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**A REGIONAL PERSPECTIVE  
ON THE CANADA-U.S. STANDARD  
OF LIVING COMPARISON**

*Occasional Paper Number 22  
February 2000*

***Industry Canada Research Publications Program***

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**A REGIONAL PERSPECTIVE  
ON THE CANADA-U.S. STANDARD  
OF LIVING COMPARISON**

*By Raynald Létourneau and Martine Lajoie  
Industry Canada*

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## 1. INTRODUCTION

This paper presents a comparison of standards of living between Canadian provinces and U.S. 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, as shown in our previous studies,<sup>1</sup> 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 paper is divided as follows. First, we present our framework of analysis and discuss issues related to the comparison of productivity and standards of living at the regional level between the two countries. We then move to a discussion of standard of living and productivity. Each of these sections presents a separate analysis of U.S. states and Canadian provinces, and a comparison of both. The paper concludes with a brief review of our main results.





## 2. FRAMEWORK OF ANALYSIS AND EMPIRICAL ISSUES

### Framework of Analysis

Standard of living is best measured through real GDP per capita as it encompasses all earnings accruing 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.

### Empirical Issues

Comparing the standard of living and labour productivity for the 10 Canadian provinces and 50 U.S. 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 U.S. data, real output is measured as GDP at market prices,<sup>2</sup> which, because of data constraints in Canada related to the market price measure, restricts the comparison exercise to the 1992-97 period. U.S. 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. U.S. 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).

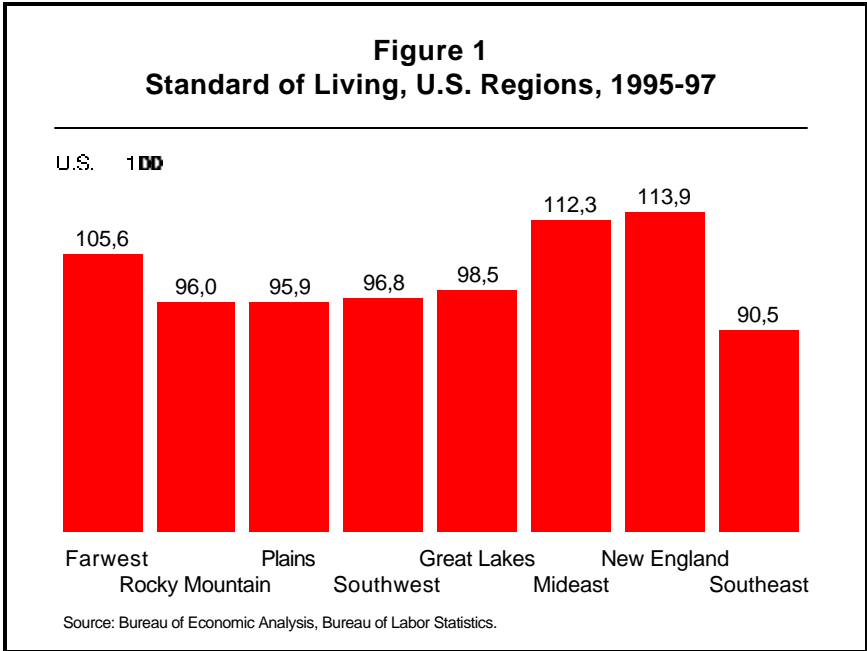
U.S. real GSP is available on a 1992-chained dollars basis and components are not strictly additive, especially for years far away from the base period.<sup>3</sup> However, for the period under consideration (1992-97), which is close to the 1992 base year, GSP estimates are nearly additive.<sup>4</sup> This allows us to calculate the relative performance of individual states in comparison to the U.S. national average. Finally, comparisons, at both the national and the 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 U.S. states<sup>5</sup> and Canadian provinces impose some limitations on the interpretation of the results. Since U.S. nominal GSP is deflated using producer prices rather than some expenditure-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 comparisons.

### 3. STANDARD OF LIVING

#### U.S. Regions

Real GDP per capita varies significantly across U.S. 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 (U.S. national average =100) over the period 1995-97 using the U.S. 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 percent below-average in the Southeast.



Real GDP per capita also varies significantly within U.S. regions. As shown in Tables 1 and 2 below, the relative standing of a region is determined by its concentration of high and low income states.<sup>6</sup> For example, in New England (Table 1), real GDP per capita ranges from 20 percent below the national average in Maine to 32 percent above in Connecticut. High income regions

include a greater number of states with a standard of living well above the U.S. 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.<sup>7</sup>

<b>Table 1</b>					
<b>Standard of Living, Above-Average U.S. Regions, 1995-97</b>					
<b>U.S. = 100</b>					
<b>New England</b>	<b>113.9</b>	<b>Farwest</b>	<b>105.6</b>	<b>Mideast</b>	<b>112.3</b>
Connecticut	132.1	Alaska	137.6	Delaware	139.2
Maine	79.7	California	106.2	Maryland	98.1
Massachusetts	118.4	Hawaii	108.4	New Jersey	120.4
New Hampshire	107.3	Nevada	112.7	New York	118.1
Rhode Island	91.7	Oregon	98.7	Pennsylvania	93.8
Vermont	87.6	Washington	99.8		

Regions with an average standard of living below that of the United States still conceal a few high income states (Table 2). In the Great Lakes, the strong standing of Illinois, with real GDP per capita nearly 10 percent 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.

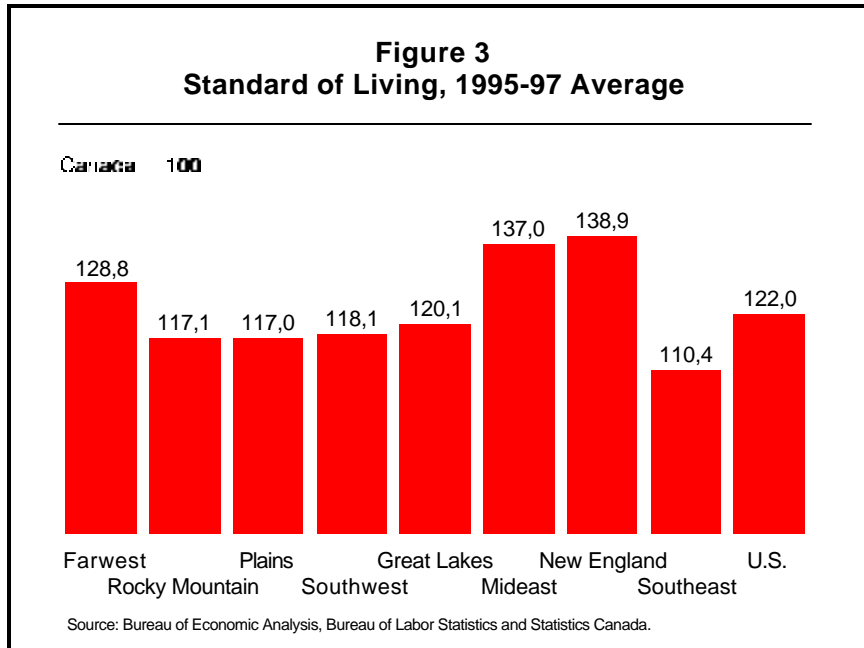
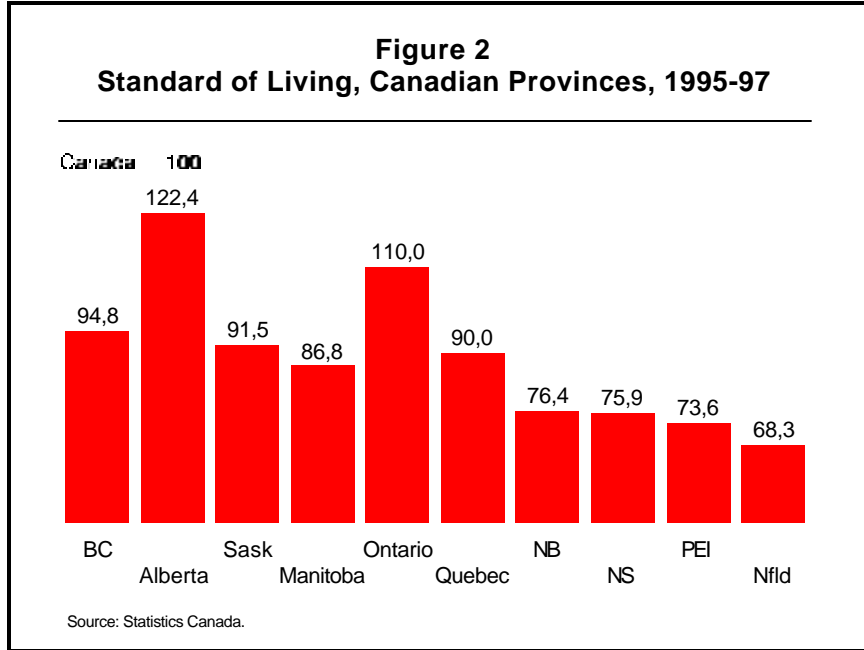
Texas is the only Southwest state to post above-average real GDP per capita. Mississippi, West Virginia, Arkansas, Alabama and South Carolina are behind the Southeast's low standard of living, largely offsetting the positive effect of Virginia and Georgia.

<b>Table 2</b>					
<b>Standard of Living, Below-Average U.S. Regions, 1995-97</b>					
<b>U.S. = 100</b>					
<b>Great Lakes</b>	<b>98.5</b>	<b>Rocky Mountain</b>	<b>96.0</b>	<b>Southeast</b>	<b>90.5</b>
Illinois	109.7	Colorado	106.1	Alabama	79.8
Indiana	93.2	Idaho	84.1	Arkansas	78.1
Michigan	93.0	Montana	72.8	Florida	85.8
Ohio	95.7	Utah	86.8	Georgia	101.6
Wisconsin	94.7	Wyoming	126.7	Kentucky	87.0
				Louisiana	94.0
<b>Plains</b>	<b>95.9</b>	<b>Southwest</b>	<b>96.8</b>	Mississippi	72.2
Iowa	94.3	Arizona	88.8	North Carolina	100.2
Kansas	90.8	New Mexico	92.7	South Carolina	83.5
Minnesota	104.4	Oklahoma	76.9	Tennessee	91.9
Missouri	93.4	Texas	102.5	Virginia	104.2
Nebraska	98.5			West Virginia	72.6
North Dakota	82.9				
South Dakota	90.6				

### Canadian Provinces

Standards of living vary less across provinces than among U.S. 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 equalization 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 a real GDP per capita more than 20 percent above the national average, followed by Ontario. The standard of living is next highest in British Columbia, Saskatchewan, Quebec and Manitoba. It is lowest in Newfoundland, at about 30 percent below the national average, behind Prince Edward Island, Nova Scotia and New Brunswick.<sup>8</sup>



## **U.S.-Canada Standard of Living Comparison**

When U.S. real GDP per capita is expressed in Canadian currency, using the 1992 PPP, the U.S. standard of living is, on average, 22 percent higher than that of Canada.<sup>9</sup> This aggregate number conceals, however, a few important facts. First, Figure 3 shows that all U.S. regions post a standard of living well above the Canadian average. Second, the gap with respect to the highest income region, New England, reaches up to 40 percent. Third, the lowest U.S. region, the Southeast, has a standard of living still 10 percent above the Canadian average.

Only seven states (Table 3) 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 percent higher than the Canadian average in one third of the states — and it is more than 50 percent higher in Delaware, Alaska, Connecticut and Wyoming.

Relative to their U.S. 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 United States.



**Table 3**  
**Ranking of Canadian Provinces and U.S. States,**  
**Average Standard of Living, 1995-97, Canada = 100**

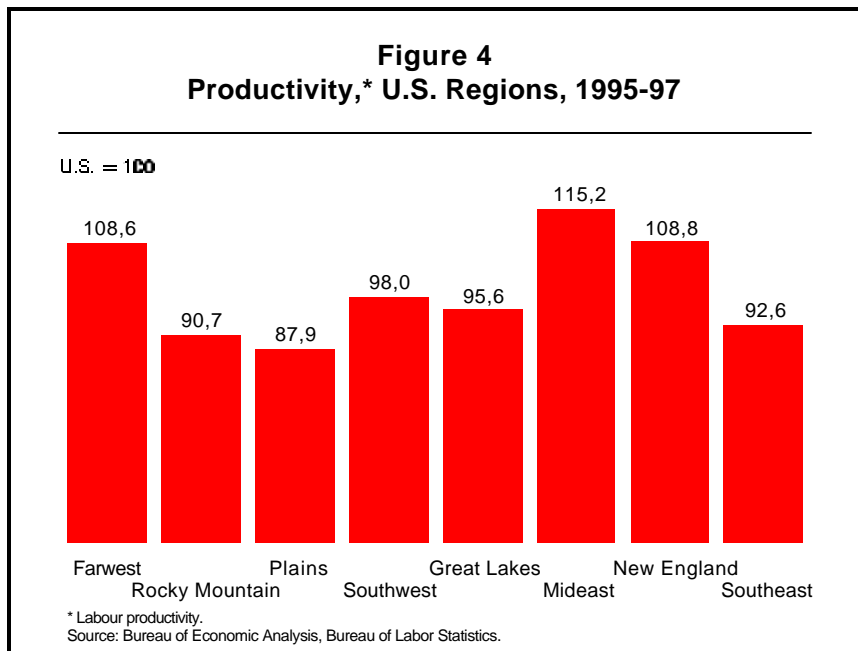
1	Delaware	169.8	31	Michigan	113.4
2	Alaska	167.9	32	New Mexico	113.0
3	Connecticut	161.1	33	Tennessee	112.1
4	Wyoming	154.6	34	Rhode Island	111.9
5	New Jersey	146.9	35	Kansas	110.8
6	Massachusetts	144.5	36	South Dakota	110.6
7	New York	144.0	37	<i>Ontario</i>	<i>110.0</i>
8	Nevada	137.5	38	Arizona	108.3
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	<i>Alberta</i>	<i>122.4</i>	48	Arkansas	95.2
19	North Carolina	122.3	49	<i>British Columbia</i>	<i>94.8</i>
20	Washington	121.7	50	Oklahoma	93.8
21	Oregon	120.4	51	<i>Saskatchewan</i>	<i>91.5</i>
22	Nebraska	120.2	52	<i>Quebec</i>	<i>90.0</i>
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	<i>Manitoba</i>	<i>86.8</i>
27	Louisiana	114.7	57	<i>New Brunswick</i>	<i>76.4</i>
28	Pennsylvania	114.4	58	<i>Nova Scotia</i>	<i>75.9</i>
29	Missouri	113.9	59	<i>Prince Edward Island</i>	<i>73.6</i>
30	Indiana	113.7	60	<i>Newfoundland</i>	<i>68.3</i>

## 4. PRODUCTIVITY

### U.S. Regions

As for the standard of living, there are significant differences in productivity<sup>10</sup> levels across U.S. states. Figure 4 shows that three out of eight regions record above-average productivity: the Mideast, New England and the 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.<sup>11</sup> In other regions, productivity is below the U.S. average — it falls more than 10 percent below-average in the Plains region.<sup>12</sup>

As for the standard of living, the high-productivity regions (Table 4) are comprised of highly productive states which more than offset the weaker performance of a few low-productivity states. The most productive U.S. region — the Mideast — records a productivity level 15 percent above the national average, supported by Delaware, New York and New Jersey. New England's high productivity standing relies on the strong performances of Connecticut and Massachusetts. High productivity levels are widespread across Farwest states, with only Oregon and Washington posting a productivity below the region's average.



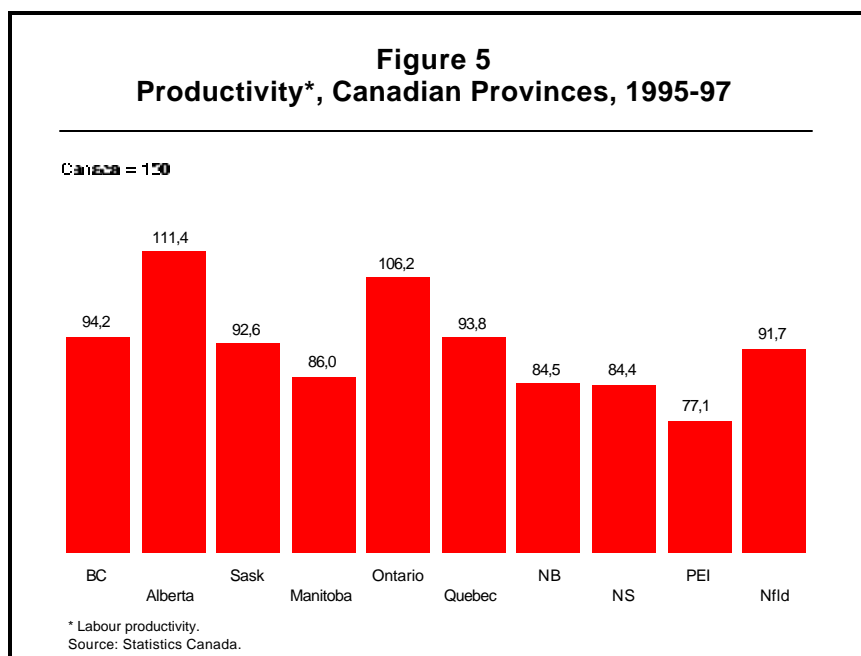
<b>Table 4</b>					
<b>Productivity, Above-Average U.S. Regions, 1995-97</b>					
<b>U.S. = 100</b>					
<b>New England</b>	<b>108.8</b>	<b>Farwest</b>	<b>108.6</b>	<b>Mideast</b>	<b>115.2</b>
Connecticut	127.3	Alaska	139.4	Delaware	132.9
Maine	76.4	California	111.6	Maryland	90.7
Massachusetts	113.2	Hawaii	111.8	New Jersey	118.9
New Hampshire	97.7	Nevada	108.2	New York	126.7
Rhode Island	93.3	Oregon	94.2	Pennsylvania	96.9
Vermont	79.5	Washington	97.0		

<b>Table 5</b>					
<b>Productivity, Below-Average U.S. Regions, 1995-97</b>					
<b>U.S. = 100</b>					
<b>Great Lakes</b>	<b>95.6</b>	<b>Rocky Mountain</b>	<b>90.7</b>	<b>Southeast</b>	<b>92.6</b>
Illinois	107.3	Colorado	95.6	Alabama	82.4
Indiana	87.8	Idaho	81.9	Arkansas	80.9
Michigan	93.1	Montana	72.4	Florida	89.7
Ohio	95.3	Utah	86.1	Georgia	99.9
Wisconsin	83.8	Wyoming	120.5	Kentucky	91.1
				Louisiana	105.4
<b>Plains</b>	<b>87.9</b>	<b>Southwest</b>	<b>98.0</b>	Mississippi	79.3
Iowa	84.6	Arizona	90.6	North Carolina	97.6
Kansas	87.0	New Mexico	101.5	South Carolina	83.7
Minnesota	92.6	Oklahoma	80.7	Tennessee	90.8
Missouri	87.5	Texas	102.2	Virginia	101.5
Nebraska	88.4			West Virginia	85.7
North Dakota	76.8				
South Dakota	84.8				

Regions with productivity levels below the U.S. average have a greater concentration of low-productivity states although they all conceal a few highly productive ones (Table 5). 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 region, Illinois is holding up the 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 the fact that high-productivity provinces tend also to be advantaged by a higher employment-population ratio. Newfoundland is perhaps 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 percent below the national average. Atlantic provinces post productivity levels below the national average: in PEI, the productivity level is more than 20 percent below the Canadian average.<sup>13</sup>

### U.S.-Canada Productivity Comparison

Overall, U.S. states are about 18 percent more productive than their Canadian counterparts (Figure 6), which is slightly below the 22 percent gap observed for the standard of living.<sup>14</sup> All U.S. regions recorded productivity levels above the Canadian average over the 1995-97 period, with the gap ranging from a low of 3 percent in the Plains to a high approaching 40 percent in the Mideast. The gap is particularly high compared to the Mideast, New England and the Farwest, all regions that have strong traditional links with Canada.

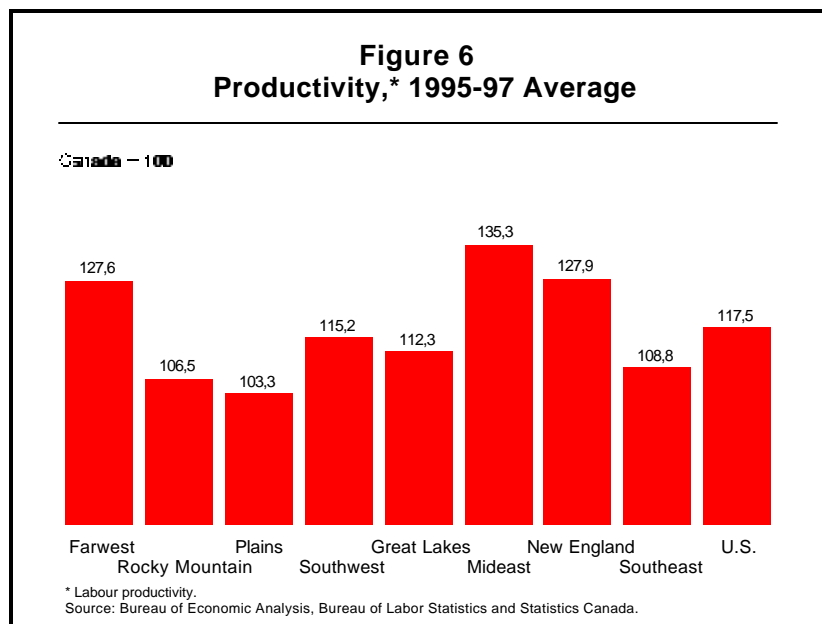


Table 6 shows the relative ranking of Canadian provinces and U.S. states. Only thirteen states, located largely in the Southern and Rocky Mountain areas, registered productivity below the Canadian average during 1995-97. Except for Alberta and Ontario, which record again the best performance in Canada, (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 U.S. states. For example, productivity in Alaska and Delaware is nearly double that of Montana, the least productive state.

1	Alaska	163.8	31	Arizona	106.4
2	Delaware	156.2	32	<i>Ontario</i>	<i>106.2</i>
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>	<i>94.2</i>
19	Washington	114.0	49	<i>Quebec</i>	<i>93.8</i>
20	Pennsylvania	113.8	50	Vermont	93.5
21	Colorado	112.4	51	Mississippi	93.1
22	Ohio	112.0	52	<i>Saskatchewan</i>	<i>92.6</i>
23	<i>Alberta</i>	<i>111.4</i>	53	<i>Newfoundland</i>	<i>91.7</i>
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>	<i>86.0</i>
27	Minnesota	108.8	57	Montana	85.1
28	Kentucky	107.1	58	<i>New Brunswick</i>	<i>84.5</i>
29	Tennessee	106.7	59	<i>Nova Scotia</i>	<i>84.4</i>
30	Maryland	106.6	60	<i>Prince Edward Island</i>	<i>77.1</i>

We tested the ranking of productivity with that of standard of living to assess the importance of productivity in determining the standard of living in a North-American context (Table 3 versus Table 6). 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.

## 5. CONCLUSION

This comparative exercise has revealed that Canada's regions all have, albeit at different degrees, income and productivity gaps vis-à-vis the United States. Standards of living of Canadian provinces are well behind those of U.S. states. In fact, the best Canadian performer, Alberta, ranks 18th among the 60 states and provinces, while Ontario is 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.





## NOTES

- 1 See R. Létourneau, M. Lajoie, and S. Nadeau, 1998 and 1999.
- 2 For a detailed discussion of the compatibility of output data between Canada and the United States, refer to Appendix A.
- 3 For more details on the estimation of chained-1992 dollars GSP estimates, see Friedenber and Beemiller, 1997.
- 4 See Appendix A, Friedenber and Beemiller, 1997, p. 29.
- 5 For example, see C. Engel 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 United States as compared to deviations among countries.
- 6 A map of U.S. regions and states by level of standard of living is shown in Appendix B.
- 7 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 percent of the region's output. California, however, accounts for more than 70 percent of the output of the Farwest region, contributing largely to its high standard of living.
- 8 A map of Canadian provinces by levels of standard of living is presented in Appendix B.
- 9 Canada-U.S. comparisons are based on the 1992 PPP value of US\$1.00 = C\$1.23 calculated by Statistics Canada.
- 10 Productivity refers here to real output per employee.
- 11 Since the variability of the employment ratio (E/POP) among regions is relatively small, 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.

- 12 A map of U.S. regions and states by productivity levels is shown in Appendix D.
- 13 A map of Canadian provinces by productivity levels is shown in Appendix D.
- 14 As for the standard of living, U.S. real GDP per employee is expressed in Canadian dollars using the 1992 PPP.
- 15 Property-type income is the sum of corporate profits, proprietors' income, rental income of persons, net interest, capital consumption allowances, business transfer payments and the current surplus of government enterprises less subsidies.

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## APPENDIX A COMPARABILITY OF CANADA AND U.S GDP MEASURES

Analysis of the relative economic performance of two countries requires a set of comparable economic indicators such as output and income estimates. However, the derivation of these estimates varies somewhat across countries. This annex examines the concepts underlying GDP estimates in the United States and Canada and assesses the compatibility of U.S. and Canadian output measures, with a special focus on provincial and state data.

### Output Measures: United States

#### *National Estimates of Output*

Three different measures of output are used to estimate GDP (at market prices) in the US: Gross Domestic Product (GDP), Gross Domestic Income (GDI) and Gross Product Originating (GPO).

- Ⓒ For the National Income and Product Accounts (NIPAs), GDP is measured as the sum of expenditures components. The Bureau of Economic Analysis considers GDP to be the most reliable measure of gross output because the source data underlying the estimates of expenditures are considered to be more accurate. The GDP measure is equivalent to Canada's expenditure-based GDP at market prices.
- Ⓒ Gross Domestic Income (GDI) is measured as the sum of costs incurred and incomes earned in the production of GDP. The GDI measure is equivalent to Canada's income-based GDP at market prices measure.
- Ⓒ Gross Product Originating (GPO), estimated by industry, is measured ***in concept*** as the sum of the "value-added" of all industries — gross output (sales or receipts and other operational income, commodity taxes, and inventory changes) minus intermediate inputs (consumption of goods and services purchased from other industries or imported). ***In practice***, GPO by industry is calculated as the sum of distributions by industry of the components of GDI (compensation of employees, indirect business tax and non-tax liability, and property-type income).

Conceptually, the three measures should give the same result. In practice, however, GDP and GDI differ because their components are estimated using

independent and less-than-perfect source data. The difference between GDP and GDI is called the statistical discrepancy; it is recorded in the NIPAs as an income component that reconciles GDI with GDP. Since GPO is calculated as the sum of GDI components across industries, GPO estimates also differ from the GDP by the statistical discrepancy.

### ***State Estimates of Output***

At the state level, Gross State Product (GSP) is derived as the sum of GPO in all industries. Therefore, *in concept*, GSP is equal to net output. *In practice*, however, GSP estimates are measured as the sum of the distributions by industry of the components of gross domestic income. For each industry, GSP is presented in three components: compensation of employees, indirect business tax and non-tax liability, and property-type income.<sup>15</sup> The relationship between these components and the components of GPO and GDP is summarized in Table A1.

The estimates of GSP are calculated in both current dollars and chained (1992) dollars. The estimates of real GSP are derived by applying national implicit price deflators to the current-dollar GSP estimates for all industries. The same chain-type index formula used in the national accounts is then used to calculate estimates of total real GSP.

State estimates of GSP and its components are controlled to national totals of GPO and its components for all industries. If the initial sum of the state estimates differs from the national total for an industry, the difference is allocated to the states. There is no expenditure-based (GDP) measure of output at the state level.

### ***Sectoral Breakdown***

In the United States, both national (GPO) and state (GSP) output estimates are available by industry. At the national level, estimates are available for 66 industries. At the state level, GSP is estimated for 63 industries.

### ***Time Series***

National GDP estimates are available for the period 1929-98 and GDP estimates by industry are available for the period 1987-98. State GSP estimates (total economy and by industry) cover the period 1977-97.

**Table A1**  
**Relationship of GSP to GPO and GDP, 1996**  
**(Billions of dollars)**

	GPO	GSP				Difference Between GPO and GSP
		Compensation of employees	IBT and non-tax liability	Property- type income	Total	
Compensation of employees	4,429.5	4,414.3 <sup>†</sup>	-----	-----	4,414.3	15.2
Indirect business tax and non-tax liability	604.8	-----	604.8	-----	604.8	-----
Property-type income	2,661.6	-----	-----	2,611.9 <sup>‡</sup>	2,611.9	49.7
<b>Equals:</b> GDI	7,695.9	4,414.3	604.8	2,611.9	7,631.0	64.9
<b>Plus:</b> Statistical discrepancy	-59.9	-----	-----	-----	-----	-59.9
<b>Equals:</b> GDP	7,636.0	4,414.3	604.8	2,611.9	7,631.0	5.0

<sup>†</sup> Differs from the GPO entry because it excludes wages and salaries and employer contributions for social insurance of Federal civilian and military personnel stationed abroad, as well as other labour income of Federal civilian personnel stationed abroad.

<sup>‡</sup> Differs from the GPO entry because it excludes military structures located abroad and because the lack of adequate source data prevents the allocation of military equipment, except office equipment, to states.

Source: R.M. Beemiller and G.K. Downey, 1998.

## Output Measures: Canada

### *National and Provincial Estimates of Output*

Two different measures of output are used to estimate both national and provincial GDP in Canada: GDP at market prices and GDP at factor cost.

- c GDP at market prices is estimated from the *National Accounts* using two approaches: expenditure-based and income-based. Estimates are only available for the total economy (national and provincial).



The components of income-based GDP at market prices correspond to those used for the estimation of U.S. GDI.

- C GDP at factor cost is calculated from the *National Accounts* (in current dollars) for the total economy by subtracting the net indirect taxes component from GDP at market prices (income-based).
- C Statistics Canada also calculates GDP at factor cost by industry (in current and constant dollars). At the national level, GDP at factor cost by industry is estimated using net output for most industries. At the provincial level, GDP estimates are based on net output only for a few industries — namely mining and manufacturing — while various proxies are used to derive output estimates in other industries.

### ***Sectoral Breakdown***

Contrary to U.S. data, Canadian GDP by industry estimates, both at the national and provincial levels, are only available on a factor cost basis.

### ***Time series***

National GDP at market prices in current and constant (1992) dollars and GDP at factor cost estimates are available for the period 1961-98. National GDP estimates are also available in current and constant (1986) dollars for the period 1947-96. Note, however, that these estimates are not fully compatible with the new estimates spanning the period 1961-98, as the latter incorporate changes related to the new base year (1992) as well as changes to the Canadian System of National Accounts in line with new international guidelines for national accounting.

Estimates of provincial GDP at market prices are available for the period 1992-97, while estimates of GDP at factor cost cover the period 1984-97.

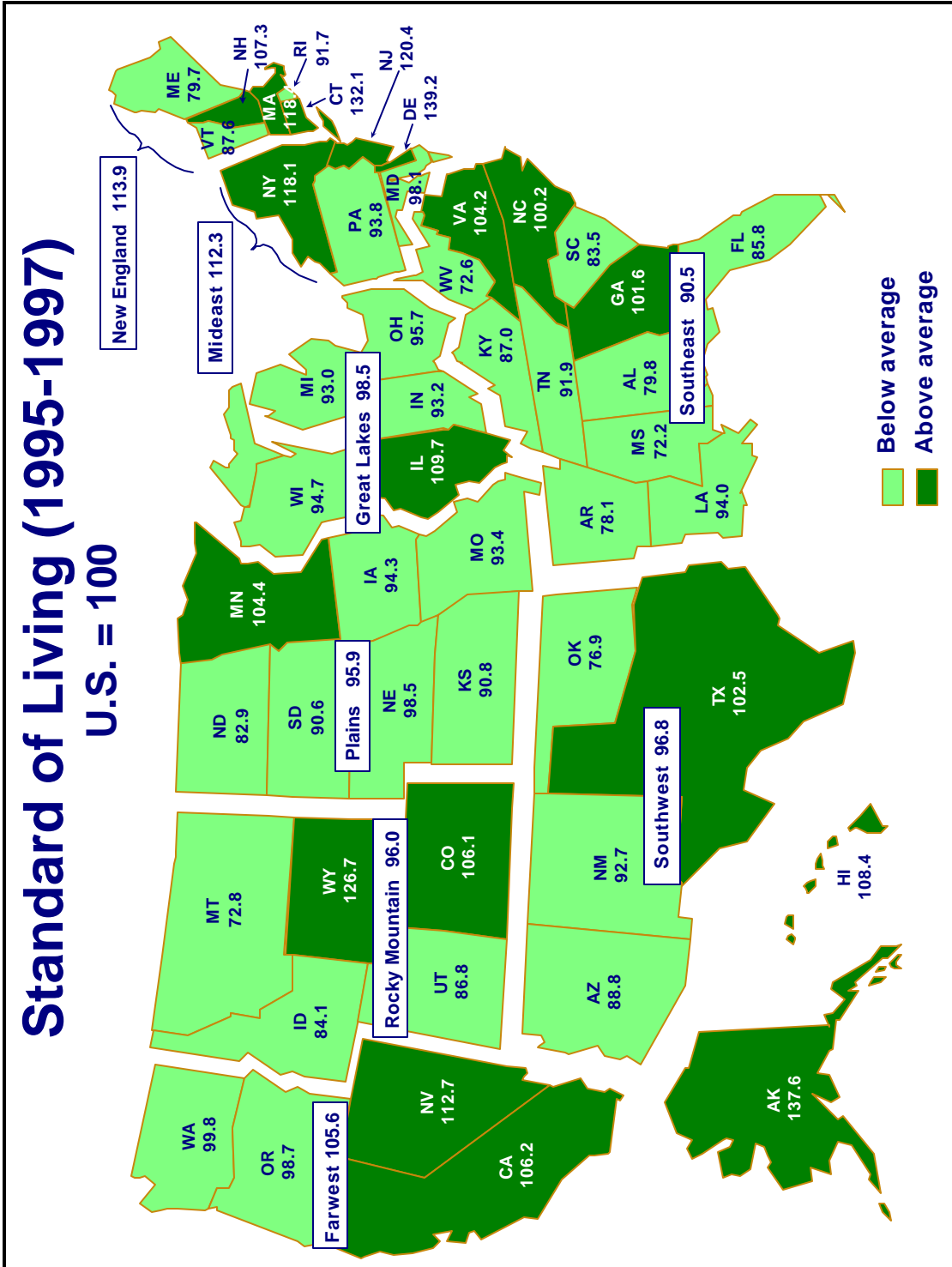
### **Are Canada and U.S. GDP Measures Comparable?**

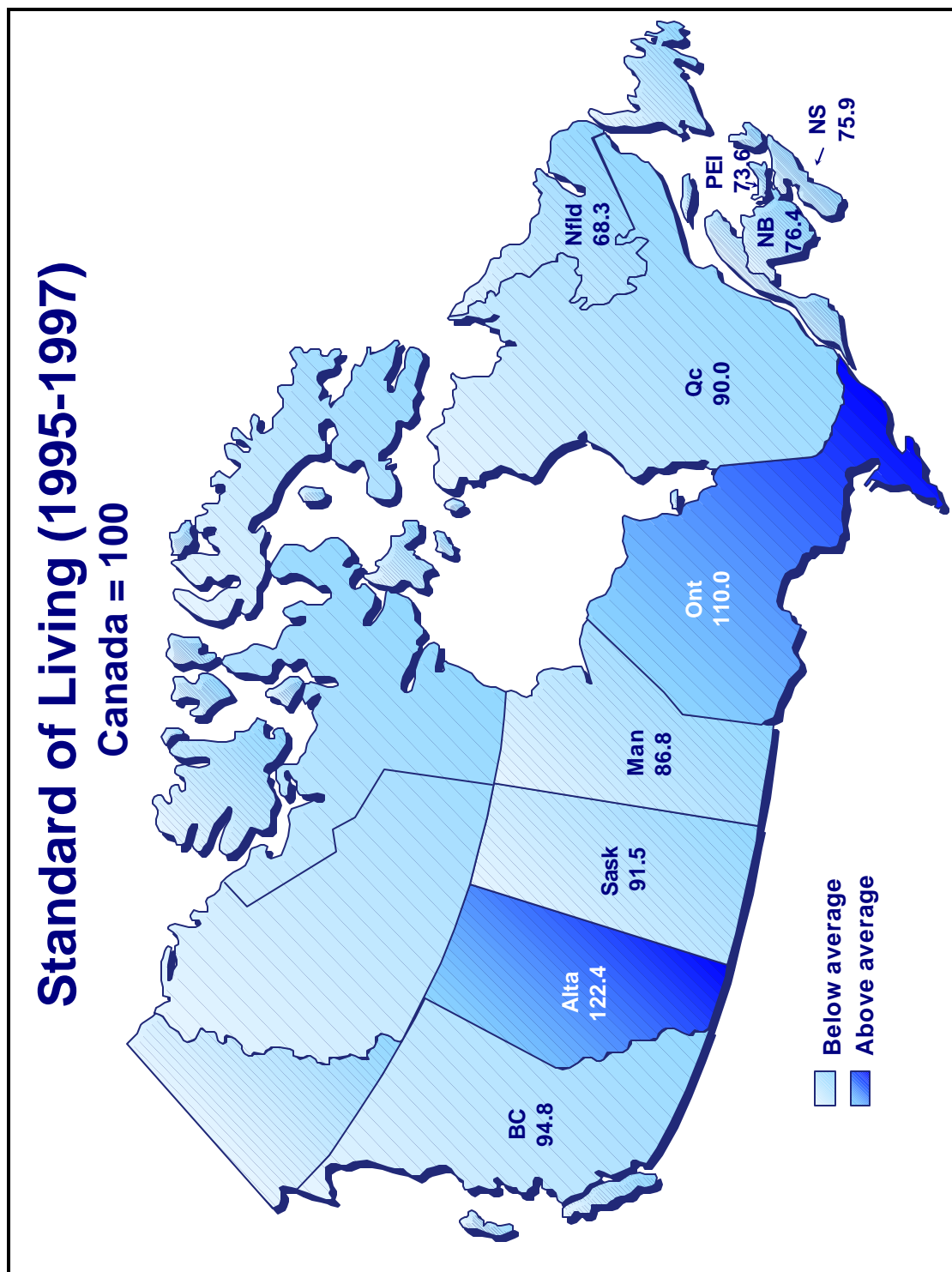
Canada and U.S. output measures need to be on the same basis to compare economic indicators such as standard of living and productivity between the two countries.

- C Measures of national GDP at market prices can easily be compared since both the U.S. and Canadian measures are expenditure-based.
- C State and provincial GDP at market prices are also comparable since both measures are derived from income components.
- C However, there is no official U.S. counterpart for Canadian provincial GDP at factor cost. (*This information was corroborated by a Bureau of Economic Analysis official.*) GSP by industry is measured on a market price basis, while provincial GDP by industry is measured on a factor cost basis. Note that these two concepts differ by the net indirect taxes component — included in the market price measure.



# APPENDIX B





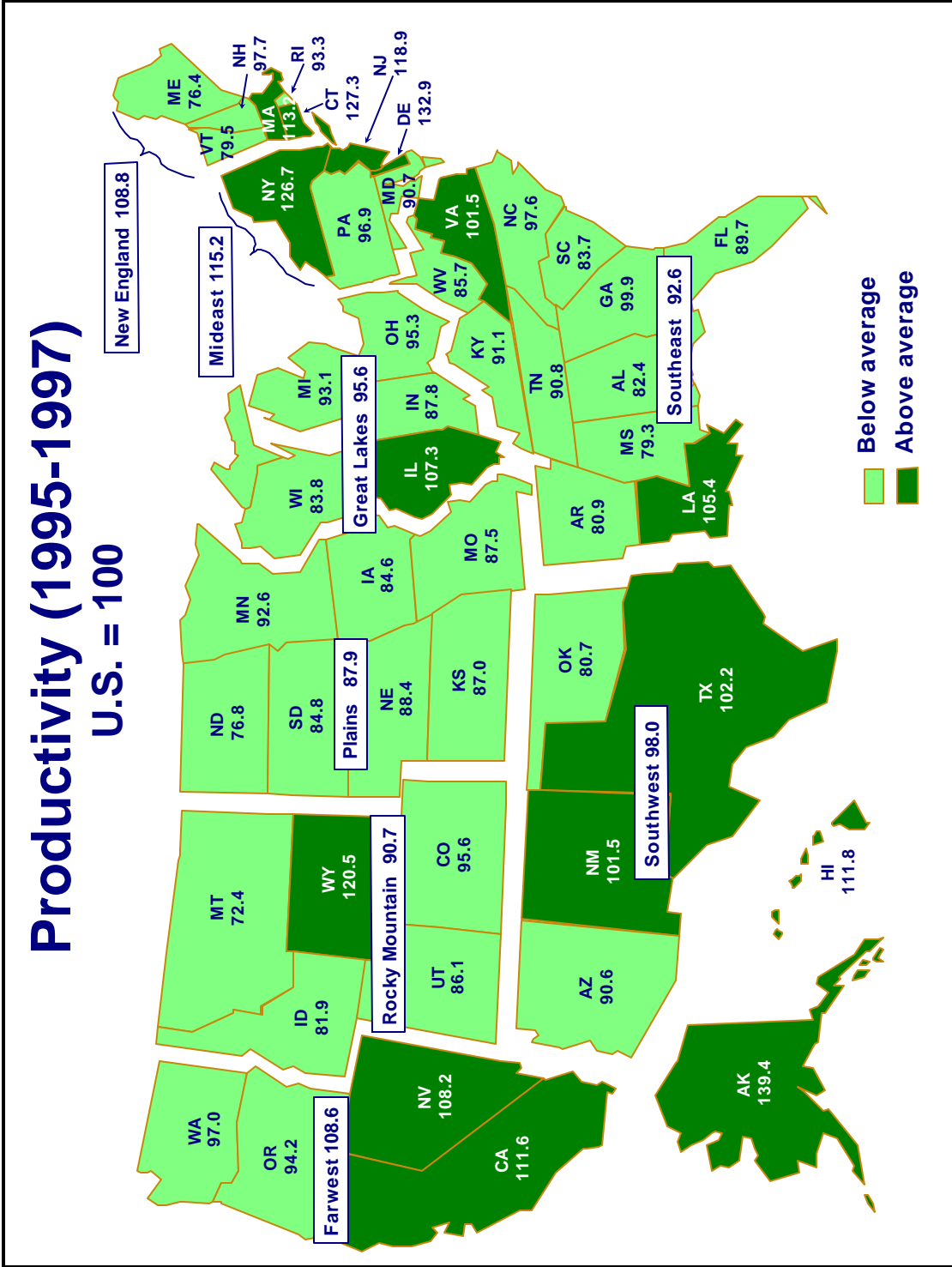
## APPENDIX C EMPLOYMENT TO POPULATION RATIOS

This table presents the rankings of employment to population ratios among provinces and states in the same way as standards of living and productivity. Employment shares vary much less than standards of living. In the United States, they range from 117.3 in Wisconsin to 87.9 in West Virginia while for Canada they fluctuate between 109.9 in Alberta and 74.5 in Newfoundland.

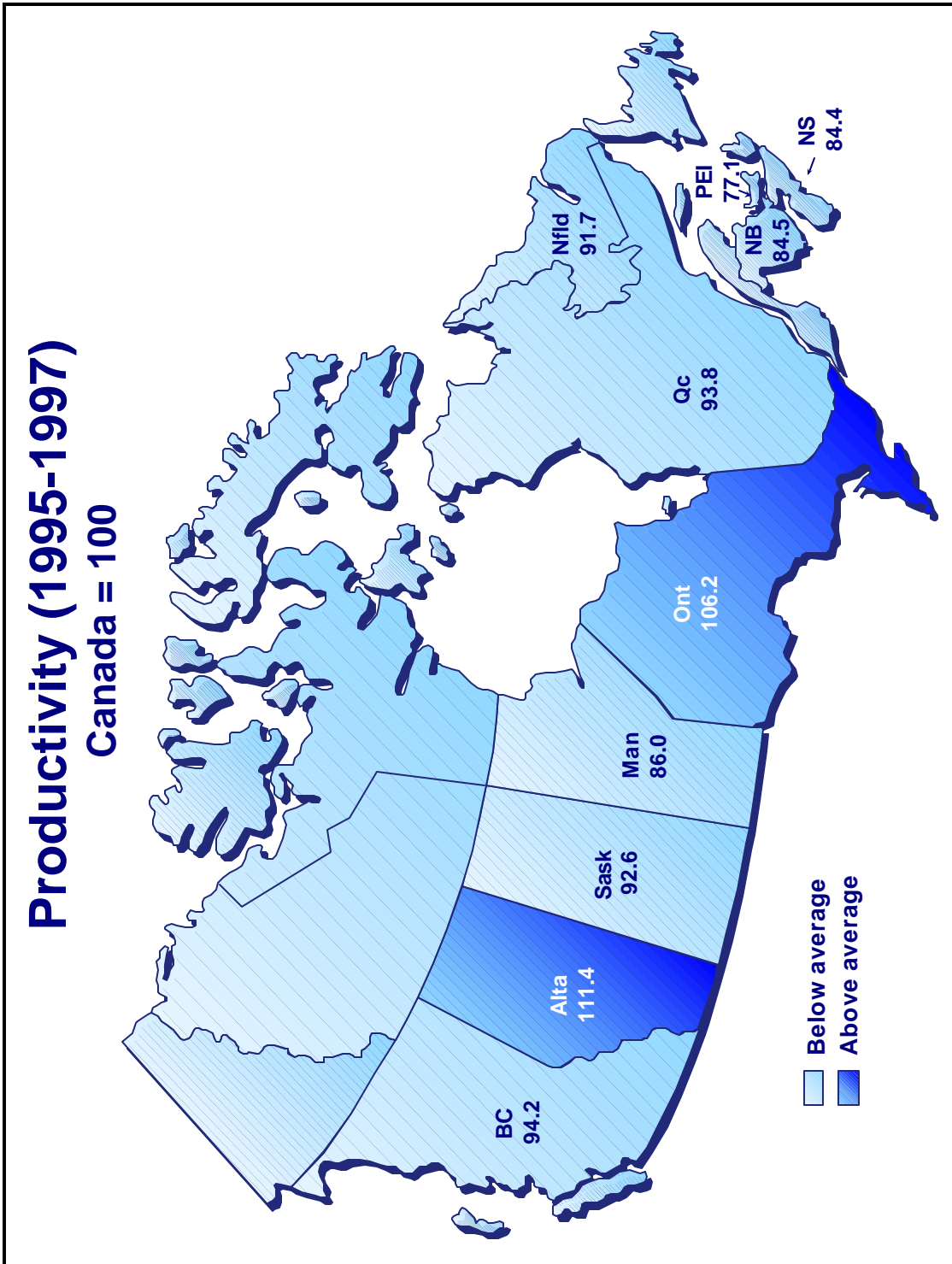
<b>Rankings of Canadian Provinces and U.S. States Employment-Population Ratio, 1995-97, Canada = 100</b>					
1	Wisconsin	117.3	31	Montana	104.3
2	Minnesota	117.1	32	Ohio	104.2
3	Iowa	115.7	33	Texas	104.1
4	Nebraska	115.7	34	<i>Ontario</i>	103.6
5	Colorado	115.1	35	Michigan	103.6
6	Vermont	114.4	36	South Carolina	103.5
7	New Hampshire	114.0	37	Alaska	102.5
8	Maryland	112.3	38	Rhode Island	102.1
9	North Dakota	112.1	39	Arizona	101.8
10	South Dakota	111.0	40	<i>Manitoba</i>	100.9
11	Missouri	110.7	41	<i>British Columbia</i>	100.7
12	Indiana	110.2	42	Hawaii	100.7
13	<i>Alberta</i>	109.9	43	Alabama	100.6
14	Wyoming	109.1	44	Pennsylvania	100.5
15	Oregon	108.8	45	Arkansas	100.2
16	Delaware	108.7	46	Florida	99.3
17	Massachusetts	108.6	47	Kentucky	99.2
18	Maine	108.4	48	Oklahoma	99.0
19	Kansas	108.3	49	<i>Saskatchewan</i>	98.9
20	Nevada	108.1	50	California	98.8
21	Connecticut	107.7	51	New York	96.7
22	Washington	106.8	52	<i>Quebec</i>	96.0
23	Idaho	106.6	53	<i>Prince Edward Island</i>	95.5
24	North Carolina	106.6	54	New Mexico	94.8
25	Virginia	106.5	55	Mississippi	94.5
26	Illinois	106.1	56	Louisiana	92.7
27	Georgia	105.6	57	<i>New Brunswick</i>	90.4
28	Tennessee	105.1	58	<i>Nova Scotia</i>	90.0
29	New Jersey	105.1	59	West Virginia	87.9
30	Utah	104.6	60	<i>Newfoundland</i>	74.5

This is confirmed by the results of an analysis of the respective contributions of productivity and employment shares in explaining standard of living variations among Canadian provinces and U.S. states. In both cases, the results strongly indicate that variations in productivity are the main determinant of variations in standards of living. In Canada, differences in productivity account for, on average, almost 70 percent of the variations in standards of living among provinces. In the United States, the productivity gap is found to explain entirely the observed differences in standards of living among states.

# APPENDIX D







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