in productivity or other determining factors (see equation (1)) could lessen or perhaps even offset the demographic effect, but that appears unlikely to occur.

The expectation of slower future workforce growth and the possibility of emerging labour market shortages are thus creating concerns among economists, policy experts, business leaders and human resource management professionals. It has led to calls for increasing the level of immigration and for more creative workforce strategies. Policy proposals have proliferated, most of which focus on encouraging boomers to keep working beyond the traditional retirement age of 65 (Policy Research Initiative 2006). Mandatory retirement has been abolished in many jurisdictions to enable and encourage older employees to remain on the job (and to deal with human rights in the workplace). These concerns are timely and legitimate, although many of the proposals are incomplete or unrealistic.

### Workforce mathematics

In terms of the mathematics I presented earlier, the retirement of the boomer generation will result in a reduction in the labour force participation rate ( $L/W$ ) but not a change in the age structure of the population ( $W/P$ ), since the adult working-age population ( $W$ ) includes seniors. In fact, continued below-replacement fertility increases  $W/P$  as the pre-working-age share of the population continues to decrease. Unlike the usual definition of the working-age population as those between the ages of 15 and 64, this definition recognizes that, although most seniors retire fully from the workforce (a lifecycle effect), some continue to work into their later years. This expanded definition of  $W$  is increasingly appropriate as jurisdictions begin to remove mandatory retirement practices and as increasing life expectancy is creating more years of healthy, productive living for increasing numbers of people beyond age 64.

There is little evidence, however, that the average Canadian worker wishes to retire later. Rather, the evidence suggests that almost all workers who can afford to retire early do so. Better pensions (including public pensions) mean that an increasing share of the workforce is able to afford to retire earlier and chooses to do so (the lifecycle again), resulting in a downward trend in the average age of retirement over the 1980s and 1990s — although some recent evidence suggests that the downward trend might now have ended. Whether the average retirement age will start to increase depends on many factors, some of which I review later.

The labour force participation rate decreases among older Canadians (an inevitable lifecycle effect), so population aging will lead to slower labour force and output growth. Even if seniors decide to continue to work, thereby increasing the senior participation rate, it will still be well below that of the pre-senior ages, and an aging population inevitably leads to slower labour force growth. It is tempting to borrow from demographics and refer to this effect as “lifecycle momentum.”

Moreover, lifecycle momentum is likely to affect other determinants of economic performance negatively as well. For example, older workers are more likely to work part-time than workers of prime working age. This means that an aging workforce reduces employees' average effort (hours per employee,  $H/E$ ). Other effects are more conjectural but just as relevant. If, for example, older workers are discriminated against in the workplace or if an increase in structural unemployment affects older workers disproportionately, then a workforce with a larger share of older workers will lead to reductions in average employability ( $E/L$ ). Also, if older workers are, on average, less technologically literate or slower physically or mentally than younger

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workers, then increasing the share of older workers in the labour force will lead to reductions in average productivity ( $Q/H$ ). In short, all these effects of population aging have negative effects on economic performance.

At this stage, it is important to recall the role of capital markets in lifecycle theory. Under the conditions I have described, material living standards ( $Q/P$ ) decrease, but the average person is not necessarily worse off, since leisure time increases and the assets the worker has accumulated over the lifecycle can be used to generate income in retirement. Lifecycle theory suggests that the composition of current income gradually shifts from labour income to capital income as more members of the aging population live off the stock of assets accumulated over their working years. This argument assumes, of course, that asset accumulation has taken place; in fact, there is evidence that debt/asset ratios are decreasing over the lifecycle in Canada, which suggests that boomers have indeed been accumulating a stock of assets. Whether this accumulation is sufficient to support the boomers' expected lifestyles in retirement remains to be seen, since economic growth and productivity will have an effect on the rates of return to these assets.

### Workforce policies: boomer retirement

Demographic analysis indicates that, on average, the retirement of Canada's boomers will begin in the 2010s and be spread out over two decades. There is still some time, therefore, to prepare appropriate workforce policies to accommodate this demographic fact of life.

There are, however, exceptions to this trend. Some groups of workers with well-managed pension plans — such as teachers, police, military personnel and other public sector workers, along with many private sector employees, both unionized (including many in the skilled trades) and non-unionized (in the banking sector) — are being given opportunities for early retirement, and the effects of the retirement of boomers are already being felt in these areas. Indeed, to save on future pension payments, some employers are using early exit packages to encourage their boomer employees to retire early. Yet trends are driven by average, not exceptional, behaviour. In the meantime, the boomers' children — the echo generation — have been going through the education system — educational enrolment increased in many jurisdictions over the late 1980s and 1990s — and are now entering the workforce, causing a temporary increase in labour force growth.

What policies could encourage boomers to delay their retirement in order to offset slower workforce growth and labour market shortages in the 2010s? Some

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possible solutions are outlined in a recent report of the Canadian Senate (Senate Standing Committee 2006), which focuses on providing incentives to work, participating in lifelong learning, eliminating age discrimination in the workplace and devising a more effective immigration policy. It is hard to argue with these general recommendations, but the devil is in the details. For example, the best incentive to work is a decent wage, yet cost-cutting and global competition have limited real wage increases. Since business has an incentive to reduce wages to increase profits, it is not likely to champion such a solution. Another example is Ontario's recent elimination of mandatory retirement, which provides older workers with an incentive to work, yet employers are not required to provide workplace insurance for workers over age 65, which is a disincentive for older workers to keep working.

Somewhat more creatively, the Senate report (2006) includes recommendations to "enhance the labour force participation of older persons" through such measures as elder care, flexible working hours and pro-rated benefits for part-time workers. Over the next decade, although many boomers are likely to wish to continue working, they might prefer to do so only part-time. Thus, it might be useful to implement a flexible policy of phased retirement, whereby aging employees gradually reduce their workweek from five days to one, go on half-salary or half-time, or take on special projects that amount to a similar commitment of less-than-full-time employment (Foot and Venne 1998). Such flexible workplace policies are likely to be popular with boomers whose lifestyle needs mean travelling as well as spending more time with grandchildren or aging parents.

Flexible workplace policies have the additional advantage of facilitating workforce renewal, since a half-salary saved on an older worker could be used to hire a younger, echo generation worker full-time with no increase in the total salary bill. This workforce strategy would also allow cross-generational mentoring, whereby older workers share their experience with younger employees, who, in turn, teach older workers how to make efficient use of the latest technologies.

Of particular note are the 2006 Senate report's suggestions to eliminate the requirement that an individual must have ceased working before being able to collect retirement benefits, to allow pension credits to be accumulated on the basis of employment earnings after the normal retirement age of 65 and to permit an individual to defer receiving old age security benefits with appropriate actuarial adjustments. The essence of these recommendations is to allow workers both to draw from and to contribute to a pension plan at the same time, and they could be extended to any employee contemplating part-time retirement after age 55 or 60. Such a policy change would likely be effective in retaining boomers in the workplace.

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### Other workforce policies

The ability to save for retirement is crucial if workers are to avoid substantially reduced material living standards when they retire. Thus, the trend away from defined-benefit to defined-contribution pension plans in the private sector is a concern, since it transfers responsibility for pension management onto the person usually least equipped to handle it. The average employee is untrained to assume this responsibility, and has no opportunity to pool the risks and costs with other employees. Moreover, the expenses associated with individually managed investing are usually high and consume future pension income, and the risks of failure, either through oversight or lack of discipline, are also higher. As a result, tomorrow's seniors might not enjoy the income security that today's seniors do, which could increase poverty among the senior population.

One key policy change that the 2006 Senate report failed to recommend is the establishment of a new, optional private pension plan that would be managed in the same way as are contributions to the Canada Pension Plan (CPP) — namely, by an arm's-length public agency that would invest private pension contributions using appropriate expertise and that would pool risk in a cost-efficient manner. Under such a fund, an employee's account could accept registered retirement savings plan (RRSP) and employer contributions, as well as after-tax contributions for people who wanted their money managed professionally with appropriate risk sharing and a minimum of fees. Such a plan would make private pensions more portable and would facilitate saving for retirement by those who cannot contribute to an employer-sponsored pension plan. Although such a fund would have only a minimum effect on boomer retirement, since most of that generation's pension arrangements are already established, future generations of workers could benefit.

Also missing from the 2006 Senate report is an analysis of the fixed costs of employment created by the caps, or maximum limits, imposed on contributions to various government programs — for example, on CPP, employment insurance and, in some cases, workers' compensation. Such caps on contributions encourage employers to give current workers more hours, rather than spreading the work around to older part-time employees and hiring new, younger employees. Instead, caps on all employment-related programs should be replaced by a revenue-neutral rate — whether hourly, daily or weekly — to remove the disincentive to part-time and flexible work, especially by older workers.

Finally, it is worth noting that the federal government's recent decision to delay the age at which an individual must convert RRSP funds into income (from 69 to 71) is appropriate for a society that is experiencing increasing life expectancy.

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Indeed, perhaps the conversion age should be linked explicitly to average life expectancy, with an opportunity for gradual conversion in cases where the holder can demonstrate that full retirement has not yet occurred. This deserves further study.

Policies to manage the effects on the Canadian workforce of the retirement of the boomer generation will be reflected in national economic performance and material living standards. The sooner they are discussed, evaluated and formulated, the better will Canada be positioned to face the economic challenges of an aging workforce. Demographic analysis that incorporates lifecycle behaviour thus provides a road map both for the most effective policies and for the timing of their implementation.

### HEALTH CARE

**T**he health care sector in all its manifestations is likely to be affected dramatically by Canada's aging population. Indeed, it has already experienced significant effects. Over the past decade, the boomers' aging parents — the relatively large generation born mostly during the Roaring 1920s — have been moving through the period of their most intensive use of the health care system, making increasing demands on physicians, hospitals, pharmaceuticals and home care services, stretching government-sponsored program budgets and service delivery to their limits.

Fortunately, demographic changes over the next decade could provide a respite for a health care system that has seemed unprepared for the inevitable effects of a rapidly growing population of aging seniors. The next generation to make intensive use of the system is the relatively small group born during the Great Depression of the 1930s, so growth in demand for health care could subside somewhat in the 2010s. This could provide a window of opportunity to develop effective and efficient health care delivery before the large boomer generation begins to make its highest demands on the system in the 2020s and 2030s.

The effect of future population aging on health care use, needs and finances is beyond the scope of this chapter; instead, I offer some observations on health care delivery, funding and staffing based on demographics and lifecycle analysis that the health care literature has largely overlooked.

#### Location

The first issue is people's access to health care where they live at different stages of life. According to lifecycle theory, young people tend to head to major cities

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for employment and entertainment. Thus, for example, boomers left Canada's small towns during the 1960s and 1970s, while the population of the downtown cores of Canada's three major cities grew rapidly. Then, in the 1980s and 1990s, the boomers started families and moved to the suburbs for the housing and space they needed in which to raise their children. In the past decade, the eldest boomers, reaching their 50s, began to inherit or purchase vacation properties — second homes that are located far from the major urban centres in which they spent their earlier years. In essence, then, population aging moves people away from downtown cores and back to smaller communities.

Yet hospitals and other health care providers are usually located in major urban centres where their older patients prefer not to be. Since the likelihood of disability or infirmity increases with age, distance from appropriate care can be debilitating for older patients. Even within major urban centres, transportation is often difficult for older people: important support and rehabilitation systems are disrupted when a 75-year-old woman has difficulty visiting her 77-year-old partner who has had a stroke or heart attack.

The response of boomers to this issue has been to place their aged and increasingly infirm parents in nursing homes located in suburban areas, which often disrupts the lifestyle of peace and quiet that their parents had become used to while living in smaller communities, further exacerbating their health care needs.

Canada thus needs to rethink the geographic delivery of health care services. At least for the needs of the aged, it makes little sense to locate hospitals, nursing homes and other health care facilities and services in the downtown cores of major cities. Instead, services and facilities should be located where the older population lives; the aged should not be expected to travel to the services. A more sensible policy would be to locate health care facilities on the suburban outskirts, where they would be more accessible to older adults from surrounding smaller communities. Younger downtown residents would still be able to access such facilities without undue imposition on their resources. In both cases, family and friends could more easily help with rehabilitation and other support services.

Another issue in the delivery of health care services is home visits, which are increasingly important for an aging and less mobile population. Because physical infirmity and disability increase with age, older patients often find it difficult to visit physicians, especially in winter, yet current policy discourages home visits by physicians or even nurses and nurse practitioners. An alternative delivery mode appropriate for an aging population should be considered — perhaps including the use of mobile nurse

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practitioners, which would improve service delivery and reduce waiting times in physicians' offices and hospital emergency wards. If the patient needed to see a physician or visit a hospital, the nurse practitioner could then advise and assist in the choice of facility and transportation, and provide a preliminary assessment to speed up diagnosis and treatment. In short, the use of nurse practitioners would improve the efficiency of the health care system by economizing on the use of scarce, more expensive physician and hospital resources. From the point of view of patients, it would also likely improve both service delivery and health outcomes.

Still another issue involves health outcomes. It is now widely recognized that increasing the volume of services generally improves the health outcomes of patients. Thus, for example, separate, stand-alone clinics that deliver specific health care services — such as cataract surgery, hip replacements and hernia operations — allow specialist physicians to increase the volume of their services in a single location. Such clinics also permit these specialists to create a work environment and manage a familiar caseload free from other pressures in the system. Relatively small clinics can also be less daunting and disorienting for older patients than large general hospitals, with staff who understand their needs, shorter corridors and more convenient parking for those who have difficulty walking, easier follow-up care and so on — all of which are important not only for older patients but also for their families and friends.

In general, the system should strive for the incorporation of best practices into all aspects of health care delivery. Undoubtedly, such a policy is more easily said than done, but appropriate geographic location needs to be better integrated into health care service delivery for Canada's aging population.

### Funding and staffing

Health care is costly, but the future demands of an aging population are unlikely to bankrupt government. Indeed, Canada has a number of ways to fund future health care costs.

Given demographic changes that will see a declining share of children and young people and an increasing share of elderly in the population, one source of additional funding is to reallocate government funding away from education and toward health care.

Another source of funding is the boomers themselves, who will continue to pay taxes in their senior years. Robert Brown, an actuary from the University of Waterloo, contends that taxes on future pension withdrawals will finance all or most future health care needs of boomers (see Daw 2002). Currently, Canada's governments forgo more tax revenues from retirement savers than they collect from retirees,

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with boomers and other pre-retirement cohorts taking tax deductions on contributions and the tax-deferred accrual of investment gains. When boomers start withdrawing money from their pension sources, however, these tax deferrals will come due and government revenues will grow. Increases in contribution limits to RRSPs could provide even more tax revenues in the future. In short, the boomers will, in large part, self-finance their health care costs.

Governments also have other revenue options to finance future health care needs. For example, businesses operating in Canada benefit significantly from a public health care system that absolves them from the responsibility of providing health insurance for their workers. Recent events in the US steel, auto and airlines sectors have drawn attention to the high corporate costs of health insurance for workers in that country. Thus, in Canada, corporate and personal contributions to future health care costs could come, for example, from new, small employer and taxpayer health insurance taxes specifically earmarked for a health care fund, not from general government revenues.

The Achilles' heel of future health care delivery, however, is likely not to be Canada's ability to pay but its inability to find sufficient health care workers. By the 2030s, most boomers will have retired and begun to make significant demands on the health care system. Meanwhile, a declining birth rate will have resulted in a much smaller cohort on which to draw for new entrants into the labour market in general and the health care sector in particular. Moreover, since the boomers have had significantly fewer children than previous generations, they will have less family support on which to draw in their senior years. Thus, Canada cannot afford to wait: now is the time to recruit the echo generation into all health care occupations, to look after their aging parents when they need care the most.

## CONCLUSIONS

**T**he policies I have outlined in this chapter are examples of the larger generic policy challenge that an aging population poses. Canadian decision-makers, whether in the private or public sector, are largely rewarded for short-term decisions. In the private sector, executives focus on near-term stock prices and financial results; in the public sector, ministers (and many deputies and other officials) focus on results that will have a positive effect on the next election. Yet demographic change is gradual, seldom having any major effect in the short term, and is rarely considered in today's important policy decisions.

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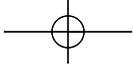
At one time, an advantage of tenure in the civil service was that it encouraged a focus on issues and solutions that transcended the current government's stay in power. This is no longer the case. The public sector has followed the private sector in introducing a focus on short-term incentives, and now even appointments below the deputy level typically are political, to provide better alignment with current government policies. Tenure is eroded as more public employees are replaced with each change of government, with the consequent loss of institutional memory and the effective discouragement of focus on longer-term issues and solutions. Policies with fast paybacks are favoured over those where results are delayed, especially if there are up-front costs, political or financial.

Although widespread, however, short-term thinking is not pervasive. In the late 1990s, for example, the solution to Canada's demographically driven pension crisis required a much longer-term time horizon. Alternative policies — increasing the retirement age (the US solution) or increasing contribution rates (ultimately the Canadian solution) — were considered. In addition, strategies to improve the rate of return on pension funds were discussed and implemented through the creation of an investment board. These difficult decisions subsequently removed the pension issue from public debate and private uncertainty.

Canada now needs to take the same approach to health care. Population aging inevitably is creating the perception of a looming health care crisis — an important economic and social issue that, like pensions, affects public budgets and private decisions. Piecemeal solutions with short-term political payback, such as reduced waiting times for selected operations or the delisting of certain procedures, cannot solve the problem or make it disappear from the public agenda. A more comprehensive, longer-term strategy is required.

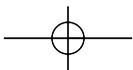
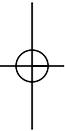
Demographic momentum ensures the inevitability of population aging in Canada and elsewhere in the world. Slower population growth will result in slower economic growth, but not necessarily in declining material living standards. In this context, immigration policy will become even more important in the years ahead. Canada has a historical advantage in the global competition for immigrants, but its immigration program will have to be fine-tuned to yield the best results for both immigrants and the country.

A lifecycle approach can provide the foundation for determining the economic and social consequences of population aging. An aging workforce will produce slower labour force growth, while the impending retirement of the boomer generation will present a variety of human resource challenges, not the least of which will be in



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health care. Yet the ability to meet future health care needs does not have to founder on the shoals of inadequate funding; rather, the challenge is likely to be to devise an efficient and effective system of health care delivery and to find the staff necessary to deliver services. Now is the time to recruit and train the future health care workforce. Delay could have deleterious consequences both for the boomers and for Canadian society at large.



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