

## Establishing the Relationship Between Technology, Economic Growth and Employment

The relationship between R&D efforts, economic growth and employment is generally accepted as a positive one.

This Appendix presents MOSST data and conclusions on the benefits of R&D to employment and real output. It also summarizes some important new Organization for Economic Cooperation and Development (OECD) findings on R&D and output, as well as giving some brief comments on the conclusions.

### 1. PERFORMANCE OF CANADIAN MANUFACTURING INDUSTRIES BY LEVELS OF RESEARCH INTENSITY

Research and development is defined as investigative work carried out to acquire new scientific and technological knowledge, to devise and develop new products and processes, or to apply newly acquired knowledge in making technically significant improvements to existing products or processes. Some years ago (1978) the Ministry of State for Science and Technology endeavoured to classify industries according to levels of research intensity. This classification was based on parameters such as R&D expenditures against percentage of output value-added, an index of number of R&D personnel engaged, etc. High research-intensive industries included such sectors as machinery industries, electrical products, petroleum products and chemicals. Medium research industries were represented by paper and allied products, primary metals and transportation equipment. By contrast, low research-intensive industries included food and tobacco, textiles, wood industry, furniture, etc. Other industries were classified as performing no research such as knitting mills, leather industries, clothing industries, and printing. High research-intensive and medium research-intensive industries accounted for over 88 percent of total intramural R&D performed by Canadian manufacturing and for 87 percent of the total personnel engaged in R&D.

### AVERAGE ANNUAL RATES OF GROWTH 1961-1974 (PERCENT)

	Employ- ment	Real <sup>1</sup> Output	Productivity <sup>2</sup>	Prices <sup>3</sup>
High Research-intensive Industries	2.42	6.41	4.49	1.39
Medium Research- Intensive Industries	2.75	5.50	3.95	1.54
Low Research-Intensive Industries	1.81	5.19	3.47	3.13
No Research Industries	0.73	3.85	3.14	3.25
Total Manufacturing	1.87	5.79	3.82	2.37

<sup>1</sup> 1971 Dollars

<sup>2</sup> Real Output Per Person

<sup>3</sup> Value-added implicit price index

Source: Based on data from Statistics Canada

<sup>1</sup> Performance of Canadian Manufacturing Industries by Levels of Research Activity, MOSST Background Paper No. 4, Ottawa, 1978