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Population Aging, Older Workers, and Canada's Labour Force

Frank T. Denton
Byron G. Spencer

SEDAP Research Paper No. 256

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September 2009

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This paper is cross-classified as No. 433 in the McMaster University QSEP Research Report Series.

Abstract

The Expert Panel on Older Workers made recommendations designed to increase the labour force participation of older workers. We explore the implications that higher rates of older-worker participation would have for the overall size and age composition of the labour force, for the productive capacity of the economy, and for the incomes of Canadians. Our purpose is to assess the potential impact that increased participation of older workers might have in offsetting any anticipated adverse effects of population aging on standards of living.

Keywords: older worker, participation rates, productive capacity, population aging
JEL Classification: J21, J24, J26

Résumé

Le Groupe d'experts sur les travailleurs âgés a fait des recommandations visant à accroître la population active des travailleurs âgés. Nous explorons les conséquences d’une hausse de la participation des travailleurs âgés sur la taille globale et la composition par âge de la population active, la capacité productive de l'économie, et les revenus des Canadiens. Notre but est d'évaluer l’impact potentiel de l’augmentation de la participation des travailleurs âgés pour compenser les effets négatifs anticipés du vieillissement démographique sur le niveau de vie.

Population Aging, Older Workers, and Canada's Labour Force[1]

1. Introduction

The Expert Panel on Older Workers (2008) found much "support for improving the participation of older workers ..." and noted that "stakeholders were clear that governments should be active in efforts to maximize participation rates among older workers" (p ii). The ensuing recommendations of the Panel, many of which were designed to increase the labour force participation of older workers, were motivated, in part, by the aging of the population and, associated with that, the impact that the slower growth of the labour force might have on standards of living.

As of 2009 all those born during the baby boom years are under age 65, and hence still of working age, using the conventional definition. In consequence we continue to enjoy a "demographic dividend" in which the overall support ratio (the ratio of labour force to population) is at an all time high. With present trends it will remain high for another few years, and then fall gradually. By the early 2030s, when all of the baby boom generation will be older than 65, it will be about 10 percent lower than it is today, assuming the continuation of recent fertility rates.[2] (The decline would be greater if there were an early return to higher fertility, and hence more children and larger numbers of dependents to support, in total.)

Older workers are defined by the Expert Panel as those aged 55 and older. In what follows we focus on how the size of the older work force has changed in the last 30 years and how it might change in the next 30. While we are not recommending that the

participation rates of older workers be *maximized*, whatever that might mean, we applaud the stated intent of recommendation 4, which is to remove "systemic barriers and disincentives to work" in order to enhance the "choices and flexibility for older workers who wish to participate in the labour force and earn income" (p iii).

With that in mind, we explore the implications that higher rates of older-worker participation would have for the overall size and age composition of the labour force, for the productive capacity of the economy, and for the incomes of Canadians. In doing so we consider participation rates that are higher, in some cases even much higher, than have been observed in recent decades. Our purpose is to assess the potential impact that increased participation of older workers might have in offsetting any anticipated adverse effects of population aging on standards of living.

2. The Population and Labour Force: 1976-2036

The aging of the population is evident from what we term the standard projection, in Table 1.[3] In 1976, when about half of those born during the baby boom had reached age 20, 83 percent of the population were under the age of 55. That proportion has decreased ever since and, in the projection shown in the table, falls to about 63 percent by 2036, when the youngest survivors of the baby boom group will be 70. As another indicator of the pronounced shift in age structure, the growth in the population under age 55 averages less than half of one percent per year over the 60 years shown, as compared to more than 2 percent for those 55 and older, and more than 3 percent for those 75 and older.

Table 2 shows the labour force for the same period. In the projections in this table the

participation rates at younger ages continue to adjust slowly until 2021, in accordance with recent trends, but for older workers (55 and over) the 2008 rates are maintained. (All rates are annual averages.) As one would expect, the age distribution of the labour force is affected by changes in the population from which it is drawn, but also by changes in the fraction of each age-sex group participating. The growth in female participation rates between 1976 and 2006 was important, but even so, the aging of the boom generation dominates the changes that occurred in the age structure of the labour force. The first of that generation became “older workers” in 2001. Prior to that year older workers accounted for roughly 10 percent of the labour force; with constant participation rates at older ages, they will account for 18 or 19 percent within a decade.

While a large increase in the proportion of older workers is in prospect, we note also the continued growth in the size of the overall labour force: even with no increase in the participation rates of older workers the labour force is projected to be 15 percent larger in 2036 than 2006. However, rates of growth will be much lower than they have been in the past.

3. *Effects on the Future Labour Force of Possible Increases in Older-Worker Participation Rates*

The Expert Panel makes a number of recommendations intended to encourage greater participation of older workers, thereby offsetting some of the anticipated negative effects of population aging. That raises the question of just how much difference it would make if, in fact, participation rates at older ages did increase to substantially higher levels, with

corresponding reductions in rates of retirement.

Table 3 provides part of the answer. Participation rates at younger ages are assumed to remain the same as in the standard projection while those at older ages increase. More specifically, by 2016 the participation rates of older males are assumed to have risen from their actual levels in 2008 to the highest levels observed at any time in the period since 1976. An exception is the case of males 65-69, whose rates in 2008 were already higher than at any time since 1976; for them we assume instead that the rates continue to rise in accordance with recent trends.[4] The rates for older females in each age group are assumed to increase even more rapidly, in such a way that by 2016 they match the rates for the corresponding male age group.

The idea here is not to provide a "realistic" projection, but rather to assess the likely maximum potential impact on the size of the labour force of higher participation at older ages. At the same time, the projection is not wildly unrealistic, in that the projected male rates have either already been attained at one time or another in the last three decades, or else are consistent with recent trends. Furthermore, the implied retirement proportions appear reasonable.[5] The assumption about female participation rates is more speculative, but we note that the gap between male and female rates continues to decrease. For the age groups 25 through 54, the gap was more than 40 percentage points in 1976, less than 20 by 1990, and less than 10 by 2007.

In any event, the recommendations of the Panel are designed, in part, to encourage increases in older-worker participation rates and our purpose here is to assess some of the consequences of what could be considered the largest possible increases that might occur. From Table 3, we see that the assumed higher participation rates result in an older labour

force that is more than 30 percent larger and an overall labour force that is 6 percent larger, compared with the standard projection. Those relative gains would be realized by 2016, and maintained thereafter. Clearly the potential impact is considerable.

4. Effects on Productive Capacity

What effects would that have on the productive capacity of the economy? To illustrate, we first consider the case in which average (economy-wide) labour productivity is assumed to remain constant over the next three decades, using output per member of the labour force as our measure of productivity. The use of that simple measure 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 would have positive effects on output, we ignore those effects. Our intent is simply to focus attention on the potential role of gains in labour productivity, and to draw comparisons with the effects of higher rates of older-worker participation.

Table 4 shows that with the standard projection total output would be 14.8 percent higher in 2036 than it was in 2006, whereas with our hypothetical higher participation rates at older ages it would be 21.9 percent higher. By 2016 and in every year thereafter, total output would be 6 or 7 percent greater with higher participation than without it. Observe that the gain is entirely the consequence of the higher participation rates at older ages, and since the increase in those rates is assumed to be complete by 2016, the gain would be almost fully realized by then.[6]

Once the higher participation rates are in place (in our case, by 2016), there are no further effects on the overall rate of growth of the economy. Thus the potential benefit of the substantially higher participation rates is a higher level of aggregate income, but not, after 2016, a rising level. Put differently, the claim in the report of the Expert Panel, p 9, that "increasing the labour force participation rates of older workers could appreciably enlarge the size of the entire labour force over time, thereby counteracting the trend toward a decreasing growth rate" is true, *but only while the rates continue to increase*. Once the rates have stabilized they will have no further impact on economic growth.

The picture is different if we consider output (or income) per capita. With more rapid growth in the population than in the labour force, output per capita declines after 2011 (in the standard projection) or 2016 (with higher participation). While the decline is offset in large part by higher participation of older workers, per capita output levels still fall. As with the aggregate, the 6 percent difference between the two projections emerges by 2016, and is sustained thereafter.

We consider a third participation projection - "target" projection, as we shall call it. With our standard assumptions, output per capita increases between 2006 and 2011, and then declines. The target projection asks whether the older labour force could increase sufficiently to maintain the 2011 level of output per capita throughout the projection period and, if so, how great the increases in participation rates of older workers would have to be. (In this projection we assume equal proportionate increases in the participation rates for males and females at each older age, but subject to the restriction that the rates cannot exceed those for males 50-54.)

It turns out that the projection is feasible, *arithmetically*. That is, we can find rates of

participation of older workers such that the 2011 per capita income level could be maintained until 2036. However, the rates would have to increase even more than in the higher participation case, such that by 2036 older workers would account for 27 percent of the labour force (as shown in the bottom panel of Table 4), as compared to 19 percent in the standard projection and 24 percent in the higher participation projection. Whether the projection is a realistic possibility is thus quite another matter.

The rates that would be required are shown in Figure 1. The figure shows that the target rates for males 55-59 and 60-64, and females 55-59, are all constrained by the ceiling imposed by the rates for younger workers, while those for females 60-64 fall just short of the ceiling by the end of the projection period.

5. Productivity Growth as an Alternative to Higher Participation Rates

The productive capacity of the economy can of course be enhanced not only through increases in the size of the labour force, but also through gains in productivity. In Table 5 we show, for each of the three participation projections, the annual rates of growth in labour productivity that would be required in each five year period to keep total output constant, and alternatively to increase it by 1 percent or 2 percent per year. The upper panel of the table relates to total output, the lower one to output per capita.

Since the labour force grows in all three projections, total output grows also if labour productivity is constant. Hence productivity would have to *decrease* in order to offset such gains. That is a case of only analytic interest, but a helpful reference point. To maintain output growth at 1 percent per year with the standard projection would require annual

productivity gains to increase from 0.46 percent in 2011-16, when the baby boomers first pass the age 65 marker, to 0.87 percent a decade later, when most of the boomers have done so. Growth at 2 percent would require an additional 1 percent of productivity growth in each period.

What if the participation rates of older workers were higher than in the standard projection? During the period in which participation rates were increasing more rapidly, less by way of productivity gains would be necessary to achieve the specified output targets. That point is illustrated by a comparison of the standard and higher projections: virtually the same rates of productivity growth are required in each five-year period after 2011-16, whether the participation rates are standard or higher. That is because the rates in both cases are constant after 2016. However, in the periods 2006-11 and 2011-16, less productivity growth is needed when the rates for older workers are increasing (the “higher” projection) than when they are constant (the “standard” projection).

The target projection provides another perspective. Recall that in this projection the participation rates of older workers continue to increase in order to keep output per capita constant at its 2011 level when labour productivity is constant. For that to happen the labour force must grow at precisely the same rate as the population. With the labour force given, labour productivity must increase by 1 percent or 2 percent per year in order to achieve 1 percent or 2 percent growth in output per capita.

As can be seen from Table 5, that is somewhat less than would be necessary if the labour force itself were not growing. Thus, for example, to achieve the same level of output per capita with constant older-worker participation rates (the standard projection), the annual gain in labour productivity would have to be 0.41 percent greater than in the target

projection (with its higher participation rates) in the period 2011-16, and 0.63 percent greater in 2016-21. After 2021 the difference in the required rate of productivity growth diminishes with time, as the rate of labour force growth in the target projection falls off; the difference is only 0.17 percent by 2031-36.

Figure 2, which is based on Table 5, shows the rate of growth of labour productivity that would be required to keep total output (upper panel) or output per capita (lower panel) growing at 1 percent per year, given each of the three labour force projections. Labour productivity would have to be greatest if there is no growth in participation rates – the standard case. In that situation, to maintain the growth of total output at 1 percent per year, labour productivity would have to grow at about 0.46 per year in 2011-16, and at somewhat more rapid rates in subsequent periods – in the 0.7 to 0.9 range – as the rate of labour force growth declines. Higher rates would be required to maintain the growth of output per capita over the same periods – as high as 1.64 in 2016-21, before declining to 1.17 a decade and a half later.

Higher participation means less need for gains in labour productivity in order to maintain economic growth – but only while the participation rates are increasing. Consider output per capita. With higher participation the percentage rate of increase of productivity could be reduced by about 0.4 per year in the 2006-11 period, as compared to the standard case, and 0.7 in the 2011-16 period. However, once participation rates are no longer rising, the rates of productivity increase required to maintain 1 percent growth of output per capita are virtually identical in the two participation scenarios – declining from about 1.6 percent per year in 2016-21 to 1.2 fifteen years later.

The situation is quite different in the target participation case, in which participation rates

increase sufficiently that the labour force grows at the same rate as the population. The result is that output per capita is constant if labour productivity is constant, and grows at 1 percent per year if that is the rate of growth of labour productivity – the case shown in Figure 2.

This permits an interesting comparison. Some specified targets relating to the growth of output or output per capita can be attained either by higher participation rates (the focus of the Expert Panel), by more rapid productivity growth, or by some combination of the two. We can ask, therefore, how much of one could be traded off for more of the other.

The answer is implied by the differences in the required rates of productivity growth in Table 5. Compare the standard and higher participation rate projections. The same level of income, whether total or per capita, could be achieved by 2016 with either a rapid transition to higher rates of labour force participation at older ages or, with no increase in participation, by an increase in productivity growth of about 0.4 per year in 2006-11 and 0.7 in 2011-16. The net result in terms of output or income levels would be the same. Put differently, relatively modest gains in productivity growth between now and 2016 would provide the same gain in output per capita right through to 2036 as would an increase of more than 30 percent in the older-worker labour force by 2016, with the higher participation rates sustained thereafter.

6. Summary and Conclusion

The Expert Panel has emphasised the potential benefits, both to the workers themselves and to the economy generally, of measures that would encourage and facilitate higher rates of labour force participation on the part of older workers. Our purpose here has been to provide some indicators of how much difference higher – even markedly higher – rates of participation would make to the size of the labour force and the productive capacity of the economy, and hence levels of income.

To that end we have made three projections of the labour force which differ only in terms of the assumed rates of participation of older workers. The first, our standard case, assumes the participation rates for each age-sex group of workers aged 55 and older to remain at their 2008 levels throughout the projection period. The second assumes that much higher rates are attained by 2016: the rates for males increase to the peak levels observed in the last 30 years, except for males 65-69 for whom 2008 was already a peak year; for them we assume a modest continuation until 2016 of the recent upward trend. The female rates in each age group are assumed to increase sufficiently to match the higher male rates by 2016.

Even with constant participation of older workers the overall labour force continues to grow throughout the projection period, although much more slowly than in the past. With our "higher" projection the labour force would indeed increase – it would be 6 percent larger by 2016, and the older labour force would be almost 31 percent larger, differences that would be maintained for the next 20 years.

With a growing labour force and constant labour productivity, the productive capacity

of the economy would increase. That is the case in our standard projection. At the same time, a still larger labour force could be translated into higher levels of output and income. However, while higher participation can result in higher income, it takes *increases* in the rates of participation to produce higher rates of growth: once the increases have taken effect, and the participation rates are constant, they will have no further effect on growth rates.

We observe also that higher levels of aggregate output do not necessarily mean that people will be better off: if the population grows more rapidly than the labour force output per capita will fall, unless there are offsetting gains in productivity. Such a decline starts after 2011 in our standard projection and after 2016 with higher participation rates.

Our third projection – target participation – asks whether the participation rates of older workers could increase sufficiently over the projection period to offset the reduction in output per capita implied in the standard case. It turns out that such increases are *arithmetically* feasible, in the sense that the participation rates at each older age group could rise but still remain below the recently observed rate for males aged 50-54. However, they would have to be substantially higher even than those in our “higher participation” projection by the end of the thirty-year projection period, and in all likelihood that scenario is unrealistic.

Gains in production that are potentially achievable through increases in participation rates could instead result from gains in productivity. Alternatively, we could think of a trade-off between the two, with many combinations that would make it possible to attain a desired rate of growth. We find, for example, that the potential gain by 2016 in either output or output per capita that would result from “higher participation”, and the associated increase

of more than 30 percent in the older work force, could instead be achieved with an increase of about 0.4 percent per year in labour productivity in the period 2006-11 and 0.7 percent in 2011-16. To put those latter values into historical perspective, we note that in each five-year period, from 1981-86 to 2001-06, the slowest annual rate of growth of labour productivity was 0.4 percent per year and the highest was 2.5.

These observations are most certainly not intended to suggest that policy makers have levers that can be used to choose between higher rates of labour force participation and higher rates of productivity growth. However, as the report of the Expert Panel makes clear, there are policy initiatives that would reduce or remove barriers and disincentives to continued participation among older workers. There may also be initiatives that could promote higher levels of productivity. They were not the concern of the Expert Panel, but we think a comparison of their potential impacts may be instructive.

References

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Endnotes

1. This paper was prepared for presentation at the annual meetings of the Canadian Economics Association, Toronto, May 2009, in a session organized by Craig Riddell to discuss the report of the Expert Panel on Older Workers (2009). The authors are grateful to SSHRC for its support of the SEDAP (Social and Economic Dimensions of an Aging Population) Research Program under the terms of its Major Collaborative Research Initiative. We thank Christine Feaver for the preparation of all tables and figures.

2.The exact dating of the “baby boom” is a bit arbitrary; we adopt the common definition of 1946 to 1966.

3. For a discussion of the MEDS system on which all population and labour force projections reported here are based, see Denton, Feaver, and Spencer (2005). The projection in Table 1 assumes that the total fertility rate remains at its most recent level of 1.63 children per woman, that immigration remains at its target level of about 250 thousand per year, that emigration remains at its recent five-year average level of 0.12 percent of the population, and that mortality rates continue to decrease in keeping with long-term trends, such that by 2036 life expectancy at birth increases from 2006 levels by 4.0 years for males and 3.4 years for females.

4. That means increases in the male rates from 77 to 84 percent for those 55-59, from 55 to 66 percent for those 60-64, from 27 to 32 percent for those 65-69, and from 8 to 9 percent for those 70+.

5. Higher rates of participation imply lower rates of retirement. Using reductions in participation rates after ages 50-54 as an indicator, the higher (rather than standard) participation rates would imply a reduction of from 13 to 5 percent in the proportion of males retired at ages 55-59, from 37 to 25 percent at ages 60-64, from 70 to 64 percent at ages 65-69, and from 91 to 90 percent at ages 70+.

6. In fact the overall adjustment is not quite complete by 2016 because of small interaction effects between the higher rates and changes in the age distribution of the population to which the rates apply.

Figure 1: Labour Force Participation Rates of Older Workers by Sex and Age Group, Actual (1976-2006) and Projected (2011-2036)

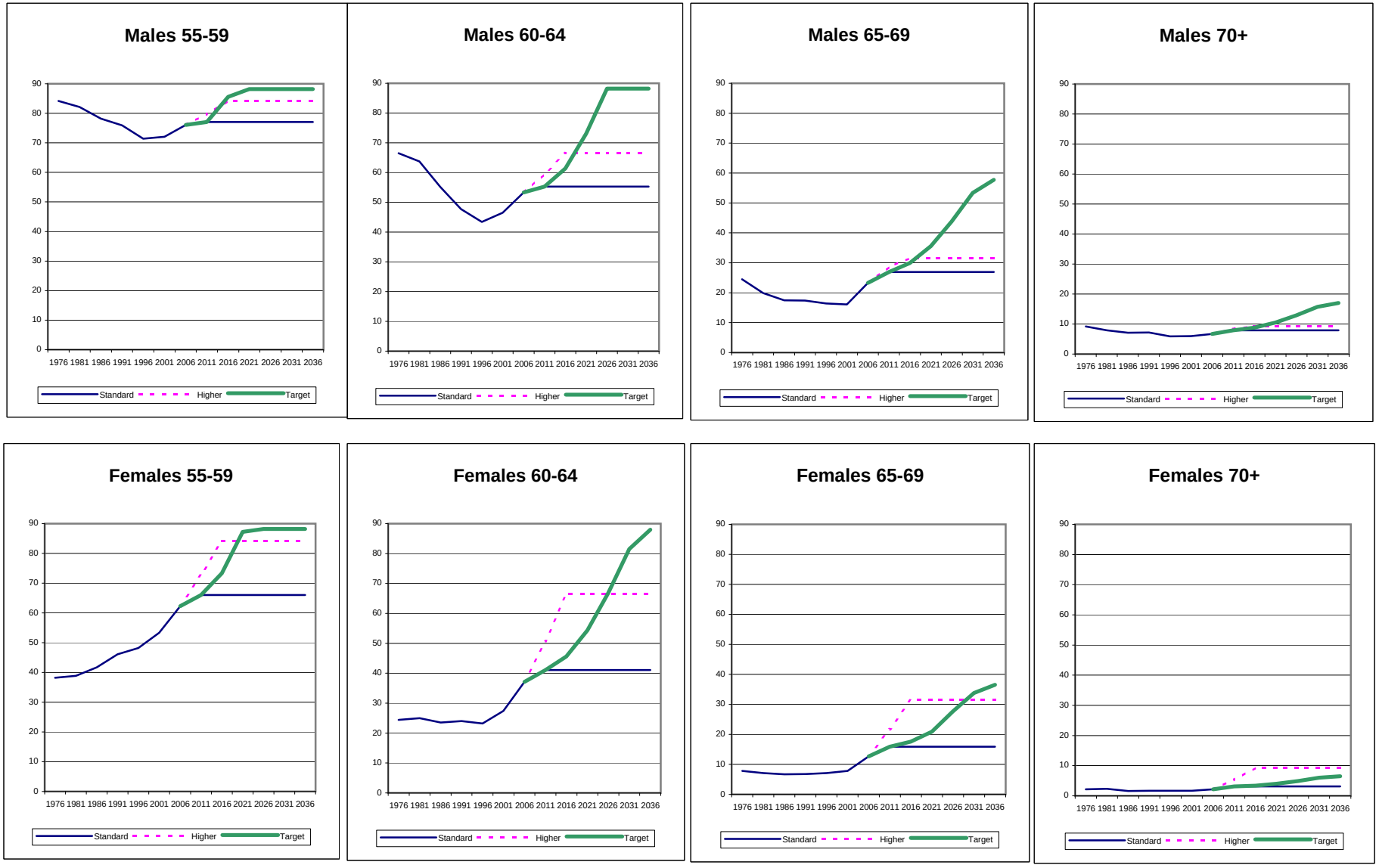
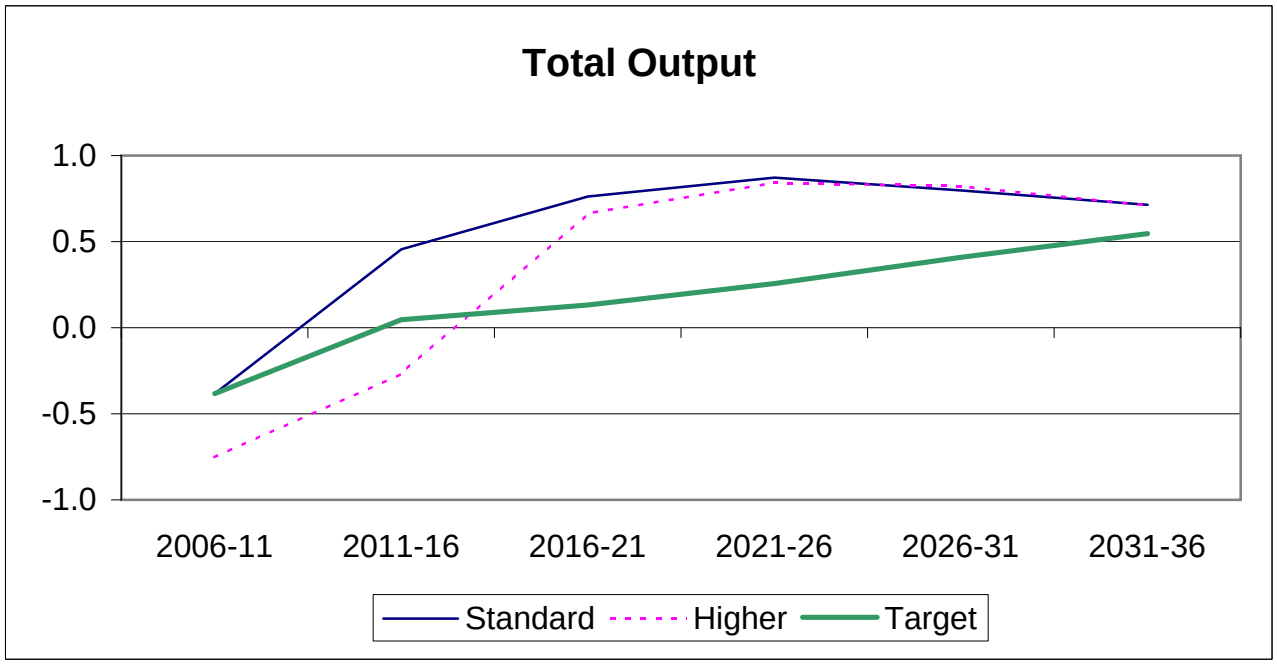
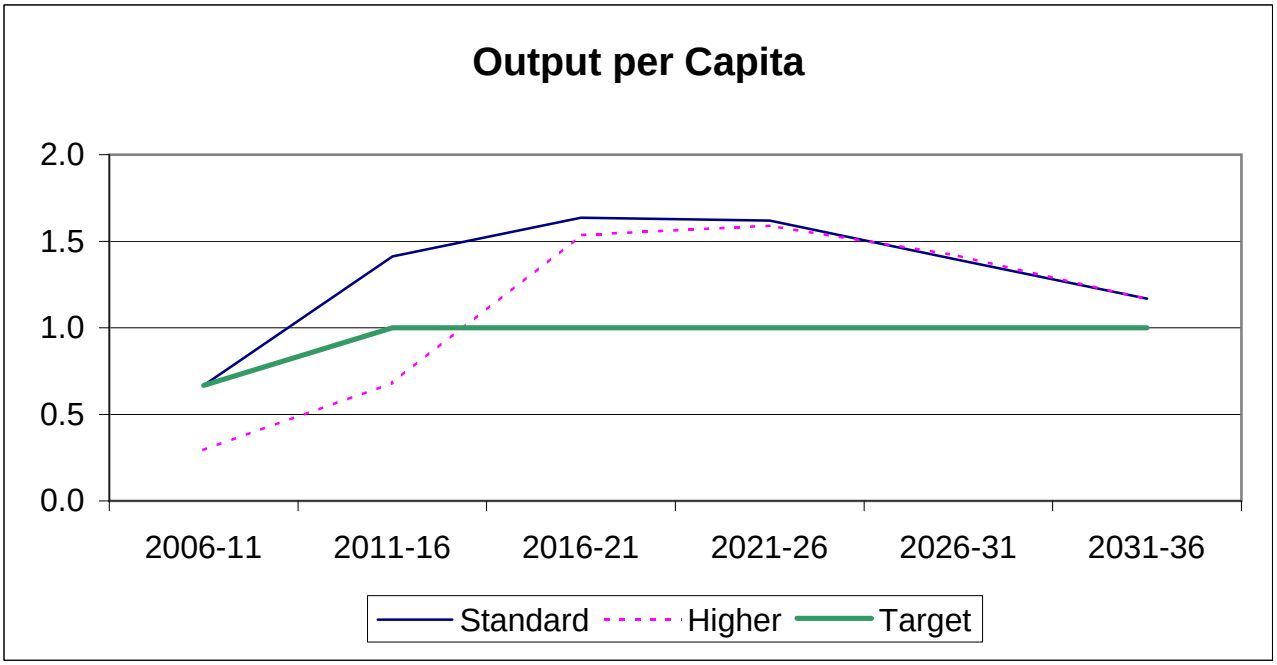


Figure 2: Average Annual Increases in Labour Productivity (Output/Labour Force) Required to Maintain 1 Percent Growth of Total Output and Output per Capita, 5-Year Periods, 2006-11 to 2031-36





Note: Standard, Higher, and Target refer to older-worker participation rate assumptions.

Table 1: Population, Canada, 1976-2036

Age	1976	1986	1996	2006	2016	2026	2036
				size (' 000)			
<55	19,483	20,997	23,495	24,562	25,102	25,575	26,068
55-74	3,212	4,040	4,625	5,970	8,366	9,739	9,737
75+	755	1,063	1,490	2,044	2,529	3,686	5,271
Total	23,450	26,100	29,610	32,576	35,997	39,000	41,076
				percent distribution			
<55	83.1	80.4	79.3	75.4	69.7	65.6	63.5
55-74	13.7	15.5	15.6	18.3	23.2	25.0	23.7
75+	3.2	4.1	5.0	6.3	7.0	9.5	12.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 2: Labour Force, Canada, 1976-2036 -- Standard Projection (Assumes 2008 Participation Rates Maintained for Ages 55+)

Age	1976	1986	1996	2006	2016	2026	2036
				size (' 000)			
<55	9,303	11,951	13,472	15,139	15,821	15,942	16,418
55+	1,189	1,322	1,382	2,454	3,544	3,779	3,786
Total	10,491	13,272	14,854	17,593	19,365	19,721	20,204
				percent distribution			
<55	88.7	90.0	90.7	86.0	81.7	80.8	81.3
55+	11.3	10.0	9.3	14.0	18.3	19.2	18.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 3: Labour Force, Canada, 1976-2036 -- Higher Participation Rates at Older Ages

Age	1976	1986	1996	2006	2016	2026	2036
				size (' 000)			
<55	9,303	11,951	13,472	15,139	15,825	15,947	16,422
55+	1,189	1,322	1,382	2,454	4,630	5,016	5,032
Total	10,491	13,272	14,854	17,593	20,455	20,962	21,454
				percent distribution			
<55	88.7	90.0	90.7	86.0	77.4	76.1	76.5
55+	11.3	10.0	9.3	14.0	22.6	23.9	23.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 4: Implications of Population and Labour Force Change for Productive Capacity and Economic Well-Being, 2006 - 2036, Assuming Constant Labour Productivity

	2006	2011	2016	2021	2026	2031	2036
Output							
- Standard	100.0	107.1	110.1	111.4	112.1	113.2	114.8
- Higher participation	100.0	109.2	116.3	118.2	119.2	120.2	121.9
- Target participation	100.0	107.1	112.3	117.3	121.7	125.3	128.2
Output/Population							
- Standard	100.0	101.7	99.6	96.5	93.6	91.8	91.1
- Higher participation	100.0	103.6	105.2	102.5	99.5	97.5	96.7
- Target participation	100.0	101.7	101.7	101.7	101.7	101.7	101.7
LF 55+ for target participation projection							
- Size (' 000)	2,454	3,099	3,934	4,886	5,468	5,827	6,138
- Percent of total	14.0	16.4	19.9	23.7	25.5	26.4	27.2

Table 5: Average Annual Increases in Labour Productivity (Output/Labour Force) Required to Maintain Specified Rates of Growth of Output and Output per Capita

Part Rate Assumption	Target Rate of Growth (%)	2006-11	2011-16	2016-21	2021-26	2026-31	2031-36
	Output						
Standard	0	-1.37	-0.54	-0.24	-0.13	-0.20	-0.28
	1	-0.38	0.46	0.76	0.87	0.80	0.71
	2	0.60	1.45	1.76	1.87	1.80	1.71
Higher	0	-1.74	-1.26	-0.33	-0.16	-0.18	-0.29
	1	-0.75	-0.27	0.66	0.84	0.82	0.71
	2	0.23	0.72	1.66	1.84	1.82	1.71
Target	0	-1.37	-0.94	-0.86	-0.74	-0.58	-0.45
	1	-0.38	0.05	0.13	0.26	0.41	0.55
	2	0.60	1.04	1.12	1.25	1.40	1.54
	Output/Population						
Standard	0	-0.33	0.41	0.63	0.61	0.39	0.17
	1	0.67	1.41	1.64	1.62	1.39	1.17
	2	1.66	2.42	2.64	2.62	2.40	2.17
Higher	0	-0.70	-0.31	0.53	0.58	0.41	0.16
	1	0.29	0.68	1.54	1.59	1.42	1.16
	2	1.29	1.68	2.54	2.60	2.42	2.17
Target	0	-0.33	0.00	0.00	0.00	0.00	0.00
	1	0.67	1.00	1.00	1.00	1.00	1.00
	2	1.66	2.00	2.00	2.00	2.00	2.00

Number	Title	Author(s)
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