Changing Industrial Structure
Edmonton

Figure 1 shows the broad shifts in the industrial composition of the regional economy. The Edmonton economy has been predominantly oriented towards the serviced industries. The proportion of employment in the service industries increased from 29.8% in 1971 to 39.6% in 2006. By contrast, the share of employment in public administration and defense declined by almost half from 11.3% in 1971 to 6.3% in 2006.

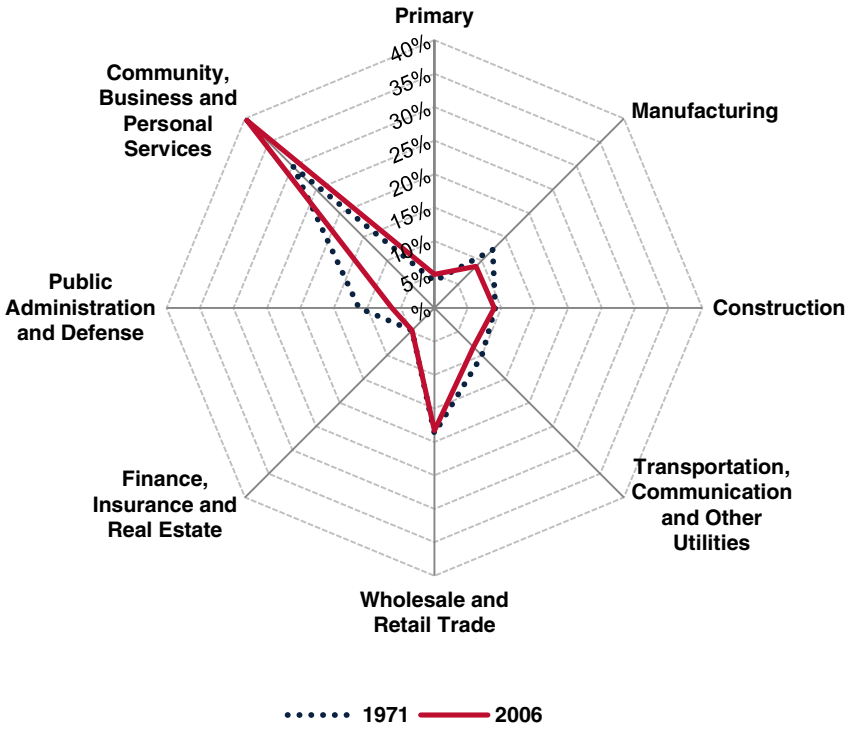
Manufacturing also witnessed a decline in its share of employment from 12.3% in 1971 to 8.8% in 2006. However, as Table 1 shows, even though the overall proportion of employment in manufacturing has declined in relative terms, between 1971 and 2006, in absolute terms, the region added almost 28,000 jobs in the manufacturing industries.

The transportation, communication and other utilities, and construction sectors both experienced moderate decline in their proportionate share of employment. Nonetheless, both sectors more than doubled in terms of absolute employment between 1971 and 2006.

Other sectors, such as trade and the FIRE industries, and wholesale retail and trade, have only witnessed moderate changes in their proportionate share through this time, with both experiencing strong annual employment growth.

Most notably, the primary industries experienced strong annual employment growth (3.8% annually) alongside an increase in the share of the regional economy, growing from 4% in 1971 to 5% by 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	8,185	14,525	21,105	22,015	30,195	22,010	3.8%
Manufacturing	24,965	41,345	40,805	49,314	52,925	27,960	2.2%
Construction	18,385	39,860	36,150	38,675	53,811	35,426	3.1%
Transp., Comm. & Other Utilities	20,365	34,845	41,170	46,297	49,649	29,284	2.6%
Wholesale & Retail Trade	37,885	67,725	85,550	95,120	110,109	72,224	3.1%
Finance, Insurance & Real Estate	9,545	23,340	26,135	24,511	28,354	18,809	3.2%
Public Administration & Defense	22,830	35,700	42,150	32,549	38,163	15,333	1.5%
Community, Business & Personal Services	60,330	114,560	174,605	214,032	238,243	177,913	4.0%
Total	**202,490**	**371,900**	**467,670**	**522,514**	**601,449**	**398,959**	**3.2%**

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
Edmonton

Figure 2 compares employment in the manufacturing industries to the overall employed labour force in Edmonton 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 accounted for by manufacturing has fluctuated since the late 1990s.

After a downturn in the early 1990s, manufacturing employment generally increased through the 1990s, fluctuating around the overall employment growth rate. After peaking in the 2002, employment in the manufacturing industries has generally declined. Notwithstanding this decline, by 2010 manufacturing employment remained slightly above 1987 levels.

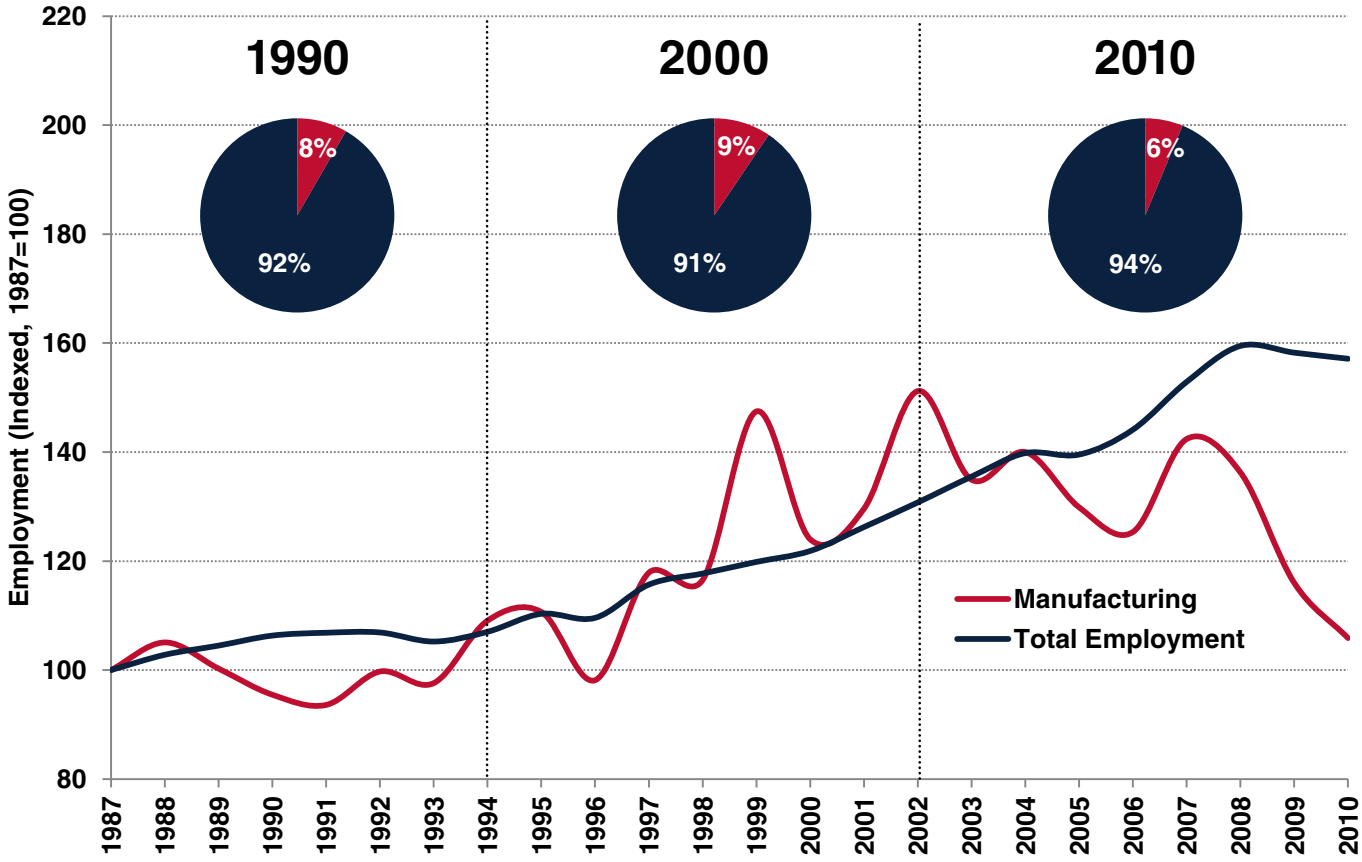
Given the diversification outside of manufacturing, a more detailed examination of the regional economy is warranted. Table 2 shows employment in eighteen industrial groups in 2001 and 2006. While there are high levels of growth and employment in the oil and gas, finance, and creative and cultural industries, 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	20,260	20,845
Mining	13,235	20,745
Oil and Gas	16,025	25,910
Wood & Wood Products	4,765	5,080
Maritime	695	570
Textiles & Apparel	2,295	1,890
Food	11,865	12,665
Steel	11,885	14,175
Automotive	8,365	9,840
Plastics & Rubber	9,935	10,640
Biomedical	3,955	4,570
ICT Manufacturing	3,835	5,325
ICT Services	25,780	29,680
Finance	25,335	31,530
Business Services	52,445	64,100
Creative & Cultural	12,985	18,135
Higher Education	16,270	21,525
Logistics	25,315	28,255

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
Edmonton

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

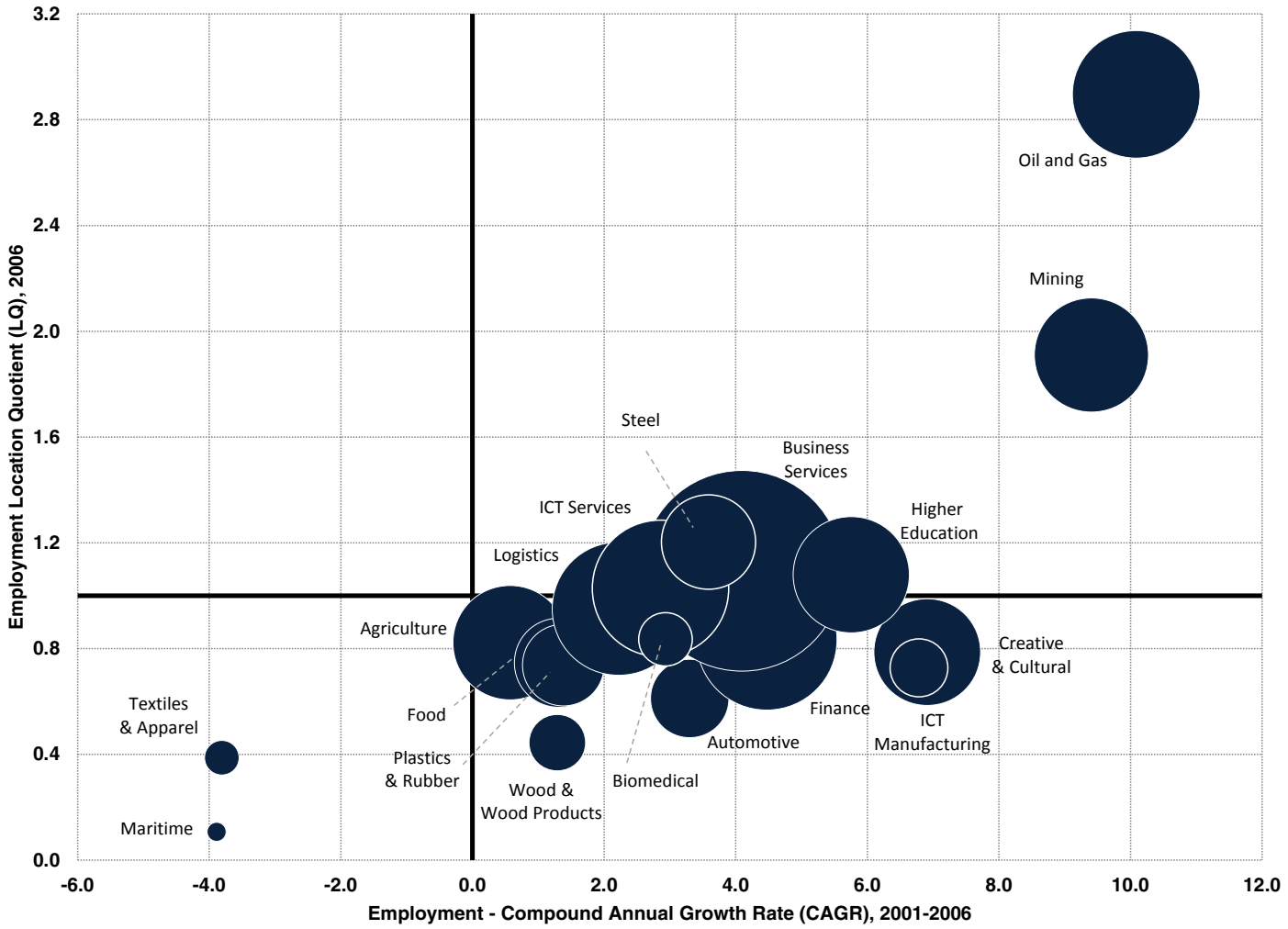
A more sophisticated analysis of industrial structure involves cluster analysis. Clusters represent groups of inter-related firms and industries that gain competitive advantage by concentrating geographically in certain locations. In this report, industrial groups that meet a set of quantitative criteria 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 three clusters in the Edmonton region: mining, oil and gas, and steel. All of these clusters demonstrated high levels of growth between 2001 and 2006. These data confirm the growing importance of the resource sector in the Edmonton economy.

A number of other industrial groups (ICT services, business services, higher education) experienced high levels of growth between 2001 and 2006. With the exception of the textiles and apparel and maritime industries, all industrial groups had high levels of growth. Overall, this suggests that the Edmonton economy is quite dynamic.

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
Edmonton

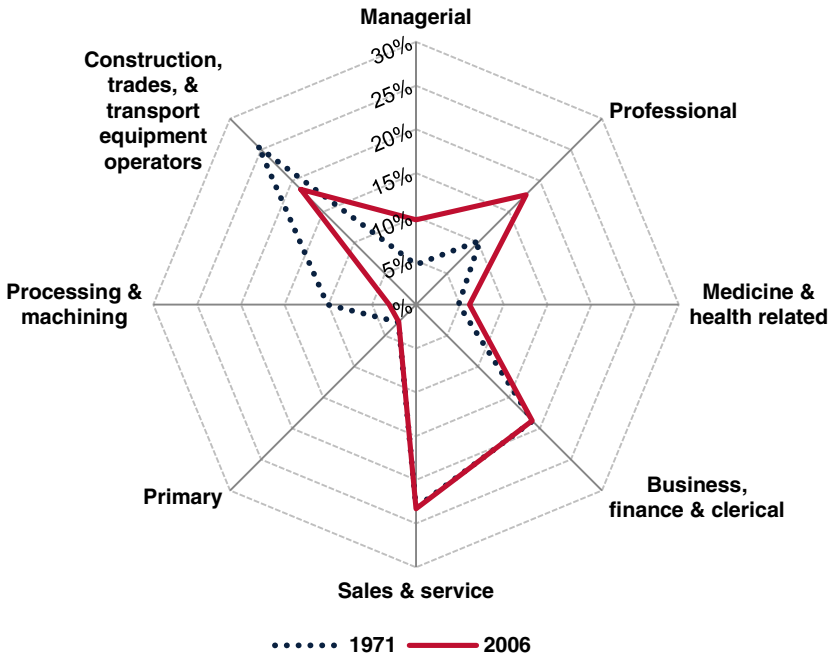
In addition to a broad shift in the industrial composition of the regional economy, Edmonton's workforce has undergone a substantial transition in the predominant forms of work over the past 25 to 30 years. Figure 4 shows the broad shifts in the occupational composition of the regional economy.

Most notably, the proportion of employment accounted for by construction, trades and other related occupations has decreased from 25.4% of the workforce in 1971 to 18.6% in 2006. Similarly, employment in processing and machining occupations decreased from 10.1% to 3.1% in the same time period.

By contrast, employment in professional occupations increased from 10.3% to 17.7% between 1971 and 2006. A similar pattern is apparent in managerial occupations, where the share of employment more than doubled from 4.6% in 1971 to 9.7% of the workforce by 2006. As seen in Table 4, medicine and health-related occupations also experienced strong annual growth (3.6% annually), accounting for 6.1% of the workforce by 2006.

The primary, business, finance and clerical, and sales and service sectors all maintained their share of the workforce between 1971 and 2006, at 2.8%, 18.8%, and 23% respectively.

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	10,000	38,210	54,150	54,965	58,665	48,665	5.2%
Professional	22,650	44,595	62,070	91,725	107,580	84,930	4.6%
Medicine & health related	10,630	16,875	25,270	29,610	37,030	26,400	3.6%
Business, finance & clerical	41,150	79,695	89,545	96,585	113,775	72,625	2.9%
Sales & service	50,690	78,545	114,205	129,575	141,250	90,560	3.0%
Primary	6,205	8,520	13,615	14,840	16,905	10,700	2.9%
Processing & machining	22,150	38,825	41,190	19,370	18,615	(3,535)	-0.5%
Constr., trades, & transport equip. operators	55,540	66,625	67,635	90,110	112,700	57,160	2.0%
Total	**219,015**	**371,890**	**467,680**	**526,780**	**606,520**	**387,505**	**3.0%**

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

Emerging Knowledge Economy
Edmonton

Figure 5 provides additional perspective on how the occupational composition of Edmonton has changed over time. In aggregate, the composition of Edmonton's regional workforce has changed very slowly. The overall share of employment in service-oriented jobs has declined moderately at the same time that a mirror increase in knowledge-based occupations can been seen. Nonetheless, service-oriented occupations have consistently accounted for the highest proportion of employment in Edmonton, peaking at 46% in 1989. By 2010, service-oriented work had declined moderately to account for 42% of employment.

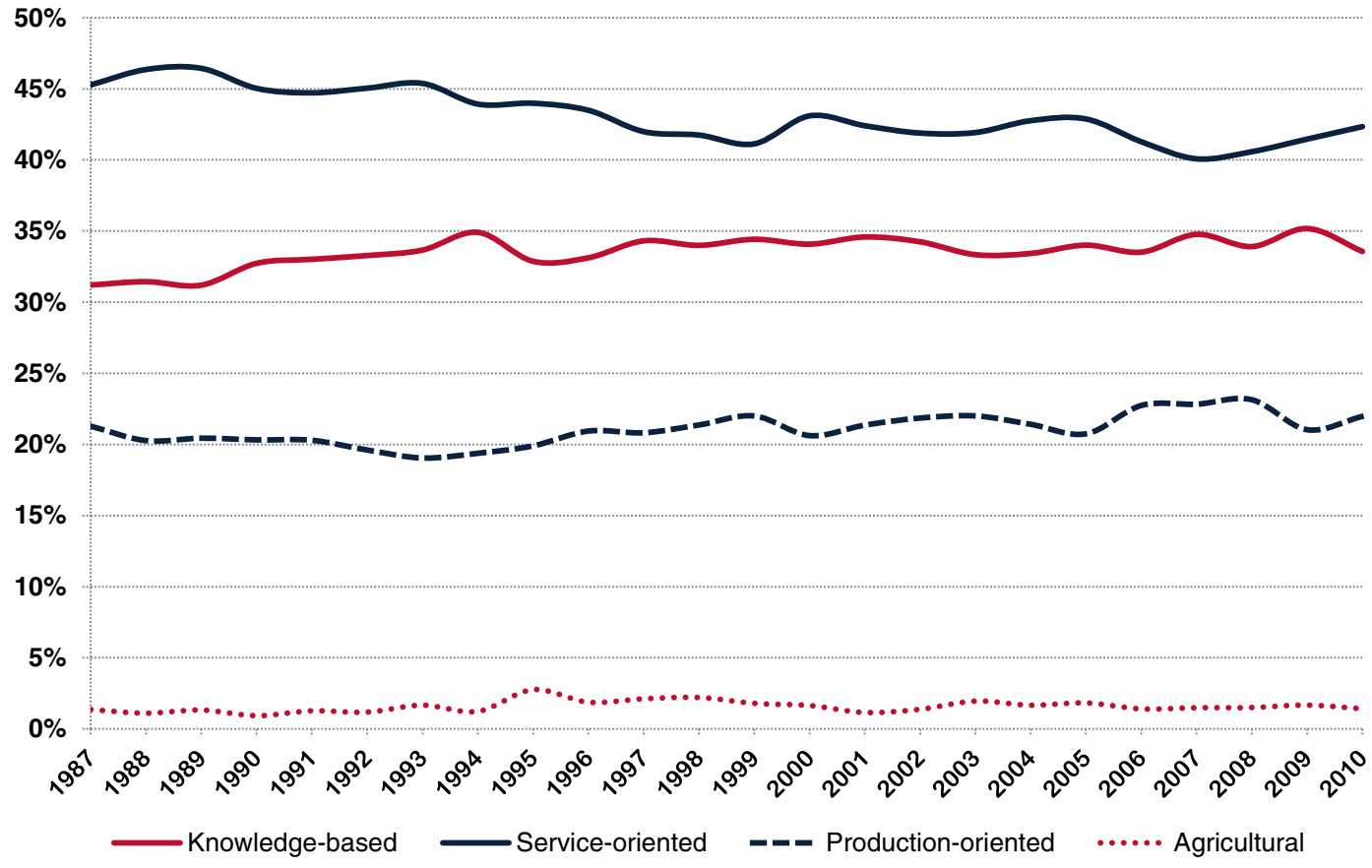
As Table 5 shows, employment in knowledge-based occupations increased at 2.4% per year between 1991 and 2006, moderately outpacing the region's overall employment growth rate of 1.7% per year. Also noteworthy is the steady proportion of employment accounted for by routine, production-oriented work. Not 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	10,705	144,230	213,140	100,185	**473,495**
1996	10,565	138,865	217,080	95,965	**472,800**
2001	10,510	177,110	225,320	113,815	**532,375**
2006	11,045	204,805	253,510	137,175	**611,245**
1991-2006	340	60,575	40,370	36,990	**137,750**
CAGR	0.2%	2.4%	1.2%	2.1%	**1.7%**

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]