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## Canada's Unemployment Mosaic

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**B**y the middle of the 1980s, the Canadian economy had by and large recovered from the 1981-1982 recession and was growing vigorously. Since then, the national unemployment rate has dropped to a level not seen since the beginning of the decade.

These trends have fuelled concerns about labour shortages. The <u>Economic Council of Canada</u> (1987) warned that "... it will be necessary to keep a watchful eye on the situation ..." (p.17). The proliferation of "help-wanted" signs in some areas, for example Toronto, has reinforced fears of labour shortages and a resulting rise in wage-driven inflation.

Some observers of the labour market wonder whether Canada might be approaching the "full employment rate of unemployment", that is, the lowest level of national unemployment that can be sustained without incurring significant pressures of wage inflation. In its annual review for 1987, the Economic Council proposed 6% to 8% as a likely range for the full employment unemployment rate, and suggested this as a goal for the early 1990s. A Bank of Canada study concluded that 8% was about the lowest unemployment rate consistent with a stable rate of inflation at the end of 1987 (Rose, 1988). In fact, the annual average rate dropped below 8% in 1988.

Despite this drop, many areas continue to experience high unemployment rates. Thus, the national average conceals a variety of local situations. This study examines the geographic pattern of unemployment from 1985 to 1988.

With the help of labour market data for 40 areas, the following key questions are addressed:

• As the economy continued to grow strongly during the late 1980s, did unemployment become more evenly distributed or less? Which areas gained and which fell behind?

- Have low unemployment areas reached a "floor", a levelling out of their unemployment rates?
- How are population shifts and different patterns of employment growth reflected in the unemployment data of the 40 areas?

#### The selected areas

The objectives of this study required that subprovincial areas be delineated. In selecting the number of areas and in drawing boundaries, trade-offs had to be made. The greater the number of regions, the more precise the measure of variations in Canadian labour market conditions. However, a large number of areas implies small labour force estimates, with correspondingly higher sampling errors; that is, less reliable data.

This study uses annual average data from the Labour Force Survey (LFS) for 24 census metropolitan areas (CMAs). (1) These are reasonable starting points because their boundaries are defined using commuting patterns and they are, therefore, among the most homogeneous labour markets in the country.

In most provinces, the area outside the CMAs was treated as if it were a single labour market. In the two largest provinces, Ontario and Quebec, the population outside the CMAs was large enough to permit further breakdowns, using LFS economic regions. In total, 40 areas were identified.

## The 40 Areas: An overall picture

The 40 areas were ranked according to their 1988 annual average unemployment rate, from lowest to highest (Table 1).



#### Table 1 Unemployment Rates in 40 Areas, 1985 to 1988

In all the years studied, the wide range of unemployment rates is striking: in 1988, for example, the rates varied from 3.7% in Toronto to 19.2% in non-metropolitan Newfoundland. There was also a wide gap between nonmetropolitan Newfoundland and the area with the next highest unemployment rate (usually Lower St. Lawrence).

Another notable pattern is that the tightest labour markets are increasingly concentrated in Ontario. Looking at the areas ranked 1 to 10 (that is, those with the lowest unemployment rates) in 1985, five of the ten areas were in Ontario and a sixth (Ottawa-Hull) straddles the Ontario border. By 1988 all ten labour markets with the lowest unemployment rates were either in or bordering Ontario.

## Measuring the distribution of unemployment

The statistic used in this study to measure inequality is called the Gini coefficient (see <u>note</u> at end of article). If all 40 areas had the same unemployment rate, the value of this coefficient would be zero. Alternatively, if the nation's unemployed were concentrated in only a few of the 40 areas, the value of the coefficient would approach one. In other words, the higher the Gini coefficient, the less equally distributed is unemployment.

The value of the Gini coefficient started at .165 in 1985, rose to .178 in 1986, .190 in 1987 and finally to .202 in 1988. This indicates that unemployment became less evenly distributed as the economy improved during the mid to late 1980s.

This increasing inequality is also illustrated by the total range of unemployment rates across Canada. Comparing Toronto with nonmetropolitan Newfoundland, the ratio of the highest to lowest rates increased from 3.6:1 in 1985 to 5.2:1 in 1988. Alternatively, comparing Toronto with the area with the second highest rate (Lower St. Lawrence in both 1985 and 1988), the range still showed a strong rise; from 2.6:1 in 1985 to 3.7:1 in 1988.

## Comparison of changes in unemployment

Behind this general pattern, there were more detailed variations. To examine these, the 40 areas were ranked and clustered into quartiles (that is, four groups of ten areas each) based on their 1988 annual average unemployment rates.

Looking only at the absolute percentage point change, the first quartile shows less movement over the years than the fourth quartile. For example, between 1985 and 1988 the unemployment rate dropped 3.1 points for quartile 1 (from 7.7% to 4.6%), compared with 3.6 points for quartile 4 (16.3% to 12.6%). However, on a proportional basis, the drop in unemployment in quartile 1 was more than double the decline in quartile 4. This is reflected in the 1985 index values (168 vs. 129), as shown in Table 2.



#### Table 2 Average Unemployment Rates, Quartiles of Areas

This approach does not directly answer a key question: What happened to areas which already had tight labour markets? Did they continue to get tighter, or did they experience moderation? To investigate this, a subset of quartile 1, consisting of seven areas in the top ten in 1987 as well as 1988, was selected to

obtain a "hard core" of the tightest labour markets in the final two of the four years. The behaviour of this subset between 1987 and 1988 allows us to check for evidence of moderating trends.

Between 1987 and 1988, the unemployment rate for these seven areas (which are all in Ontario or on its borders) dropped more quickly than those for the rest of the country. Their average 1987 index value was 123, compared with a range of 109 to 113 for areas in quartiles 2, 3 and 4. Therefore, there is no evidence that labour market tightness has a moderating effect: quite the opposite.



Table 3 Unemployment Rates, Seven Areas in Quartile 1

## Changes in rank

Another dimension of the changing mosaic of unemployment is the relative order of the 40 areas. Despite the widening distribution, the overall ranking of areas by their unemployment rate changed little over the four years. In fact, 27 of the 40 regions changed rank by four places or less between 1985 and 1988. (2)



Map 1 Selected Areas in Ontario and Quebec



Map 2 1988 Unemployment Rate, 40 Areas

There were however some exceptions to this pattern of stability. Some areas improved their relative positions between 1985 and 1988, most notably Thunder Bay (by 13 places), St. Catharine's-Niagara (12 places), nonmetropolitan Southern Ontario and London CMA (10 places), and Abitibi Northern Quebec (9 positions). Other areas suffered losses in rank, most noticeably Quebec CMA (11 positions). Other areas which slipped were: Saskatoon (10 places), and nonmetropolitan Saskatchewan, Windsor and Winnipeg (nine places each).

Smaller rank shifts also occurred, but these may not be meaningful since rank can be affected by small

differences in the unemployment rate (often below the level of sampling reliability). (3)

## **Employment changes and population factors**

The supply of labour is affected by both the size of the working-age population and the proportion of this group in the labour force (the participation rate). The demand for labour is primarily reflected in employment levels. In terms of the impact on unemployment, a variety of outcomes is possible from the interaction of these factors; for example, if employment grows, but more slowly than the supply of labour, both employment and unemployment will increase.

To obtain a better understanding of labour supply and demand shifts underlying changes in the unemployment rate, this section addresses changes in employment and population for the four groups of areas.



#### Table 4 Growth in Employment and Working-age Population

Not surprisingly, low-unemployment areas in 1988 generally experienced faster employment growth than the country as a whole. Comparing quartile 1 with the Canada total, the difference in employment change was over 0.5 percentage points in each year. An increase in labour demand may not always be the driving force behind a drop in unemployment, but it certainly appears to be the case here.

However, above-average employment growth was not entirely concentrated in tight labour markets. Between 1987 and 1988, employment growth in the fourth quartile (the ten areas with the highest unemployment) exceeded that of the first quartile. A number of developments may have contributed to the above-average employment growth in the quartile 4 areas; a variety of growth patterns are evident within the quartile (see <u>Table 5</u>).



# Table 5 Growth in Employment and Working-age Population in 40 areas, 1985 to 1988

Population growth was much higher in quartile 1 areas than elsewhere, suggesting that population flows were responding to economic opportunities.

What impact would population inflow have on an area's unemployment rate? By increasing the supply of labour, it should raise unemployment, thus moderating the difference between quartile 1 and the rest of the country, particularly if the skills and training possessed by new arrivals are not appropriate for the vacant jobs. However, other factors are also at work here, one of which might be that population inflow itself generates jobs by increasing local demand for housing and other goods and services.

## Summary

Although most areas of the nation benefited from the general decline in unemployment rates from 1985 to 1988, regional inequality in the distribution of unemployment worsened. Areas of the country with the tightest labour markets continued to expand quickly in 1988, with employment and population growth above the Canadian average.

## **Unemployment concepts**

In simple classical models, unemployment was the result of an inappropriate level of wages. In a market for any type of good, there was presumed to be a price level at which the quantity supplied equalled the quantity demanded. If this price was too high, then supply exceeded demand. In the case of labour markets, the price was expressed as a wage and the excess supply showed up as unemployment.

The real world (and modern theory) is much more complex. Unemployment can exist even when the demand for labour is fully adequate to absorb the available supply. Some people become unemployed due to job dissatisfaction, others from dismissal or layoffs resulting from business reorganization.

Furthermore, there is a steady flow of entrants and re-entrants to the labour market. Regardless of the reason behind their job search, for many of these people the process can take time even in the best conditions. This is sometimes referred to as "frictional unemployment".

Another reason for unemployment is a mismatch of available persons and jobs. These mismatches can exist for numerous reasons. For example, employers may be seeking types of skills or training different from those possessed by unemployed persons, or the jobs and potential workers may be in different locations. Unemployment resulting from such mismatches is commonly referred to as "structural unemployment".

Frictional and structural unemployment essentially dictate that unemployment cannot become zero. Instead, as unemployment declines, "real life" labour shortages develop while there is still

unemployment. This means that pressures of wage inflation begin to occur well above a level of zero unemployment.

In Canada, particularly since 1985, considerable public attention has been focused on one particular type of structural unemployment - that due to a geographical mismatch of persons and jobs. This paper is not intended to present a full analysis of structural factors in Canadian unemployment, but rather to highlight this one aspect.

#### Labour market defined

In its broadest sense, a market can be defined as "...an area within which buyers and sellers are in sufficiently close communication that price tends to be the same throughout the area" (Reynolds, 1982). The extent of a market for labour, however, depends partly on the type of worker involved. For example, the market for university teachers or senior business executives is national or even international, whereas store clerks and truck drivers are seldom recruited from outside their local area.

A key concept used to define local labour markets is daily commuting distance. This concept works well in metropolitan areas. It is, for example, unlikely that a very tight labour market could exist in one half of Calgary without the other half being affected, since an imbalance could be easily corrected if even a small proportion of the population commuted from one side of the city to the other.

At the other extreme, in an area such as Northern Ontario, sheer physical size prevents this adjustment process from operating, and means that local conditions can vary widely from place to place at any one time.

In between are areas such as Southern Ontario, which are larger and more diverse than individual metropolitan areas, but still sufficiently compact to allow internal market equalization mechanisms to operate to a limited extent.

# The gini coefficient: estimating inequality in the distribution of unemployment

The Gini coefficient is commonly used to measure inequality in the distribution of income. (See Morgan et al, 1962, pp. 310-311.)

In this study, the Gini coefficient was used as a global measure of inequality in the distribution of unemployment among 40 areas. This measure rose steadily during the study period, from .166 in 1985 to .202 in 1988, indicating that unemployment became less evenly distributed during the period.

The Gini coefficient is sensitive to the choice of units. If another set of areas were used for example, provinces different values would result.

The calculation procedures normally used for income calculations were adapted to the needs of the data set in this study. Within any given year:

- (a) The 40 areas were ranked by their unemployment rate, from lowest to highest.
- **(b)** A cumulative count of the labour force was made over the areas.
- (c) The same was done for unemployment.
- (d) The cumulative counts in steps (b) and © were converted to frequency distributions summing to 1.
- (e) In each of the 40 areas the value resulting from step (d) for unemployment was subtracted from the same value for the labour force. Because discrete areas were used in this study rather than a continuous distribution, this difference was calculated according to the following formula:

$$D_r = \frac{C_{br} + C_{br-1}}{2} - \frac{C_{ur} + C_{ur-1}}{2}$$

where

r refers to the  $r^{th}$  area, after ordering according to unemployment rates;  $D_r$  refers to the difference between the cumulative labour force and unemployment proportions;

 $C_{lr}$  and  $C_{lr-1}$  are the cumulative labour force proportions over, respectively, the first r and first r-1 (when r=1, the value for r-1 is set to 0); and

 $C_{ur}$  and  $C_{ur-1}$  are the corresponding values for cumulative unemployment.

(f) These differences were summed over the 40 areas to calculate the size of the crescent-shaped area under the curve. However, to allow for the fact that the areas are not all the same size, the differences were weighted by the labour force in each area. The sum can therefore be expressed as:  $S = \text{the sum over the 40 areas of } (F_r \times D_r)$ , where  $I_r$  is the proportion of labour force in the area

**(g)** Finally, the Gini coefficient is calculated by dividing *S* by .5 (the area under the diagonal) as illustrated below:



#### Chart

The line representing the cumulative proportional distribution of unemployment is called the Lorenz curve. In this schematic representation, if all areas had the same unemployment rate, the Lorenz curve would be a straight line at 45° from the axes. In fact, because the areas are ordered from the lowest to the highest unemployment rate, the Lorenz curve lies below this straight line. The cumulative proportion of unemployment will initially grow more slowly than the cumulative proportion of the labour force, catching up as higher unemployment areas are added into the calculation. Note that cumulative frequencies for both the labour force and unemployment sum to one.

The Gini coefficient is calculated by dividing the size of the crescent shaped zone between the curve and the 45° line by the area of the triangle under the 45° line.

Literature on income inequality states that an increase in the Gini coefficient can be interpreted unambiguously as an increase in inequality only if the Lorenz curves do not intersect (<u>Atkinson</u>, 1983). There is no overlap between the Lorenz curves for the 1985 and 1988 data.

#### **Notes**

#### Note 1

The Labour Force Survey (LFS) provides labour market data on the working-age population (aged 15 and over) excluding residents of the Yukon and Northwest Territories, Indian reserves and institutions, as well as full-time members of the Armed Forces.

#### Note 2

A Spearman rank-order correlation of the unemployment rates in 1985 and 1988 yielded a coefficient of .87.

#### Note 3

The same consideration dictates caution in comparing minor differences in rank between areas at any given point in time. Unrounded numbers were used to separate apparently equal rates.

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#### Source

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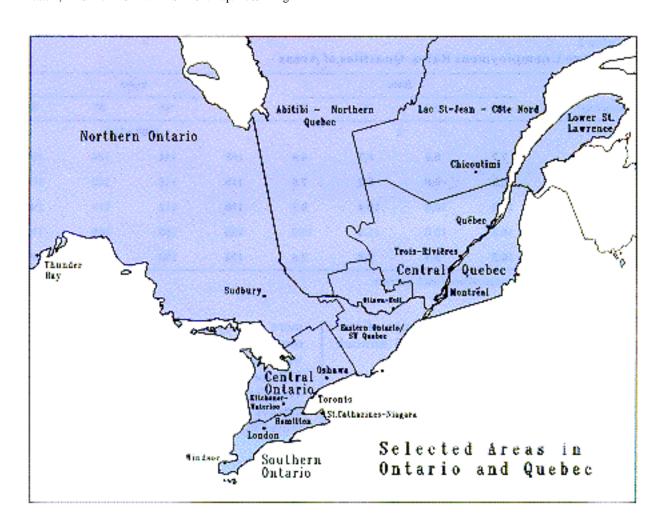


Unemployment Rates in 40 Areas, 1985 t	o 198	8						
Areas ordered by 1988 unemployment rate	Une	mploy	ment	Rank				
	'85	'86	'87	'88	'85	'86	'87	'88
		9	6					
Toronto CMA	6.7	5.5	4.5	3.7	1	1	1	1
London CMA	8.8	7.1	7.1	4.4	12	8	9	2
Central Ontario excl. CMAs	7.2	6.7	5.3	4.7	4	6	2	3
Ottawa-Hull CMA	8.3	8.4	7.3	5.0	7	12	10	_
Kitchener-Waterloo CMA	7.2	5.9	5.8	5.1	3	2	3	5
Oshawa CMA	7.2	6.1	6.4	5.2	5	3	6	6
Hamilton CMA	8.8	6.9	6.3	5.7	13	7	4	7
Thunder Bay CMA	10.7	10.4	8.2	6.1	21	21	14	8
Southern Ontario excl. CMAs	10.1	8.2	7.4	6.2	19	11	11	9
St Catharines-Niagara CMA	10.7	9.8	9.3	6.4	22	19	20	10
Saskatchewan excl. CMAs	7.1	6.6	6.7	6.9	2	5	7	11
Alberta excl. CMAs	8.3	8.5	8.8	7.0	8	14	17	12
Manitoba excl. Winnipeg	7.3	6.5	6.4	7.0	6	4	5	13
Regina CMA	9.6	8.1	6.9	7.1	15	10	8	14
E. Ont/SW Que excl. CMA	9.8	8.6	7.7	7.3	17	15	12	15
Northern Ontario excl. CMAs	9.7	11.1	9.6	7.7	16	25	22	16
Halifax CMA	9.5	9.8	8.9	7.8	14	17	18	17
Windsor CMA	8.4	8.1	9.3	7.9	9	9	21	18
Calgary CMA	10.2	9.8	9.0	8.1	20	18	19	19
Winnipeg*	8.8	8.5	8.0	8.3	11	13	13	20
Quebec CMA	8.6	8.8	8.8	8.4	10	16	16	21
Central Quebec excl. CMAs	11.6	10.2	10.3	8.8	23	20	25	22
Abitibi - Northern Quebec	13.7	12.1	8.8	9.2	32	30	15	23
Edmonton CMA	12.0	11.6	11.3	9.2	25	28	28	24
Montreal CMA	11.7	10.6	10.0	9.3	24	22	24	25
Vancouver CMA	13.2	10.7	11.4	9.4	29	24	29	26

* Data for Winnipeg refer to LFS eco				7.0				
Non CMA total  Canada	10.5	9.5	9.9 8.8	7.8				
CMA total	9.8	8.7	8.2	7.1				
Nfld. excl. St.John's	24.0	22.4	20.8	19.2	40	40	40	40
Lower St Lawrence	17.7	18.8	13.7	13.8	39	39	37	39
St-Jean - Côte Nord excl. CMA	15.4	15.1	14.4	13.1	36	37	38	38
Prince Edward Island	13.3	13.4	13.2	13.0	30	33	35	37
New Brunswick excl.Saint John	15.1	14.5	13.2	12.3	34	35	36	36
Nova Scotia excl. Halifax	16.2	15.3	14.6	11.8	38	38	39	35
British Columbia excl. CMAs	15.5	14.9	12.8	11.6	37	36	34	34
St. John's CMA	14.8	13.1	12.5	11.3	33	32	32	33
Chicoutimi CMA	13.2	11.4	11.7	11.0	28	26	31	32
Saint John CMA	15.4	13.6	12.6	10.9	35	34	33	31
Trois-Rivières CMA	12.9	12.7	11.0	10.4	26	31	27	30
Victoria CMA	13.0	12.1	10.9	10.2	27	29	26	29
Saskatoon CMA	10.0	10.6	9.9	9.9	18	23	23	28
Sudbury CMA	13.5	11.4	11.5	9.8	31	27	30	27

Table 2										
Average Unemployment Rates, Quartiles of Areas										
Quartile*		Rate Index								
	'85	'86	'87	'88	'85	'86	<b>'87</b>	'88		
	%				1988=100					
1	7.7	6.6	5.7	4.6	168	144	124	100		
2	8.9	8.6	8.2	7.5	118	115	109	100		
3	11.8	10.6	10.4	9.2	129	115	113	100		
4	16.2	15.6	13.9	12.6	129	123	110	100		
Canada total	10.5	9.5	8.8	7.8	135	123	114	100		
* See Table 1 fo	* See Table 1 for the composition of each quartile.									

Table 3									
<b>Unemployment Rates, Seven Areas in Quartile 1</b>									
	'85   '86   '87   '88								
	%								
Unemployment	7.3 6.3 5.3 4.3								
	1988=100								
Index	169 145 123 100								



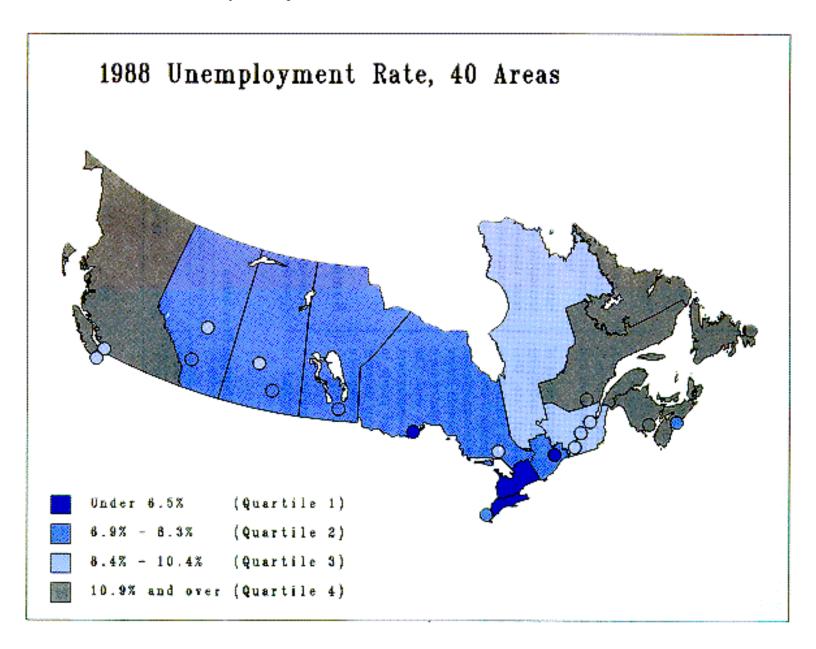


Table 4										
Growth in Employment and Working-age Population										
Year to year percentage change										
	Employment Population									
	'85-'86	'86-'87	'87-'88	'85-'86	'86-'87	'87-'88				
Quartile										
1	3.7	3.9	3.8	1.9	2.1	1.9				
2	1.4	1.2	2.4	0.7	0.7	0.7				
3	3.1	2.8	2.8	1.1	1.2	1.2				
4	1.6	3.1	4.2	0.1	0.5	0.7				
Canada total	2.8	2.9	3.2	1.1	1.3	1.3				

<b>Growth in Employment and Working-ag</b>	e Popul	lation ii	1 40 are	as, 198	5 to 198	8		
Areas ordered by 1988 unemployment rate	te Year-to-year percentage change							
	En	nploym	ent	P	opulatio	n n		
	'85-'86	'86-'87	'87-'88	'85-'86	'86-'87	'87-'88		
Toronto CMA	4.1	3.9	2.4	2.5	2.3	2.1		
London CMA	6.3	2.1	3.7	1.8	1.4	1.1		
Central Ontario excl. CMAs	2.2	4.7	5.2	0.9	1.8	1.8		
Ottawa-Hull CMA	2.8	4.6	6.5	2.2	2.3	2.1		
Kitchener-Waterloo CMA	3.0	1.6	6.2	2.6	1.9	1.7		
Oshawa CMA	6.1	4.1	3.9	3.3	3.4	3.2		
Hamilton CMA	6.9	6.6	3.0	1.4	2.0	1.9		
Thunder Bay CMA	0.6	4.6	1.7	1.1	1.7	1.5		
Southern Ontario excl. CMAs	4.6	0.5	5.2	0.6	2.0	2.0		
St Catharines-Niagara CMA	-2.4	5.4	4.2	0.2	0.9	0.8		
Saskatchewan excl. CMAs	0.1	-0.7	-0.7	-0.7	-0.4	-1.1		
Alberta excl. CMAs	0.8	-0.7	4.2	0.7	0.1	0.4		
Regina CMA	3.9	2.8	-0.8	1.6	1.8	1.1		
Manitoba excl. Winnipeg	2.8	1.5	0.2	0.4	1.1	0.8		
E. Ont/SW Que excl. CMA	2.8	5.7	3.4	0.4	1.5	1.5		
Northern Ontario excl. CMAs	-5.5	-0.7	4.2	-0.6	0.2	0.1		
Halifax CMA	3.5	3.2	3.3	2.1	2.2	2.2		
Calgary CMA	3.6	0.0	2.8	1.8	0.9	1.8		
Windsor CMA	3.6	3.7	6.6	1.5	1.3	1.1		
Quebec CMA	1.4	-1.7	0.5	1.7	0.7	0.4		
Winnipeg*	1.9	1.1	0.3	1.0	0.6	0.3		
Central Quebec excl. CMAs	2.8	4.4	5.0	0.0	1.1	1.1		
Abitibi - Northern Quebec	6.6	1.1	7.1	-0.1	0.3	0.2		
Edmonton CMA	0.8	2.4	3.3	1.0	0.6	1.1		
Montreal CMA	2.1	3.7	1.4	1.1	1.0	0.8		
Vancouver CMA	7.7	0.8	4.1	2.1	2.4	2.9		

Non-CMA total	1.7	2.7	4.0	0.2	0.8	0.0
CMA total	3.5	3.0	2.8	1.7	1.6	1.0
Nfld. excl. St. John's	2.7	3.2	5.3	0.1	0.9	0.9
Lower St Lawrence	-2.2	4.3	3.0	-0.4	0.1	0.0
St-Jean - Côte Nord excl. CMA	1.8	2.6	2.1	-1.1	0.2	0.2
Prince Edward Island	1.6	2.4	3.2	0.8	0.8	1.
New Brunswick excl. Saint John	2.7	4.0	1.9	0.6	0.6	0.
Nova Scotia excl. Halifax	1.6	2.4	5.5	0.2	0.2	0.0
British Columbia excl. CMAs	0.9	3.9	4.7	-0.3	0.3	1.0
St. John's CMA	2.7	0.9	5.9	1.4	0.9	0.9
Chicoutimi CMA	5.5	-2.3	3.6	0.4	1.2	1.
Saint John CMA	3.7	1.4	9.0	1.2	1.4	1
Trois-Rivières CMA	2.5	4.0	6.0	1.3	1.2	1.0
Sudbury CMA	5.5	1.1	0.5	-0.1	-0.9	-1.2
Victoria CMA	-2.3	10.9	0.1	1.7	2.1	2.
Saskatoon CMA	2.5	1.4	0.5	2.7	1.4	0.0

