Changing Industrial Structure
Montréal

Since 1971, Montréal's economy has undergone a considerable transformation. Figure 1 shows how Montréal's regional industrial composition has changed in the past 25 to 30 years.

Most notably, Montréal's economy has become dominated by service-based industries. Employment in service-based industries increased from 26.9% in 1971 to 42.3% in 2006, or at a rate of 3.2% annually, much higher than the overall regional employment growth rate of 1.9% annually. Wholesale and retail trade accounted for the second-largest share of employment, growing from 16.5% in 1971 to 18.9% in 2006.

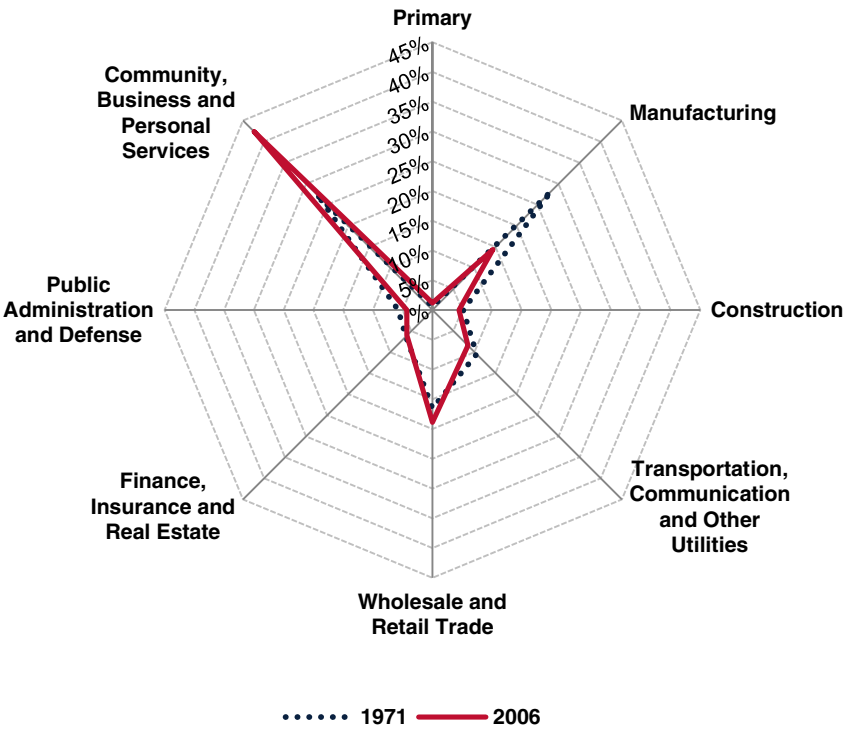
By contrast, employment in manufacturing declined sharply from 28.2% to 14.4% between 1971 and 2006. While all other sectors of the economy added jobs between 1971 and 2006, the manufacturing industries shed jobs in the same period.

The relative share of employment declined in several sectors. Transportation, communication and other utilities shrank from 10.5% to 8.5%, public administration declined from 5.7% to 4.3%, and construction fell from 5.2% to 4.5% between 1971 and 2006. Notwithstanding these proportionate losses, all of these industries made gains in employment numbers.

Other sectors experienced relative stability. The share of employment in FIRE industries remained around 6% throughout the period.

Despite strong annual employment growth (3.8% per year), primary industries accounted for only a small share of the regional economy (1.2% in 2006).

Figure 1: Change in industrial structure, 1971-2006



Source: Statistics Canada, Census of Population, 1971 and 2006

Table 1: Employment by industry, 1971-2006

	1971	1981	1991	2001	2006	1971-2006	CAGR
Primary	6,100	8,905	12,395	19,315	22,799	16,699	3.8%
Manufacturing	276,770	336,790	303,000	315,206	274,382	- 2,388	-0.0%
Construction	51,040	60,915	88,930	68,816	85,473	34,433	1.5%
Transp., Comm. & Other Utilities	102,875	138,255	139,080	152,023	161,703	58,828	1.3%
Wholesale & Retail Trade	161,740	248,015	297,360	326,127	360,816	199,076	2.3%
Finance, Insurance & Real Estate	61,690	89,860	109,680	98,832	115,161	53,471	1.8%
Public Administration & Defense	56,150	79,255	91,020	77,421	81,677	25,527	1.1%
Community, Business & Personal Services	264,275	436,040	584,770	706,602	808,983	544,708	3.2%
Total	**980,640**	**1,398,035**	**1,626,235**	**1,764,342**	**1,910,994**	**930,354**	**1.9%**

CAGR = Compound Annual Growth Rate
Source: Statistics Canada, Census of Population, 1971-2006

Data Sources
Due to changes in industrial and occupational classification schemes, there are analytical challenges in ensuring that the data are comparable over time. Thus, the data in this report are often presented in aggregate form and for varying time periods. Long term structural change (1971 to 2006) is evaluated using Census data using eight industrial and occupational groups to ensure consistency. *Labour Force Survey* (LFS) data are only available from 1987 onwards. These data can only be used reliably at high levels of aggregation due to the nature of the LFS sampling frame. Cluster analysis relies on detailed 4-digit codes from the North American Industrial Classification System (NAICS). Such employment data are only available from the 2001 and 2006 *Census of Population*, due to changes in the classification scheme. Detailed occupational data from the Census are comparable from 1991 onwards.

Manufacturing Dynamics
Montréal

Figure 2 compares employment in the manufacturing industries to the overall employed labour force in Montréal over the period between 1987 and 2010. Employment is indexed to 100 in the base year (1987) to allow for easier comparison of their relative growth performance over time.

Figure 2 shows that throughout the late 1980s and until the mid-1990s, manufacturing employment declined. While employment in Montreal's manufacturing industries experienced a brief period of volatile growth through the late 1990s, beginning at the turn of millennium, manufacturing employment entered a phase of steady decline diverging from the overall trend of steady growth in Montreal's overall labour force. The share of manufacturing employment declined sharply from 18% in 2000 to only 12% by 2010.

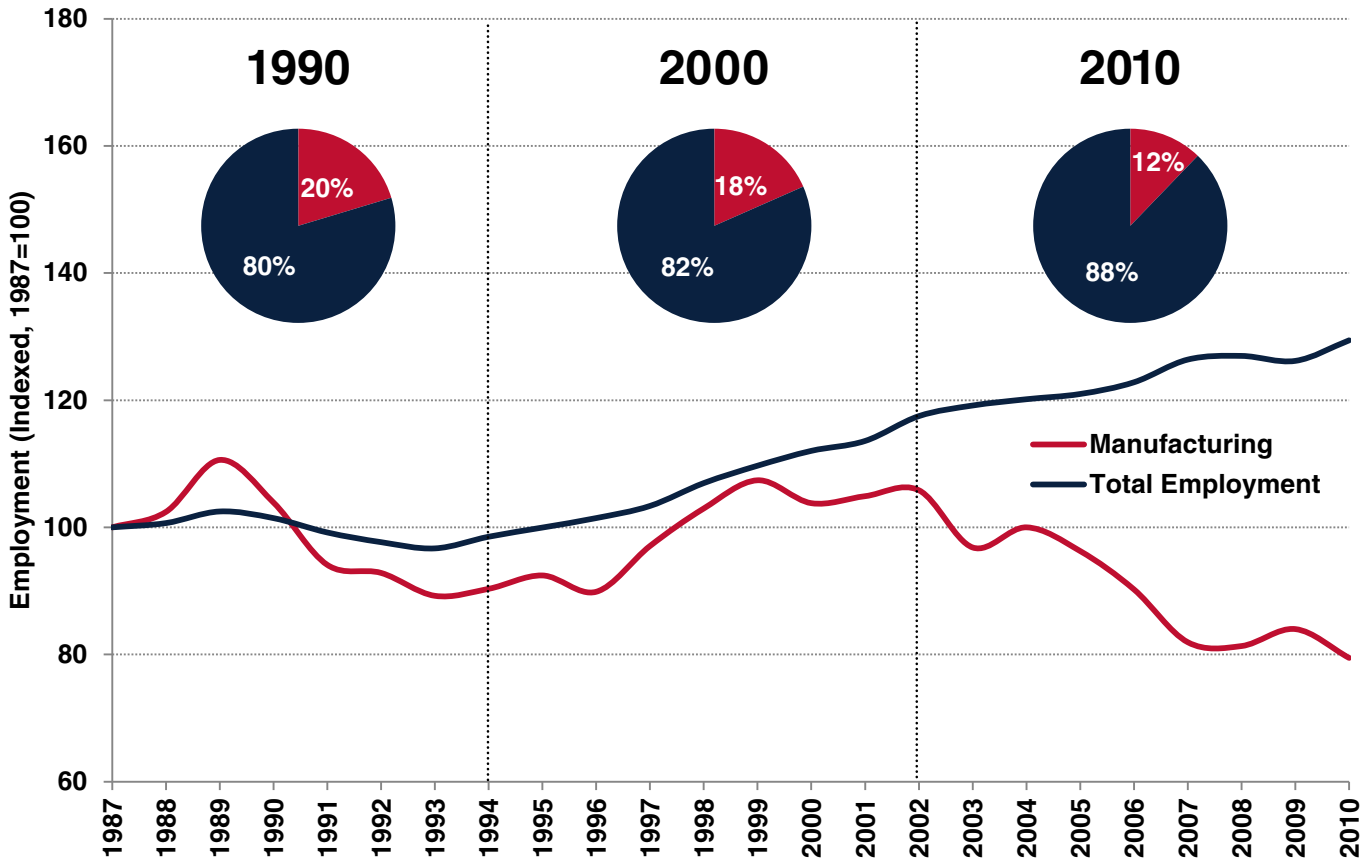
Given the diversification outside of manufacturing, a more detailed examination of the regional economy is warranted. Table 2 shows employment in eighteen industrial groups in 2001 and 2006. While there is still a high level of employment in several manufacturing-related industrial groups (plastics and rubber, food, and textiles and apparel), growth performance and levels of specialization vary across sectors. These industrial groups, when demonstrating sufficient size, scope and specialization form the basis of clusters in the regional economy (see next page).

Table 2: Employment by industrial group, 2001 and 2006

Industrial Group	2001	2006
Agriculture	30,235	33,730
Mining	17,675	20,845
Oil and Gas	7,125	6,610
Wood & Wood Products	14,375	14,970
Maritime	5,710	6,375
Textiles & Apparel	63,630	44,260
Food	52,175	55,990
Steel	34,985	37,180
Automotive	36,195	35,450
Plastics & Rubber	64,030	57,915
Biomedical	24,925	29,290
ICT Manufacturing	40,570	30,630
ICT Services	101,135	125,670
Finance	105,830	136,510
Business Services	175,100	220,250
Creative & Cultural	71,665	99,545
Higher Education	48,730	78,885
Logistics	121,760	129,005

Source: Statistics Canada, Census of Population, 2001 and 2006

Figure 2: Manufacturing Employment, 1987-2010 (1987=100)



Source: Statistics Canada, Labour Force Survey, 1987-2010 [custom tabulations]

Cluster Dynamics
Montréal

Figure 3 depicts a 'bubble chart' comparing the performance eighteen industrial groups (or clusters) in Montréal. The horizontal axis shows the employment growth rate between 2001 and 2006. The vertical axis shows the employment location quotient comparing the proportion of Montréal's employment in an industrial sector to the Canadian average. The diameter of each 'bubble' is proportional to employment in the specified industrial group in 2006. Industrial groups that appear in the upper-right quadrant have positive growth rates and have a higher-than expected proportion of employment (specialization) in this group of industries.

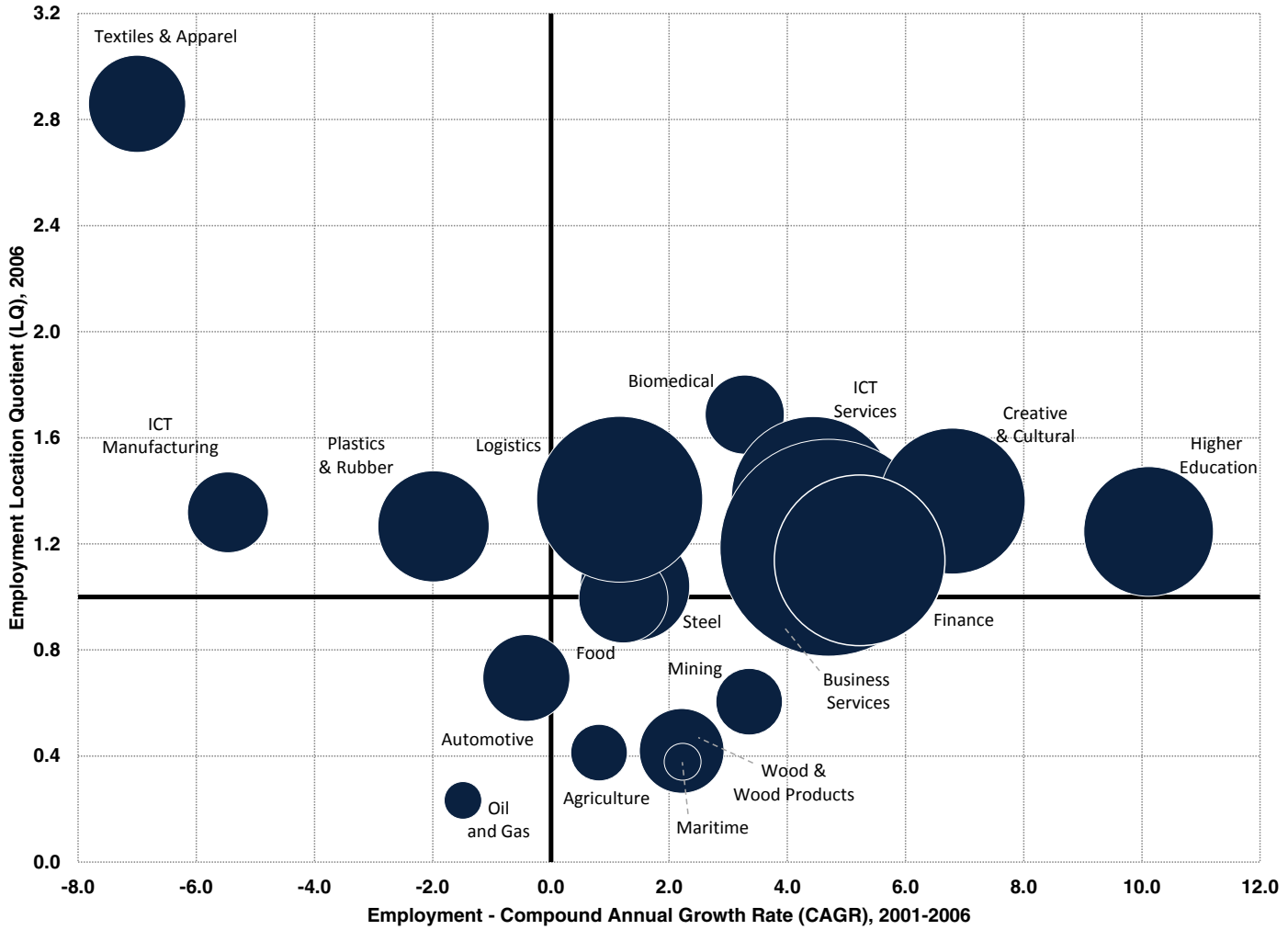
A more sophisticated analysis of industrial structure involves cluster analysis. Clusters represent groups of inter-related firms and industries that gain competitive advantage by concentrating geographically in certain locations. In this report, industrial groups that meet a set of quantitative criteria are identified as clusters. Clusters are identified based on their relative size (employment), their relative specialization (location quotient), as well as the breadth or scope of activities undertaken in the region.[1]

According to these criteria, in 2006, there were ten clusters in the Montréal region: textiles and apparel, food, plastics and rubber, biomedical, ICT manufacturing, ICT services, finance, business services, creative and cultural, and logistics. With the exception of textiles and apparel, and plastics and rubber, all of these clusters demonstrated growth between 2001 and 2006.

Additionally, higher education demonstrated high levels of growth between 2001 and 2006.

1. For a more detailed description of the methodology, see: Spencer, G. M., Vinodrai, T., Gertler, M. S., & Wolfe, D. A. (2010). Do Clusters Make a Difference? Defining and Assessing their Economic Performance. *Regional Studies, 44*(6), 697–715.

Figure 3: Cluster growth and specialization, 2001-2006



Source: Statistics Canada, Census of Population, 2001 and 2006

Changing Occupational Structure
Montréal

In addition to shifts in the industrial composition of the regional economy, between 1971 and 2006, Montréal's workforce has undergone a substantial transition in its occupational structure. Figure 4 shows the broad changes in the occupational composition of the regional economy.

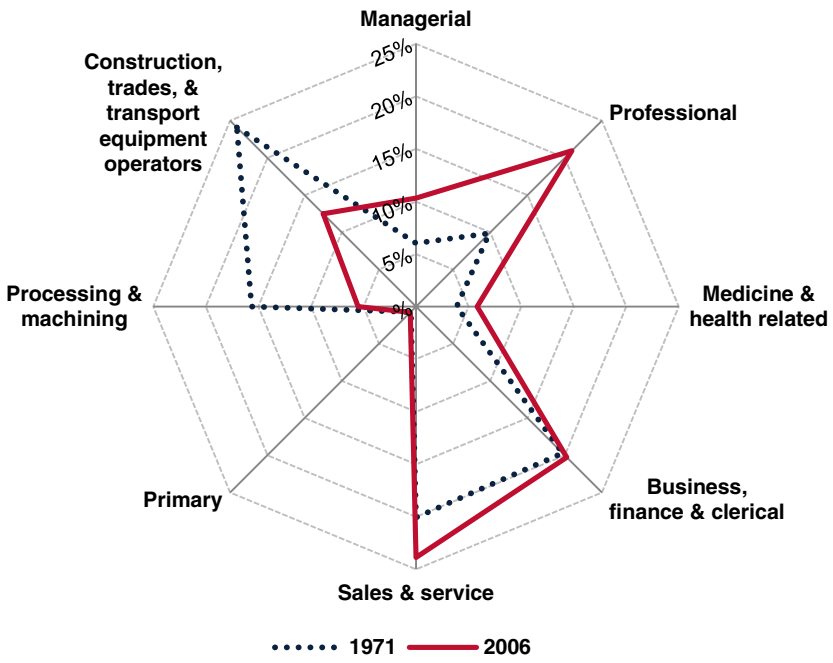
Most notably, the proportion of employment accounted for by construction, trades and other related occupations decreased from 24.1% of the workforce in 1971 to 12.5% in 2006. Similarly, employment in processing and machining occupations decreased from 15.7% to 5.5% in the same time period.

By contrast, the share of employment in professional occupations more than doubled from 9.9% to 21% between 1971 and 2006. Managerial occupations saw a similar growth in share, increasing from 6% to 10.3% of the workforce between 1971 and 2006. As seen in Table 4, medicine and health-related occupations saw strong annual growth (2.8% annually), though only accounted for 5.8% of the workforce by 2006.

Modest gains were experienced in both sales and service occupations, and business, finance and clerical occupations: the former increased from 20.1% in 1971 to 23.9% by 2006, while the latter grew slightly from 19.7% of the workforce to 20.3% in the same period. Occupations related to primary labour remain a marginal portion of the workforce, increasing to 0.8% by 2006.

Table 4 provides more detail of these changes. It is clear that Montréal's economy has undergone a transition, shifting from production-oriented labour towards more knowledge-based, professional forms of labour.

Figure 4: Change in occupational structure, 1971-2006



Source: Statistics Canada, Census of Population, 1971 and 2006

Table 4: Employment by occupation, 1971-2006

	1971	1981	1991	2001	2006	1971-2006	CAGR
Managerial	65,125	146,430	231,370	192,440	198,525	133,400	3.2%
Professional	106,520	169,160	226,345	348,740	403,440	296,920	3.9%
Medicine & health related	41,835	68,140	88,280	97,245	111,565	69,730	2.8%
Business, finance & clerical	213,300	309,915	333,010	364,040	389,925	176,625	1.7%
Sales & service	216,835	287,465	350,490	398,500	459,220	242,385	2.2%
Primary	7,670	9,830	12,900	12,615	14,995	7,325	1.9%
Processing & machining	169,310	233,730	197,765	135,360	106,370	- 62,940	-1.3%
Constr., trades, & transport equip. operators	260,800	173,360	186,060	216,815	239,930	- 20,870	-0.2%
Total	**1,081,395**	**1,398,030**	**1,626,220**	**1,765,755**	**1,923,970**	**842,575**	**1.7%**

CAGR = Compound Annual Growth Rate
Source: Statistics Canada, Census of Population, 1971-2006

Emerging Knowledge Economy
Montréal

Figure 5 provides additional perspective on how the occupational composition of Montréal has changed over time. In aggregate, the composition of Montréal's regional workforce has changed at a moderate pace. The share of employment in production-oriented jobs has declined at the same time that an increase in knowledge-based occupations can been seen. Service-oriented occupations have consistently accounted for the highest proportion of employment in Montréal, peaking at 45% in 2004. However, knowledge-based occupations have grown throughout the last few decades, accounting for 43% of the workforce in 2010.

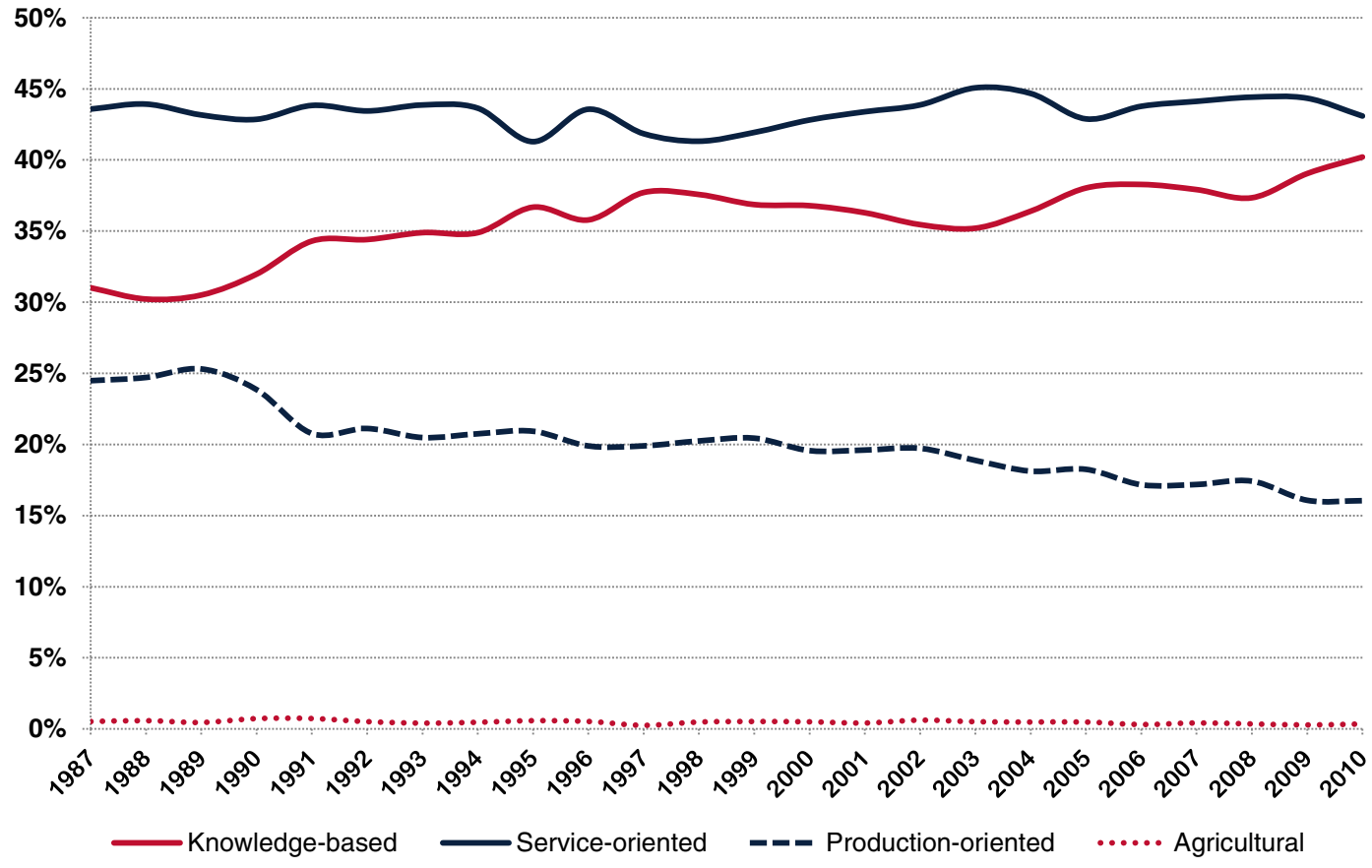
As Table 5 shows, employment in knowledge-based occupations increased at 1.9% per year between 1991 and 2006, outpacing the region's overall employment growth rate of 0.9% per year. Also noteworthy is the mostly steady decline in share of employment accounted for by routine, production-oriented work. The share of employment in production-oriented jobs peaked at 25% in 1989 but had declined to 16% by 2010. Not surprisingly, agricultural work accounted for a marginal share of employment throughout the period.

Table 5: Employment by occupation class, 1991-2006

	Agricultural occupations	Knowledge-based	Service-oriented	Production-oriented	Total Workforce
1991	8,250	536,440	751,500	370,990	**1,715,770**
1996	8,500	538,675	739,800	333,870	**1,703,970**
2001	7,145	639,695	769,300	362,330	**1,827,130**
2006	7,530	706,830	855,835	353,765	**1,972,455**
1991-2006	-720	170,390	104,335	-17,225	**256,685**
CAGR	-0.6%	1.9%	0.9%	-0.3%	**0.9%**

CAGR = Compound Annual Growth Rate
Source: Statistics Canada, Census of Population, 1991-2006 (custom tabulations)

Figure 5: Changing occupational composition of the labour force, 1987-2010



Source: Statistics Canada, Labour Force Survey, 1987-2010 [custom tabulations]