

A Regional Perspective on the Canada-US Standard of Living Comparison

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Introduction

This article presents a comparison of standards of living between Canadian provinces and US States. Most comparisons with the United States focus on the national perspective while provincial analyses are essentially restricted to the domestic context. This study extends the scope of the exercise to the regional level since the relative performance of the provinces varies significantly and, therefore, the challenges raised by the greater integration of the North-American market are also likely to differ. The comparison focuses on standards of living with a special emphasis on labour productivity.

The article is divided as follows. First, we present our framework of analysis and discuss issues related to the comparison of productivity and standard of living at regional levels between the two countries. We then move to the discussion of standard of living and productivity. Each of these sections presents separately an analysis of US states, Canadian provinces and a comparison of both provinces and states. The paper concludes with a brief review of the main results.

1. Framework of Analysis and Empirical Issues

1.a Framework of Analysis

Standard of living is best measured through real GDP per capita as it encompasses all earnings accrued to residents of a country. The standard of living can be expressed as:

$$(1) \text{ GDP/POP} = \text{GDP/E} * \text{E/POP}$$

where

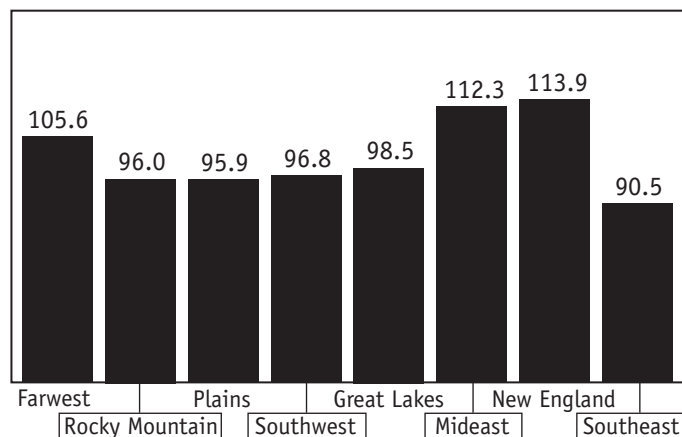
GDP/POP: Real GDP per Capita or Standard of Living

GDP/E: Labour Productivity (Real GDP per Worker)

E/POP: Employment Rate or the proportion of the population that is working

The framework of analysis is relatively simple and states that real income per capita is determined by the productivity of workers as well as the proportion of the population at work. A high level of productivity and a large proportion of the population at work will result in a high standard of living.

Figure 1:
Standard of Living, US regions, 1995-1997
(US=100)



Source: Bureau of Economic Analysis, Bureau of Labor Statistics and Statistics Canada

1.b Empirical issues

Comparing standards of living and labour productivity for the 10 provinces and 50 states raises serious challenges in terms of data requirements. These measures are based on three variables: real gross domestic product, population and employment. Standard of living is measured through real GDP per capita and labour productivity through real GDP per worker.

In order to make valid comparisons with US data, real output is measured as GDP at market prices, which, because of data constraints in Canada related to the market price measure, restricts the comparison exercise to the 1992-1997 period. US data have been obtained from three different sources. Gross State Product (GSP) in constant 1992 dollars were taken from the Bureau of Economic Analysis while population and employment data were obtained from the Bureau of the Census and the Bureau of Labor Statistics respectively. Canadian data are derived from Statistics Canada's Provincial Economic Accounts, Labour Force Survey and Population estimates. US real GDP is expressed in Canadian dollar terms by using the Purchasing Power Parity value of the exchange rate for 1992 (\$1.23 according to Statistics Canada).

US real GDP is available on a 1992-chained dollars basis and components are not strictly additive, especially for years far away from the base period.¹ For the period under consideration (1992-1997) which is close to the 1992 base year, however, GSP estimates are nearly additive. This allows us to calculate the relative performance of individual states in comparison to the US national average. Finally, comparisons, at both national and international levels, are calculated using an average of the three most recent years (1995 to 1997) in order to obtain more robust estimates.

Data constraints at the regional/state levels and the presence of significant cost-of-living differences across US states² and provinces impose some limitations on the interpretation of the results. Since US nominal GSP is deflated using producers prices rather than some expenditures-based deflators and since differences between production and consumption measures can be large at the state level, productivity comparisons are less affected by these considerations than standard of living.

2. Standards of Living

US Regions

Real GDP per capita varies significantly across states: real GDP per capita in Delaware, the highest income state, is nearly twice that of Mississippi, the lowest income state. Figure 1 shows the relative level of regional real GDP per capita (US national average =100) over the period 1995-1997 using the US Bureau of Economic Analysis' classification. Three out of eight regions recorded above-average standards of living: New England, Mideast and Farwest, all regions that have extensive trade links with Canada. The Great Lakes, Plains and Rocky Mountain regions' standards of living were

slightly below-average, while it was as much as 10% below-average in the Southeast.

Real GDP per capita also varies significantly within US regions. The relative standing of a region is determined by its concentration of high and low income states. For example, in New England, real GDP per capita ranges from 20% below the national average in Maine to 32% above in Connecticut. High income regions include a greater number of states with standards of living well above the US average. Connecticut, Massachusetts and New Hampshire account for New England's strong performance, more than offsetting the weakness of Maine and Vermont. The Mideast's standard of living is supported by Delaware, New York and New Jersey while California is raising the Farwest's standard of living, followed by Nevada and Hawaii.³

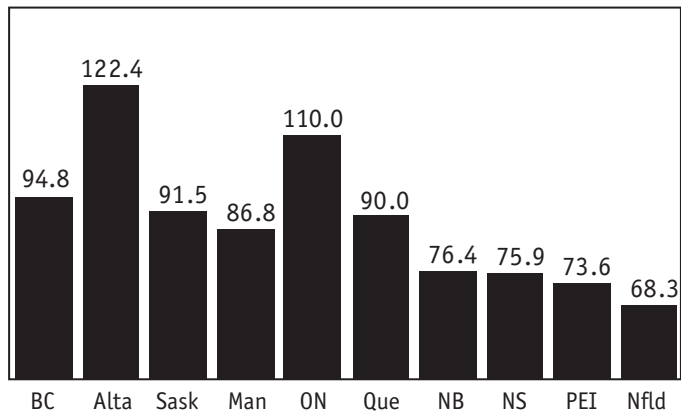
Regions with average standards of living below that of the US still conceal a few high income states. In the Great Lakes, the strong standing of Illinois, with real GDP per capita nearly 10% above the national average, is offset by under performers such as Michigan and Indiana while Minnesota is driving up the Plains' standard of living. In Rocky Mountain states, the weak performance of Montana, Idaho and Utah is offsetting that of Wyoming and Colorado.

Texas is the only Southwest state to post above-average real GDP per capita. Mississippi, West Virginia, Arkansas, Alabama and South Carolina are behind the Southeast's low standard of living, largely offsetting the positive effect of Virginia and Georgia.

Canadian Provinces

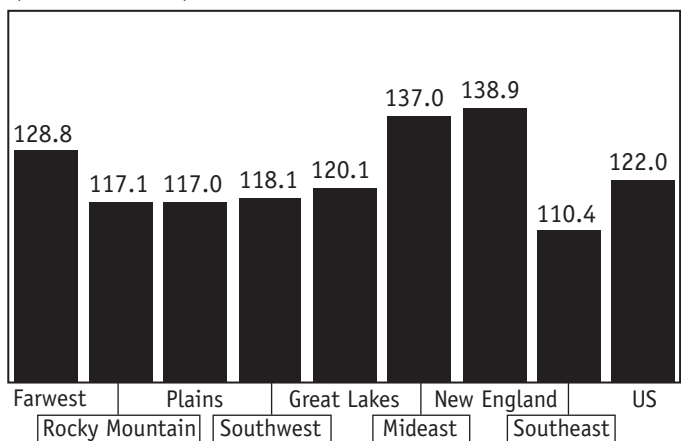
Standards of living vary less across provinces than among US states. Although this reflects different economic profiles between provinces and states, it is also related to the presence of federal transfers to the provinces, such as the equaliza-

Figure 2:
Standard of Living, Canadian provinces, 1995-1997
(Canada = 100)



Source: Statistics Canada

Figure 3:
Standard of Living, 1995-1997 average
(Canada = 100)



Source: Bureau of Economic Analysis, Bureau of Labor Statistics and Statistics Canada

tion program, which tend to reduce regional disparities.

Standards of living are generally highest in provinces west of Quebec. These provinces tend to be more productive and also have a higher proportion of their population at work. Alberta ranks first with real GDP per capita more than 20% above the national average, followed by Ontario. The standard of living is next highest in British Columbia, Saskatchewan and Quebec. It is lowest in Newfoundland, at about 30% below the national average, behind Prince Edward Island, Nova Scotia and New Brunswick.

Table 1 Rankings of Canadian Provinces and US States Average Standard of Living, 1995-1997, Canada=100

1	Delaware	169.8	31	Michigan	113.4
2	Alaska	167.9	32	New Mexico	113.0
3	Connecticut	161.1	33	Tennessee	112.1
4	Wyoming	154.6	34	Rhode Island	111.9
5	New Jersey	146.9	35	Kansas	110.8
6	Massachusetts	144.5	36	South Dakota	110.6
7	New York	144.0	37	Ontario	110.0
8	Nevada	137.5	38	Arizona	108.3
9	Illinois	133.8	39	Vermont	106.9
10	Hawaii	132.3	40	Kentucky	106.2
11	New Hampshire	130.9	41	Utah	105.8
12	California	129.6	42	Florida	104.7
13	Colorado	129.4	43	Idaho	102.6
14	Minnesota	127.4	44	South Carolina	101.8
15	Virginia	127.1	45	North Dakota	101.2
16	Texas	125.1	46	Alabama	97.4
17	Georgia	123.9	47	Maine	97.3
18	Alberta	122.4	48	Arkansas	95.2
19	North Carolina	122.3	49	British Columbia	94.8
20	Washington	121.7	50	Oklahoma	93.8
21	Oregon	120.4	51	Saskatchewan	91.5
22	Nebraska	120.2	52	Quebec	90.0
23	Maryland	119.7	53	Montana	88.8
24	Ohio	116.8	54	West Virginia	88.5
25	Wisconsin	115.6	55	Mississippi	88.0
26	Iowa	115.0	56	Manitoba	86.8
27	Louisiana	114.7	57	New Brunswick	76.4
28	Pennsylvania	114.4	58	Nova Scotia	75.9
29	Missouri	113.9	59	Prince Edward Island	73.6
30	Indiana	113.7	60	Newfoundland	68.3

US-Canada Standards of Living Comparison

When US real GDP per capita is expressed in Canadian currency, using the 1992 PPP, the US standard of living is, on average, 22% higher than that of Canada.⁴ This aggregate number conceals, however, a few important facts. First, Figure 3 shows that all US regions post standards of living well above the Canadian average. Second, the gap with respect to the highest income region, New England, reaches up to 40%. Third, the lowest US region, the Southeast, has a standard of living still 10% above the Canadian average.

Only seven states (Table 1) recorded standards of living below the Canadian average. Except for Maine, they all come from low-income regions,

particularly the Southern States. The standard of living is more than 25% higher than the Canadian average in a third of the states — and is more than 50% higher in Delaware, Alaska, Connecticut and Wyoming.

Relative to their US counterparts, Canadian provinces tend to rank at the lower end of the spectrum. Alberta records the best performance, in 18th place, followed by Ontario (37th), British Columbia, 49th, Saskatchewan, 51th and Quebec, 52th. All other provinces rank below Mississippi, the state with the lowest standard of living in the US.

Table 2 Rankings of Canadian Provinces and US States Productivity,
1995-1997, Canada=100

1	Alaska	163.8	31	Arizona	106.4
2	Delaware	156.2	32	<i>Ontario</i>	106.2
3	Connecticut	149.5	33	Florida	105.4
4	New York	148.9	34	Nebraska	103.9
5	Wyoming	141.6	35	Indiana	103.2
6	New Jersey	139.7	36	Missouri	102.9
7	Massachusetts	133.0	37	Kansas	102.3
8	Hawaii	131.4	38	Utah	101.2
9	California	131.2	39	West Virginia	100.7
10	Nevada	127.2	40	South Dakota	99.6
11	Illinois	126.1	41	Iowa	99.4
12	Louisiana	123.8	42	Wisconsin	98.5
13	Texas	120.1	43	South Carolina	98.4
14	New Mexico	119.3	44	Alabama	96.8
15	Virginia	119.3	45	Idaho	96.3
16	Georgia	117.3	46	Arkansas	95.0
17	New Hampshire	114.9	47	Oklahoma	94.8
18	North Carolina	114.7	48	<i>British Columbia</i>	94.2
19	Washington	114.0	49	<i>Quebec</i>	93.8
20	Pennsylvania	113.8	50	Vermont	93.5
21	Colorado	112.4	51	Mississippi	93.1
22	Ohio	112.0	52	<i>Saskatchewan</i>	92.6
23	<i>Alberta</i>	111.4	53	<i>Newfoundland</i>	91.7
24	Oregon	110.6	54	North Dakota	90.3
25	Rhode Island	109.7	55	Maine	89.7
26	Michigan	109.4	56	<i>Manitoba</i>	86.0
27	Minnesota	108.8	57	Montana	85.1
28	Kentucky	107.1	58	<i>New Brunswick</i>	84.5
29	Tennessee	106.7	59	<i>Nova Scotia</i>	84.4
30	Maryland	106.6	60	<i>Prince Edward Island</i>	77.1

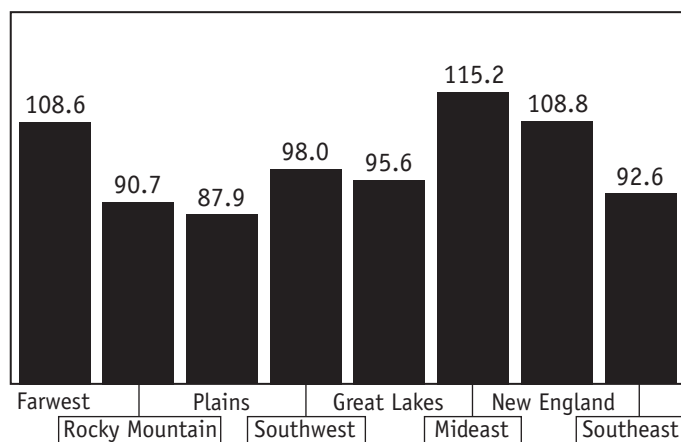
3. Productivity

US Regions

As for standards of living, there are significant differences in productivity⁵ levels across US states. Figure 4 shows that three out of eight regions record above-average productivity: Mideast, New England and Farwest. Not surprisingly, these regions also posted the highest standards of living, indicating that productivity is the main driving force behind the standard of living.⁶ In other regions, productivity is below the US average — it falls more than 10% below-average in the Plains region.

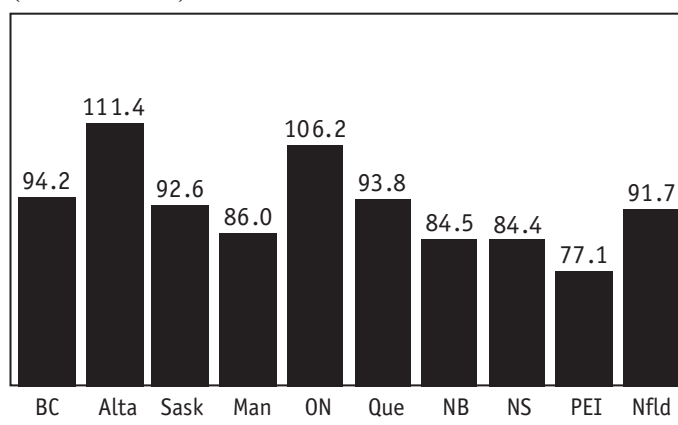
The high-productivity regions, as in the case of standard of living, are comprised of highly productive states which more than offset the weaker performance of a few low-productivity states. The most productive US region — the Mideast — records a productivity level 15% above the national average, supported by Delaware, New York and New Jersey. New England's high productivity standing lies on the strong performances of Connecticut and Massachusetts. High productivity levels are widespread across Farwest states, with only Oregon and Washington posting productivity below the region's average.

Figure 4:
Productivity*, US regions, 1995-1997
(US=100)



* Labour Productivity
Source: Bureau of Economic Analysis, Bureau of Labor Statistics

Figure 5:
Productivity*, Canadian provinces, 1995-1997
(Canada = 100)



* Labour Productivity
Source: Statistics Canada

Regions with productivity levels below the US average have a greater concentration of low-productivity states although they all conceal a few highly productive ones. Southwest's productivity is supported by Texas and New Mexico. In the Southeast, Louisiana and Virginia are raising the region's average, partly offsetting the impact of low productivity states such as Mississippi, Arkansas and Alabama. In the Great Lakes, Illinois is holding up the regional average while Wyoming and Colorado are the driving force of the Rocky Mountain region. Low productivity is widespread across Plains states.

Canadian Provinces

Productivity rankings in Canada are also very similar to those for standard of living, highlighting the importance of the level of productivity as a fundamental determinant of the standard of living. Moreover, the gap among provinces is somewhat smaller for productivity compared to standard of living, reflecting that high-productive provinces tend also to be advantaged by a higher employment-population ratio. Newfoundland perhaps is the only exception to this general trend as the deterioration of its ranking from productivity (sixth) to standard of living (tenth) reflects a very low employment-population ratio.

Alberta records the best productivity performance, followed by Ontario. Productivity is next highest in British Columbia, Quebec and Saskatchewan. Manitoba's productivity is the weakest among western provinces, at more than 10% below the Canadian average. Atlantic provinces post productivity levels below the national average: the productivity level in PEI is more than 20% below the Canadian average.

US-Canada Productivity Comparison

Overall, US states are about 18% more productive than their Canadian counterparts (Figure 6), slightly below the 22% gap in the case of standard of living.⁷ All US regions recorded productivity levels above the Canadian average over the 1995-1997 period with the gap ranging from a low of 3% in the Plains to a high approaching 40% in the Mideast. The gap is particularly high compared to Mideast, New England and Farwest, all regions that have strong traditional links with Canada.

Table 2 shows the relative ranking of Canadian provinces and US states. Only thirteen states, located largely in Southern and Rocky Mountain areas, registered productivity below the Canadian average in 1995-1997. At the exception of Alberta and Ontario, which record

again the best performance within Canada, (23th and 32th place respectively), other provinces ranked at the lower end of the spectrum. This table also emphasizes the large differences in productivity levels among US states. For example, productivity in Alaska and Delaware is nearly double that of Montana, the least productive state.

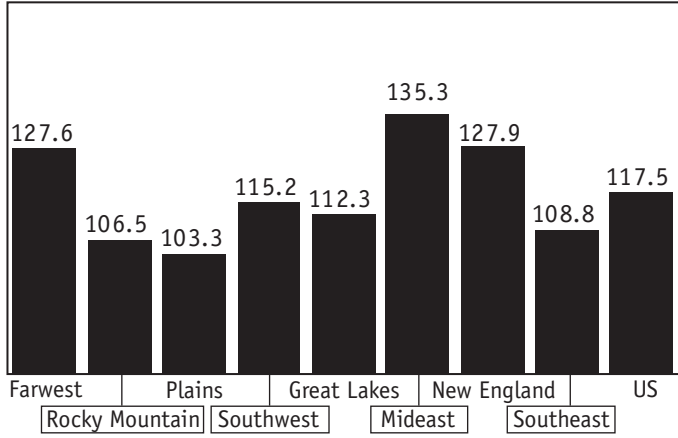
We tested the ranking of productivity with that of standard of living to assess the importance of productivity in determining standard of living in a North-American context (Table 1 versus Table 2). Not surprisingly, we found the Spearman rank correlation coefficient to be high (0.92) and significant, indicating a very strong relationship between the two variables for all jurisdictions in North America.

Conclusion

This comparative exercise has revealed that Canada’s regions all face, albeit to varying degrees, income and productivity gaps vis-à-vis the US. Standards of living of Canadian provinces are well behind those of US states. In fact, the best Canadian performer, Alberta, ranks 18th among the 60 states and provinces, followed by Ontario in 37th place. Most Canadian provinces are concentrated at the bottom of the list.

Our results also show that productivity is the predominant factor explaining income gaps among provinces and states, a conclusion that supports findings at the national level. Differences in employment rates play a limited role in explaining these gaps and, therefore, do not influence final rankings. A similar picture to that of standard of living emerges from the productivity comparison: except for Alberta and Ontario, provinces are ranked at the bottom end.

Figure 6:
Productivity*, 1995-1997 average
(Canada=100)



* Labour Productivity
Source: Bureau of Economic Analysis, Bureau of Labor Statistics and Statistics Canada

Notes

- * This article is based on "A Regional Perspective on the Canada-US Standard of Living," Occasional Paper Number 22, Industry Canada, February 2000. The authors wish to thank Richard G. Harris, Someshawr Rao and Shane Williamson for helpful comments. The views expressed in this paper reflect those of the authors and should not be attributed to Industry Canada. Martine Lajoie has joined the Privy Council Office. Email address: letourneau.raynald@ic.gc.ca
- 1 For more details on the estimation of chained-1992 dollars GSP estimates, see Friedenber and Beemiller (1997).
 - 2 For example, see Engel C. and J. H. Rogers, Violating the Law of One Price: Should We Make a Federal Case Out of It, NBER, Working Paper 7242, July 1999. Nevertheless, the authors found that law of one price deviations are not as important for locations within the US as compared to deviations among countries.
 - 3 Although Alaska's standard of living is the highest among Farwest states, its contribution to the region's average standard of living is marginal because it only accounts for about 2% of the region's output. California, however, accounts for more than 70% of the Farwest output, contributing largely to the region's high standard of living.
 - 4 Canada-US comparisons are based on the 1992 PPP value of US\$1.00= \$1.23 Canadian calculated by Statistics Canada.
 - 5 Productivity refers here to real output per employee.

- 6 The variability of the employment ratio (E/POP) among regions is relatively small so productivity is the key determinant of each region's standard of living. However, higher-than-average standard of living in some states such as, Minnesota, Colorado, North Carolina, New Hampshire and Georgia is also the result of a greater-than-average share of population at work. For more details see Appendix C.
- 7 As in the case of standard of living, US real GDP per employee is expressed in Canadian dollars using the 1992 PPP.

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