

Changing Industrial Structure

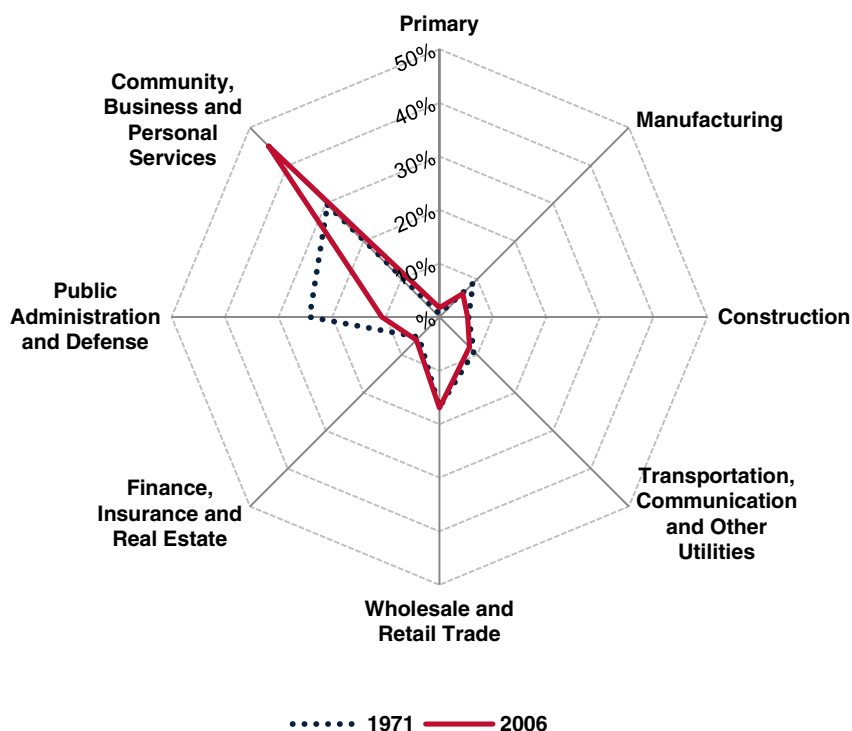
Halifax

Since 1971, Halifax's economy has undergone a considerable transformation. Figure 1 shows how Halifax's regional industrial composition has changed in the past 25 to 30 years. Most notably, the Halifax economy has become even more dominated by service-based industries. Employment in service-based industries increased from 29.6% in 1971 to 45.1% in 2006. By contrast, employment in public administration and defense declined sharply from 24.2% to 10.7% between 1971 and 2006. While manufacturing employment accounted for 8.9% of the Halifax workforce in 1971, by 2006, the share of employment in manufacturing industries was only 6.2%. Moderate decline was also experienced in the transportation, communication and other utilities sector, decreasing from 9.1% to 8.0% between 1971 and 2006.

Other sectors, such as the construction and trade sectors, have experienced relative stability. The share of employment in construction remained around 5% throughout the period, Wholesale and retail trade accounted for close to 17% of total employment. While the proportion of employment in these sectors remained roughly the same for both sectors, there was an absolute increase in employment in both sectors.

Primary industries experienced strong relative growth (5.6% per year) even though employment in these industries accounted for only a small proportion of the regional economy (1.7% 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	540	1,945	2,260	3,410	3,593	3,053	5.6%
Manufacturing	7,885	11,075	12,020	12,308	12,858	4,973	1.4%
Construction	4,840	7,300	10,260	9,587	11,079	6,239	2.4%
Transp., Comm. & Other Utilities	8,120	12,450	15,250	16,280	16,638	8,518	2.1%
Wholesale & Retail Trade	14,960	25,025	31,365	32,991	35,406	20,446	2.5%
Finance, Insurance & Real Estate	4,760	9,550	11,730	11,835	12,636	7,876	2.8%
Public Administration & Defense	21,545	26,515	29,645	21,099	22,416	871	0.1%
Community, Business & Personal Services	26,310	48,240	65,345	84,980	94,273	67,963	3.7%
Total	88,960	142,100	177,875	192,490	208,899	119,939	2.5%

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

Halifax

Figure 2 compares employment in the manufacturing industries to the overall employed labour force in Halifax 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 the share of employment in Halifax accounted for by manufacturing has fluctuated over the period between 1987 and 2010. However, for most of this period, the trend in manufacturing employment underperformed relative to the growth of the economy as a whole.

After a sharp downturn in the early 1990s, manufacturing employment increased through the 1990s and 2000s, surpassing 1987 levels by

the year 2000. Manufacturing employment peaked in 2002 and subsequently entered into a period of volatility, peaking again in 2007 and declining ever since.

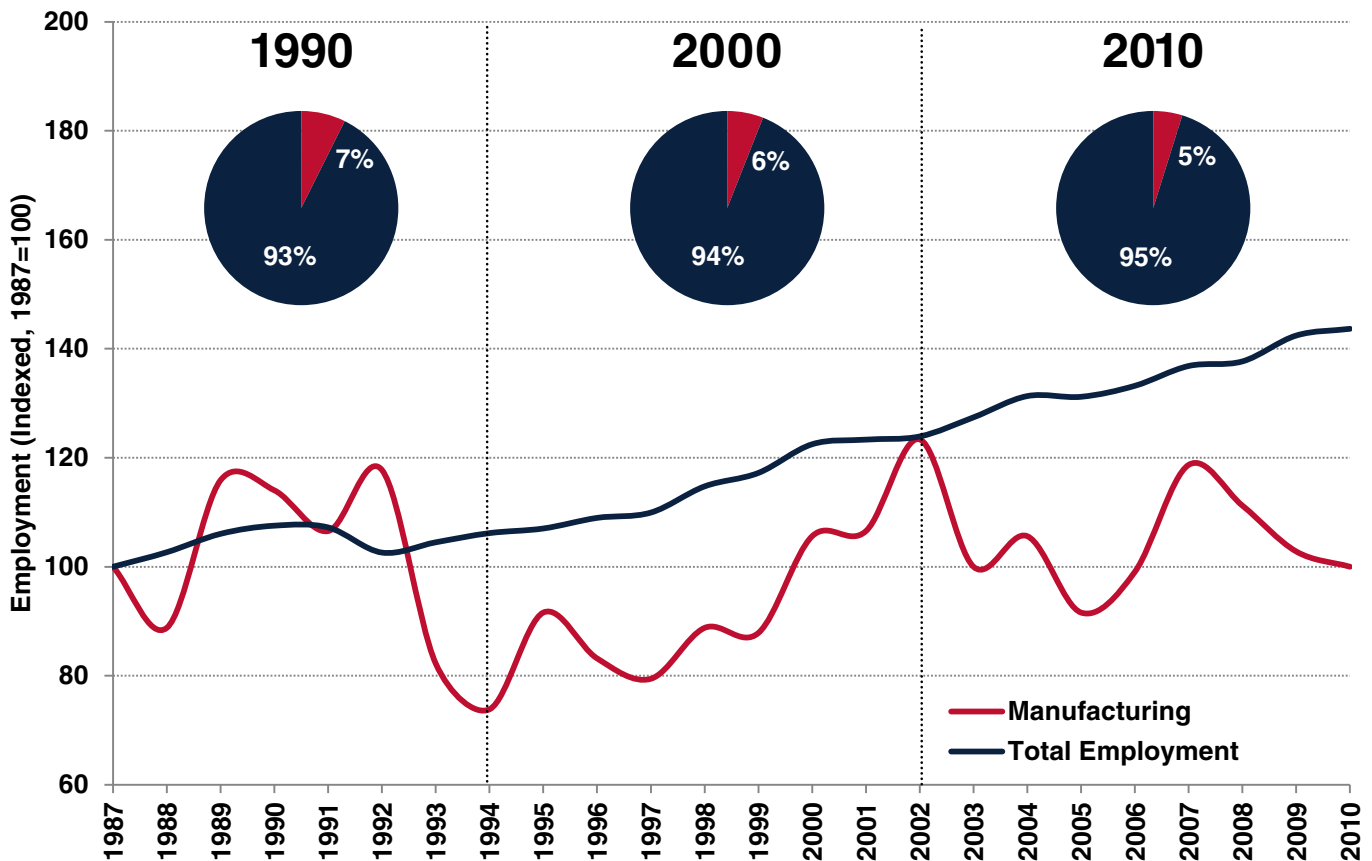
Given the diversification outside of manufacturing, a more detailed examination of the regional economy is warranted. Table 2 shows employment in eighteen industrial groups in 2001 and 2006. While there are high levels of growth and employment in the ICT services and finance industries, growth performance 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	1,430	1,585
Mining	1,930	1,710
Oil and Gas	1,415	1,465
Wood & Wood Products	1,440	1,330
Maritime	2,935	3,715
Textiles & Apparel	410	470
Food	4,740	5,045
Steel	1,650	1,695
Automotive	880	885
Plastics & Rubber	2,160	2,240
Biomedical	1,720	2,165
ICT Manufacturing	1,925	1,750
ICT Services	11,450	14,700
Finance	11,165	14,055
Business Services	24,015	27,640
Creative & Cultural	5,525	9,140
Higher Education	7,915	10,835
Logistics	11,565	10,890

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

Halifax

Figure 3 depicts a 'bubble chart' comparing the performance eighteen industrial groups (or clusters) in Halifax. The horizontal axis shows the employment growth rate between 2001 and 2006. The vertical axis shows the employment location quotient comparing the proportion of Halifax'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.

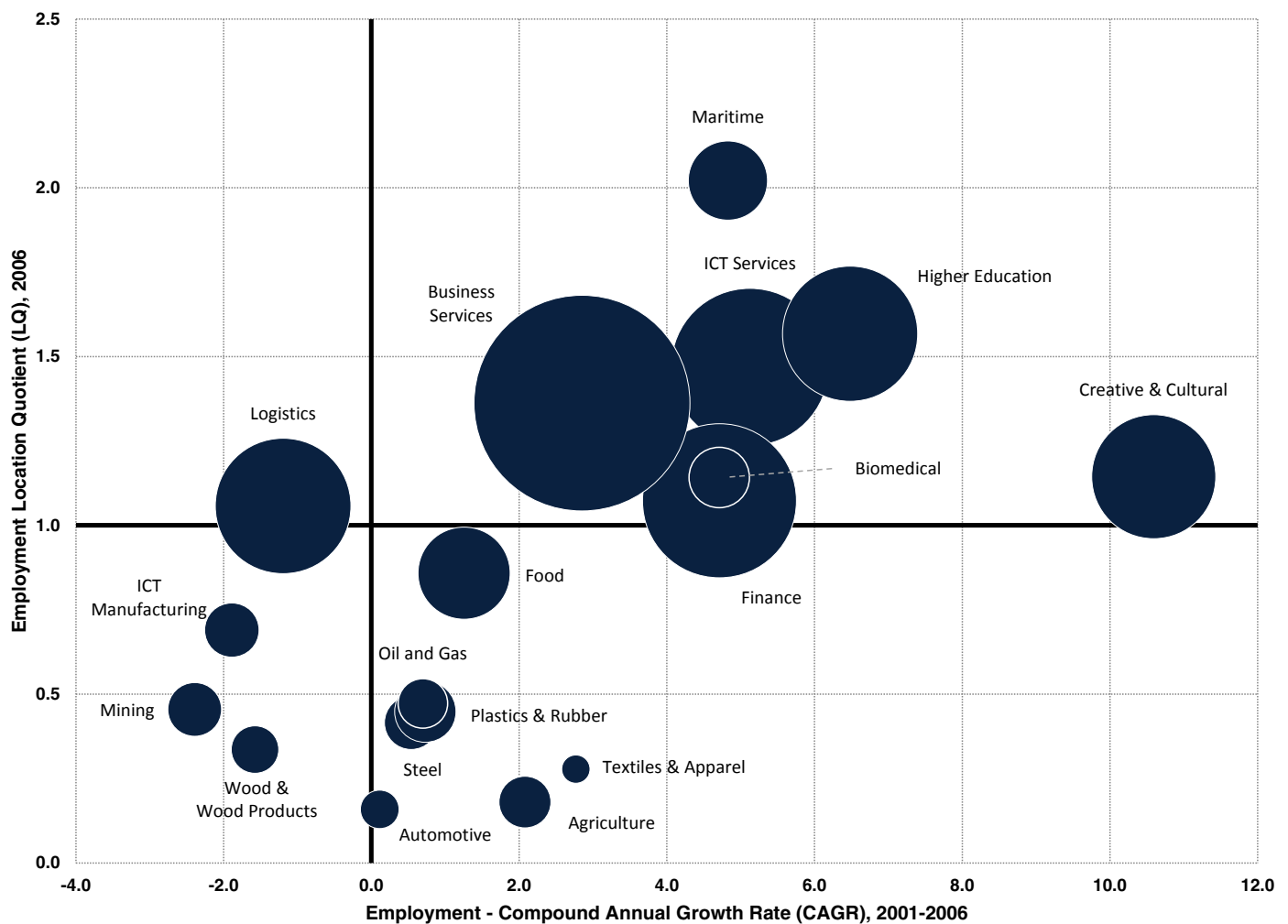
A more sophisticated analysis of industrial structure involves cluster analysis. Clusters represent groups of inter-related firms and industries that gain competitive advantage by concentrating geographically in certain locations. In this report, industrial groups that meet a set of quantitative criteria 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 six clusters in the

Halifax region: maritime industries, biomedical, ICT services, business services, creative and cultural, and higher education. All six of these clusters demonstrated strong growth between 2001 and 2006. Additionally, finance 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

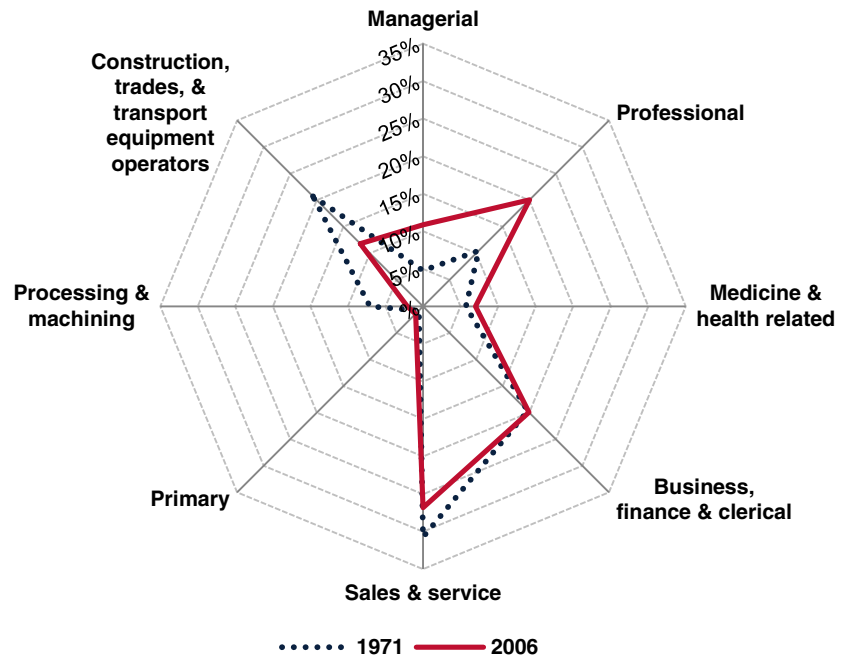
Halifax

In addition to shifts in the industrial composition of the regional economy, between 1971 and 2006, Halifax'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 20.7% of the workforce in 1971 to 11.8% in 2006. Similarly, employment in processing and machining occupations decreased from 7.1% to 2.1% in the same time period. By contrast, employment in professional occupations almost doubled from 10.5% to 20.1% between 1971 and 2006. Managerial occupations saw similar growth, increasing from 4.8% to 10.9% of the workforce between 1971 and 2006.

The proportion of employment accounted for by medicine and health-related occupations increased slightly to 7.0% by 2006, from 5.7% in 1971. Moderate decline is apparent in the sales and service sector, decreasing from 30.7% to 26.8% in the same period. Business, financial and clerical occupations have seen their share of the workforce stay relatively stable at just under 20%.

Table 4 provides more detail of these changes. It is clear that Halifax 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	4,535	13,590	22,410	22,540	22,815	18,280	4.7%
Professional	9,945	17,700	24,295	35,855	42,170	32,225	4.2%
Medicine & health related	5,415	8,990	11,655	12,505	14,670	9,255	2.9%
Business, finance & clerical	18,700	30,830	35,675	38,510	41,905	23,205	2.3%
Sales & service	29,170	39,210	47,000	54,080	56,315	27,145	1.9%
Primary	755	1,805	2,130	2,490	2,980	2,225	4.0%
Processing & machining	6,705	10,540	11,560	4,345	4,420	-2,285	-1.2%
Constr., trades, & transport equip. operators	19,670	19,465	23,150	23,380	24,855	5,185	0.7%
Total	94,895	142,130	177,875	193,705	210,130	115,235	2.3%

CAGR = Compound Annual Growth Rate

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

Emerging Knowledge Economy

Halifax

Figure 5 provides additional perspective on how the occupational composition of Halifax has changed over time. In aggregate, the composition of Halifax's regional workforce has changed very slowly. The share of employment in production and service oriented jobs has declined at the same time that a mirror increase in knowledge-based occupations can be seen. Nonetheless, service-oriented occupations have consistently accounted for the highest proportion of employment in Halifax, peaking at 59% in 1993. By 2010, service-oriented work had declined moderately to account for 45% of employment.

As Table 5 shows, employment in knowledge-based occupations increased at 1.8% per year between 1991 and 2006, moderately outpacing the region's overall employment growth rate of 1.0% per year. Also noteworthy is the steady proportion of employment accounted for by routine, production-oriented work.

Employment in production-oriented jobs remained around 15% throughout the period between 1987 and 2010. Not surprisingly, agricultural work accounted for only a fraction of employment.

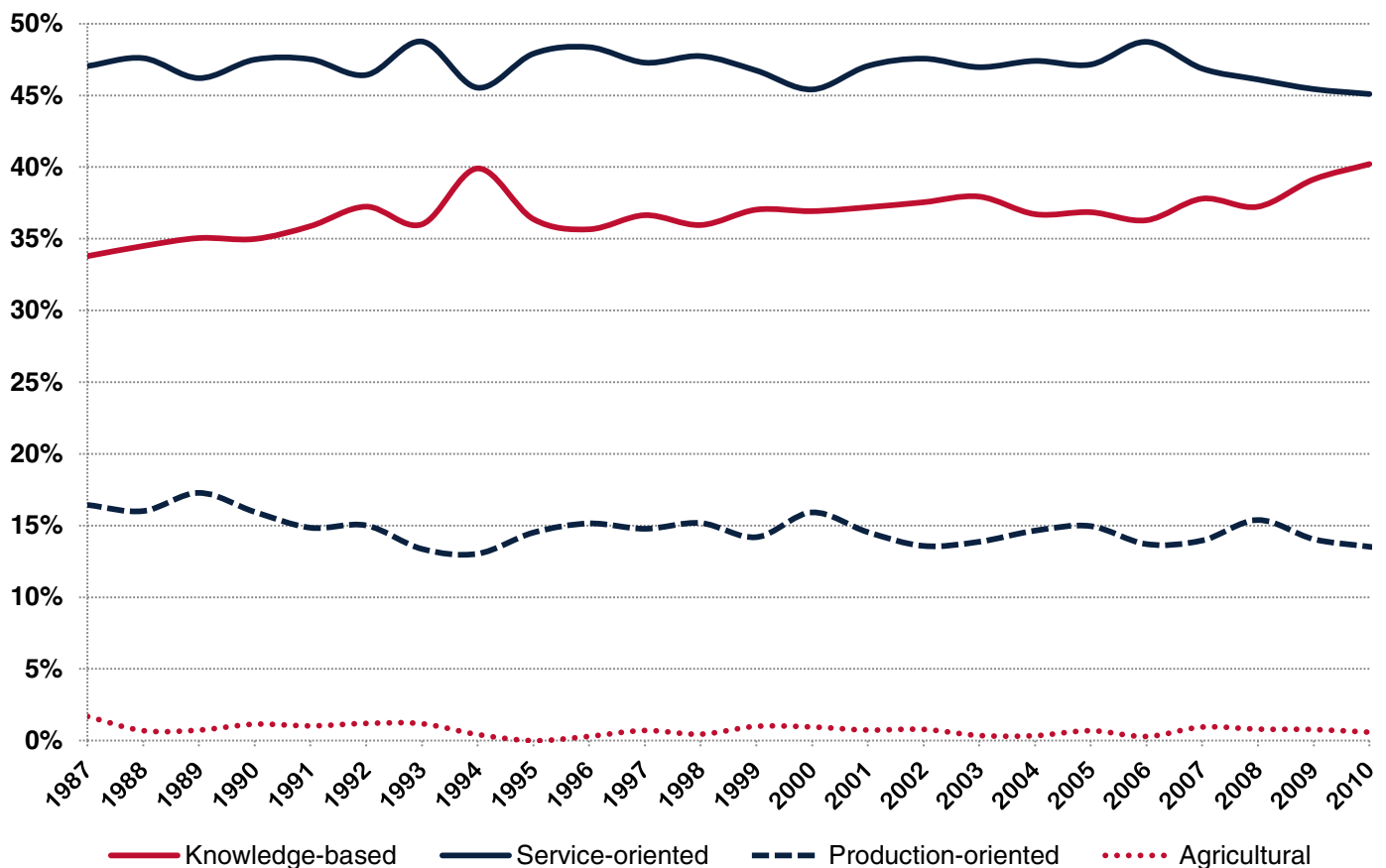
Table 5: Employment by occupation class, 1991-2006

	Agricultural occupations	Knowledge-based	Service-oriented	Production-oriented	Total Workforce
1991	1,645	61,310	88,375	30,965	184,665
1996	1,815	59,570	89,395	27,460	182,970
2001	1,470	72,355	91,130	28,740	196,590
2006	1,725	79,910	97,960	30,520	212,935
1991-2006	80	18,600	9,585	- 445	28,270
CAGR	0.3%	1.8%	0.7%	-0.1%	1.0%

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]