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URBANIZATION AND ECONOMIC GROWTH
IN CANADA, 1851-1971

by

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Urbanization and Economic Growth in Canada, 1851-1971

   The purpose of this paper is to provide a long overdue examination
of the historical relationship between urbanization and economic growth in
Canada. Although the urbanization of population accompanying Canada's
economic development is obvious, economic historians have written virtually
nothing about the relationship between the long-run shift of population
into urban areas and Canadian economic growth.[1] This neglect has occurred
in large part because of the paucity, unitl recently, of certain historical
demographic and economic statistics. During the past decade, however,
several scholars have compiled a large array of Canadian historical statis-
tics on urban population, national output, and regional incomes. Methods
for organizing such statistics to analyze urban-economic development have
been suggested, moreover, by recent studies of American urbanization.[2]
These methods and statistics provide the essential basis for the examination
of Canada's urban development in this paper. The research reported here
supports recent studies which challenge earlier judgments concerning Canada's
late nineteenth century rate of economic development; this research also
suggests that the long-run trend of regional per capita income differentials
is closely related to the long-run trend of regional urbanization differentials.

   Although no well defined economic theory of urbanization exists,
certain aspects of theory dictate the choice of variables selected for
analysis in this paper. In particular, two sets of assumptions are generally
regarded as sufficient conditions to explain the historic rise in the share
total population living in urban areas, U/P, that occurred in most developed
nations during the past 200 years.[3] One set of assumptions is that average
total factor productivity has been higher in nonagricultural activities than
in agriculture and that the share of the work force in nonagricultural

occupations has grown steadily. The rise in the numbers of those available

for nonagricultural employment has been influenced in part, of course, by

the increased productivity of labor in agriculture. Primarily because of

technological change, the agricultural sector's demand for labor has fallen

sharply during the past century. Complementing the release of workers once

needed in agriculture has been the increasing demand during the past century

for manpower in nonagricultural endeavors. This rise in demand for non-

agricultural labor is caused by growth in real per capita income, given

that the per capita income elasticities of demand for manufactured goods

and services are higher than for agricultural goods. The other set of

assumptions noted above is that economies of agglomeration exist in most

nonagricultural pursuits and that nonagricultural activity tends to locate

in urban areas. The tendency for nonagricultural activity to locate in

cities reflects, of course, agglomeration economies which reduce production

costs, transaction costs, and levels of risk.

Two predictions can be deduced from the assumptions outlined above.

The first prediction is that the urbanized share of total population, U/P,

rises as the nonagricultural share of work force increases. The second

prediction is that the incremental urbanization ratio, Δ(U/P), "...captures

the share of total population transferred to a presumably more efficient

use or productive location."[4] The latter prediction suggests, of course,

that large increments to the urbanized population share, ceteris paribus,

are accompanied by increases in the economy's overall productivity. To

determine if these two predictions are confirmed by Canada's urban-economic

experience during the twelve decades since 1851, data on Canada's historical

rural-to-urban population shift must be compared with data on long-run

changes both in work force structure and in overall economic efficiency. These data will be examined first at the national level and then at the level of Canada's major regions.[5]

Nationwide Urbanization and Economic Change

National data on urban population change presented in Table 1 indicate that the public's preference for urban locations increased sharply during the 1870's.[6] The absolute increment to the urbanized share of Canada's total population, shown as $\Delta(U/P)$ in column 1 of Table 1, accelerates during the 1870's. Although national urban population data go back only to 1851, the magnitude of $\Delta(U/P)$ in any decade before 1871 was probably never larger than it was during the 1850's. Indeed, even if we assume a very low estimate of .05 for U/P around 1800, then the incremental addition of 2.8 to U/P during the 1850's was surely larger than it was in any prior decade. Therefore, the incremental rate of urbanization jumped during the 1870's to a level almost twice as large as any rate experienced prior to that time.[7] This conclusion is reinforced by other data which reveal that over three-quarters of the increment to total population during the 1850's took place in rural areas (i.e., $\Delta R/\Delta P = .76$) and almost two-thirds did the same during the 1860's. During the 1870's and the 1880's, however, less than one-half and one-tenth, respectively, of the increment to total population occurred in rural locations. No sharp discontinuity in the incremental rate of urbanization occurs, moreover, after 1871, except during the depression of the 1930's, when a brief but perceptible movement back to the farm took place. The rate of rural-to-urban shift established during the first decade of Confederation has been fairly stable and persistent ever since.

Table 1

Demographic Determinants of Urban Population Change, Canada, 1851-1971

Decade	Increment in Level of Urbanization $\Delta(U/P)$ (1)	Growth Rate of Total Population $100(\Delta P/P)$ (2)	Percentage of ΔU Attributable to	
			$\Delta(U/P)$ (3)	ΔP (4)
1851-61	2.8	32.6	41	59
1861-71	2.4	13.0	54	46
1871-81	5.0	17.2	60	40
1881-91	6.5	10.9	70	30
1891-01	5.1	12.5	57	43
1901-11	6.9	35.1	38	62
1911-21	5.6	22.0	39	61
1921-31	5.1	18.1	38	62
1931-41	3.2	10.9	36	64
1941-51	7.2	18.6	42	58
1951-61	7.3	30.2	30	70
1961-71	6.4	18.3	34	66

Sources:

Column 1 ; Table 2, column 1.

Column 2 ; 1851-1961 are from Stone, Urban Development in Canada, p. 269. 1971 is from Statistics Canada, Catalogue 92-709, Table 10.

Column 3 ; $100(P_t \Delta(\frac{U}{P}) + \frac{1}{2}[\Delta P \Delta(\frac{U}{P})] / \Delta U)$

Column 4 ; $100(\Delta P(\frac{U}{P})_t + \frac{1}{2}[\Delta P \Delta(\frac{U}{P})] / \Delta U)$

These expressions used to calculate the percentages in columns 3 and 4 are derived as follows: If

$$U_t = P_t (\frac{U}{P})_t \tag{1}$$

at one decade date, then at the next decade date

$$U_{t+1} = P_{t+1} (\frac{U}{P})_{t+1} . \tag{2}$$

Let $U_t + \Delta U = U_{t+1}$, $P_t + \Delta P = P_{t+1}$, and $(\frac{U}{P})_t + \Delta(\frac{U}{P}) = (\frac{U}{P})_{t+1}$.

Then, substituting in (2), $U_t + \Delta U = (P_t + \Delta P)((\frac{U}{P})_t + \Delta(\frac{U}{P}))$

or, $$U_t + \Delta U = P_t (\frac{U}{P})_t + \Delta P(\frac{U}{P})_t + P_t \Delta(\frac{U}{P}) + \Delta P \Delta(\frac{U}{P}) . \tag{3}$$

$\Delta U = U_{t+1} - U_t = (3) - (1)$. Therefore,

$$\Delta U = P_t \Delta(\frac{U}{P}) + \Delta P(\frac{U}{P})_t + \Delta P \Delta(\frac{U}{P}) \tag{4}$$

The first factor on the right-hand side of equation (4) is used in column 3 above and the second factor is used in column 4. Thus, column 3 shows the contribution to ΔU of $\Delta(\frac{U}{P})$, assuming P is constant, and column 4 shows the contribution of ΔP, assuming $\frac{U}{P}$ is constant. The third factor in equation (4) reflects the interaction between ΔP and $\Delta(\frac{U}{P})$ and it has been allocated equally (linear interaction assumed) to the amounts in columns 3 and 4. The interaction variable is small, ranging from 3 to 11 percent of ΔU in the twelve decade intervals shown here.

The large jump in $\Delta(U/P)$ during the 1870's suggests that a change occurred at that time in the forces generating the rural-to-urban shifts of employment and population. This change, as was predicted above, presumably caused an increase in the diversification of Canada's productive activities and a rise in the economy's productive efficiency. Recent historical research supports the suggestion offered here by the sharp rise of $\Delta(U/P)$ during the 1870's that a pronounced increase in the rate of economic development and a marked shift in the structure and location of economic activity did in fact occur in Canada around the 1870's. The orthodox view of Canada's economic development in the late nineteenth century presents the period, on the contrary, as one of stagnation. This orthodox interpretation rests in part on evidence of declining population growth rates after the 1860's and in part on inferences drawn from the absence of a dominant export staple during those years.[8] While it is certainly true that growth rates of population and aggregate output from 1870 to 1900 were below historic long-run averages, some scholars suggest that growth rates both of per capita income and productivity equalled or even excelled their long-run averages.[9] The larger contribution which the incremental urbanization ratio makes to urban population growth compels the inference that significant structural changes and productivity improvements occurred in Canada's agricultural, manufacturing, and service sectors after 1870. These changes and improvements combined to enhance the attractiveness of urban locations for residence and employment.[10] If the forces which caused the increase in $\Delta(U/P)$ after 1871 had not materialized, then the rate of urban population growth during the late nineteenth century would undoubtedly have been much less than we observe here.

This revised picture of late nineteenth century economic conditions
rests on statistical data which economic historians do not accept, of
course, without reservation; surely final judgment on the merits of this
"revisionist" view must be reserved until we have a much better series
of historical national income estimates than the series which now exists.[11]
In the meantime it is worth noting, as Jeffrey Williamson pointed out almost
a decade ago, that "systematic analysis of urban population statistics [might]
help explain the pace and character of...growth for a period which only
grudgingly releases economic data."[12]

Having dealt with one of the predictions in our economic theory of
urbanization, the prediction that the incremental urbanization ratio, $\Delta(U/P)$,
"...captures the share of total population transferred to a présumably more
efficient use or productive location," we turn now to the prediction that
the rate of growth of nonagricultural employment was one of the most im-
portant determinants of the incremental rate of urbanization. Given the
proclivity of industrial and service functions to locate in settled urban
areas, it is generally assumed that increments to the urban share of total
population follow increments in nonagricultural employment. This relationship
surely holds true in the long run; however, the data in columns (2) and (4)
of Table 2 do not reveal a close short-run correlation between incremental
urbanization, $\Delta(U/P)$, and the incremental nonagricultural work force share,
$\Delta(NAW/W)$. The reason for this low short-run correlation is simply that the
level of nonagricultural employment, NAW/W, has been much higher than the
level of urbanization, U/P, particularly in the early decades of the urban
"takeoff." Therefore, large numbers of workers formerly living in rural
areas and employed in nonagricultural occupations (largely in the primary
"staples" and rural service sectors) who then move to the city have the

effect of raising the level of urbanization without changing the nonagricultural work force share.

One historian's emphasis on the rural-to-urban migration of nonagricultural workers in South Central Ontario suggests that this movement contributes substantially to the sharp rise in Δ(U/P) after 1871.[13] Not much is known, however, of the jobs available to these migrants in urban areas during the late nineteenth century. The data in column (6) of Table 2 suggest that a large share of the incremental work force was employed in service occupations. Most of the new jobs created in the burgeoning commercial, financial, and transport sectors were undoubtedly in urban areas. Although Canada did not participate in the old industrialism of coal, iron, and steam, the country did experience a large increase in the volume of primary and secondary manufacturing activity during the last quarter of the nineteenth century. Most of this new activity was also located in urban areas, where it mainly served the needs of urban residents for processed foods, clothing, furniture, hardware, and a myriad of other consumer goods.[14]

Regional Patterns of Urban Economic Change

The long-term relationships obtaining between urbanization, work force structure, and productivity at the national level are particularly germane to comparative studies of economic performance in Canada's major regions. A notable feature in the historical pattern of Canada's development is that urbanization has accompanied the westward movement of population across the sharply differentiated regions of the continent. Whereas the small share of the population that was urbanized in 1851 resided

TABLE 2

Urbanization of the Population and Industrialization of the Work Force, Canada, 1851-1971

Date	Level of Urbanization U/P	Incremental Change Δ(U/P)	Nonagricultural Work Force NAW/W	Incremental Change Δ(NAW/W)	Manufacturing Work Force MW/W	Service Work Force SW/W
	(1)	(2)	(3)	(4)	(5)	(6)
1851	13.1		45.5		12.1	14.7
		2.8		0.5		
1861	15.9		46.0 (1860)		11.8 (1860)	15.9 (1860)
		2.4		4.0		
1871	18.3		50.0		13.1	17.0
		5.0		2.0		
1881	23.3		52.0		13.8	19.4
		6.5		2.2		
1891	29.8		54.2		16.2	24.2
		5.1		5.6		
1901	34.9		59.8		17.3	27.8
		6.9		5.9		
1911	41.8		65.7		19.9	33.4
		5.6		1.5		
1921	47.4		67.2		17.5	36.9
1931	52.5		68.3		18.7	40.2
		3.2		5.0		
1941	55.7		73.3		23.4	39.7
		7.2		10.5		
1951	62.9		83.8		26.4	45.5
		7.3		5.7		
1961	70.2		89.5		24.0	56.3
		6.4		4.2		
1971	76.6		93.7		22.2	62.6

Sources: Column 1; 1851-1961. Stone, Urban Development in Canada, Table 2.2, p. 29.
1971. Statistics Canada, 1971 Census of Canada, Catalogue 92-709, Vol. 1, Part 1 (February, 1973), Table 10.

Columns 3, 5 and 6; 1851 and 1860 are from Firestone, "Development of Canada's Economy, 1850-1900," Tables 5 and 6, p. 229, 1871-1921 are from Firestone, Canada's Economic Development, 1867-1953, Table 66, p. 185. The Firestone data are consistent from 1851-1921. The data for 1931-1961, not entirely consistent with Firestone, are from Noah M. Meltz, Changes in the Occupational Composition of the Canadian Labour Force, 1931-1961 (Ottawa: Dept. of Labour, Economics and Research Branch, Occasional Paper No. 2, March, 1965), Table A-5, p. 120. The data for 1971, consistent with Meltz, are from Statistics Canada, The Labour Force, Catalogue 71-001 (January, 1972), Table 7, pp. 20-21.

entirely in the settled regions of eastern Canada, the largely urbanized

population of 1971 was widely distributed throughout the nation. This

westward shift of urban population is seen in Chart 1 where the levels of

urbanization, U/P, in Canada and the five major regions are plotted on a

logarithmic scale at decade intervals from 1851 to 1971.

Although no estimates of Canada's urban population before 1851

exist, it is nevertheless possible to reach certain conclusions concerning

the relative rates of urbanization in the three regions of eastern Canada

during the first half of the nineteenth century. It is known that by 1851

Quebec was the most urbanized region, Ontario was less urbanized, and the

Maritimes was the least urbanized region of eastern Canada.[15] If, as is

widely believed, the Maritimes was the most urbanized region of British

North America at the beginning of the nineteenth century,[16] then it follows

that the rate of urbanization was certainly much higher in Quebec and Ontario

than in the Maritimes during the half century before 1851. The presumably

higher rate of urbanization in central Canada, dating perhaps from the

1820's, reflects both the impact of immigration and the high demand of com-

mercial farmers for urban services in nineteenth century North America.

Virtually all of the immigrants to British North America during the first

half of the nineteenth century came from either the United States or the

British Isles. Because of their agricultural backgrounds, most of these

migrants, especially after 1820, sought the more fertile areas of the upper

St. Lawrence valley and the lower Great Lakes region rather than settle in

the poor farming areas of the Maritimes. The strong commercial orientation

of these agricultural migrants gave rise, moreover, to many small and

medium sized urban service centers, particularly in Ontario. The Maritimes

Chart 1

Urban Share of Total Population, U/P,

Canada and Major Regions, 1851-1971

Census Year
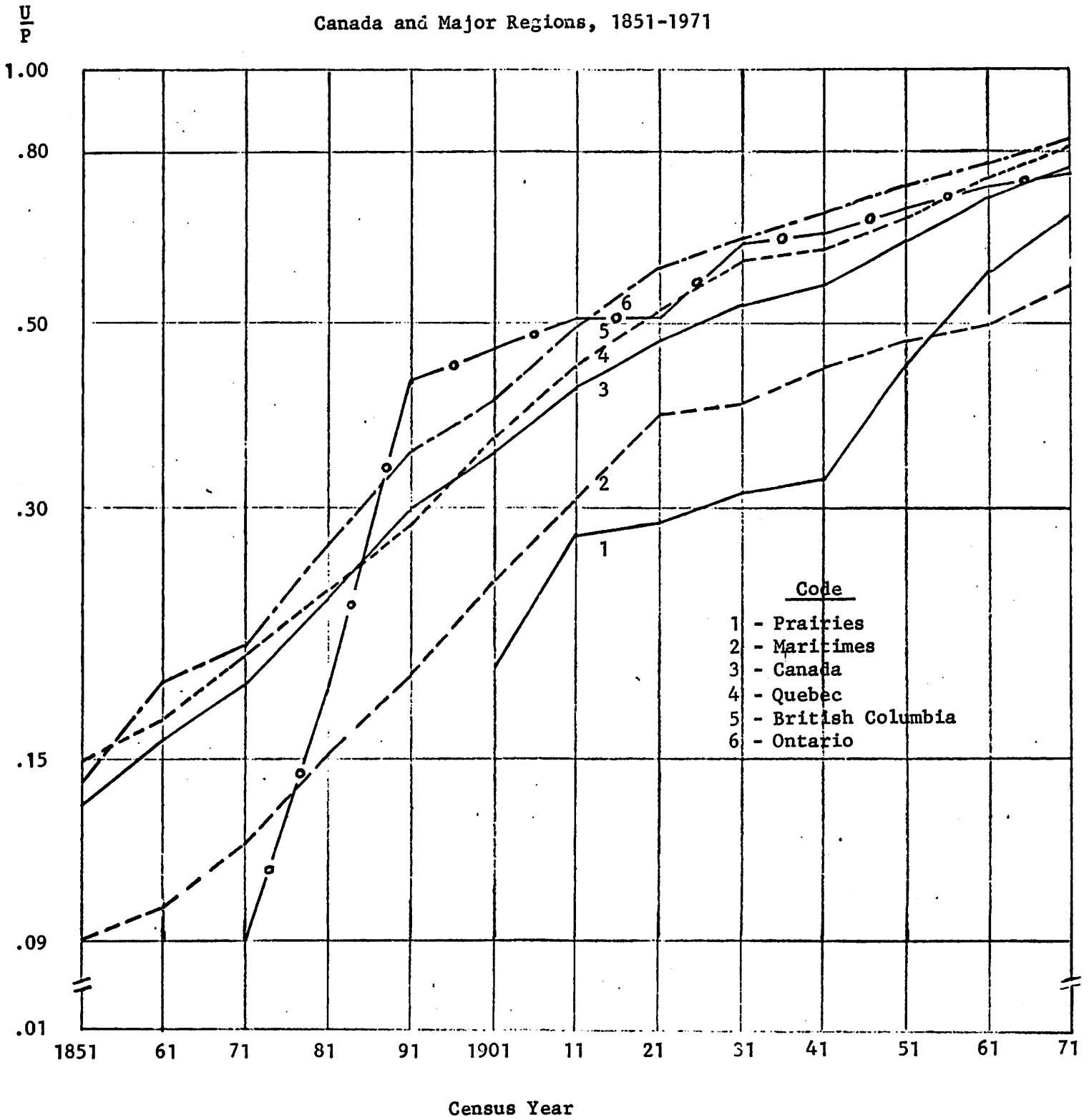
Source: Stone, <u>Urban Development in Canada</u>, p. 29, Table 2.2.

contained some of the largest urban centers in British North America during the early nineteenth century; since the region's economy was directed toward the sea, however, the Maritimes did not require many towns to serve the hinterland. Central Canada, on the contrary, was characterized by a large agricultural base which depended upon small but numerous urban centers. Consequently, this area was more urbanized than the Maritmes by at least 185L

From 1861 to 1921, the rates of urbanization in Canada's three eastern regions are about equal. Virtually no change occurs in the regional urbanization differential during these sixty years. It is widely believed that after the 1860's certain developments such as technological change in ocean shipping and the institutional arrangements of Confederation put the Maritimes in a relatively unfavorable economic position. It would seem, however, that the forces which attract incremental population to urban areas were as strong in the Atlantic Provinces after 1871 (and until at least the end of the World War I decade) as they were in central Canada. Indeed, during much of this period after 1871, particular developments in the field of rail transportation gave a strong impetus to development in Atlantic ports such as St. John and Halifax.[17] One cannot ignore, however, the traditional argument that the advent of steam-powered, iron-hulled shipping reduced many of the economic opportunities enjoyed by the Maritimes region during the age of sailing ships. Heavy migration from the Atlantic Provinces both to central Canada and to the United States indicates that marginal opportunities were much greater outside the Maritimes after 1871 than in the Atlantic Provinces. More research is needed to determine the exact causes of the high rate of urbanization in the Maritimes after 1871, although it is likely that outmigration of rural population is a major cause.

In the West, rates of urbanization have been much more volatile than in the East, with pronounced upward movements closely linked with major economic developments. In British Columbia, for example, rapid urbanization during the 1870's and 1880's reflects the construction and completion of the transcontinental railway connection with eastern Canada. Since 1891, however, British Columbia's level of urbanization has grown at the lowest rate of any region in Canada, a rate matched only by the slow growth of the Prairie region during the interwar period. As does British Columbia, the Prairies also demonstrate volatile rates of urbanization. The least urbanized region of Canada at the time, the Prairies reported in 1901 just under 20 percent of their population in urban areas. The wheat boom of the next decade brought a substantial burst of urbanization to the region. As the rush of settlement in the Prairies abated after 1911, the rate of urbanization there approached the lowest level in any region of Canada in modern times. Then, after the discovery of major oil and gas reserves in Alberta during the late 1940's, the level of urbanization in the Prairies shot up once more at a rate almost as high as in the decade of the wheat boom. The Prairies, and Alberta in particular, has been Canada's most rapidly urbanizing region throughout the entire period since World War II.

It is well known that a long-run increase in economic welfare has accompanied urbanization of the population and industrialization of the work force in Canada as a whole, as it has in all modern developed nations. Is there also a direct relation between these variables in each of Canada's geographic regions? Although the data needed to study this question are limited, it is possible to compare regional levels of income, industrialization, and urbanization for three distant points in time: approximately 1890, when the nation's first wave of industrial urbanization was well under

way; the late 1920's, when the nation's population was almost exactly one-half urbanized; and the recent past around 1960. The regional data in Table 3 offer evidence on the cross sectional relationship between urbanization and economic activity, and they also offer limited evidence on the temporal relationship between urbanization and incomes per capita.

In none of the three time periods in Table 3 is there an unambiguous cross sectional relationship between urbanization and the various economic indicators. In about 1890, a direct relationship between high levels of urbanization and high incomes per capita existed in Ontario and British Columbia, the two most urbanized regions of Canada. Moreover, the higher income level in British Columbia was associated with a much higher non-agricultural work force share. Although Ontario's nonagricultural work force had proportionately more workers in the high value-added "urban industrial" sectors of mining, manufacturing, and construction, the province's higher agricultural work force share evidently reduced the average income level. In the other regions of Canada at about 1890, relationships between incomes and urbanization were not as direct as they were in Ontario and British Columbia. The Prairies, for example, enjoyed fairly high incomes without benefit of any significant urbanization. That region's development had barely begun, however, and the very small population there by 1891 hardly warrants comparison with the older, more settled regions. In Quebec and the Maritimes, the two least urbanized regions of eastern Canada, the levels of urbanization and income around 1890 were inversely related. This inverse relationship suggests, perhaps, that where the level of urbanization is below a certain point, a higher percentage of population living in urban areas, as in Quebec, does not insure a higher average income per capital. It

Table 3

Regional Differentiation, Canada: ca. 1890, ca. 1929, and ca. 1960

	1890/1891				Late 1920's				Early 1960's			
	Urbanization Level	Non-agricultural Work Force	Mining, Mfg. and Construction in the Non-agricultural Work Force	Per Capita Gross Value Added Relatives				Per Capita Income Relatives				Per Capita Income Relatives
	U/P (1891)	NAW/W (1891)	MMCW/NAW (1891)	(1890)	U/P (1931)	NAW/W (1929)	MMCW/NAW (1929)	(1926-29)	U/P (1961)	NAW/W (1956)	MMCW/NAW (1956)	(1956-62)
Canada	29.8	53.9	49.2	100	52.5	72.9	37.3	100	70.2	85.6	34.5	100
Maritimes	18.8	55.0	43.8	88	39.7	70.5	31.8	66	49.5	86.3	28.0	70
Quebec	28.6	53.9	51.0	85	59.5	78.9	40.8	87	74.3	87.9	39.3	86
Ontario	35.0	53.4	51.3	113	63.1	78.7	42.8	111	77.3	90.4	40.4	118
Prairies	-	36.4	34.9	97	31.3	52.2	24.3	100	57.6	67.8	19.1	98
British Columbia	42.6	82.6	49.0	162	62.3	87.6	31.6	123	72.6	94.3	31.7	117

Sources: U/P; Stone, Urban Development in Canada, Table 2.2, p. 29.

Work force data; Green, Regional Aspects of Canada's Economic Growth, Appendix C, pp. 104-107.

Gross value added (1890); Ibid., Table B-1, p. 85. Green's GVA estimate ≃ Firestone's GNP estimate. See Ibid., p. 100.

Per capita income relatives; McInnis, "The Trend of Regional Income Differentials in Canada," p. 444.

would seem that the large nonagricultural population living in rural areas in the Maritimes contributed more value added per capita than did Quebec's agricultural population. Possibly this segment of the Maritimes population contributed even more value added per capita than did many of the residents in Quebec's two large cities, Montreal and Quebec.

Cross-sectional relationships for the late 1920's and for about 1960 in Table 3 resemble those prevailing in approximately 1890. In the Maritimes the combination of low urbanization and low income levels evident in around 1890 becomes more pronounced during the twentieth century, while the Prairie region continues in this century to maintain near average incomes in spite of below average urbanization levels. Quebec's population and work force structures become more like Ontario's over the years, and yet the income gap between these two provinces remains about the same as it was in the late nineteenth century. British Columbia continues to maintain high levels of both urban population and income.

While the data in Table 3 are hardly sufficient to permit generalizations about time-series relationships, they do suggest that during the past fifty years regional differentials in income per capita and urbanization have diminished. Recent studies by Green and McInnis support the impression of falling regional income differentials. These differentials, already quite large in 1890, increased during the era of rapid growth from the late 1890's to about 1910; thereafter they decreased.[18] It is not clear exactly when, after 1910, the regional income differentials began to diminish. It is fairly certain, however, that the degree of regional income inequality around 1960 is less than it was in the 1920's.[19]

Although Canadian income differentials have been the subject of considerable investigation, no one has analyzed the evidence on regional

urbanization differentials. Regional population data are, however, more plentiful than, and go back much further in time than regional income data. An assessment of regional differentials in urbanization may increase our understanding of trends in regional development. Such trends are measured only partially, at best, by any single set of statistics such as income, employment structure, or urbanization. Accordingly, the data in column (1) of Table 4 measure the degree of difference between the urbanization levels in Canada's regions and the national average; the larger the mean deviation, the larger the degree of difference. There is no marked trend toward either convergence or divergence among the three regions of eastern Canada from 1851 to 1891. The data after 1900 are not consistent with the nineteenth century data in that they include all five regions of Canada. Beginning in 1901, therefore, the regional levels of urbanization converge markedly during the period of rapid settlement and growth which ends around the time of World War I. Economic expansion during the 1920's, perhaps because so much of it occurred in central Canada, is accompanied by sharp divergence in regional urban population ratios. Since 1941, however, regional urbanization levels have converged substantially. It is well known that Canada's rapid growth since World War II has proceeded both from the rapid development of Prairie resources, as in the period 1901 to 1921, and from the rapid development of central Canada's manufacturing sector. In both the early 1900's and the last two decades, wider regional distribution of the sources of economic growth has been accompanied by a sharp decrease in regional urbanization differentials.

This decrease in the differences between the urbanization levels in the various regions raises an important question. Does convergence of

Table 4

Deviation of Urbanization Ratios and Dispersion of
Urban and Rural Population, Canada's Regions, 1851-1971

| | Mean Deviation of Regional Urbanization Ratios m.d. | Measures of Relative Dispersion of - | |
		Urban Population V^U	Rural Population V^R
	(1)	(2)	(3)
Eastern Canada			
1851	.17	.4657	.2586
1861	.19	.5743	.3058
1871	.19	.5556	.3141
1881	.17	.5967	.3153
1891	.19	.6473	.3138
All Canada			
1901	.25	.9508	.7154
1911	.21	.7529	.5119
1921	.19	.7448	.5114
1931	.23	.7363	.5518
1941	.22	.7460	.5345
1951	.17	.7163	.4638
1961	.13	.7171	.4172
1971	.11	.7163	.3613

Notes: Column 1; The mean deviation at time t, where U_{rt} and P_{rt} are the urban and total population respectively of the rth region at time t and U_{ct} and P_{ct} are the urban and total populations of Canada at time t, is

$$(m.d.)_t = \frac{\sum_{r=1}^{n} \left| \left(\frac{U_{rt}}{P_{rt}} \div \frac{U_{ct}}{P_{ct}} \right) - 1.00 \right|}{n}$$

where n is the number of regions. From 1851 to 1891 there are three regions (Maritimes, Quebec and Ontario) and from 1901 to 1971 there are five regions (the first three plus the Prairies and B.C.). Source of data: See Chart 1.

Columns 2 and 3; The measure of relative dispersion used here is the coefficient of variation, which is the standard deviation (σ) divided by the mean of the respective population group. Source of data: See Table 2.

Format adopted from Williamson, "Urbanization in the American Northeast," Tables 2 and 3.

regional urbanization levels result primarily from interregional shifts
in urban population, or does it occur mainly because of interregional shifts
in rural population? To answer this question, columns (2) and (3) of
Table 4 show measures of the relative dispersion of urban and rural
population in Canada at each Census year since 1851. A larger absolute
magnitude of a coefficient of variation reflects a higher degree of con-
centration of the relevant population variable. Thus, urban population
in Canada has always been less equally distributed (i.e., more concentrated)
than rural population ($V^U > V^R$). When urbanization ratios diverged slightly
during the last half of the nineteenth century (1851-1891 in column (1)),
both urban and rural populations became increasingly concentrated (i.e.,
V^U and V^R rose). In general, both rural and urban population were con-
centrating more heavily in Ontario than elsewhere, and, because Ontario's
urban population ratio was well above the national mean, this inflow caused
a moderate degree of divergence in regional urbanization ratios. Con-
versely, when regional urbanization ratios have converged sharply, as from
1901 to 1921 and 1941 to 1971, a pronounced diffusion of both urban and
rural populations has resulted. It is notable, however, that during the past
three decades far more diffusion of rural population than urban population
has taken place. This is indicative of the large relative decline of rural
population in the Prairies. Surely not much latitude is left for further
diffusion of rural population; continued convergence of regional urbani-
zation ratios in the future will depend, therefore, on increased diffusion
of urban population--a trend which seems unlikely in view of the experience
of the past fifty years.

These comments on the future importance of regional urban population

diffusion highlight the obvious fact that the historical migration of population from Canada's rural areas to the city is nearly complete. Henceforth, inter- and intra-regional migration will entail movement primarily from city to city. Studies of urbanization and economic growth in the future will rely much less than this study does, therefore, on measures of urbanization which stress the rural-to-urban shift.[20] Urban population dynamics will remain important, however, to the study of economic growth. Indeed, an important issue in the area of regional development policy is the mechanism linking economic growth to migration and urbanization. As Leroy Stone's research suggests, "...the level of urbanization in a Canadian region is positively associated with the level of net migration to the region."[21] Migration of population is certainly one of the major factors that affect regional disparities in income and urbanization. Although the topic has only begun to receive serious attention from Canadian urban scholars, it would seem that the lessening of both regional income differentials and regional urbanization differentials in recent years reflects the efficiency with which Canada's present system of cities encourages migration of population and diffusion of economic growth.

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FOOTNOTES

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me with unpublished demographic statistics from Mr. Stone's data bank.

[1]Undoubtedly the most important historical survey of Canadian
urbanization to date is Leroy O. Stone, Urban Development in Canada: An
Introduction to the Demographic Aspects (Ottawa: Dominion Bureau of Statis-
tics, 1967). Stone's study concentrates on demographic and sociological
aspects of urbanization, however, and mentions only briefly its economic
aspects. Stone's historical series of urban population data are nevertheless
an invaluable aid to the study of Canadian urban history, as their prevalence
in the tables and charts of this paper testifies. Economists and historians
frequently consider economic factors in their studies of Canadian urban
development, but they confine their attention to particular cities and
regions or they limit their analysis to a limited time period. None examine
the secular process of urbanization in relation to overall economic growth.
Two recent bibliographical sources on Canadian urban history are Frederick
H. Armstrong, "Urban History in Canada: Present State and Future Prospects,"
Urban History Review No. 1 (Ottawa: National Museum of Man, February, 1972)
and Gilbert A. Stelter, Canadian Urban History: A Selected Bibliography
(Sudbury: Laurentian University Press, 1972).

[2] See especially Eric E. Lampard, "The Evolving System of Cities in the United States: Urbanization and Economic Development," in Harvey S. Perloff and Lowdon Wingo, Jr., eds., Issues in Urban Economics (Baltimore: The Johns Hopkins Press for Resources for the Future, Inc., 1968), pp. 81-139 and Jeffrey G. Williamson, "Urbanization in the American Northeast, 1820-1870," in Robert W. Fogel and Stanley L. Engerman, eds., The Re-interpretation of American Economic History (New York: Harper and Row, 1971), pp. 426-436.

[3] A full accounting for the sustained rise in U/P in modern developed nations is beyond the scope of this paper; the linkage between industrialization of the work force and population agglomeration, stated in this paragraph in tautological form, is nevertheless a widely accepted generalization and it is used frequently in this paper. A classic discussion of the economic aspects of industrial urbanization is in Eric E. Lampard, "The History of Cities in the Economically Advanced Areas," Economic Development and Cultural Change, III (January, 1955), pp. 81-136. Further discussion of the applications and limitations of location and growth theories to historical urban studies is in Lampard, "The Evolving System," pp. 82-106.

[4] Williamson, "Urbanization in the American Northeast, 1820-1870," p. 427.

[5] The two predictions outlined here are concerned exclusively with economic aspects of the urbanization of population as such. A more complete theory of urbanization would also consider how economic and technological factors affect both population densities within cities and the size

distribution of cities. These two aspects of Canadian urban-economic history are the subject of another research project still in progress. Preliminary historical data on the size distribution of Canadian cities are available to interested readers on request.

[6]The urbanization statistics in this paper are derived from a series of urban population data in which historical census estimates of population in urban areas are adjusted to conform with the census definition of "urban" employed in 1961. (See Stone, Urban Development in Canada, p. 28 and Appendix A.) Areas classed as "urban" in the 1961 Census are: 1) incorporated cities, towns, and villages $\geq$ 1,000 population; 2) un-incorporated towns or villages $\geq$ 1,000 population; and 3) built-up fringes of incorporated cities, towns, and villages $\geq$ 5,000 population with a population density $\geq$ 1,000 persons per square mile. The same definition of an urban area is used in the 1971 Census, data from which are used without adjustment in Table 2. All historical statistics relating to Canada in this paper exclude Newfoundland and the Northwest and Yukon Territories.

[7]Leroy Stone notes this abrupt "takeoff" of the incremental urbanization ratio during the 1870's and 1880's. Moreover, he emphasizes that "the historical pattern of urban development in Canada is not merely a result of places 'graduating' from rural to urban status and cities enlarging their boundaries through annexation; it is a pattern which is shown by the intercensal growth rates for cities independently of boundary changes." Stone, Urban Development in Canada, pp. 36 and 19.

[8]M. H. Watkins, "A Staple Theory of Economic Growth," in W. T. Easterbrook and M. H. Watkins, eds., Approaches to Canadian Economic History

(Toronto: McClelland and Stewart, 1967), pp. 69-70.

[9]O. J. Firestone, "Development of Canada's Economy, 1850-1900," in Trends in the American Economy in the Nineteenth Century, National Bureau of Economic Research, Studies in Income and Wealth, Vo.. 24 (Princeton: Princeton University Press, 1960), pp. 222-239. G. W. Bertram, "Economic Growth in Canadian Industry, 1870-1915: The Staple Model," in Easterbrook and Watkins, eds., Approaches, pp. 78 and passim.

[10]Bertram, "Economic Growth in Canadian Industry," pp. 96-98. Edward J. Chambers and Gordon W. Bertram, "Urbanization and Manufacturing in Central Canada, 1870-1890," in Sylvia Ostry and T. K. Rymes, eds., Papers on Regional Statistical Studies, Canadian Political Science Association, 1964 Conference on Statistics (Toronto: University of Toronto Press, 1966), pp. 225-258.

[11]Duncan M. McDougall, "Canadian Manufactured Commodity Output, 1870-1915," The Canadian Journal of Economics, IV (February, 1971), pp. 21-22.

[12]Jeffrey G. Williamson, "Antebellum Urbanization in the American Northeast," Journal of Economic History, 25 (December, 1965), p. 593.

[13]Jacob Spelt, Urban Development in South-Central Ontario (Toronto: McClelland and Stewart, 1972), pp. 147 and 178.

[14]Gordon W. Bertram, "Historical Statistics on Growth and Structure of Manufacturing in Canada, 1870-1957," in Canadian Political Science Association, 1962 Conference on Statistics (Toronto: University of Toronto Press, 1964), pp. 117-118.

[15] In contemporary sources before 1867, Quebec is referred to as Lower Canada or Canada East and Ontario is referred to as Upper Canada or Canada West.

[16] S. A. Cudmore and H. G. Caldwell, "Rural and Urban Composition of the Canadian Population," in Seventh Census of Canada, 1931 (Ottawa: D.B.S., 1942), Vol. XIII, p. 466.

[17] J. M. S. Careless, "Aspects of Metropolitanism in Atlantic Canada," in Mason Wade, ed., Regionalism in the Canadian Community, 1867-1967 (Toronto: University of Toronto Press, 1969), pp. 117-129.

[18] Alan S. Green, Regional Aspects of Canada's Economic Growth (Toronto: University of Toronto Press, 1971), p. 61.

[19] Marvin McInnis, "The Trend of Regional Income Differentials in Canada," The Canadian Journal of Economics, I (May, 1968), pp. 443 and 446.

[20] For a similar remark concerning the study of American urbanization see Lampard, "The Evolving System," p. 138.

[21] Stone, Urban Development in Canada, pp. 122-123.