Trends in Corporate Research: Implications for Tech. Transfer

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Canada's Corporate Innovation Leaders

PREPARED BY RESEARCH INFOSOURCE INC., AN IMPACT GROUP COMPANY

Canada's Top 100 Corporate R&D Spenders 2011

Rank		Company	R&D Spending			Revenue	Research Intensity	Industry
2010	2009		FY2010 $000	FY2009 $000	% Change 2009-2010	FY2010 $000	R&D as % of Revenue***	
1	1	Research In Motion Limited* **	$1,391,395	$1,101,848	26.3	$20,502,219	6.8	Comm/Telecom Equipment
2	3	BCE Inc.	$821,000	$806,000	1.9	$18,069,000	4.5	Telecommunications Services
3	5	IBM Canada Ltd. (fs)	$551,100	$556,500	-1.0	nd		Software & Computer Services
4	8	Atomic Energy of Canada Limited	$476,400	$393,051	21.2	$460,935	103.4	Engineering Services
5	6	Magna International Inc.* (a)	$463,455	$553,870	-16.3	$24,142,916	1.9	Automotive
6	7	Pratt & Whitney Canada Corp. (fs)	$395,000	$398,000	-0.8	$2,912,000	13.6	Aerospace
7	10	Ericsson Canada Inc. (fs)	$353,000	$197,000	79.2	$1,004,000	35.2	Comm/Telecom Equipment
8		AMD Canada (fs)	$241,694	$252,612	-4.3	nd		Electronic Systems & Parts
9	9	Alcatel-Lucent (fs)	$233,000	$224,000	4.0	nd		Comm/Telecom Equipment
10	14	Bombardier Inc.* **	$198,771	$161,022	23.4	$18,241,589	1.1	Aerospace
11	11	Apotex Inc.	$178,852	$188,773	-5.3	$1,216,780	14.7	Pharmaceuticals/Biotechnology
12	12	Sanofi (fs) (b)	$159,182	$181,621	-12.4	$609,910	26.1	Pharmaceuticals/Biotechnology

Canada's University Innovation Leaders

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Canada's Top 50 Research Universities 2011

Rank			Sponsored Research Income			Full-time Faculty**	Research Intensity	
2010	2009	University	FY2010 $000	FY2009 $000	% Change 2009-2010	2009-2010 #	$ per Full-time Faculty $000	Province
1	1	University of Toronto* ++	$878,725	$858,182	2.4	2,439	$360.3	Ontario
2	2	University of British Columbia*	$538,398	$524,569	2.6	2,301	$234.0	British Columbia
3	4	Université de Montréal* (a)	$524,133	$486,179	7.8	1,884	$278.2	Quebec
4	3	University of Alberta*	$513,473	$507,613	1.2	1,686	$304.6	Alberta
5	5	McGill University* (a)	$469,729	$432,118	8.7	1,614	$291.0	Quebec
6	6	McMaster University*	$395,364	$377,732	4.7	1,275	$310.1	Ontario
7	7	Université Laval* (a)	$307,928	$282,657	8.9	1,326	$232.2	Quebec
8	8	University of Calgary*	$282,752	$264,358	7.0	1,572	$179.9	Alberta

Canada's Hospital Innovation Leaders

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Canada's Top 40 Research Hospitals 2011

Rank			Research Income					
2010	2009	Hospital	FY2010 $000	FY2009 $000	% Change 2009-2010	Hospital Type	Province	Main Affiliated Research Institute(s)/Centre(s)
1	1	University Health Network	$267,654	$261,113	2.5	General	Ontario	Ontario Cancer Institute, Toronto General Research Institute, Toronto Western Research Institute
2	2	Hamilton Health Sciences	$180,435	$191,200	-5.6	General	Ontario	Population Health Research Institute, Thrombosis/Atherosclerosis Res. Inst., Escarpment Cancer Research Inst.
3	3	Hospital for Sick Children	$172,213	$146,260	17.7	Pediatric	Ontario	Hospital for Sick Children Research Institute
4	4	McGill University Health Centre (MUHC)	$131,147	$130,092	0.8	General	Quebec	Research Institute of the MUHC
5	8	Sunnybrook Health Sciences Centre	$106,000	$84,000	26.2	General	Ontario	Sunnybrook Research Institute
6	6	Ottawa Hospital	$104,948	$87,720	19.6	General	Ontario	Ottawa Hospital Research Institute
7	16	British Columbia Cancer Agency [a] (Provincial Health Services Authority)	$81,765	$41,708	96.0	Cancer	British Columbia	

Part 1
The “Ocean”: Canada’s Corporate R&D Scene

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Why Does It Matter?

- Corporations account for nearly all higher education sector technology licensing
- Represent a substantial proportion of research contracting activity
- Heavily involved in collaborative R&D, networks, Chairs, etc.

- *As goes corporate R&D spending, so goes tech. transfer*

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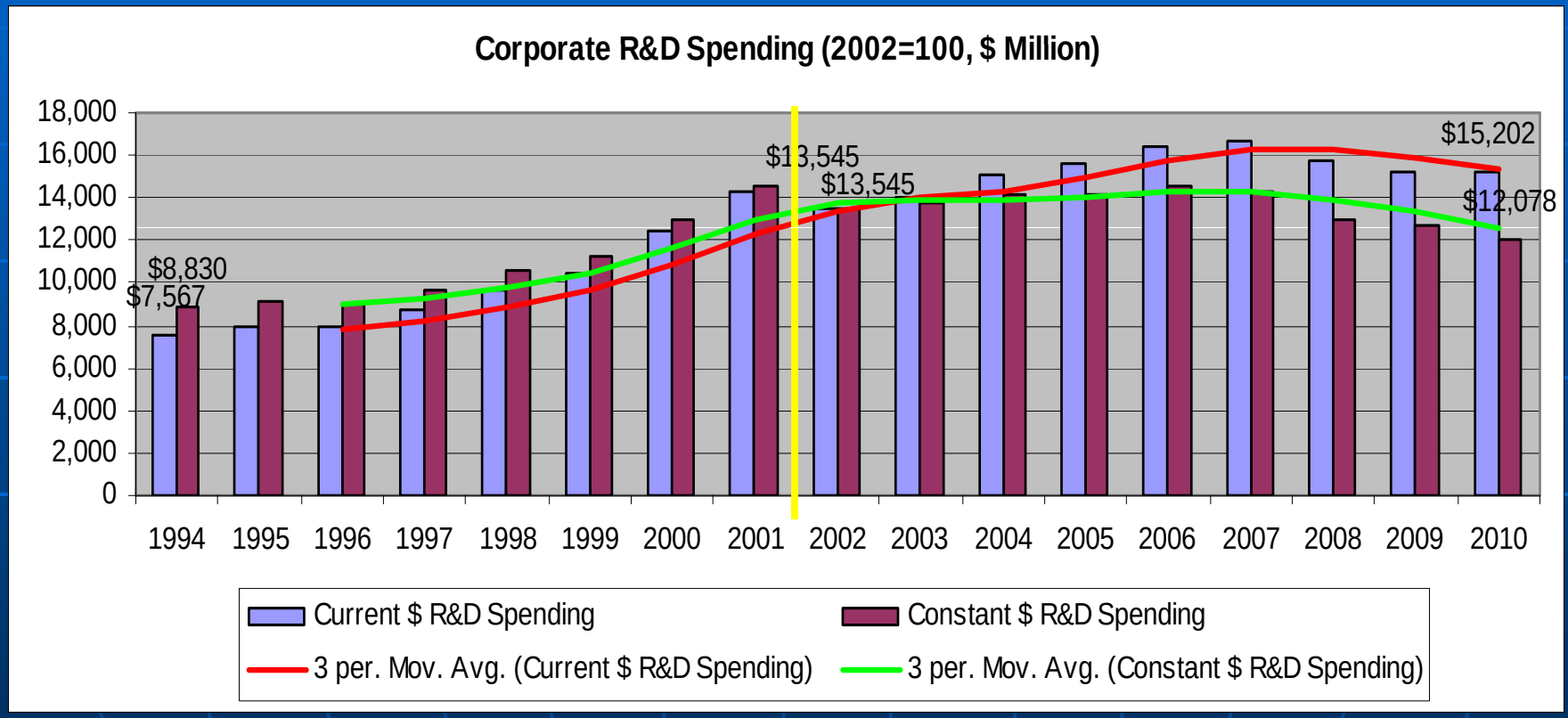
The Big Picture: Real Corporate R&D Spending Dropping



Source: StatCan Cat. No. 88-001-X

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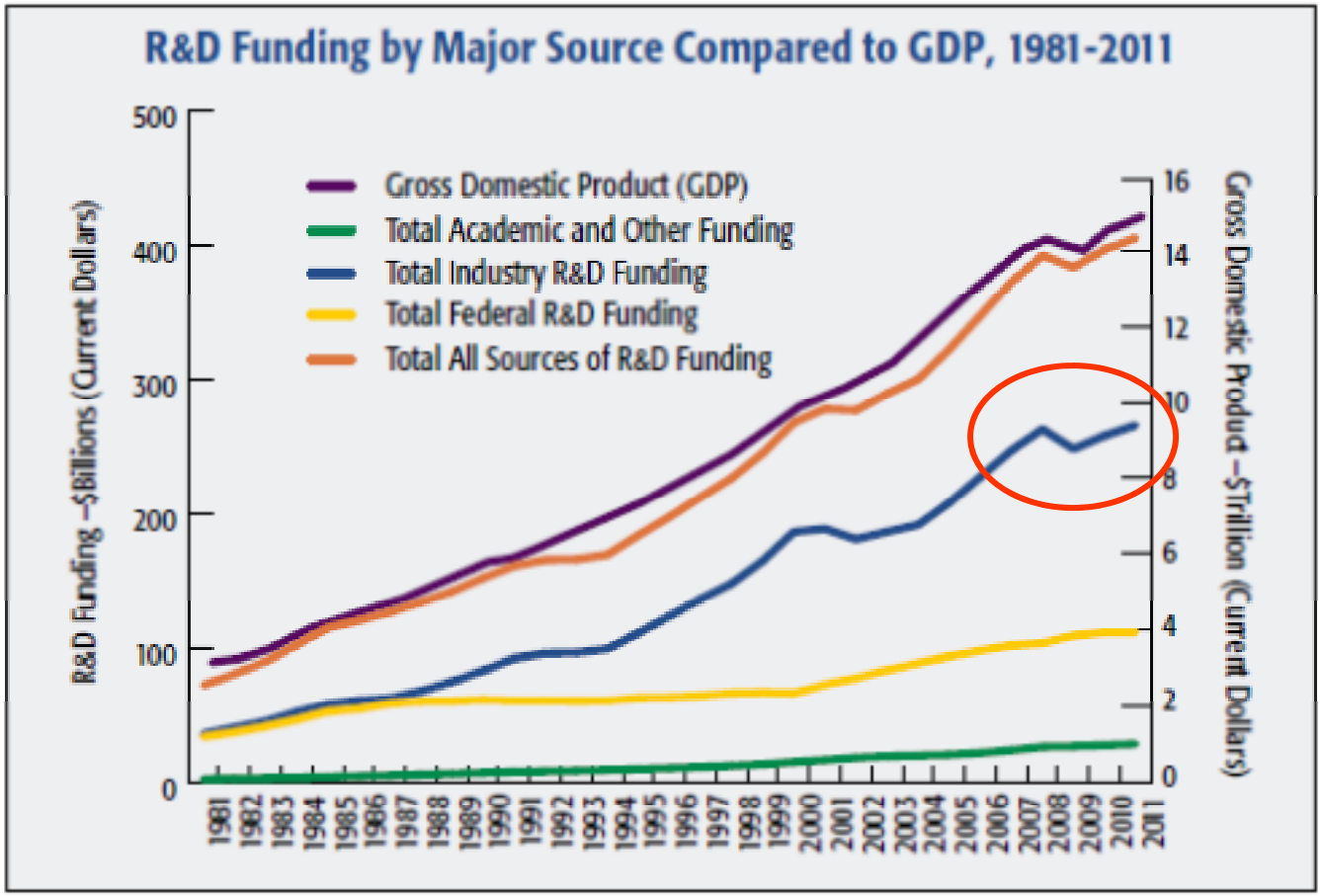
US Funding Also Dropping



Source: NSF National Patterns of R&D Expenditures Data, Battelle/*R&D Magazine* Analysis, Estimates, and Forecasts

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R&D Spending Becoming Less Concentrated

Concentration of total intramural research and development expenditures by companies size

	Top 25	Top 50	Top 75	Top 100
	percent			
2010 p	30	40	46	50
2009 p	31	40	46	51
2008 p	30	40	47	51
2007 r	29	39	45	49
2006 r	31	42	48	51
2005 r	32	42	49	52
2004 r	33	43	49	53
2003	34	44	50	54
2002	34	44	50	54
2001	41	49	55	59
2000	46	54	60	64
1999	44	54	59	63
1998	46	55	60	64
1997	44	53	59	63
1996	41	50	56	61
1995	39	48	54	58
1994	39	49	54	58
1993	43	54	60	64
1992	45	55	60	64
1991	47	57	63	67
1990	47	58	64	68
1989	48	59	64	68
1988	49	59	64	68
1987	49	58	64	67
1986	47	57	63	67
1985	48	58	64	68

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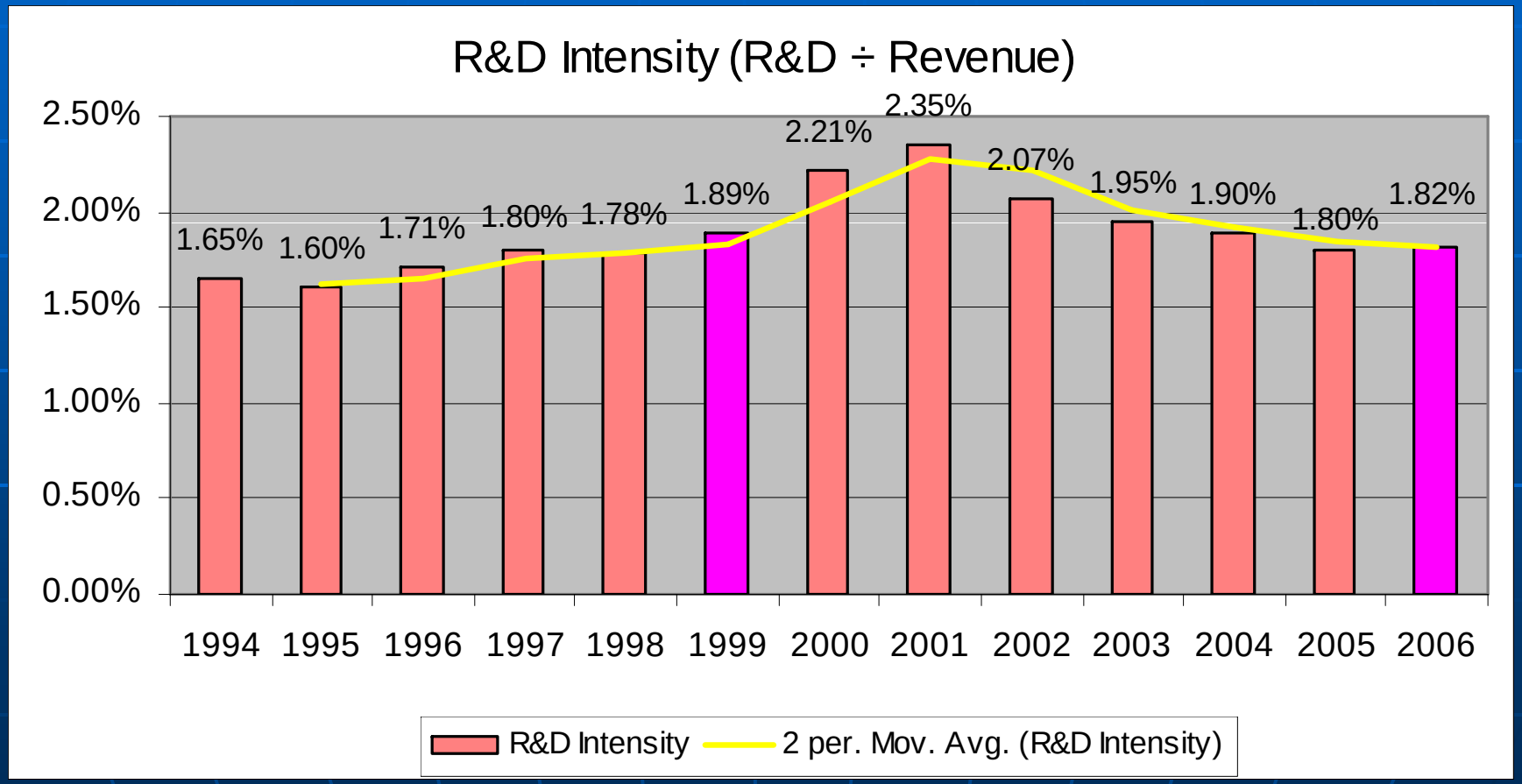
R&D Intensity Declining (R&D/Revenues)



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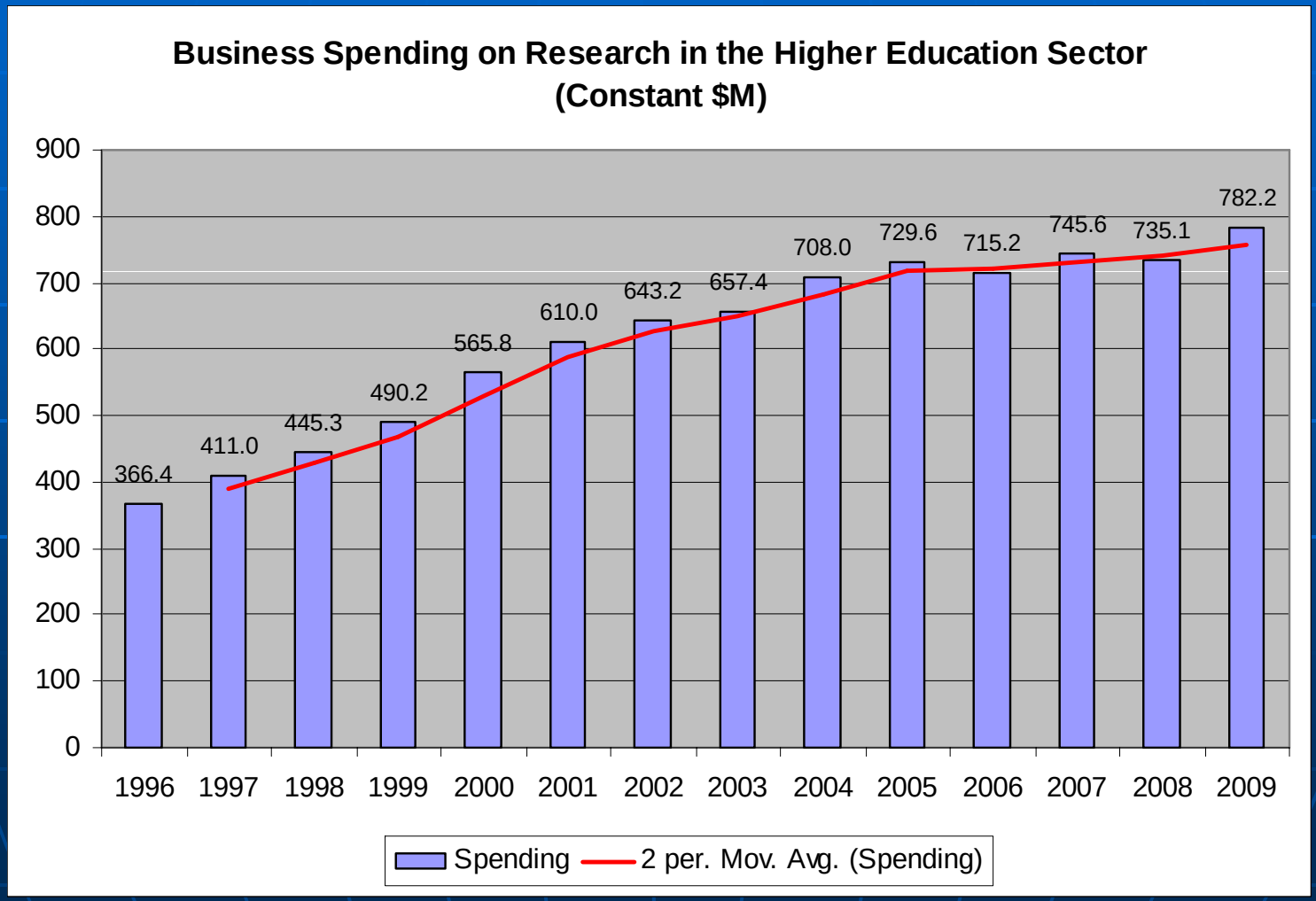
Business Spending on Higher Education Research



Source: StatCan 88-001-X

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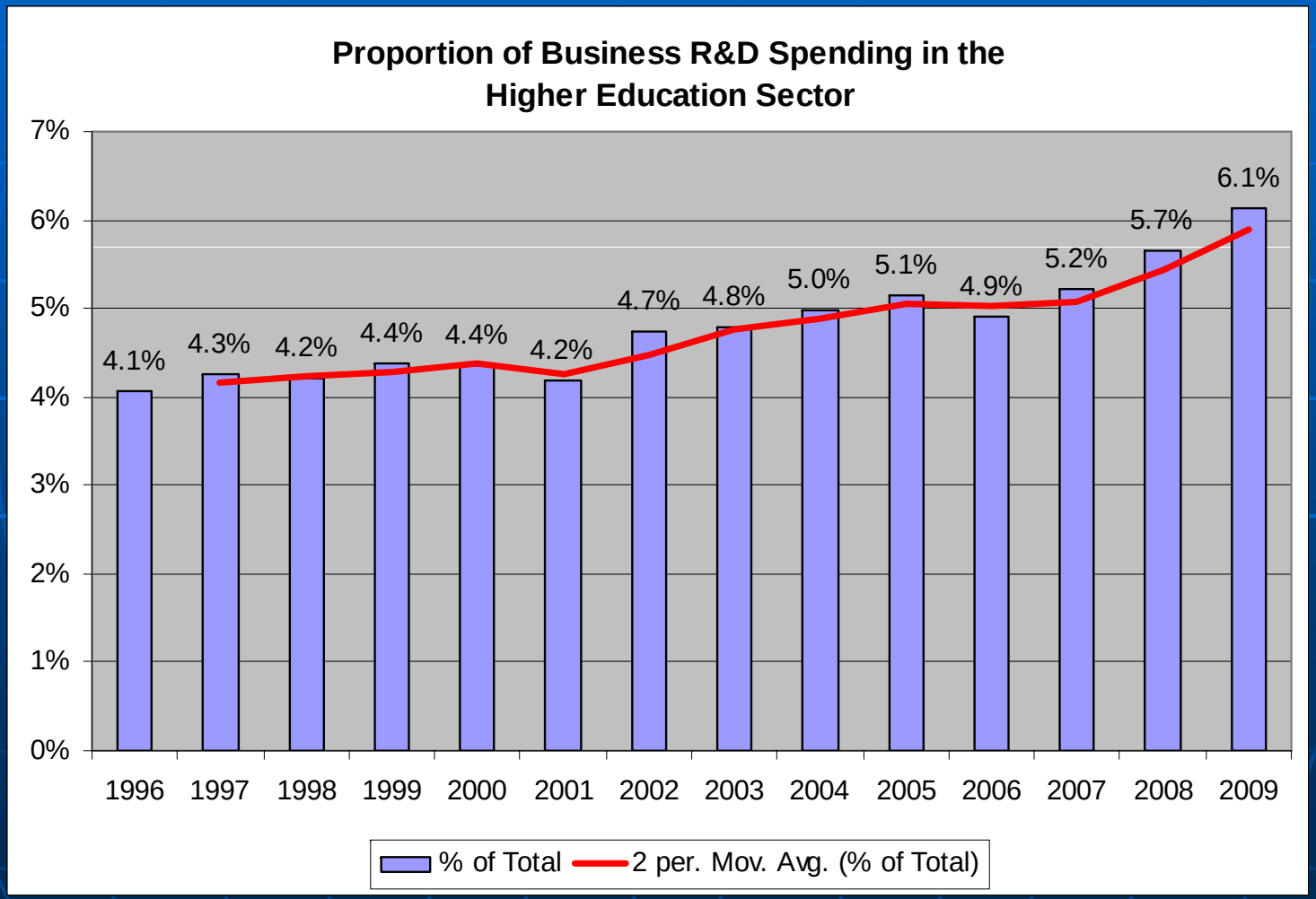
Growing Reliance on the Higher Ed. Sector



Source: StatCan

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US Funding Smaller … and Dropping

The Source-Performer Matrix
Estimated Distribution of R&D Funds in 2011
Millions of Current U.S. Dollars *(Percent Change from 2010)*

Source	Performer					
	Federal Gov't	Industry	Academia	FFRDC	Non-Profit	Total
Federal Government	$27,499 -0.71%	$25,983 -0.05%	$36,098 0.58%	$15,595 -0.24%	$6,245 -0.19%	$111,421 -0.04%
Industry		$260,878 3.33%	$2,765 5.89%		$1,781 2.56%	$265,444 3.35%
Academia			$12,140 4.35%			$12,140 4.35%
Other Government			$3,413 5.34%			$3,413 5.34%
Non-Profit			$3,088 1.58%		$9,778 2.13%	$12,865 2.00%
Total	$27,499 -0.71%	$286,862 3.01%	$57,524 1.93%	$15,595 -0.24%	$17,803 1.35%	$405,283 2.40%

Source: Battelle, *R&D Magazine*

Notes: **1% of Total R&D Spending**
Spending falling

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The Corporate Tech. Transfer "Market" - Licensing

Licenses and options — 2008

	Exclusive and sole licenses	Non-exclusive licenses	Unclassified	Total
	number			
Total new licenses	**226**	**298**	**...**	**524**
Total new licenses executed with Canadian licensees	136	104	...	**240**
Total new licenses executed with foreign licensees	65	182	...	**247**
Unclassified new licenses	25	12	...	**37**
Total active licenses	**1,530**	**1,813**	**...**	**3,343**
Total active licenses with Canadian licensees	965	502	...	**1,467**
Total active licenses with foreign licensees	420	1,274	...	**1,694**
Unclassified active licenses	145	37	...	**182**

Note(s): Based on the questionnaires received representing **125** responding institutions. Unclassified: Respondents provided totals but were unable to break down components as requested. Counts include stand-alone licenses and options only and exclude those embedded in research contracts and non-commercial (royalty free) licenses.

Source: StatCan 88-222. Survey of Intellectual Property Commercialization in the Higher Education Sector. 2010

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The Corporate Tech. Transfer "Market" – Research Contracts

Value of research contracts by sponsor — 2008

	Contracts
	thousands of dollars
Total	**1,971,207**
Federal government	440,132
~~Provincial and other levels of government~~	~~481,715~~
Other Canadian sources (business enterprises or organizations)	660,852
Foreign sources (government, business enterprises or organizations)	235,321
Other	153,187

Note(s): Research contracts do not include research grants (e.g. SSHRC, NSERC, CIHR) and multi-year contracts have been prorated for the reference year. Based on the questionnaires received representing **125** responding institutions.

Source: StatCan 88-222. Survey of Intellectual Property Commercialization in the Higher Education Sector. 2010

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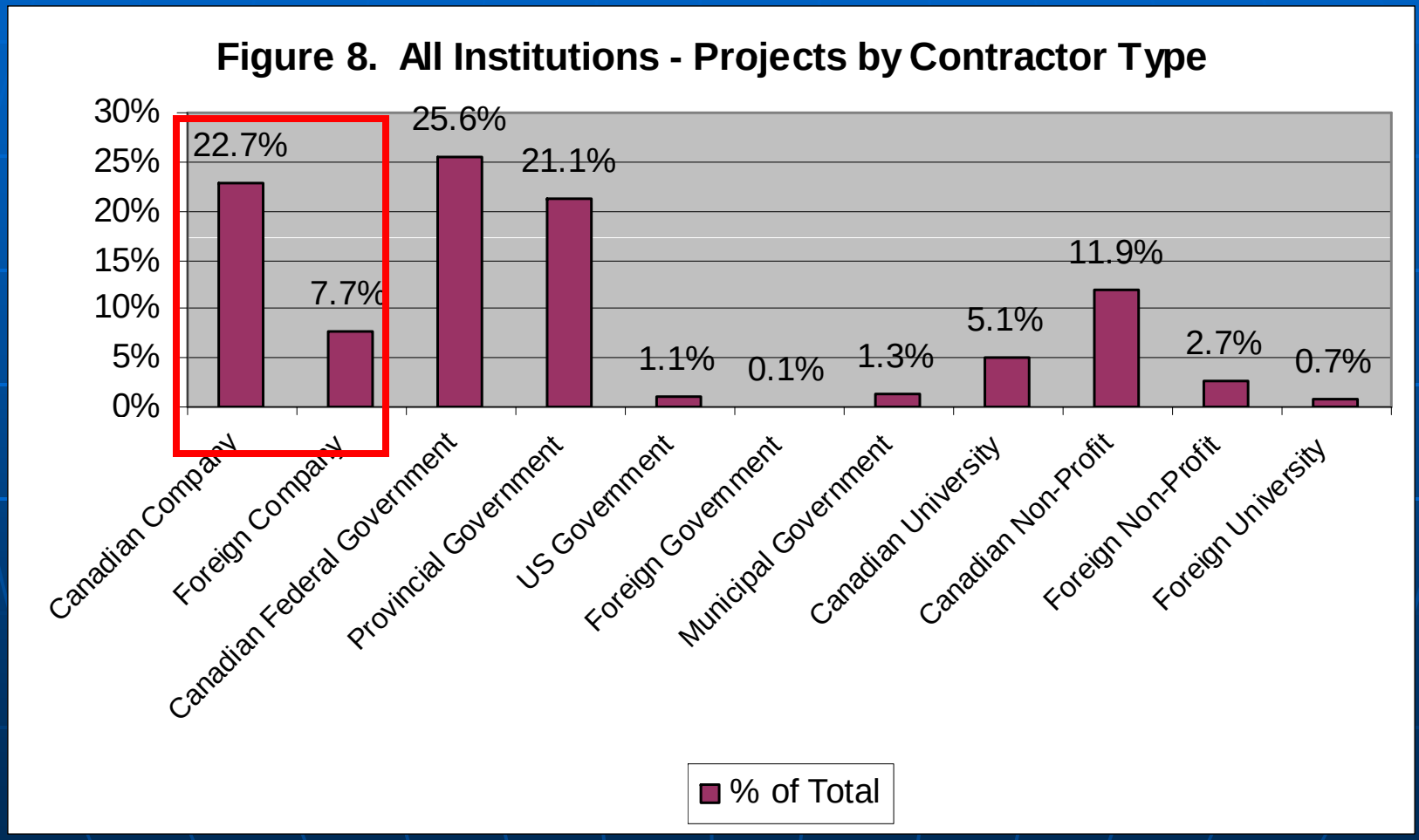
Companies Account for 30% of All Research Contracting



Source: Knowledge Transfer Through Research Contracting, The Impact Group, 2010

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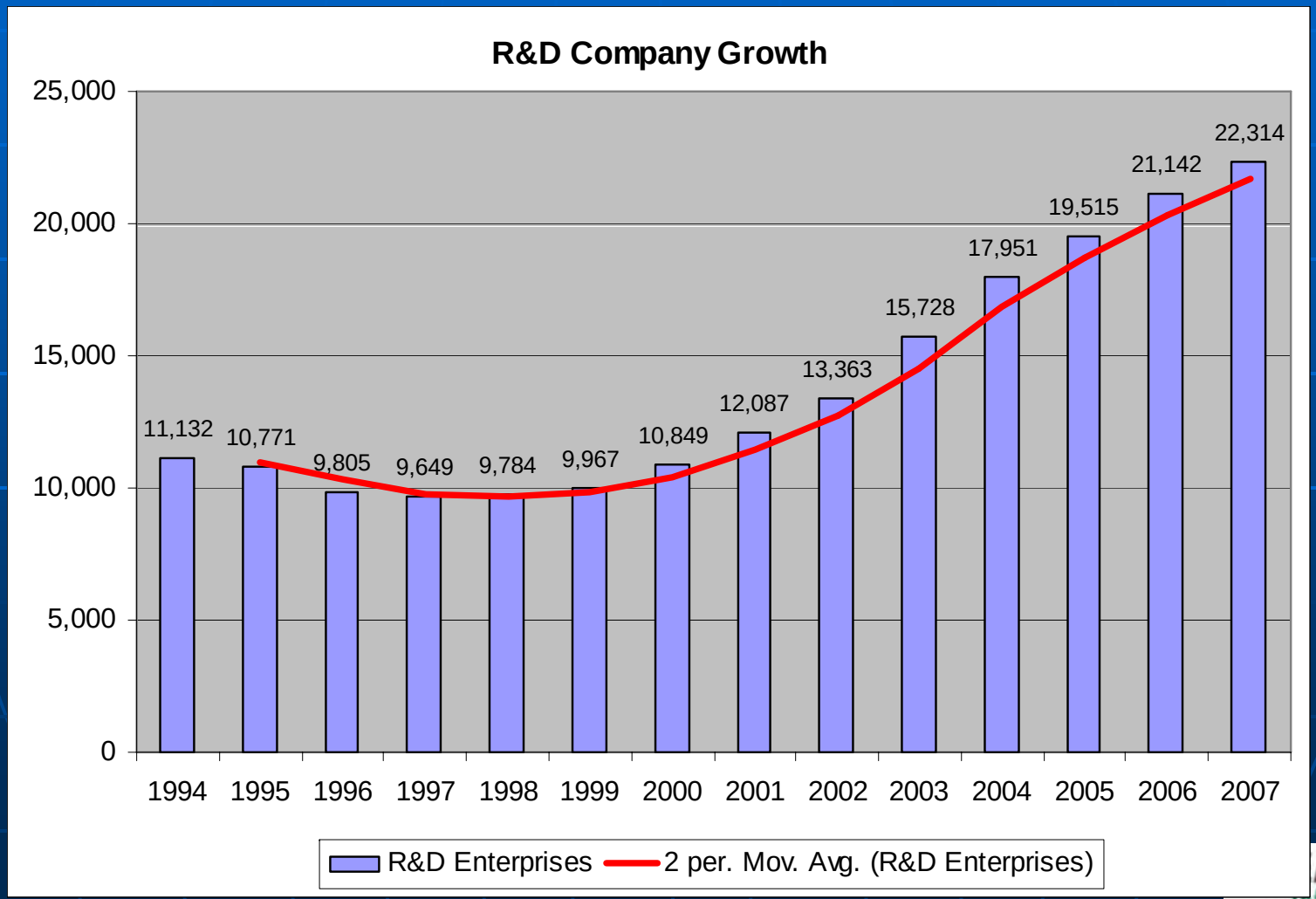
Corporate R&D Performers: Growth Continues



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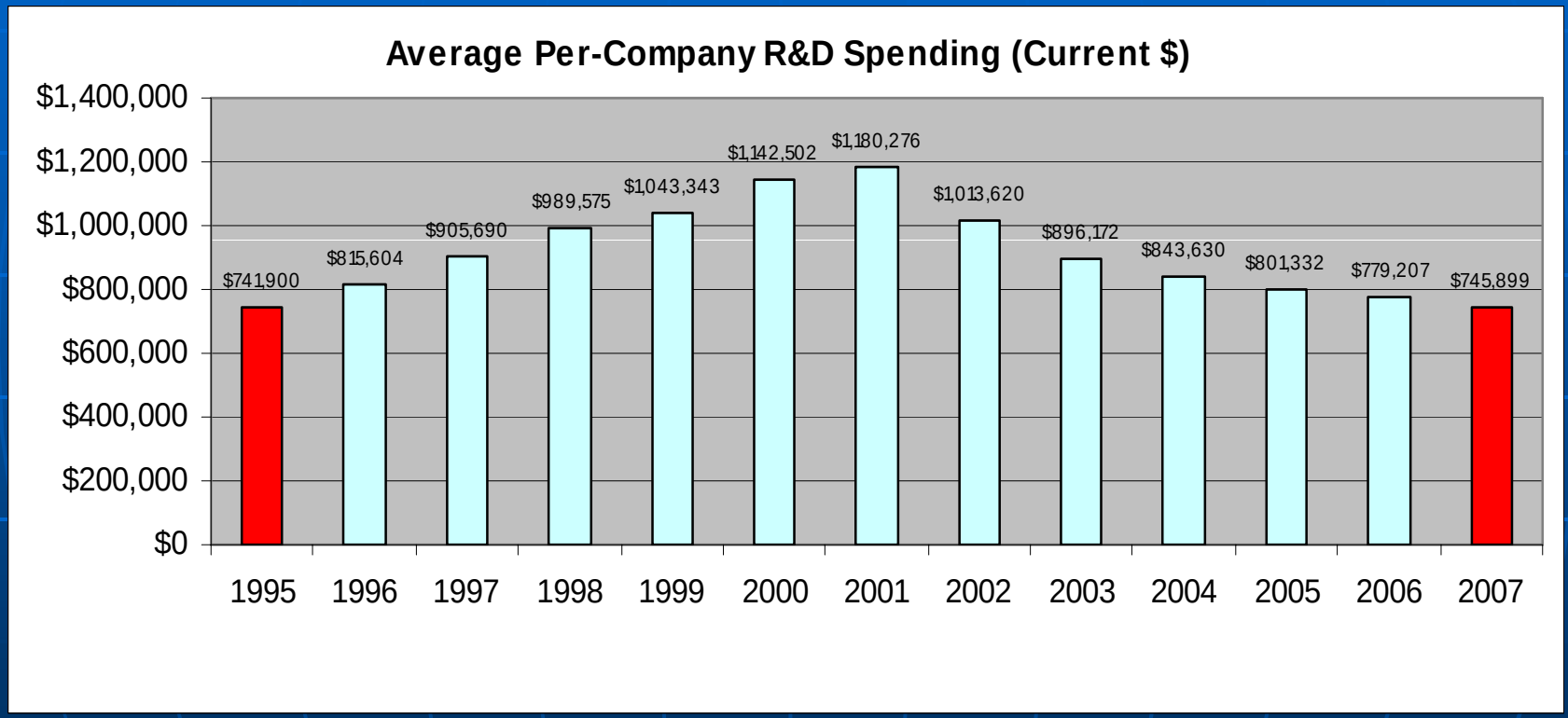
Average Spending Dropping



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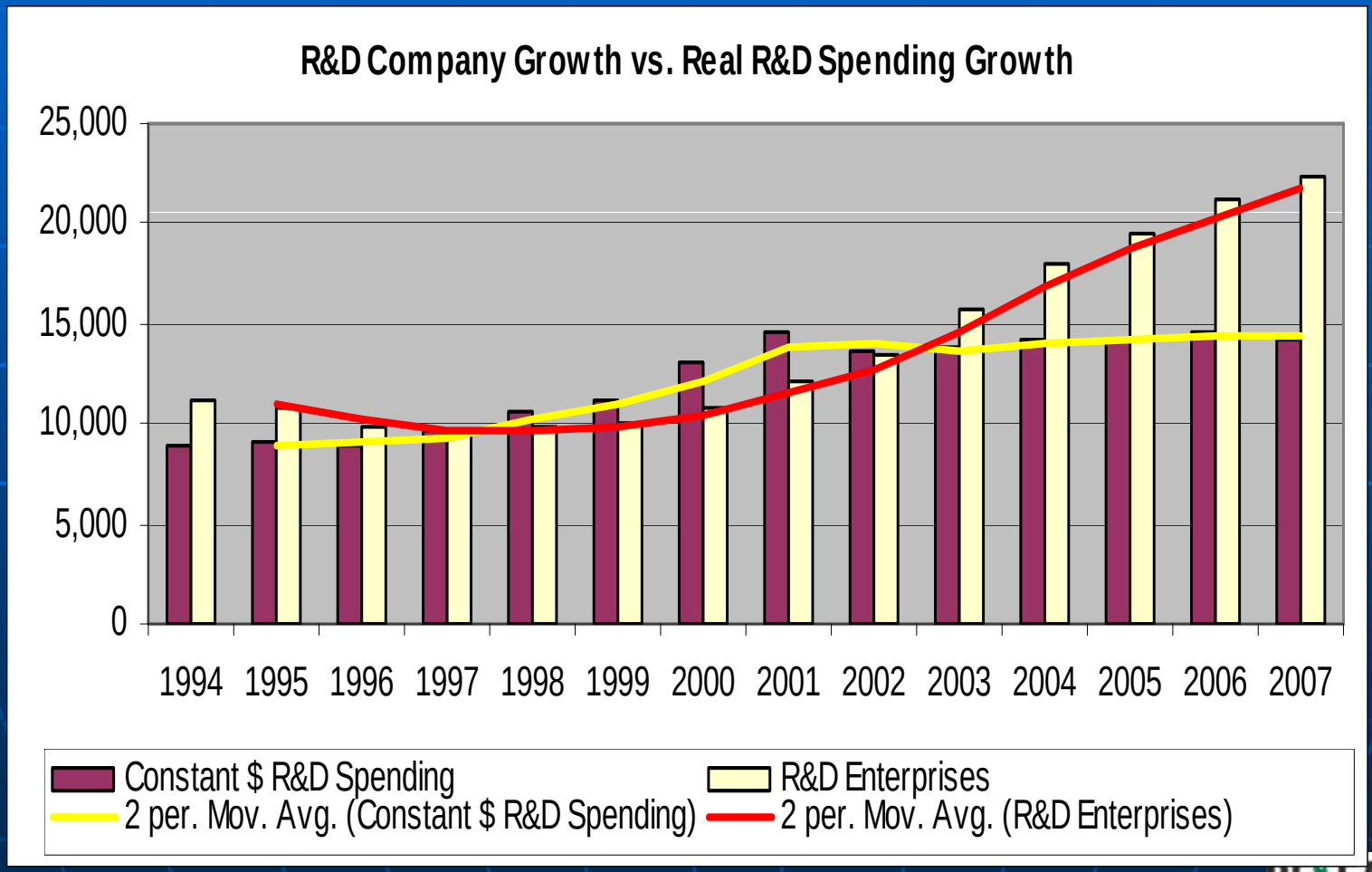
Company Growth Outpacing R&D Spending



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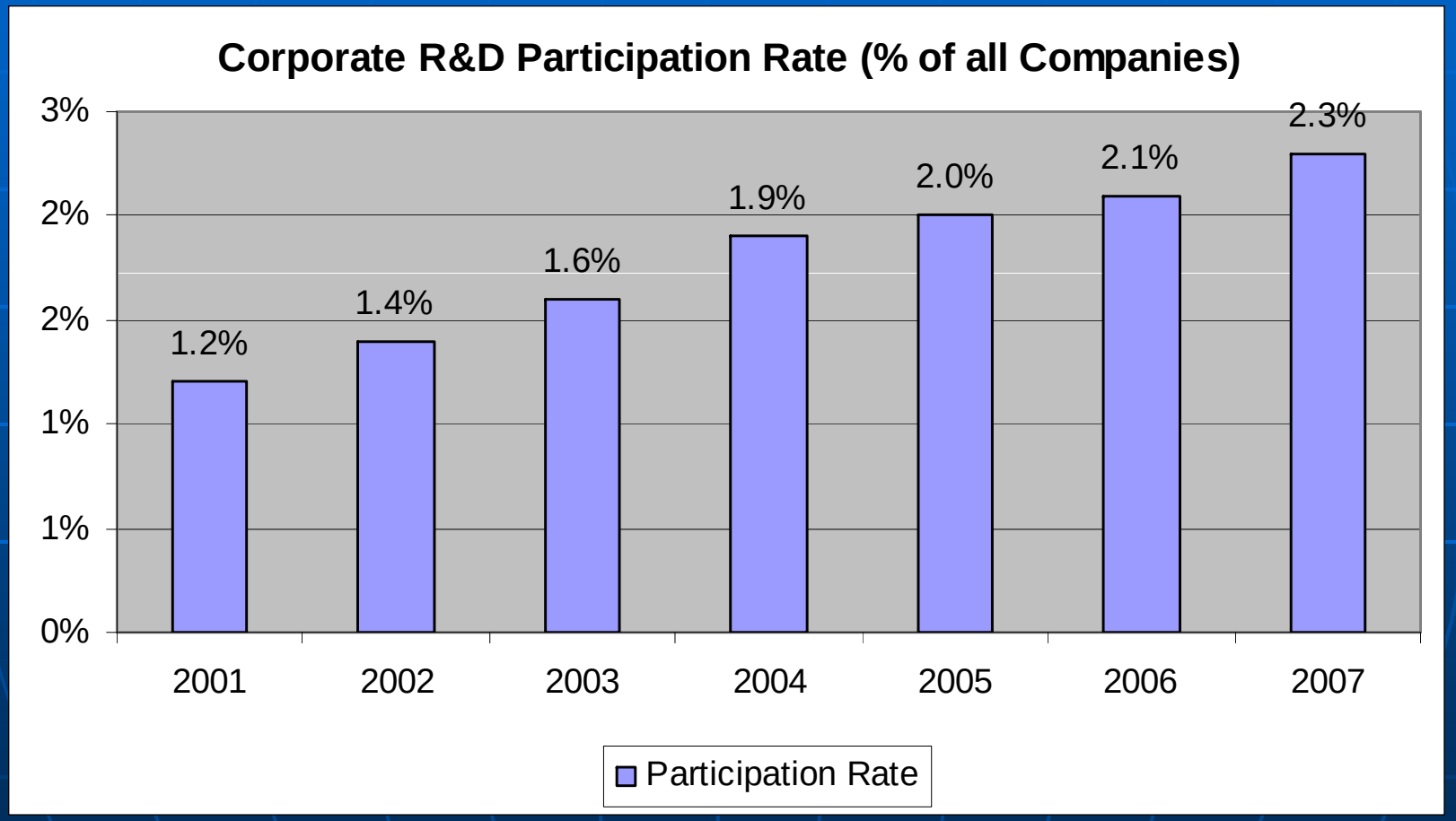
R&D Participation Rate Growing
(R&D Companies as a % of Total)



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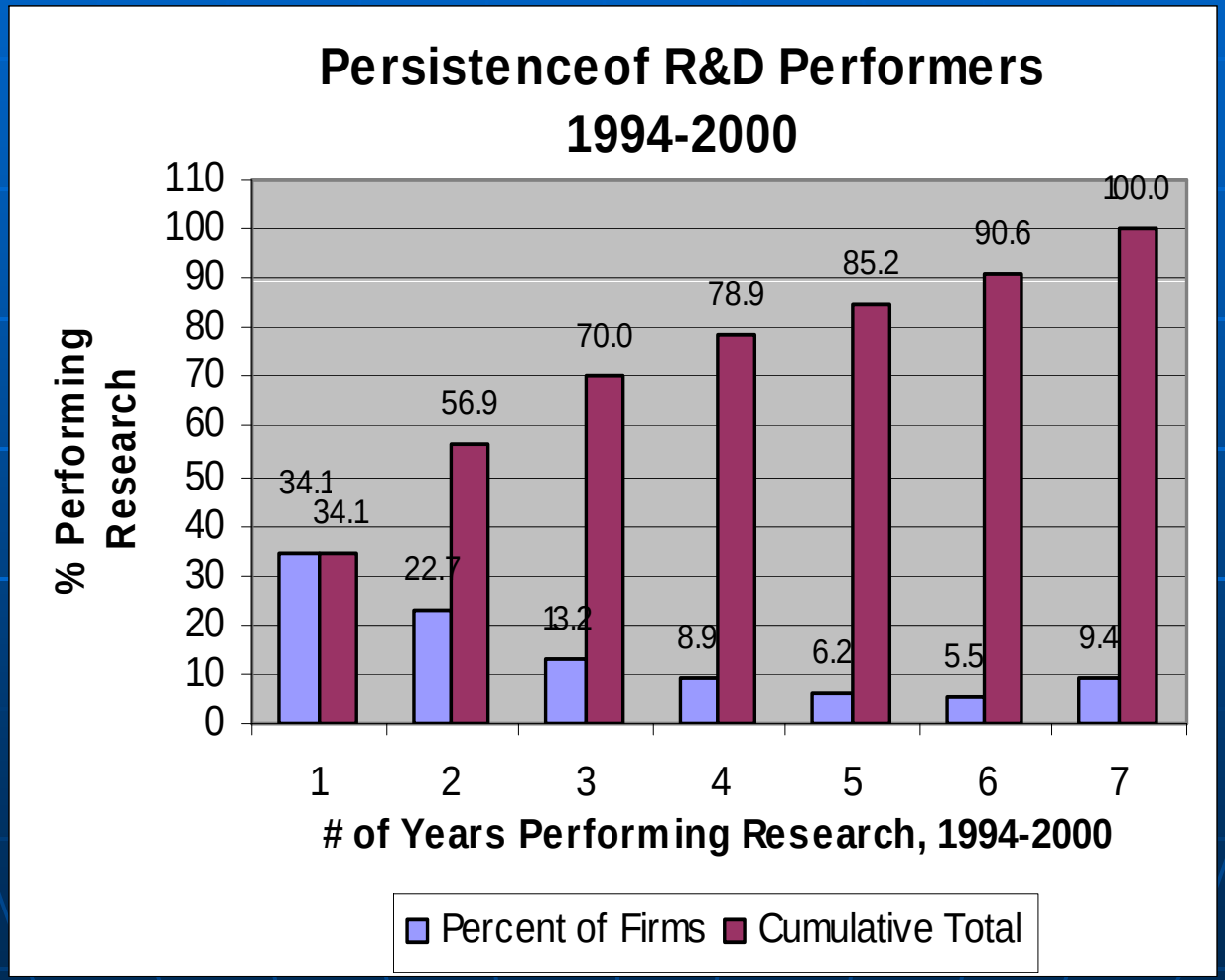
R&D Persistence: A Moving Target



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Business R&D Persistence

- Data imply that approx. 49,000 – 57,000 different companies performed research in a 7-year period

- "Research-ready" market much larger than the annual totals suggest

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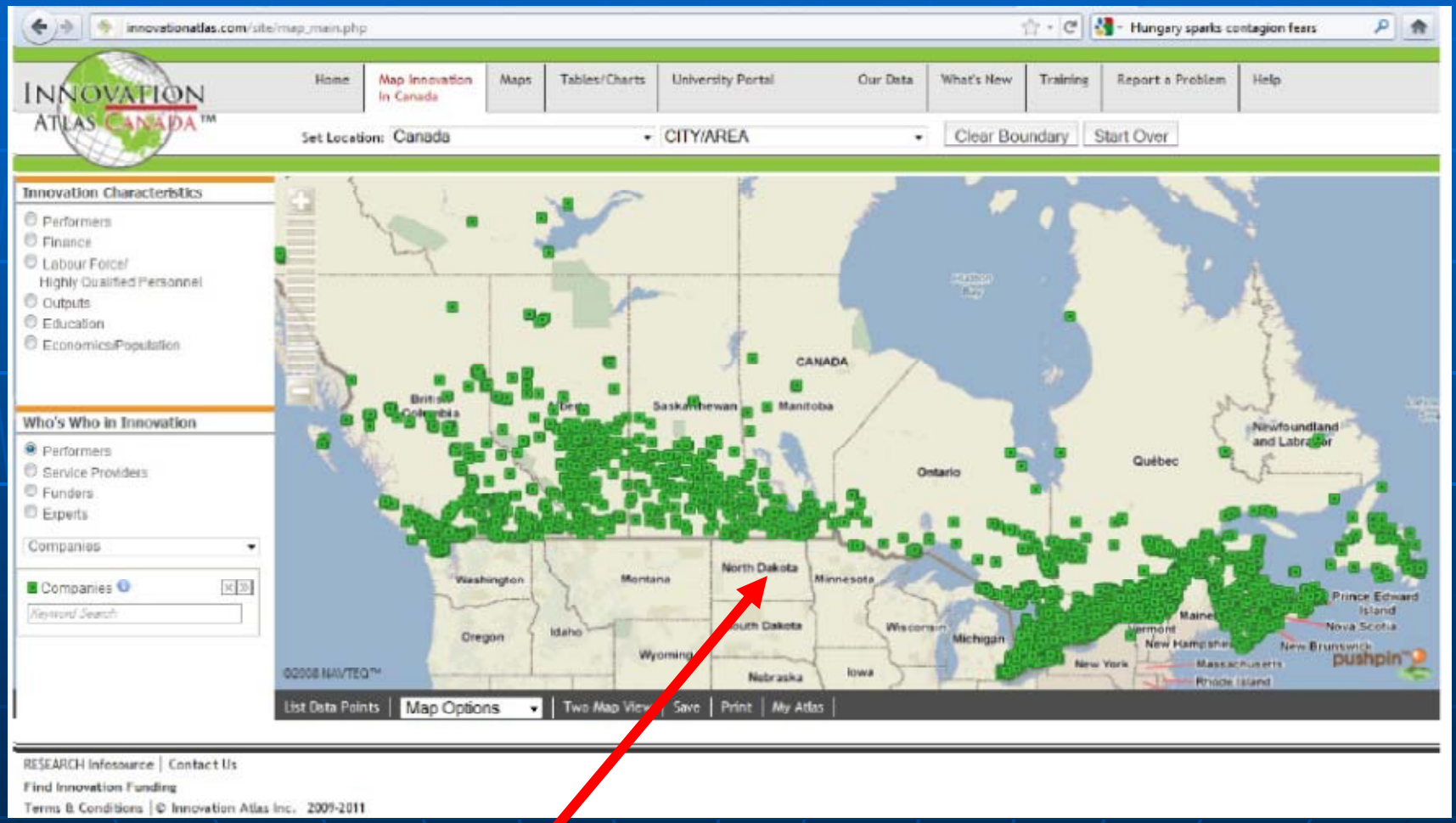
Similar to the 58,000 “high tech” Companies in the Innovation Atlas of Canada



30,000 Manufacturing + 28,000 Service companies

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Business Innovation Capacity =

$$\frac{\text{R\&D Spending \$}}{\text{\# of R\&D Performers}}$$

Proposition:

Improving Capacity Means Improving Spending AND Performers

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Part 2 – Implications for Tech. Transfer

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The Bad News

- Corporate R&D Spending has flat-lined; no real growth
  - US figures also dropping
- Most licensing to foreign companies

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The Good News

- Number of R&D players growing
  - More players = more customers
- Large pool of R&D-ready firms
  - Between 49,000-57,000 in a 7-year period
  - A lot of businesses to “engage”
- Business spending on university technology/research increasing
  - Both in real terms and as a % of total
  - Canada doing better than US

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Implications for Tech Transfer

- Foreign multinationals a key customer (for "codified" knowledge)
  - Represent the "export" of R&D/knowledge
- Many channels for knowledge transfer to business
  - IP, contracts, collaborative R&D, etc.
- Coordinated marketing strategies can supplement individual ones
  - Need to boost economies-of-scale in marketing higher ed. R&D to business

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Thank you !

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