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## **BUSINESS INDICATORS**

**April, 1996**

### **The British Columbia High Technology Sector, 1984-94**

#### **INTRODUCTION**

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

The need for a reliable, consistent tool to measure developments in the high technology sector of British Columbia's economy has become apparent during the last few years. However, past efforts to develop a mechanism for monitoring the high technology sector have been hampered by definitional challenges. Unlike other industries, such as clothing or footwear, for instance, the high technology sector cannot be sharply defined only by examining the commodities or services it provides.

Many jurisdictions and researchers are grappling with this problem, with the result that there is an abundance of high technology definitions. Some define high technology in terms of commodity

inputs, others look at outputs, still others consider the skills of employees or expenditures on research and development.

The figures reported in this article are based on a high technology definition developed by pulling together the results of several other studies, by consulting with British Columbia high technology experts, and with lengthy testing of the selected industries against common perceptions as well as existing databases of high technology companies. This resulted in the designation of a group of 24 standard industries to represent the high technology sector in British Columbia.

Using this definition, we have developed estimates of high technology gross domestic product, revenues, employment, wages and salaries, geography and exports. In addition, the forward and backward linkages of the high technology sector to the rest of the provincial economy have been explored through Input/Output analysis.

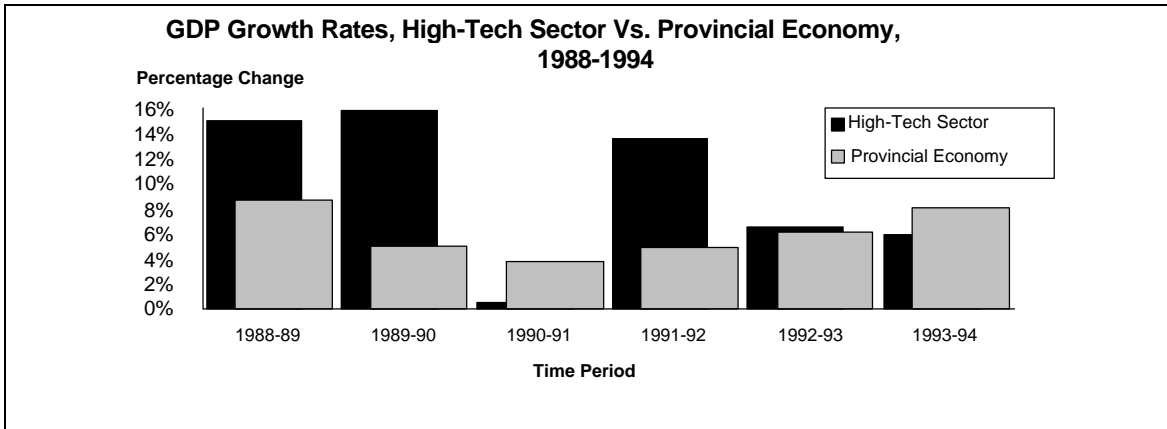
Some of the results of this work are reported here. For a complete review of the definitions, methodologies, and results, readers are invited to visit the BC Stats home page, at <http://www.bcstats.gov.bc.ca>. In the Business/Economics section, under the heading "High Technology Sector" will be found the papers:

- P Defining the High Technology/ Knowledge Sector in B.C.*
- P The British Columbia High Technology Sector, 1988-1994*
- P The British Columbia High Technology Sector, Input/Output Analysis*

## HIGHLIGHTS

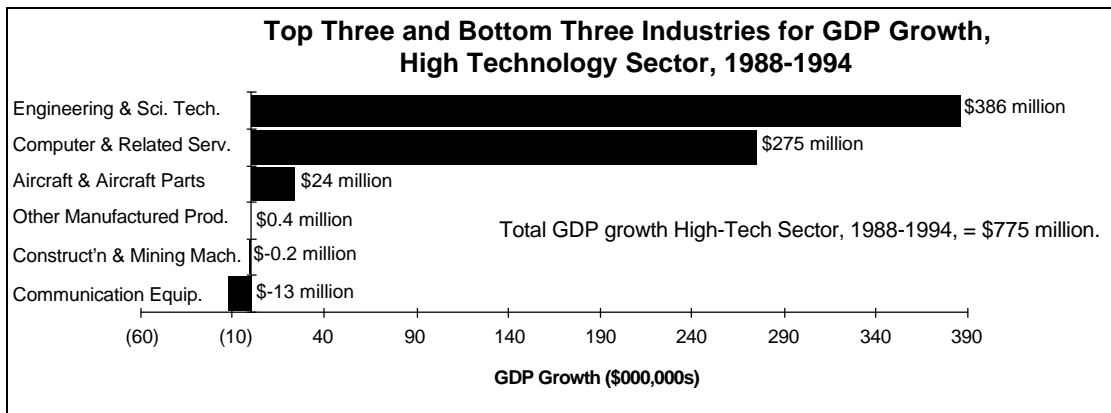
- In 1994, the high technology sector in British Columbia employed just under 35,000 people, up 27% from 1988. Despite impressive employment growth, the high technology sector accounted for just 2% of the province's overall 1994 employment.
- Seventy-eight percent of employees in the high technology sector provide services, such as engineering and computer consulting; the remainder work in the manufacturing sector.
- High technology sector revenues more than doubled between 1988 and 1994, increasing from \$2.0 to \$4.1 billion.
- GDP in the high technology sector is \$1.9 billion, representing an average annual growth rate of 12% between 1988 and 1994.
- High technology industries in B.C. are in the early stages of development. Consequently, they show both rapid growth and rapid decline from year -to-year.
- Geographically, the high technology sector is very concentrated -- almost two-thirds of establishments in the high technology sector are located in Greater Vancouver.
- Fifty-nine percent of high technology commodities produced by the high technology sector in British Columbia are destined for international export markets.
- The biggest export market for British Columbia produced high-tech goods is the United States, receiving 72% of B.C.'s 1994 high technology exports.
- British Columbia's high technology exports are diversifying, as electronic components, and new materials, such as optical fibres, join computer and telecommunication equipment, aerospace, and computer integrated manufacturing equipment as key export commodities.
- The total impacts on GDP and employment of increasing output in the high technology sector exceed those of most other sectors.
- One third of commodities used by the high technology sector are imported, however less than half of these imports embody high technology.

## Profile and Trends



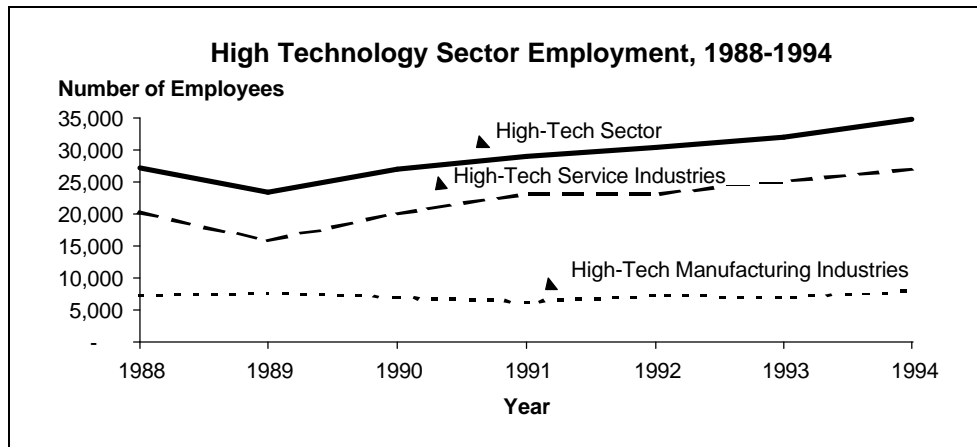
Between 1988 and 1994, the GDP of the high technology sector grew at an average annual rate of 12%, compared with 7% for the total provincial economy. The margin was greatest between 1988 and 1992, when the average annual rate of high technology GDP growth out-

paced that of the overall economy by 7 percentage points. As a result of this growth, the GDP of the high technology sector increased as a percentage of overall economy GDP from 1.8% to 2.1%.



The high technology sector added \$775 million to its GDP between 1988 and 1994. Half of this growth is attributable to two industries: Offices of Engineers, and Other Scientific and Technical Services. The Computer and Related Services Industry added \$275 million to its GDP over the period, and accounted for 36% of overall GDP growth in the high-tech sector.

The Aircraft and Aircraft Parts Industry also added an impressive \$24 million to its GDP. Industries showing slower GDP growth or a loss over the period include, Other Manufacturing, Construction, Mining Machinery and Materials Handling Equipment and, finally, Communication and Other Electronic Equipment.

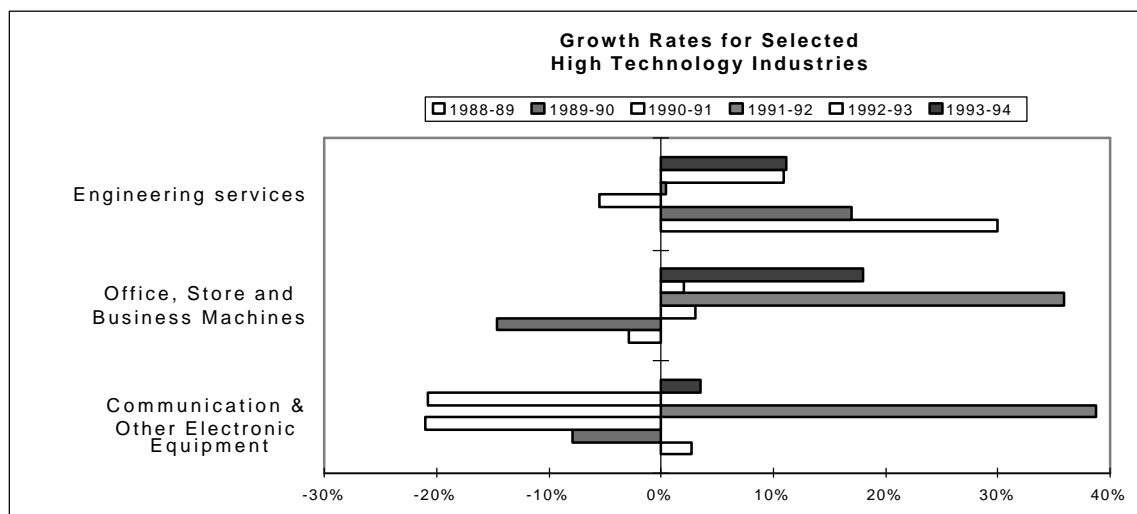


In 1994, the high technology sector in British Columbia employed close to 35,000 workers, about 2% of total B.C. employment. Just over three-quarters of these employees provided high-tech services, such as computer consulting, engineering or other scientific and technical services. The remainder were employed by high-tech manufacturing industries, such as electronics, aerospace, and telecommunications. Employment growth was fueled by the service industries; between 1988-1994, they provided 91% of total employment growth. As a result, the service

industries increased as a percentage of total high-tech employment from 74% in 1988 to 78% in 1994.

As the charts above illustrate, the growth of high technology GDP and employment has not been uniform across component industries or over time.

In fact, even specific industries appear to have annual periods of boom and bust. The chart below illustrates some of the more marked variations over the study period.



Further study of the dynamics of the high technology industries will be required to assist the high technology sector in achieving steady growth. Plans for this work, and for the development of other indicators and

benchmarks for high technology are being developed in conjunction with the Ministry of Employment and Investment. We hope to report further results within the coming year.