Changing Industrial Structure
Toronto

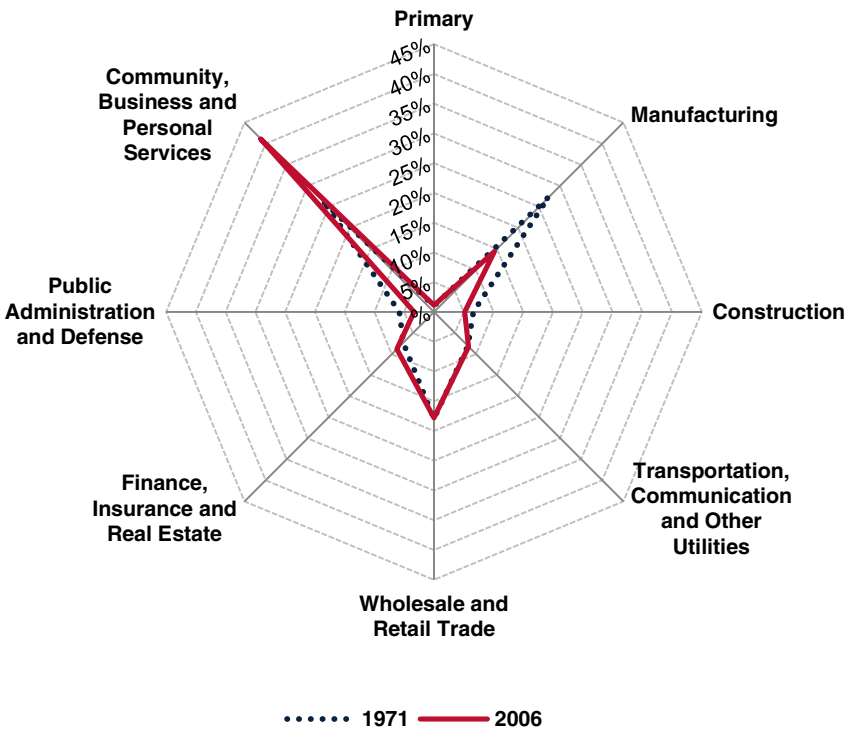
Since 1971, Toronto's economy has undergone a considerable transformation. Figure 1 shows how Toronto's regional industrial composition has changed in the past 25 to 30 years.

Most notably, Toronto's economy has become dominated by service-based industries. Employment in service-based industries increased from 25.9% in 1971 to 41.1% in 2006. Although it only accounted for 8.8% of the overall employment by 2006, the FIRE sector experienced strong annual growth (3.0% annually).

By contrast, employment in manufacturing declined sharply from 27.3% to 14.4% between 1971 and 2006. Notwithstanding this decline, manufacturing industries added almost 80,000 jobs in the same period. Moderate decline was also experienced in the public administration sector, decreasing from 5.8% to 3.3% between 1971 and 2006.

Other sectors, such as the construction and trade sectors, have experienced relative stability. The share of employment in transportation, communication and other utilities remained close to 8% throughout the period. Wholesale and retail trade accounted for close to 18% of total employment. While the proportion of employment in these sectors remained roughly the same, both sectors saw strong gains in employment numbers. Primary industries accounted for only a small proportion of the regional economy (1.1% 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	11,970	14,515	20,860	27,136	31,282	19,312	2.8%
Manufacturing	315,570	399,630	384,810	418,761	394,882	79,312	0.6%
Construction	76,565	91,005	139,010	119,000	142,201	65,636	1.8%
Transp., Comm. & Other Utilities	93,505	133,885	162,575	205,177	226,276	132,771	2.6%
Wholesale & Retail Trade	207,845	304,020	389,555	449,730	486,946	279,101	2.5%
Finance, Insurance & Real Estate	84,575	142,200	201,485	218,077	241,922	157,347	3.0%
Public Administration & Defense	66,790	86,210	121,175	81,126	90,610	23,820	0.9%
Community, Business & Personal Services	300,215	496,325	776,080	985,453	1,125,229	825,014	3.8%
Total	**1,157,035**	**1,667,790**	**2,195,550**	**2,504,459**	**2,739,349**	**1,582,314**	**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
Toronto

Figure 2 compares employment in the manufacturing industries to the overall employed labour force in Toronto 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 employment in Toronto's manufacturing industries generally mirrored overall employment trends until the middle of the 2000s, if - in some cases - more pronounced.

After a steady decline in the late 1980s and early 1990s, manufacturing employment began to increase through the mid 1990s and 2000s, surpassing 1987 levels by the year 2001. Since 2004 manufacturing employment has been in a steady state of decline.

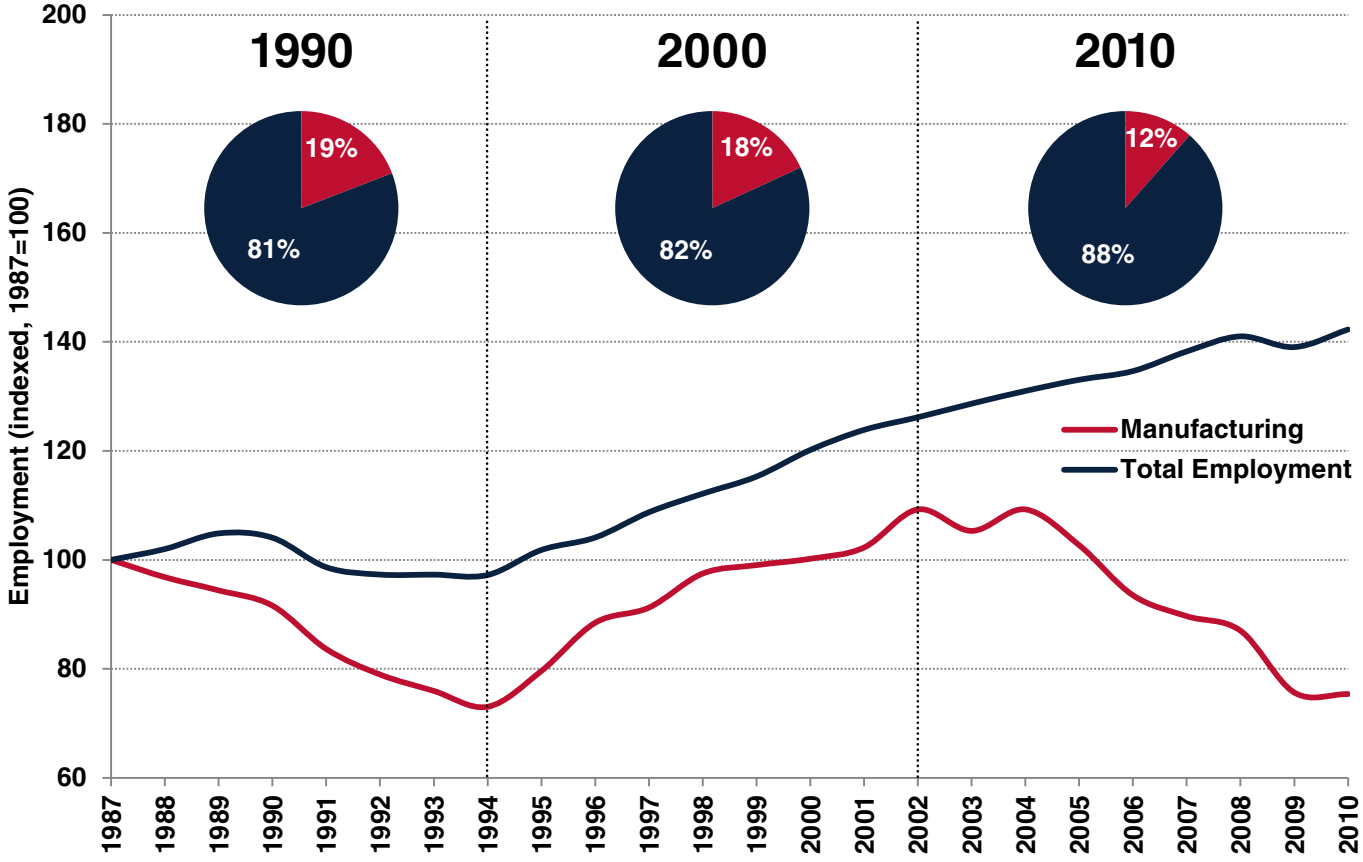
Given the diversification outside of manufacturing, a more detailed examination of the regional economy is warranted. Table 2 shows employment in eighteen industrial groups in 2001 and 2006. While there is still a high level of employment in the automotive and plastics and rubber industries, growth performance 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	43,165	45,095
Mining	17,840	17,355
Oil and Gas	12,255	12,430
Wood & Wood Products	14,185	15,255
Maritime	3,860	4,370
Textiles & Apparel	34,765	28,510
Food	76,215	86,765
Steel	51,845	52,010
Automotive	102,935	107,335
Plastics & Rubber	107,990	101,360
Biomedical	35,585	41,710
ICT Manufacturing	68,460	58,700
ICT Services	143,785	181,360
Finance	227,040	277,210
Business Services	293,225	354,625
Creative & Cultural	114,810	159,155
Higher Education	57,255	100,585
Logistics	187,775	204,950

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
Toronto

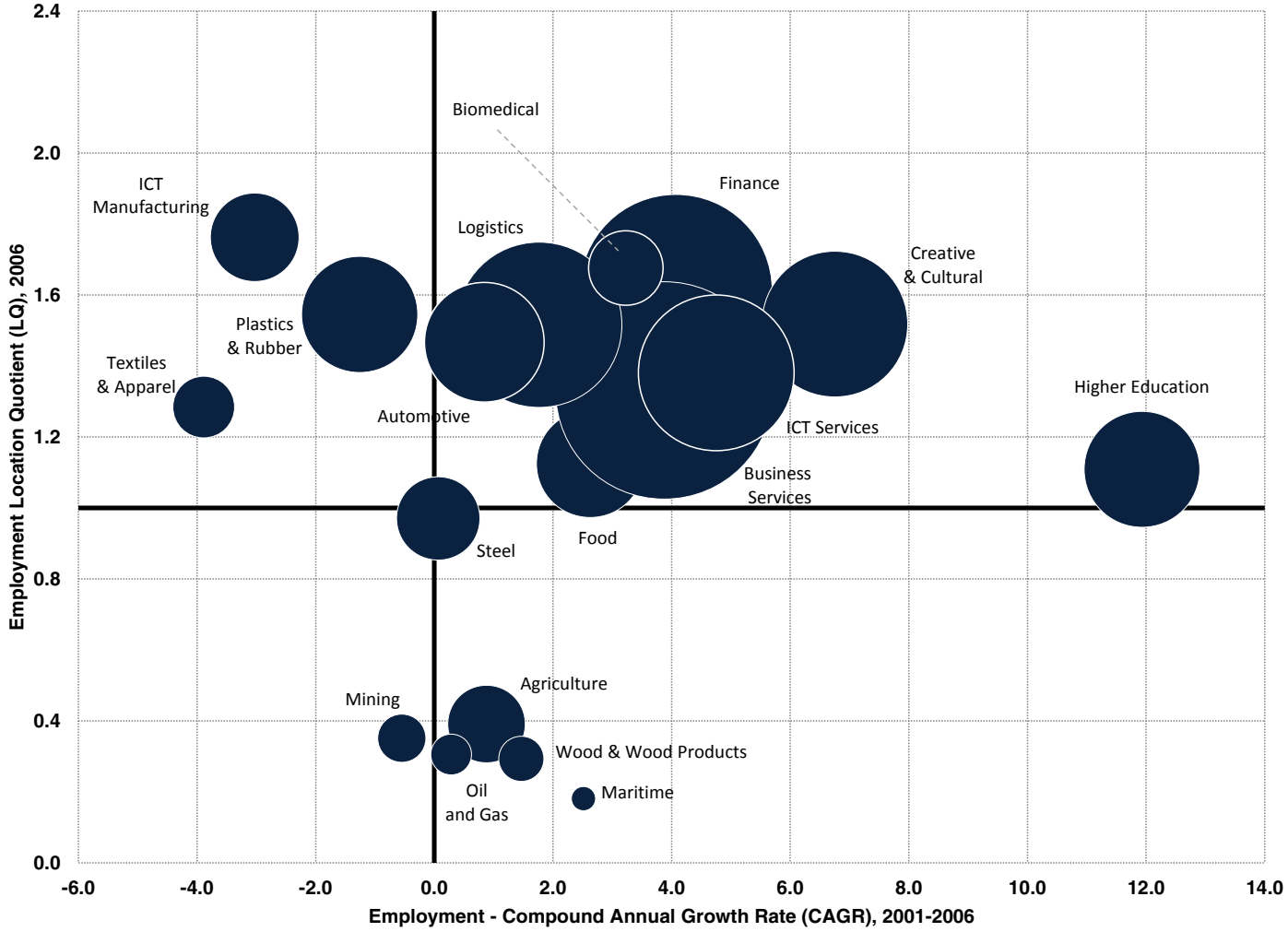
Figure 3 depicts a 'bubble chart' comparing the performance eighteen industrial groups (or clusters) in Toronto. The horizontal axis shows the employment growth rate between 2001 and 2006. The vertical axis shows the employment location quotient comparing the proportion of Toronto's employment in an 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 twelve clusters in the Toronto region: textiles and apparel, food, automotive, plastics and rubber, biomedical, ICT manufacturing, ICT services, finance, business services, creative and cultural, higher education, and logistics. The wide array of industrial groups that qualify as clusters in Toronto highlights the growth and dynamism of the region as a whole. Moreover, all but three of these clusters (textiles and apparel, plastics and rubber, ICT manufacturing) experienced growth between 2001 and 2006. Additionally, Toronto's economy demonstrated growth and specialization in the automotive and food industries.

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
Toronto

In addition to shifts in the industrial composition of the regional economy, between 1971 and 2006, Toronto'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.

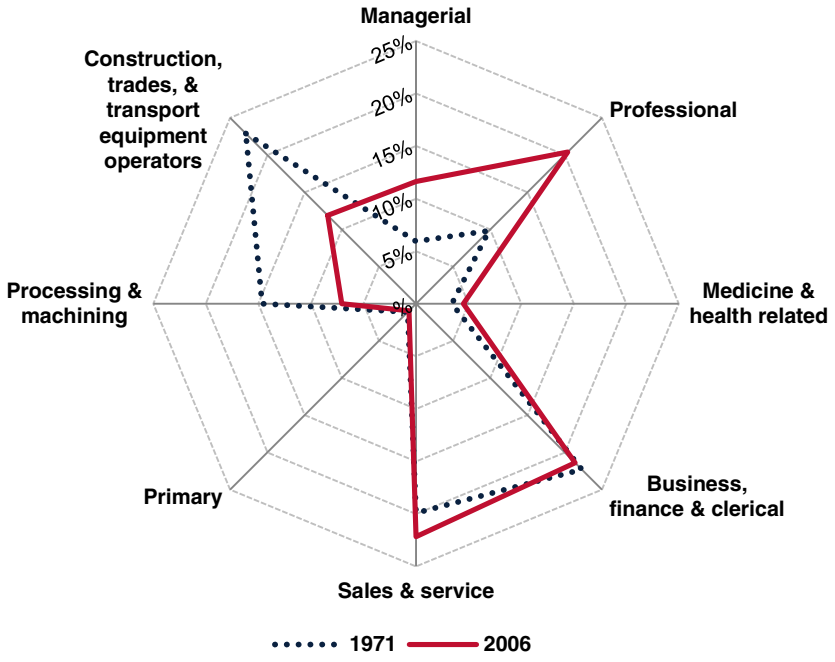
Most notably, the proportion of employment accounted for by construction, trades and other related occupations decreased from 22.9% of the workforce in 1971 to 11.8% in 2006. Similarly, employment in processing and machining occupations decreased from 14.6% to 7.1% in the same time period.

By contrast, employment in professional occupations more than doubled from 9.8% to 20.4% between 1971 and 2006. Managerial occupations experienced similar growth, increasing from 5.9% to 11.6% of the workforce between 1971 and 2006. As seen in Table 4, medicine and health-related occupations experienced strong annual growth (3.1% annualy), although only accounted for 4.5% of the workforce by 2006.

Modest gains in sales and service occupations mirror the slight decline in business, finance and clerical occupations: the former increased from 19.9% in 1971 to 22.2% by 2006, while the latter declined slightly from 22.3% of the workforce to 21.4% in the same period.

Table 4 provides more detail of these changes. It is clear that Toronto'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	74,075	191,225	361,430	328,295	320,600	246,525	4.3%
Professional	122,055	197,740	309,735	489,690	562,550	440,495	4.5%
Medicine & health related	42,220	62,515	90,765	104,020	124,080	81,860	3.1%
Business, finance & clerical	277,520	402,970	468,445	547,725	590,605	313,085	2.2%
Sales & service	247,805	328,825	441,445	536,980	611,410	363,605	2.6%
Primary	13,940	16,240	22,095	22,040	26,270	12,330	1.8%
Processing & machining	182,255	240,615	212,750	198,565	195,330	13,075	0.2%
Constr., trades, & transport equip. operators	285,410	227,675	288,885	294,700	327,850	42,440	0.4%
Total	**1,245,280**	**1,667,805**	**2,195,550**	**2,522,015**	**2,758,695**	**1,513,415**	**2.3%**

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

Emerging Knowledge Economy
Toronto

Figure 5 provides additional perspective on how the occupational composition of Toronto has changed over time. In aggregate, the composition of Toronto's regional workforce has changed at a steady pace.

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 been seen. Whereas service-oriented occupations historically accounted for the highest proportion of employment in Toronto, by 2008, knowledge-based work began to surpass other forms of work to account for the largest share of employment. As Table 5 shows, employment in knowledge-based occupations increased at 2.5% per year between 1991 and 2006, outpacing the region's overall employment growth rate of 1.6% per year.

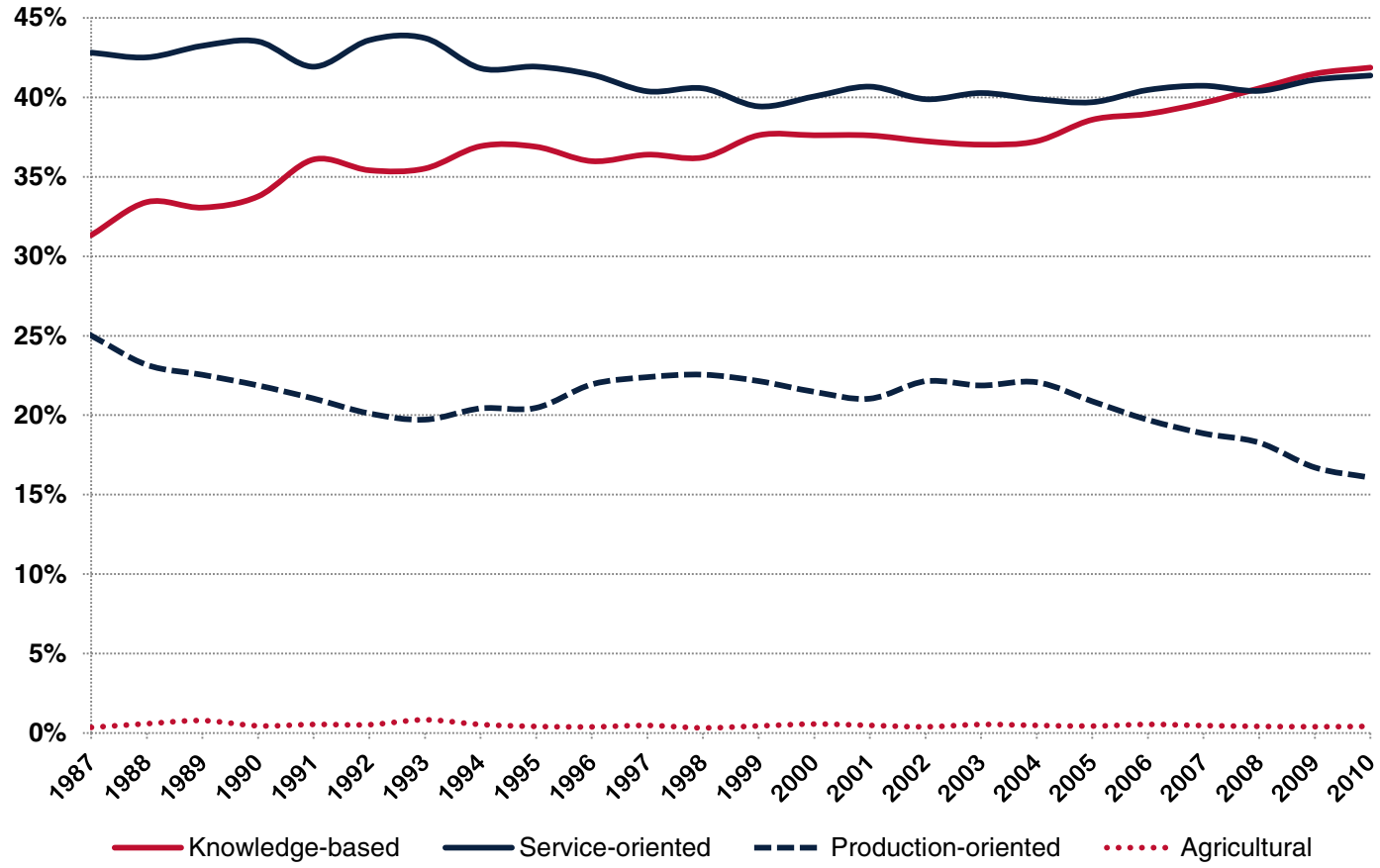
Also noteworthy is the steady decline in the proportion of employment accounted for by routine, production-oriented work. Employment in production-oriented declined from 25% of the workforce in 1987 to 16% by 2006. Not surprisingly, agricultural work accounted for only a fraction of employment throughout the period.

Table 5: Employment by occupation class, 1991-2006

	Agricultural occupations	Knowledge-based	Service-oriented	Production-oriented	Total Workforce
1991	12,810	735,150	979,905	470,980	**2,232,470**
1996	10,885	747,655	989,285	436,610	**2,268,610**
2001	10,395	980,810	1,025,895	504,915	**2,564,585**
2006	10,350	1,069,320	1,139,905	539,085	**2,815,850**
1991-2006	-2,460	334,170	160,000	68,105	**583,380**
CAGR	-1.4%	2.5%	1.0%	0.9%	**1.6%**

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]