Differences in Annual Work Hours per Capita between the United States and Canada

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The quickest way to get rich is to win the lotto; or to discover oil in Texas, in Alberta, or on the Grand Banks of Newfoundland, nickel in Labrador, water power in Northern Quebec, diamonds in the Northwest Territories, etc. But this occurs only at certain times and places. Most countries, most of the time, raise their standard of living through two channels: work more hours, or work smarter. Working smarter means increasing labour productivity by producing more output per hour worked. Working more hours means one of two things (or both): working in larger numbers, leading to a higher employment-to-total-population ratio; or supplying more hours per employed person, leading to a longer average work year.

Accordingly, the standard of living of a nation or region,[1] can be expressed as the product of three factors:

1) labour productivity (real GDP per work hour);
2) the length of the work year (annual work hours per employed person); and
3) the employment-to-total-population ratio (the fraction of total population in employment).

The objective of this paper is to focus on differences between Canada and the United States in the length of the work year and the employment-to-total-population ratio, whose product forms aggregate labour input or annual work hours per capita. To enrich this perspective, a regional dimension is also included. Comparisons between the United States and Canada are supplemented with data on the two largest Canadian provinces, Ontario and Quebec, which account for more than 60 per cent of the country's GDP.[2]

Relative Productivity and Labour Input Per Capita: Major Facts and Issues

Table 1 breaks down the 2001 standard of living of the two countries and the two largest Canadian provinces into its three components. It is immediately apparent that the two provinces enjoy similar levels of aggregate labour productivity — 87 per cent of U.S. level for Ontario and 88 per cent for Quebec.[3] However, measured living standards are different in the two provinces. In Ontario, the standard-of-living gap with the United States (-14 per cent) is about the same as the labour productivity gap (-13 per cent). This means Ontarians supply about as much work hours per capita annually as Americans. In contrast, the Quebec-U.S. standard-of-living gap

Table 1
Components of the Standard of Living, United States and Canada, 2001

Country or Province	Real output per hour (US=100) (1)	Work hours/ employed person (US=100) (2)	Employment/total-population ratio (US=100) (3)	Work hours per capita (US=100) (4)=(2)x(3)	Real income per capita (US=100) (5)=(1)x(4)	Real income per capita ($US) (6)
United States	100	100	100	100	100	34,450
Canada	90	91	103	94	85	29,190
Ontario	87	93	106	98	86	29,590
Quebec	88	88	99	87	77	26,470

Note: Real output (or income) is real gross domestic product expressed in constant U.S. dollars as based on purchasing power parity exchange rates for 2000. In these calculations, the national PPP exchange rate for Canadian dollars is set at 84 U.S. cents as of 2000, based on Statistics Canada's U.S.-Canada bilateral PPP calculations. For provincial PPP exchange rates, the starting point is Statistics Canada's estimates of retail price differentials as of October 1999. On a Canada = 100 basis, the price index is 108 for Toronto and 103 for Ottawa, giving a weighted average of 106 for Ontario. The only index available for Quebec is that of Montreal, which Statistics Canada puts at 95. Further assumptions on components of GDP other than private consumption finally lead to provincial GDP price-differential indexes of 105 for Ontario and 97 for Quebec. Combining this information with the national PPP estimate of 84 U.S. cents yields provincial PPP estimates of 80 U.S. cents for Ontario and 86.6 U.S. cents for Quebec. Total hours actually worked and employment are from the U.S. and Canadian monthly household surveys of the civilian noninstitutional population aged 16 and over in the United States, and 15 and over in Canada. In principle, official data for hours worked and employment should be adjusted for Canada-U.S. differences in the size of the military and institutionalized population, as well as in the definition of the working-age population. But the needed data for hours worked by these groups are not available. Alternative measures of hours can be drawn from the U.S. and Canadian monthly establishment surveys. This has the effect of lowering absolute hours levels in the two countries, but leaves relative levels almost unchanged. Estimates of total population are from the U.S. Bureau of the Census and Statistics Canada.

Sources: Statistics Canada; Bureau of Economic Analysis and Bureau of the Census, U.S. Department of Commerce; Bureau of Labor Statistics, U.S. Department of Labor.

(-23 per cent) is almost twice as large as the Quebec-U.S. labour productivity gap (-12 per cent). Quebecers supply fewer work hours per capita than Americans and Ontarians.

Expressing annual work hours per capita as the product of annual work hours per employed person and the employment-to-population ratio sheds greater light on differences between labour input in Ontario and Quebec. Near equality of Ontario and U.S. work hours per capita is the net outcome of two offsetting factors: (1) the fraction of the total population that have jobs is larger in Ontario than in the United States; but, (2) annual work hours per employed person are shorter in Ontario than in the United States. In contrast, these two factors do not offset but reinforce each other in Quebec: (1) a smaller fraction of the total population have jobs in Quebec than in Ontario; and, (2) annual work hours per employed person are shorter in Quebec than in Ontario.

All this raises two important issues about geographic differences in annual work hours per capita. First, why is the average work year shorter in Canada than in the United States, and what are the implications for societal welfare? And second, why is the employment-to-total-population ratio lower in the United States and Quebec than in Ontario?

The Shorter Work Year in Canada: Why, and So What?

Table 2 addresses the first question by presenting the detailed distribution of annual work hours underlying the average outcome reported

Table 2

Percentage Distribution of Work Hours of Employed Persons in Reference Weeks of Household Monthly Surveys, United States and Canada, Annual Average for 2001

Work hours		United States	Canada	Ontario	Quebec
0 hours		4	8	7	9
due to:	vacation	2.2	4.4	4.1	5.2
	illness	0.8	1.8	1.4	2.2
	obligations, etc.	1.1	1.7	1.6	1.5
1-29 hours		16	20	20	19
30-39 hours		14	24	23	30
40 hours		38	23	23	22
> 40 hours		28	25	27	20
Total		100	100	100	100
Average hours:					
weekly		37.6	34.4	34.8	33.1
annual		1,953	1,788	1,809	1,722
index (U.S.=100)		100	91	93	88

Note: Data are from the U.S. and Canadian monthly household surveys of the civilian noninstitutional population aged 16 and over in the United States, and 15 and over in Canada. Employed persons working zero hours during the survey reference week (i.e., not at work at all) are included in the distribution and in the calculation of average hours. Shorter hours arising from part-week absence from work (due to vacation, holiday, illness, personal or family obligations, maternity leave, bad weather, etc.) are incorporated directly into the hours distribution. Multiplying average weekly work hours calculated from this type of distribution by 52 therefore gives an estimate of average annual work hours per employed person. For Canada, Ontario and Quebec, the sub-distribution shown for employed persons working zero hours according to the reason they are not at work is that of paid workers (about 85 per cent of total employment), since it is the only one that is published. The average hours index shown in the bottom line is the same as in the second column of Table 1.

Sources: Statistics Canada; Bureau of Labor Statistics, U.S. Department of Labor.

in the second column of Table 1 for each geographic unit. These distributions suggest four differences between the United States and Canada. First, complete absence from work in survey reference weeks (due to vacation, illness, various obligations, etc.) is twice as common in Canada as in the United States. On average in 2001, only 4 per cent of employed persons were not at work in the United States, compared to 8 per cent in Canada. Second, while in the United States the standard work week is strongly concentrated at 40 hours, in Canada it is at least as likely to be found in the 30-39-hour interval as at 40 hours. Standard work weeks of 32.5, 35 and 37.5 hours are much more common in Canada, and particularly so in Quebec. Third, while work weeks in excess of 40 hours occur almost as frequently in Ontario as in the United States, such long hours are far less common in Quebec. Fourth, part-time work of less than 30 hours per week is somewhat more frequent in Canada than in the United States — but not much so.

In sum, Canadians enjoy shorter standard work weeks and are more often found to be absent from work than Americans, and work weeks in excess of 40 hours are particularly unpopular in Quebec.[4] All this puts Canada's annual work hours per employed person somewhere between the U.S. and European levels, with Ontario closer to the United States, and Quebec closer to Europe. In 2001, annual work hours per employed person were 93 per cent of U.S. level in Ontario, 88 per cent in Quebec and 82 per cent on average in the European Union.[5]

It was not always so. As shown in Chart 1, in the mid-1960s employed persons worked longer annual hours in Canada than in the United States. Annual hours dropped in both countries between 1965 and 1982, but much more in Canada (-14 per cent) than in the United States (-9 per cent). Since 1982, the length of the work year has changed little in Canada, but has risen cumulatively by 5 per cent in the United States.

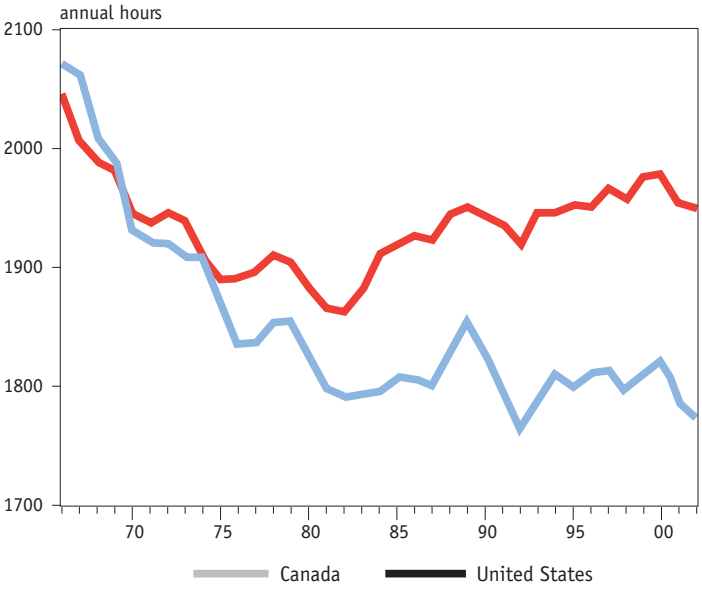
What are the implications of these developments for societal welfare? Shorter work weeks and longer and more frequent absence from work clearly reduce real income per capita. However, the increase in leisure time supports greater interaction with family and friends, more freedom from congestion and pollution, more involvement in time-consuming cultural and sporting activities, etc. These benefits procured by working less hours provide an offset to the decrease in welfare that the real income reduction represents. In a classical laissez-faire context where decisions about work and leisure are the result of individual free choice, the leisure gain must have the same welfare value as the income loss.

However, in real-world environments, those decisions are partly the outcome of collective action through governments and labour unions, and therefore sometimes seem imposed on individuals instead of reflecting their voluntary decisions. Further, while the idea that U.S. labour markets are unregulated is patently false, the involvement of governments and unions does seem to be more extensive in Canada than in the United States.[6] We know, for example, that during the 1965-1980 period of rapidly falling annual work hours per employed person in Canada, provincial governments were very active in introducing restrictive overtime legislation, longer vacations and more holidays in labour standards, and that unions were successful in seeking shorter work weeks and longer vacations for their members.[7]

Does this mean that the reduction of annual work hours per employed person that has occurred in the two countries since the mid-1960s has translated into a larger drop in societal welfare in Canada than in the United States? Not necessarily so. The reason is that work and leisure are, to a very large extent, based on interaction between humans. The value of work generally depends on how much workers can interact with one another within and across firms and organizations, and therefore on how much time they spend collectively on the job. The same remark applies to leisure: its value depends on how much people can interact with one another within families and groups of friends, and therefore on how much time they themselves spend collectively at home.

The interactive nature of work and leisure means that allocating time between them based on individual decisions exempt from any collective input could make everyone worse-off. The blind rat race could drive us to work too much. As a result, the greater extent of collective decision-making in Canada than in the United States could have the effect of increasing the welfare of Canadians relative to Americans. Admittedly, the

Chart 1
Average Annual Work Hours Per Employed Person, United States and Canada, 1966-2002



Sources: Statistics Canada; US Bureau of Labor Statistics.

Table 3
Components of the Employment-to-Total-Population Ratio, United States and Canada, 2001

Country or province	Employment/ working-age population (US=100)	x	Ratio Working-age population/ total population (US=100)	=	Employment/ total population (US=100)
United States	100		100		100
Canada	96		107		103
Ontario	99		107		106
Quebec	91		109		99

Note: Data on employment and working-age population are from the U.S. and Canadian monthly household surveys of the civilian noninstitutional population aged 16 and over in the United States, and 15 and over in Canada. Estimates of total population are from the U.S. Bureau of the Census and Statistics Canada. The third column of this Table replicates the third column of Table 1.

Sources: Statistics Canada; Bureau of Labor Statistics, U.S. Department of Labor; Bureau of the Census, U.S. Department of Commerce.

true importance of the interactivity argument is not known with certainty, and there could be, on the other hand, too much collective decision-making in Canada. But one cannot dismiss on logical grounds the possibility that shorter work hours have increased welfare on net in Canada and, conversely, that average work hours are too long in the United States.

Where Do Geographic Differences in Employment Rates Come From?

The second question raised by Table 1 — again, aside from lower productivity in Canada — is: why do employment-to-total-population ratios differ between geographic areas? More specifically, what explains the fact that the 2001 employment-to-total-population ratio was lower in the United States and Quebec than in Ontario?

An important part of the answer is purely demographic: there are significant differences in the relative weight of children (i.e., the 0-to-14/15 age group) across geographic areas. Owing to its higher birth rate, the United States has a higher proportion of children than Canada. Since children do not participate in the labour force, the employment-to-total-population ratio is dampened in the United States relative to Canada.

Table 3 clarifies the quantitative importance of this phenomenon. The 2001 employment-to-total-population ratio of each geographic unit is expressed as the product of the employment-to-working-age-population ratio and the working-age-to-total-population ratio. The working-age-to-total-population ratios are found to be 107 per cent of U.S. level in Ontario and 109 per cent in Quebec. The demographic situation per se reduces the measured standard-of-living gap between the United States and Canada below what it would otherwise be. Equivalently, Ontario and Quebec are made "richer" by the fact that they have more adults to put to work and less children to feed than the United States.

Calculating the standard of living as the ratio of real GDP to total population clearly exaggerates the purchasing power loss from having a larger child population for two reasons. First, children consume less than adults. Sophisticated measures of living standards adjust family size according to a consumption equivalence scale which gives children only a fraction of the weight of adults.[8] Second, in a world of free choice and perfect foresight, having more children is a particular expression of preferences in the use of household income. Just as in the case of the income-leisure choice, the gain from parenthood must have the same societal welfare value as the accompanying income reduction. If so, children should be excluded from the measurement of living standards, and real GDP should be divided by the adult (or working-age) population, not total population.

This adjustment is, of course, too extreme. The real world is not one of perfect foresight. When young parents decide on whether to have

a baby, they often have no idea of the "joy" of coping with their future teenagers twelve to eighteen years later. Nevertheless, there is no escape from the conclusion that the straight calculation of the standard of living as the ratio of real GDP to total population must lead to a significant underestimate of societal welfare in the United States relative to that in Canada.

In addition to this demographic difference between the United States and Canada, there are also differences in employment-to-working-age-population ratios. Table 3 shows that the employment-to-working-age-population ratio is smaller on average in Canada than in the United States.[9] An important reason is that Canadian workers retire earlier than American workers. This is shown in Table 4, which compares the age-specific employment-to-population ratios of the two countries in 2001. U.S. and Canadian ratios are very similar for ages up to 54, but for older age groups Canadian ratios are significantly smaller. This phenomenon could in principle be a cohort effect associated with later entry of Canadian women into the labour force. But, in fact, it is not. Female labour force participation rates in the 25-54 age bracket has been very similar in the two countries over the last two decades. The "Freedom 55" concept seems more popular in Canada.

Recent evidence suggests that Canadian income security programs contain stronger incentives for early retirement than U.S. programs do. A study by Coile and Gruber (2000) has shown that U.S. workers begin to lose money on average if they retire past age 64, while another study using the same methodology by Baker, Gruber and Milligan (2001) has found that Canadian workers begin to lose money if they retire past age 60.

It is not known to what extent this difference in incentives between the two countries reflects a true international difference in preferences mediated through governement action, and to what extent it is the unintended consequence of distortionary work disincentives in the Canadian income security system. This is important to clarify for at least two reasons. First, this information is needed for a proper assessment of how much of the smaller employment-to-working-age-population ratio in Canada constitutes a genuine reduction in societal welfare. Second, it is required knowledge for policies attempting to cushion the future economic effects of population aging. Now that the first cohorts of baby-boomers are more than 55 years old, both the economy and income security programs have begun to suffer from the severe downward pressure on Canada's employment-to-working-age-population ratio.

Table 3 also underlines important provincial differences in employment-to-working-age-population ratios. With a relative score of 99 on this account, Ontario is seen to employ about the same fraction of its working-age population as the United States. But Quebec's score of 91 suggests a much weaker relative employment performance in that province. Why does Quebec

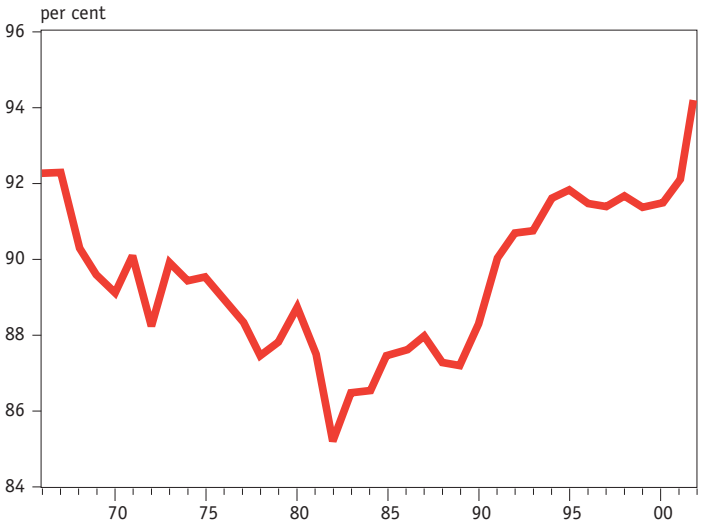
Table 4
Age-specific Employment-to-Population Ratios, United States and Canada, 2001

Age group	United States (per cent)	Canada (per cent)	Canada/US (US=100)
15/16-24	57.8	56.4	98
25-54	80.6	79.8	99
55-59	67.0	59.0	83
60-64	47.5	34.8	73
65 and over	12.7	5.8	46
All working ages	63.8	61.2	96

Note: Data on employment and working-age population are from the US and Canadian monthly household surveys of the civilian noninstitutional population aged 16 and over in the United States, and 15 and over in Canada. The value of 96 for the Canada-US relative employment-to-working-age-population ratio at the bottom of the third column is the same as the index number for Canada in the first column of Table 3.

Sources: Statistics Canada; Bureau of Labor Statistics, US Department of Labor.

Chart 2
Employment-to-Working-Age-Ropulation Ratio, Quebec as a Percentage of Ontario



Source: Statistics Canada.

employ a smaller fraction of its adult population than the United States and Ontario? The short answer is because it is still in the process of catching up with the others. Evidence of this ongoing process is summarized in Chart 2, which traces Quebec's employment-to-working-age-population ratio relative to Ontario's back to the mid-1960s. The time path followed by Quebec's relative employment rate over this 35-year period is V-shaped. There is, first, a large drop from 1966 to 1982, and then a strong recovery from 1982 to 2002.

What happened? Basically, the 1965-1980 period saw rising union power and militancy, very difficult industrial relations, and sharply accelerating real wages, reaching up to 10 per cent above Ontario real wages during 1978-1982. The entirely predictable macroeconomic outcome was falling relative employment, rising relative unemployment, increasing capital/labour ratios, high average labour productivity, and declining capital formation. All these were observed during the period.

Following the 1982 recession, under rank-and-file pressure labour union made a startling about-face in their policies. They changed abruptly from extracting maximum wages to chasing maximum job security. As a result, over the last two decades Quebec has been a model of industrial peace, wage moderation, and relative employment growth. Days lost due to labour disputes have fallen below the national average, real wages relative to Ontario have declined, capital/labour ratios and labour productivity have returned to sustainable levels, the pace of capital formation per capita has accelerated and exceeded Ontario's, relative employment has increased, and relative unemployment has declined.[10]

In sum, Quebec's relatively weak employment level is an instantaneous picture taken along an ongoing process of learning, change and convergence. To understand the full story, one needs to view the film, not only look at the photograph.[11]

Implications for Societal Welfare and Policy

What is the societal welfare significance of differences in labour input per capita between the United States and Canada? The fairest answer is that we do not know for sure. First, the length of the work year is shorter in Canada than in the United States. But it is not known whether the additional leisure time enjoyed by Canadians increases or decreases their well-being on net relative to Americans.

Second, U.S. real GDP per capita is held down by the fact that the (non-working) child population is larger in the United States than in Canada. But it is hard to determine how much of an offset the greater satisfaction from having children in the United States provides to the purchasing power loss incurred by their parents.

Third, Canadians retire earlier than Americans. But the net societal welfare significance of this phenomenon is also unclear. It could be a faithful reflection of Canada-U.S. dif-

ferences in individual preferences, but it could also partly be the outcome of poor design of income security programs in the two countries.

Fourth, the relatively lower employment rate in Canadian provinces such as Quebec is not entirely involuntary. Undoubtedly, it results largely from some residual lack of employment opportunities, and is welfare-reducing to that extent. But by exactly how much is uncertain.

What policy prescriptions come out of this analysis? Focusing on means of raising labour input per capita, two types of policies at least suggest themselves naturally. First, take a hard look at possible work disincentives inherent in Canada's income security system. Second, keep fighting excess unemployment by the standard means: more and better education and training, freer trade and competition, better incentives for innovation and capital formation, continued industrial peace and wage moderation, and a stable macroeconomic environment. This policy package also has the "side-benefit" of helping to increase productivity itself.

Notes

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1 Defined as real gross domestic product (GDP) per capita. A more sophisticated measure would be net national product (NNP) per adult equivalent. This would exclude capital consumption and net payments of investment income to foreigners, and would count people in terms of a consumption equivalence scale. GDP is deflated by its own price index. Thus, real GDP measures the volume of output. Deflation by the price index for final domestic demand would, more appropriately, reflect the purchasing power of nominal income.

2 An obvious extension would be to compare the two Canadian provinces to neighbouring U.S. regions such as the Northeastern and Midwestern states. Unfortunately, U.S. regional data on hours worked are not available.

3 That Quebec's productivity level is as high as Ontario's comes as a surprise. This results from taking provincial differences in the aggregate price level into account, which few studies care to do. Also surprising is the fact that the estimated productivity level for Canada as a whole (90 per cent of U.S. level) is higher than that for Central Canada (88 per cent). This is largely due to the very high productivity level for the Province of Alberta (114 per cent of U.S. level), where resource extraction is highly capital-intensive.

4 It is interesting to observe here that part-time work refers to a less-than-35-hour work week according to the U.S. Bureau of Labor Statistics, but to a less-than-30-hour work week according to Statistics Canada.

5 This assumes the average employed European worked 1,609 hours in 2001, an estimate based on Bart van Ark (2002).

6 It is even more extensive in Europe. For recent assessments, see Richard B. Freeman (2000) and Robert J. Gordon (2002).

7 For an account and analysis of these events in Quebec, see Pierre Fortin (1980).

8 Statistics Canada (2002) gives a child under 16 30 per cent of the consumption weight of an adult.

9 In what follows, I refrain from decomposing the employment-to-working-age-population further into the product of the employment-to-labour-force ratio (which is equal to one minus the unemployment rate) and the labour-force-to-working-age-population ratio (which is the labour force participation rate). These concepts are too intermingled. Labour force participation and unemployment are both very sensitive to employment opportunities and various types of policy intervention. For recent Canadian evidence, see Pierre Fortin and Mario Fortin (1999).

10 The Quebec-Ontario unemployment rate differential averaged 4 points between 1977 and 1990. It came down to 2.5 points in the early 1990s, and dropped below 2 points in 2002.

11 A more in-depth comparative analysis of contemporary trends in Quebec's standard of living can be found in Pierre Fortin (2001). Changes in union behaviour have not been the only factor in the recovery of Quebec employment. The accelerated (belated) entry of women into the labour force, and rising relative levels of schooling have also been instrumental. Canada's Atlantic provinces have shared in these trends, and have also experienced a marked improvement in their employment performance relative to Ontario since the mid-1980s.

References

Baker, Michael, Jonathan Gruber and Kevin Milligan (2001) "The Retirement Incentive Effects of Canada's Income Security Programs," Working paper No. 8658, December (Cambridge, Mass: National Bureau of Economic Research).

Coile, Courtney and Jonathan Gruber (2000) "Social Security and Retirement," Working paper No. 7830, August (Cambridge, Mass: National Bureau of Economic Research).

Fortin, Pierre (1980) "Les conditions minimales de travail : leurs conséquences économiques," in Laurent Bélanger et al. (eds.), *La détermination des conditions minimales de travail par l'État* (Quebec City: Presses de l'Université Laval), pp. 125-139.

Fortin, Pierre (2001) "Has Quebec's Standard of Living Been Catching Up?" in P. Grady and A. Sharpe (eds.) *The State of Economics in Canada: Festschrift in Honour of David Slater* (Montreal: McGill-Queen's University Press), pp. 381-402.

Fortin, Pierre and Mario Fortin (1999) "The Changing Labour Force Participation of Canadians, 1969-96: Evidence from a Panel of Six Demographic Groups", *Canadian Business Economics* 7, May, pp. 12-24.

Freeman, Richard B. (2000), "The US Economic Model at Y2K: Lodestar for Advanced capitalism?" *Canadian Public Policy* 26, Special Supplement, July, pp. S187-S200.

Gordon, Robert J. (2002) "Two Centuries of Economic Growth: Europe Chasing the American Frontier," Unpublished paper, Department of Economics, Northwestern University, October (http://faculty-web.at.northwestern.edu/economics/gordon).

Statistics Canada (2002) *Income Trends in Canada 1980 to 2000: User's Guide*, Cat. No. 13F0022XCB, November.

van Ark, Bart (2002) "Understanding Productivity and Income Differentials among OECD countries: A Survey," in A. Sharpe, F. Saint-Hilaire and K. Banting (eds.), *The Review of Economic Performance and Social Progress 2002: Toward a Social Understanding of Productivity* (Montreal: Institute for Research on Public Policy and Ottawa: Centre for the Study of Living Standards), pp. 69-92.