

Business Indicators ♦ August 1998

The High Technology Sector

A growing force in BC's economy

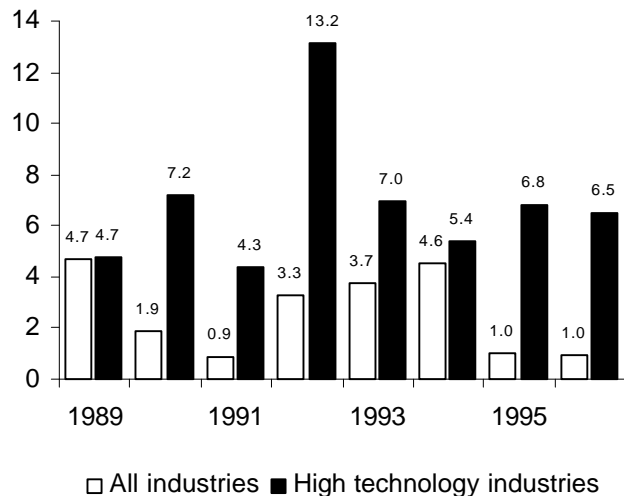
The high technology sector is generally acknowledged to be a strong and growing part of British Columbia's economy. For this reason, planners are looking with increasing interest to high technology industries as a source of future growth and diversity, and also as a source of technology inputs to our more traditional resource industries.

The growing importance of high technology industries in BC has created a need for reliable data for reporting on the contribution that the sector makes to British Columbia's economy. Because the high technology sector can be characterized as an emerging industry, most traditional sources of data do not include it as a standard industry. Instead, BC Stats has compiled the information by aggregating data for selected industries which meet the criteria for inclusion in the high technology sector¹. BC Stats, together with the Information, Science and Technology Agency, has just released the third annual report on the BC High Technology Sector. The report covers the period from 1988 to 1996 (the latest year for which all the data were available at the time the report was produced). For the sake of consistency, the analysis in this paper is based on the information available at the time the report was compiled. The GDP figures quoted were published by Statistics Canada in May of 1997.

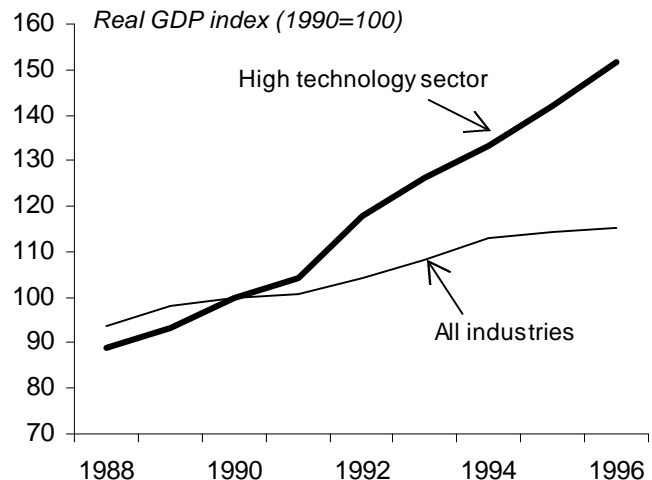
¹ More information on the definitions used by BC Stats are available in "Defining the High Technology/Knowledge Sector in British Columbia", at www.bcstats.gov.bc.ca/data/bus/bus_stat/hi_tech.htm

The sector's GDP continues to grow at rates well above the provincial average

Annual growth rate, real GDP (%)



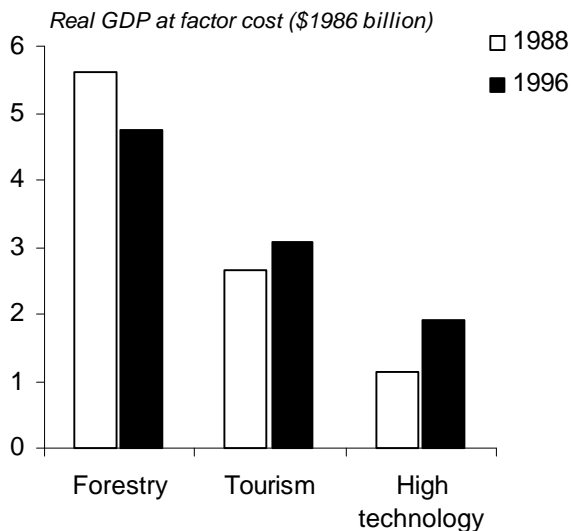
The high technology sector has made significant gains during the 1990s



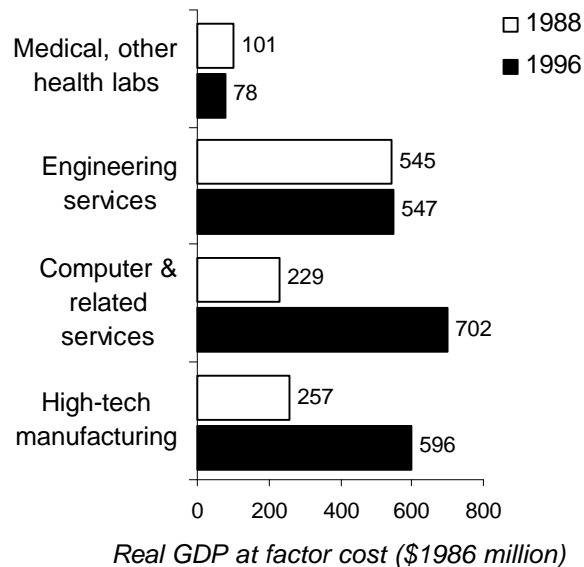
British Columbia's high technology sector has out-paced the provincial economy in every year since 1989. In 1996, the sector's real gross domestic product (GDP) grew 6.5%, compared to a growth rate of 1.0% for all industries. Since 1990, GDP in the high technology sector has increased 51%. During the same period, total GDP growth for all industries has been much more moderate, rising 15%.

The high-tech sector generated \$1.9 billion (1986 dollars) of the \$69.0 billion of the value added (GDP) by all industries to the economy in 1996. Although it is still small compared to other more established industries, BC's high technology sector has been growing faster than other industries. It was almost two-thirds as big as tourism and about four-tenths the size of the forest sector (forestry, wood and paper manufacturing) in 1996. In comparison, the GDP of the province's largest industry (finance, insurance and real estate) was \$14.4 billion in 1996.

GDP in the high-tech sector has increased to just under \$2 billion



The high-tech sector is primarily engaged in the provision of services

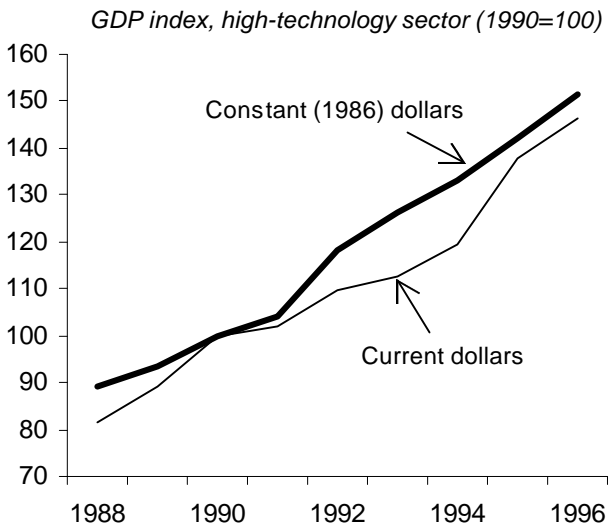


British Columbia's high technology sector is primarily engaged in the provision of services, which account for about two-thirds of its total GDP. The computer and related services industry dominates the sector, producing 36% of its GDP in 1996. Manufacturing (mainly the manufacture of communications and electronic equipment, computers, and other office, store and business machines) is the second largest industry (31%). Engineering, scientific and technical services (28%) also account for a significant share of total GDP in BC's high-tech sector. Four percent of the sector's GDP originated in medical and other health laboratories in 1996.

Current dollar GDP growth in the high-tech sector has also exceeded the provincial average

In 1996, the high technology sector's current dollar (unadjusted for inflation) GDP rose 6.2%, while the economy grew 1.6% overall. As illustrated in the figure on the following page, current dollar GDP growth in the high technology sector has been somewhat slower

Current dollar GDP growth shows the effect of declining prices in some high-tech industries



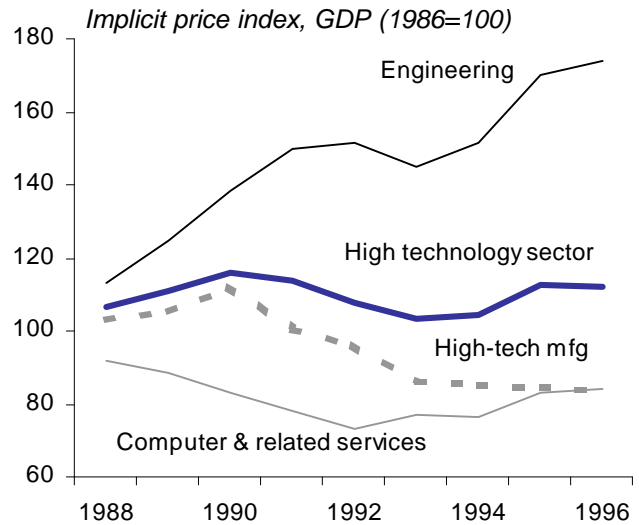
than constant dollar growth during the 1990s. This indicates that the industry has been expanding its output even though the prices of its products have not increased significantly.

The GDP implicit price index (IPI) is a composite measure of the overall effect of changes in the value of an industry's output and changes in the cost of inputs used in production. The IPI for the high technology sector has been fairly stable during the 1990s, but was slightly lower in 1996 than at the beginning of the decade. However, the index for high-tech manufacturing has declined significantly. This may not be surprising, as the phenomenon of falling prices for computer products and office machines, which make up a significant portion of the output of high-tech manufacturing, is well known. The computer and related services industry has also experienced some price deflation during the 1990s, but prices have rebounded in recent years and were marginally higher in 1996 than in 1990.

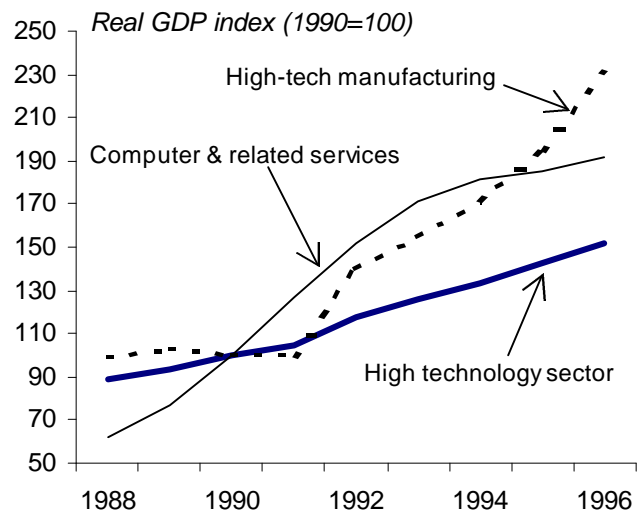
Despite declining prices, the high technology sector's very strong growth during the 1990s is largely due to the rapid expansion of the

manufacturing and computer services industries. The IPIs for other industries in the sector, such as engineering services and medical and health laboratories, have increased at rates above the provincial average during the period since 1990.

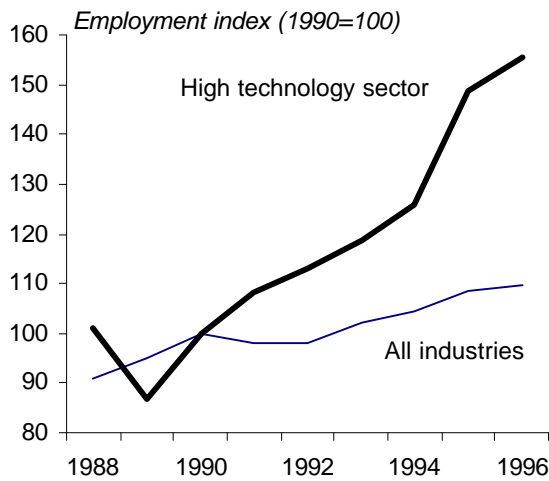
Prices have fallen in high-tech manufacturing and in the computer and related services industry...



...but these industries have experienced the strongest GDP growth in the high technology sector



Employment in high-tech industries has risen 50% since the beginning of the decade



Almost 42,000 British Columbians are employed in the high technology sector

In 1996, there were 41,850 BC residents employed in high technology industries, making up about 3% of BC's workforce². Employment in high technology industries increased 5% between 1995 and 1996. During the same period, total employment in the province rose 1%. Most of the employment growth was in the high-tech service industries, which grew 4% (+1,300) to 33,820 in 1996. Between 1988 and 1995 employment growth in the high-tech sector averaged 5% annually, compared to 2% for the BC workforce as a whole.

Engineering services was the biggest high-tech employer in 1996, accounting for more than a third (15,600, or 37%) of the sector's workforce. Another 11,210 people were

² The employment estimates quoted here come from the Survey of Employers, Earnings and Hours. Total employment estimates from this survey do not include workers in agriculture and fishing, or those who are self-employed.

employed in the computer and related services industry, while scientific and technical services (4,110) and medical and other health laboratories (2,900) employed relatively fewer people than the other major high-tech industries.

High-tech manufacturing employed 8,030 people in 1996. More than half (4,530) of the manufacturing jobs were in industries producing communication and other electronic equipment, or office, store and business machines. There is strong evidence of a productivity increase between 1990 and 1996 in the high-tech manufacturing sector. While total employment grew 15%, the sector's real GDP more than doubled, increasing from \$260 to \$596 million. Such an increase is usually the result of capital investment or changes in labour productivity. However, while productivity has improved in high-tech manufacturing, the situation is not the same for the economy as a whole, where large employment increases have not resulted in similar increases in output.

High-tech workers earned \$1.9 billion in 1996

BC workers employed in high-tech industries earned \$1.9 billion in 1996, up from \$1.8 billion in the previous year. Of this total, \$1.6 billion originated in high-tech service industries. Despite a 2% decline (to \$790 million), engineering services remained the largest source of wages and salaries in the sector, accounting for 41% of the total in 1996. This was significantly more than in computer and related services (\$482 million). However, some of this gap can be explained by the fact that engineering services is the largest employer in the high-tech sector. Workers in the engineering services industry earned an average salary³ of about \$51,000, compared to \$43,000 for those in the computer services

³ This does not account for differences in hours worked by full-time and part-time workers.

sector. The average wage of all high-tech workers was \$46,000 in 1996.

Revenues in the high-tech sector reached \$4.4 billion in 1996

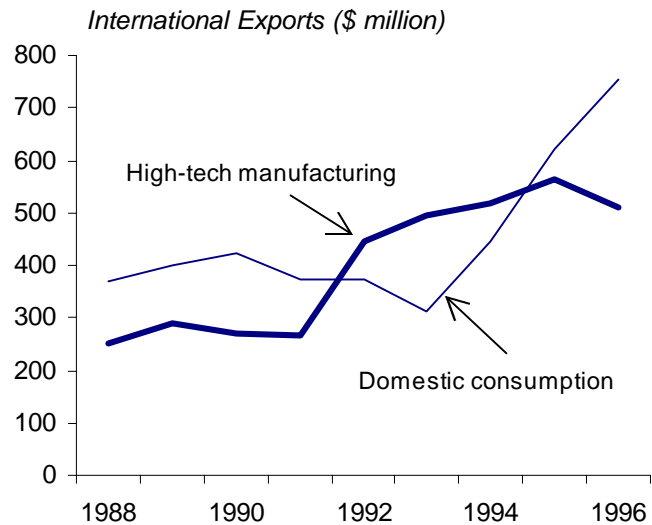
Three service industries earned two-thirds of the \$4.4 billion in revenue generated by the high-tech sector in 1996. Computer and related services (\$1.2 billion) led the way, followed by engineering services (\$1.1 billion) and scientific and technical services (\$571 million). High-tech manufacturers earned revenues of \$1.3 billion in 1996. More than half of the earnings in this industry were generated by office, store and business machinery manufacturers (\$373 million) and manufacturers of communications and other electronic equipment (\$369 million).

Exports

High technology service industries exported \$346 million in services in 1995 (the latest year for which estimates are available). Exports of computer and related services were valued at \$208 million, or 18% of the industry's total revenue. Engineering services was less reliant on exports, earning only 12% (\$138 million) of its revenue from international sales.

There was good news and not quite as good news for international trade and the high-tech manufacturing sector in 1996. While total shipments rose 7% to \$1.3 billion, exports slipped 9% to \$512 million. This represented the lowest export to shipment ratio in six years, reflecting a progressive increase in the domestic consumption of BC high-tech manufactured goods. By comparison, shipments by all BC manufacturers fell 3.2% in 1996.

International exports by high-tech manufacturers in BC were valued at half a billion dollars in 1996



High-tech trade with the US dipped 13% in 1996. Total exports to the US represented 68% (\$349 million) of all high-tech exports. The decline in exports to the US was the first in six years, and was largely due to an 18% drop in exports of computer and telecommunications products. Partially offsetting this was an increase in US purchases of computer integrated manufacturing (+19%). The US continues to be the province's dominant high-tech trading partner.

Growth in exports to the Pacific Rim continued in 1996. Total exports were \$110 million, up 9% from 1995. An increase in exports to China played a large role in offsetting decreases in exports to Japan and Hong Kong. Computer and telecommunication technology exports to the Pacific Rim grew increased 26% in 1996.

Most high technology establishments are located in Southwestern BC

There were 5,728 establishments operating in the high technology sector in 1996, a net increase of 612 establishments from 1995. High technology accounted for 4% of all BC establishments (149,315) in 1996. There were more than three service industry establishments for every high-tech manufacturing establishment in the province. The engineering services (1,683) and computer and related services (1,620) industries had the largest number of establishments.

Over 90% of all high-tech establishments were located in the Mainland/Southwest, Vancouver Island/Coast, and Thompson/Okanagan regions in 1996. This concentration was even more pronounced at the regional district level. The Greater Vancouver Regional District accounted for 62% of all high-tech establishments. The next largest was the Capital Regional District (10%) and Central Okanagan (4%). Only 8% of all high-tech establishments were located in other regions of British Columbia .

Note to readers:

The complete report, "The British Columbia High Technology Sector, 1988-96" is now available on our web site.