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Community innovation: Industrial specialization in Canadian cities

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Community innovation: Industrial specialization in Canadian cities

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Symbols

The following standard symbols are used in Statistics Canada publications:

.   not available for any reference period
..   not available for a specific reference period
…   not applicable
0   true zero or a value rounded to zero
0^s value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
p   preliminary
r   revised
x   suppressed to meet the confidentiality requirements of the Statistics Act
E   use with caution
F   too unreliable to be published

NOTE: Due to rounding, components may not add to totals

Community Innovation

Since early 2003, Statistics Canada's Science Innovation and Electronic Information Division (SIEID) have been working in conjunction with Industry Canada's Marketplace Innovation Division to bring together existing indicators of community innovation and to develop new ones. This series of working papers on **Community Innovation** highlights some of the results. While there are other initiatives to develop more detailed community-level data in Canada, the focus of this work is on innovation, technology-based industries, R&D and highly-qualified personnel.

In some cases, we have been able to generate community-level estimates from surveys that were not originally intended to provide them. In other cases, we have exploited and refined administrative datasets to extract reliable community-level data. Relevant innovation indicators have also been developed from existing sub-provincial datasets such as Statistics Canada's Census of Population Community Profiles data. The intent of these papers is to propose indicators and to stimulate discussion.

Background and purpose

"*A paradox of the global, knowledge based economy is that sources of competitive advantage tend to be localized. Communities and regions across Canada use their knowledge resources to create economic value, and it is in communities that the elements of the national innovation system come together.*" - Government of Canada (2002)

Economic specialization indices allow communities to identify local economic strengths and weaknesses and to help them make the best use of their knowledge resources. As well, they enable communities to see potential cluster development opportunities[1]. According to Michael Porter (1998), business clusters are: "geographic concentrations of interconnected companies and institutions in a particular field. Clusters encompass an array of linked industries and other entities important to competition. They include, for example, suppliers of specialized inputs such as components, machinery, and services, and providers of specialized infrastructure."

This paper presents an index of specialization (the location quotient) for Canada's 50 largest communities. It also presents the initial analysis comparing changes in specialization in selected "high technology" industries with changes in employment in these communities. The analysis is not intended to be definitive—various issues with the time period, the data and the interpretation of the indicators are taken into account. Despite the imperfections, the indicators provide another interesting and hopefully useful insight into community innovation.

The concepts required to understand the results are explained in detail in the **Concepts, definitions and data quality** section. In short, an LQ is a measure of specialization—the higher the LQ, the more specialized the community is in that industry compared with the national level. The Tech-Pole industries are selected sectors that represent some high technology sectors. The LQ Tech-Pole shows how specialized a community is in these selected industries. The HHI (Herfindahl-Hirschmann Index) is a general measure of concentration (or market share). If a community's economy is evenly distributed among all the sectors, the HHI is low. If one sector dominates, the HHI increases towards 1.00.

Results

Summary

Many smaller communities tend to exhibit high LQs for the industries in which they specialize but, for the year 2000, none of these included high technology industries (Table 2). For example, Saint John shows a high degree of specialization in the "Air transport"; Prince George shows specialization in the "Forestry services" and Sarnia in "Other chemical products". The larger communities, although the specializations are less extreme, do generally exhibit the expected specializations in high technology areas such as Ottawa-Hull in "Communication and other electronic equipment" and Montreal in "Pharmaceuticals and medicine".

This may be, at least in part, to the economic inertia observed by Shearmur and Polese (2001). According to their analysis of Canadian regional specialization between 1971 and 1996: "…*areas will tend to grow and decline as the sectors which are located there grow and decline: only in rare circumstances…will an area grow because it has been able to significantly modify its economic base.*"

Between 1989 and 2000, some communities increased their specialization in the Tech-Pole industries while others decreased theirs. There was no obvious relationship between these changes and the change in employment in the later years of that period. All of the cities in Figure 1 experienced an increase in employment between 1996 and 2001 but almost half of them did so by becoming less specialized in the Tech-pole industries.

While there were similar changes in concentration over the same period, there were also no obvious relationships with employment change (Figure 2).

Location quotients

Some common industries such as "Trade contracting", "Telecommunications", "Motor vehicles wholesale" and "Department stores" will exhibit location quotients just beyond one in most cities (not shown in tables). Whereas, other

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1. See *Note to communities*, page 5.

industries such as "Fishing and trapping", "Mines", "Oil, gas and mineral extraction services", "Communication and other electronic equipment", "Farm products wholesale", and "Apparel dry goods wholesale" exhibit LQs significantly higher than one in only a handful of cities. These cities can be thought of as having a specialization in those industries.

There is a clear distinction in LQ indices between larger and smaller cities. Due to their diversity, larger cities tend to have lower LQs. The highest LQs (Table 2) found in the three largest cities, is 3.53 ("Agricultural services") in Vancouver. Smaller cities usually have a few specializations above the national average (typically in manufacturing and primary industries).

The highest LQs are found in relatively small cities and this may demonstrate a vulnerability to changes in these particular industries. A decrease in demand or price may bring about cataclysmic layoffs or closures (Page and Beshiri, 2003) that may be beyond the capacity of the community to absorb.

In some cases, a high LQ is attributed to a few very large firms. For example, Saint John exhibits a LQ of 27.09 in "Air transport", which represents only 4 firms and 9,000 employees. In other cases, a high LQ is attributed to a dynamic environment with several firms. For example, in Montreal, "Pharmaceuticals and medicine" has a LQ of 3.00 representing 76 companies and 9,545 employees (not shown in tables).

Some communities display high specializations in related industries. Local economic developers and community leaders may evaluate potential relationships among these industries to better understand the competitive opportunities and vulnerabilities. In Sarnia (Table 2), for example, specializations occur in the "Other chemical products" (18.77 LQ, 26 firms, 5,039 employees), "Petroleum products wholesale" (15.76 LQ, 13 firms, 1,357 employees) and "Petroleum coal products" (6.03 LQ, 7 firms, 363 employees).

Similarly, in Chicoutimi-Jonquière and Prince George strength exists in two related industries, "Logging" and "Forestry services" (the second highest industry in Prince George is "Wood industries").

Another example of this can be seen in Southern Ontario where several cities exhibit a specialization in the "Other transportation equipment", commonly known as the car manufacturing industry: specifically, Kawartha Lakes (4.74), Oshawa (6.79), St. Catharines (3.50), London (3.76), Chatham-Kent (7.23), Windsor (10.54), and Barrie (3.41). Additionally, a specialization occurs in automotive support industries such as "Rubber plastic leather products textile" (2.02) in Kawartha Lakes, "Motor vehicle parts accessories wholesale" (3.32) in St. Catharines and "Fabricated metal products" (3.05) in Windsor.

All cities in British Columbia (with exception of Prince George in the north) have a significant specialization in the "Agricultural services". This reflects the overall specialization of the province in this sector: over 60% of Canada's employment in "Agricultural services"[2] is in British Columbia.

Alberta demonstrates high specializations in oil and gas areas specifically in the "Oil, gas and mineral extraction services" in Calgary (6.14), Red Deer (10.21) and Edmonton (3.69) or "Pipeline transport, storage and warehousing" in Lethbridge (2.15).

Analysis based on LQ can be highly informative and can challenge some of the commonly held perceptions about a community. When combined with other local knowledge, economic development officials can develop a more robust understanding of the dynamics of the local economy.

High-technology and employment

Does specialization in high technology industries lead to long-term economic growth of a community? Is increasing or decreasing concentration of a community's economy better for longer term growth? At this stage of the analysis, there appear to be no direct correlations between increases in high technology specialization or changes in degree of concentration with overall employment growth of a community.

An index of high-technology specialization was calculated for 1989 and 2000 as the LQ of employment in the Tech-Pole sectors (Table 1, as defined by Gertler and Florida, 2003). For the same period, a general index of specialization, the Hirfindahl-Hirschmann Index (HHI) was calculated. These two new indices were then compared with the rate of employment growth in the community over 1996 to 2001. The data are shown in Table 3.

Absolute LQ Tech-Pole values for 2000 range from a low of 0.26 for Drummondville, Quebec, to a high of 2.22 for Ottawa-Hull. Larger cities tend to have higher LQ Tech-Pole values with exceptions being Edmonton and Hamilton, which have low values for their size. Conversely, Belleville and Granby show relatively high LQ Tech-Pole values given their smaller sizes.

The LQ Tech-Pole change between 1989 and 2000 shows that some cities have increased their specialization of high-tech employment by as much as 0.58 points (Saint John, NB increased from 0.30 to 0.89). Over the same period, some cities have decreased their specialization. The most extreme cases are St. Hyacinthe (dropping from 2.17 to 0.40) and Trois Rivières (dropping from 1.93 to 0.43).

For 2000, Kingston shows the highest concentration (HHI) and Granby, the least. In terms of changes between 1989 and 2000, Victoria shows the greatest decrease in concentration (from 0.45

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2. This sector contains "Services incidental to livestock and animal specialties" (Establishments primarily engaged in providing services to livestock and animals such as veterinary services, animal breeding services and poultry services.), "Services incidental to agricultural crops" (Establishments primarily engaged in providing soil preparation, planting and cultivating services crop dusting and spraying services harvesting, baling and threshing services and other services incidental to agricultural crops), and "Other services incidental to agriculture".

Figure 1. LQ Tech Pole change and employment change (selected cities)
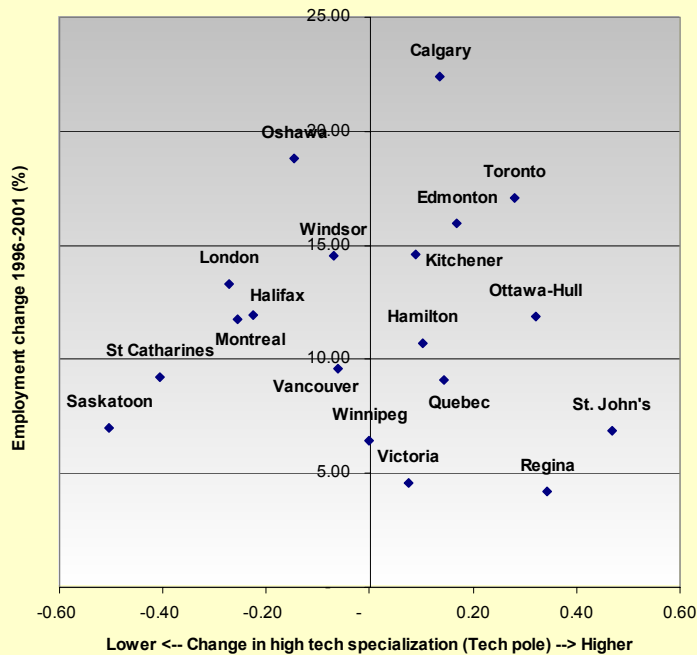
Source: Statistics Canada, LEAP-SAF and Census of Population.
Note: For simplicity, only the largest 19 cities are represented. See Table 4 for details.

Figure 2. Concentration (HHI) change and employment change (selected cities)
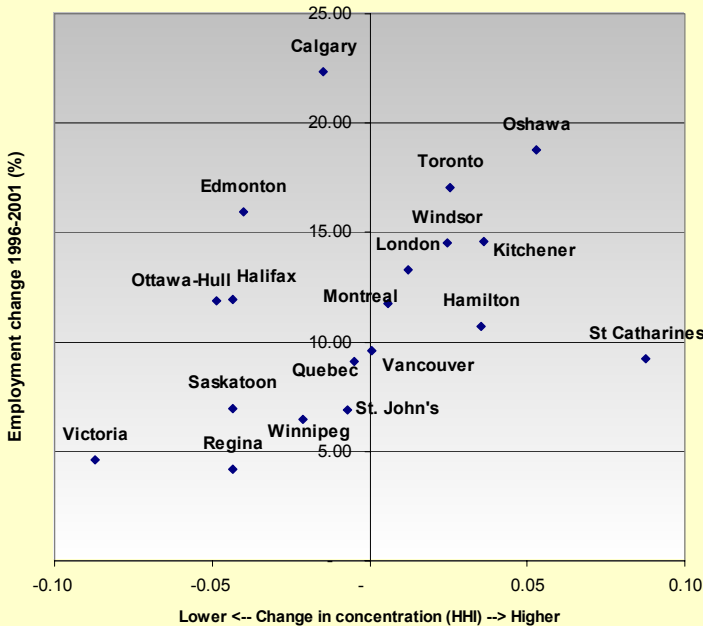
Source: Statistics Canada, LEAP-SAF and Census of Population.
Note: For simplicity, only the largest 19 cities are represented. See Table 4 for details.

to 0.36) and Sault Ste. Marie shows the greatest increase in concentration (0.41 to 0.54).

While these indicators are useful for measuring some aspects of changes in a community's economic structure, as illustrated by Figure 1 (for 19 cities only), there are no simple relationships between employment change and either change in high-tech specialization or overall concentration.

Concepts, definitions and data quality

The location quotient (LQ) is a common calculation used to identify specialization in an industry in a specific geographic area. It provides a measure of how the proportion of local industries in a particular economic sector compare with the national average where:

$$LQ = \frac{\dfrac{\text{Community Employment in Industry "X"}}{\text{Total Community Employment}}}{\dfrac{\text{National Employment in Industry "X"}}{\text{Total National Employment}}}$$

A LQ of one indicates the same local specialization in an industry as the national average. LQs higher than one signify an industrial specialization higher than national average. For example: a location quotient of ten in a community indicates that there is ten times more employment in the specific industry than would be expected in a city of that size. Ratios surpassing 1.25 are generally considered initial evidence of specialization in a given industry (Bergman and Feser, 1999). For more information on LQ please refer to Juleff (1993), Carnegie Mellon (2002) and Penn State (2003).

The Tech-Pole indicator is one used by Gertler et al. (2003) to assess the proportion of a community's economy that can be considered "high technology". Statistics Canada has no operational definition of "high technology", so Gertler's definition[3] (Table 1) was used.

The Tech-Pole, originally expressed as a percentage, for this analysis is expressed as a location quotient. That is, the LQ Tech-Pole is the relative proportion of employment in the selected industries, comparing the community with the national proportion.

The Herfindahl-Hirschmann Index (HHI) is an index of the degree of concentration in the community's economy as a whole. It measures the degree of "evenness" across economic sectors. The HHI ranges from 1/j (where *j* represents the number

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3. This selection of industries is not intended to be exhaustive. Other sectors will contain "high technology" components but, given the data source, it was not possible to include more detailed industry classes.

Table 1. Industries included in Tech Pole Index

SIC80(E) (3-digit)	Industry Description
321	Aircraft and aircraft parts industry
335	Electronic equipment industries
374	Pharmaceutical and medicine industry
391	Scientific and professional equipment
482	Telecommunication carriers industry
483	Other telecommunication industries
772	Computer and related services
775	Architectural, Engineering and other scientific and technical services
868	Medical and other health laboratories
961	Motion picture audio and video production and distribution

Source: Gertler and Florida, 2003.

of sectors) where there is equal distribution among all sectors to one where all activity occurs in only one sector.

The general formula is:

$$\text{HHI} = \sum_{i=1}^{j} \left[\frac{x_i}{x} \right]^2$$

Where x_i is the proportion of employment in industry i and x is the total employment in the community.

Although LQ estimates can be generated from the Census of Population or the Labour Force Survey, neither of these can supply the geographic and industry detail of the LEAP Small Area File (LEAP-SAF). The LEAP-SAF is a synthesis of corporate and individual administrative data. It includes any business remitting taxes on behalf of employees through Canada Revenue Agency's payroll deduction account. At this time, the LEAP-SAF is based on the older industrial classification, the 1980 Standard Industrial Classification (SIC80).

To minimize the degree of suppression of confidential data, some of the original 3-digit industrial sectors were combined to create a custom 82-sector classification. Modified codes are shown with a trailing "x" (as in "07x Oil, gas industry and mineral extraction services"). Table 4 shows the custom aggregations. For descriptions of the original 3-digit codes, please see the Statistics Canada Web site (www.statcan.ca) under *Definitions, data sources and methods, Standard classifications, Industry.*

Most sources of employment data are based on the place of residence of the employee rather than the place of work. In cities where there is a great deal of commuting to another city, industries may appear to be located in neighbouring communities. In this analysis, Peterborough exhibits a high LQ in "Other transportation and equipment" yet there is no automotive plant in that city.

Communities in this study are defined according to Statistics Canada's Standard Geographic Classification (SGC) 2001. The Census Metropolitan Areas (CMAs) and largest Census Agglomerations (CAs) are represented in this paper.

Text Box 1. Note to communities

Communities should be aware that LQs are an imperfect tool for describing a local economy and approximating exports (Prislow, 1996). The LQ approach assumes that local consumption and labour productivity (output per worker) are uniform, which may not be the case in many instances (Penn State, 2003). For example, an industry may require more workers than typically needed to produce the output necessary to meet local needs, implying that the local workforce is inefficient.

Additionally, the use of LQs, on their own, do not allow communities to identify whether or not a cluster exists, as they only provide information on specific industry employment, not interdependencies between sectors and firms. Clusters develop through clear interactions and partnerships between firms in related industries. LQ data may be used in concert with other qualitative techniques to add to standard cluster analyses (Bergman and Feser, 1999) and it is incumbent upon the communities to bring hands on local knowledge to interpret what these data represent for them.

For communities using LQ data in their planning processes, Penn State (2003) provides an excellent list of questions that can be used when examining location quotients.
1. Compared to other regions, does the community seem highly dependent on any particular industry? How might this dependence be problematic? Or, is this dependence a strength?
2. Are there any obvious relationships between industries with high location quotients and other sectors of the local economy? For example, an exporting industry might be highly dependent on other local businesses for important inputs.
3. Does this information support popular perceptions? Or, does the analysis uncover surprising areas of economic strength?
4. Does the analysis reveal any potential opportunities to substitute local production for imports?

Table 4. Custom aggregations of SIC80(E) used

Classification	Contains
07x Oil and gas industry, mineral extraction services	07-09
10x Food, beverage and tobacco	10-12
15x Rubber, plastic, leather products and textile	15-19
323x Other transportation equipment	323-329
33x Other electrical and electronic products	330-334, 336-339
37x Other chemical products	371-373, 375-379
45x Other transportation	452-459
46x Pipeline transport, storage, warehousing	46-47
482x Other communication	482-483
52x Beverages, drugs, tobacco wholesale	522-529
70x Banks, trust companies, mortgage companies, credit unions, consumer business financing	70-71
81x Federal, provincial, local government, international agencies	81-84
85x Other education	853-859

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Table 2: Top 3 Location Quotients in Canada's CMAs and largest cities, 2000

Community (2001 population)	LQ	Industry	SIC[1]
Newfoundland and Labrador			
St. John's (172,918)	4.12	Petroleum and coal products	36
	3.37	Other communication	482x
	3.03	Other education	85x
Prince Edward Island			
Charlottetown (58,358)	5.71	Fishing and trapping	03
	3.94	Petroleum products wholesale	511
	3.15	Pharmaceuticals and medicine	374
Nova Scotia			
Halifax (359,183)	5.21	Utility	49
	2.27	Investment companies	72
	2.19	Other business services	779
Cape Breton (109,330)	13.11	Mining	06
	7.91	Fishing and trapping	03
	2.02	Petroleum products wholesale	511
New Brunswick			
Moncton (117,727)	7.06	Investment companies	72
	2.66	Petroleum products wholesale	511
	2.36	Telecommunications, broadcasting	481
Saint John (122,678)	27.09	Air transport	451
	3.64	Other business services	779
	3.56	Construction services	44
Fredericton (81,346)	4.83	Utility	49
	3.69	Federal, provincial, local government and international agencies	81x
	3.18	Other education	85x
Quebec			
Chicoutimi-Jonquière (154,938)	13.49	Primary metal	29
	10.37	Logging	04
	3.35	Forestry services	05
Québec (682,757)	6.78	Investment companies	72
	2.46	Insurance	73
	2.27	Motor vehicle wholesale	551
Sherbrooke (153,811)	3.82	Rubber, plastic, leather products and textile	15x
	3.28	Paper and allied products	27
	3.08	Other education	85x
Trois Rivières (137,507)	6.63	Paper and allied products	27
	5.47	Primary metal	29
	3.14	Utility	49

Community (2001 population)	LQ	Industry	SIC[1]
Drummondville (68,451)	5.01	Rubber, plastic, leather products and textile	15x
	4.66	Other electrical and electronic products	33x
	2.81	Machinery	31
Granby (60,264)	8.79	Communication and other electronic equipment	335
	6.21	Rubber, plastic, leather products and textile	15x
	4.47	Other electrical and electronic products	33x
St-Hyacinthe (49,536)	6.45	Furniture and fixture	26
	4.89	Food, beverage and tobacco	10x
	2.74	Machinery	31
St-Jean sur Richelieu (79,600)	4.29	Other electrical and electronic products	33x
	3.04	Rubber, plastic, leather products and textile	15x
	2.88	Other manufactured products	39
Montreal (3,426,350)	3.46	Apparel and dry goods wholesale	53
	3.19	Clothing	24
	3.00	Pharmaceuticals and Medicine	374
Ontario			
Ottawa – Hull (1,063,664)	4.94	Communication and other electronic equipment	335
	3.37	Federal, provincial, local government and international agencies	81x
	2.86	Other electrical and electronic products	33x
Kingston (146,838)	5.28	Other education	85x
	3.02	Rubber, plastic, leather products and textile	15x
	2.28	Federal, provincial, local government and international agencies	81x
Belleville (87,395)	4.11	Department stores and general merchandise stores	64
	2.87	Paper and allied products	27
	2.61	Petroleum products wholesale	511
Peterborough (102,423)	5.17	Other electrical and electronic products	33x
	3.16	Real estate operators	75
	2.01	Other transportation equipment	323x

Community (2001 population)	LQ	Industry	SIC[1]
Kawartha Lakes (69,179)	4.74	Other transportation equipment	323x
	2.02	Rubber, plastic, leather products and textile	15x
	1.84	Other products wholesale	59
Oshawa (296,298)	6.79	Other transportation equipment	323x
	4.05	Utility	49
	1.60	Department stores and general merchandise stores	64
Toronto (4,682,897)	2.55	Advertising services	774
	2.51	Other financial	74
	2.32	Insurance	73
Hamilton (662,401)	8.46	Primary metal	29
	2.28	Other electrical and electronic products	33x
	1.88	Machinery	31
St. Catharines (377,009)	3.50	Other transportation equipment	323x
	3.32	Motor vehicle parts accessories wholesale	552
	2.77	Farm products wholesale	501
Kitchener (414,284)	3.31	Fabricated metal products	30
	3.18	Machinery	31
	2.95	Insurance and real estate agencies	76
Brantford (86,417)	4.44	Machinery	31
	3.32	Primary metal	29
	3.08	Fabricated metal products	30
Norfolk (60,847)	9.67	Agriculture	01
	7.10	Petroleum products wholesale	511
	4.70	Utility	49
Guelph (117,344)	6.78	Other electrical and electronic products	33x
	5.38	Fabricated metal products	30
	5.10	Other education	85x
London (432,451)	3.76	Other transportation equipment	323x
	2.21	Other education	85x
	1.63	Insurance	73
Chatham-Kent (107,709)	7.23	Other transportation equipment	323x
	5.37	Agriculture	01
	3.88	Utility	49
Windsor (307,877)	10.54	Other transportation equipment	323X
	3.05	Fabricated metal products	30
	2.56	Amusement and recreational services	96
Sarnia (88,331)	18.77	Other chemical products	37x
	15.76	Petroleum products wholesale	511
	6.03	Petroleum and coal products	36
Barrie (148,480)	3.41	Other transportation equipment	323x
	2.37	Industrial heavy construction	41
	2.32	Real estate operators	75
North Bay (63,681)	2.02	Machinery	31
	1.89	Other transportation equipment	45x
	1.79	Post-secondary non-university education	852
Greater Sudbury (155,601)	8.58	Machinery	31
	6.89	Mines	06
	2.51	Other business services	779
Sault Ste Marie (78,908)	17.17	Primary metal	29
	2.58	Paper and allied products	27
	1.89	Amusement and recreational services	96
Thunder Bay (121,986)	6.06	Paper and allied products	27
	5.29	Aircraft and aircraft parts	321
	4.51	Logging	04
Manitoba			
Winnipeg (671,274)	5.07	Farm products wholesale	501
	3.69	Aircraft and aircraft parts	321
	3.07	Foods wholesale	521

Community (2001 population)	LQ	Industry	SIC[1]
Saskatchewan			
Regina	5.12	Petroleum and coal products	36
	4.40	Pipeline transport, storage and warehousing	46x
	4.37	Other communication	482x
Saskatoon (225,927)	3.88	Mines	06
	3.22	Other education	85x
	2.84	Post-secondary non-university education	852
Alberta			
Medicine Hat (61,735)	9.27	Oil, gas industry, mineral extraction services	07x
	4.33	Industrial heavy construction	41
	3.41	Forestry services	05
Lethbridge (67,374)	2.15	Pipeline transport, storage and warehousing	46x
	1.98	Food, beverage and tobacco	10x
	1.98	Motor vehicles wholesale	551
Calgary (951,395)	6.14	Oil, gas. mineral extraction services	07x
	3.79	Pipeline transport, storage and warehousing	46x
	3.21	Architectural engineering and other scientific services	775
Red Deer (67,707)	10.21	Oil, gas, mineral extraction services	07x
	3.79	Industrial heavy construction	41
	3.45	Construction services	44
Edmonton (937,845)	7.31	Post-secondary non-university education	852
	3.81	Construction services	44
	3.69	Oil, gas, mineral extraction services	07x
Wood Buffalo (42,602)	24.59	Oil, gas, mineral extraction services	07x
	11.23	Construction services	44
	4.95	Post-secondary Non-university Education	852
British Columbia			
Kelowna (147,739)	3.94	Agricultural services	02
	2.81	Construction services	44
	2.25	Wood	25
Kamloops (86,491)	7.32	Agricultural services	02
	3.69	Wood	25
	3.32	Forestry services	05
Chilliwack (69,776)	5.44	Agricultural services	02
	4.07	Logging	04
	3.61	Agriculture	01
Abbotsford (147,370)	8.13	Agricultural services	02
	5.94	Agriculture	01
	3.55	Wood	25
Vancouver (1,986,965)	3.53	Agricultural services	02
	1.98	Other communication	482x
	1.89	Accounting and bookkeeping services	773
Victoria (311,902)	16.08	Agricultural services	02
	2.23	Other education	85x
	2.11	Telecommunications and broadcasting	481
Nanaimo (85,664)	7.60	Agricultural services	02
	3.47	Wood	25
	2.85	Logging	04
Prince George (85,035)	20.85	Forestry services	05
	7.94	Wood	25
	7.14	Logging	04

Notes: 1. The industry classification is a custom aggregation of the SIC80(E). See the text for details.

Table 3. High technology, specialization and employment change, 1989-2001

CMA/CA	LQ Tech Pole[1]			HHI (concentration)[1]			Employment[2]		
	1989	2000	Change 1989-2000	1989	2000	Change 1989-2000	1996	2001	% change 1996-2001
Toronto	1.25	1.53	0.28	0.43	0.46	0.03	2,061,615	2,413,100	17.05
Montreal	1.69	1.43	-0.26	0.44	0.44	0.01	1,502,380	1,678,720	11.74
Vancouver	1.27	1.21	-0.06	0.50	0.50	0.00	908,320	995,320	9.58
Ottawa-Hull	1.90	2.22	0.32	0.64	0.59	-0.05	502,070	561,875	11.91
Calgary	1.40	1.53	0.14	0.46	0.45	-0.01	441,575	540,370	22.37
Edmonton	0.57	0.73	0.17	0.53	0.49	-0.04	434,020	503,360	15.98
Quebec	0.65	0.79	0.14	0.60	0.59	-0.01	315,040	343,745	9.11
Winnipeg	0.78	0.78	-0.00	0.54	0.52	-0.02	324,740	345,725	6.46
Hamilton	0.52	0.62	0.10	0.39	0.43	0.04	294,225	325,795	10.73
Kitchener	0.94	1.03	0.09	0.34	0.37	0.04	192,055	220,080	14.59
London	0.95	0.68	-0.27	0.47	0.49	0.01	190,405	215,695	13.28
Halifax	1.12	0.90	-0.23	0.62	0.57	-0.04	163,035	182,480	11.93
St. Catharines	0.85	0.45	-0.41	0.38	0.47	0.09	165,230	180,470	9.22
Windsor	0.47	0.40	-0.07	0.39	0.41	0.02	130,770	149,810	14.56
Victoria	0.77	0.85	0.08	0.62	0.54	-0.09	148,895	155,730	4.59
Oshawa	0.90	0.76	-0.15	0.37	0.42	0.05	126,860	150,690	18.78
Saskatoon	1.08	0.57	-0.51	0.58	0.53	-0.04	107,145	114,615	6.97
Regina	0.66	1.00	0.34	0.63	0.59	-0.04	96,400	100,465	4.22
St. John's	0.42	0.89	0.47	0.61	0.61	-0.01	74,930	80,090	6.89
Sherbrooke	0.63	0.76	0.14	0.45	0.47	0.02	66,645	74,960	12.48
Chicoutimi-Jonquière	0.54	0.59	0.04	0.40	0.42	0.02	63,900	65,525	2.54
Moncton	0.28	0.44	0.15	0.57	0.53	-0.04	54,095	60,025	10.96
Kingston	0.74	0.65	-0.09	0.58	0.63	0.05	66,850	71,040	6.27
Sudbury	0.33	0.44	0.11	0.41	0.53	0.12	70,170	70,530	0.51
Kelowna	0.82	0.72	-0.10	0.43	0.46	0.03	62,475	67,805	8.53
Trois Rivières	1.93	0.43	-1.50	0.39	0.45	0.06	58,670	60,955	3.89
Saint John	0.30	0.89	0.58	0.45	0.38	-0.07	53,385	55,865	4.65
Thunder Bay	0.41	0.76	0.35	0.46	0.49	0.03	57,765	57,065	-1.21
Guelph	0.90	0.52	-0.37	0.39	0.41	0.02	54,690	63,655	16.39
Barrie	1.00	0.40	-0.60	0.44	0.49	0.05	56,890	76,005	33.60
Belleville	1.55	0.94	-0.61	0.43	0.47	0.03	41,050	40,560	-1.19
Abbotsford	0.20	0.30	0.10	0.39	0.41	0.02	60,645	68,925	13.65
Brantford	0.38	0.32	-0.06	0.36	0.38	0.02	45,380	41,505	-8.54
Peterborough	0.78	0.60	-0.19	0.45	0.49	0.05	43,135	47,055	9.09
Prince George	0.92	0.45	-0.47	0.38	0.39	0.01	37,495	42,585	13.58
Fredericton	0.60	0.79	0.18	0.60	0.57	-0.04	39,785	42,470	6.75
Sarnia	0.52	0.37	-0.15	0.40	0.44	0.05	38,165	41,470	8.66
Kamloops	0.78	0.50	-0.28	0.52	0.48	-0.04	40,480	41,625	2.83
Cape Breton	0.20	0.49	0.29	0.60	0.55	-0.05	36,780	35,825	-2.60
Red Deer	0.25	0.44	0.19	0.53	0.47	-0.05	30,130	37,820	25.52
Lethbridge	0.59	0.32	-0.27	0.54	0.54	0.01	31,190	34,995	12.20
Granby	2.53	2.07	-0.46	0.29	0.29	0.01	27,455	30,430	10.84
Nanaimo	0.83	0.34	-0.49	0.49	0.51	0.02	38,285	37,575	-1.85
Charlottetown	0.18	0.60	0.42	0.59	0.58	-0.00	26,850	28,900	7.64
Wood Buffalo	0.30	0.29	-0.01	0.41	0.41	0.01	18,855	25,330	34.34
St-Jean sur Richelieu	0.91	0.74	-0.17	0.41	0.40	-0.01	34,340	39,435	14.84
Drummondville	0.39	0.26	-0.13	0.34	0.35	0.00	29,150	32,540	11.63
Sault Ste Marie	0.56	0.31	-0.25	0.41	0.54	0.14	34,860	34,405	-1.31
North Bay	0.61	0.41	-0.20	0.49	0.57	0.08	28,385	28,940	1.96
St-Hyacinthe	2.17	0.40	-1.77	0.35	0.39	0.03	22,465	24,265	8.01

Notes:
1. Calculated from Statistics Canada's LEAP-SAF in terms of Individual Labour Units (ILUs). See the text for details.
2. Derived from the Census of Population Community Profiles 1996 and 2001. Note that 1996 employment is based on 1996 community boundaries. Some changes in employment could have occurred due to changes in boundaries.