

SCIENCE AND TECHNOLOGY DATA

2002



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SCIENCE AND TECHNOLOGY DATA — 2002

Innovation Policy Branch

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ACRONYMS AND ABBREVIATIONS

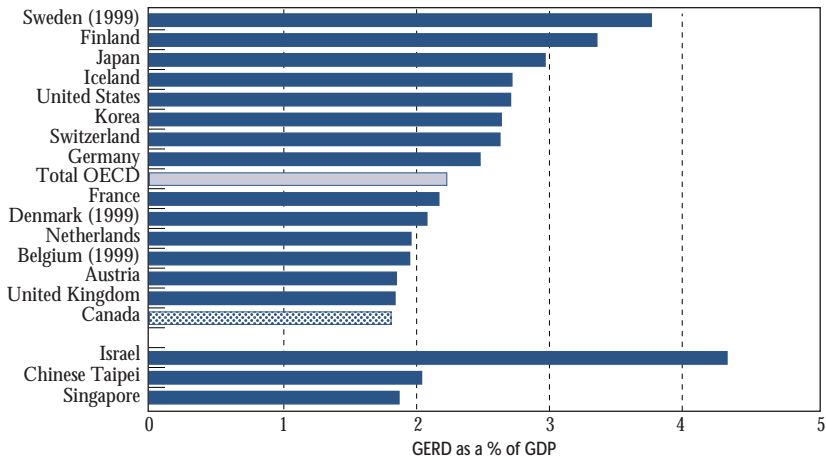
AAFC	Agriculture and Agri-Food Canada
ARC	Australian Research Council
BERD	Business enterprise expenditure on research and development
CAUBO	Canadian Association of University Business Officers
CFI	Canada Foundation for Innovation
CIHR	Canadian Institutes of Health Research
CIDA	Canadian International Development Agency
CSA	Canadian Space Agency
CSIRO	Commonwealth Scientific and Industrial Research Organisation
EC	Environment Canada
FTE	Full-time equivalent
GDP	Gross domestic product
GERD	Gross domestic expenditure on research and development
HERD	Higher education expenditure on research and development
ISI, NSIOD	Institute for Scientific Information, National Science Indicators Database
NHMRC	National Health and Medical Research Council
NRCan	Natural Resources Canada
NSE	Natural sciences and engineering

NSERC	Natural Sciences and Engineering Research Council of Canada
OECD	Organisation for Economic Co-operation and Development
PNP	Private non-profit organization
PRO	Provincial research organization
R&D	Research and development
RSA	Related scientific activities
S&T	Science and technology
SSH	Social sciences and humanities
SSHRC	Social Sciences and Humanities Research Council of Canada

DEFINITIONS

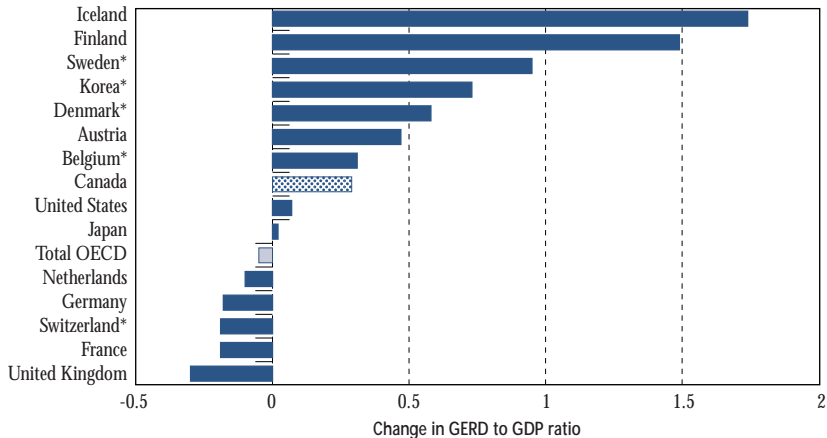
R&D	Research and development is creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of humankind, culture and society, and the use of this stock of knowledge to devise new applications.
S&T	Research and development plus related scientific activities such as scientific data collection, information services, and operation and policy studies.
Triadic patent family	An invention for which a patent application has been filed at the European Patent Office, the Japanese Patent Office and the United States Patent and Trademark Office.

GERD as a Percentage of GDP, Top OECD and Non-OECD Countries, 2000



Source: OECD, *Main Science and Technology Indicators 2002/2*, December 2002.

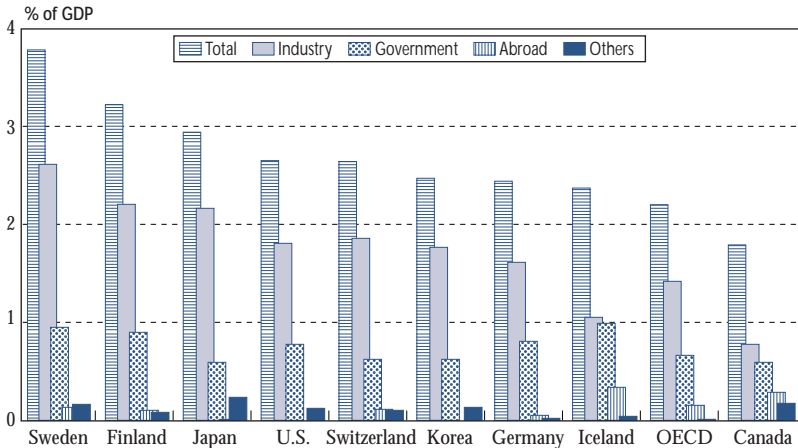
Growth in GERD to GDP Ratio, Top OECD Countries and Canada, 1990 to 2000



*1989 to 1999 for Sweden, Denmark and Belgium; 1989 to 2000 for Switzerland; and 1991 to 2000 for Korea.

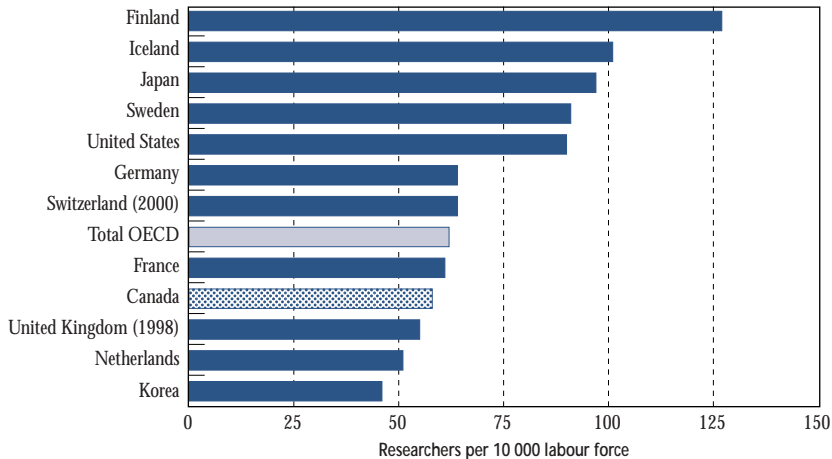
Source: OECD, *Main Science and Technology Indicators 2002/2*, December 2002.

R&D Expenditures by Source of Funds, Top Eight OECD Countries and Canada, 1999



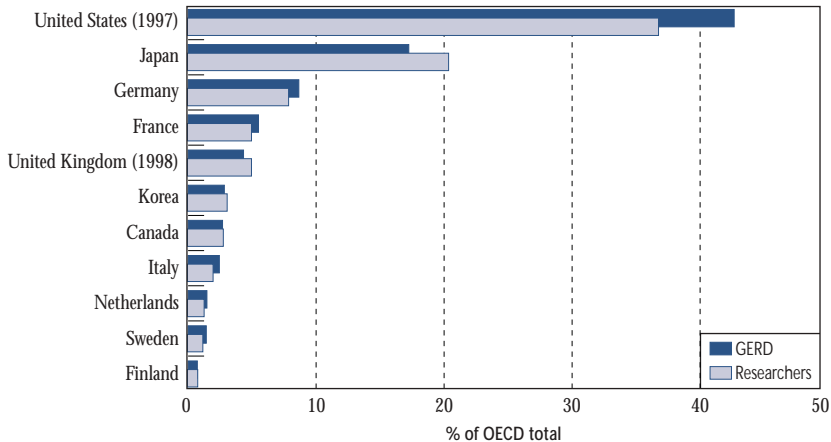
Source: OECD, *Main Science and Technology Indicators 2002/2*, December 2002.

Total Researchers per 10 000 Labour Force, Selected Countries, 1999 or Most Recent Year



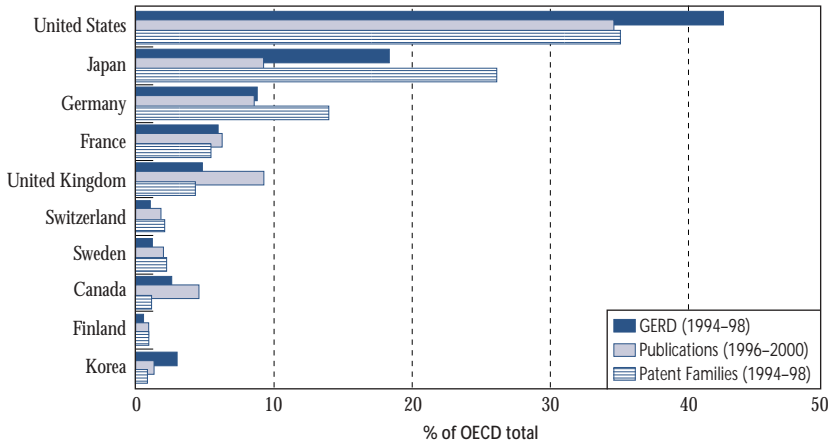
Source: OECD, *Main Science and Technology Indicators 2002/2*, December 2002.

Country Share in Total OECD R&D Expenditures and Researchers, Selected Countries, 1999



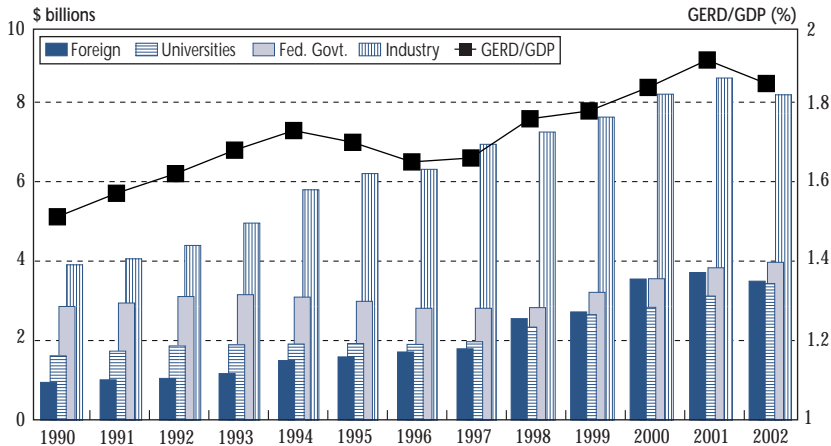
Source: OECD, *OECD Science, Technology and Industry Outlook 2002*, October 2002.

Country Share of the OECD's R&D, Publications and Triadic Patent Families



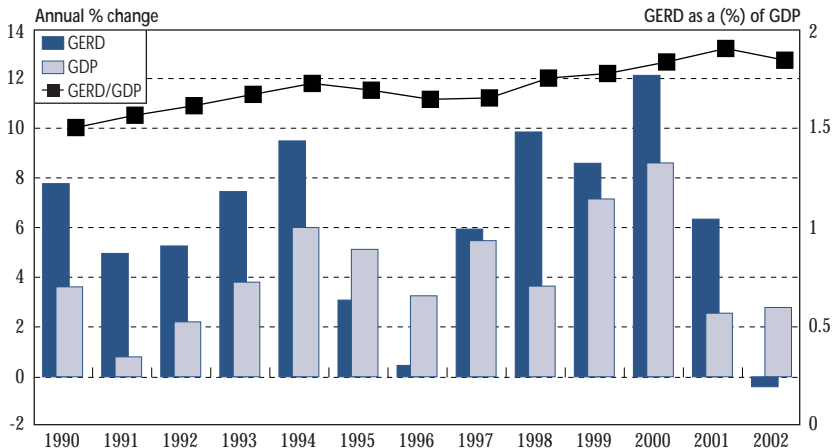
Source: ISI, NSIOD 2000; and OECD, *Main Science and Technology Indicators 2002/2*, December 2002.

Canada's R&D Expenditures by Major Source of Funds, 1990 to 2002



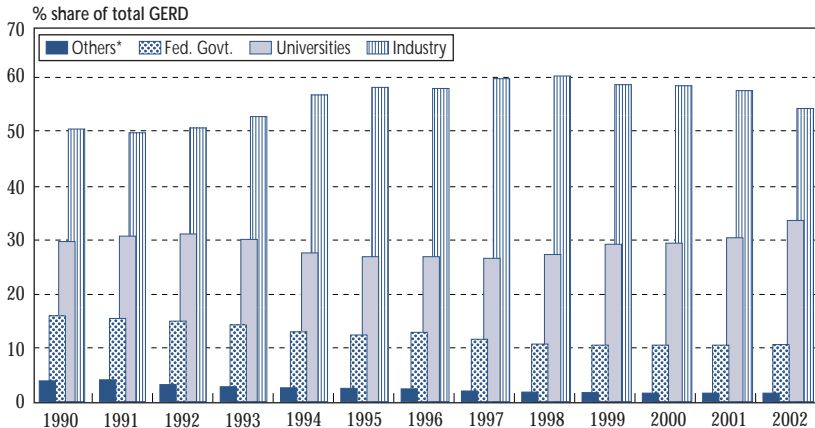
Source: Statistics Canada, *Science Statistics*, Vol. 26, No. 7, November 2002.

Annual Growth in Canada's GERD and GDP, 1990 to 2002



Source: Statistics Canada, *Science Statistics*, Vol. 26, No. 7, November 2002.

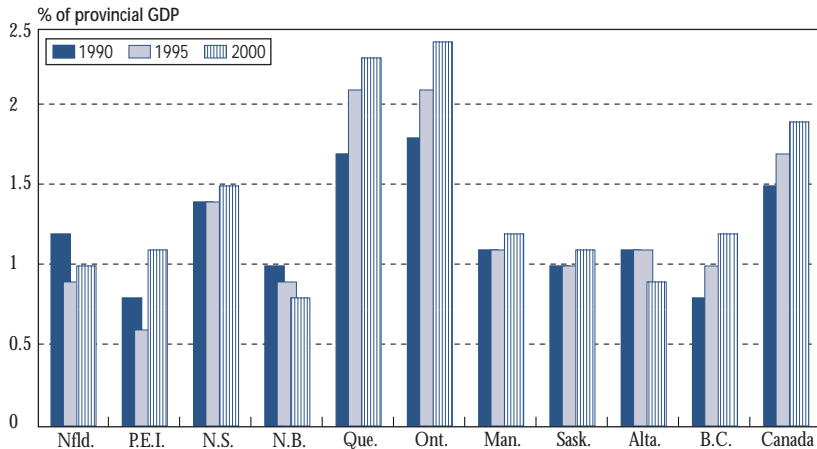
Canada's R&D Expenditures by Major Sector of Performance, 1990 to 2002



*Provincial governments and private non-profit organizations.

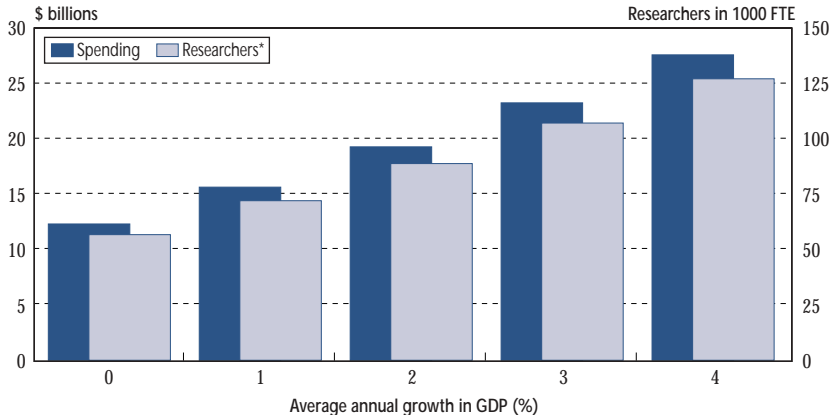
Source: Statistics Canada, *Science Statistics*, Vol. 26, No. 7, November 2002.

R&D Intensity at the Provincial Level, 1990, 1995 and 2000



Source: Statistics Canada, *Science Statistics*, Vol. 26, No. 7, November 2002.

Estimated Increase in Canada's R&D Spending and Researchers Needed to Attain a 3% GERD-to-GDP Target in 2010



*Using the 2000 GERD/researchers ratio for the total OECD.

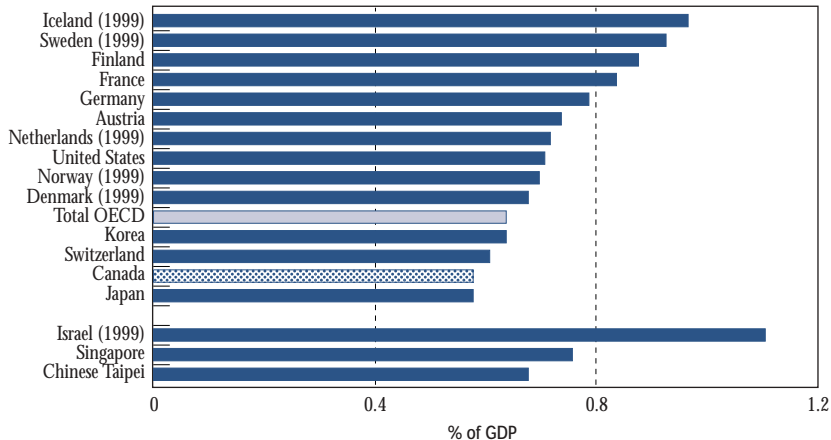
Source: Industry Canada estimate based on Statistics Canada data and the OECD's *Main Science and Technology Indicators 2002/2*, December 2002.

Estimate of Canada's R&D Expenditures by Source of Funds and Performing Sector, 2002

Performers	Source of Funds							Percent by Performer
	Total	Federal Government	Provincial Governments	Business Enterprises	Higher Education	PNPs	Foreign	
	\$ millions							
Total	20 745	3971	1012	8297	3433	536	3496	100
Business Enterprises	11 244	232	42	7541	0	0	3429	54
Higher Education	6942	1564	710	669	3433	506	60	33
Federal Government	2227	2166	4	57	0	0	0	11
Provincial Governments	199	0	199	0	0	0	0	1
PNPs	71	7	21	12	0	30	1	1
PROs	62	2	36	18	0	0	6	0
Percent by Source	100	19	5	40	16	3	17	—

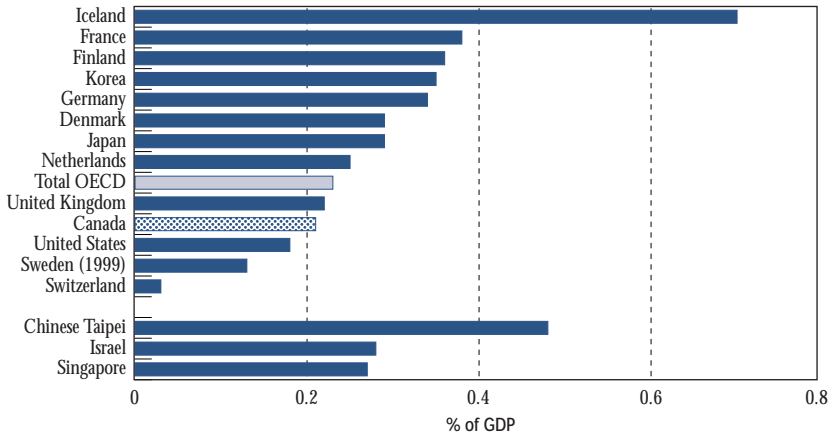
Source: Statistics Canada, Cat. No. 88F0006XIE2002015.

Government-Financed GERD as a Percentage of GDP,
Top OECD and Non-OECD Countries, 2000



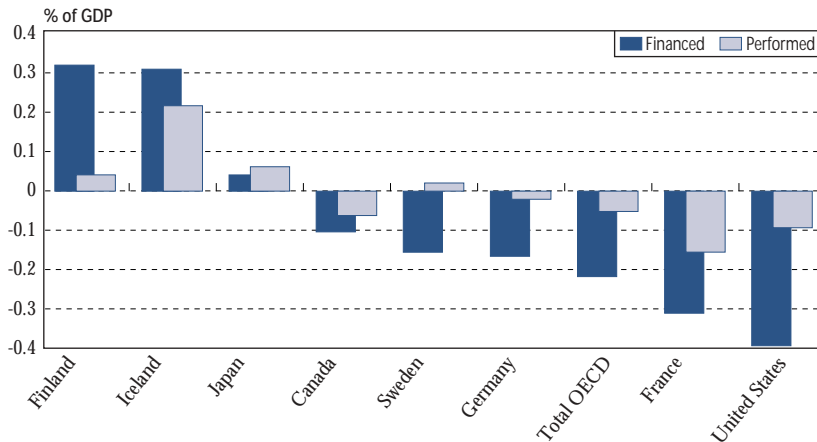
Source: OECD, *Main Science and Technology Indicators 2002/2*, December 2002.

Government-Performed R&D as a Percentage of GDP, Top OECD and Non-OECD Countries, 2000



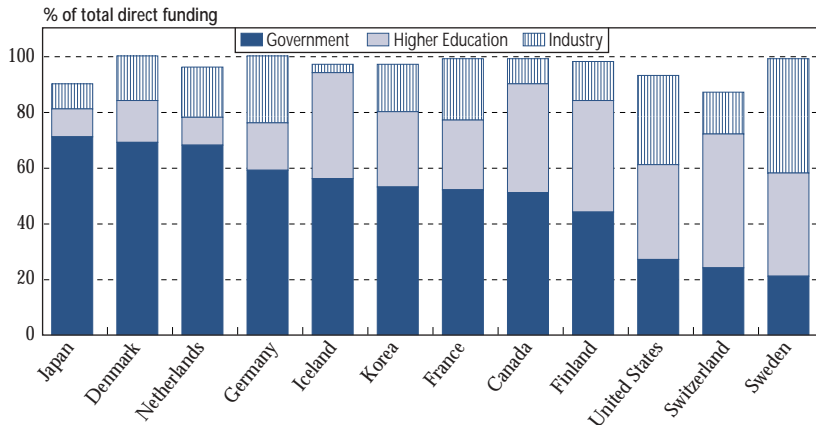
Source: OECD, *Main Science and Technology Indicators 2002/2*, December 2002.

Change in Government-Financed and in Government-Performed R&D, Selected Countries, 1989 to 1999



Source: OECD, *Main Science and Technology Indicators 2002/2*, December 2002.

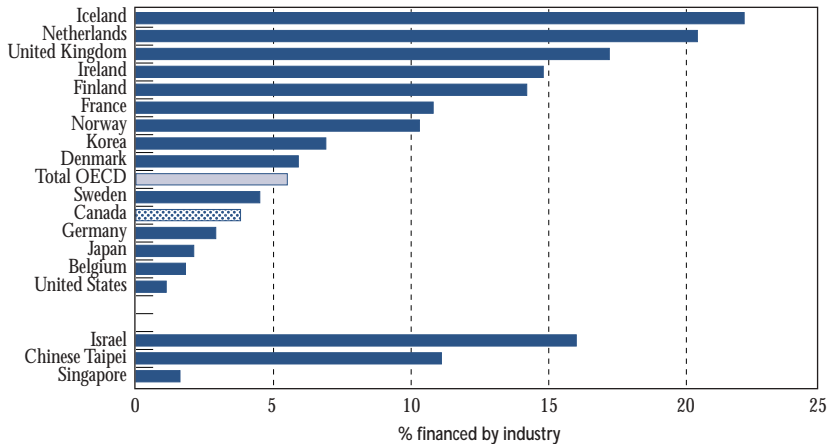
Direct* Government-Financed R&D by Major Sector of Performance, Selected Countries, 1999



*Total government-financed less general university funds.

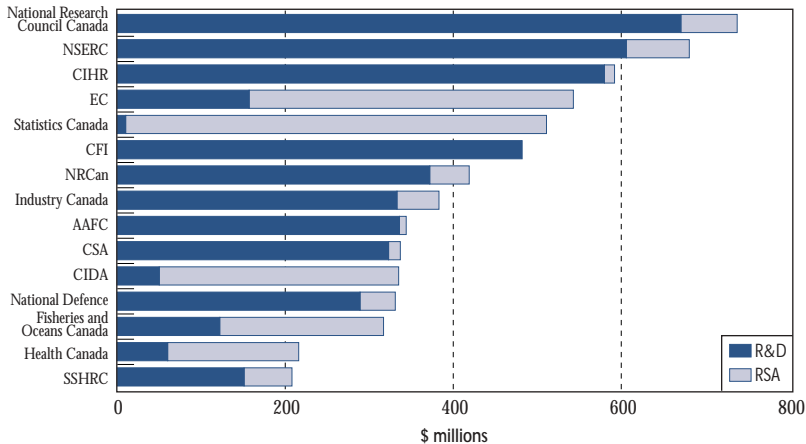
Source: OECD, *Basic Science and Technology Statistics*, 2001 edition, April 2002.

Percentage of Government-Performed R&D Financed by Industry,
Selected Countries, 1999



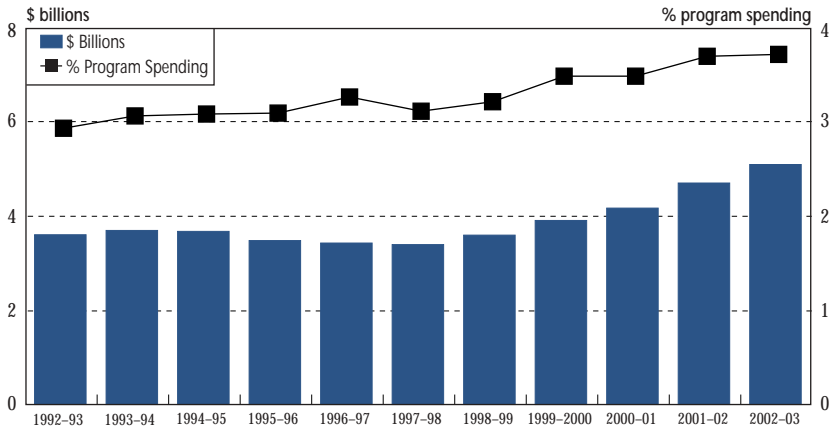
Source: OECD, *Main Science and Technology Indicators 2002/2*, December 2002.

Federal S&T Expenditures by Major Funders and Type of Activity, 2002-03



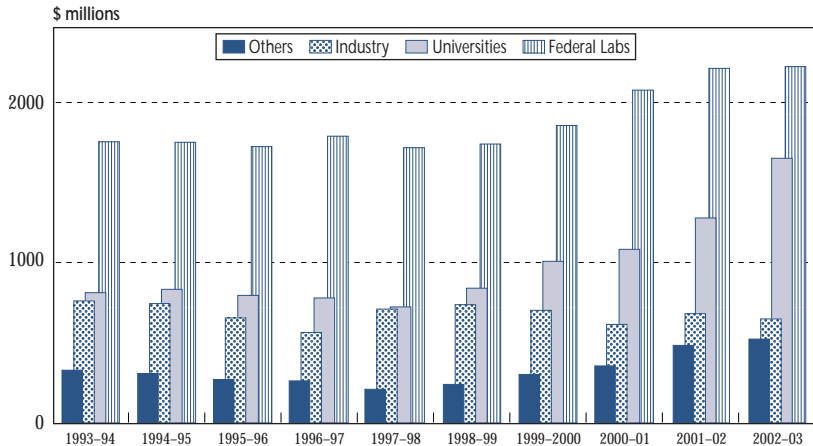
Source: Statistics Canada, *Science Statistics*, Vol. 26, No. 5, October 2002.

Federal R&D Expenditures in Absolute and Relative Terms, 1992-93 to 2002-03



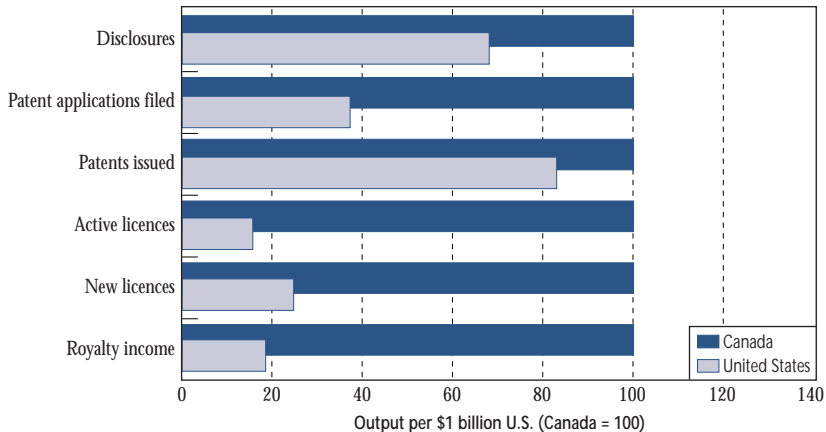
Source: Statistics Canada, *Science Statistics*, Vol. 26, No. 5, October 2002; and Department of Finance Canada, *Fiscal Reference Tables*, October 2002.

Federal R&D Expenditures by Performance Sector, 1993-94 to 2002-03



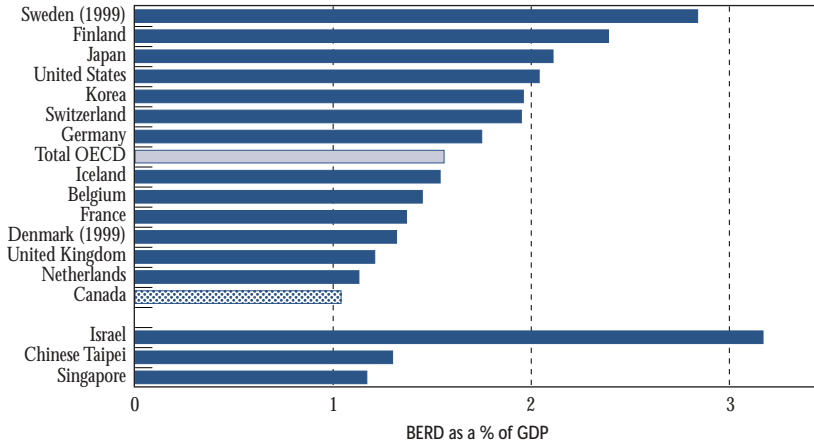
Source: Statistics Canada, *Science Statistics*, Vol. 26, No. 5, October 2002.

Technology Transfer from Federal Laboratories: A Canada-U.S. Comparison, FY 2000



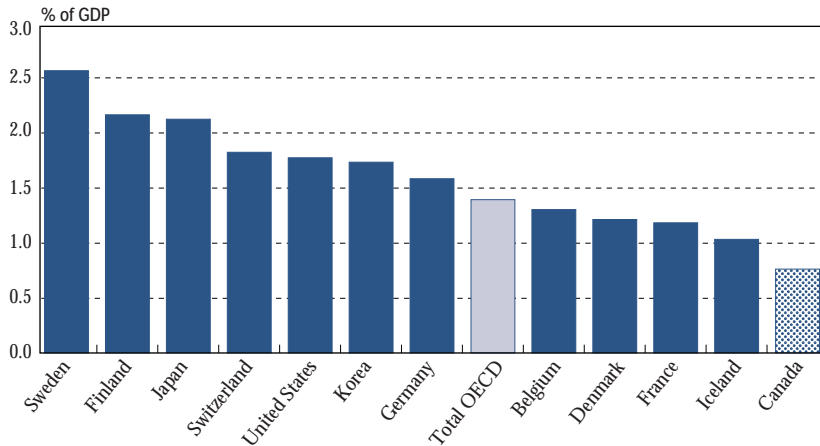
Source: U.S. Department of Commerce, *Federal Laboratory Technology Transfer*, September 2002; and Statistics Canada, private communication.

BERD as a Percentage of GDP, Top OECD and Non-OECD Countries, 2000



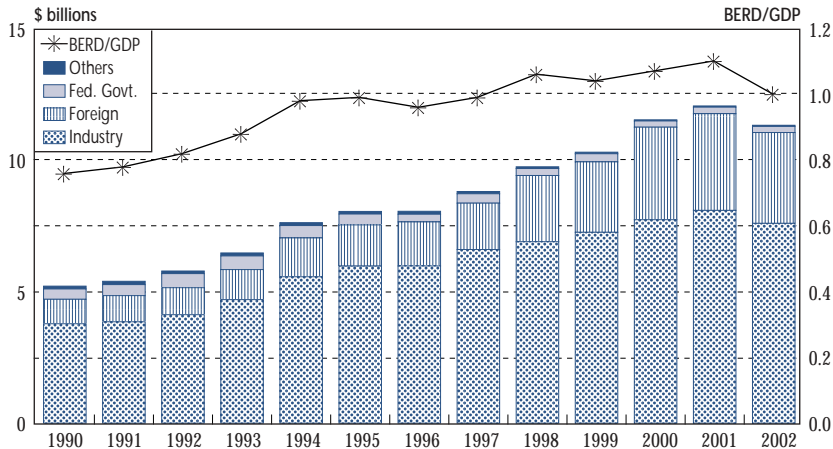
Source: OECD, *Main Science and Technology Indicators 2002/2*, December 2002.

Industry-Financed GERD as a Percentage of GDP, Leading OECD Countries and Canada, 1999



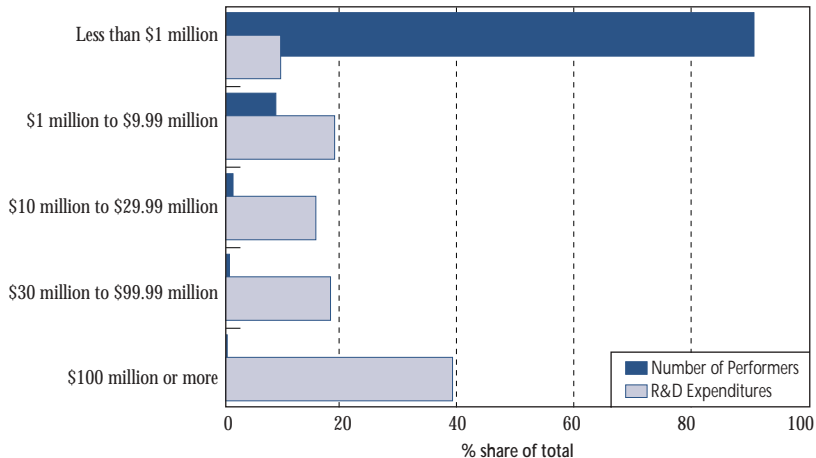
Source: OECD, *Main Science and Technology Indicators 2002/2*, December 2002.

Canada's BERD by Major Source of Funds, 1990 to 2002



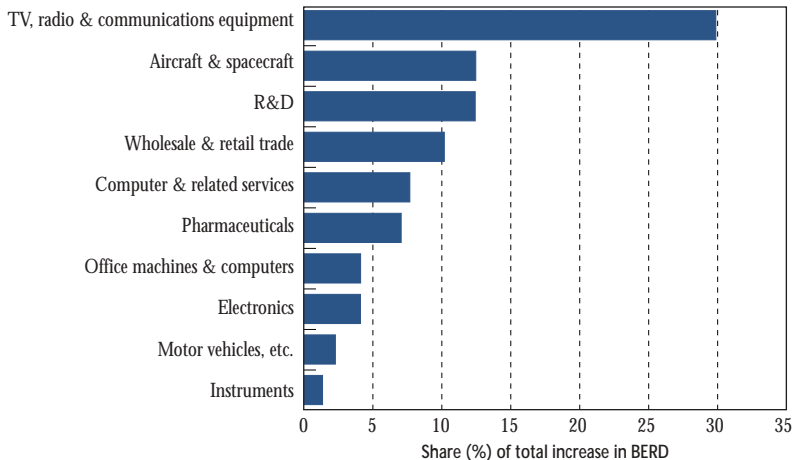
Source: Statistics Canada, *Industrial Research and Development: 2002 Intentions*, October 2002.

Distribution of Business R&D by \$ Value of R&D Program, 2000



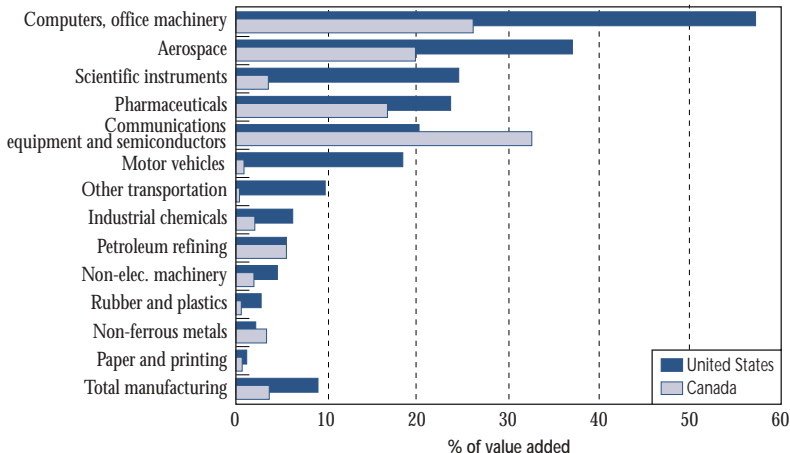
Source: Statistics Canada, private communication, January 2002.

Increase in Business R&D Expenditures by Leading Industry Sectors, 1990 to 2000



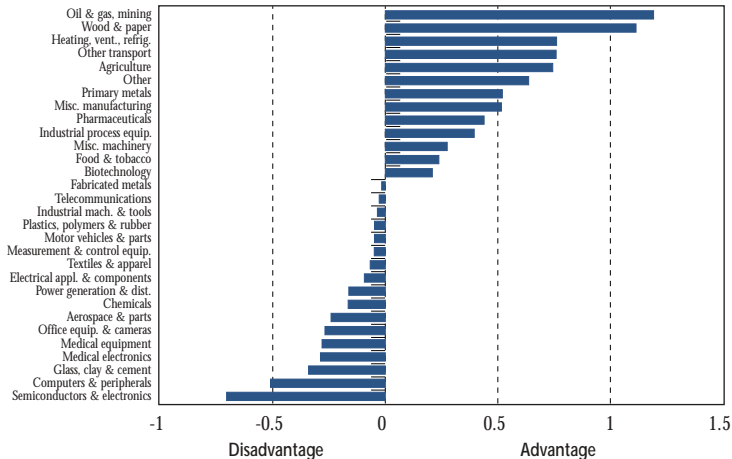
Source: Industry Canada calculation based on the OECD's *R&D Expenditure in Industry 1987-2000*, September 2002.

A Canada–United States Comparison of R&D Intensity in Major Industrial Sectors, 1997



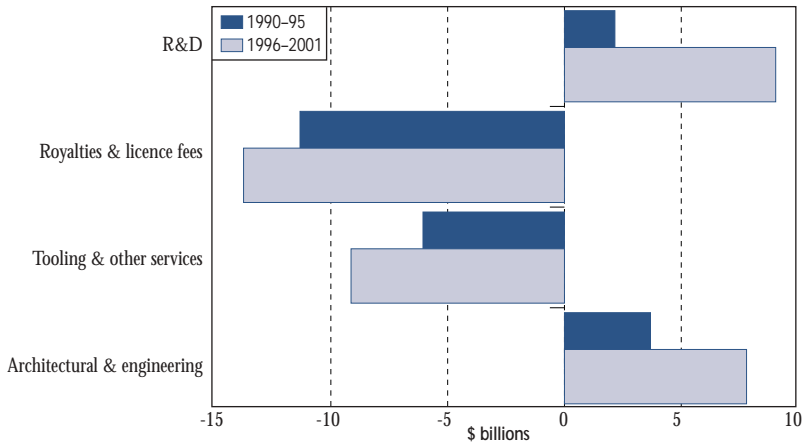
Source: OECD, *Science, Technology and Industry Outlook 2000*, September 2000.

Relative Comparative Advantage of Canadian Inventions Patented in the U.S., 1996 to 2000



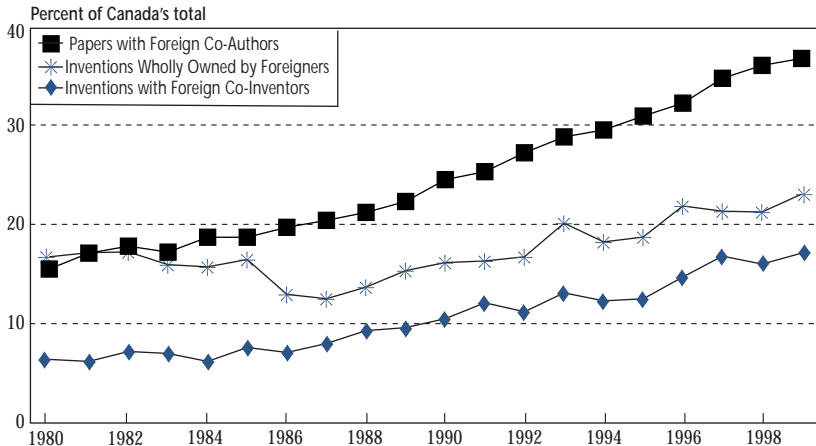
Source: Computer Horizons Incorporated, International Technology Indicators Database.

Canada's International Trade Balance in Some Knowledge-Based Services, 1990 to 2001



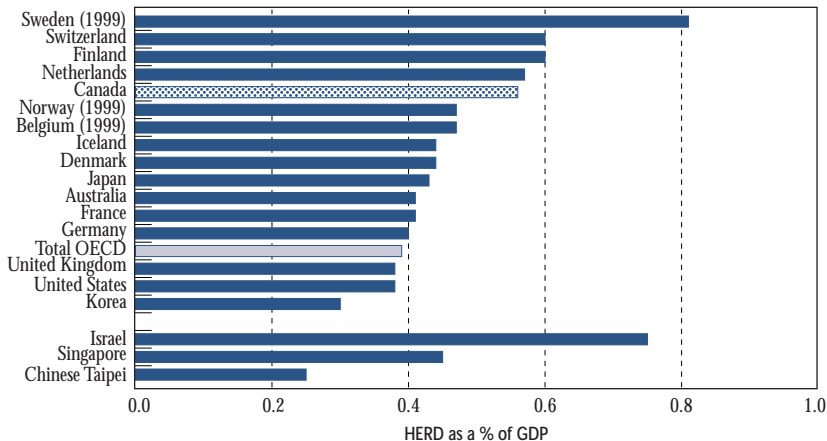
Source: Statistics Canada, *Canada's International Trade in Services 2000*, June 2001; and *Canada's International Trade in Services 2001*, June 2002.

Internationalization of Canadian Science and Technology, 1980 to 1999



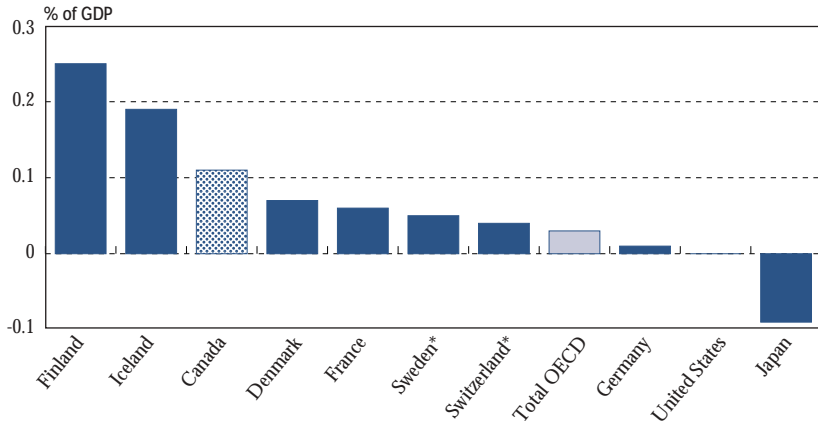
Source: Observatoire des sciences et des technologies; and OECD Secretariat, private communication.

R&D Expenditures in the Higher Education Sector, Selected OECD and Non-OECD Countries, 2000



Source: OECD, *Main Science and Technology Indicators 2002/2*, December 2002.

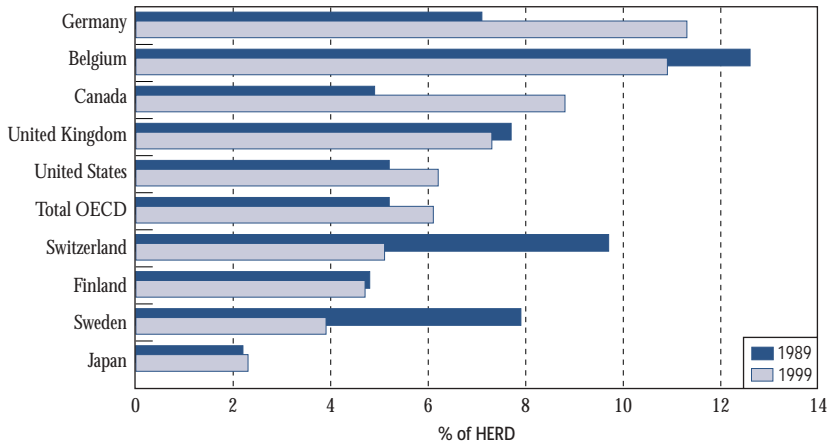
Increase in R&D Intensity in the Higher Education Sector, Selected Countries, 1990 to 2000



*1989 to 1999 for Sweden; and 1989 to 2000 for Switzerland.

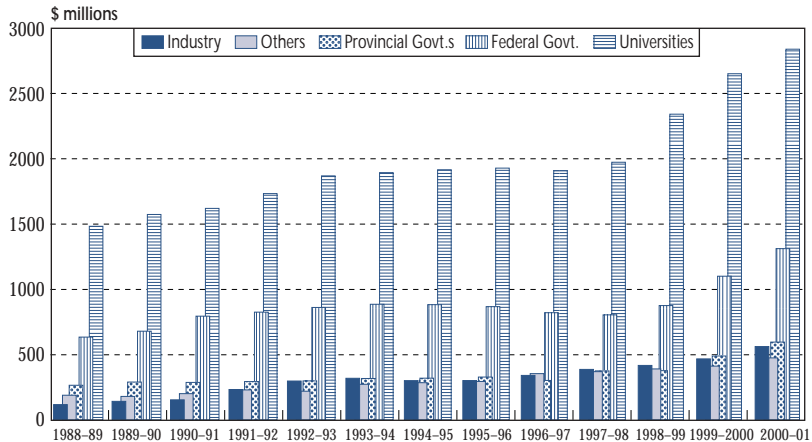
Source: OECD, *Main Science and Technology Indicators 2002/2*, December 2002.

Share of Higher Education R&D Financed by Industry, Selected Countries, 1989 and 1999



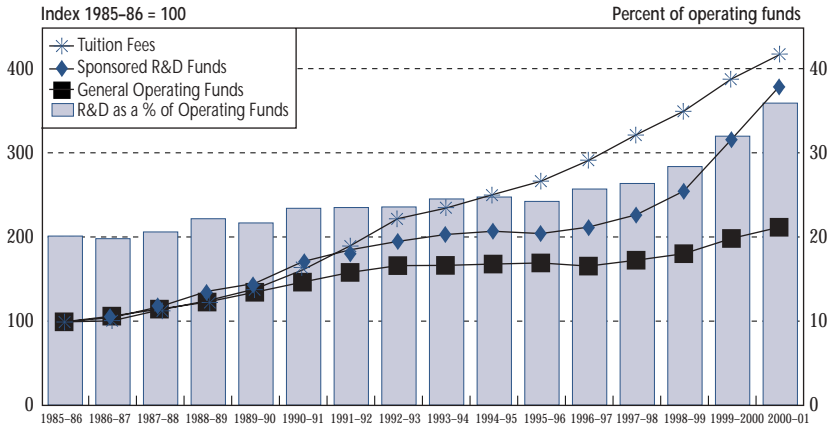
Source: OECD, *Main Science and Technology Indicators 2002/2*, December 2002.

R&D Expenditures in the Higher Education Sector by Source of Funds, 1988-89 to 2000-01



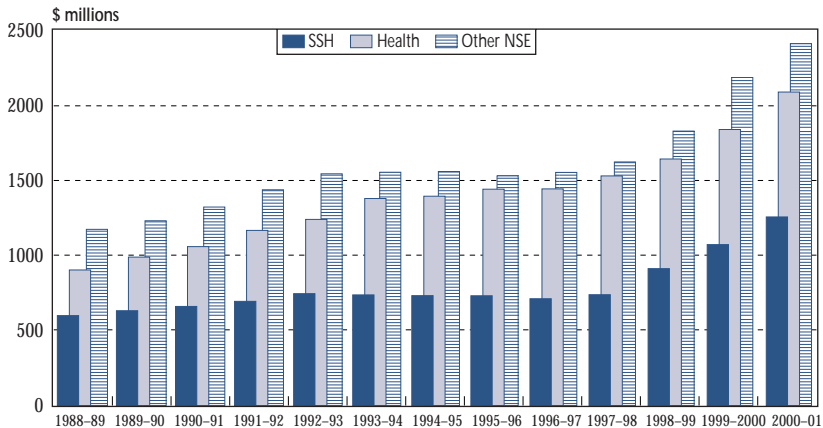
Source: Statistics Canada, *Science Statistics*, Vol. 26, No. 6, November 2002.

Growth in University Income from Tuition Fees, General Operating Funds and Sponsored R&D Funds, 1985-86 to 2000-01



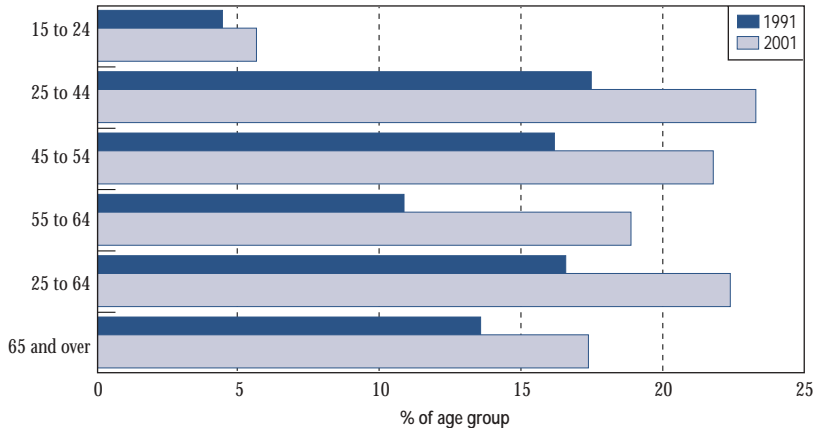
Source: Statistics Canada, private communication.

Higher Education R&D by Major Research Field, 1988-89 to 2000-01



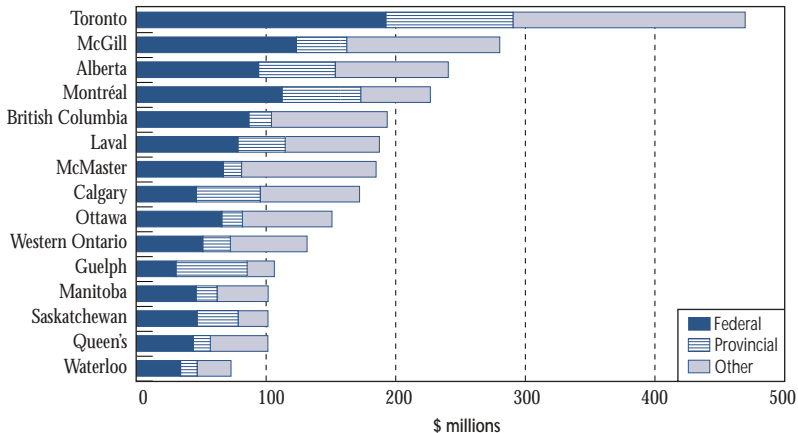
Source: Statistics Canada, *Science Statistics*, Vol. 26, No. 6, November 2002.

Percentage of Labour Force with a University Degree, by Age Group, 1991 and 2001



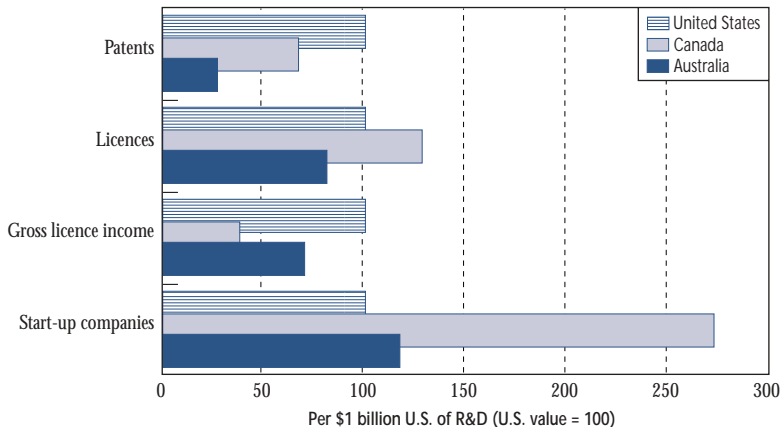
Source: Statistics Canada, *Labour Force Historical Review 2001*, February 2002.

Government Contribution to Sponsored R&D in Canada's Top 15 Universities, 2000-01



Source: CAUBO, *Financial Information of Universities and Colleges 2000-2001*, October 2002.

Commercialization of University R&D in Canada, Australia and the United States, 2000



Source: ARC, CSIRO and NHMRC, *National Survey of Research Commercialisation, Australia*, September 2002.