Changing Industrial Structure
Winnipeg

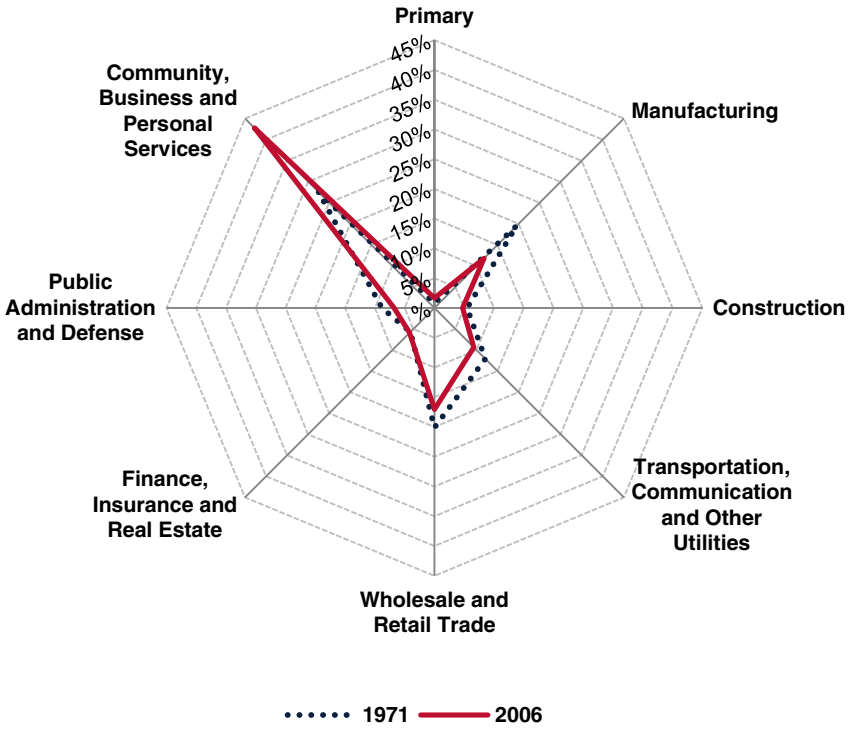
Since 1971, Winnipeg's economy has undergone a considerable transformation. Figure 1 shows how Winnipeg's regional industrial composition has changed in the past 25 to 30 years. Most notably, the Winnipeg economy has become even more dominated by service-based industries. Employment in service-based industries increased from 27.5% in 1971 to 42.7% in 2006. By contrast, while manufacturing industries accounted for 19.6% of the Winnipeg industrial structure in 1971, by 2006, the share of employment in manufacturing industries was only 11.8%.

Moderate decline in employment share was also experienced in several other sectors. Wholesale and retail trade saw its share of employment decrease from 20.1% to 17% between 1971 and 2006, while transportation, communication and other utilities similarly declined from 12.1% to 9.4% in the same period. Public administration and defense, and the construction sector also declined, from 8.8% to 6.8%, and 5.5% to 4.8% between 1971 and 2006, respectively.

The FIRE sector experienced relative stability, with its share of the economy remaining around 5% through the period.

Primary industries experienced strong annual employment growth (3.6% 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	1,815	3,520	4,770	5,785	6,312	4,497	3.6%
Manufacturing	44,425	52,515	46,575	50,272	44,733	308	0.0%
Construction	12,445	14,820	18,370	15,537	18,024	5,579	1.1%
Transp., Comm. & Other Utilities	27,490	36,595	35,865	35,607	35,420	7,930	0.7%
Wholesale & Retail Trade	45,650	58,480	61,025	61,312	64,528	18,878	1.0%
Finance, Insurance & Real Estate	12,865	19,260	22,650	20,486	22,226	9,361	1.6%
Public Administration & Defense	19,975	27,845	30,655	25,374	25,552	5,577	0.7%
Community, Business & Personal Services	62,560	94,190	127,025	148,829	161,724	99,164	2.8%
Total	**227,225**	**307,225**	**346,935**	**363,202**	**378,519**	**151,294**	**1.5%**

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
Winnipeg

Figure 2 compares employment in the manufacturing industries to the overall employed labour force in Winnipeg 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 the manufacturing industries has mirrored broader employment trends in Winnipeg until the early 2000s.

After a downturn in the early 1990s, manufacturing employment increased through the mid-1990s and early-2000s. Manufacturing employment peaked in 2002 and subsequently entered into a period of decline, dipping below 1987 levels beginning in 2009.

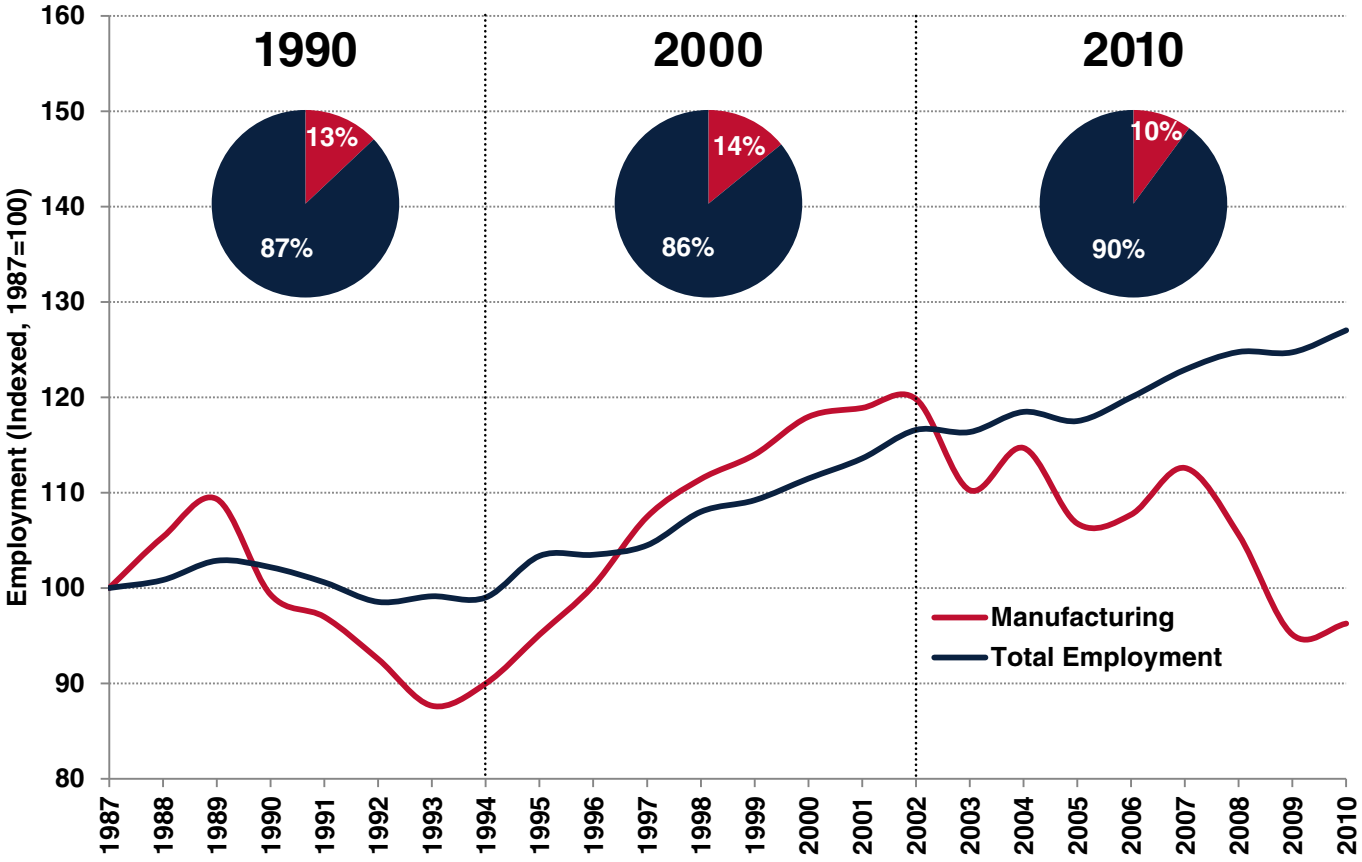
Given the diversification outside of manufacturing, a more detailed examination of the regional economy is warranted. Table 2 shows employment in eighteen industrial groups in 2001 and 2006. While there are high levels of employment and growth in the agriculture, food, and ICT services industries, growth 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	12,685	13,485
Mining	8,015	7,910
Oil and Gas	1,420	1,055
Wood & Wood Products	3,155	2,895
Maritime	885	935
Textiles & Apparel	5,895	3,420
Food	7,755	9,025
Steel	6,750	7,080
Automotive	7,490	7,745
Plastics & Rubber	9,255	9,005
Biomedical	3,390	3,465
ICT Manufacturing	3,475	3,315
ICT Services	14,610	18,425
Finance	20,285	26,265
Business Services	29,220	34,935
Creative & Cultural	9,180	13,515
Higher Education	9,385	13,245
Logistics	18,555	18,555

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
Winnipeg

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

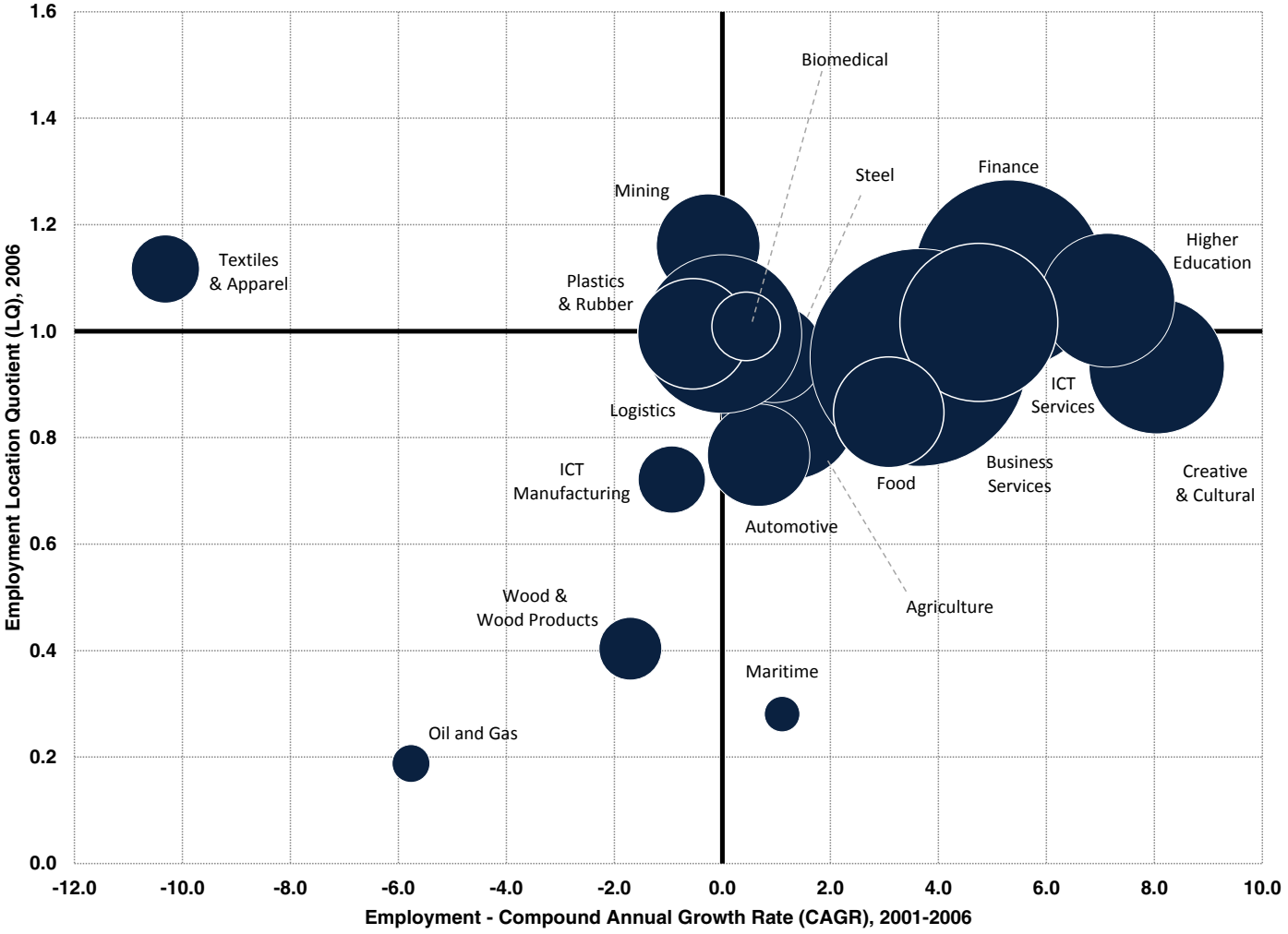
A more sophisticated analysis of industrial structure involves cluster analysis. Clusters represent groups of inter-related firms and industries that gain competitive advantage by concentrating geographically in certain locations. In this report, industrial groups that meet a set of quantitative criteria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

While the Winnipeg economy has demonstrated many specializations (as shown by the small number of industry groups with location quotients substantially higher than 1) there are a number of knowledge-based industry groups that have high employment and grew between 2001 and 2006, including finance, ICT services and higher education.

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
Winnipeg

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

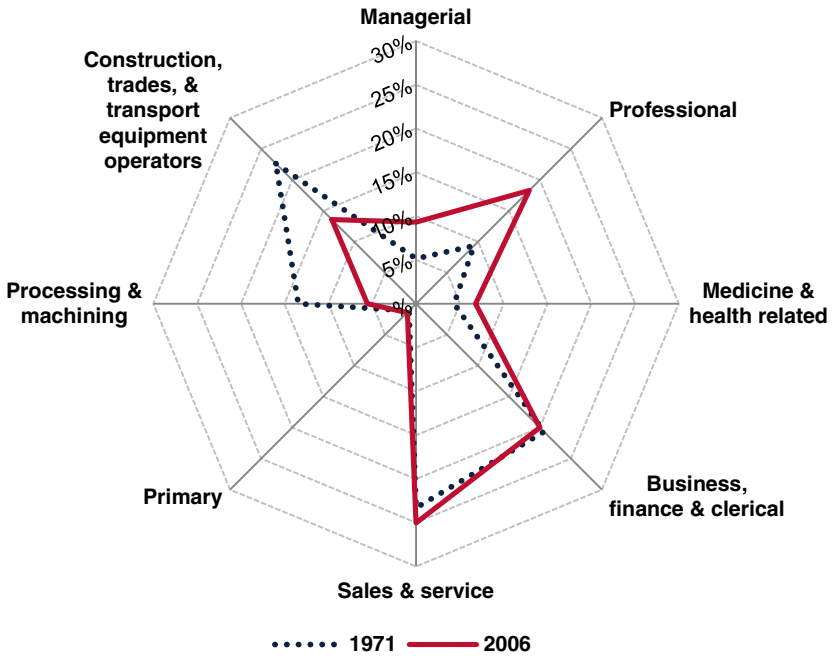
Most notably, the proportion of employment accounted for by construction, trades and other related occupations decreased from 22.6% of the workforce in 1971 to 13.6% in 2006. Similarly, employment in processing and machining occupations decreased from 13.4% to 5.6% in the same time period.

By contrast, the share of employment in professional occupations more than doubled from 9.3% to 18.3% between 1971 and 2006. Managerial occupations similarly increased in share, increasing from 5.1% to 9.3% of the workforce between 1971 and 2006. As seen in Table 4, medicine and health-related occupations saw relatively strong annual growth (2.6% annually), accounting for 6.8% of the workforce by 2006.

Modest gains were experienced in sales and service occupations, growing from 23.3% of the workforce in 1971 to 25% by 2006. Business, finance and clerical occupations maintained relative stability, fluctuating around 20% between 1971 and 2006, while primary occupations accounted for approximately 1% of employment in the same period.

Table 4 provides more detail of these changes. It is clear Winnipeg's economy has shifted 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	12,495	28,540	37,420	34,480	35,480	22,985	3.0%
Professional	22,700	34,900	44,940	60,270	69,595	46,895	3.3%
Medicine & health related	10,580	16,070	20,980	23,955	25,885	15,305	2.6%
Business, finance & clerical	50,170	67,840	70,385	73,890	76,155	25,985	1.2%
Sales & service	56,570	69,740	83,615	90,015	95,175	38,605	1.5%
Primary	2,750	4,140	5,570	4,685	5,410	2,660	2.0%
Processing & machining	32,670	43,885	38,605	25,240	21,200	-11,470	-1.2%
Constr., trades, & transport equip. operators	54,970	42,095	45,405	49,215	51,715	-3,255	-0.2%
Total	**242,905**	**307,210**	**346,920**	**361,750**	**380,615**	**137,710**	**1.3%**

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

Emerging Knowledge Economy
Winnipeg

Figure 5 provides additional perspective on how the occupational composition of Winnipeg has changed over time. In aggregate, the composition of Winnipeg's regional workforce has changed very slowly. The share of employment in production-oriented jobs has declined at the same time that a mirror increase in knowledge-based occupations can been seen. Service-oriented occupations have consistently accounted for the highest proportion of employment in Winnipeg, peaking at 48% in 1992. By 2010, service-oriented work had declined slightly to account for 46% of employment.

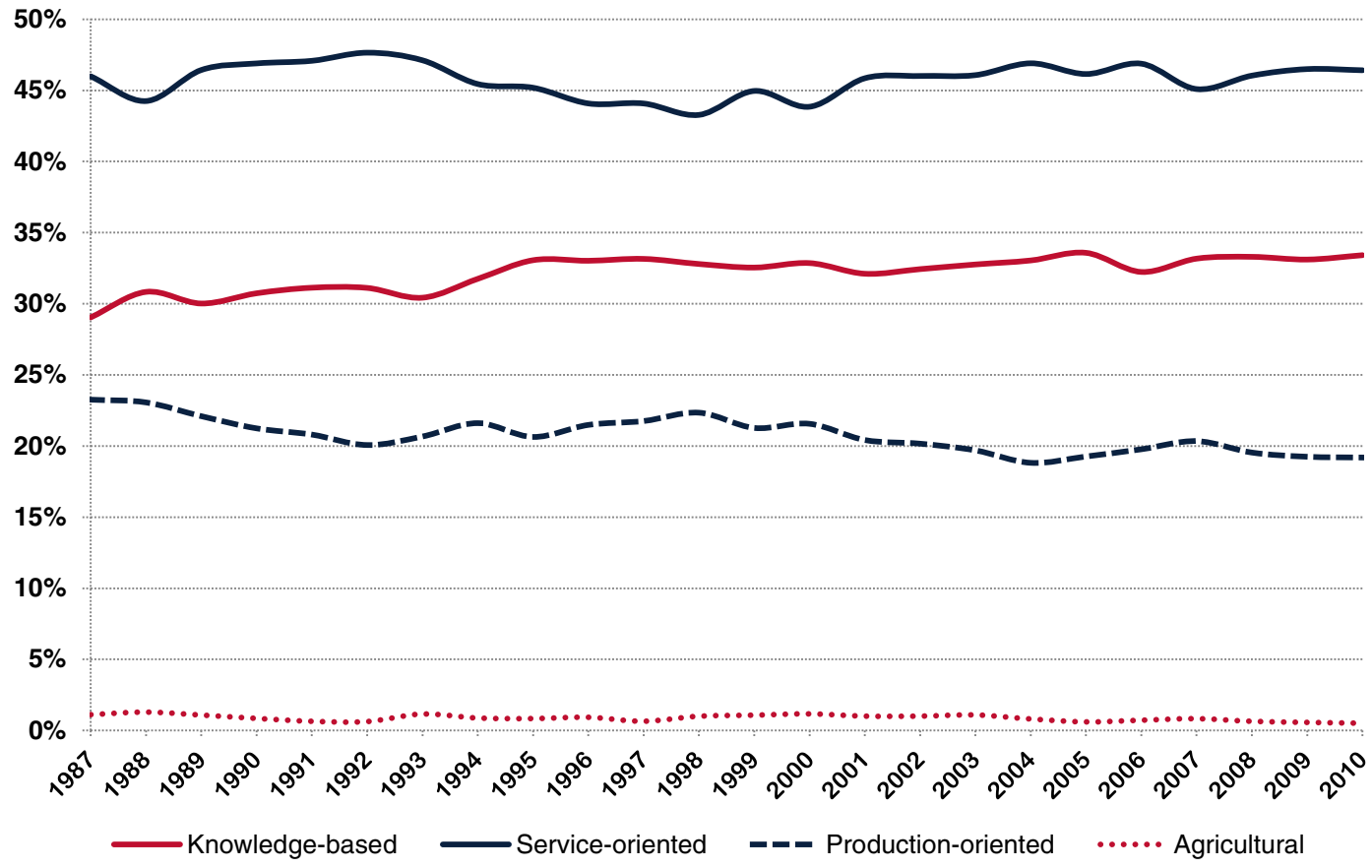
As Table 5 shows, employment in knowledge-based occupations increased at 1.4% per year between 1991 and 2006, outpacing the region's overall employment growth rate of 0.5% per year. Knowledge-based occupations accounted for a higher share of employment, increasing from 29% in 1987 to 33% by 2010. The share of employment in production-oriented jobs declined from 23% to 19% between 1987 and 2010, while agricultural work accounted for only a fraction of total employment throughout the period.

Table 5: Employment by occupation class, 1991-2006

	Agricultural occupations	Knowledge-based	Service-oriented	Production-oriented	Total Workforce
1991	3,865	104,645	164,910	78,145	**356,910**
1996	3,970	101,405	167,900	72,810	**355,500**
2001	3,315	116,610	168,045	76,880	**369,205**
2006	3,200	128,170	174,110	75,120	**385,870**
1991-2006	-665	23,525	9,200	-3,025	**28,960**
CAGR	-1.3%	1.4%	0.4%	-0.3%	**0.5%**

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]