



**AN ECONOMIC FUTURE  
WITH SMALLER NUMBERS:  
The Population and Labour Force  
Outlook for the Atlantic Region**



**FRANK T. DENTON  
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BYRON G. SPENCER**

November 2009

## **Atlantic Institute for Market Studies**

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The Atlantic Institute for Market Studies (AIMS) is an independent, non-partisan, social and economic policy think tank based in Halifax. The Institute was founded by a group of Atlantic Canadians to broaden the debate about the realistic options available to build our economy.

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# EXECUTIVE SUMMARY

Despite considerable population growth until the past decade, the Atlantic region's percentage share of Canada's population has fallen continuously for more than half a century. Further decreases seem likely, in large measure because few immigrants to Canada have thus far been attracted to the region.

Like the rest of the country, the Atlantic provinces experienced the postwar baby boom and subsequent bust, and their populations are now aging; the proportion of the population ages 65 and older will rise continuously over the next few decades. If rates of fertility remain at or near their current low levels and the loss of population through net out-migration to the rest of Canada is not reversed, increasingly slower growth will turn to eventual decline throughout the region. The trend is likely to be most pronounced in Newfoundland and Labrador.

As the rate of population growth diminishes in Atlantic Canada, so, too, will the rate of growth of the labour force. Coupled with relatively low participation rates and unemployment rates well above the national average, diminishing labour force growth has important implications for the region's future productive capacity and how it is used. Of particular interest is the "dependency burden," as measured by the ratio of the "dependent" or nonworking population to the population that is working. Projections indicate that the ratio will rise in Atlantic Canada, as elsewhere in the country, but even by 2040 it will fall short of what it was in the baby boomer years of the 1950s and 1960s. This time, however, the dependent population will be predominantly elderly, rather than youthful, and overall ratios will not be as high as they were then. Thus, issues related to how best to reallocate resources to cope with an aging population could prove more important for society than those related to the overall "cost" of that demographic change.

Future growth in the region's productive capacity is unlikely to result from population growth, but could come through gains in productivity. Income per capita could be maintained with gains in output per worker of less than 1 percent per year, even as the dependency burden increases, and it would be higher if the gains were higher. Since the average annual rate of productivity growth in the region over the past quarter-century has been about 1.5 percent, it would be reasonable to expect increases in per capita income even in the face of declines in both the population and the labour force.

Slower growth and population aging affect not just the region's ability to generate output and income, but also patterns of saving and household consumption — and, hence, investment. Their effects on sales, production, and investment levels differ from one industry to another, however, so they fall unevenly on different areas in the region. Moreover, slower growth and population



aging affect the tax bases from which provincial governments must draw revenue and the demands for government program expenditures.

Education and health care are major budgetary components that obviously are sensitive to population change, and they deserve special attention. Planning should anticipate that the school-age population is likely to be smaller in the years ahead than it is today. How many teachers will be required in 10, 20, or 30 years? How many will have to be hired, after taking into account the likely numbers of retirements and departures for other reasons? What are the implications for teacher training programs? How much classroom space will be needed? Planning should also anticipate large increases in the numbers of elderly people: What health care and other services will be required to meet the needs of a rapidly aging population? How much of each type of service? And how will future needs for personnel and facilities compare with what are likely to be available?

Well-informed policy decisions are those that take prospective demographic changes into account, rather than ignore them. The case was put strongly years ago, in the April 1995 Notice of Motion establishing the Select Committee of the Legislature on Demographics in New Brunswick: “It is imperative for government to understand and assess the impact of our changing society in the context of our aging population and the demands and challenges this presents for the design and delivery of programs and services.” Those same sentiments were echoed by the Atlantic Institute for Market Studies in its commentary on our report of a decade ago and, more recently, in the Final Report of the Special Senate Committee on Aging: “The aging population will change the way we do things. We can allow this change to happen by passively reacting to change. Or we can anticipate it and meet the challenges by design.”



# INTRODUCTION

The population of a nation changes gradually but continuously. It is renewed by births, augmented by immigration, and depleted by deaths and emigration — and, of course, its members grow older year by year as they move through the life cycle. The population has a long “memory” too: a statistical snapshot at census time reveals it to have a certain size and age composition, reflecting the demographic events of the previous hundred years or so and, indeed, through intergenerational connections, events much further back in history. In large measure, the Canadian demographic future is predetermined by the population of today. The baby boomers, born in the two decades following World War II, are now in middle age, and soon the first of them will qualify to be called “old.” The generation behind them is much smaller, and the record of the past decade and more gives no indication that another major birth boom is likely. The population of Canada is thus slowly aging, in a collective sense.

What is true for Canada is also true for its constituent regions. Patterns of immigration from abroad and migration within and differences in birth and death rates have engendered faster rates of change in some parts of the country, slower rates in others. But population aging is a prominent characteristic of all regions and will remain so far into the century. It is against that background that we give our attention in this paper to the demographic past and future of the Atlantic provinces.

We begin with a brief review of some demographic history, going back to the 1950s. We compare the rates of growth in both the Atlantic region and its four provinces with the national rate, take note of their changing shares of the Canadian population, and look at the shifts in age distribution that have occurred over the decades. We then analyze changes in population in terms of their components: the contributions of births, deaths, and migration. A question of particular interest is the extent to which the decline in the region’s population as a percentage of the Canadian population can be attributed to its disproportionately low share of immigrants to Canada.

Demographic change and economic change are inextricably linked, and nowhere is that more obvious than in the population-labour force nexus. The baby boomers began to enter the working population on a full-time basis around the mid-1960s and their influx continued until the first half of the 1980s. Rates of labour force growth fell sharply thereafter. We review the recent labour force history of the Atlantic provinces in that setting and compare it with that of Canada as a whole.

From the past we turn to the future. Using a computer-based demographic model we have developed and applied in other studies, we project the size and age distribution of the population and labour force for each of the four Atlantic provinces and for the region as a whole. Our initial projection — Projection A, as we call it — is based on what we regard as realistic assumptions, in the absence of a major change in patterns of demographic behaviour. However, we present some alternative projections,



too, in order to explore the implications of different assumptions. In all of the projections, we take a long view: populations change slowly, and the collective aging process will be with us far into the century. While considering the nearer-term outlook, we think it helpful also to consider the prospects for the next several decades, in order to see where Atlantic Canada is headed in the long run in terms of its population and work force. The projections presented here update and extend ones that we prepared more than a decade ago (Denton, Feaver, and Spencer 1998). The earlier projections started from 1996 and extended to 2036; the ones here start from 2006 and extend to 2051. While our Projection A values for 2006 were somewhat optimistic, in the sense that the census numbers for the Atlantic region and each of its provinces were somewhat lower than we projected, we find that the longer-term trends have not changed.

From a policy perspective, an important question is whether one province, or perhaps the Atlantic provinces acting in concert, could affect the course of population growth, or whether each must simply respond to demographic changes as they evolve, and make the best of it. The answer is not simple. People tend to move to areas that are prospering and leave those that are not, and it makes no sense to try to attract more immigrants to, or to hold young people in, a region where they cannot find employment. Successful policies leading to more rapid economic growth in the Atlantic region would likely encourage population growth, both by reducing (or even reversing) net interprovincial out-migration and by attracting immigrants from abroad. But as much experience attests, policies leading to sustained economic growth in Atlantic Canada (or elsewhere, for that matter) are hard to find.<sup>1</sup> The search for such policies, however, is not in any central way a *demographic* matter: successful economic policies might have an impact on population growth, but it probably would be better to view that as a by-product rather than as their main focus.

The general outlook for Canada over the next few decades is one of continuous population aging, a trend that almost certainly will be more pronounced in the Atlantic region, as we show below. That prospect raises many concerns, among them large increases in health care costs and even larger increases in pension costs. Will the social programs put in place four decades ago, when those born during the baby boom were still young, be sustainable in another decade or two, when the baby boomers are old? Questions of that kind are at the forefront of public concern and debate, with anxieties heightened by occasional pronouncements from apparently knowledgeable people suggesting future insolvency of the Canada Pension Plan or expressing concern about prospective intergenerational conflicts. We have written about some aspects of those topics elsewhere (Denton and Spencer 2000; Crossley and Spencer 2008). Here, we restrict our attention more narrowly to demographic matters, and identify those of particular relevance for public policy.

An important aspect of population structure is the relationship between economically “dependent” and economically “active” age groups — between the young and the elderly, on the one hand, and the working population or labour force, on the other. We review the history of “dependency ratios”

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1 The relatively poor economic performance of Atlantic Canada and the associated sustained low rate of employment growth have been the subject of many studies; see, for example, Beale (2006).



in Atlantic Canada, and evaluate current and projected future ratios in light of the historical ones. The significance of the dependency ratios is that they can be interpreted as measures of the relative “burden” to society of its age distribution, having regard for the costs of raising and educating children and of supporting and caring for the elderly.

The effects of population change on the labour force and dependency ratios have important implications for the economies of the Atlantic region. However, there is much more to be considered in assessing demographic effects on those economies and the likely impact on future development. Detailed analyses and projections of these effects are beyond the scope of this paper, but we devote some space to an outline of how population and the economy interact and to the kinds of questions that should be addressed if a careful assessment of the economic effects of future population change were to be undertaken. We note the importance of population aging for provincial health care and education systems, and for public expenditures over the full range of government budget categories.

We end the paper with a summary and statement of conclusions.



## A HISTORICAL PERSPECTIVE

The people of Atlantic Canada numbered somewhat more than 1.6 million in 1951, the year in which the first national census was taken after Newfoundland and Labrador joined Confederation; in 2006, Atlantic Canadians numbered about 2.3 million, a gain of just over 42 percent. Over the same period, Canada's population grew three times as fast. Thus, although the Atlantic region has experienced considerable population growth, its share of the national total has declined: the region accounted for 11.5 percent of the total in 1951 but just 7.2 percent in 2006.

The pattern has been a consistent one, as Table 1 and Figure 1 show: while the region's population increased in every five-year period until recently, its share of the national total has fallen in every period. Net losses through migration to other parts of Canada go some way to explaining the declining share, but much of the explanation is to be found in the disproportionately small numbers of immigrants to Canada who have taken up residence in the region. We explore that matter in the next section.

Prior to the 1990s, long-run population growth patterns were much the same in all four provinces in broad terms: the population of each increased in size but decreased as a percentage of the Canadian total. Between the 1991 and 1996 censuses, however, the population of Newfoundland and Labrador decreased by 12 percent, that of New Brunswick showed virtually no growth, and the population of the region as a whole declined by 2 percent. Even so, within the region, the percentage shares have not changed drastically. Atlantic Canada's population today is distributed among the four provinces in much the same way as it was at the middle of the last century.

The age distribution of the population is a different matter: it has been anything but constant, as Table 2 makes clear. The postwar baby boom and subsequent baby bust were historical experiences shared by many western countries and throughout Canada, including the Atlantic region. In 1961, more than 46 percent of the region's population was under age 20 (the all-Canada figure was about 42 percent). By 2006, the proportion had fallen below 23 percent (and the all-Canada figure to 24 percent). Concomitantly, the proportion of the region's population ages 65 and older rose from less than 8 percent to more than 14 percent. In Newfoundland and Labrador, the median age of the population in 1971 was 20.9; by 2006, it had risen to 41.4, a quite remarkable change in just three and a half decades. The increase in the median age was a little smaller in the other three provinces, but nevertheless large: 24.8 to 40.3 in Prince Edward Island; 25.4 to 41.3 in Nova Scotia; 23.9 to 41.1 in New Brunswick. For comparison, the all-Canada median age rose from 26.2 to 38.9. The pattern of collective aging is well established, and will be a dominant feature of the demography of Atlantic Canada, and of the rest of the country, for a long time to come.

**Table 1: Population, Atlantic Provinces and Canada, 1951–2006**

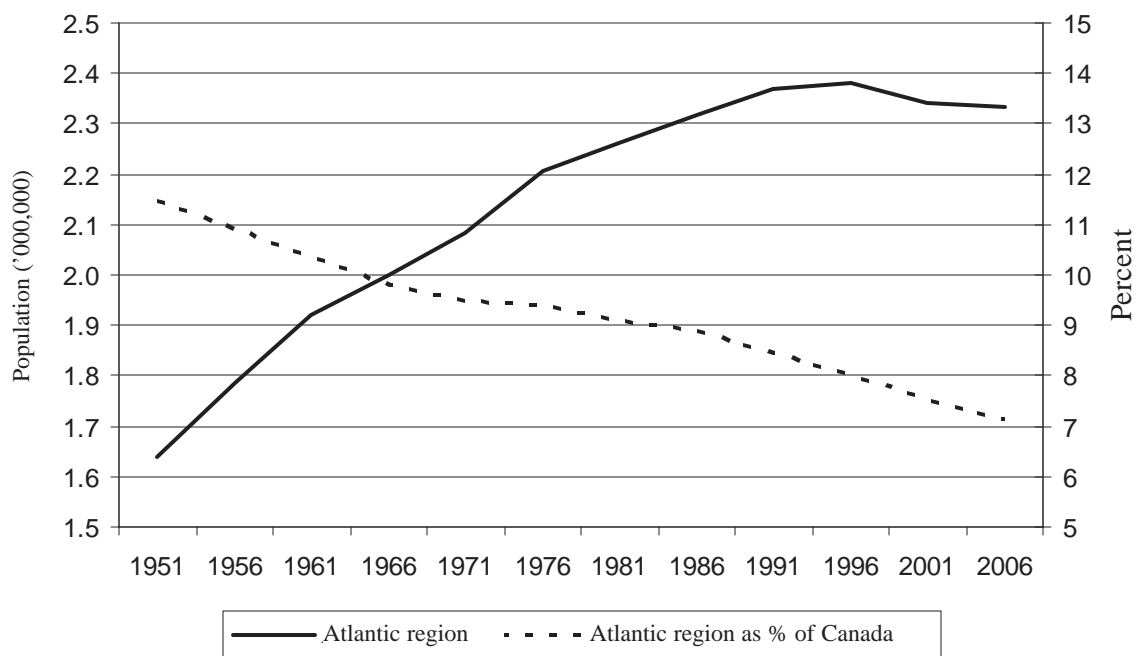
	1951	1956	1961	1966	1971	1976	1981	1986	1991	1996	2001	2006
	<i>Population (thousands)</i>											
Newfoundland & Labrador	367.6	422.1	465.3	501.4	530.9	562.6	575.3	576.3	579.6	559.7	522.0	510.3
Prince Edward Island	99.3	100.2	105.5	109.4	112.6	118.6	123.6	128.4	130.4	135.7	136.7	137.9
Nova Scotia	649.6	702.1	744.6	763.7	797.3	835.2	854.9	889.1	915.0	931.3	932.5	938.0
New Brunswick	522.3	561.4	605.1	624.1	642.5	689.5	706.4	725.0	745.6	752.3	749.8	745.7
Atlantic region	1,638.8	1,785.8	1,920.5	1,998.6	2,083.2	2,205.9	2,260.2	2,318.8	2,370.5	2,379.0	2,341.0	2,331.9
Canada	14,272.6	16,377.7	18,567.4	20,372.0	21,962.0	23,449.8	24,819.9	26,100.3	28,037.4	29,610.2	31,019.0	32,576.1
	<i>Increase, last 5 years (thousands)</i>											
Newfoundland & Labrador	--	54.5	43.2	36.1	29.5	31.7	12.7	1.0	3.3	-19.9	-37.7	-11.7
Prince Edward Island	--	0.9	5.3	3.9	3.2	6.0	5.0	4.8	2.0	5.3	1.0	1.2
Nova Scotia	--	52.5	42.5	19.1	33.6	37.9	19.7	34.2	25.9	16.3	1.2	5.5
New Brunswick	--	39.1	43.7	19.0	18.4	47.0	16.9	18.6	20.6	6.7	-2.5	-4.1
Atlantic region	--	147.0	134.7	78.1	84.6	122.7	54.3	58.6	51.7	8.5	-38.0	-9.1
Canada	--	2,105.1	2,189.7	1,804.6	1,590.0	1,487.8	1,370.1	1,280.4	1,937.1	1,572.8	1,408.8	1,557.1
	<i>% Increase, last 5 years</i>											
Newfoundland & Labrador	--	14.8	10.2	7.8	5.9	6.0	2.3	0.2	0.6	-3.4	-6.7	-2.2
Prince Edward Island	--	0.9	5.3	3.7	2.9	5.3	4.2	3.9	1.6	4.1	0.7	0.9
Nova Scotia	--	8.1	6.1	2.6	4.4	4.8	2.4	4.0	2.9	1.8	0.1	0.6
New Brunswick	--	7.5	7.8	3.1	2.9	7.3	2.5	2.6	2.8	0.9	-0.3	-0.5
Atlantic region	--	9.0	7.5	4.1	4.2	5.9	2.5	2.6	2.2	0.4	-1.6	-0.4
Canada	--	14.7	13.4	9.7	7.8	6.8	5.8	5.2	7.4	5.6	4.8	5.0
	<i>% of Region</i>											
Newfoundland & Labrador	22.4	23.6	24.2	25.1	25.5	25.5	25.5	24.9	24.5	23.5	22.3	21.9
Prince Edward Island	6.1	5.6	5.5	5.5	5.4	5.4	5.5	5.5	5.5	5.7	5.8	5.9
Nova Scotia	39.6	39.3	38.8	38.2	38.3	37.9	37.8	38.3	38.6	39.1	39.8	40.2
New Brunswick	31.9	31.4	31.5	31.2	30.8	31.3	31.3	31.3	31.5	31.6	32.0	32.0
Atlantic region	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	<i>% of Canada</i>											
Newfoundland & Labrador	2.6	2.6	2.5	2.5	2.4	2.4	2.3	2.2	2.1	1.9	1.7	1.6
Prince Edward Island	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4
Nova Scotia	4.6	4.3	4.0	3.7	3.6	3.6	3.4	3.4	3.3	3.1	3.0	2.9
New Brunswick	3.7	3.4	3.3	3.1	2.9	2.9	2.8	2.8	2.7	2.5	2.4	2.3
Atlantic region	11.5	10.9	10.3	9.8	9.5	9.4	9.1	8.9	8.5	8.0	7.5	7.2

Note: The population figures relate to July 1. For 1971 to 2006, they are taken or calculated from published Statistics Canada estimates adjusted for net undercoverage; for 1951 to 1966, June 1 census figures have been adjusted by the authors to reflect current Statistics Canada definitions.

**Table 2: Population under Age 20 and Ages 65 and Over, Atlantic Provinces and Canada, 1951–2006**

	1951	1956	1961	1966	1971	1976	1981	1986	1991	1996	2001	2006
<i>% of population under age 20</i>												
Newfoundland & Labrador	47.1	49.0	51.1	51.0	48.3	44.7	40.3	35.8	31.6	27.8	24.7	22.0
Prince Edward Island	41.7	42.9	44.4	44.7	41.9	38.9	35.2	31.4	30.2	29.0	27.0	24.5
Nova Scotia	40.4	41.8	43.3	43.3	40.5	37.3	33.4	29.5	27.7	26.4	24.6	22.6
New Brunswick	43.7	45.3	46.7	46.4	42.8	39.1	35.1	30.9	28.7	26.5	24.4	22.5
Atlantic Region	43.1	44.7	46.3	46.3	43.3	39.9	35.8	31.6	29.1	26.9	24.7	22.5
Canada	37.6	39.5	41.6	41.9	39.1	35.6	31.8	28.6	27.5	27.0	25.7	24.1
<i>% of population ages 65 and over</i>												
Newfoundland & Labrador	6.4	5.9	5.8	5.9	6.1	6.5	7.7	8.7	9.6	10.7	12.1	13.6
Prince Edward Island	9.9	10.4	10.4	10.7	11.0	11.2	12.1	12.6	13.1	12.9	13.7	14.6
Nova Scotia	8.5	8.4	8.5	8.9	9.1	9.7	10.9	11.8	12.5	12.9	13.7	14.7
New Brunswick	7.5	7.7	7.8	8.1	8.6	8.9	10.0	11.0	12.0	12.5	13.3	14.5
Atlantic region	7.8	7.7	7.8	8.0	8.3	8.7	9.9	10.8	11.7	12.3	13.2	14.4
Canada	7.7	7.7	7.6	7.6	8.0	8.6	9.6	10.5	11.5	12.1	12.6	13.3

Source: Authors' calculations, based on data from Statistics Canada.

**Figure 1: Population of the Atlantic Region, 1951–2006**

Source: See Table 1.

# THE COMPONENTS OF POPULATION CHANGE

Statistics Canada conducts a national census every five years and produces detailed estimates of the population for each noncensus year. It calculates the change in the population of a province or region between the middle of one year and the middle of the next by looking at the number of births, minus the number of deaths, plus migration into the region or province, minus migration out of it. Unavoidably, these estimates are not exact — migration is particularly difficult to measure. Moreover, the census enumerations themselves are subject to some error and require adjustment for estimated undercounting. Nevertheless, the work of Statistics Canada provides a record not only of the changes in population from year to year and census to census, but also of the sources of change — the contributions of births, deaths, and migration flows of different types. We organize these records into a set of demographic accounts in Tables 3 and 4. Table 3 shows, for the region, each province, and all of Canada, the changes in population over five-year intervals from 1971 to 2006 and the contributions to those changes of births, deaths, and net in-migration from all sources. Table 4 shows the main components of migration for the same period: immigration from other countries, emigration to other countries, in-migration from the rest of Canada, and out-migration to the rest of Canada.

Births exceeded deaths in every period shown in Table 3 and, indeed, in every single year of the three and a half decades the table covers. But the gap has narrowed: in the 1971–76 period, there were about 194,000 births and 82,000 deaths in the Atlantic region as a whole, and thus a natural increase in population of 113,000; in the 2001–06 period, there were 108,000 births and 99,000 deaths, leaving a natural increase of only 9,000. A similar pattern of decline in natural increase can be seen in each of the four provinces. Underlying the decline in births is a dramatic decrease in fertility rates (the average number of children born per woman at different ages in the child-bearing range). The decreases in fertility commenced around the beginning of the 1960s and continued through the 1970s, leaving rates at unprecedentedly low levels — so low that, if they were to remain at those levels, the population eventually would fail to reproduce itself, and only immigration could keep it from a continuous decline. Mortality rates have fallen, too, while life expectancies have risen, which have had some effect on rates of natural increase, but not enough to offset the precipitous fall in the numbers of children born. This phenomenon, in fact, is characteristic of all parts of Canada.

The other component of population change shown in Table 3 we term “apparent net in-migration.” We use the word “apparent” because of the inclusion of a statistical discrepancy: the difference between the sum of the measured components of change and the total five-year change, as calculated from census counts. The discrepancy is the result either of inaccuracies in the measurement of migration flows or of differences in the degree of undercounting in successive censuses. (Births and deaths, in



contrast, must be registered by law and hence are recorded with great accuracy.) The overall population changes shown in the table incorporate estimated adjustments for undercounting, and it seems likely that the statistical discrepancy should be interpreted as unrecorded additional net migration. That is the way we have treated it.

The table shows that the Atlantic region has been a net loser in the combined exchange of migrants with other countries and other parts of Canada. Net in-migration was negative in all but the first of the five-year periods, and over the past 35 years the region's apparent net loss was about 197,000. That compares with a *gain* of more than 4.6 million from migration for the country as a whole.

The losses have been distributed unevenly among the provinces. Newfoundland and Labrador has been a consistent net loser from migration and New Brunswick, too, has lost in most periods, although to a lesser extent. In the most recent period, 2001–06, the Atlantic region appears to have lost some 18,000 people through migration, a result of net outflows of 13,100 from Newfoundland and Labrador and 8,200 from New Brunswick, offset in part by net inflows of 2,900 into Nova Scotia and just 300 into Prince Edward Island. Caution is certainly warranted in interpreting the migration figures because of the measurement problems noted above. At a general level, though, it is clear that the Atlantic region has lost substantial numbers of people through migration (while Canada has gained large numbers) and that the migration pattern for the region has been dominated by Newfoundland and Labrador.

It would be a mistake to think of negative or positive net migration as indicating movements in one direction only; regardless of the net balance, there are, in any period, large numbers of people moving both in and out. That is especially true of migration to and from the rest of Canada, as Table 4 makes clear. While almost 1.7 million people moved from the Atlantic region to other parts of Canada over the period 1971–2006, more than 1.5 million moved in the opposite direction. For example, while 428,000 people left Newfoundland and Labrador for elsewhere in the country, 308,000 moved in. As always, the migration estimates should be treated with care because of the possibilities for error; however, the fact that gross flows of population into and out of a province or region generally far exceed net flows is not in question.<sup>2</sup>

Immigration from other countries is relatively unimportant as a source of population growth in Atlantic Canada, as Table 4 again makes clear. About 123,000 foreign immigrants came to the region between 1971 and 2006, with 52 percent of them going to Nova Scotia. In the most recent five-year period ending in 2006, about 16,000 foreign immigrants came to the Atlantic region — again, with 52 percent going to Nova Scotia — compared with a total of about 1.2 million for the country as a whole.

Let us explore the immigration issue a little further. Table 5 compares the percentage share of Canada's population in the Atlantic region with the corresponding share of immigrants to Canada. The difference has been consistently large. Looking back over the whole of the period between the

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2 Some of the migration into Newfoundland and Labrador, or any other province, represents people who left in an earlier period and were returning. Some of the movement into and out of individual Atlantic provinces is to and from other provinces in the region, although most is to and from the rest of Canada.



Table 3: Major Components of Population Change, Atlantic Provinces and Canada, 1971-76 to 2001-06

	1971-76	1976-81	1981-86	1986-91	1991-96	1996-01	2001-06
	(thousands)						
Newfoundland & Labrador							
Population increase	31.7	12.7	1.0	3.3	-19.9	-37.7	-11.7
Births	59.8	52.6	44.1	38.3	32.0	25.5	22.9
Deaths	16.5	16.0	17.4	18.5	19.5	21.1	21.5
Apparent net in-migration	-11.6	-23.9	-25.7	-16.5	-32.4	-42.1	-13.1
Prince Edward Island							
Population increase	6.0	5.0	4.8	2.0	5.3	1.0	1.2
Births	9.8	9.8	9.8	9.8	8.9	7.6	6.8
Deaths	5.3	5.1	5.3	5.6	5.7	5.8	5.9
Apparent net in-migration	1.5	0.3	0.3	-2.2	2.1	-0.8	0.3
Nova Scotia							
Population increase	37.9	19.7	34.2	25.9	16.3	1.2	5.5
Births	66.4	62.1	61.8	61.9	56.6	47.9	43.1
Deaths	34.4	34.7	35.3	36.7	38.1	39.4	40.5
Apparent net in-migration	5.9	-7.7	7.7	0.7	-2.2	-7.3	2.9
New Brunswick							
Population increase	47.0	16.9	18.6	20.6	6.7	-2.5	-4.1
Births	58.5	54.9	51.7	48.3	44.8	38.6	34.9
Deaths	25.6	25.9	26.4	27.2	28.9	30.4	30.8
Apparent net in-migration	14.1	-12.1	-6.7	-0.5	-9.2	-10.7	-8.2
Atlantic region							
Population increase	122.7	54.3	58.6	51.7	8.5	-38.0	-9.1
Births	194.4	179.4	167.4	158.3	142.3	119.6	107.7
Deaths	81.7	81.7	84.4	88.0	92.3	96.7	98.7
Apparent net in-migration	10.0	-43.4	-24.4	-18.6	-41.5	-60.9	-18.1
Canada							
Population increase	1,487.8	1,370.1	1,280.4	1,937.1	1,572.8	1,408.8	1,557.1
Births	1,759.8	1,819.5	1,872.2	1,933.3	1,935.9	1,704.8	1,681.8
Deaths	823.6	842.6	885.5	946.0	1,024.4	1,088.9	1,128.6
Apparent net in-migration	551.6	393.2	293.7	949.8	661.3	792.9	1,003.9

Note: Apparent net in-migration is equal to immigration from other countries, minus emigration to other countries, plus in-migration from the rest of Canada, minus out-migration to the rest of Canada, plus returning emigrants, plus net temporary emigrants, plus the net increase in non-permanent residents, plus the statistical discrepancy. (The statistical discrepancy is assumed to arise primarily from inaccuracies in the measurement of migration flows.)

Source: Authors' calculations, based on data from Statistics Canada.

Table 4: Migration Into and Out of the Atlantic Provinces and Canada, 1971-76 to 2001-06

	1971-76	1976-81	1981-86	1986-91	1991-96	1996-01	2001-06
	(thousands)						
Newfoundland & Labrador							
Immigration from other countries	4.6	2.7	1.7	2.3	3.4	2.1	2.3
Emigration to other countries	1.1	0.8	1.3	0.9	1.2	1.4	1.8
In-migration from rest of Canada	61.4	43.3	37.6	47.6	36.8	38.2	42.9
Out-migration to rest of Canada	63.3	62.2	52.7	61.0	60.9	70.3	58.0
Prince Edward Island							
Immigration from other countries	1.2	1.0	0.6	0.8	0.8	0.8	1.2
Emigration to other countries	0.3	0.2	0.2	0.2	0.3	0.4	0.5
In-migration from rest of Canada	23.2	17.7	15.7	15.4	13.7	13.1	12.9
Out-migration to rest of Canada	19.5	18.5	15.0	15.5	11.6	12.9	13.3
Nova Scotia							
Immigration from other countries	11.0	7.2	5.4	6.8	14.7	10.7	8.5
Emigration to other countries	1.6	1.1	1.3	1.9	4.0	4.6	4.0
In-migration from rest of Canada	125.5	97.2	89.8	93.0	82.9	79.3	78.2
Out-migration to rest of Canada	114.1	104.4	82.9	94.8	88.4	85.7	85.4
New Brunswick							
Immigration from other countries	9.0	5.4	3.3	3.7	3.5	3.6	4.4
Emigration to other countries	2.9	2.1	2.6	2.9	2.9	2.4	2.6
In-migration from rest of Canada	109.7	73.2	64.0	68.2	57.7	54.4	54.4
Out-migration to rest of Canada	93.0	83.6	64.1	71.7	61.2	62.8	62.8
Atlantic region							
Immigration from other countries	25.9	16.2	11.0	13.6	22.4	17.3	16.3
Emigration to other countries	5.8	4.2	5.4	6.0	8.3	8.8	8.8
In-migration from rest of Canada	319.7	231.4	207.2	224.2	191.1	185.0	188.4
Out-migration to rest of Canada	289.9	268.7	214.7	243.0	222.2	231.7	219.5
Canada							
Immigration from other countries	852.3	587.5	497.9	885.5	1,184.7	1,050.7	1,193.6
Emigration to other countries	171.9	125.7	144.9	138.3	253.3	285.6	190.9

Note: Migration to other countries includes net temporary emigrants and is net of returning emigrants. Migration of non-permanent residents into and out of Canada and the statistical discrepancy are not included.

Source: Authors' calculations, based on data from Statistics Canada.

**Table 5: Shares of Canadian Immigration and Population, Atlantic Provinces, 1971–76 to 2001–06**

	1971–76	1976–81	1981–86	1986–91	1991–96	1996–01	2001–06
	(percent)						
Newfoundland & Labrador							
% of Canadian population	2.4	2.4	2.3	2.1	2.0	1.8	1.6
% of Canadian immigration	0.5	0.5	0.3	0.3	0.3	0.2	0.2
Prince Edward Island							
% of Canadian population	0.5	0.5	0.5	0.5	0.5	0.4	0.4
% of Canadian immigration	0.1	0.2	0.1	0.1	0.1	0.1	0.1
Nova Scotia							
% of Canadian population	3.6	3.5	3.4	3.3	3.2	3.1	2.9
% of Canadian immigration	1.3	1.2	1.1	0.8	1.2	1.0	0.7
New Brunswick							
% of Canadian population	2.9	2.9	2.8	2.7	2.6	2.5	2.4
% of Canadian immigration	1.1	0.9	0.7	0.4	0.3	0.3	0.4
Atlantic region							
% of Canadian population	9.4	9.3	9.0	8.7	8.3	7.8	7.4
% of Canadian immigration	3.0	2.8	2.2	1.5	1.9	1.6	1.4

Note: Population shares are based on average populations over the five-year intervals.

Source: Authors' calculations, based on data from Statistics Canada.

1971 and 2006 censuses, the proportion of immigrants to Canada who went to the Atlantic region never exceeded 3 percent. In 2001–06, the region accounted for 7.4 percent of Canada's population but received only 1.4 percent of all immigrants. The share differences vary among the provinces but the same general pattern holds: in each, the immigration share has invariably been much smaller than the population share.

A simple calculation serves to bring out the implications. In 1971, the Atlantic region had 9.4 percent of Canada's population. If, in the following 35 years, the region had received 9.4 percent of immigrants to Canada, some 588,000 would have taken up residence in the region, rather than the actual total of 123,000. Some of the additional immigrants would have died or left the region subsequently, but there also would have been more births to immigrant parents, thus augmenting the population. The calculation is rough, but taking it one step further, the addition of another 465,000 immigrants would have added more than two-thirds to the total population increase in the region — from an actual increase of 693,000 over the 35 years to 1,158,000. Indeed, that might be a somewhat conservative estimate; if the additional natural increase associated with the larger number of immigrants exceeded any associated addition to out-migration, the population would have grown by even more. All of this is hypothetical, of course — a “what-if-history-had-been-different” calculation. Nevertheless, it serves to make the point that how immigrants have distributed themselves across the country (with concentrations in Ontario, Quebec, and British Columbia) has had important demographic (and hence economic) implications for Atlantic Canada.



# THE LABOUR FORCE: GROWTH, SIZE, AND COMPOSITION

Population changes have their most direct impact on the supply side of the economy through their effects on the labour force. Table 6 provides estimates of the labour force, its growth rates, and related information, based on data from Statistics Canada's monthly Labour Force Survey. The figures in the table are annual averages of the monthly data or have been calculated from annual averages, and cover the period 1976–2006 (changes in the survey make it difficult to construct consistent series going back further than 1976). In accordance with the definitions used by Statistics Canada, the figures exclude full-time members of the armed forces, residents of institutions and certain remote regions, and persons living on First Nations reserves and Crown lands; those exclusions, however, are of little importance for our purposes.

The Atlantic region had 6.8 percent of the Canadian labour force in 2006, compared with 7.2 percent of the population. The difference between population and labour force shares was greatest in Newfoundland and Labrador and in Nova Scotia, but New Brunswick had a slightly smaller share also. Consistent with the share differences, 51.5 percent of the region's population was in the labour force, compared with 54.0 percent for Canada. In some degree that might reflect differing population age structures, but higher unemployment rates probably have played an important role. (Average rates of unemployment have been one-quarter to two-thirds greater in the Atlantic region than in Canada over the past 30 years, and about twice as high in Newfoundland and Labrador.) A known and long-standing absence of jobs has an obvious disincentive effect on people who might otherwise look for work. In Newfoundland and Labrador, only 42 percent of the population was employed in 2006, compared with 51 percent for Canada.

The rate of growth of the labour force reflects the history of the birth rate. Between 1976 and 1981, when the baby boomers were entering the world of work in large numbers, the region's labour force grew by 13.0 percent — less than the all-Canada rate of 16.6 percent, but a high rate of growth nevertheless. The years 1981–86 caught the tail end of the baby boom generation, and the Atlantic region's labour force increased by another 9.3 percent. The rate of growth fell to 7.4 percent during the period 1986–91 and then registered a slight drop of 0.8 percent in between 1991 and 1996. The past decade has witnessed growth, however, as the children of the baby boomers have joined the labour force, but the growth has been relatively slow: in the most recent period, it was less than half the all-Canada rate. Of particular note, in Newfoundland and Labrador, the labour force declined by 7.2 percent during the period 1991–96, reflecting both a high net rate of out-migration and a decline

**Table 6: Labour Force, Atlantic Provinces and Canada, 1976–2006**

	1976	1981	1986	1991	1996	2001	2006
<b>Labour force (thousands)</b>							
Newfoundland & Labrador	183.3	215.1	230.2	249.7	231.7	242.7	253.1
Prince Edward Island	47.3	53.1	60.0	64.1	68.9	72.3	77.1
Nova Scotia	328.0	364.8	403.9	433.0	430.1	460.0	480.0
New Brunswick	259.6	291.4	316.2	338.2	345.5	371.5	389.6
Atlantic region	818.2	924.4	1,010.3	1,085.0	1,076.2	1,146.5	1,199.8
Canada	10,491.3	12,235.8	13,272.1	14,336.3	14,853.5	16,109.8	17,592.8
<b>Increase, last 5 years (thousands)</b>							
Newfoundland & Labrador	--	31.8	15.1	19.5	-18.0	11.0	10.4
Prince Edward Island	--	5.8	6.9	4.1	4.8	3.4	4.8
Nova Scotia	--	36.8	39.1	29.1	-2.9	29.9	20.0
New Brunswick	--	31.8	24.8	22.0	7.3	26.0	18.1
Atlantic region	--	106.2	85.9	74.7	-8.8	70.3	53.3
Canada	--	1,744.5	1,036.3	1,064.2	517.2	1,256.3	1,483.0
<b>Increase, last 5 years (percent)</b>							
Newfoundland & Labrador	--	17.3	7.0	8.5	-7.2	4.7	4.3
Prince Edward Island	--	12.3	13.0	6.8	7.5	4.9	6.6
Nova Scotia	--	11.2	10.7	7.2	-0.7	7.0	4.3
New Brunswick	--	12.2	8.5	7.0	2.2	7.5	4.9
Atlantic region	--	13.0	9.3	7.4	-0.8	6.5	4.6
Canada	--	16.6	8.5	8.0	3.6	8.5	9.2
<b>Labour force as % of population</b>							
Newfoundland & Labrador	32.6	37.4	39.9	43.1	41.4	46.5	49.6
Prince Edward Island	39.9	43.0	46.7	49.2	50.8	52.9	55.9
Nova Scotia	39.3	42.7	45.4	47.3	46.2	49.3	51.2
New Brunswick	37.7	41.2	43.6	45.4	45.9	49.5	52.2
Atlantic region	37.1	40.9	43.6	45.8	45.2	49.0	51.5
Canada	44.7	49.3	50.9	51.1	50.2	51.9	54.0
<b>Employed labour force as % of population</b>							
Newfoundland & Labrador	28.2	32.3	32.4	35.3	33.5	39.0	42.3
Prince Edward Island	36.2	38.1	40.6	41.0	43.4	46.5	49.7
Nova Scotia	35.7	38.4	39.4	41.6	40.5	44.5	47.1
New Brunswick	33.5	36.5	37.3	39.6	40.6	44.0	47.7
Atlantic region	33.1	36.2	37.1	39.4	39.0	43.3	46.4
Canada	41.6	45.5	45.9	45.9	45.3	48.2	50.6

Note: The labour force figures are annual averages. Following the definition in the Statistics Canada Labour Force Survey, they exclude persons living on reserves and other Aboriginal settlements in the provinces, full-time members of the Canadian Armed Forces and the institutionalized population.

**Table 7: Labour Force Shares, under Age 25, Ages 55 and over, and Women, Atlantic Provinces and Canada, 1976–2006**

	1976	1981	1986	1991	1996	2001	2006
	(percent)						
Labour force under age 25							
Newfoundland & Labrador	31.4	28.5	23.5	21.0	17.6	15.7	14.1
Prince Edward Island	29.8	27.5	24.7	20.4	19.2	17.8	18.2
Nova Scotia	29.0	27.6	24.6	19.7	17.3	16.9	17.1
New Brunswick	30.0	27.6	23.5	19.9	17.7	17.2	16.2
Atlantic region	29.9	27.8	24.0	20.1	17.6	16.8	16.3
Canada	27.6	26.8	22.8	18.5	16.4	16.6	16.3
Labour force ages 55 and over							
Newfoundland & Labrador	8.7	8.0	7.2	6.3	6.7	8.5	13.4
Prince Edward Island	14.4	11.5	10.7	10.1	9.6	11.6	15.8
Nova Scotia	12.8	10.1	8.6	8.3	8.3	9.8	14.0
New Brunswick	11.1	10.1	8.8	7.9	8.0	9.5	13.4
Atlantic region	11.5	9.7	8.5	7.8	7.9	9.6	13.8
Canada	11.3	10.6	10.0	9.5	9.3	10.5	14.0
Women's share of total labour force							
Newfoundland & Labrador	31.9	36.7	40.9	43.8	44.5	46.6	48.0
Prince Edward Island	37.6	41.1	43.5	45.9	46.6	47.6	48.8
Nova Scotia	36.7	40.8	42.8	44.9	45.8	47.4	48.3
New Brunswick	36.1	39.8	42.2	44.3	45.5	46.6	47.7
Atlantic region	35.5	39.5	42.2	44.5	45.5	47.0	48.1
Canada	37.6	40.6	42.8	44.7	45.3	46.1	46.9

Source: Authors' calculations, based on data from Statistics Canada.

in labour force participation in an economy characterized by severely limited employment opportunities at the time.

The age composition of the labour force reflects the historical pattern of births, too, as Table 7 shows. In 1976, 29.9 percent of the Atlantic region's labour force was under age 25; by 2006, with smaller numbers of new entrants, the percentage had fallen to 16.3 and, for the first time, the latter figure did not exceed the national percentage.

One of the most significant postwar social and economic developments in Canada, as in the United States and other countries, has been the increased labour force participation of women. The trend has been a persistent one during the past five or six decades. Table 7 covers only 30 years, but the trend is clearly evident in the Atlantic region for that period. The proportion of women rose in every province of the region in every five-year period shown in the table. For the region as a whole, the proportion has been somewhat above the national average since 1996. The percentage varied a little from province to province — somewhat lower in New Brunswick, somewhat higher in Prince Edward Island — but the most striking features are the broad similarity of the percentages and the roughly similar trends.

Rates of labour force participation remain generally lower in the Atlantic region than in the country as a whole, as Table 8 shows, but the gap has been reduced in the past decade. That is true of men and women in all age groups. At the individual-province level, Prince Edward Island is a notable exception, with the provincial rate exceeding the national rate in all age categories in 2006. Rates in Newfoundland and Labrador are the lowest by far: 38.8 percent and 41.5 percent for men and women, respectively, for ages 15 to 19 in 2006, compared with 52.4 and 55.1 percent for the nation; 68.9 and 64.7 percent for men and women ages 20 to 24, compared with 80.0 and 77.1 percent for Canada as a whole. Even in the “prime” working ages of 25 to 54, the rates in Newfoundland and Labrador are far below the national ones. In large measure, the province’s low rates probably reflect the depressed state of its labour market. The figures in Table 8 are annual averages. If one looks at seasonal patterns of participation, it is clear that the biggest gaps between provincial and national rates occur in the winter months, when opportunities for employment are particularly scarce. The rates are lower at other times, too, though, and whatever the seasonal pattern, the net effect is that the average labour force over the course of a year is well below its potential level.

**Table 8: Labour Force Participation Rates, by Sex and Age Group, Atlantic Provinces and Canada, 1976–2006**

	Men						Women							
	1976	1981	1986	1991	1996	2001	2006	1976	1981	1986	1991	1996	2001	2006
Ages 15–19							(percent)							
Newfoundland & Labrador	37.4	42.4	31.4	34.0	30.8	32.7	38.8	33.1	35.0	28.0	32.8	29.0	34.5	41.5
Prince Edward Island	59.4	55.4	54.5	55.8	58.8	55.8	56.9	45.3	46.0	49.1	52.1	51.0	54.0	58.8
Nova Scotia	49.0	51.1	46.2	49.1	42.8	49.2	50.6	41.5	49.4	48.1	49.1	42.0	51.7	55.4
New Brunswick	45.6	47.4	42.9	46.5	43.2	49.6	53.7	37.8	44.3	41.6	45.1	43.2	54.1	55.7
Atlantic region	45.4	47.8	41.4	44.3	40.6	45.7	49.4	38.3	43.7	40.4	43.4	39.4	48.4	52.7
Canada	53.2	59.2	56.6	57.1	48.9	52.5	52.4	47.7	54.1	53.5	54.7	47.5	52.0	55.1
Ages 20–24														
Newfoundland & Labrador	80.1	76.8	71.9	69.5	64.8	74.2	68.9	53.0	62.7	65.7	67.6	57.2	65.2	64.7
Prince Edward Island	82.0	84.3	84.5	85.1	85.4	82.2	85.4	66.0	70.4	75.4	78.7	78.3	80.0	81.6
Nova Scotia	86.5	83.1	83.7	81.3	79.0	82.6	83.2	65.3	70.8	77.5	74.3	73.0	74.4	77.9
New Brunswick	84.1	79.3	79.8	77.1	73.3	79.4	79.3	59.5	66.5	68.7	67.8	69.1	73.7	74.7
Atlantic region	83.8	80.3	79.5	76.9	73.8	79.6	79.0	60.3	67.3	71.6	70.7	68.0	72.4	74.2
Canada	85.8	87.5	85.2	82.4	79.6	79.8	80.0	69.1	74.9	77.8	76.5	73.1	74.3	77.1
Ages 25–54														
Newfoundland & Labrador	85.1	86.4	84.6	82.9	76.7	81.9	84.5	35.3	47.1	57.6	64.8	62.4	72.0	76.7
Prince Edward Island	90.9	91.1	90.4	90.0	90.5	91.6	91.7	50.3	61.2	70.8	78.9	81.6	83.2	87.4
Nova Scotia	91.4	91.3	91.4	90.3	86.6	88.0	87.8	46.6	56.7	63.8	71.8	71.6	77.4	80.0
New Brunswick	87.9	88.3	86.9	85.3	84.3	86.9	87.9	45.6	54.3	62.4	68.6	70.3	76.1	81.8
Atlantic region	88.6	89.1	88.2	86.8	83.7	86.5	87.3	43.8	53.8	62.2	69.4	69.5	76.1	80.3
Canada	94.5	94.6	93.6	92.4	90.8	91.1	91.1	52.3	62.6	70.2	75.9	76.0	79.1	81.3
Ages 55 and over														
Newfoundland & Labrador	35.1	33.1	29.2	24.7	22.1	25.4	30.6	8.3	9.5	9.2	9.4	9.3	12.0	20.9
Prince Edward Island	43.9	36.3	37.6	34.4	32.5	35.5	42.5	17.6	15.3	14.6	16.2	16.7	20.9	27.1
Nova Scotia	42.1	34.0	30.3	28.7	26.7	27.4	33.5	15.2	12.5	11.6	12.0	11.6	15.9	22.2
New Brunswick	38.3	35.5	31.1	27.2	24.7	28.8	34.5	13.9	13.3	12.1	11.4	12.8	14.9	20.9
Atlantic region	39.6	34.4	30.8	27.7	25.4	27.9	33.7	13.6	12.3	11.5	11.5	11.8	15.0	21.8
Canada	47.2	44.3	39.8	35.6	32.2	33.6	39.1	17.7	17.6	16.8	16.7	16.6	19.4	26.1

Note: A participation rate is the percentage of the eligible population that is in the labour force in a given age group. Following the definitions in the Statistics Canada Labour Force Survey, both the labour force and the eligible population exclude persons living on reserves and other Aboriginal settlements in the provinces, full-time members of the Canadian Armed Forces and the institutionalized population. (The population definition differs from the one used in Table 6, where the labour force and employed labour force are expressed as percentages of the total population, all ages combined, with no exclusions.)



# THE FUTURE POPULATION

Now we look into the crystal ball. We begin with a projection of the population based on a computer model we have developed and applied in other contexts (Denton, Feaver, and Spencer 2000, 2005). Taking the long view, we project the population all the way to 2046 at five-year intervals. Like other demographic or economic projections, of course, this one is likely to be wrong: no one can know exactly what the population will be at any future date, and chances are that the further into the future one looks, the less accurate will be the results. Nevertheless, one can predict much of what is going to happen rather well, at least in broad outline. We can say with absolute certainty that the 40-year-olds of today will be 50 in ten years (that is, those who do not die) and that the 50-year-olds will be 60. We cannot know exactly what future mortality rates will be at different ages, but the rates change slowly and differences in the rates will have a relatively small effect on the projection. We cannot know just what fertility rates will be in the future either. Another baby boom does not have zero probability, but the rates have been rather stable for many years now and a large increase seems highly unlikely from today's perspective. In our basic projection — Projection A — we assume that current fertility levels will persist and that mortality rates will continue to decline, although at a somewhat slower rate than in the past quarter-century.

Migration is a more difficult matter. Barring a major shift in the locational patterns of immigrants, variations in Canadian immigration levels are unlikely to have much effect on the population of Atlantic Canada. (Our assumption for projection purposes is that Canadian immigration will continue at roughly the level of recent years and that the proportionate distribution of new immigrants among the provinces will remain the same.) However, variations in migration between the region and other parts of Canada could have a greater effect. What we have done is assume, for purposes of Projection A, that such net migration will change gradually from the observed average annual rate in the period 2003–08 to a rate of zero by 2015 — in other words, that by 2015 the numbers moving into each of the four provinces will exactly balance the numbers moving out. That assumption has significant implications for Newfoundland and Labrador, in particular, and we explore later the consequences of assuming instead that the out-migration of recent years will continue unabated. In order to focus mainly on a single projection, though, we have made the gradual tapering off of net migration our basic assumption, which we believe is a reasonable choice. The recent rate of loss of population from Newfoundland and Labrador, especially, does not seem sustainable in the long run.

The Projection A population figures are presented in Table 9 for the region, the four individual provinces, and Canada. Canada's population is seen to increase over the whole of the 40-year projection period, but the five-year rate of increase declines markedly. Between 2001 and 2006, Canada's population increased by 5.0 percent, or 1 percent per annum; despite an assumed high

**Table 9: The Future Population of the Atlantic Provinces and Canada, 2006–46, Projection A**

	2006	2011	2016	2021	2026	2031	2036	2041	2046
<i>Population (thousands)</i>									
Newfoundland & Labrador	510.3	502.0	496.2	488.8	476.5	459.5	438.8	415.8	391.6
Prince Edward Island	137.9	141.0	143.3	145.1	145.9	145.3	143.3	140.3	136.6
Nova Scotia	938.0	938.8	944.1	948.1	945.4	934.2	915.3	891.1	864.2
New Brunswick	745.7	746.8	748.9	748.5	742.4	730.1	712.5	691.0	666.7
Atlantic region	2,331.9	2,328.6	2,332.5	2,330.5	2,310.2	2,269.1	2,209.9	2,138.2	2,059.1
Canada	32,576.1	34,330.0	35,997.0	37,586.0	39,000.0	40,161.0	41,076.0	41,801.0	42,383.0
<i>Increase, last 5 years (thousands)</i>									
Newfoundland & Labrador	-11.7	-8.3	-5.8	-7.4	-12.3	-17.0	-20.7	-23.0	-24.2
Prince Edward Island	1.2	3.1	2.3	1.8	0.8	-0.6	-2.0	-3.0	-3.7
Nova Scotia	5.5	0.8	5.3	4.0	-2.7	-11.2	-18.9	-24.2	-26.9
New Brunswick	-4.1	1.1	2.1	-0.4	-6.1	-12.3	-17.6	-21.5	-24.3
Atlantic region	-9.1	-3.3	3.9	-2.0	-20.3	-41.1	-59.2	-71.7	-79.1
Canada	1,557.1	1,753.9	1,667.0	1,589.0	1,414.0	1,161.0	915.0	725.0	582.0
<i>Increase, last 5 years (percent)</i>									
Newfoundland & Labrador	-2.2	-1.6	-1.2	-1.5	-2.5	-3.6	-4.5	-5.2	-5.8
Prince Edward Island	0.9	2.2	1.6	1.3	0.6	-0.4	-1.4	-2.1	-2.6
Nova Scotia	0.6	0.1	0.6	0.4	-0.3	-1.2	-2.0	-2.6	-3.0
New Brunswick	-0.5	0.1	0.3	-0.1	-0.8	-1.7	-2.4	-3.0	-3.5
Atlantic region	-0.4	-0.1	0.2	-0.1	-0.9	-1.8	-2.6	-3.2	-3.7
Canada	5.0	5.4	4.9	4.4	3.8	3.0	2.3	1.8	1.4
<i>% of region</i>									
Newfoundland & Labrador	21.9	21.6	21.3	21.0	20.6	20.3	19.9	19.4	19.0
Prince Edward Island	5.9	6.1	6.1	6.2	6.3	6.4	6.5	6.6	6.6
Nova Scotia	40.2	40.3	40.5	40.7	40.9	41.2	41.4	41.7	42.0
New Brunswick	32.0	32.1	32.1	32.1	32.1	32.2	32.2	32.3	32.4
Atlantic region	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<i>% of Canada</i>									
Newfoundland & Labrador	1.6	1.5	1.4	1.3	1.2	1.1	1.1	1.0	0.9
Prince Edward Island	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3
Nova Scotia	2.9	2.7	2.6	2.5	2.4	2.3	2.2	2.1	2.0
New Brunswick	2.3	2.2	2.1	2.0	1.9	1.8	1.7	1.7	1.6
Atlantic Region	7.2	6.8	6.5	6.2	5.9	5.7	5.4	5.1	4.9

Note: See text for assumptions underlying the projection.

level of foreign immigration, the rate is projected to fall to 3.8 percent by the period 2021–26, and to only 1.4 percent by the period 2041–46. The long-run consequences of continuing low fertility levels are clearly apparent in this projection.

The consequences are also apparent in the regional and provincial projections. Atlantic Canada's population has declined since the mid-1990s and is projected to fall by about 12 percent between 2006 and 2046. The region's share of the national population is also expected to continue to decline over the 40-year projection period, just as it has over the past 50 or 60 years. In 2006, the region

accounted for 7.2 percent of Canada's population; by 2026, the share is projected to fall to 5.9 percent, and by 2046 to 4.9 percent. On that basis, four decades from now, the Atlantic region's share of Canada's population will be less than half of what it was when Newfoundland and Labrador entered Confederation.

A pattern of declining growth rates is common to all four provinces, although the rates themselves vary considerably. In recent years, Newfoundland and Labrador has had by far the lowest fertility rates in the region (indeed, in the country); despite the assumption that its net losses from out-migration will diminish and disappear entirely within a decade, its population is projected to decline continuously. On the other hand, Nova Scotia's population is projected to increase for another 15 years and Prince Edward Island's for another 20. Between 2011 and 2016, New Brunswick will see a slight reversal of the decrease it has experienced since 1996, but its population decline will continue thereafter.

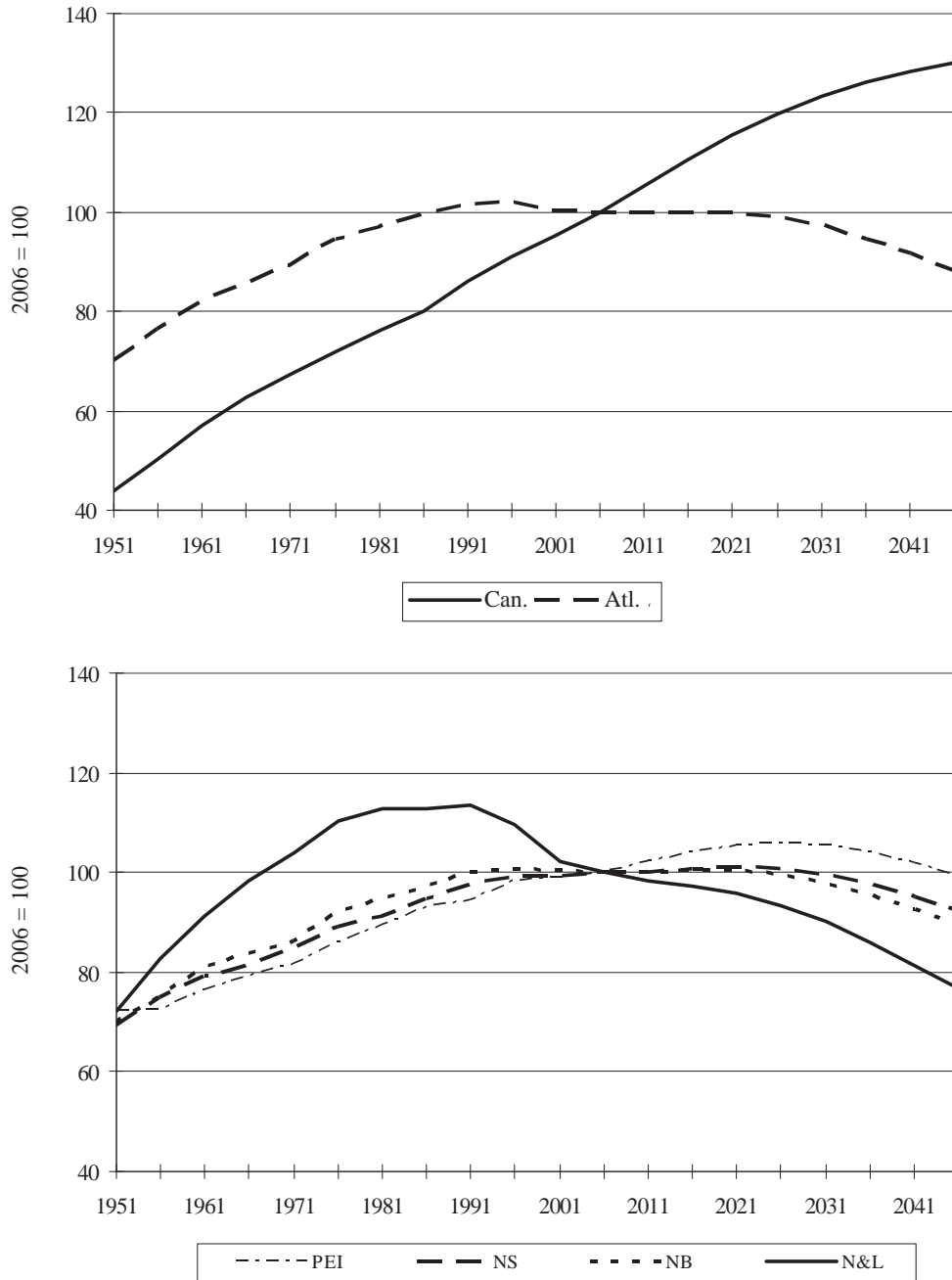
The changes in Newfoundland and Labrador are especially striking. The projected figure of about 392,000 implies a population in 2046 of roughly the same size as in the early 1950s and almost one-third below the level of the early 1990s. When Newfoundland and Labrador became part of Canada, its population accounted for about 2.6 percent of the national total; by 2046, its share is projected to be only 0.9 percent.

Indexes of population size (with 2006 set equal to 100) are shown in Figure 2 for each of the provinces (the lower panel) and for the region as a whole and for Canada (the upper panel). Historical and projected values are plotted at five-year intervals for the period 1951–2046. The use of indexes facilitates comparisons across the various jurisdictions over this 95-year period, and many of the points made earlier stand out clearly. For example, the relative flatness of the plot for the Atlantic region before 1996 reflects its slower population growth as compared with that of Canada, and the continued growth for Canada as a whole stands in contrast to the projected decline in the Atlantic region. Within the region, Newfoundland and Labrador differs notably from the other provinces in both its relatively high rate of population growth in the first two decades, the early reversal of that growth, and the onset of decline after 1991.

Declining rates of growth across the country will be accompanied by shifts in age distribution, as Table 10 shows. For Canada, the proportion of the population age 65 or older is projected to almost double in the next 40 years, from 13.3 percent in 2006 to 21.3 percent by 2026 and to 25.4 percent by 2046. To put it differently, about one in every five Canadians will be age 65 or older within 20 years, and one in four within 40. In the Atlantic region, the prospective shift toward these older ages is even more pronounced: from 14.4 percent in 2006 to 32.2 percent in 2046 for the region as a whole, and from 13.6 percent to 35.3 percent for Newfoundland and Labrador. Accompanying the increases in the proportions of older people will be decreases at the young end of the age spectrum (barring some unforeseen major turnaround in fertility rates). Again, the national trend is shared by the Atlantic provinces: the proportion of the regional population under age 20 is projected to fall from 22.5 percent in 2006 to 17.6 over the next 40 years.



Figure 2: Population Indexes, Atlantic Provinces and Canada, 1951–2046



Note: Indexes are based on the actual population totals reported in Table 1 (for 1951–2006) and the projected totals in Table 9 (for 2011–2046).

**Table 10: Population under Age 20 and Ages 65 and over,  
Atlantic Provinces and Canada, 2006–46, Projection A**

	2006	2011	2016	2021	2026	2031	2036	2041	2046
	<i>(percent)</i>								
Population under age 20									
Newfoundland & Labrador	22.0	20.3	19.7	19.3	18.9	18.2	17.7	17.6	17.8
Prince Edward Island	24.5	22.7	21.2	20.5	20.2	19.7	18.9	18.3	17.9
Nova Scotia	22.6	20.7	19.6	19.1	19.0	18.6	18.1	17.6	17.3
New Brunswick	22.5	21.0	20.0	19.6	19.3	18.6	18.0	17.7	17.6
Atlantic region	22.5	20.8	19.8	19.4	19.2	18.6	18.0	17.6	17.6
Canada	24.1	22.6	21.7	21.5	21.3	20.9	20.3	19.8	19.6
Population ages 65 and over									
Newfoundland & Labrador	13.6	16.3	20.2	24.2	27.9	31.4	33.7	34.8	35.3
Prince Edward Island	14.6	16.5	19.7	22.8	26.1	29.5	31.5	32.9	33.7
Nova Scotia	14.7	16.6	19.6	22.6	26.0	29.0	30.2	30.6	30.7
New Brunswick	14.5	16.4	19.6	23.0	26.3	29.4	30.8	31.6	32.0
Atlantic region	14.4	16.5	19.7	23.1	26.5	29.6	31.2	31.9	32.2
Canada	13.3	14.5	16.5	18.8	21.3	23.5	24.5	24.9	25.4

Further information about changes in age structure is provided in Figure 3, which shows population “pyramids” for each of the provinces, for the region, and for Canada, at 20-year intervals from 1966 through 2046. The horizontal bars show the percentage of the total population in each age group, with the youngest (ages 0–4) at the base and the oldest (90 and older) at the top. (Except for the 90-and-older group, all bars refer to five-year age groups.) Males are shown on the left side of the vertical line, females on the right.

The most obvious features of the pyramids are, first, that they are generally similar in shape in the different areas and, second, that their shapes change markedly over time. All the 1966 pyramids have broad bases, reflecting the baby boom throughout the country. The subsequent narrowing of the bases in 1986 and again in 2006 reflects the “baby bust.” By 2006, as a close approximation, members of the boom generation were between the ages of 40 and 60, their relatively large numbers evident in the bulges in the 2006 pyramids for the age groups 40–44 through 55–59. With the assumptions underlying the projections, the bases of the pyramids continue to contract so that, by 2026, and more especially by 2046, the populations become concentrated in the older age groups.

While the changes in the shapes of the pyramids are broadly similar from one area to another, there are important differences. A striking indication of the rapid aging of the population in the Atlantic region as a whole is evident from comparisons of the regional pyramids with those for Canada. The region had relatively high proportions in the youngest age groups in 1966 and 1986. By 2026, it is projected that the age groups 50–54 through 80–84 will be proportionately larger in the region than in Canada as a whole, and that by 2046 the proportions in all of the age groups 60–64 and older will be larger than the corresponding all-Canada proportions.



Figure 3: *Population Age Pyramids, Atlantic Provinces and Canada, 1966–2046*

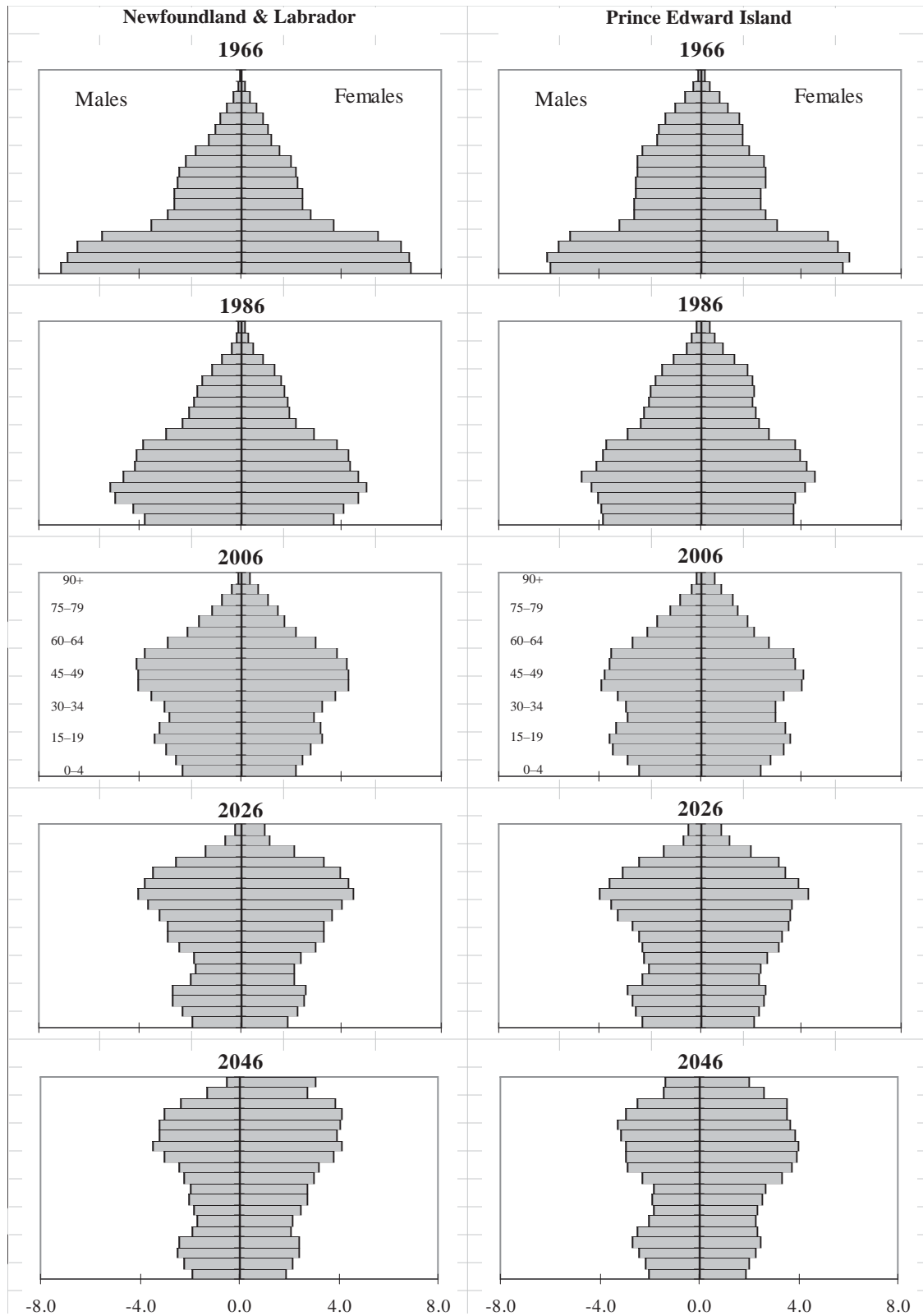


Figure 3 - continued

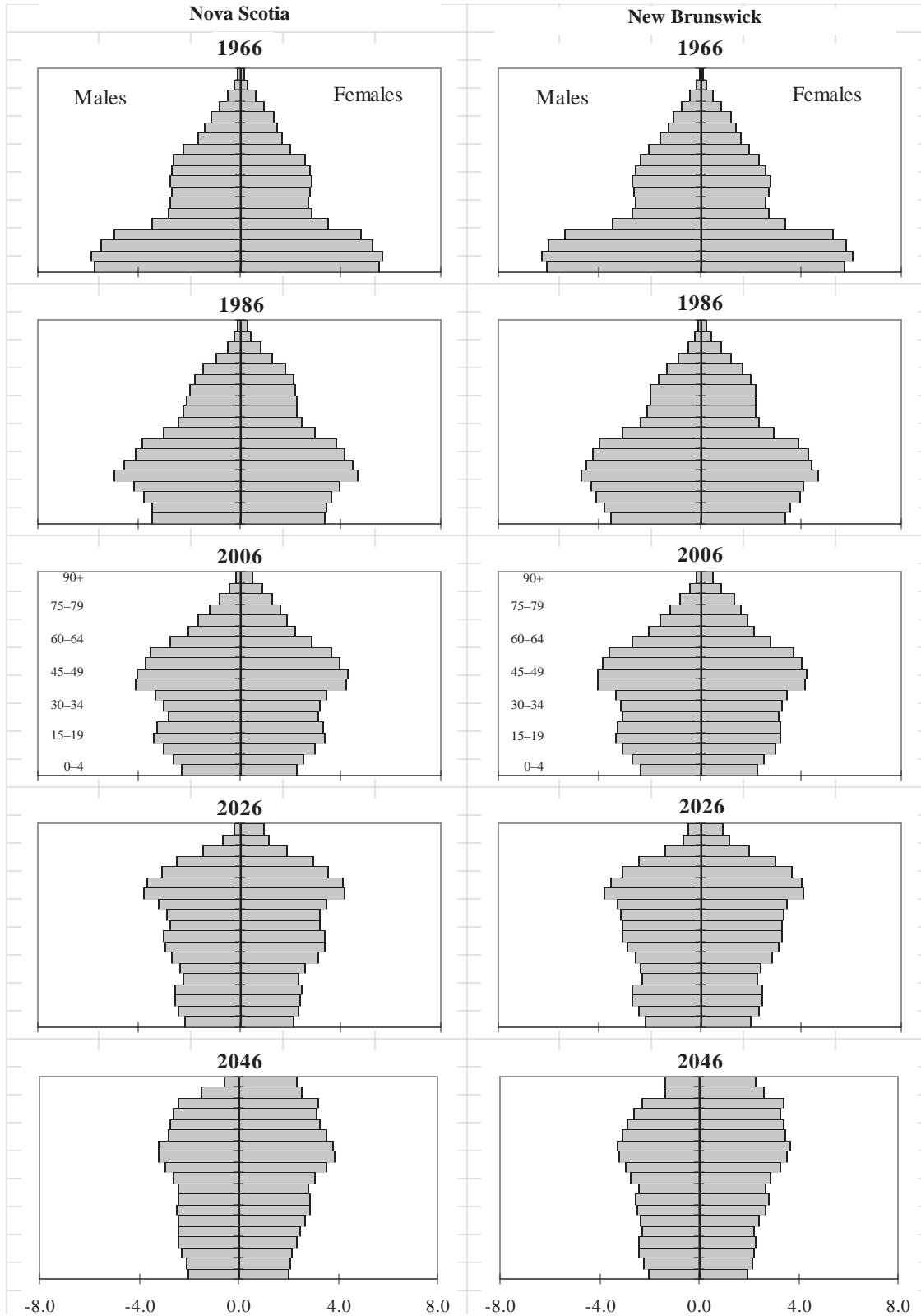
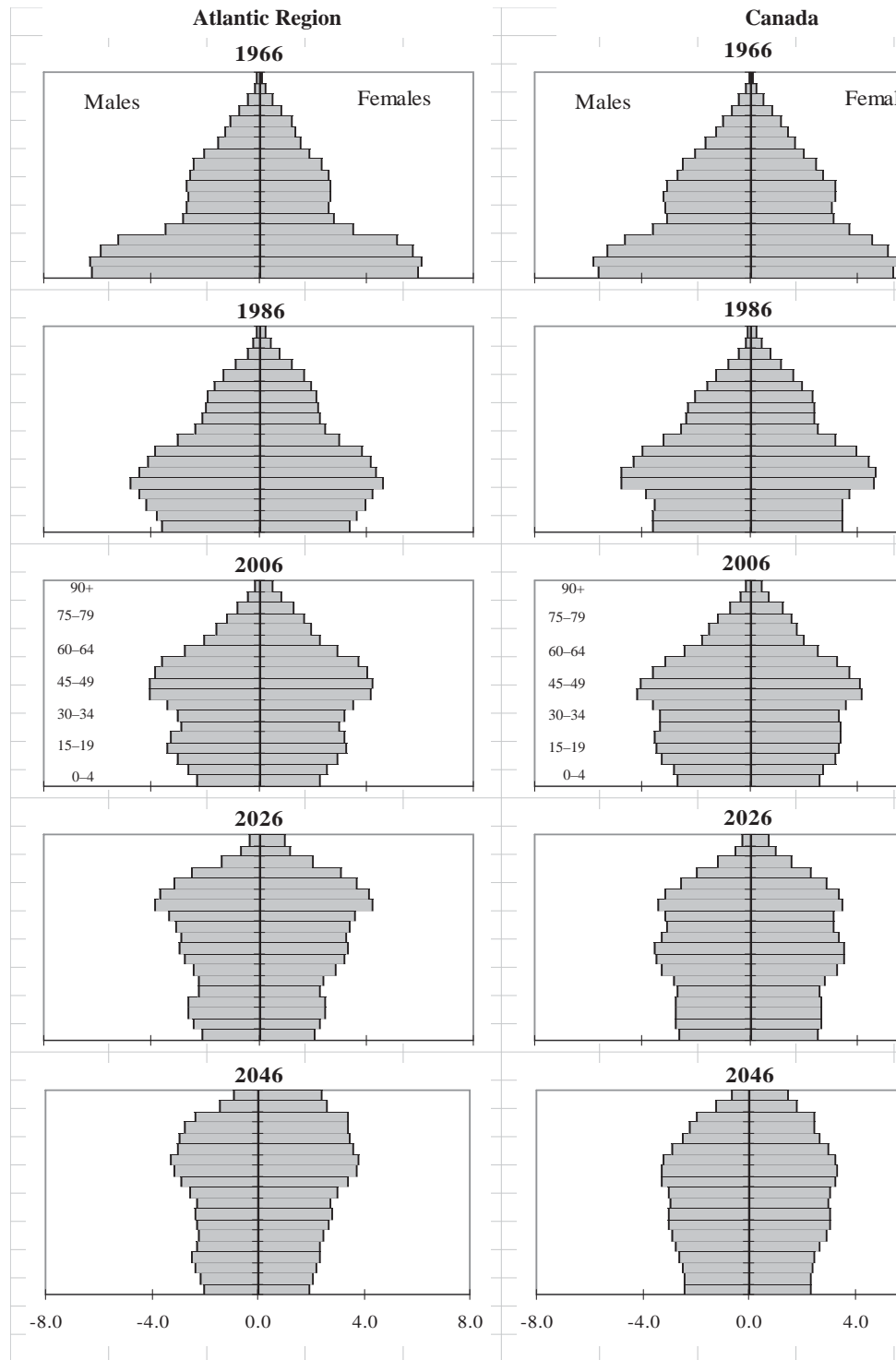




Figure 3 - continued



Note: The horizontal bars on each side of the vertical lines represent, for males and females, the percentages of the total population in each five-year age group from 0–4 to 85–89 and in the group 90 and over. The pyramids for 1966, 1986, and 2006 are based on Statistics Canada data; those for 2026 and 2046 relate to Projection A by the authors. (See the text for assumptions underlying the projection.)



Another notable difference is the relatively large reduction in the base of the pyramid for the Atlantic region. That, combined with the declining population, means a sharp decrease in the number of young people. The reduction in the size of the school-age population has obvious implications for the provision of educational services, just as the increase in the older population has for the health care system and social security.

The pattern of change in age distribution is quite similar in New Brunswick and Nova Scotia (the provinces with the largest populations) to that of the region as a whole. However, the situation is much different in Newfoundland and Labrador, which had an especially high proportion of young people in 1966 and 1986, but is projected to have an especially high proportion of middle-aged people by 2026 and of middle-aged and older people by 2046.

**Table 11: The Future Labour Force, Atlantic Provinces and Canada, 2006–46**

	2006	2011	2016	2021	2026	2031	2036	2041	2046
<i>Labour force (thousands)</i>									
Newfoundland & Labrador	253.1	248.6	235.1	219.1	201.9	186.0	171.8	158.9	146.6
Prince Edward Island	77.1	79.2	79.1	77.3	74.4	71.2	68.5	66.1	63.6
Nova Scotia	480.0	491.0	481.8	464.9	443.2	424.2	409.5	396.9	382.8
New Brunswick	389.6	396.7	385.7	369.7	350.8	333.9	320.1	306.9	292.6
Atlantic region	1,199.8	1,215.5	1,181.6	1,131.0	1,070.2	1,015.4	970.0	928.9	885.6
Canada	17,592.8	18,963.5	19,628.4	19,976.3	20,106.9	20,289.3	20,568.5	20,840.6	20,984.2
<i>Increase, last 5 years (thousands)</i>									
Newfoundland & Labrador	10.4	-4.5	-13.5	-15.9	-17.2	-15.8	-14.2	-12.9	-12.3
Prince Edward Island	4.8	2.1	-0.1	-1.8	-2.9	-3.1	-2.7	-2.4	-2.5
Nova Scotia	20.0	11.0	-9.2	-16.8	-21.7	-19.0	-14.7	-12.6	-14.2
New Brunswick	18.1	7.1	-11.1	-16.0	-18.9	-16.9	-13.8	-13.2	-14.3
Atlantic region	53.3	15.7	-33.9	-50.6	-60.8	-54.9	-45.4	-41.1	-43.3
Canada	1,483.0	1,370.7	664.9	347.9	130.6	182.4	279.1	272.1	143.5
<i>Increase, last 5 years (percent)</i>									
Newfoundland & Labrador	4.3	-1.8	-5.4	-6.8	-7.9	-7.8	-7.6	-7.5	-7.7
Prince Edward Island	6.6	2.7	-0.1	-2.3	-3.8	-4.2	-3.8	-3.5	-3.8
Nova Scotia	4.3	2.3	-1.9	-3.5	-4.7	-4.3	-3.5	-3.1	-3.6
New Brunswick	4.9	1.8	-2.8	-4.1	-5.1	-4.8	-4.1	-4.1	-4.7
Atlantic region	4.6	1.3	-2.8	-4.3	-5.4	-5.1	-4.5	-4.2	-4.7
Canada	9.2	7.8	3.5	1.8	0.7	0.9	1.4	1.3	0.7
<i>Labour force as % of population</i>									
Newfoundland & Labrador	49.6	49.5	47.4	44.8	42.4	40.5	39.2	38.2	37.4
Prince Edward Island	55.9	56.2	55.2	53.3	51.0	49.0	47.8	47.1	46.5
Nova Scotia	51.2	52.3	51.0	49.0	46.9	45.4	44.7	44.5	44.3
New Brunswick	52.2	53.1	51.5	49.4	47.2	45.7	44.9	44.4	43.9
Atlantic region	51.5	52.2	50.7	48.5	46.3	44.7	43.9	43.4	43.0
Canada	54.0	55.2	54.5	53.1	51.6	50.5	50.1	49.9	49.5

Note: The projected labour force is based on population Projection A, combined with projected participation rates.



## THE FUTURE LABOUR FORCE

Table 11 provides a projection of the labour force, based on population Projection A, coupled with assumptions about participation rates for men and women in different age groups. The participation rates we have assumed take account of recent trends and our judgement as to likely modifications of the trends. Different assumptions would alter the labour force calculations, but only to a limited extent; changes in the size and age distribution of the population will be the major determinant of the future labour force.

Rates of growth of the labour force have been lower in the Atlantic region than in Canada as a whole in the past five years and, starting in the 2006–11 period, Newfoundland and Labrador will begin to experience on-going negative growth, soon to be joined, according to the projections, by the other three Atlantic provinces. If relatively high rates of foreign immigration to Canada continue, as we assume — although, of course, this is not a certainty — Canada’s labour force will continue to grow, albeit slowly, whereas all the Atlantic provinces will experience decreases after 2011. The Atlantic region’s share of the national labour force, like that of the population, will continue to fall.

# AGE STRUCTURE AND DEPENDENCY RELATIONS

The population and labour force projections can be used to calculate measures of “dependency” — that is, the total number of “mouths to feed” in relation to the number of “providers,” so to speak. Table 12 and Figure 4 show two types of dependency measure. The first is the ratio of the total population to the number of people ages 20 to 64 (roughly the population of working age). The second measure is the ratio of the total population to the number of people actually in the labour force. The table shows historical values for comparison with the projected ones. As crude as they are, the two measures of dependency serve to indicate the “burden” of a given population age structure for the economy.

The population-based ratios, which go back to 1956 in Table 12, and to 1951 in Figure 4, rose between 1951 and 1966, reflecting the high fertility levels and large numbers of children born in that period. They then fell, as fertility rates dropped sharply and as the baby boomers came of working age and changed their status from “dependents” to “providers.” The decline in the ratios has continued for four decades, but that is projected to end. As the baby boom generation moves into old

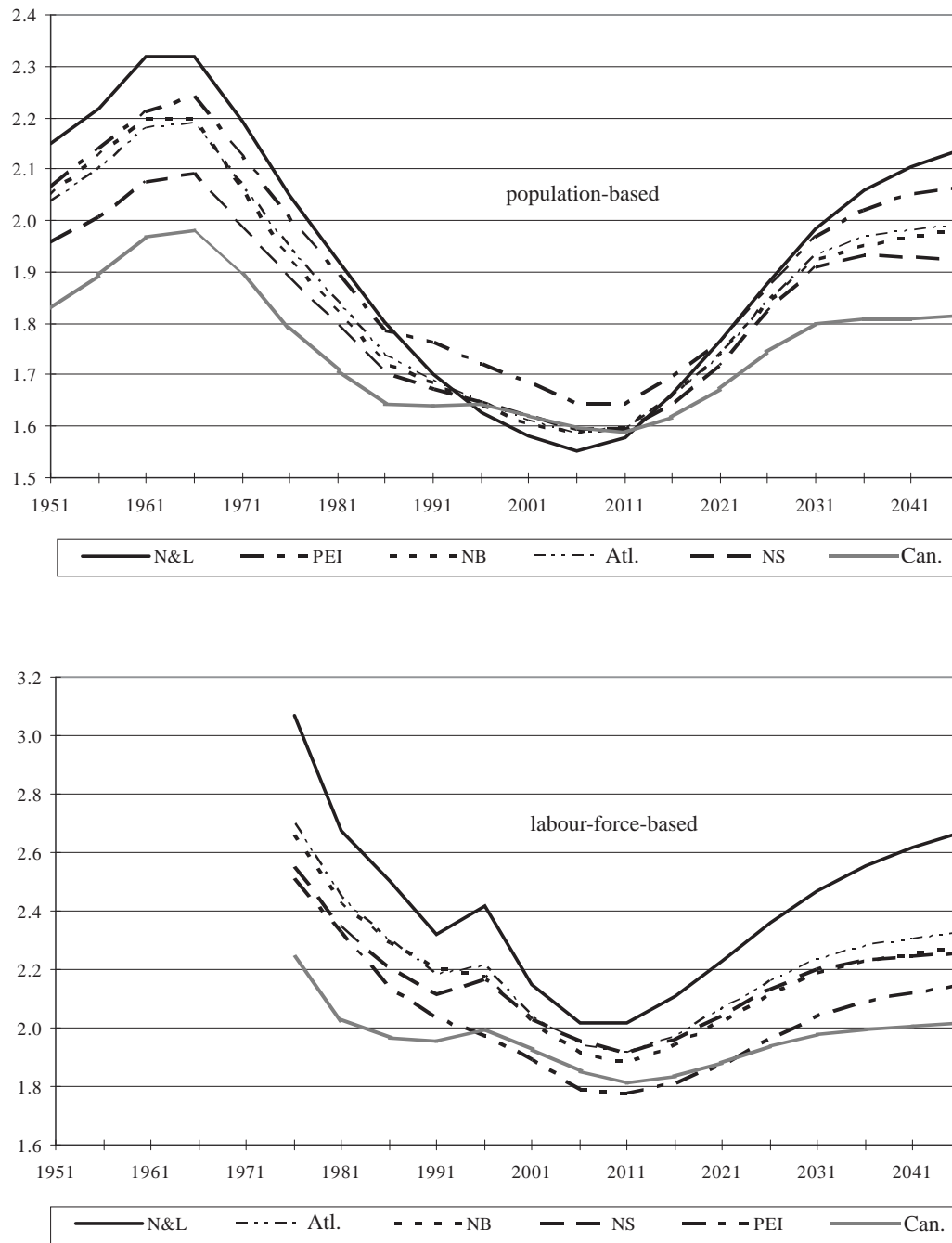
**Table 12: Dependency Ratios, Historical and Projected, Atlantic Provinces and Canada, 1956–2046**

	1956	1966	1976	1986	1996	2006	2016	2026	2036	2046
Population-based ratios										
Newfoundland & Labrador	2.22	2.32	2.05	1.80	1.63	1.55	1.66	1.88	2.06	2.14
Prince Edward Island	2.14	2.24	2.00	1.79	1.72	1.64	1.69	1.86	2.02	2.07
Nova Scotia	2.01	2.09	1.89	1.70	1.65	1.59	1.64	1.82	1.93	1.92
New Brunswick	2.13	2.20	1.92	1.72	1.64	1.59	1.66	1.84	1.95	1.98
Atlantic region	2.10	2.19	1.95	1.74	1.64	1.58	1.65	1.84	1.97	1.99
Canada	1.89	1.98	1.79	1.64	1.64	1.60	1.62	1.74	1.81	1.82
Labour-force-based ratios										
Newfoundland & Labrador	--	--	3.07	2.50	2.42	2.02	2.11	2.36	2.55	2.67
Prince Edward Island	--	--	2.51	2.14	1.97	1.79	1.81	1.96	2.09	2.15
Nova Scotia	--	--	2.55	2.20	2.17	1.95	1.96	2.13	2.23	2.26
New Brunswick	--	--	2.66	2.29	2.18	1.91	1.94	2.12	2.23	2.28
Atlantic region	--	--	2.70	2.30	2.21	1.94	1.97	2.16	2.28	2.33
Canada	--	--	2.24	1.97	1.99	1.85	1.83	1.94	2.00	2.02

Note: The ratios for 2016 to 2046 are calculated using population Projection A. A population-based dependency ratio is defined as the ratio of the total population to the population ages 20 to 64. A labour-force-based ratio is defined as the ratio of the total population to the total labour force.



Figure 4: *Dependency Ratios, Atlantic Provinces and Canada, 1951–2046*



Note: See Table 12.

age, the ratios will once again start to increase, starting early in the second decade of the century, and they will continue to increase to the end of the projection period. While the ratios differ between the Atlantic region and Canada as a whole, and among the four Atlantic provinces, the most striking feature of the top parts of Table 12 and Figure 4 is the consistency of the patterns: the directions of change are the same in every province and at the national level.

The “dependency burden,” then, as measured by the population-based ratio, is projected to rise, but it is worth noting that, even by 2046, the ratio will not be as high as it was in 1956 and 1966, either in Canada or in any of the Atlantic provinces. The composition of the dependent population will differ in 2046 from that of earlier times, of course, in that it will be largely a population of the elderly rather than of children. Overall, though, the ratio of the total population to that of working age will never reach the levels attained during the 1950s and 1960s.

The labour-force-based ratios in the lower parts of Table 12 and Figure 4 are higher than the population-based ones but their patterns of change are generally the same. They can be calculated only back to 1976, thus missing the peak levels of the 1950s and 1960s, but even using 1976 as a standard, all the projected ratios will be lower by 2046.

We reiterate that the dependency ratios are but crude indicators of the “burden” of the age structure. They do suggest, though, that the problem will be not so much the overall economic burden as the need to reallocate public and private expenditure to accommodate the shift from a younger to an older population — relatively less will need to be directed to education, for example, and more to health care and pensions. In the aggregate, however, reallocation, rather than total cost, seems to be the major concern for the future.



## CHANGING THE PROJECTION ASSUMPTIONS

It is of interest to see how the population projections would be affected by changing some of the basic assumptions. We offer five alternative projections in Table 13, together with the original Projection A. Projection B assumes that recent rates of net migration to and from the rest of Canada will be maintained — specifically, that the annual rate in each of the four provinces will be equal to its 2003–08 average. Projection C assumes that mortality rates will decline more rapidly than in Projection A: life expectancy at birth in Projection A increases at the national level by 4.7 years between 2006 and 2046 for men and by 3.9 years for women; in Projection C, with lower mortality rates, the increases are 6.2 and 5.3 years for men and women, respectively. Mortality rates in each of the four Atlantic provinces have been modified in a manner commensurate with the changes in the national rates. Projection D assumes a sharp upward movement of fertility rates — a rise of 50 percent over the decade from 2006 to 2016, with the rates remaining at the higher levels thereafter. Projection E is a modification of Projection B; it assumes that all net interprovincial migration flows end abruptly in 2009, rather than continuing on at recently observed rates. Finally, Projection F combines assumptions B (recent interprovincial migration patterns are maintained), C (life expectancy rises relatively rapidly), and D (fertility rates increase).

We hasten to add that we do not expect a 50 percent increase in fertility; the higher rates would still be well below the levels of the 1950s and early 1960s, but there is nothing to suggest that an increase of the assumed magnitude is likely. Neither do we expect the rates of migration in Projection B actually to hold over the next four decades, nor that outflows will suddenly equal inflows, as in Projection F. (The alternative assumptions about mortality rates underlying Projection C are more plausible, although our preferred choice is those of A.) Our sole purpose in displaying the alternative projections in Table 13 is to explore the sensitivity of the projections to changes in basic assumptions — to see how “robust” are the conclusions we have drawn above. In the interest of brevity, we show the alternative projections only at 20-year intervals in the table.

How much difference do the changes in assumptions make? The changes in migration assumptions have large effects on the population totals in the Atlantic provinces, as seen by a comparison of Projections B and F with Projection A. If recent rates of net outflow are maintained, the populations of all four provinces are reduced (Projection B); if the net outflows suddenly end, their populations increase (Projection E). In Projection A, the population of Newfoundland and Labrador falls to about 392,000 by 2046; in B, it falls to 293,000; in E, it falls to 402,000. Again, we do not think the assumptions underlying Projections B or F are credible, but the comparisons serve to highlight the critical importance of migration to the demographic future of Newfoundland and Labrador and the Atlantic region more generally.

**Table 13: Alternative Projections of Population and Age Distribution, Atlantic Provinces and Canada, 2006–46**

	Population ('000)			% under 20			% 65 and over		
	2006	2026	2046	2006	2026	2046	2006	2026	2046
<b>Projection A</b>									
Newfoundland & Labrador	510.3	476.5	391.6	22.0	18.9	17.8	13.6	27.9	35.3
Prince Edward Island	137.9	145.9	136.6	24.5	20.2	17.9	14.6	26.1	33.7
Nova Scotia	938.0	945.4	864.2	22.6	19.0	17.3	14.7	26.0	30.7
New Brunswick	745.7	742.4	666.7	22.5	19.3	17.6	14.5	26.3	32.0
Atlantic region	2,331.9	2,310.2	2,059.1	22.5	19.2	17.6	14.4	26.5	32.2
Canada	32,576.1	39,000.0	42,383.0	24.1	21.3	19.6	13.3	21.3	25.4
<b>Projection B</b>									
Newfoundland & Labrador	510.3	436.9	292.8	22.0	18.4	16.7	13.6	30.0	43.6
Prince Edward Island	137.9	141.1	124.4	24.5	20.1	17.4	14.6	26.7	35.9
Nova Scotia	938.0	910.5	776.8	22.6	18.8	16.9	14.7	26.8	32.8
New Brunswick	745.7	713.9	594.6	22.5	19.0	17.0	14.5	27.1	34.6
Atlantic region	2,331.9	2,202.4	1,788.6	22.5	18.9	16.9	14.4	27.5	35.4
Canada	32,576.1	39,000.0	42,383.0	24.1	21.3	19.6	13.3	21.3	25.4
<b>Projection C</b>									
Newfoundland & Labrador	510.3	477.6	397.6	22.0	18.8	17.6	13.6	28.0	36.2
Prince Edward Island	137.9	146.3	138.7	24.5	20.2	17.7	14.6	26.2	34.6
Nova Scotia	938.0	947.8	877.3	22.6	19.0	17.1	14.7	26.2	31.5
New Brunswick	745.7	744.3	677.0	22.5	19.2	17.4	14.5	26.4	32.9
Atlantic region	2,331.9	2,316.0	2,090.6	22.5	19.1	17.3	14.4	26.6	33.1
Canada	32,576.1	39,083.0	42,876.0	24.1	21.3	19.3	13.3	21.4	26.1
<b>Projection D</b>									
Newfoundland & Labrador	510.3	503.3	457.9	22.0	23.2	24.0	13.6	26.4	30.2
Prince Edward Island	137.9	155.6	161.1	24.5	25.2	24.6	14.6	24.5	28.6
Nova Scotia	938.0	1,005.7	1,016.7	22.6	23.9	24.0	14.7	24.5	26.0
New Brunswick	745.7	788.4	785.9	22.5	24.0	24.4	14.5	24.8	27.1
Atlantic region	2,331.9	2,453.0	2,421.6	22.5	23.9	24.2	14.4	25.0	27.3
Canada	32,576.1	41,793.0	50,027.0	24.1	26.6	26.5	13.3	19.9	21.5
<b>Projection E</b>									
Newfoundland & Labrador	510.3	486.7	401.9	22.0	19.0	17.8	13.6	27.5	35.0
Prince Edward Island	137.9	147.2	137.9	24.5	20.3	17.9	14.6	26.0	33.6
Nova Scotia	938.0	954.4	873.3	22.6	19.1	17.3	14.7	25.8	30.6
New Brunswick	745.7	749.9	674.4	22.5	19.3	17.6	14.5	26.1	31.9
Atlantic region	2,331.9	2,338.2	2,087.5	22.5	19.2	17.5	14.4	26.3	32.1
Canada	32,576.1	39,000.0	42,383.0	24.1	21.3	19.6	13.3	21.3	25.4
<b>Projection F</b>									
Newfoundland & Labrador	510.3	473.6	374.8	22.0	24.6	24.1	13.6	27.9	35.4
Prince Edward Island	137.9	150.8	149.6	24.5	25.0	23.9	14.6	25.2	31.1
Nova Scotia	938.0	971.5	933.2	22.6	23.7	23.3	14.7	25.3	28.6
New Brunswick	745.7	760.2	716.3	22.5	23.7	23.6	14.5	25.7	29.9
Atlantic region	2,331.9	2,356.1	2,173.9	22.5	24.0	23.6	14.4	25.9	30.4
Canada	32,576.1	41,877.0	50,527.0	24.1	26.6	26.2	13.3	20.0	22.1

Note: Projection A is the basic projection; B to F incorporate particular departures from the assumptions underlying A. Projection B assumes continuation of 2003-08 inter-provincial migration patterns throughout the projection period; C assumes greater declines in mortality rates; D assumes a rise in fertility rates; E assumes zero net inter-provincial migration by 2009; and F combines assumptions from B, C, and D. See text for additional detail.

**Table 14: Alternative Projections of Population and Dependency Ratios, Atlantic Provinces and Canada, 2006–46**

	Population (2006 = 100)			Population-based dependency ratio			Labour-force-based dependency ratio		
	2006	2026	2046	2006	2026	2046	2006	2026	2046
<b>Projection A</b>									
Newfoundland & Labrador	100.0	93.4	76.7	1.55	1.88	2.14	2.02	2.36	2.67
Prince Edward Island	100.0	105.8	99.1	1.64	1.86	2.07	1.79	1.96	2.15
Nova Scotia	100.0	100.8	92.1	1.59	1.82	1.92	1.95	2.13	2.26
New Brunswick	100.0	99.6	89.4	1.59	1.84	1.98	1.91	2.12	2.28
Atlantic region	100.0	99.1	88.3	1.58	1.84	1.99	1.94	2.16	2.33
Canada	100.0	119.7	130.1	1.60	1.74	1.82	1.85	1.94	2.02
<b>Projection B</b>									
Newfoundland & Labrador	100.0	85.6	57.4	1.55	1.94	2.52	2.02	2.44	3.17
Prince Edward Island	100.0	102.3	90.2	1.64	1.88	2.14	1.79	1.98	2.21
Nova Scotia	100.0	97.1	82.8	1.59	1.84	1.99	1.95	2.16	2.33
New Brunswick	100.0	95.7	79.7	1.59	1.86	2.07	1.91	2.14	2.37
Atlantic region	100.0	94.4	76.7	1.59	1.87	2.10	1.94	2.19	2.44
Canada	100.0	119.7	130.1	1.60	1.74	1.82	1.85	1.94	2.02
<b>Projection C</b>									
Newfoundland & Labrador	100.0	93.6	77.9	1.55	1.88	2.16	2.02	2.36	2.70
Prince Edward Island	100.0	106.1	100.6	1.64	1.87	2.10	1.79	1.96	2.17
Nova Scotia	100.0	101.0	93.5	1.59	1.82	1.95	1.95	2.14	2.28
New Brunswick	100.0	99.8	90.8	1.59	1.84	2.01	1.91	2.12	2.30
Atlantic region	100.0	99.3	89.7	1.59	1.84	2.02	1.94	2.16	2.35
Canada	100.0	120.0	131.6	1.60	1.75	1.83	1.85	1.94	2.04
<b>Projection D</b>									
Newfoundland & Labrador	100.0	98.6	89.7	1.55	1.98	2.19	2.02	2.48	2.68
Prince Edward Island	100.0	112.8	116.8	1.64	1.99	2.14	1.79	2.08	2.19
Nova Scotia	100.0	107.2	108.4	1.59	1.94	2.00	1.95	2.26	2.30
New Brunswick	100.0	105.7	105.4	1.59	1.95	2.06	1.91	2.24	2.32
Atlantic region	100.0	105.2	103.8	1.59	1.95	2.06	1.94	2.28	2.36
Canada	100.0	128.3	153.6	1.60	1.87	1.92	1.85	2.07	2.11
<b>Projection E</b>									
Newfoundland & Labrador	100.0	95.4	78.8	1.55	1.87	2.12	2.02	2.35	2.66
Prince Edward Island	100.0	106.7	100.0	1.64	1.86	2.06	1.79	1.96	2.15
Nova Scotia	100.0	101.7	93.1	1.59	1.82	1.92	1.95	2.13	2.26
New Brunswick	100.0	100.6	90.4	1.59	1.83	1.98	1.91	2.11	2.27
Atlantic region	100.0	100.3	89.5	1.59	1.84	1.98	1.94	2.15	2.32
Canada	100.0	119.7	130.1	1.60	1.74	1.82	1.85	1.94	2.02
<b>Projection F</b>									
Newfoundland & Labrador	100.0	92.8	73.4	1.55	2.10	2.47	2.02	2.58	3.02
Prince Edward Island	100.0	109.4	108.5	1.64	2.01	2.22	1.79	2.10	2.26
Nova Scotia	100.0	103.6	99.5	1.59	1.96	2.08	1.95	2.29	2.39
New Brunswick	100.0	101.9	96.1	1.59	1.98	2.15	1.91	2.27	2.42
Atlantic region	100.0	101.0	93.2	1.59	2.00	2.17	1.94	2.32	2.48
Canada	100.0	128.6	155.1	1.60	1.87	1.94	1.85	2.07	2.12

Note: See note to Table 13.



The sharply reduced Newfoundland and Labrador population in Projection B is accompanied by a much higher proportion of elderly people: in Projection A, the proportion ages 65 and older is 35 percent by 2046; in B, it is 44 percent, reflecting the disproportionately large losses of younger people associated with out-migration. Changes in the proportion of elderly people take place in the other provinces, too, although they are of a much smaller order than in Newfoundland and Labrador. Without those larger losses through net out-migration, their proportions are quite similar to those in Projection A.

Do changes in the assumptions about death rates have much effect on the number of deaths and hence the size of the population? The answer is no — the effects are rather minor, even after 40 years, as a comparison of Projections C and A makes clear. That conclusion applies to the total population and also to its age distribution. Contrary to popular belief, lower mortality rates and greater life expectancies would have little consequence for the collective aging process, as represented by the slightly increased percentage of the population ages 65 and older.

Increases in fertility rates would have a greater effect, as evidenced by Projection D. They would produce a larger population in each province, of course, and they would raise the percentage of young people and lower the percentage of old. But the percentage of old would still almost double in the Atlantic region as a whole over the next four decades, and would still rise sharply in each of the provinces. Combining this result with the results observed for Projections B, C, and D, as we do in Projection F, it is safe to say that population aging will be a prominent fact of life for the Atlantic provinces over the coming decades, regardless of what happens to migration, mortality, and fertility. As elsewhere in the country, the inertia of the collective aging process is too strong to be offset by other demographic influences.

That point is emphasized in the dependency ratios shown in Table 14. By 2046, in Projection A, the labour-force-based ratio increases by 9 percent for Canada and by 20 percent for the Atlantic region. Reduced mortality (Projection C) and, more especially, higher fertility (Projection D) increase the ratio in all jurisdictions, but only by a few percentage points. The effect of interprovincial migration is substantial at the regional level: the labour-force-based ratio is 11 percentage points higher when the recent net outflows continue right through to 2046 than when they are phased out (B compared to A). The effect is especially great in Newfoundland and Labrador, which has experienced the greatest outflows in recent years.

We can go further. Suppose that an immediate and sustained improvement in the economic fortunes of the region results in a sudden reversal of demographic trends, all favouring more rapid population growth. Suppose an increase in fertility (Projection D) combines with an immediate end to net interprovincial out-migration from each province (Projection E) and that each begins immediately to receive its population share of immigrants. We do not show the projection based on this implausible set of assumptions, but simply note that, even then, the proportion of older people increases sharply. We conclude again that the aging of Atlantic Canada's population is inevitable and easily anticipated far in advance, and should not be ignored in the framing of economic and social policy.



## THE EFFECTS ON THE ECONOMY

Population growth and changing age structure have profound economic implications. It is beyond the scope of this paper to explore in any detail how demographic change will affect the economies of the Atlantic provinces. It is perhaps helpful, however, to indicate the nature of the effects one would look for, and some of the questions one should address in a further exploration of this issue.

The most direct and obvious effect of population change is on the productive capacity of the economy. A higher birth rate produces a larger number of new entrants into the labour market after a little less than two decades, thus increasing the potential size of the work force. But there are other effects, too. For one, young entrants, having received their formal training only recently, are the bearers of new ideas and likely to be more adaptable than older workers. At the same time, their inexperience tends to limit their immediate contribution to productivity. An influx of youth means a larger labour force, but when and by how much the economy's average level of productivity rises depends on the net result of those opposing tendencies. Studies show that productivity tends to rise generally with age, flatten out in mid-career, and then possibly fall somewhat as retirement age approaches. (That is an average sort of pattern; the pattern varies from one occupation to another.)

The present situation in the Atlantic provinces and generally throughout Canada is, of course, the reverse of what we have just described. The low birth rates of the past quarter-century mean falling numbers of new labour force entrants and, consequently, fewer young, recently trained, more adaptable, but less experienced workers, a situation that will probably continue for many decades to come. The rate of labour force growth is likely to decline and the average age of the working population to rise. A remaining question is what will happen to labour productivity as a result of the change in the proportions of younger and older workers.

We can gain an impression of the implications for the economy as a whole. To illustrate, we first consider the case in which average (economy-wide) labour productivity is assumed to remain constant over the projection period, using output per member of the labour force as our measure of productivity. The use of that simple ratio allows us to abstract from changes in the rate of unemployment, the age-sex composition of employment, educational attainment, hours worked, and other productive characteristics of those employed. While it is evident that less unemployment, more highly skilled workers, and more full-time employment have positive effects on output, we ignore those effects. Our intent is simply to focus attention on the consequences of demographic change itself and then on the potential role of gains in labour productivity.

Table 15 shows what would happen to the productive capacity and to output per capita of each of the Atlantic provinces, the region as a whole, and Canada. Figure 5 plots the projected values of total output and output per capita for the region. With the assumption of constant labour productivity, the time path of total output mimics that of the labour force. For the region as a whole, it shows growth of 1 percent in the 2006–11 period, followed by steady decline thereafter. By 2046, total output is projected to be only 72 percent as great as it was in 2006. The projected decline is especially large in Newfoundland and Labrador, reflecting the reduction in the size of its labour force, and least in Prince Edward Island. If the population grows somewhat less rapidly than the labour force, output per capita would fall by somewhat less in three of the four Atlantic provinces, with Prince Edward Island the exception.

Migration provides an alternative source of labour force growth, the effects of which are more or less immediate, since migrants tend to be younger adults. However, the Atlantic region has received only a small share of immigration to Canada in recent decades, and it has had a deficit in its exchange of population with the rest of the country. Circumstances vary from province to province, but overall it seems unlikely that the region's labour force will expand to any considerable extent as a consequence of migration; indeed, it is more likely to contract from migration if recent rates of outflows from Newfoundland and Labrador and, to a lesser extent, New Brunswick, continue. Thus, neither natural increase nor migration can be expected to provide much of a stimulus on the supply side of the economy or to be a significant source of growth in the region's productive capacity.

Nonetheless we can make a tentative assessment of the potential impact of higher levels of net in-migration. Starting with population Projection A and the associated projection of the labour force, and assuming constant labour productivity, we ask first whether there is some rate of net in-migration that would maintain productive capacity in the region at its 2006 level and, if so, how great would it have to be. We ask also whether the standard of living, as measured by output per capita in 2006, could be maintained if levels of net in-migration were higher.

Some indications are provided in Table 16 and for the region as a whole in Figure 6. Keeping in mind that, over the past quarter-century, the region has lost 0.3 percent of its population each year, on average, through net outflows, we find that, to keep total output from falling, the annual rate of net in-migration into the region as a whole would have to be about 0.4 percent of the population each year in the 2011–16 period and increase to double that a decade later. If the goal were instead to keep output per capita from falling, net in-migration would have to increase far more — to more than 4 percent per year a decade from now before declining to about half that amount. Such levels of net in-migration must be considered quite unrealistic in light of historic experience and, if achievable, would lead to very large increases in the population in a relatively short period of time.

What about gains in productivity? How great would they have to be to achieve the same goals? Figure 7 shows the average annual growth in labour productivity (measured by output per member of the labour force) that would be required in each five-year period to keep total output and output per capita at their 2006 levels. (Table 17 shows, in addition, what would be required to maintain growth at 1 and 2 percent per year.) With constant labour productivity, total output would decrease

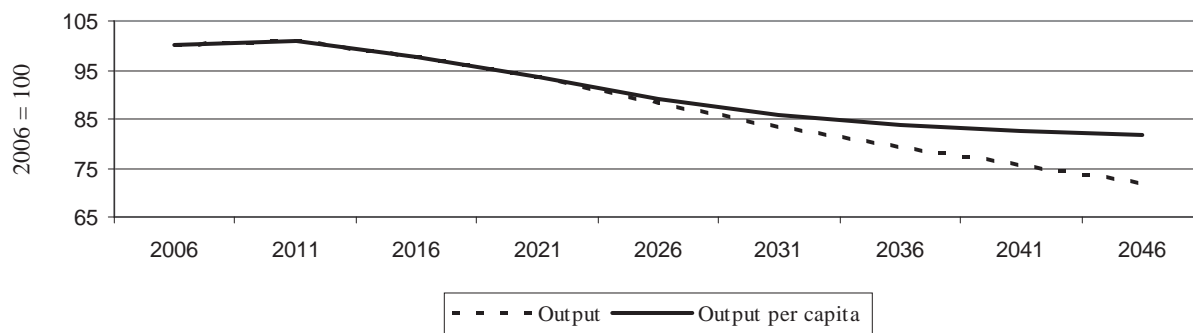


**Table 15: Implications of Population and Labour Force Change for Productive Capacity and Output per Capita, Atlantic Provinces and Canada, 2006–46**  
(assuming constant labour productivity and population projection A)

	2006	2011	2016	2021	2026	2031	2036	2041	2046
	(2006 = 100)								
Output									
Newfoundland & Labrador	100.0	98.2	92.9	86.6	79.8	73.5	67.9	62.8	57.9
Prince Edward Island	100.0	102.7	102.6	100.3	96.5	92.4	88.9	85.7	82.5
Nova Scotia	100.0	102.3	100.4	96.9	92.3	88.4	85.3	82.7	79.7
New Brunswick	100.0	101.8	99.0	94.9	90.0	85.7	82.2	78.8	75.1
Atlantic region	100.0	101.0	97.9	93.4	88.1	83.4	79.4	75.8	72.1
Canada	100.0	107.8	111.6	113.5	114.3	115.3	116.9	118.5	119.3
Output per capita									
Newfoundland & Labrador	100.0	99.8	95.5	90.4	85.4	81.6	79.0	77.1	75.5
Prince Edward Island	100.0	100.5	98.8	95.3	91.2	87.7	85.5	84.3	83.2
Nova Scotia	100.0	102.2	99.7	95.8	91.6	88.7	87.4	87.1	86.6
New Brunswick	100.0	101.7	98.6	94.5	90.4	87.5	86.0	85.0	84.0
Atlantic region	100.0	101.1	97.8	93.5	89.0	85.7	83.8	82.7	81.6
Canada	100.0	102.3	101.0	98.4	95.5	93.5	92.7	92.3	91.7
	(percentage rates of growth)								
Output									
Newfoundland & Labrador		-1.8	-5.4	-6.8	-7.9	-7.8	-7.6	-7.5	-7.7
Prince Edward Island		2.7	-0.1	-2.3	-3.8	-4.2	-3.8	-3.5	-3.8
Nova Scotia		2.3	-1.9	-3.5	-4.7	-4.3	-3.5	-3.1	-3.6
New Brunswick		1.8	-2.8	-4.1	-5.1	-4.8	-4.1	-4.1	-4.7
Atlantic region		1.0	-3.1	-4.5	-5.6	-5.4	-4.8	-4.5	-4.9
Canada		7.8	3.5	1.8	0.7	0.9	1.4	1.3	0.7
Output per capita									
Newfoundland & Labrador		-0.2	-4.3	-5.4	-5.5	-4.4	-3.3	-2.4	-2.0
Prince Edward Island		0.5	-1.7	-3.5	-4.3	-3.8	-2.5	-1.5	-1.2
Nova Scotia		2.2	-2.4	-3.9	-4.4	-3.1	-1.5	-0.4	-0.6
New Brunswick		1.7	-3.1	-4.1	-4.3	-3.2	-1.8	-1.1	-1.2
Atlantic region		1.1	-3.2	-4.5	-4.8	-3.7	-2.2	-1.3	-1.3
Canada		2.3	-1.3	-2.5	-3.0	-2.0	-0.9	-0.4	-0.7

Note: Labour productivity is expressed as provincial GDP/LF.

**Figure 5: Projected Values of Output and Output per Capita, Atlantic Region, 2006–46**  
(assuming constant labour productivity and population projection A)

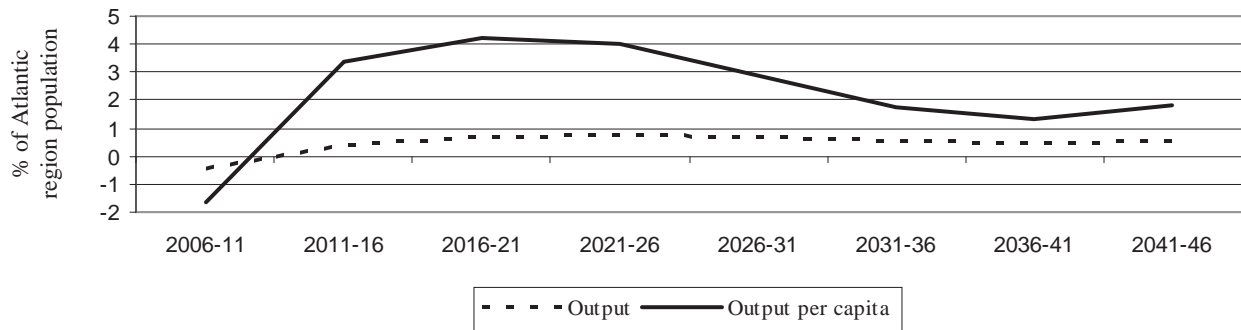


**Table 16: Average Annual Net In-migration Required to Maintain Specified Rates of Output Growth, Atlantic Provinces and Canada, 2006–46**  
(assuming constant labour productivity)

	Target rate of growth	2006 -11	2011 -16	2016 -21	2021 -26	2026 -31	2031 -36	2036 -41	2041 -46
	(%)	(% of population)							
Output									
Newfoundland & Labrador	0	-0.1	0.8	1.0	1.0	0.9	0.8	0.8	0.8
	1	0.8	1.5	1.7	1.7	1.5	1.4	1.4	1.4
	2	1.7	2.3	2.4	2.3	2.2	2.1	2.1	2.1
Prince Edward Island	0	-0.6	0.0	0.4	0.6	0.6	0.5	0.4	0.4
	1	0.1	0.8	1.1	1.3	1.2	1.2	1.1	1.1
	2	1.0	1.6	1.9	2.0	2.0	1.9	1.8	1.9
Nova Scotia	0	-0.6	0.3	0.6	0.7	0.6	0.4	0.4	0.4
	1	0.2	1.1	1.3	1.3	1.2	1.1	1.1	1.1
	2	1.1	1.9	2.0	2.0	1.9	1.8	1.8	1.9
New Brunswick	0	-0.5	0.4	0.7	0.7	0.6	0.5	0.4	0.5
	1	0.4	1.2	1.4	1.4	1.2	1.1	1.1	1.2
	2	1.2	2.0	2.1	2.1	1.9	1.8	1.8	1.9
Atlantic region	0	-0.4	0.4	0.7	0.8	0.7	0.5	0.5	0.5
	1	0.4	1.2	1.4	1.4	1.3	1.2	1.2	1.2
	2	1.3	2.0	2.1	2.1	2.0	1.9	1.9	2.0
Canada	0	-0.6	0.1	0.4	0.5	0.4	0.3	0.3	0.4
	1	0.2	0.9	1.1	1.2	1.1	1.0	0.9	1.0
	2	1.1	1.7	1.8	1.9	1.7	1.6	1.6	1.7
Output per capita									
Newfoundland & Labrador	0	-0.2	4.8	5.0	4.4	3.2	2.4	2.3	2.9
	1	7.6	18.8	>36	—	—	—	—	—
	2	20.4	>37	—	—	—	—	—	—
Prince Edward Island	0	-1.0	2.2	4.3	5.0	4.4	3.4	2.6	2.3
	1	7.8	20.8	>38	—	—	—	—	—
	2	22.4	>39	—	—	—	—	—	—
Nova Scotia	0	-2.3	2.3	3.5	3.7	2.7	1.5	0.8	1.0
	1	3.8	12.2	21.3	>30	—	—	—	—
	2	12.3	>37	—	—	—	—	—	—
New Brunswick	0	-2.0	3.9	4.4	4.0	2.5	1.1	0.7	1.5
	1	6.6	19.9	>35	—	—	—	—	—
	2	21.2	>36	—	—	—	—	—	—
Atlantic region	0	-1.7	3.4	4.2	4.0	2.9	1.8	1.3	1.8
	1	5.9	17.5	>36	—	—	—	—	—
	2	18.3	>37	—	—	—	—	—	—
Canada	0	-1.3	2.1	3.6	3.5	2.3	1.0	0.5	1.4
	1	10.1	>15	—	—	—	—	—	—
	2	>21	—	—	—	—	—	—	—



**Figure 6: Average Annual Net In-migration Required to Maintain Output and Output per Capita at 2006 Levels, Atlantic Region, 2006–46**  
(assuming constant labour productivity)



at the same rate as the labour force. To offset that decrease, labour productivity would have to increase by about 0.6 percent per year in the 2011–16 period, increase to above 1 percent a decade later, and then remain at about that level to the end of the projection period. Similar gains in labour productivity would be required until the 2021–26 period to maintain output per capita, but much lower gains after that — of the order of 0.2 percent per year. Such gains are well within historical bounds: in the past quarter-century, the average annual rate of productivity growth in the region has been about 1.5 percent.

Turning to the demand side of the economy, new household formation is determined also by births, with a lag of two decades or more, and more immediately by migration. Standard economic life cycle theory tells us that households save during their working years and dissave in old age, but there are many qualifications to that: there is evidence that many households continue to save well after retirement — and, of course, the presence of children alters a household’s pattern of saving and consumption, and so does a spell of unemployment. The main point, though, is that the age distribution of the population can have an important bearing on a society’s patterns of saving and spending and on the types of consumption goods that are purchased. The demand for new housing is related directly to the rate of household formation; the demand for food, clothing, and recreation to average household size and composition; the demand for educational services to the number and age distribution of children; and so on.

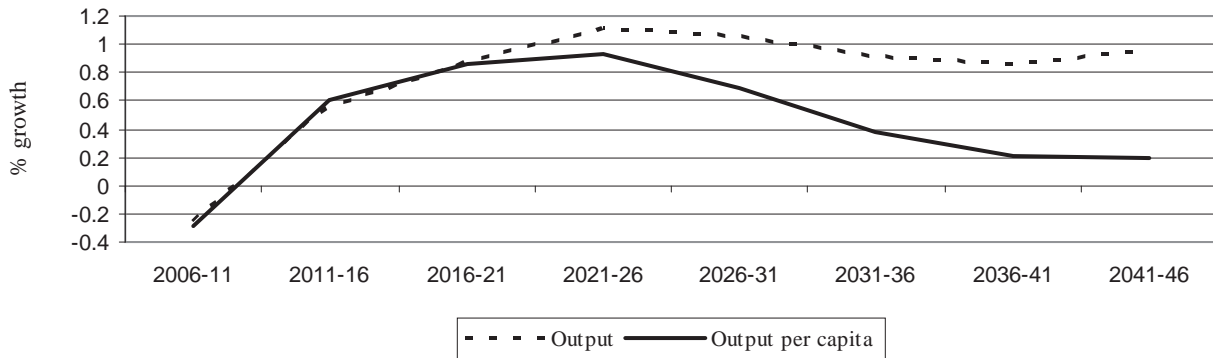
Population-related changes in rates of saving have a bearing on the financial resources available for investment. Changes in consumption patterns affect the demand for the products of different industries, inducing some to expand and others to contract, thus influencing rates and types of investment — in residential and nonresidential building construction, machinery and equipment, roads, sewage systems, and infrastructure generally — as well as the demand for imports, in terms of both their size and composition. In turn, changes in the fortunes of individual industries have implications for employment and for the availability of jobs in particular parts of the economy: some areas and occupations prosper while others suffer. In short, the economic effects of population change can be important, varied, and pervasive.

**Table 17: Average Annual Labour Productivity (GDP/LF) Increases Required to Maintain Specified Rates of Output Growth, Atlantic Provinces and Canada, 2006–46**  
(assuming population projection A)

	Target rate of growth	2006 -11	2011 -16	2016 -21	2021 -26	2026 -31	2031 -36	2036 -41	2041 -46
	(%)								
					(% growth)				
Output									
Newfoundland & Labrador	0	0.4	1.1	1.4	1.7	1.6	1.6	1.6	1.6
	1	1.4	2.1	2.4	2.7	2.7	2.6	2.6	2.6
	2	2.4	3.1	3.4	3.7	3.7	3.6	3.6	3.7
Prince Edward Island	0	-0.5	0.0	0.5	0.8	0.9	0.8	0.7	0.8
	1	0.5	1.0	1.5	1.8	1.9	1.8	1.7	1.8
	2	1.4	2.0	2.5	2.8	2.9	2.8	2.7	2.8
Nova Scotia	0	-0.5	0.4	0.7	1.0	0.9	0.7	0.6	0.7
	1	0.5	1.4	1.7	2.0	1.9	1.7	1.6	1.7
	2	1.5	2.4	2.7	3.0	2.9	2.7	2.6	2.7
New Brunswick	0	-0.4	0.6	0.9	1.1	1.0	0.8	0.8	1.0
	1	0.6	1.6	1.9	2.1	2.0	1.9	1.9	2.0
	2	1.6	2.6	2.9	3.1	3.0	2.9	2.9	3.0
Atlantic region	0	-0.3	0.6	0.9	1.1	1.1	0.9	0.9	1.0
	1	0.7	1.6	1.9	2.1	2.1	1.9	1.9	2.0
	2	1.7	2.6	2.9	3.1	3.1	2.9	2.9	3.0
Canada	0	-1.5	-0.7	-0.4	-0.1	-0.2	-0.3	-0.3	-0.1
	1	-0.5	0.3	0.6	0.9	0.8	0.7	0.7	0.9
	2	0.5	1.3	1.6	1.9	1.8	1.7	1.7	1.9
Output per capita									
Newfoundland & Labrador	0	0.0	0.9	1.1	1.1	0.9	0.7	0.5	0.4
	1	1.0	1.9	2.1	2.1	1.9	1.7	1.5	1.4
	2	2.0	2.9	3.1	3.2	2.9	2.7	2.5	2.4
Prince Edward Island	0	-0.1	0.3	0.7	0.9	0.8	0.5	0.3	0.2
	1	0.9	1.4	1.7	1.9	1.8	1.5	1.3	1.2
	2	1.9	2.4	2.7	2.9	2.8	2.5	2.3	2.2
Nova Scotia	0	-0.4	0.5	0.8	0.9	0.6	0.3	0.1	0.1
	1	0.6	1.5	1.8	1.9	1.6	1.3	1.1	1.1
	2	1.6	2.5	2.8	2.9	2.7	2.3	2.1	2.1
New Brunswick	0	-0.3	0.6	0.8	0.9	0.7	0.4	0.2	0.2
	1	0.7	1.6	1.8	1.9	1.7	1.4	1.2	1.2
	2	1.7	2.6	2.9	2.9	2.7	2.4	2.2	2.2
Atlantic region	0	-0.3	0.6	0.9	0.9	0.7	0.4	0.2	0.2
	1	0.7	1.6	1.9	1.9	1.7	1.4	1.2	1.2
	2	1.7	2.6	2.9	3.0	2.7	2.4	2.2	2.2
Canada	0	-0.5	0.3	0.5	0.6	0.4	0.2	0.1	0.1
	1	0.5	1.3	1.5	1.6	1.4	1.2	1.1	1.1
	2	1.5	2.3	2.5	2.6	2.4	2.2	2.1	2.1



**Figure 7: Average Annual Labour Productivity (GDP/LF) Increases Required to Maintain Output and Output per Capita at 2006 Levels, Atlantic Region, 2006–46**  
(assuming population projection A)



The effects will be felt in both the private and public sectors of the economy. Public sector effects include changes in the tax base, on the one hand, and in the demands for program expenditures, on the other. Some of the expenditure effects are obvious: expansion of educational facilities following a rise in the birth rate, retrenchment and coping with excess capacity following a decline; increased requirements for hospital beds and health care personnel as the population ages; increased pension commitments as larger numbers of people cross the retirement threshold. But other types of public expenditure are affected, too.<sup>3</sup>

Health care is an area of concern to provincial governments across the country. Expenditures on health care have risen sharply, and controlling them has become one of the most prominent (and controversial) aspects of public policy. A widespread belief is that the increases are largely a consequence of population aging, but that is not correct: the collective aging process is much too slow to account for the recent increases, and one must seek the causes elsewhere.<sup>4</sup> Nevertheless, the aging process continues, slowly but inexorably, and it will put increasing pressure on health care systems as time passes. It is extremely important, therefore, to understand and anticipate the effects of population change in that area of public policy, given that health care programs represent such a large fraction of overall government spending.

3 We have carried out detailed studies of the effects of population change on government budgets at the federal level and for the province of Ontario (Denton and Spencer 1978, 1985, 1995). These studies identified the types of expenditure that are relatively insensitive to changes in population (defence expenditure is a good example at the federal level) and those that are highly sensitive. Similar studies, with more recent data and for other provinces, would identify those areas of public expenditure in which demographic change indicates that contraction might be appropriate and those in which increases would be required if service levels were to be maintained.

4 For example, between 1976 and 2006, provincial expenditures on health care in Atlantic Canada increased by more than 186 percent (after allowing for price increases) while the population increased by only 6 percent; even the older population (which uses relatively more health care services) increased less than one-half as rapidly as expenditures (CIHI 2008). We note also that, during that same period, education expenditures increased by about 9 percent, even though the population under age 20 declined by more than 40 percent. (For education, the values reported here are based on Statistics Canada's estimates of public and private expenditures on elementary and secondary education for the period 1976–2002, drawn from the CANSIM database. We have adjusted for inflation, using the consumer price index, and have extrapolated to 2006, based on rates of growth.)



There are many questions to be addressed in considering the effects of demographic changes on the health care systems of the Atlantic provinces. What are the implications for personnel requirements and for future enrolment in training programs? More specifically: how many physicians will be required, in each specialty, to serve the health care needs of the changing population? how many nurses and other health care providers? what about physical facilities? how many hospital bed days will be needed, and of those, how many in intensive care, rehabilitation, and so on? how many bed days in nursing homes? what difference would it make if more care were to be provided in “the community” and less in institutions?<sup>5</sup>

The need to anticipate demographic change is evident also for the education system. In each of the provinces in the region, the school-age population is likely to be much smaller in the years ahead than it is today. The numbers are quite striking. Based on our Projection A, for example, the decrease in the population of elementary school age will be roughly in the range 11 percent (for Prince Edward Island) to 15 percent (for Newfoundland and Labrador) over the next two decades, and about 20 percent across the region in the two decades after that. With obvious lags, the smaller numbers will work their way through the entire education system, affecting secondary and then postsecondary enrolment as well. The smaller numbers of students at each level suggest a reduction in the requirements for teachers. But how well will normal attrition through retirement and departures of teachers for other reasons match the anticipated reduction in student numbers? What are the implications for teacher training programs? What about the number of classrooms that will be required, and the associated implications for capital expenditures? There are obvious advantages to anticipating well in advance the consequences of demographic trends.

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5 In recent work, we study the effects of population change on the demand for physician services in Ontario, the specialties involved, and the cost implications (Denton, Gafni, and Spencer 2001a, 2001b, 2003a, 2003b, 2009). We also assess the effects of population aging on the prevalence of chronic conditions and their resource implications at the all-Canada level (Denton and Spencer forthcoming).



## SUMMING UP

Let us take stock. Until the past decade, when the population began to decline, the Atlantic region had experienced considerable demographic growth. Even so, its percentage of Canada's population has fallen continuously over the past half-century or more, and further decreases seem likely. In large measure, that decline can be attributed to the fact that the region receives a disproportionately small share of immigrants to Canada. Like the rest of the country, the Atlantic provinces experienced the postwar baby boom and subsequent bust and, in consequence, their populations are now aging in a collective sense. Within a few years, the first of Atlantic Canada's baby boomers will be "old" by conventional definition, and the percentage of the population ages 65 and older will rise continuously in the decades that follow. If rates of fertility remain at or near their current low levels, the rate of population growth will decline continuously.

Net migration to and from the rest of Canada has been strongly negative in Newfoundland and Labrador, and its population actually decreased by more than 9 percent between the censuses of 1991 and 2006. Even if a migration balance were to be restored, the current outlook is for substantial further declines as a result of that province's exceptionally low fertility rate. Population decline has occurred also in New Brunswick, but not yet in Nova Scotia or Prince Edward Island, although their rates of growth have dropped. While slower growth and eventual decline are in prospect throughout the Atlantic region, the trend is likely to be much more pronounced in Newfoundland and Labrador.

As the rate of population growth diminishes in Atlantic Canada, so too does the rate of growth of the labour force. That, coupled with relatively low participation rates, has important implications for the region's future productive capacity. Actual levels of production (and hence income) continue to be restricted by unemployment rates that are well above the national average. In some other respects, though, the labour force patterns of the region are quite similar to those of Canada as a whole — notably, the increased participation of women.

The relationship between the working and nonworking components of the population can be captured in a simple way by calculating "dependency" ratios. We have calculated two types: the ratio of the total population to the population ages 20 to 64, and the ratio of the total population to the labour force. Both types reflect in a rough way the economic "burden" of the age distribution at any given time. Our projections indicate that the dependency burden will rise in Atlantic Canada, as elsewhere in the country, and that it will continue to do so far into the future, which is what one would expect as the population ages. Of particular interest, though, is that, even by the decade of the 2040s, the dependency ratios will fall short of what they were in the 1950s and 1960s. The dependent population will be predominantly elderly, rather than youthful as it was in the earlier period, but the overall ratios will not be as high. In light of that, we suggest that issues related to

how resources might best be reallocated as the population ages may prove to be of greater importance for society than the overall “cost” associated with the aging of the population.

We have focused mainly on a particular set of demographic projections, based on what we think are reasonable assumptions. However, while no one can anticipate the future with certainty, alternative projections suggest that our main conclusions are unlikely to be affected much by changing the assumptions. Faster declines in mortality rates would have little effect on the growth and age distribution of the population. There is nothing to suggest that fertility rates will increase sharply, but even if they were to do so, the age distribution would still shift toward the older end — population aging would still be a future fact of life. Changes in rates of migration would alter the rates of growth, of course, but they too would not reverse the collective aging process. Indeed, if out-migration were to remain at recent levels in the Atlantic region as a whole, and especially in Newfoundland and Labrador, the increase in the proportion of elderly people would generally be greater than we have predicted, inasmuch as migrants tend to be concentrated in the younger adult ages.

Higher levels of in-migration would increase the productive capacity of the region. However, if the goal is to keep output per capita from falling, and if increased in-migration were the only means to reach that goal, in-migration would have to exceed 4 percent of the population each year in the coming decade. That is not realistic: the region has experienced continued out-migration in recent decades and even annual immigration into Canada as a whole is far less than 1 percent of the population.

A more realistic scenario would be to maintain or even increase income through growth in labour productivity. Income per capita could be maintained with gains in labour productivity of less than 1 percent per year, and it would increase if the gains were higher. Since the average annual rate of productivity growth in the region over the past quarter-century has been about 1.5 percent, gains in per capita income levels could reasonably be expected even in the face of declines in the population and the labour force.

While slower growth and aging affect the labour force — and hence a region’s ability to generate output and income — they also affect virtually all other aspects of the economy. They affect patterns of saving and household consumption, and hence investment. They have differential effects on sales, production, and investment levels in different industries, and their impact thus falls unevenly on different areas within a region. They affect the tax bases from which provincial governments must draw revenue, and they affect the demands for government program expenditures. Work carried out in other contexts suggests the feasibility and importance of anticipating the effects of population change on government expenditures.

Education, pensions, and health care are major budgetary components with obvious sensitivity to population change, and they deserve special attention. However, other components can be affected also. In the case of health care, it is particularly important that the delivery system be viewed as just that — a system — in assessing the implications of population change, and that future resource



availability and requirements be considered. That is true of education and other government program areas, but it is especially important in the case of health care, where piecemeal and inconsistent policies are a greater risk.

We conclude with further observations concerning the relationships between prospective demographic change, on the one hand, and public expenditures, on the other. In each of the Atlantic provinces, economic planning should anticipate that the school-age population is likely to be much smaller in the years ahead than it is today. That is of major practical concern. How many teachers will be required in 10, 20, or 30 years in each province? How many will have to be hired, after taking into account the likely numbers of retirements, and departures for other reasons? What are the implications for teacher training programs? How much classroom space will be needed? At the other end of the age spectrum, planning should anticipate large increases in the numbers of elderly people. What health care and other services will be required to meet the needs of a rapidly aging population, and how much of each type of service? And how will future needs for personnel and facilities compare with what are likely to be available?

Only careful analysis can provide the information required to make well-informed policy decisions, and policies that take prospective demographic changes into account are likely to be better than those that ignore them. The case was put strongly in New Brunswick many years ago in the April 1995 Notice of Motion establishing the Select Committee of the Legislature on Demographics. It argued that “It is imperative for government to understand and assess the impact of our changing society in the context of our aging population and the demands and challenges this presents for the design and delivery of programs and services” (New Brunswick, 1996, 2). Those same sentiments were echoed by the Atlantic Institute for Market Studies in its commentary on our report of a decade ago and more recently in the Final Report of the Special Senate Committee on Aging: “The aging population will change the way we do things. We can allow this change to happen by passively reacting to change. Or we can anticipate it and meet the challenges by design” (Canada 2009, 9).

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