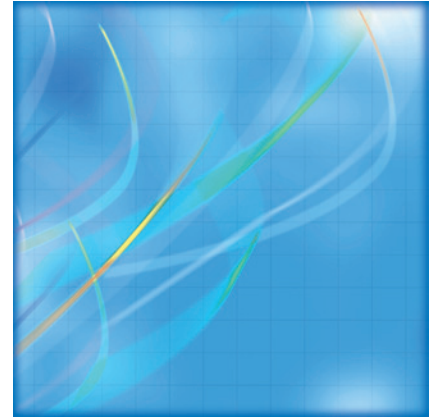## Analytical Paper

Insights on the Canadian economy

From Labrador City to Toronto: The industrial diversity of Canadian cities, 1992-2002

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Aussi disponible en français

Abstract

This paper provides an empirical analysis of the levels and trends in the industrial diversity of Canadian cities over the past ten years (1992-2002), a period of significant structural change in the Canadian economy. Diverse cities are thought to be more stable and provide environments that lead to stronger economic growth. Using detailed establishment level data on businesses from the entire spectrum of small and larger Canadian cities, the study shows that diversity levels vary significantly across cities, with the most populous cities being far more diverse than the least. Although there is a strong positive relationship between diversity and the population of a city, relatively small cities (those with a population around 100,000) can achieve levels of diversity that are near that of the largest urban centres. Consequently, most Canadian's live in relatively diverse urban economic environments. Over time, the level of diversity of Canadian cities has in general increased. This was particularly true of small cities with populations less than 100,000. The largest cities experienced declining diversity levels.

Introduction

> Urban economies with more diverse industrial bases are thought to be more stable and more dynamic. Because of this, increasing industrial diversity has been a goal of policy makers.

When describing the characteristics of urban economies, analysts regularly focus on indicators like rates of employment growth, wage growth, and unemployment. Often ignored is the diversity of a region's economy. This is somewhat surprising because increasing industrial diversity is the stated goal of many local and regional development authorities.[1]

There are two primary reasons why policy makers see diversity as a positive characteristic of urban economies.[2] The first reason is that diverse economies are thought to be stable economies.[3] 'One-industry towns' are vulnerable to a downturn in their key industry, which can lead to high levels of unemployment and the out-migration of workers. Places with a wide spectrum of industries are better able to weather a slump in any one of their industries, because workers are more likely to find jobs quickly in other sectors.

The second reason is that diverse economies are thought to be more dynamic. Jane Jacobs has long argued that diverse cities are places where new ideas are formed and most easily transferred across industries; this, in turn, promotes higher levels of growth.[4] There is evidence from the U.S. that diverse cities grow faster than cities that are more highly specialized.[5] Moreover, there is also evidence from the U.S. and Canada that fast-growing, high-tech industries are attracted to diverse cities.[6]

The level of diversity that characterizes an urban economy is a reflection of its industrial structure—the number and size of industries found in that place. Rarely does the industrial structure of an economy change rapidly. Rather, the structures of urban economies change gradually—at what might best be described as a glacial pace. Still, change does occur and during the 1990s there were structural forces at work in the Canadian economy that may have had a strong effect on the diversity of its urban economies.[7]

Two of the most important forces are technological change and trade liberalization. As new technologies have reduced communication and transportation costs, the need to be in large cities may have declined, allowing industries to spread out from large to smaller cities. For example, call centres have been attracted to smaller urban centres because of lower labour costs.

Trade liberalization may have had the opposite effect on diversity. With increased international trade, urban regions will tend to specialize in those industries where they have a comparative advantage in international markets, resulting in reduced levels of diversity.[8]

Given that diversity can influence the stability and growth of urban economies and that there have been economic forces at work in the 1990s that might affect the economic diversity of these economies, this paper has two objectives. The first is to show how the level of diversity varies across Canada's urban areas. If there is a wide variation in diversity levels, then urban economies might also differ in terms of their stability and potential for growth—particularly growth driven by new high-tech industries.

The second objective is to determine whether diversity levels have changed over time. That is, the paper asks whether structural shifts in the Canadian economy have caused Canadian cities to become more or less specialized.

The rest of the paper is organized as follows. Initially, we will discuss how we measure diversity and the characteristics of the data used to develop this measure. This is followed by a discussion of how diversity levels vary across urban areas and how diversity levels have changed over time. A brief conclusion ends the paper.

Measuring industrial diversity

> Urban economies are more diverse if they contain more industries and/or their employment is spread more evenly across their industries.

The simplest way to measure the diversity of an urban economy is to count the number of industries present in each city. Although simple in its application, this approach is likely to provide an inaccurate measure of industrial diversity. To see why, it is helpful to think of two cities, both with the same number of industries. In one of the cities, employment is evenly spread across all industries. In the other, ninety percent of employment is concentrated in only one of the industries. Clearly, the economy of the former is far more diverse than the latter, even though both have the same number of industries. This means that any meaningful measure of diversity must take into consideration (1) the number of industries and (2) how employment is shared across them. The measure of diversity we use here takes both of these characteristics into account.[9]

For ease of exposition, we present our measure of diversity not as a raw number, but as a relative measure. Each urban area is compared to a reference urban area, Toronto[10], whose diversity level is indexed to 100.

In this paper, we use a comprehensive Statistics Canada micro-database—the Business Register[11]—to measure the industrial diversity of Canadian cities. The Business Register contains detailed information on all businesses across all goods and service producing industries in Canada. The Register provides detail on the industry, employment and location of business establishments. Its comprehensiveness allows us to examine, in detail, diversification patterns for all areas of Canada.

Geographically, we have chosen to measure diversity across Canada's cities—Census Metropolitan Areas (CMA) and Census Agglomerations (CA). Throughout the analysis we maintain a constant urban geography[12] to ensure boundary changes do not affect the comparability of our results over time.

In order to employ a consistent industrial classification over the study period, we used the 1980 Standard Industrial Classification (SIC). The level of industrial detail chosen was the 3-digit SIC. It was necessary to use this level of industrial aggregation because in the earlier years not all businesses were coded to the 4-digit level, the most detailed level possible.

Several sectors had to be excluded from the analysis in order to maintain consistent measures of diversity over time and across urban areas. Agriculture in earlier years was coded only to the 2-digit level and was excluded as a consequence. However, little information was lost by excluding agriculture, because agricultural industries play only a small role in urban economies. In additional to agricultural industries, government, postal, health and education industries were also excluded from the study. Since employment data is based on payroll information, these industries tended to be reported as geographically concentrated within the Business Register, even though the actual employment is spread over the entire province or country. In the end, we use 285 three-digit industries, which account for 75% of urban employment.

Industrial diversity across cities

There is a wide variation in diversity across Canadian cities. Montreal is Canada's most industrially diverse city and Kitimat is the least diverse, with a diversity that is one-eighth that of Montreal.

There is a high degree of variation in the level of diversity across Canada's urban regions. This is evident in Figure 1, which plots the level of diversity for each urban area against its population level. In 2002, Montreal was Canada's most diversified urban region and was assigned a diversification index value of 108. Toronto, Vancouver and Winnipeg follow closely behind Montreal. The least diverse (most specialised) urban centre was Kitimat, which was approximately one-eighth as diverse as Montreal.

Figures 1 and 1A. Industrial diversity as a function of population, 2002
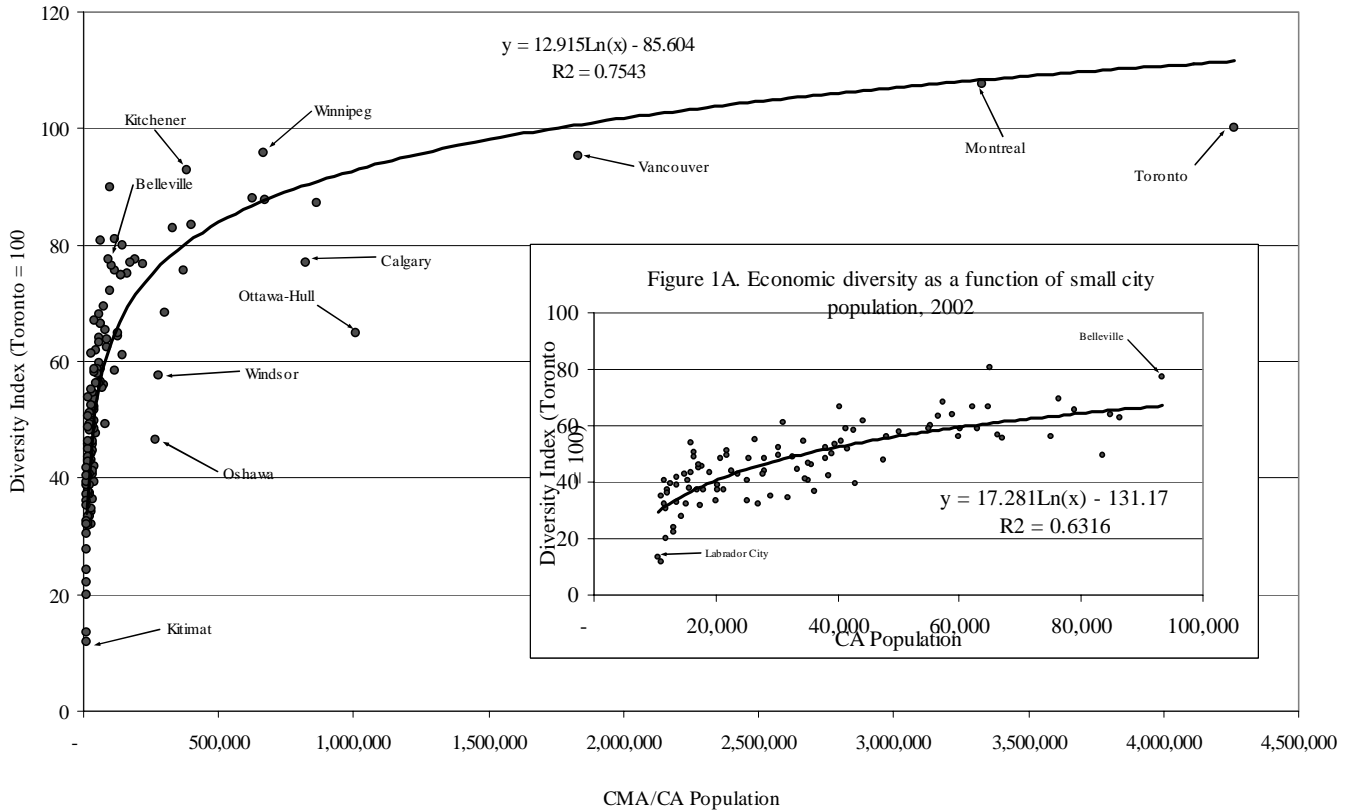
Source: Special Tabulation, Business Register and the Census (1996).

> Diversity increases consistently with population size. But although the largest cities are the most diverse, it is the population size of small cities (population less than 100,000) that is the most important determinant of their diversity.

The wide variation in diversity levels across cities is not random. As Figures 1 and 1A illustrates, there is a strong positive relationship between diversity and the population size. The places with the smallest populations tend to have the most specialized (or least diverse) economies. On the other hand, large urban centres have the most diverse economies.

What is also apparent in Figure 1 is that the relationship between population and diversity is non-linear. For small urban centres—those between 10,000 and 100,000—an increase in population has a very strong positive effect on the level of diversity (see Figures 1 and 1A). Belleville, with a population just below 100,000 in 1996, has about six times the level of diversity as Labrador City, whose population in the same year was about ten times smaller (see Figure 1A). But for larger urban centres the relationship between diversity and size is much weaker. Kitchener, Winnipeg, Vancouver and Toronto have approximately the same levels of diversity, even though Toronto's population is much larger than the other cities (see Figure 1). In the case of Kitchener, Toronto's population is over ten times larger.

The non-linear relationship between diversity and size suggests that there are different factors driving increases in diversity as cities increase their populations. We suggest two reasons why diversity increases rapidly as the population of small cities increases. First, the growth of these cities may in part be driven by the addition of new industries, which in turn increases diversity levels. Second, as the populations of cities increase, so does their local market, which can support a wider diversity of industries. However, beyond a certain level of local population (roughly 100,000), industries that rely on local markets to survive are probably already represented. Left are industries that, by definition, are found in relatively few places. These industries are rarer because they require specific factor endowments (e.g., fish processing), or have strong scale economies (e.g., aircraft manufacturing) or rely on strong agglomeration economies (e.g., financial services). Consequently, there is relatively little opportunity to diversify the economies of large urban areas. This helps to explain the weaker relationship between population size and diversity for large cities.

> Not all cities follow the expected relationship between population size and diversity. Kitchener and Winnipeg are more diverse than expected and Ottawa-Hull, Oshawa, Windsor and Calgary are less diverse than expected.

Also of interest in Figure 1 are the urban areas that do not follow the expected relationship between population size and diversity. For their size, Kitchener and Winnipeg have high levels of diversity. For Winnipeg, this may be because of its historic role as the gateway to the west and its current position as regional centre for the eastern prairies and north western Ontario—it is serving a much larger market than itself. In the case of Kitchener, its high level of diversity may reflect its role as both a traditional manufacturing centre and as a centre for new high technology industries.

For some other centres diversity levels are below what we would expect for cities of the same size. These include Ottawa-Hull, Calgary, Windsor and Oshawa. In all cases, these cities have lower than expected levels of diversity not because they have fewer industries than places of similar size, but rather because their industrial structures tend to be highly concentrated in a few industries. For Ottawa-Hull, it is the large presence of high technology industries that has reduced its level of diversity. In the case of Calgary, the heavy presence of the oil and gas industry explains low levels of diversity given its population size. Finally, for both Windsor and Oshawa, their low levels of diversity are a result of the large presence of the auto industry.

Industrial diversity over time

> Over the 1990s, large cities (population greater than 500,000) became slightly less diverse, while medium and small cities have, on average, increased their diversity over time by 6% and 9%, respectively.

City size effects are also related to diversity over time. Large cities—classified as having a population greater than 500,000—have tended to become less diverse (more specialized) through the 1990s and into this century.[13] On the other hand, small (10,000-99,000) and medium (100,000-499,000) sized cities became more diversified over the same period (see Table 1). These changes are relatively small, reflecting the slow pace of urban structural change. Nevertheless, they possibly point to the spreading out of industry from large to smaller urban centres, which is a point that we will return to latter in the discussion.

These broad trends across these three city size classes are also generally reflected in the trends for individual cities (see Table 1 and Appendix A for all cities) found in all parts of Canada. For the selected large urban centres reported in Table 1, all experience a decline in their diversity levels. The strongest decline was in Toronto, but Vancouver also experienced a drop in its diversity level. Edmonton and Montreal's diversity levels were little changed, however.

For medium sized cities, diversity levels also increased, and this was particularly true of Windsor and Moncton. For others like London and Saskatoon, their industrial diversity was little changed. Small cities like Truro, Nova Scotia and Cowansville, Quebec also experienced strong increases in their diversity levels. This was also true to a lesser degree of Portage la Prairie, Manitoba and Kamloops, British Columbia.

Looking at the average level of diversity across all cities (see Table 1), we also observe an increase, reflecting the preponderance of small and medium sized cities in Canada. This average, however, does not reflect the fact that large urban centres account for two of every three Canadians that live in urban areas. From the perspective of the average urban resident, it is the weighted average (by population) diversity level that matters (see Table 1). From this perspective, there was a slight decline in diversity levels over the period.

Although it is beyond the scope of this paper to test hypotheses as to the sources of these trends, it is possible to place them in context of the two factors identified above that might be driving structural change in Canada's urban economies—technological change and trade liberalization. The general increase in diversity suggests that specialization driven by trade has not been strong enough to overcome other structural forces driving change.[14] Rather, technological change may be driving the increasing diversity of small and medium sized cities. It has been argued that declining transportation and communication costs creates an incentive for industry to locate in small cities and rural areas to take advantage of lower wages in these areas.[15] The increasing diversity of medium sized and small cities is consistent with this argument.

Table 1. Industrial diversity averaged by city size and selected cities, 1992-2002 (Toronto 1992=100)

City Size*	Selected Cities	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Change 1992-2002
Large	*Average*	**84.8**	**84.4**	**84.0**	**85.1**	**83.9**	**83.0**	**82.2**	**82.6**	**83.0**	**82.2**	**82.2**	**-3.0%**
	Montreal	100.1	103.9	102.7	106.4	101.8	106.2	104.2	98.9	101.6	100.7	99.1	-1.0%
	Toronto	100.0	101.2	100.4	99.9	97.5	93.0	92.9	95.8	93.7	92.6	92.0	-8.0%
	Edmonton	82.3	83.0	84.3	83.7	82.2	84.7	83.4	82.8	82.2	82.3	80.3	-2.4%
	Vancouver	92.8	92.1	91.7	91.3	90.1	90.9	88.9	87.5	88.5	88.7	87.8	-5.5%
Medium	*Average*	**63.7**	**64.2**	**64.1**	**65.0**	**64.9**	**62.7**	**64.0**	**66.2**	**67.0**	**67.5**	**67.5**	**6.0%**
	Moncton	70.4	70.2	69.3	68.0	66.3	70.5	71.3	74.3	74.7	77.2	74.4	5.7%
	London	76.6	79.7	78.2	76.9	75.3	70.3	70.3	69.6	72.5	75.6	76.8	0.3%
	Windsor	41.4	41.7	42.9	45.8	45.8	46.4	50.7	52.0	53.4	54.3	53.0	28.1%
	Saskatoon	70.2	69.2	68.3	68.4	70.4	72.9	73.0	70.8	72.3	70.9	70.6	0.5%
Small	*Average*	**39.6**	**40.6**	**40.9**	**42.2**	**42.3**	**43.5**	**42.8**	**43.7**	**43.5**	**43.0**	**43.1**	**8.6%**
	Truro	53.2	53.1	53.3	54.1	56.5	57.7	58.4	61.2	55.4	58.2	56.9	6.9%
	Cowansville	29.6	30.2	31.8	33.4	33.3	34.5	33.9	35.7	34.3	33.0	34.1	15.1%
	Portage la Prairie	34.7	34.4	35.2	36.4	39.7	39.1	36.8	36.2	33.5	35.1	35.7	2.9%
	Kamloops	55.6	56.8	57.4	58.2	56.5	59.3	57.2	57.8	57.3	58.0	58.6	5.4%
Average over all cities		*47.1*	*47.9*	*48.1*	*49.3*	*49.3*	*49.8*	*49.4*	*50.5*	*50.5*	*50.2*	*50.2*	*6.5%*
Weighted Average (by population)		*78.8*	*79.6*	*79.3*	*80.3*	*79.0*	*78.0*	*77.8*	*78.3*	*78.6*	*78.1*	*77.8*	*-1.3%*

Source: Special Tabulation, Business Register

*Large cities are CMAs with a population greater than 500,000; Medium cities are those CMA/CAs with a population between 100,000 and 499,999; and Small cities are those CAs with less than 100,000 population. Population based on 1996 Census data.

Conclusion

The level of diversity across Canada's urban landscape varies widely. This suggests the economic stability of urban economies and their potential to develop may vary significantly. What is also evident from the analysis is that diversity levels are related closely to the population of an urban area.

The smallest urban areas are the least diverse and the largest urban areas are the most diverse. But very high levels of diversity are not limited to cities whose populations are counted in the millions. Cities with populations around 100,000 often match the level of diversity found in much larger urban centres. Over 70% of urban dwellers live in cities whose economic diversity is at least 70% of the level of the most diverse economy, currently Montreal.

Over the study period, Canada's economy has become more integrated into world markets and has undergone significant technological change associated with the information technology revolution. Integration into world markets is associated with a decrease in the diversity of large Canadian cities and an increase in the diversity of smaller centres. The evolution in diversity levels over the study period suggests a growing dispersion of economic activity towards medium sized and smaller urban centres, possibly driven by the implementation of new technologies that have reduced transportation and communication costs. Only time will tell whether the recent trend towards more diverse small and medium size cities will continue into the future.

Appendix A

This appendix lists all of the cities used in our analysis of diversity across Canadian cities. As in Table 1, diversity is reported as an index for 1992 and 2002 and the percentage change over this period.

Also reported in Table A is the expected diversity index for each city conditioned on its 1996 population for 1992 and 2002. If a city's expected diversity index is less than its actual index, then its industrial diversity is greater than we would anticipate, based on the city's population. An expected value greater than a city's actual value would imply the opposite.

Not all CMA/CAs are included in the cities listed in Table A. Most establishments are associated with the actual location of employment. However, the employment levels for a small minority of establishments are, in fact, aggregates of employment of several production units spread across discrete locations. Hence, these establishments may over estimate the actual level of employment at their location. For some cities, particularly small ones, this has the effect of biasing downward their level of diversity. Moreover, over time the establishment and location where employment is concentrated can change, leading to sharp changes in diversity levels (up or down) that are not associated with actual changes in employment in the city. Hence, nine cities were excluded from the study (Sudbury, Kelowna, Nanaimo, Brandon, Woodstock, Rivière-du-Loop, Cranbrook, Smith Falls and Wetaskiwin).

Table A. Diversity across Canadian cities, 1992 and 2002

Size Class/Name	Province	Population 1996	Diversity Index			Expected Diversity Index[a]	
			1992	2002	Change	1992	2002
			(Toronto 1992 = 100)[b]		percent		
Panel A: Large Cities							
Toronto	Ontario	4,263,757	100.0	92.0	-8.0	101.9	102.7
Montréal	Quebec	3,326,510	100.1	99.1	-1.0	98.8	99.7
Vancouver	British Columbia	1,831,665	92.8	87.8	-5.5	91.4	92.6
Ottawa - Hull	Ontario-Quebec	1,010,498	62.7	59.6	-4.9	84.1	85.6
Edmonton	Alberta	862,597	82.3	80.3	-2.4	82.1	83.7
Calgary	Alberta	821,628	69.7	70.9	1.7	81.5	83.1
Québec	Quebec	671,889	79.1	80.6	2.0	79.0	80.7
Winnipeg	Manitoba	667,209	89.2	88.1	-1.1	78.9	80.6
Hamilton	Ontario	624,360	87.0	81.1	-6.8	78.1	79.8
		Average	*84.8*	*82.2*	*-3.0*		
Panel B: Medium Size Cities							
London	Ontario	398,616	76.6	76.8	0.3	72.5	74.5
Kitchener	Ontario	382,940	83.4	85.3	2.4	72.0	74.0
St. Catharines - Niagara	Ontario	372,406	69.5	69.6	0.1	71.7	73.7
Halifax	Nova Scotia	332,518	72.0	76.3	6.0	70.3	72.3
Victoria	British Columbia	304,287	58.3	62.8	7.7	69.2	71.3
Windsor	Ontario	278,685	41.4	53.0	28.1	68.1	70.2
Oshawa	Ontario	268,773	31.3	42.8	36.9	67.6	69.8

Table A. Diversity across Canadian cities, 1992 and 2002 (cont'd …)

Size Class/Name	Province	Population 1996	Diversity Index			Expected Diversity Index[a]	
			1992	2002	Change	1992	2002
			(Toronto 1992 = 100)[b]		percent		
Saskatoon	Saskatchewan	219,056	70.2	70.6	0.5	65.1	67.4
Regina	Saskatchewan	193,652	70.8	71.4	0.7	63.5	65.9
St. John's	Newfoundland and Labrador	174,051	69.0	70.8	2.6	62.2	64.6
Chicoutimi - Jonquière	Quebec	160,454	62.8	69.2	10.2	61.2	63.7
Sherbrooke	Quebec	147,384	70.1	73.6	4.9	60.2	62.7
Kingston	Ontario	143,416	58.0	56.1	-3.3	59.8	62.3
Trois-Rivières	Quebec	139,956	67.1	68.9	2.7	59.5	62.1
Abbotsford	British Columbia	136,480	62.0	68.7	10.8	59.2	61.8
Saint John	New Brunswick	125,705	62.0	59.1	-4.6	58.2	60.8
Thunder Bay	Ontario	125,562	61.8	59.8	-3.3	58.2	60.8
Barrie	Ontario	118,695	55.6	69.6	25.2	57.5	60.1
Cape Breton	Nova Scotia	117,849	48.9	53.6	9.7	57.4	60.0
Moncton	New Brunswick	113,491	70.4	74.4	5.7	56.9	59.6
Guelph	Ontario	105,420	72.2	70.4	-2.5	56.0	58.7
Brantford	Ontario	100,238	71.6	82.8	15.7	55.4	58.1
Peterborough	Ontario	100,193	59.7	66.3	11.0	55.4	58.1
		Average	*63.7*	*67.5*	*6.0*		
Panel C: Small Cities							
Belleville	Ontario	93,442	58.4	71.2	22.0	54.5	57.3
Sarnia	Ontario	86,480	40.8	57.6	41.0	53.5	56.3
Kamloops	British Columbia	84,914	55.6	58.6	5.4	53.3	56.1
Sault Ste. Marie	Ontario	83,619	29.9	45.4	52.1	53.1	55.9
Fredericton	New Brunswick	78,950	43.9	60.2	37.0	52.4	55.3
Saint-Jean-sur-Richelieu	Quebec	76,461	64.7	63.8	-1.3	52.0	54.9
Prince George	British Columbia	75,150	48.2	51.6	7.0	51.8	54.7
Chatham	Ontario	67,068	45.5	51.1	12.3	50.4	53.3
Chilliwack	British Columbia	66,254	50.6	52.1	3.0	50.2	53.2
Drummondville	Quebec	65,119	73.0	74.4	1.8	50.0	53.0
North Bay	Ontario	64,785	57.9	61.2	5.8	50.0	52.9
Lethbridge	Alberta	63,053	50.7	54.1	6.5	49.6	52.6
Cornwall	Ontario	62,183	58.2	61.2	5.1	49.4	52.4
Red Deer	Alberta	60,075	55.3	54.2	-2.0	49.0	52.0
Shawinigan	Quebec	59,851	45.8	51.8	13.1	49.0	52.0
Granby	Quebec	58,872	58.8	58.9	0.1	48.8	51.8
Charlottetown	Prince Edward Island	57,224	60.6	62.7	3.5	48.4	51.4
Medicine Hat	Alberta	56,570	54.2	58.2	7.4	48.3	51.3
Vernon	British Columbia	55,359	55.3	55.1	-0.4	48.0	51.0
Courtenay	British Columbia	54,912	50.4	54.1	7.3	47.9	50.9
Saint-Hyacinthe	Quebec	50,027	64.6	53.3	-17.6	46.7	49.8
Rimouski	Quebec	48,104	46.5	51.7	11.1	46.3	49.4
Timmins	Ontario	47,499	20.3	43.8	115.5	46.1	49.2
Truro	Nova Scotia	44,102	53.2	56.9	6.9	45.2	48.3
Sorel	Quebec	43,009	32.1	36.1	12.8	44.9	48.0

Table A. Diversity across Canadian cities, 1992 and 2002 (cont'd ...)

Size Class/Name	Province	Population 1996	Diversity Index			Expected Diversity Index[a]	
			1992	2002	Change	1992	2002
			(Toronto 1992 = 100)[b]		percent		
Brockville	Ontario	42,709	47.2	53.6	13.5	44.8	47.9
Prince Albert	Saskatchewan	41,706	46.0	47.6	3.5	44.5	47.7
Penticton	British Columbia	41,276	50.4	53.9	7.0	44.4	47.5
Leamington	Ontario	40,687	37.7	50.0	32.6	44.2	47.4
Victoriaville	Quebec	40,438	58.8	61.6	4.8	44.1	47.3
Salaberry-de-Valleyfield	Quebec	39,563	46.2	49.2	6.6	43.8	47.0
Rouyn-Noranda	Quebec	39,096	39.6	45.8	15.6	43.7	46.9
Williams Lake	British Columbia	38,552	36.6	38.6	5.7	43.5	46.7
Orillia	Ontario	38,103	47.9	48.0	0.1	43.4	46.6
New Glasgow	Nova Scotia	38,055	41.4	44.7	7.9	43.3	46.6
Wood Buffalo	Alberta	36,124	31.8	33.5	5.2	42.7	46.0
Duncan	British Columbia	35,803	40.1	42.2	5.3	42.6	45.9
Campbell River	British Columbia	35,183	35.5	42.7	20.2	42.4	45.6
Grand Centre	Alberta	35,161	34.1	37.4	9.8	42.4	45.6
Moose Jaw	Saskatchewan	34,829	44.5	37.9	-14.9	42.2	45.5
Joliette	Quebec	34,391	53.4	50.3	-5.9	42.1	45.4
Midland	Ontario	33,291	46.0	41.1	-10.7	41.7	45.0
Val-d'Or	Quebec	32,648	37.8	45.0	19.0	41.4	44.8
Baie-Comeau	Quebec	31,795	29.6	31.5	6.5	41.1	44.4
Grande Prairie	Alberta	31,140	51.4	56.5	9.9	40.9	44.2
Alma	Quebec	30,383	46.8	48.3	3.1	40.6	43.9
Owen Sound	Ontario	30,319	37.6	45.5	20.9	40.5	43.9
Stratford	Ontario	28,987	27.3	32.0	17.0	40.0	43.3
Sept-Îles	Quebec	28,005	42.7	44.5	4.2	39.5	42.9
Corner Brook	Newfoundland and Labrador	27,945	43.8	40.5	-7.6	39.5	42.9
Thetford Mines	Quebec	27,760	45.7	39.6	-13.4	39.4	42.8
Port Alberni	British Columbia	26,893	22.2	29.5	32.8	39.0	42.5
Saint-Georges	Quebec	26,584	45.0	50.8	13.0	38.9	42.3
Bathurst	New Brunswick	25,415	23.3	44.5	90.9	38.3	41.8
Quesnel	British Columbia	25,279	27.0	30.6	13.5	38.3	41.7
Kentville	Nova Scotia	25,090	34.6	37.3	7.8	38.2	41.6
Pembroke	Ontario-Quebec	23,745	44.3	39.5	-10.9	37.5	41.0
Edmundston	New Brunswick	22,624	36.1	40.3	11.7	36.9	40.4
Lindsay	Ontario	21,949	47.3	45.4	-3.9	36.5	40.0
Whitehorse	Yukon	21,808	46.0	47.0	2.1	36.4	40.0
Magog	Quebec	21,334	32.4	34.4	6.0	36.2	39.7
Terrace	British Columbia	20,941	36.6	44.4	21.1	35.9	39.5
Portage la Prairie	Manitoba	20,385	34.7	35.7	2.9	35.6	39.2
Grand Falls-Windsor	Newfoundland and Labrador	20,378	30.5	34.2	12.4	35.6	39.2
Powell River	British Columbia	19,936	21.6	30.8	42.3	35.3	38.9
Lloydminster	Saskatchewan-Alberta	18,953	33.4	39.7	19.1	34.7	38.3
North Battleford	Saskatchewan	17,987	37.1	34.2	-7.8	34.0	37.7
Yorkton	Saskatchewan	17,713	38.6	42.1	9.2	33.9	37.5

Table A. Diversity across Canadian cities, 1992 and 2002 (concl'd …)

Size Class/Name	Province	Population 1996	Diversity Index			Expected Diversity Index[a]	
			1992	2002	Change	1992	2002
			(Toronto 1992 = 100)[b]		percent		
Prince Rupert	British Columbia	17,414	22.5	29.3	30.2	33.6	37.3
Yellowknife	North West Territories	17,275	35.2	41.4	17.6	33.5	37.2
Matane	Quebec	17,118	39.8	42.7	7.3	33.4	37.1
Campbellton	New Brunswick	16,867	33.2	34.3	3.2	33.2	36.9
Swift Current	Saskatchewan	16,437	41.7	46.6	11.9	32.9	36.6
Kenora	Ontario	16,365	31.0	44.9	44.9	32.9	36.5
Cobourg	Ontario	16,027	33.1	40.1	21.2	32.6	36.3
Summerside	Prince Edwand Island	16,001	41.3	49.6	20.1	32.6	36.3
Collingwood	Ontario	15,596	27.5	34.7	26.0	32.3	36.0
Simcoe	Ontario	15,380	41.9	37.3	-11.1	32.1	35.8
Dolbeau	Quebec	15,214	27.3	29.7	8.7	32.0	35.7
Fort St. John	British Columbia	15,021	45.5	39.5	-13.3	31.8	35.5
Thompson	Manitoba	14,385	16.4	25.4	54.9	31.3	35.0
Camrose	Alberta	13,728	39.9	38.3	-4.0	30.7	34.5
Haileybury	Ontario	13,712	36.8	35.5	-3.5	30.7	34.4
Elliot Lake	Ontario	13,588	28.1	29.9	6.5	30.6	34.3
Tillsonburg	Ontario	13,211	15.4	22.2	44.4	30.2	34.0
La Tuque	Quebec	13,165	16.9	20.4	20.2	30.2	34.0
Estevan	Saskatchewan	12,656	41.0	36.2	-11.7	29.7	33.5
Cowansville	Quebec	12,051	29.6	34.1	15.1	29.1	32.9
Gander	Newfoundland and Labrador	12,021	34.2	33.3	-2.6	29.0	32.9
Strathroy	Ontario	11,852	29.3	28.1	-4.1	28.9	32.7
Port Hope	Ontario	11,698	15.4	18.4	19.9	28.7	32.6
Hawkesbury	Ontario-Quebec	11,605	30.4	37.2	22.3	28.6	32.5
Lachute	Quebec	11,493	31.0	29.6	-4.6	28.5	32.3
Kitimat	British Columbia	11,136	7.8	10.9	40.5	28.1	32.0
Dawson Creek	British Columbia	11,125	39.8	32.4	-18.6	28.1	32.0
Labrador City	Newfoundland and Labrador	10,473	9.1	12.4	37.0	27.3	31.2
		Average	*39.6*	*43.1*	*8.6*		

[a] Conditional expectation based on each city's 1996 population using the equation shown in main portion of Figure 1.
[b] The numbers equivalent for Toronto in 1992 =124.2.
Sources: Special Tabulation, Business Register and the Census (1996).

Endnotes

[1] Schoening, N.C. and L.E. Sweeny. 1992. "Proactive Industrial Development Strategies and Portfolio Analysis". *Review of Regional Studies* 24: 71-86.

[2] For a detailed review of the possible benefits of diversity see Quigley, J.M. 1998. "Urban Diversity and Economic Growth". *The Journal of Economic Perspectives* 12: 127-138.

[3] See Baldwin, J.R. and W.M. Brown. 2003. *Regional Manufacturing Employment Volatility in Canada: The Effects of Specialization and Trade*. Economic Analysis Research Paper Series 11F0027MIE2003005. Analytical Studies Branch. Ottawa: Statistics Canada.

[4] Jacobs, J. 1969. *Economy of Cities*. New York: Vintage; Glaeser E.L., H. Kallal, J.A. Scheinkman and A. Shleifer. 1992. "Growth in Cities". *Journal of Political Economy* 100: 1126-1152; Glaeser, E.L. 2000. "The New Economics of Urban and Regional Growth". In *The Oxford Handbook of Economic Geography*. Edited by G.L. Clark, M.P. Feldman, and M.S. Gertler 2000; and Duranton, G. and D. Puga. 2001. "Nursery Cities: Urban Diversity, Process Innovation, and the Life Cycle of Products". *The American Economic Review* 91: 1454-1477.

[5] Glaeser E.L., H. Kallal, J.A. Scheinkman and A. Shleifer. 1992.

[6] Henderson, V. , A. Kuncoro and M. Turner (1995) "Industrial Development in Cities*". Journal of Political Economy*. 103: 1067-1090; and Beckstead D., M. Brown, G. Gellatly and C Seaborn 2003. *A Decade of Growth: The Emerging Geography of New Economy Industries in the 1990s*. The Canadian Economy in Transition Research Paper Series. 11622MIE2003003. Analytical Studies Branch. Ottawa: Statistics Canada.

[7] For analyses of the distribution of economic activity across Canadian cities see Polèse, M. and É. Champagne. 1999. "Location Matters: Comparing the Distribution of Economic Activity in the Canadian and Mexican Urban Systems". *International Regional Science Review* 22: 102-132 and Coffey, W.J. 1994. *The Evolution of Canadian Metropolitan Economies*. Montreal: The Institute of Research on Policy (IRPP).

[8] Baldwin and Brown (2003).

[9] Our measure of diversity is technically known as the numbers equivalent (NE), which is derived from the entropy measure of industrial diversity. The entropy measure is given by $E = \sum_i s_i \ln\left(1/s_i\right),$ where s_i is the share of employment in industry i for a given region. *E* ranges from zero if employment is concentrated in one industry to log(*N*) if employment is spread evenly across *N* industries. The NE diversity measure is simply the antilog of entropy: $NE = \exp\left[\sum_i s_i \ln\left(1/s_i\right)\right].$ The NE is interpreted as the number of industries that would be present in a region if employment were evenly distributed across all industries. Recalling the example given above, the city with 90% of its employment concentrated in one of its industries would have a much lower NE than the city with employment evenly distributed across the same number of industries. Thus, the NE diversity measure takes into account both the number of industries and how employment is distributed across them. For a fuller explanation of description of the NE diversity measure see Berry, C.H. 1975. *Corporate Growth and Diversification*. Princeton, NJ: Princeton University Press or Baldwin, J.R. 1995. *Dynamics of Industrial Competition: A North American Perspective*. Cambridge: Cambridge University Press.

[10] Toronto was chosen because it is Canada's largest urban area and as such is often used as a point of reference. Its numbers equivalent in 2002 was 114.3.

[11] The Business Register is used when developing the frame for Statistics Canada's business surveys.

[12] We use the 1996 census geography.

[13] This difference is, however, not statistically significant. Nevertheless, this finding is consistent with the declining diversity of manufacturing in the cores of larger cities (greater than 1 million) over a much longer period of time. See Baldwin, J.R. and W.M. Brown. 2001. *Dynamics of the Canadian Manufacturing Sector in Metropolitan and Rural Regions*. Analytical Studies Research Paper Series 11F0019MIE2001169. Analytical Studies Branch. Ottawa: Statistics Canada.

[14] Baldwin and Brown 2003.

[15] Kilkenny, M. 1998. "Transportation Costs and Rural Development". *Journal of Regional Science* 38: 293-312; Fujita, M, P. Krugman and A.J. Venebles. 1999. *The Spatial Economy: Cities, Regions and International Trade*. Cambridge, Mass.: MIT Press.