

Industry-Funded University Research: Limits and Possibilities

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Overview

- Policy context
- Links between university research and industry R&D
- National patterns
- Factors shaping industry-funded university research

Policy Context

- Strengthening university-industry research collaboration as policy objective since 1980s
- Canadian industry underperform in R&D/innovation as compared to leading industrial economies
- Business R&D ~ 55% of national total
 - U.S., Germany, Japan, Korea 70%+
 - U.K., France 60%+



Policy Context (cont.)

- Federal and provincial initiatives to stimulate university-industry collaborations
- Networks/Centers of Excellence programs
- R&D tax incentives for firms
- Industry matching fund requirements in university grants



Industry and University Research

- Academic science contributes in multiple direct and indirect to innovation in industry
- Great variability in relative importance, channels across industries/fields
- Public research is one of the most important channels

Types of University-Industry Research Relations

Personnel

Graduate student support

Co-op/internships

Personnel exchanges

Individual projects

Research grants

Research contracts

Collaborative R&D

Consulting

Licensing

Institutional links

Industry-funded research centers

Industry partner in govt.-funded centers

University-industry networks/consortia

Why does industry fund university research?

- Enhancement function (Rosenberg & Nelson 1990)
- University research as an “intermediate good” to be developed in the industrial lab
- Gain admission into scientific networks
- Cost-sharing
- Hire students

Industry R&D in Canada

- \$16.1 billion in 2009
- Most R&D performed by industry itself (\$13 bi.)
- Emphasis on “D”
 - 5% of intramural expenditures on basic research
 - 13% applied research

(Source: Statistics Canada)

Concentration

- Six economic sectors perform almost half
- 76% in Ontario and Quebec
- Largest firms – 19 companies > \$100 mi accounted for \$6.8 bi in 2008

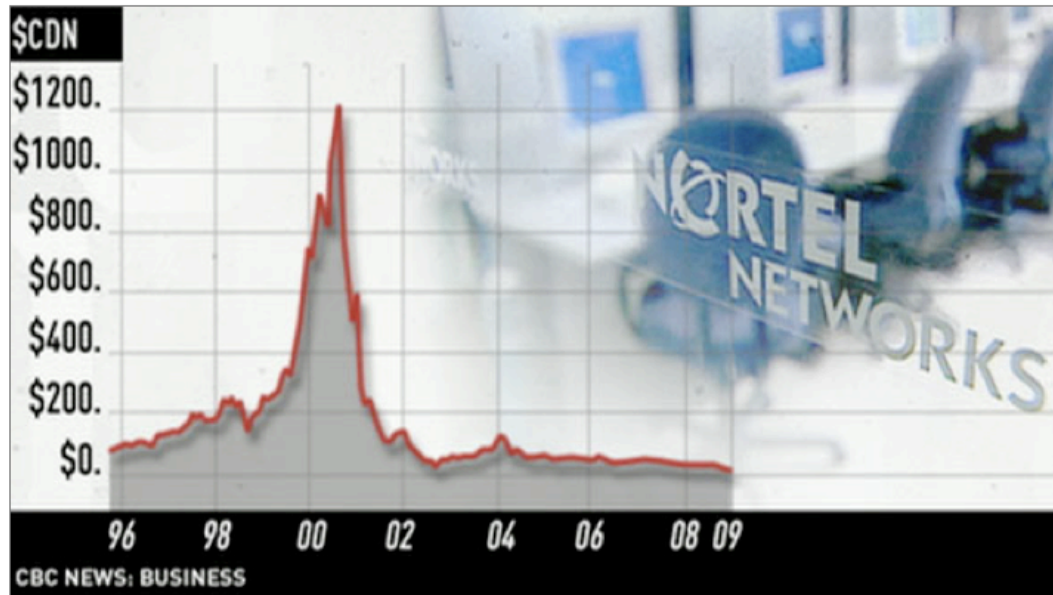
(Source: Statistics Canada)

Top Performers

1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Company
1	1	1	1	1	1	1	1	1	1	Nortel Networks Corporation
#	#	119	6	2	2	2	2	2	2	BCE Inc.
6	3	4	2	3	3	3	3	3	3	Magna International Inc.
2	2	3	3	4	4	4	4	4	4	Pratt & Whitney Canada Corp. (fs)
#	#	7	5	6	6	6	6	5	5	IBM Canada Ltd. (fs)
85	73	46	29	25	30	17	11	7	6	Research In Motion Limited
3	7	9	12	10	13	8	8	6	7	Atomic Energy of Canada Limited
#	#	#	#	#	10	11	10	8	8	Alcatel-Lucent (fs)
14	14	20	13	11	11	12	12	10	9	Apotex Inc.
#	#	#	#	#	31/24	35/27	28/23	9	10	Sanofi-Aventis Group (fs)
#	#	#	45	41	38	16	19	26	11	TELUS Corporation
9	10	16	8	9	9	9	9	13	12	Bombardier Inc.
(15	17)	23	18	15	14	14	13	12	13	GlaxoSmithKline Canada (fs)
4	4	5	9	7	8	10	14	14	14	Ericsson Canada Inc. (fs)
32	35	13	14	14	12	13	17	17	15	Pfizer Canada Inc. (fs)
8	11	17	20	19	27	21	26	21	16	CAE Inc.
64	57	50	49	49	37	33	37	27	17	Open Text Corporation
#	#	163	76	73	77	43	39	41	18	Aastra Technologies Limited
10	15	22	24	23	29	25	25	19	19	Hydro-Québec

Nortel Networks files for bankruptcy protection

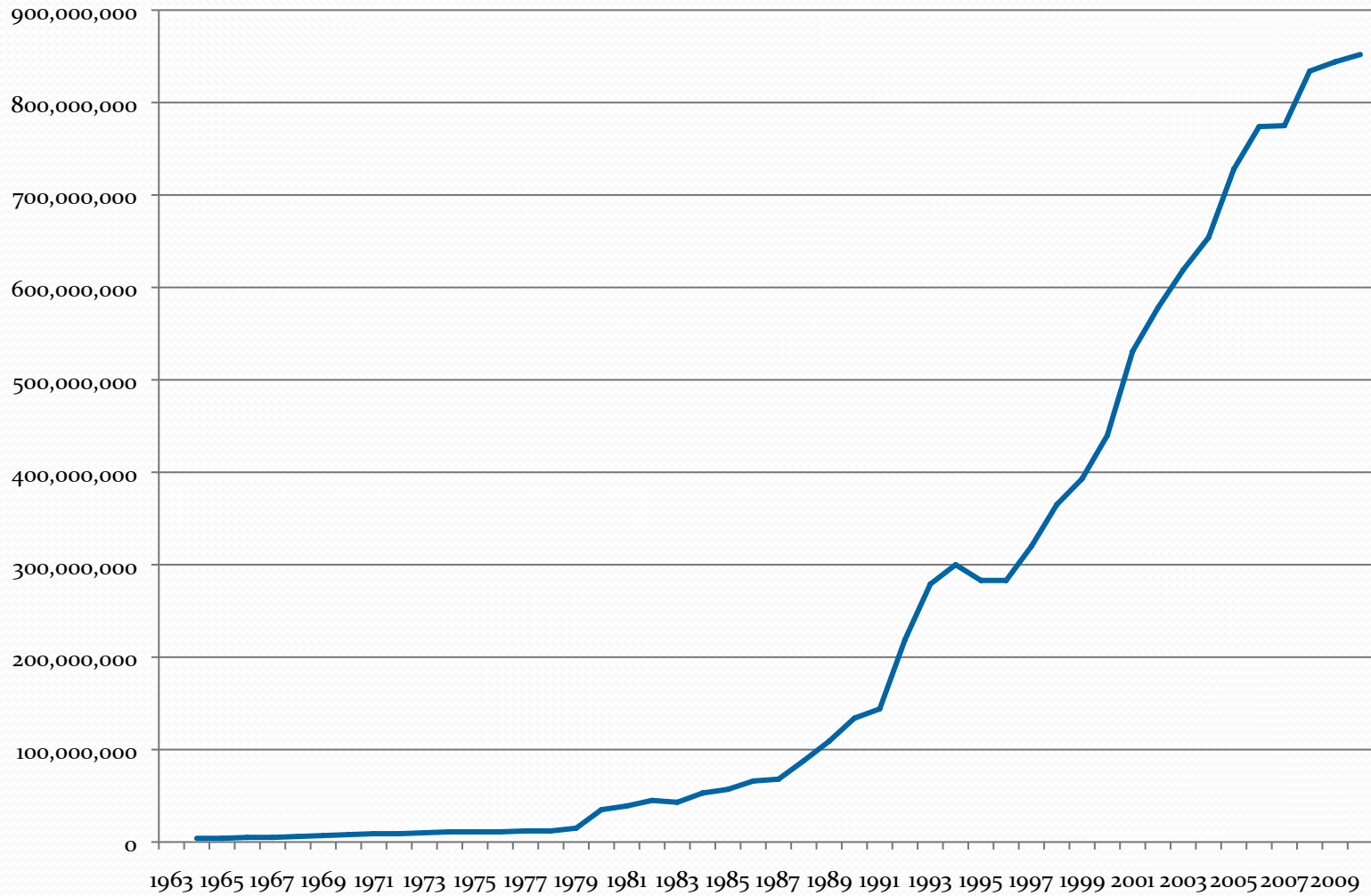
Last Updated: Wednesday, January 14, 2009 | 9:32 AM ET Comments 192 Recommend 230
CBC News



A multi-year TSX chart of Nortel shows the rise and fall of the firm's common shares.

Once a high-flying darling of the technology sector and a stock market heavyweight, Nortel Networks filed for bankruptcy protection on Wednesday in both Ontario and Delaware.

Industry-funded university research



(Source: Statistics Canada)

Industry-funded university research

- \$850 million performed by universities
- Total academic R&D: \$10.4 billion
- ~ 8% of the total
 - Higher than comparators (e.g. US ~ 5%)



Limiting Factors

- Economic climate (shorter-term goals)
- Conflict over Intellectual Property
- International investments in R&D infrastructure
- Industry focus on other providers



Potential drivers

- Industry reliance on ‘Open Innovation’
- Cutbacks in internal R&D
- Complexity of Science-based technologies



Conclusions

- Challenging economic climates have near term impacts on industry R&D decisions
- Multiple possibilities to encourage industry investment in academic research



Conclusions

Universities

- Build long-term relationships
- Flexible IP arrangements

Research and Innovation policy

- Sustain investments in scientific capacity
- Balance of tax incentives and direct investments in industry R&D

Industry

- Innovation strategies involving long-range investments in generic research



Thank you!

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