



NSERC's Discovery Grants Program

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Policy and International Relations Division and
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OVERVIEW

Section 1 provides a brief review of NSERC's Discovery Grants program, its objectives and general design.

Section 2 provides a statistical overview: trends in the Program budget and in the number of researchers supported. It also highlights how the Program supports new and established researchers, according to a number of parameters (by region, institution, faculty rank, gender). The analysis indicated the following:

- Discovery Grant funding and the number of professors supported is at an all time high, spurred on by a large influx of new and active researchers in Canadian universities;
- The program forms an important base of support for NSERC's entire suite of programs;
- The majority of program funding is concentrated at large institutions and a minority of professors;
- Competition success rates have ranged from 69% to 84%, with current success rates approaching all-time lows;
- The average Discovery grant has fallen slightly after accounting for inflation;
- Established researchers receiving different grant levels still tend to leverage the same proportionate amount from other NSERC programs;
- A major reduction in the number of professors supported would likely have the most detrimental consequences for professors from Canada's 6 smallest provinces, or small universities and assistant or adjunct professors;
- Additional Discovery grant funding increases the number of papers published by professors but not the quality of those publications., i.e. the quality of scientific publications produced by all NSERC Discovery grantees is high.
- A reduction of funding going to grantees in the lower ranges would have a negative impact on the number of undergraduate and master's students being trained in the natural sciences and engineering.

Section 3 lists advantages and many arguments for keeping the Program as is, as well as disadvantages and arguments for changing it (at least to some extent). On the plus side, the built-in flexibility it provides; the role it plays in launching the career of large number of new researchers and maintaining that of established professors; the impact on the training of undergraduate and graduate students. On the negative side, the modest amounts that large numbers of researchers receive due to the incredible pressure on the Program and a sense of entitlement resulting from the high success rate.

Finally, the two Appendices provide a number of tables with background information and details related to Program delivery.

1. INTRODUCTION

The Natural Sciences and Engineering Research Council (NSERC) is the national instrument for making strategic investments in Canada's capabilities in science and technology. NSERC functions at arm's length from the federal government: it is funded directly by Parliament and reports to it through the Minister of Industry.

The Council's ultimate objective is to advance Canada's prosperity and high quality of life by supporting the creation and transfer of knowledge in the natural sciences and engineering (NSE) in Canada, and by ensuring people are trained to create and use that knowledge. To achieve this, NSERC supports research in Canadian universities and colleges that meets international standards of excellence and it supports the training of undergraduate and graduate students, postdoctoral fellows and other researchers.

Through its investments, NSERC helps to build Canada's capabilities in science and technology and supports innovation that drives the economy and improves the quality of life of all Canadians. Annually, NSERC invests nearly \$1 billion in three core priorities – people, discovery and innovation – mainly at Canadian universities, but also at colleges, and in collaboration with industry and government laboratories.

NSERC's Discovery Grants program (under a succession of names – Operating Grants; Research Grants and now Discovery Grants) predates the creation of NSERC in 1978. It is NSERC's largest (\$328¹ million) program. Though it has evolved over time, for instance a greater emphasis on the training of the next generation, its basic philosophy has remained essentially the same. The Program recognizes that creativity and innovation are at the heart of all advances in research, whether made individually or in groups.

The Program's objectives are to:

- promote and maintain a diversified base of high-quality research capability in the natural sciences and engineering in Canadian universities;
- foster research excellence; and
- provide a stimulating environment for research training.

Rather than funding projects that have defined deliverables to be achieved within a set timeline, Discovery Grants support new and ongoing programs of research in Canadian universities through several different grant types – individual, team, and project. A program of research is more than a collection of projects – it is framed by long term goals and sets a roadmap for achieving them.

Discovery Grants allow considerable flexibility to capitalize on opportunities, both in terms of changing research directions, in training the next generation of researchers and in the use of

¹ This includes the Discovery Grants portion of the Subatomic Physics envelope budget

funds. The intent of the program is to accompany researchers throughout their career, subject to substantial productivity and quality contributions to the advancement of knowledge or its application and to training of Highly Qualified Personnel.

Recently, a new component was added – the Discovery Accelerator Supplements. These ‘Accelerators’ provide substantial (\$120,000 normally over 3 years) and timely additional resources in order to accelerate progress and maximize the impact of outstanding research programs. In 2007, 79 awards were made (out of more than 3,500 Discovery Grants applications). In 2008 and on, there will be 100 awards available each year.

The Program only covers the direct costs of research. These include salaries/stipends to students and other research personnel, materials & supplies, equipment, travel to attend conferences or do field work, publication costs. The universities themselves, provinces or other agencies provide funding for the indirect costs of research (“overheads”).

1.1 PROGRAM DESIGN

The Discovery Grants program includes several different grant types – individual, group, and project (only for Sub-Atomic Physics). The vast majority of grants, greater than 95%, are individual grants.

Researchers can apply for only one research grant at a time, either individually or as part of a group but not both, and can only hold one research grant at any given time. This restriction does not apply to SAP (Sub-Atomic Physics) Project Research Grants, which may be held concurrently with an individual or group grant. ²

Researchers who apply individually can use their grants to participate in collaborative efforts. Researchers who see advantages in working together in a long-range collaborative program are encouraged to combine their efforts and apply as a group. The added benefits and costs associated with the collaboration are taken into account in the assessment.

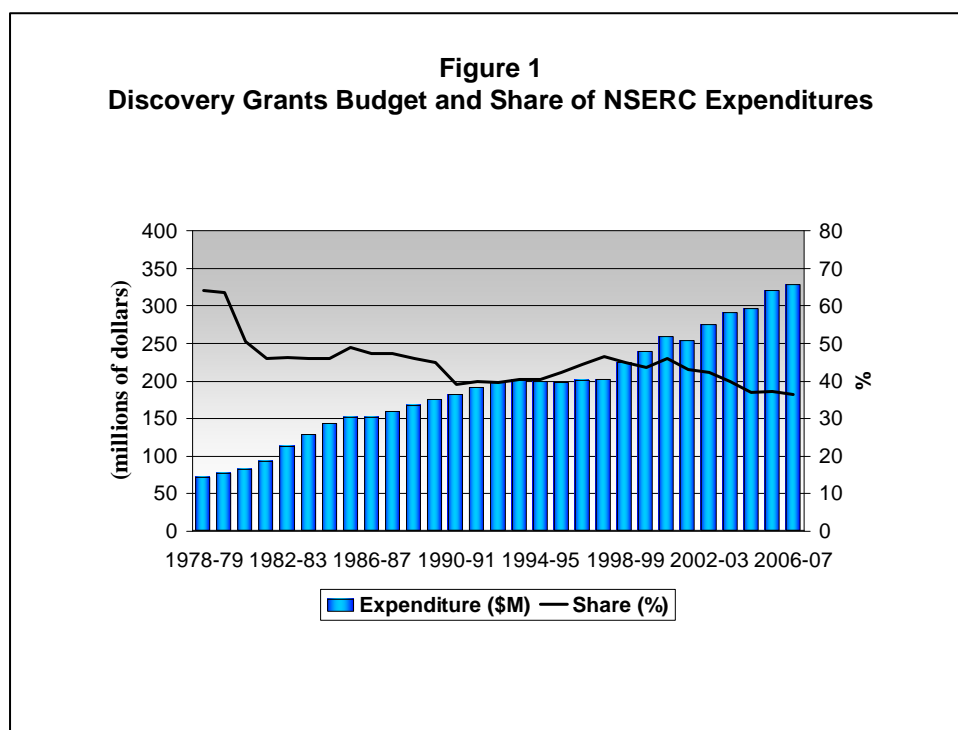
Research grants are awarded for one to five years, the normal duration being five years. A shorter duration can be requested, at the time of application, by researchers phasing out their research program. NSERC may award grants for a duration different than that requested.

² In 2007-08, there are 65 such Subatomic Physics Project Grants out of over 10,000 active grants.

2. PROGRAM STATISTICS

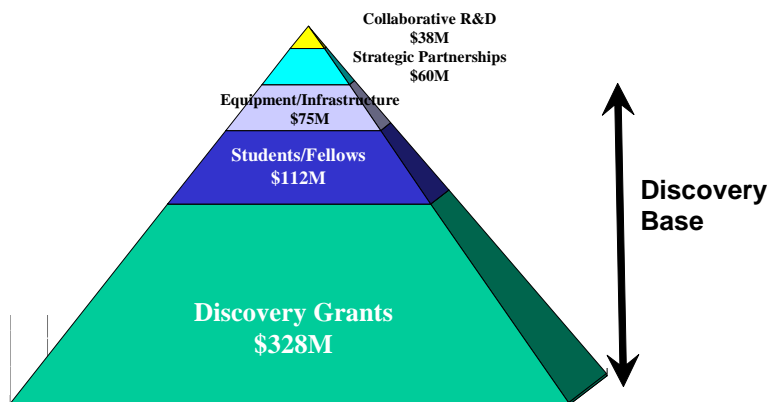
a) Historical Budget

The Discovery Grants program has always been NSERC's largest program and its budget since the creation of NSERC in 1978 is highlighted in Figure 1 and Table 1. As NSERC expanded its programs to support students and collaboration with industrial partners, and as the government introduced major new programs such as the Canada Research Chairs, Networks of Centres of Excellence and Canada Graduate Scholarships, the Discovery Grants program share of NSERC expenditures has fallen and now hovers around 40%.



NSERC's Discovery Grants program forms an important base for the entire university research community in the natural science and engineering. Many of NSERC's other programs build upon the basic support delivered through the DGP. The students and fellows supported through NSERC scholarships and fellowships train to a great extent under the supervision of Discovery grantees, and the vast majority of funding for equipment and infrastructure support is held by the same grantees. This base funding also complements NSERC's project programs in which 90% of those receiving project funding also hold a Discovery Grant. Figure 2 presents NSERC's major forms of support and the continuum from basic to project funding.

Figure 2
Discovery Grants Budget and Share of NSERC Expenditures



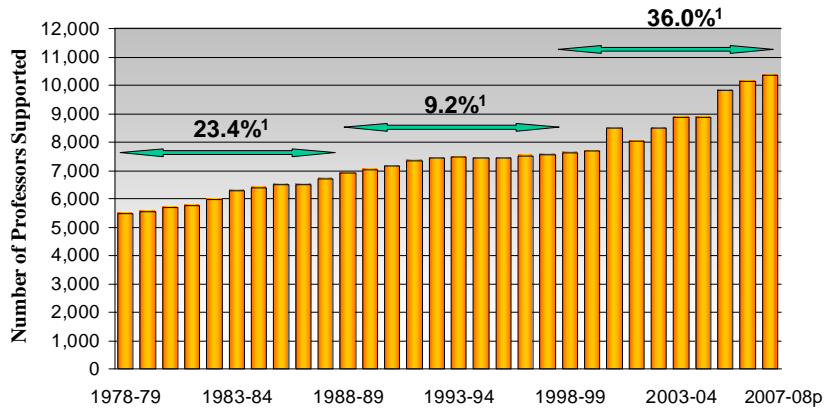
The program currently supports more than 10,000 professors or approximately 70% of the eligible academic population in the natural sciences and engineering. The number of professors supported has doubled over the 30 year period from 1978-79 to 2007-08 (as shown in Table 1 and Figure 3). The growth rates in the number of professors supported has varied by decade, with the first decade increase of 23.4%, followed by successive decade increases of 9.2% and 36.0%, respectively. After a period of faculty decline for most of the nineties, a turnaround began in the late nineties as universities began to replace retiring professors and hire additional staff as provincial and federal funding (Canada Research Chairs) increased. The most recent hiring cycle has resulted in unprecedented numbers of new faculty applying for their first Discovery Grant (see Figure 4). The pressure to give young faculty a good start to their research careers by offering a reasonable chance of receiving Discovery Grant funding has resulted in an overall average grant for the program that has struggled to keep pace with inflation (see Figure 5).

Table 1
Discovery Grants Program (DGP) Budget History

Fiscal Year	Discovery Grants	NSERC Budget	DGP as a % of NSERC Budget	Number of Professors Supported	Average Grant \$	Average Grant 1978 \$
	Budget (\$M)	Budget (\$M)				
1978-79	71.6	111.7	64.1%	5,480	13,064	13,064
1979-80	76.8	120.7	63.6%	5,551	13,834	12,597
1980-81	82.0	162.3	50.5%	5,673	14,455	11,948
1981-82	92.7	201.1	46.1%	5,754	16,110	12,029
1982-83	113.3	244.4	46.3%	5,975	18,961	13,048
1983-84	129.5	281.2	46.1%	6,293	20,579	13,420
1984-85	143.1	311.6	45.9%	6,400	22,362	14,130
1985-86	152.1	310.2	49.0%	6,484	23,455	14,355
1986-87	151.5	319.8	47.4%	6,508	23,282	13,833
1987-88	159.7	338.2	47.2%	6,704	23,816	13,540
1988-89	167.8	364.6	46.0%	6,910	24,291	13,207
1989-90	175.9	392.0	44.9%	7,015	25,078	13,049
1990-91	182.5	466.2	39.1%	7,143	25,552	12,891
1991-92	191.6	482.1	39.7%	7,344	26,087	12,787
1992-93	198.3	499.2	39.7%	7,443	26,645	12,877
1993-94	200.5	494.9	40.5%	7,482	26,797	12,771
1994-95	199.1	492.6	40.4%	7,446	26,742	12,598
1995-96	198.4	468.9	42.3%	7,453	26,620	12,269
1996-97	200.5	451.6	44.4%	7,503	26,721	12,116
1997-98	202.3	435.5	46.5%	7,546	26,808	12,010
1998-99	224.1	498.5	45.0%	7,610	29,452	13,247
1999-00	239.8	549.9	43.6%	7,674	31,247	13,819
2000-01	259.2	565.0	45.9%	8,497	30,500	12,951
2001-02	253.7	587.6	43.2%	8,046	31,536	13,241
2002-03	275.6	651.1	42.3%	8,508	32,399	13,464
2003-04	291.5	732.4	39.8%	8,886	32,801	13,179
2004-05	296.3	803.0	36.9%	8,873	33,390	13,030
2005-06	319.7	859.4	37.2%	9,828	32,526	12,307
2006-07	328.3	904.2	36.3%	10,153	32,338	11,973

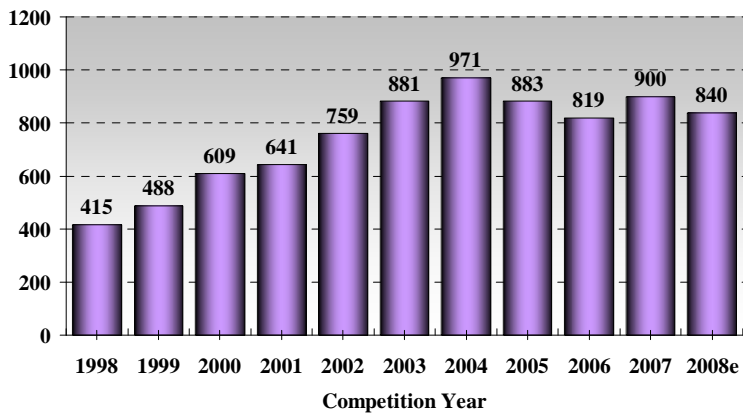
Includes Subatomic Physics Discovery Grants.

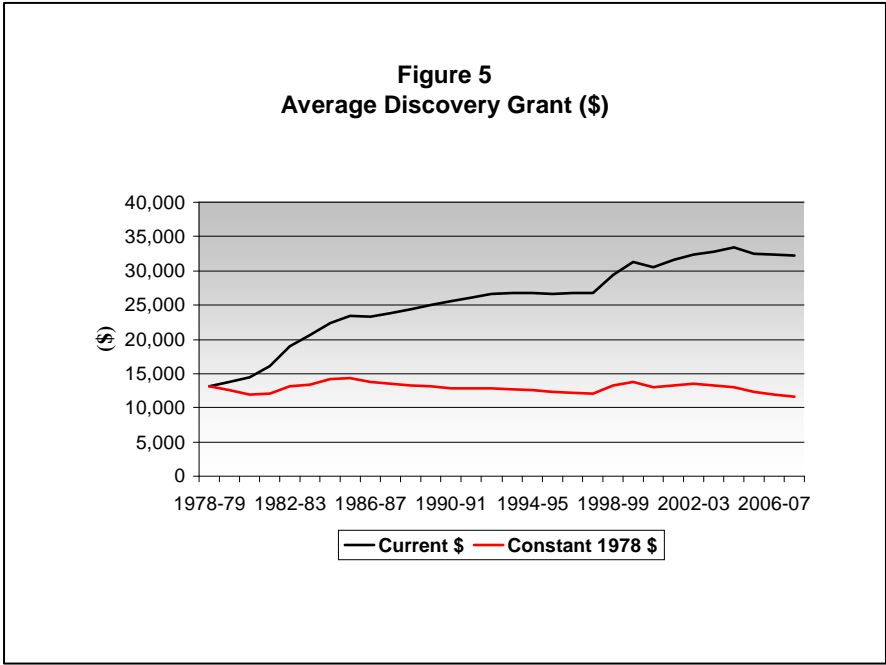
Figure 3
Number of Professors Supported by the Discovery Grants Program



1. Growth over the decade.

Figure 4
Number of First Time Applicants to NSERC's Discovery Grants Program





In 2006-07, professors from 65 Canadian universities received Discovery Grants program funding. Funding at the institutional level is concentrated at the large Canadian universities, with the top 10 institutions receiving 55% of DGP funding and the top 25 universities receiving 89% of program funding (see Figure 6). The universities of Toronto, British Columbia, Alberta, McGill and Montreal are the top 5 ranked DGP recipient institutions. Table 2 presents DGP funding by university for 2006-07.

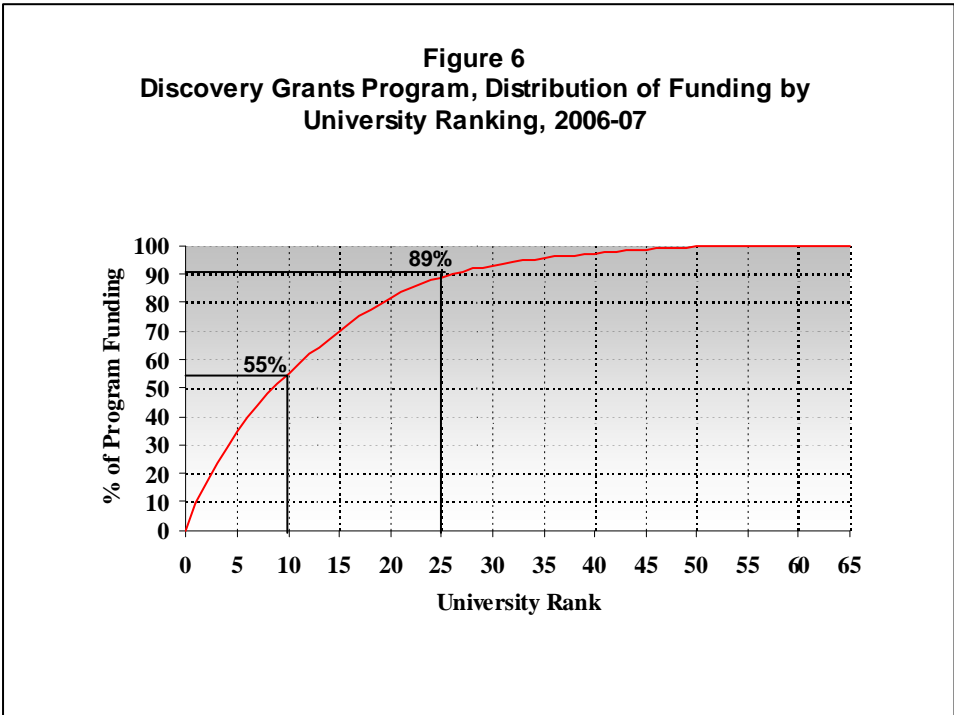


Table 2
Discovery Grants¹ Expenditures by University, 2006-07

Rank	University	(\$000)	(%)
1	Toronto	30,904	9.5
2	British Columbia	25,260	7.8
3	Alberta	19,548	6.0
4	McGill	18,855	5.8
5	Montreal ²	18,364	5.7
6	Waterloo	16,659	5.1
7	Queen's	14,055	4.3
8	McMaster	12,200	3.8
9	Calgary	11,491	3.5
10	Laval	11,487	3.5
11	Western Ontario	10,871	3.4
12	Guelph	10,571	3.3
13	Dalhousie	9,177	2.8
14	Simon Fraser	9,142	2.8
15	Victoria	8,426	2.6
16	Ottawa	8,340	2.6
17	Saskatchewan	8,147	2.5
18	Manitoba	7,735	2.4
19	Carleton	6,988	2.2
20	Concordia	5,869	1.8
21	York	5,837	1.8
22	Sherbrooke	5,793	1.8
23	Memorial	4,943	1.5
24	New Brunswick	4,271	1.3
25	Windsor	4,021	1.2
26	U of Q at Montreal	3,518	1.1
27	U of Q : INRS-IAF	3,022	0.9
28	Ryerson	2,400	0.7
29	Regina	2,068	0.6
30	Lethbridge	1,896	0.6
31	U of Q : ÉTS	1,732	0.5
32	Lakehead	1,652	0.5
33	Laurentian	1,639	0.5
34	Brock	1,629	0.5
35	U of Q at Trois-Rivières	1,621	0.5
36	Trent	1,296	0.4
37	Wilfrid Laurier	1,113	0.3
38	St. Mary's	1,037	0.3
39	U of Q at Rimouski	1,018	0.3
40	Royal Military College	977	0.3
41	St. Francis Xavier	966	0.3
42	Acadia	931	0.3
43	Northern British Columbia	780	0.2
44	U of Q at Chicoutimi	739	0.2
45	Winnipeg	722	0.2
46	Mount Allison	717	0.2
47	Moncton	681	0.2
48	Ontario Institute of Technology	639	0.2
49	Prince Edward Island	543	0.2
50	U of Q in Outaouais	403	0.1
51	Brandon	219	0.1
52	U of Q at A.-T.	212	0.1
53	Thompson Rivers	184	0.1
54	N.S. Agri. College	166	0.1
55	Bishop's	137	0.0
56	Mount St. Vincent	121	0.0
57	Cape Breton	112	0.0
58	Nipissing	108	0.0
59	Fraser Valley	56	0.0
60	Malaspina	53	0.0
61	Athabasca	48	0.0
62	Trinity Western	48	0.0
63	U of Q: Siège social	24	0.0
64	Redeemer University College	23	0.0
65	King's	22	0.0

1. Includes all Discovery Grants and Subatomic Physics Discovery Grants.

2. Includes École des H.É.C and École Polytechnique.

b) Competition Statistics

A Discovery Grant can be awarded for a period up to 5 years. On average, more than 3,000 applications are reviewed in a competition: applying will be those grantees that wish to renew their grants at the end of their terms, new applicants and those without funding.

The success rate, or number of awards divided by the number of applications, in a competition is one measure of competition results. The funding rate, another measure of competition results, is the ratio of the dollars requested by the applicant versus the actual amount awarded. Figure 7 and Table 3 present the historic success and funding rates for the program over the past 30 years. The success rate has fluctuated in a tight range from 69% to 84% while the funding rate has ranged from 37% to 55%. Perhaps what is more instructive to use is a combination of success rate and funding rate. The success rate multiplied by the funding rate for the Discovery Grants program has averaged 30.9% over the past five years. This value is typical of project-type grants programs. The success rates for NSERC's 'project-based' programs are typically in the 20% to 40% range.

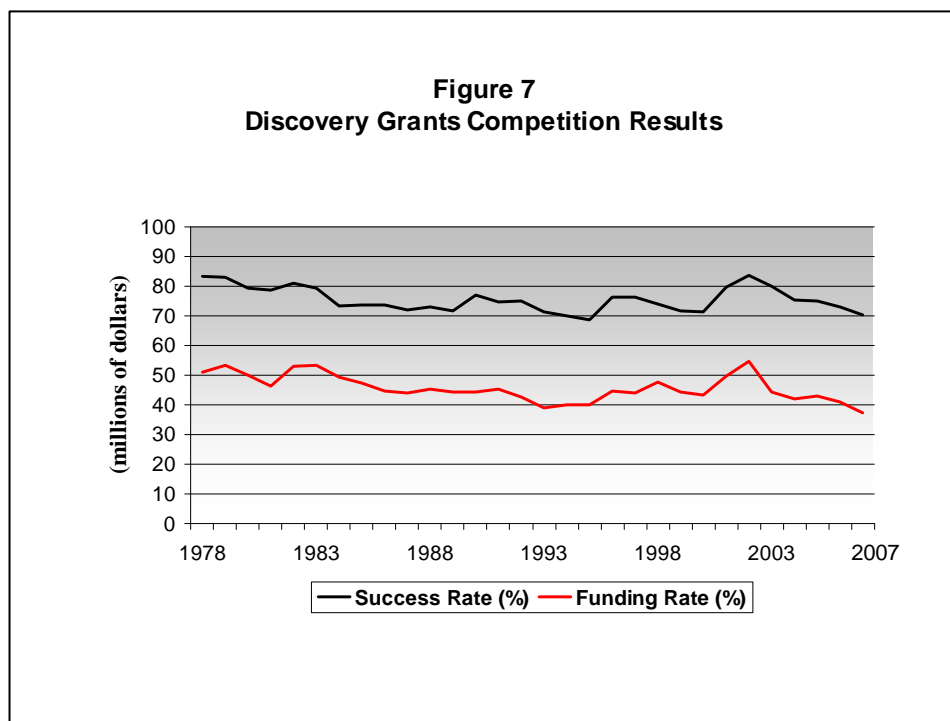


Table 3
Discovery Grants¹ Competition Results History, 1978 - 2007

Competition Year	No. of Requests	No. of Awards	Success Rate (%)	Dollars Requested (\$K)	Dollars Awarded (\$K)	Funding Rate (%)	Average Grant (\$)
1978	3,189	2,653	83.2	60,158	30,689	51.0	11,568
1979	3,120	2,590	83.0	65,740	34,976	53.2	13,504
1980	3,568	2,826	79.2	82,405	41,135	49.9	14,556
1981	3,503	2,752	78.6	86,967	40,347	46.4	14,661
1982	3,474	2,811	80.9	100,560	53,272	53.0	18,951
1983	3,791	3,013	79.5	120,349	64,254	53.3	21,326
1984	3,520	2,583	73.4	116,088	57,422	49.5	22,231
1985	3,577	2,631	73.6	135,939	64,337	47.3	23,688
1986	3,957	2,915	73.7	154,312	69,051	44.7	23,688
1987	3,881	2,795	72.0	152,542	67,248	44.1	24,060
1988	3,584	2,621	73.1	152,581	69,090	45.3	26,360
1989	3,864	2,773	71.8	169,870	75,287	44.3	27,150
1990	3,469	2,666	76.9	157,099	69,655	44.3	26,127
1991	3,476	2,594	74.6	164,598	74,372	45.2	28,671
1992	3,683	2,765	75.1	175,707	74,836	42.6	27,065
1993	3,586	2,557	71.3	173,792	67,777	39.0	26,506
1994	3,593	2,511	69.9	180,076	72,064	40.0	28,699
1995	2,557	1,752	68.5	125,987	50,290	39.9	28,704
1996	3,043	2,326	76.4	147,370	66,026	44.8	28,386
1997	2,777	2,119	76.3	136,532	59,985	43.9	28,308
1998	2,685	1,990	74.1	134,803	64,366	47.7	32,345
1999	2,645	1,892	71.5	137,663	61,050	44.3	32,267
2000	2,963	2,111	71.2	156,482	67,720	43.3	32,080
2001	3,089	2,461	79.7	186,319	92,480	49.6	37,578
2002	2,947	2,466	83.7	168,703	92,449	54.8	37,489
2003	3,001	2,401	80.0	172,660	76,600	44.4	31,904
2004	3,043	2,297	75.5	175,854	73,987	42.1	32,210
2005	3,245	2,439	75.2	182,054	78,180	42.9	32,054
2006	3,285	2,399	73.0	189,238	77,873	41.2	32,461
2007	3,590	2,521	70.2	199,639	74,238	37.2	29,448

1. Includes Discovery grants (individual, group, project, and multidisciplinary network groups), EWR Steacie supplement, and Subatomic Physics discovery grants (individual, group, and project).

Participation and performance in the Discovery Grants competition vary for applicants from universities of different size (See Figures 8 to 11).

Figure 8 shows the number of applications for institutions in 3 size categories – large (the 13 research intensive universities), small (those having received less than a total of \$3 million in the past 5 years) and the medium-sized institutions. For instance, in the 2007 competition 51.5% of applicants were from the large (G-13) universities; 44.1% from medium sized universities and 4.4% from small universities. Over the 1999-2007 timeframe, the number of applicants in the competition has increased, and the growth has been largest in medium sized institutions:

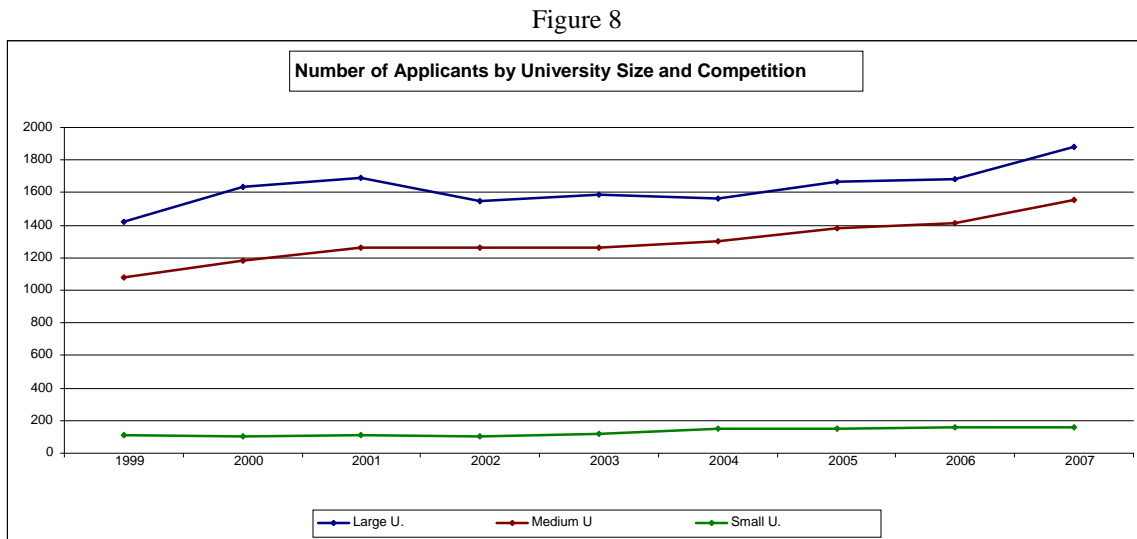


Figure 9 presents the Success Rate of applicants at these institutions. The success rates declines with the size of the institution. There may be many factors contributing to differences in success rates:

- Enabling, research friendly environments
- Critical mass of researchers in the same or related fields
- Availability of graduate programs, particularly at the PhD level
- Access to equipment and facilities
- Teaching loads
- Availability of internal sources of funding
- Availability of other external sources of funding (e.g., provincial).

Figure 9

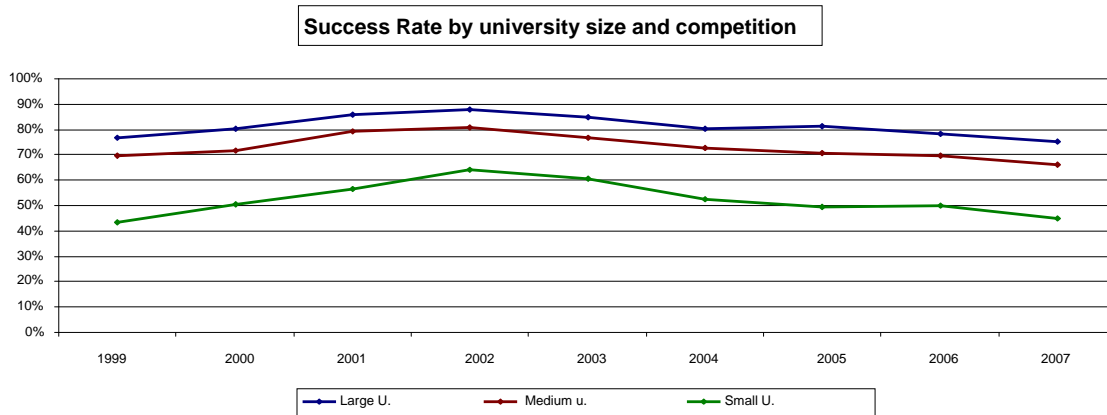
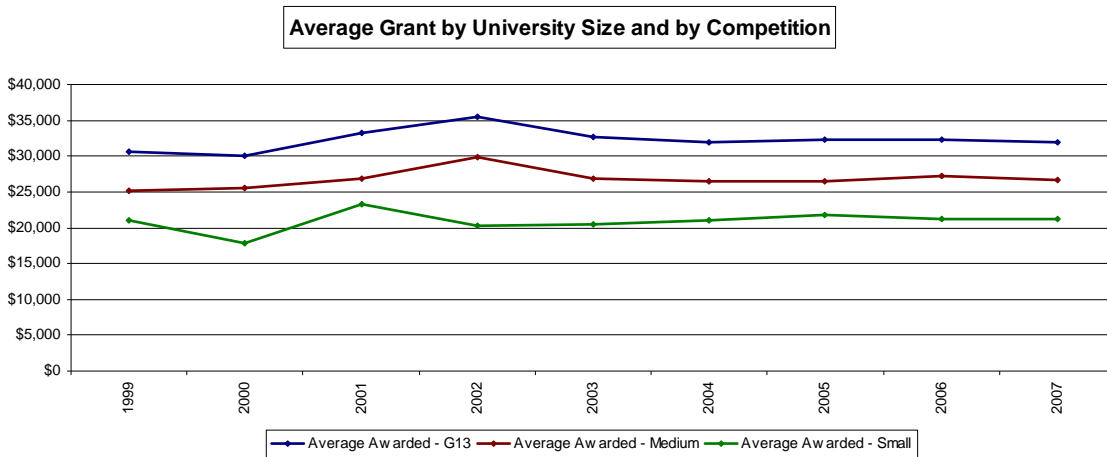


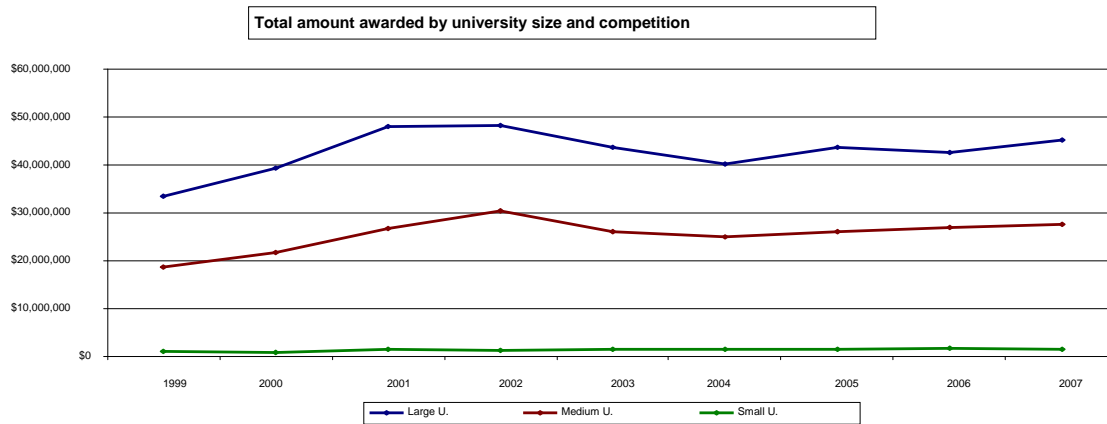
Figure 10 shows the average grant awarded to researchers from the 3 university categories.

Figure 10



Finally Figure 11 gives the total amount awarded by institution size. Not surprising the amounts to large universities are the largest given they have the most applicants, with the highest success rate and average grants.

Figure 11.



The funding rate for Discovery Grants reflects the objective to provide a "grant in aid" of research, that is, basic operating support for a researcher's ongoing research and student training activities. Discovery Grants provide a platform and leverage from which a researcher can: access knowledge around the world; develop and launch projects through other grants from NSERC or; in many areas, secure R&D funding from other sources, notably industry.

c) New Researchers

As previously mentioned, the number of new applicants (see Figure 4 on page 7) to NSERC’s Discovery Grants Program has more than doubled over the past ten years. The number of new researchers now supported through the DGP is at an all-time high. In the following analysis, professors still holding their first Individual Discovery Grant in 2006-07 are classified as “new researchers.”

In 2006-07, there were nearly 2,800 new researchers funded for a total of \$56M or an average grant of \$20,400. The details by Grant Selection Committee for new researchers are presented in Table 4. The overall decile range of average grants for new researchers is presented in Figure 12 (the overall decile distribution is the compilation of decile distribution by Grant Selection Committees). New researchers tend to be awarded fairly similar award amounts to launch their research careers. A recent phenomenon with respect to new applicants has been the influx of senior researchers (attracted to Canada from abroad due to Canada’s enhanced support for university research, e.g. through the Canada Research Chairs) applying and receiving funding for the first time. This phenomenon results in the top (90-100) decile average grants to be considerably higher than for the remaining 90% of new researchers. Because of this rather narrow grant range for new researchers, the bulk of the analysis in this report will concentrate on “established researchers.”

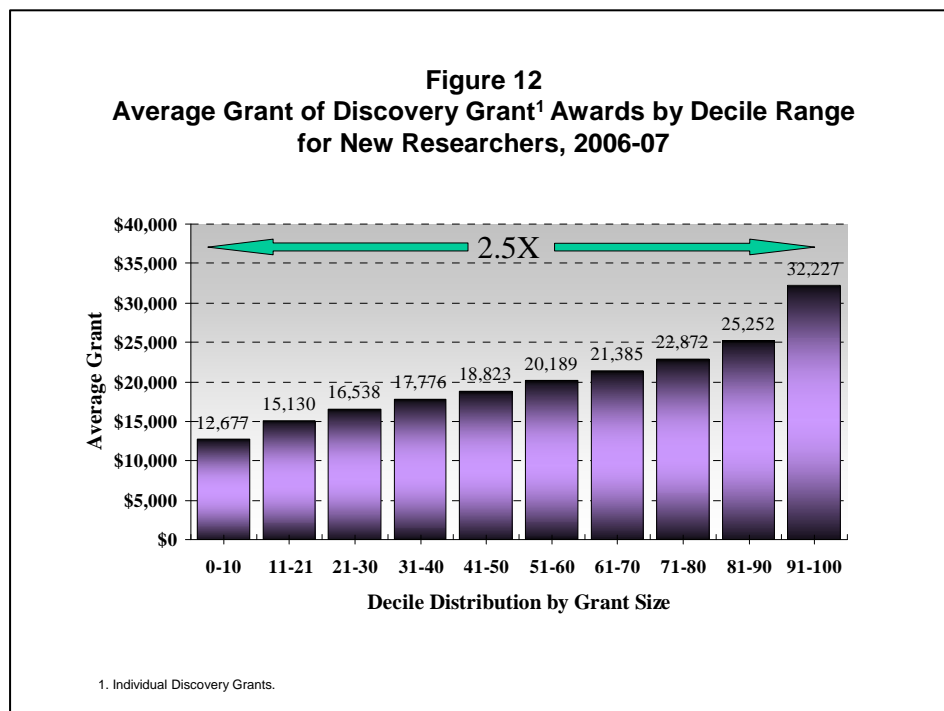


Table 4
Grant Distribution of New Researchers¹, 2006-07

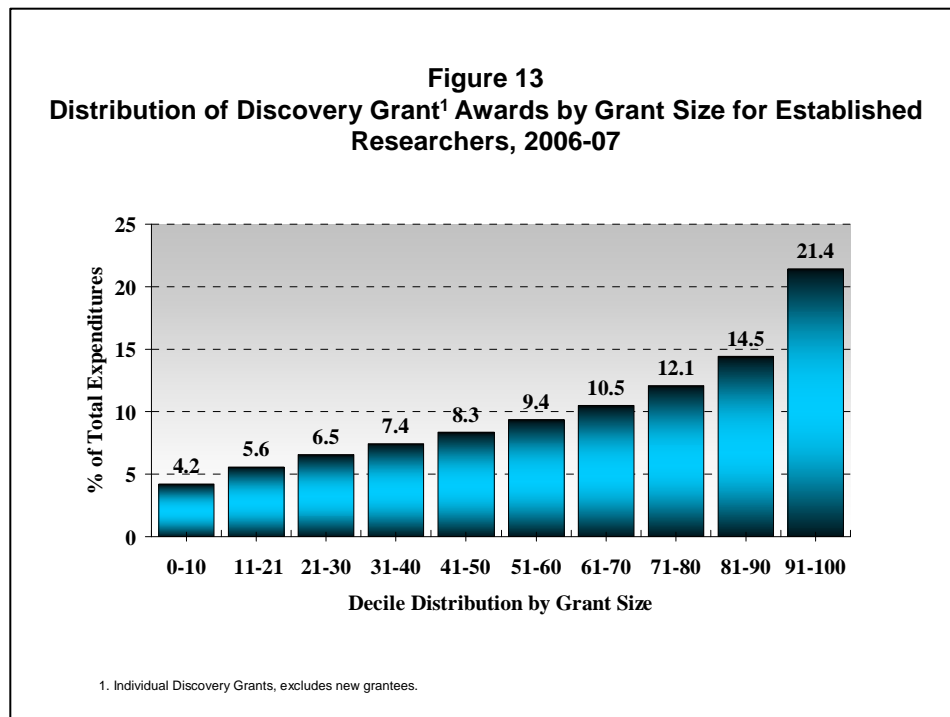
Grant Selection Committee (GSC)	No. of Grantees	Dollars Awarded (\$)	Average Grant (\$)	Average Grant (\$) by Decile										Decile Range Multiple ²
				0-10	10-20	20-30	30-40	40-15	50-60	60-70	70-80	80-90	90-100	
Analytical & Physical Chemistry	78	2,415,995	30,974	16,578	21,931	24,818	26,659	28,629	30,798	31,915	35,861	40,250	50,211	3.0
Cell Biology	126	3,579,343	28,407	20,612	23,729	25,047	26,163	27,187	28,572	29,958	31,461	33,122	37,557	1.8
Chem. & Metallurgical Eng	167	3,351,024	20,066	15,199	15,906	16,673	17,475	18,403	19,223	20,522	21,344	22,798	32,704	2.2
Civil Engineering	129	2,110,734	16,362	12,450	13,088	14,084	14,940	15,392	16,270	17,366	17,981	19,192	22,558	1.8
Communications, Computers & Components Engineering	193	3,517,661	18,226	12,497	14,577	15,667	16,515	16,988	18,101	18,345	19,288	21,202	28,618	2.3
Computing and Information Sciences	325	5,461,065	16,803	9,579	11,918	12,791	14,134	15,444	16,924	17,857	19,425	21,381	28,216	2.9
Condensed Matter Physics	86	2,437,187	28,339	10,869	16,336	20,470	22,795	26,198	28,869	31,074	33,205	36,555	54,511	5.0
Electromagnetics & Electrical Systems Engineering	84	1,960,340	23,337	15,726	17,326	19,551	20,418	21,093	21,811	23,795	25,529	28,996	37,722	2.4
Environmental Earth Sciences	118	2,028,501	17,191	10,467	13,003	14,701	15,646	16,185	16,854	18,301	19,715	21,243	25,147	2.4
Evolution & Ecology	174	3,306,437	19,003	11,337	13,443	14,880	16,062	17,244	18,426	20,043	22,203	24,796	30,975	2.7
General Physics	48	1,156,191	24,087	12,130	15,520	17,654	19,466	20,833	24,485	25,896	29,431	33,731	38,684	3.2
Industrial Engineering	78	1,243,511	15,942	9,178	13,026	13,910	14,349	14,957	15,840	16,650	17,999	19,659	22,888	2.5
Inorganic & Organic Chemistry	72	2,193,250	30,462	18,531	22,530	24,900	26,337	27,104	30,088	31,434	33,911	36,964	50,070	2.7
Integrative Animal Biology	160	4,159,427	25,996	17,516	20,737	22,379	23,856	25,023	26,435	27,657	28,994	30,888	35,363	2.0
Interdisciplinary	43	969,610	22,549	11,621	15,150	16,351	17,712	19,372	21,103	24,073	26,975	30,636	39,171	3.4
Mechanical Engineering	180	3,224,543	17,914	12,942	14,472	15,632	16,044	16,691	17,277	18,187	19,307	21,110	26,715	2.1
Molecular & Developmental Genetics	90	2,601,902	28,910	20,522	21,128	24,098	25,752	28,364	29,195	30,256	31,614	35,290	40,645	2.0
Plant Biology & Food Science	91	2,550,419	28,027	17,171	20,241	22,135	24,822	25,857	28,064	29,775	32,234	35,753	42,595	2.5
Psychology: Brain, Behaviour & Cognitive Science	134	2,261,088	16,874	11,099	12,889	13,931	14,990	16,203	17,212	18,296	19,116	20,571	23,918	2.2
Pure and Applied Mathematics	182	2,217,720	12,185	5,531	6,871	8,069	9,249	10,147	11,147	12,542	13,995	17,369	26,211	4.7
Solid Earth Sciences	67	1,376,466	20,544	12,163	15,502	16,633	17,474	19,182	20,504	21,326	22,846	25,718	32,570	2.7
Space & Astronomy	40	1,070,065	26,752	11,080	16,950	18,841	20,709	24,236	26,228	27,473	30,918	33,740	48,090	4.3
Statistical Sciences	91	991,910	10,900	6,705	8,396	9,407	9,960	10,237	10,790	11,343	11,801	13,123	16,606	2.5
Total	2,756	56,184,391	20,386	12,677	15,130	16,558	17,776	18,823	20,189	21,385	22,872	25,252	32,227	2.5

1. Grantees still on their first NSERC Individual Discovery Grant in 2006-07. Excludes Subatomic Physics.

2. Average Grant for the 90-100 decile range divided by average grant in the 0-10 decile range.

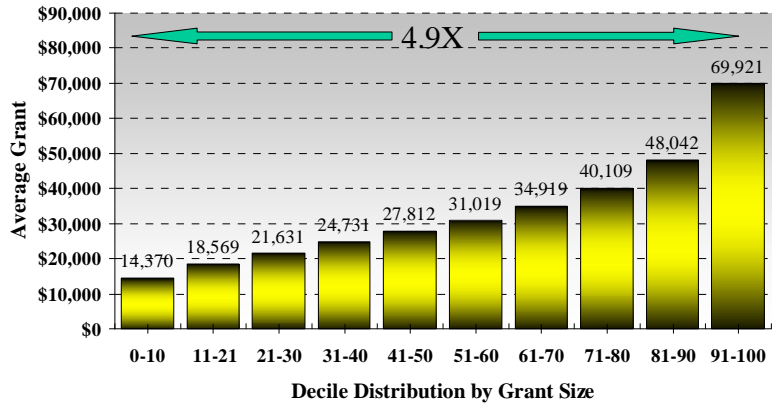
d) Established Researchers

In the analysis that follows “established researchers” were the professors that were on at least a minimum of their 2nd Individual Discovery Grant. The established researcher population numbered slightly more than 7,000 and received total funding of \$233M or an average grant of \$33,200 in 2006-07. Funding for this group of researchers is more dispersed than for the new researcher population. Similar to institutional concentration of resources, the upper deciles of the established researcher population receives the lion’s share of funding (see Figure 13 and Table 5). The average grant by decile for established researchers ranges from \$14,400 at the low end to nearly \$70,000 at the top (see Figure 14), for a spread of 4.9 times.



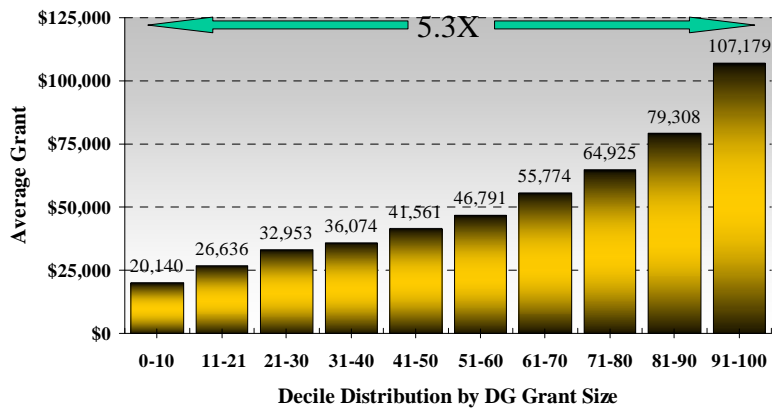
Many established researchers apply for funding provided by other NSERC programs. As researchers tap into other NSERC program funding, their average total funding levels increase. The average grants by DG decile for established researchers when all NSERC funding is included is presented in Figure 15. As the figure indicates, the average grants increase to a range from \$20,100 to \$107,200 as compared to the range shown in Figure 9. A comparison of DGP funding with other NSERC funding is presented in Table 6. A leverage ratio of other NSERC funding to NSERC DGP funding for established researchers can be calculated and is presented in Figure 16. Figure 16 indicates, for the most part, that established researchers with higher Discovery grants leverage more funding from other NSERC sources. Researchers in the lower decile range also perform fairly well in leveraging other NSERC funding. (Detailed leverage ratios by Grant Selection Committee are provide in Table A1 in Appendix A).

Figure 14
Average Discovery Grant¹ Awards by Decile Range
for Established Researchers, 2006-07



1. Individual Discovery Grants, excludes new grantees.

Figure 15
Average for all NSERC Funding by Discovery Grants¹ Decile Range
for Established Researchers, 2006-07



1. Individual Discovery Grants. Includes all NSERC funding. Excludes new grantees.

Table 5
Grant Distribution of Established Grantees¹, 2006-07

Grant Selection Committee (GSC)	No. of Grantees	Dollars Awarded (\$)	Average Grant (\$)	Average Grant (\$) by Decile										Decile Range Multiple ²
				0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	
Integrative Animal Biology	345	13,962,782	40,472	19,521	24,859	27,833	30,742	33,766	37,328	41,431	46,445	56,283	85,268	4.4
Plant, Biology & Food Science	266	11,176,969	42,019	18,563	22,662	26,760	31,017	34,692	38,430	44,789	53,167	62,929	85,886	4.6
Psychology: Brain, Behaviour & Cognitive Science	344	10,475,606	30,452	12,432	15,543	18,726	21,560	24,705	28,307	32,163	36,726	46,066	67,430	5.4
Evolution & Ecology	440	14,357,873	32,632	11,355	15,329	18,519	22,590	25,766	29,587	35,275	42,225	51,333	72,937	6.4
Cell Biology	242	9,894,357	40,886	22,542	27,217	29,873	33,257	35,888	38,512	41,620	47,961	55,433	75,223	3.3
Molecular & Developmental Genetics	214	9,278,902	43,359	22,976	27,438	30,203	34,018	39,149	43,012	46,265	51,268	59,839	78,040	3.4
Solid Earth Sciences	282	9,972,272	35,363	11,844	18,183	21,921	26,461	30,215	33,230	37,290	42,848	49,659	80,441	6.8
Environmental Earth Sciences	285	8,226,871	28,866	13,079	15,911	18,979	21,113	23,129	25,541	29,061	33,140	41,145	66,340	5.1
Space & Astronomy	147	5,725,525	38,949	8,959	17,281	22,315	27,655	32,826	36,404	43,703	52,730	62,197	82,987	9.3
Analytical & Physical Chemistry	294	14,958,234	50,878	16,261	27,080	32,620	38,848	43,838	47,380	53,353	60,981	74,674	112,041	6.9
Inorganic & Organic Chemistry	274	15,753,334	57,494	21,704	30,074	36,518	41,512	46,770	55,428	63,904	74,614	86,937	115,548	5.3
Condensed Matter Physics	183	7,441,166	40,662	11,729	18,238	24,295	30,798	35,092	38,945	43,909	49,844	60,845	90,525	7.7
General Physics	128	4,568,443	35,691	10,206	17,580	20,659	24,686	29,404	32,737	37,354	45,072	55,738	81,030	7.9
Pure and Applied Mathematics	479	8,424,984	17,589	5,911	8,242	10,083	12,120	14,146	15,646	17,990	21,833	28,646	41,028	6.9
Statistical Sciences	228	4,496,972	19,724	8,290	11,161	13,239	15,348	17,041	18,826	20,522	23,261	28,261	40,674	4.9
Computing and Information Sciences	690	19,424,986	28,152	11,790	15,009	17,498	20,104	23,564	26,665	29,957	33,420	40,033	62,742	5.3
Chem. & Metallurgical Eng	443	14,845,225	33,511	18,680	21,662	24,217	26,322	28,498	30,785	33,586	36,886	44,324	69,491	3.7
Civil Engineering	429	11,620,031	27,086	15,205	17,314	18,587	20,438	22,950	25,454	28,553	31,531	36,476	54,278	3.6
Mechanical Engineering	457	12,435,842	27,212	14,995	17,715	19,989	23,570	25,283	27,719	31,759	36,495	52,247	81,110	4.9
Industrial Engineering	194	5,010,054	25,825	11,108	14,677	17,069	19,705	21,313	23,690	27,222	31,226	36,932	54,110	4.9
Communications, Computers & Components Engineering	325	10,009,750	30,799	14,488	17,434	19,658	21,802	24,541	28,246	32,467	37,222	46,834	64,246	4.4
Electromagnetics & Electrical Systems Engineering	253	8,775,737	34,687	17,962	21,802	24,320	26,482	30,177	33,539	37,548	42,749	49,002	62,392	3.5
Interdisciplinary	73	2,175,470	29,801	12,152	17,400	20,581	22,783	24,283	26,126	29,461	34,199	41,500	65,480	5.4
Total	6,942	230,835,915	33,252	14,370	18,569	21,631	24,731	27,812	31,019	34,919	40,109	48,042	69,921	4.9

1. Grantees on their second or greater NSERC Individual Discovery Grant in 2006-07. Excludes Subatomic Physics.

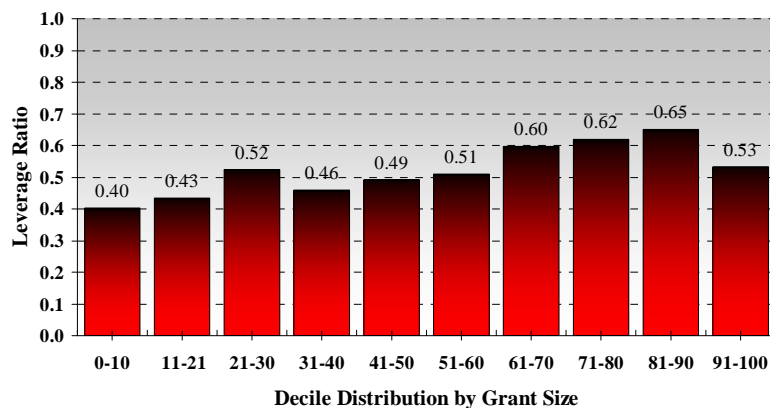
2. Average Grant for the 90-100 decile range divided by average grant in the 0-10 decile range.

Table 6
Leverage Ratios for Established Researchers¹

Decile	DGP Funding (\$)	Other NSERC Funding (\$)	Leverage Ratio²
0-10	9,901,185	3,974,990	0.40
10-20	12,961,403	5,630,255	0.43
20-30	15,249,827	7,981,824	0.52
30-40	17,312,000	7,939,623	0.46
40-15	19,412,735	9,596,851	0.49
50-60	21,868,289	11,119,629	0.51
60-70	24,547,750	14,661,089	0.60
70-80	28,156,606	17,420,458	0.62
80-90	33,677,651	21,917,096	0.65
90-100	49,923,939	26,601,714	0.53

1. Grantees on their second or greater NSERC Individual Discovery Grant in 2006-07. Excludes Subatomic Physics.
2. Other funding divided by DGP funding.

Figure 16
Leverage Ratio¹ by Discovery Grants² Decile Range for Established Researchers, 2006-07



1. Other NSERC funding divided by Discovery Grants funding. 2. Individual Discovery Grants. Includes all NSERC funding. Average grant rounded to the nearest one hundred dollars.

A profile of established researchers can also be developed to better understand who is being funded and at what level. Table 7 presents the distribution of established researchers by decile and province, university size, position, and gender. As an example of the uneven distribution of researchers by the factors mentioned above, Figures 17 to 19 present the percentage of grantees that are in the 0 to 30 decile range by province, position, university size, and sex, respectively. For example, Figure 17 indicates that 45.3% of established researchers from Newfoundland (NL), 71.4% from P.E.I., 58.1% from New Brunswick (NB), and 23.9% from B.C. are in the 0-30% range of the established researcher pool. If the distribution of established grantees was evenly spread-out, each province would have 30% of its grantees in this range. Figures 18 and 19 indicate that adjunct and assistant professors, researchers at small universities, and slightly more females are in the 0-30 decile range for the established researcher pool. Any changes in selectivity in the Discovery Grants Program would need to take into consideration the impact on certain segments of the population. A sharp decrease in the number of researchers supported by the program would likely lead to a significant drop in university research being conducted in the Atlantic provinces and research by younger, older (emeriti) and affiliated (adjuncts) professors.

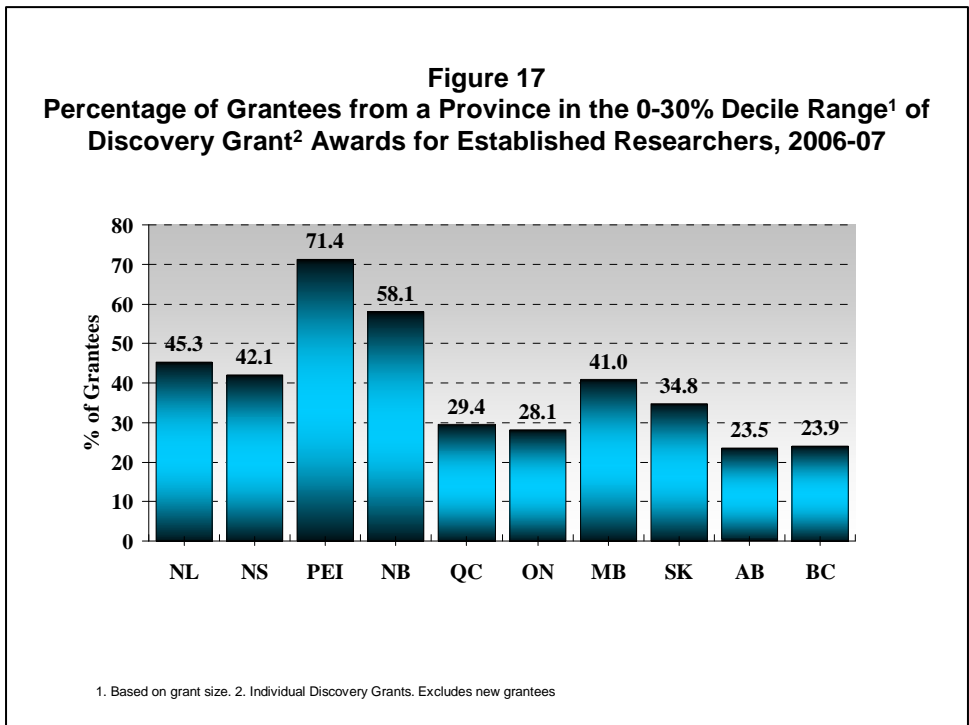
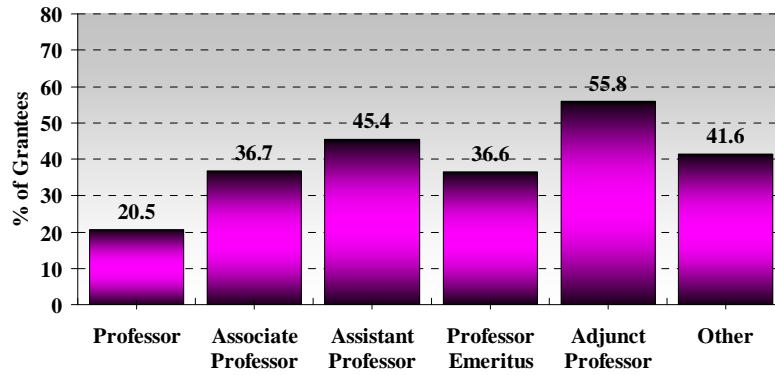
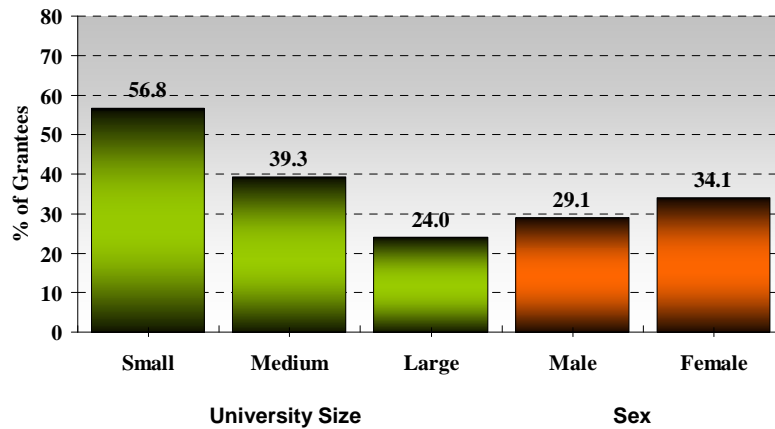


Figure 18
Percentage of Grantees by Rank in the 0-30% Decile Range¹ of Discovery Grant² Awards for Established Researchers, 2006-07



1. Based on grant size. 2. Individual Discovery Grants. Excludes new grantees

Figure 19
Percentage of Grantees by University Size and Sex in the 0-30% Decile Range¹ of Discovery Grant² Awards for Established Researchers, 2006-07



1. Based on grant size. 2. Individual Discovery Grants. Excludes new grantees

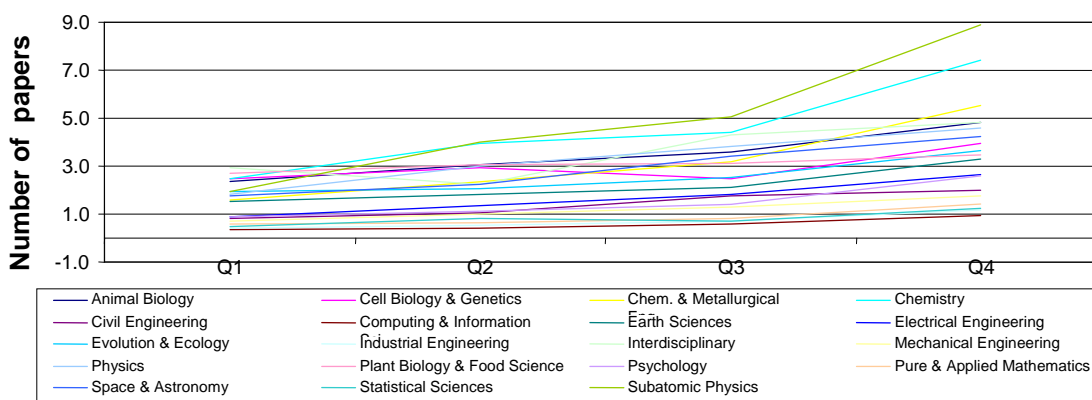
e) Research and Training

In the report *A Review of Canadian Publications and Impact in the Natural Sciences and Engineering, 1996 to 2005* it was shown that Canadian science and engineering publications were of high quality and produced in significant numbers.

In a previous detailed bibliometric study³ on Discovery Grants recipients it was determined that:

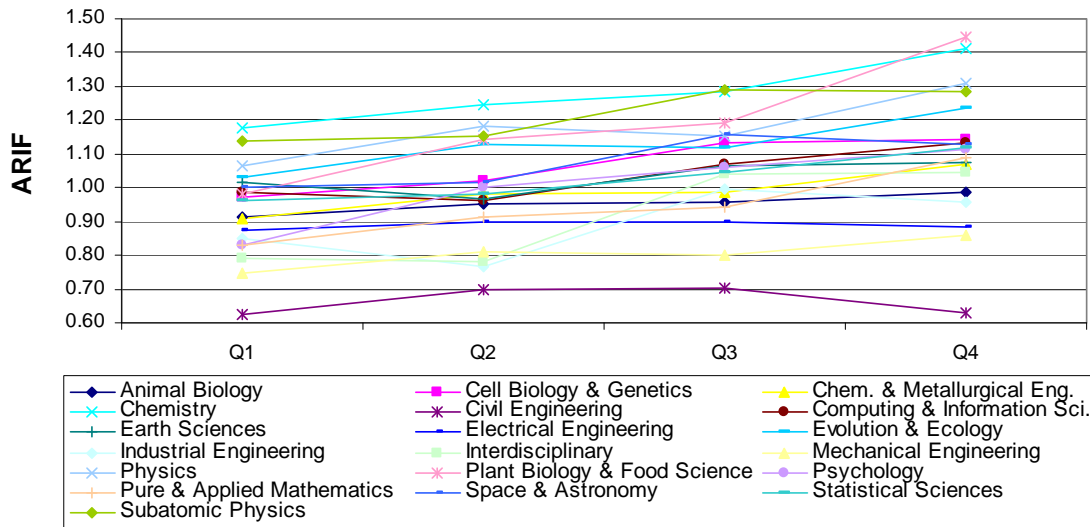
- There was a positive correlation between the funding level of the Discovery Grant and the number of papers produced (see Figure 20), The correlation does vary, however, from committee to committee. It is stronger in the case of chemical engineering and metallurgy, space and astronomy, physics, and electrical engineering, but far weaker (virtually non-existent) in biology and interdisciplinary research. It should be noted, however, that the differences in scientific production by funding level are not always significant. In general, it is only when funding is relatively high (quartiles 3 and 4), that the number of papers differentiates the researchers.
- There was also a very weak statistical relationship between funding level and ARIF (average relative impact factor) – a significant difference by funding level exists for a limited number of committees only, such as chemistry, plant biology, physics, and mathematics (Figure 21). From these results, it was concluded that regardless of the level of funding that researchers receive, they publish in journals of similar quality, and this quality is high.

Figure 20
Average Annual Number of Papers by Established Researchers,
by Funding Quartile and by Committee



³ A Bibliometric Evaluation of the NSERC Research Grants Program
(http://www.nserc.gc.ca/about/bibliometric_e.htm)

Figure 21
Average Relative Impact Factor (ARIF) for Established Researchers,
by Funding Quartile and by Committee

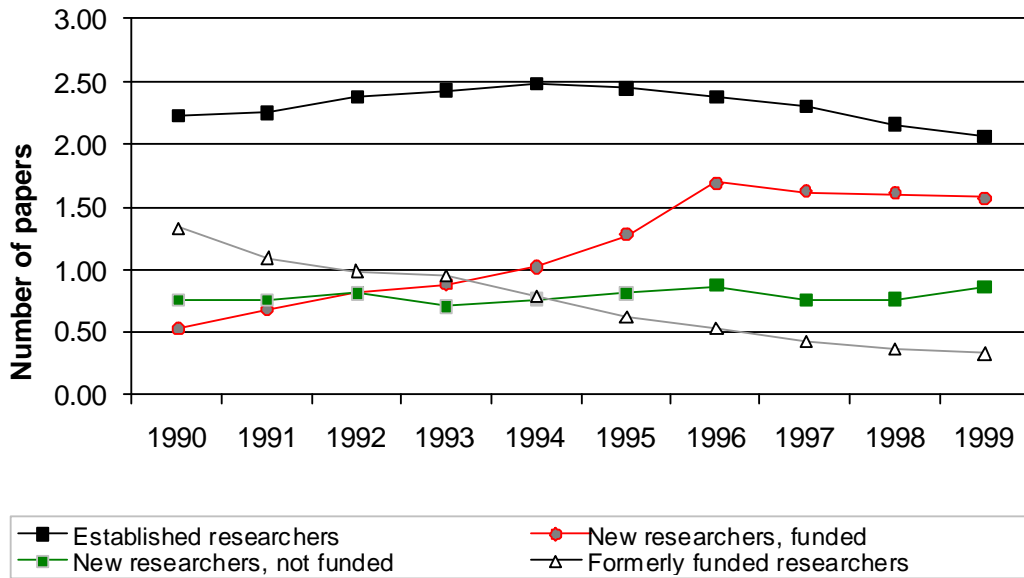


Further analysis from this study examined the impact of Discovery Grant funding for four groups of researchers, as follows:

- Group 1. Established researchers
- Group 2. Funded new researchers
- Group 3. Unfunded new researchers
- Group 4. Previously funded researchers whose funding was terminated.

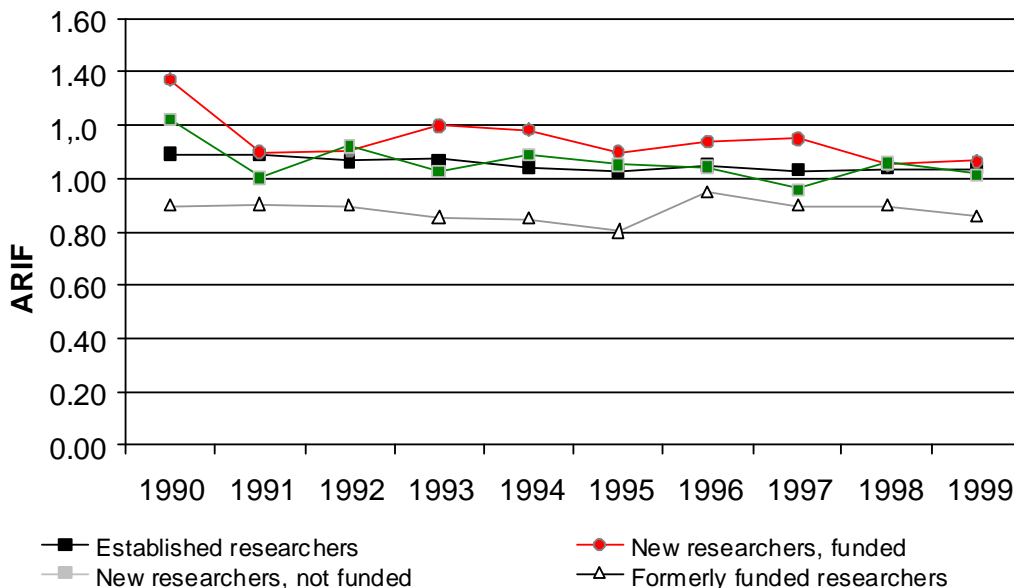
The results of the analysis for the 4 groups is presented in Figure 22 and reveal three facts. First, the established researchers (Group 1) are the ones who produce the most papers: over 2 per year throughout the period. Their productivity has decreased slightly, however, since 1994. Perhaps some of them are slowly joining the ranks of researchers who are winding up their careers. Second, the productivity of newly funded researchers (Group 2) has increased steadily: they went from less than one paper per year in 1993 to 1.5 in 1999, which is almost double. (Their productivity had already begun to climb before 1993.) At this rate, they should catch up with the established researchers within a few years. Lastly, the new researchers who did not receive funding (Group 3) have seen their productivity languish below one paper per year. In short, the data show that the funding has a definite impact on researchers' productivity, and on the productivity of new researchers in particular.

Figure 22
Productivity (Average Number of Papers per Year) for Researchers with Different Funding Histories



Regarding the ARIF for the researchers in the four groups, we see the same trends as before: funding has no impact on the quality of the journals in which authors publish (Figure 23). Apart from those researchers who have not received any funding since 1992 (Group 4), all the researchers, including those who were unsuccessful in the 1993 competition and never received any NSERC funding subsequently (Group 3), publish in journals of the same quality.

Figure 23
Average Relative Impact Factor (ARIF) for Researchers with Different Funding Histories



Another important consideration for the Discovery Grants program is the level of training provided by the funded researchers. The expenditures of the established researchers in 2006-07 were examined to determine the amount of funding per thousand dollars of awarded amount going to pay for students and fellows. Figures 24 to 27 and Table 8 (see Tables A2 to A9 for details by Grant Selection Committee in Appendix A) provide details for the student and postdoctoral fellow support provided by established researchers and decile range. The students and fellows supported can either be Canadian citizens or foreign students/fellows. As can be seen from the figures and table the results indicate:

- Grantees with smaller grants tend to spend more on undergraduate students as compared to the better funded colleagues;
- A similar trend exists at the master’s level, especially for Canadian students, with grantees in the lower decile ranges spending more on master’s student funding;
- At the doctoral level, spending per thousand dollar grant is fairly even across most deciles, except for the lowest decile range,
- Funding for postdoctoral fellows is more probable at the upper decile ranges where the necessary funds to pay for the more expensive postdoctoral fellows exist; and
- Overall spending on students and fellows is fairly similar at all decile levels, with only the mix of student/fellow funding changing.

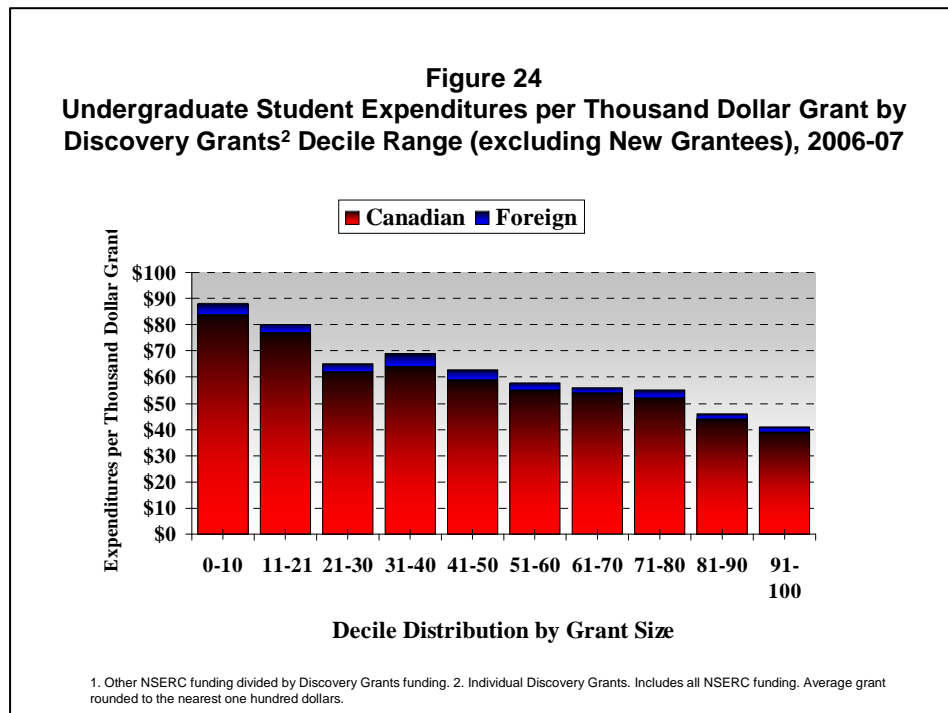
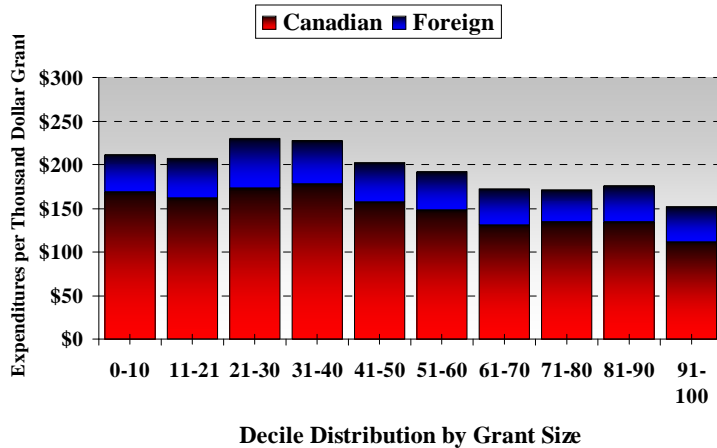
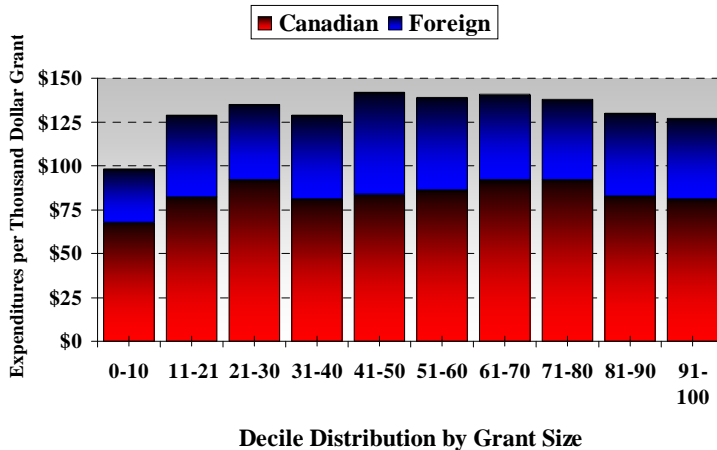


Figure 25
Master's Student Expenditures per Thousand Dollar Grant by Discovery Grants² Decile Range (excluding New Grantees), 2006-07



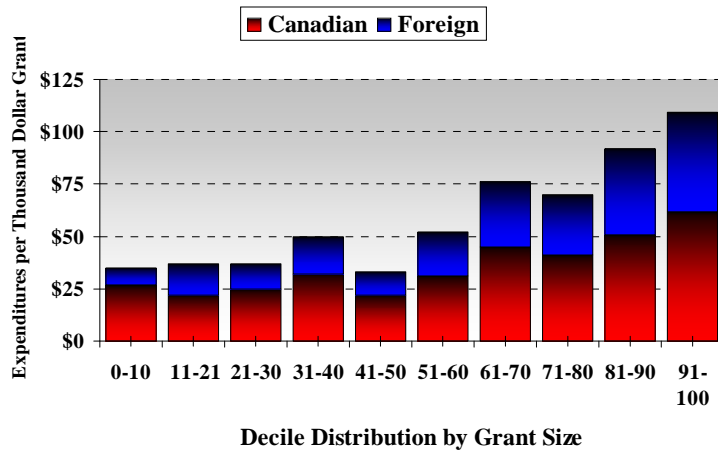
1. Other NSERC funding divided by Discovery Grants funding. 2. Individual Discovery Grants. Includes all NSERC funding. Average grant rounded to the nearest one hundred dollars.

Figure 26
Ph.D. Student Expenditures per Thousand Dollar Grant by Discovery Grants² Decile Range (excluding New Grantees), 2006-07



1. Other NSERC funding divided by Discovery Grants funding. 2. Individual Discovery Grants. Includes all NSERC funding. Average grant rounded to the nearest one hundred dollars.

Figure 27
PDF Expenditures per Thousand Dollar Grant by Discovery Grants² Decile Range (excluding New Grantees), 2006-07



1. Other NSERC funding divided by Discovery Grants funding. 2. Individual Discovery Grants. Includes all NSERC funding. Average grant rounded to the nearest one hundred dollars.

Table 8
Expenditures Per Thousand Dollar Grant by Established Researchers and Decile on Training

Decile	Undergraduate Students		Master's Students		Ph.D. Students		Postdoctoral Fellows		Training
	Canadian (\$)	Foreign (\$)	Canadian (\$)	Foreign (\$)	Canadian (\$)	Foreign (\$)	Canadian (\$)	Foreign (\$)	Total (\$)
0-10	84	4	169	42	68	30	27	8	431
10-20	77	3	162	45	82	47	22	15	452
20-30	62	3	173	57	92	43	25	12	468
30-40	64	5	178	50	81	48	32	18	478
40-50	59	4	157	45	84	58	22	11	440
50-60	55	3	148	44	86	53	31	21	442
60-70	54	2	131	41	92	49	45	31	445
70-80	52	3	134	37	92	46	41	29	434
80-90	44	2	135	41	83	47	51	41	445
90-100	39	2	111	41	81	46	62	47	430

3. THE ISSUE OF HIGH SUCCESS RATES

On occasion, questions are raised with respect to what some may find as high success rates (i.e. percentage of applicants receiving an award) in the program. Figure 7 on page 10 presents the success rates for the program since 1978, which have averaged roughly 75%.

These success rates cannot be compared with those of programs supporting research projects, to which applicants can apply multiple times. For this program, which supports the person's program of research rather than a specific project, one either receives support or one doesn't, and if one receives a grant, one cannot apply for another one, until the end of this grant (generally 5 years).

On the one hand, the Discovery Grants Program has advantages and there are many arguments in favour of keeping it as is. On the other hand the philosophy carries its share of disadvantages and one can list several arguments for changing it (at least to some extent):

3.1 ADVANTAGES/ARGUMENTS IN FAVOUR OF MAINTAINING THE PROGRAM

The high success rates reflect a philosophy of providing meritorious applicants an opportunity to establish their research programs and to maintain a level of research activity for as long as they continue to convince their peers of its merit. This philosophy of providing a fairly stable research support environment, is seen as providing a unique advantage for a highly-skilled professoriate in the natural sciences and engineering in Canada. This is relevant both for maintaining on-going research and training activities.

The funding rate⁴ of about 40% for Discovery Grants reflects the objective to provide a "grant in aid" of research, that is, basic operating support for a researcher's ongoing research and student training activities. Discovery Grants provide a platform and leverage ("seed money") from which a researcher can: access knowledge around the world; develop and launch projects through other grants from NSERC; or in many areas, secure R&D funding from other sources, notably industry. The success rates for NSERC's project-based programs are typically much lower, in the 20% to 40% range, consistent with similar project-support programs in Canada and abroad; in those programs, the decision is binary – the proposal is either funded at the level required to achieve the objectives of the projects or it is not funded at all.

The Program's criteria are flexible and can be adapted to specific applications. For example, new researchers are assessed on the basis of their potential contribution to research and to training. The criteria can also be adapted to specific research environments. For example, the

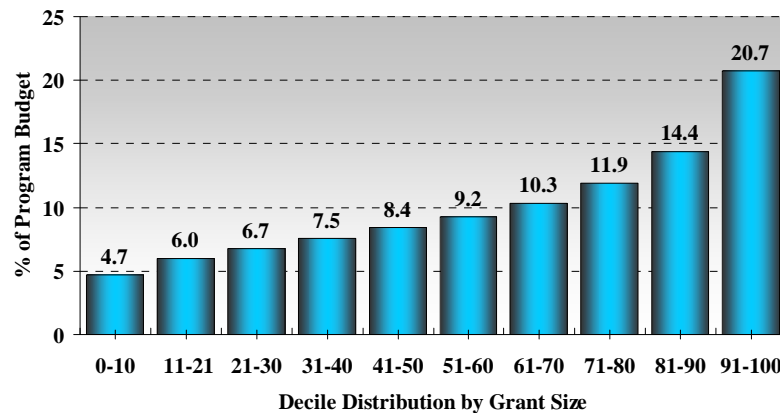
⁴ Funding rate is the ratio of funds awarded to funds requested

training criterion is considered somewhat differently for large institutions with many graduate programs and small institutions, where research assistants are often undergraduate students.

- The Program supports the research career of a pre-selected pool of research talent. Every professor appointed to a university position has been hired following a rigorous selection procedure in which research ability is a major consideration. The high success rate avoids a proportionate waste of research talent and potential.
- In recent years, the number of first time applicants to the Program (Figure 4 on page 7) has increased dramatically as Canadian universities hire more faculty to deal with enrolment growth and as a bulge of older faculty, many of whom were not active in research, retire. NSERC has made it a priority of funding first-time applicants, and increases to the Program budget have been earmarked for these applicants, so that they can contribute to Canada's research and innovation system.
- The rate of applicant success supports a major objective of the program; it provides mentors to train highly qualified personnel and the next generation of researchers and S&T specialists. The 10,000 university researchers supported through the program use their grant funds to support more than 9,000 students and postdoctoral fellows as well as to hire 900 technicians and research associates. Student training and the hiring of research technicians and associates account for 59% of program expenditures.
- The program philosophy allows a large number of researchers to be active in research and training, and to remain "connected" with each other by enabling the attendance to conferences, workshops, etc. It could be argued that this increases the "collective" excellence of the community, as well as focusing on excellence at an individual basis.
- In the 2002 evaluation of the program, it was noted that "Canadian universities have a diverse and high quality research capability in the natural sciences and engineering. The Discovery Grants program is seen to play an important role in promoting and maintaining that capability, and the program is seen to be superior in that respect compared to similar programs in other countries."⁵
- Also from the 2002 evaluation of the program, survey results indicated that although "the balance between grant size and number of awards varies considerably among the GSCs. The general consensus among funded researchers is that the present balance between grant size and number of awards is about right."
- A 75% program success rate does not mean that all recipients receive the same award amount. After establishing successful research programs, many grant holders receive much larger grants. Figure 28 presents a decile distribution of grant size for the Discovery Grants program. As shown in the figure, the bottom 10% of recipients receive 4.7% of the program budget while the top 10% receive 20.7%. The average grants for these two respective groups are \$14,485 and \$65,392.

⁵ http://www.nserc.gc.ca/pubs/rg_table_e.htm

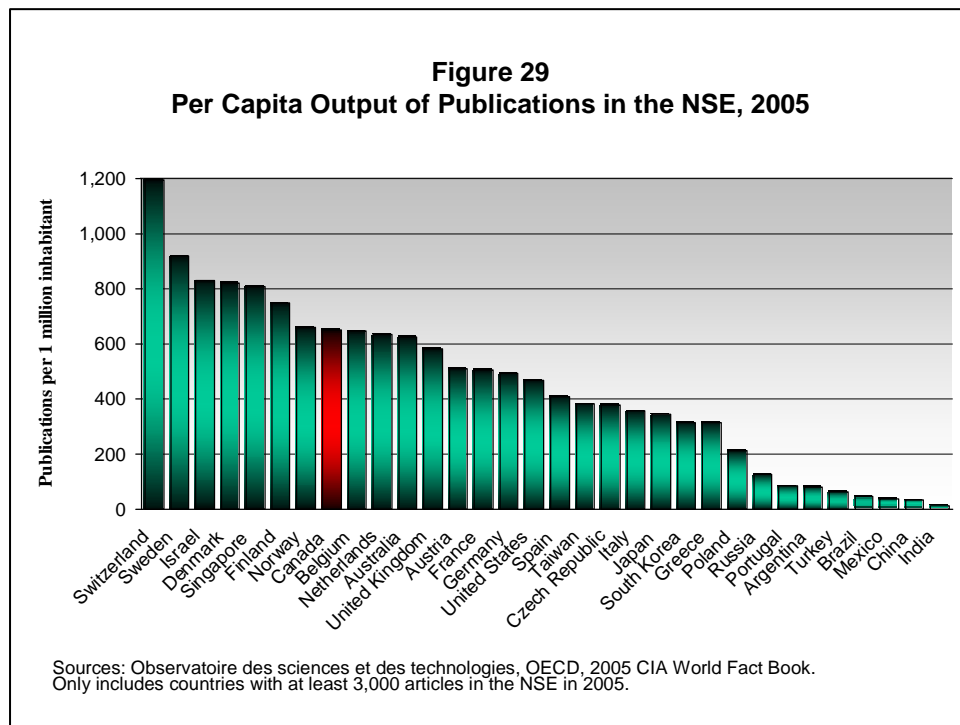
Figure 28
Distribution of Discovery Grants Program Budget
by Grant Size, 2006-07



1. Individual Discovery Grants including Subatomic Physics Individual Discovery Grants.

- The Program maintains a wide base of research capacity in the NSE in universities across the country (Table 2 on page 9). Success rates vary by institution although these are the result of decisions on individual applications from that institution and not the result of a pre-defined quota or policy (Figure 9 on page 13).
- Applicants from small, often regional, institutions able to establish a quality program can reasonably aspire to carry out research. This allows these institutions to contribute research-based evidence to local issues, solve local problems and perform science-based public advocacy roles in their region.
- In institutions without graduate programs, researchers involve undergraduate students, often giving these students a first taste for research and encouraging them to pursue graduate studies in other, research intensive institutions. In time, some of these trainees will return to the region and their acquired skills will serve local institutions, whether in academia, government or industry.
- The Program promotes continuity and stability in research funding, as grants are normally 5 years in duration. This is essential in a program that aims at supporting and promoting a broad base of research capability in the NSE; a start/stop approach would be disruptive given the nature of research in the NSE, the need to provide support for graduate students, to sustain collaboration, etc.

- Publishing in scientific and engineering journals is dominated by the university sector worldwide. The Discovery Grant program has enabled Canada to publish at higher rates than most countries and all of the G7 countries (see Figure 29). In addition, a 2002 bibliometric study noted that recipients of lower average grants in the Discovery Grants program produced equally highly rated publications (although fewer) as compared to their more highly funded colleagues.⁶

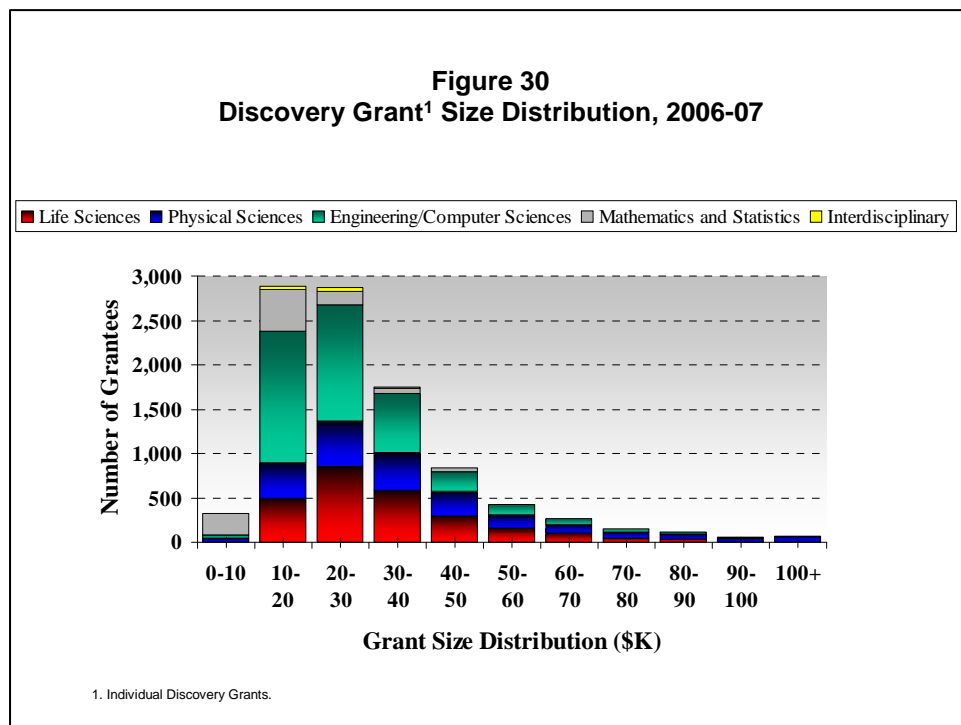


- There is a dynamism in the program that allows new researchers to get a first grant, that sees increases in the grant level for those who make increasing contributions, decreases for those whose contributions decline and discontinued support when applications are no longer competitive.
- The Program provides flexibility at two levels. First, researchers have the freedom to reorient their research programs to capitalize on promising avenues, provided that the new activity is still research in the NSE. Second, the rules on the use of funds are also very flexible; researchers can use their funds in proportions different from what was included in their budget, as long as the funds are used in support of the direct costs of research.

⁶ http://www.nserc.gc.ca/about/bibliometric_e.htm

3.2 DISADVANTAGES / ARGUMENTS FOR CHANGE

- Despite the large injections of new funds of the past several years, the budget has not kept pace with the increasing size of the research community. As a consequence the average grant has remained static (in current dollars) despite an increase in costs of doing research (see Figure 5 on page 8) that far exceeds the Consumer's Price Index. Effectively the purchasing power of the grants has been eroding over the years. Grant holders may not apply for another DG nor request supplemental funding before the end of the term of the grant. Over the normal duration of 5 years inflation may further erode the purchasing power of grants.
- In some disciplines the average grant is below the amount needed to effectively support one graduate student; in other disciplines the grant amount is significantly lower than the actual costs of research (see Figure 30). In both cases, this limits the productivity potential and/or forces researchers to multiply the number of applications to other sources thereby impacting the amount of time they can spend on research.



- There is built-in inertia in the way Grant Selection Committees (GSCs) operate. GSCs are often reluctant to recommend a substantial decrease in the grant or no award to senior researchers even when research productivity and impact, and contribution to training of Highly Qualified Personnel are no longer sustained at past levels. In a large part, this is a remnant of NSERC past policies and practices: until the mid-1990's there were selectivity guidelines, which specified an expected success rate for renewal applicants of 85 to 92%; the method for calculating GSCs competition budgets, where the renewal portion was the sum returning grants. Though these have been rescinded several years ago, they are still present in the community's mind. This results in a review that is incremental rather than zero-based.
- Discovery Grants are seen as "credentialing". Many universities use the awarding of a Discovery Grant and its size as elements of decisions on tenure and promotion. This is an unintended effect that may influence GSC members in making positive funding recommendations in some borderline cases.
- High success rates contribute to a sense of entitlement, since large numbers of researchers receive continuous support over their entire career.
- High success rates make it very difficult for unsuccessful applicants to accept the decision, because of a perceived stigma associated with not holding a Discovery Grant.

APPENDIX A – TABLES

**Table A1
Established Researcher Funding from Other NSERC Programs and Leverage Ratios**

Grant Selection Committee (GSC)	A - Other NSERC Grant Funding (\$) by Decile									
	0-10	10-20	20-30	30-40	40-15	50-60	60-70	70-80	80-90	90-100
Integrative Animal Biology	85,207	245,593	604,650	361,712	555,466	328,715	682,114	589,016	446,954	804,923
Plant Biology & Food Science	493,927	359,853	663,327	1,056,412	734,634	592,789	1,197,652	861,278	1,258,145	804,024
Psychology: Brain, Behaviour & Cognitive Science	12,439	15,056	20,651	0	156,518	46,326	148,030	89,074	129,350	42,128
Evolution & Ecology	206,891	872,856	725,682	745,754	693,263	1,201,016	850,850	1,784,225	899,611	2,037,212
Cell Biology	175,938	15,234	191,757	162,536	188,727	536,584	212,010	437,096	342,122	465,988
Molecular & Developmental Genetics	447,806	280,390	80,907	282,641	194,015	280,177	272,873	398,702	215,296	397,236
Solid Earth Sciences	45,302	198,700	347,462	399,883	142,117	413,427	344,499	353,197	301,558	368,195
Environmental Earth Sciences	325,076	267,750	263,236	485,597	1,067,432	888,063	521,962	764,458	954,025	1,867,055
Space & Astronomy	36,163	68,611	41,540	50,773	143,115	172,496	102,447	127,043	308,738	134,036
Analytical & Physical Chemistry	101,926	436,262	547,471	303,964	326,572	514,155	656,956	891,319	2,288,113	1,750,862
Inorganic & Organic Chemistry	131,620	236,692	849,545	366,232	210,135	728,900	833,359	858,901	1,822,978	1,176,110
Condensed Matter Physics	0	49,174	69,958	246,506	502,447	119,905	512,646	291,668	560,157	1,974,629
General Physics	0	76,960	118,547	141,113	44,355	153,116	317,316	373,888	471,300	661,588
Pure and Applied Mathematics	0	2,917	80,122	27,000	87,273	0	0	78,197	133,866	289,677
Statistical Sciences	7,583	22,417	0	25,334	10,500	14,834	295,488	0	22,417	2,917
Computing and Information Sciences	201,815	86,653	86,858	203,981	515,524	420,626	1,143,494	1,542,605	1,167,402	1,187,555
Chem. & Metallurgical Eng	827,687	1,455,370	995,234	1,525,477	1,360,186	2,247,803	2,805,448	2,455,901	2,991,581	3,578,196
Civil Engineering	280,585	150,965	344,402	336,688	1,128,521	782,899	1,086,302	1,686,559	1,964,734	2,561,700
Mechanical Engineering	238,031	342,259	596,868	396,660	741,112	714,053	795,002	1,028,742	1,473,522	1,829,528
Industrial Engineering	0	53,817	0	141,310	137,601	0	14,834	348,084	911,456	253,419
Communications, Computers & Components Engineering	112,245	185,958	772,219	339,594	528,275	507,933	1,149,265	1,858,851	1,837,966	2,376,763
Electromagnetics & Electrical Systems Engineering	230,625	166,404	486,329	268,487	106,565	307,269	460,800	552,954	1,185,836	1,845,856
Interdisciplinary	14,125	40,363	95,061	71,969	22,500	148,543	257,741	48,700	229,969	192,119
Total	3,974,990	5,630,255	7,981,824	7,939,623	9,596,851	11,119,629	14,661,089	17,420,458	21,917,096	26,601,714

Table A1
Established Researcher Funding from Other NSERC Programs and Leverage Ratios (Continued)

Grant Selection Committee (GSC)	B - Discovery Grant Funding (\$) by Decile									
	0-10	10-20	20-30	30-40	40-15	50-60	60-70	70-80	80-90	90-100
Integrative Animal Biology	663,728	845,209	974,167	1,045,216	1,181,816	1,269,167	1,450,083	1,579,118	1,969,912	2,984,366
Plant Biology & Food Science	482,628	611,882	695,748	837,470	901,988	1,037,609	1,209,312	1,382,342	1,699,078	2,318,912
Psychology: Brain, Behaviour & Cognitive Science	422,672	528,469	655,416	733,038	839,973	990,760	1,093,558	1,285,419	1,566,245	2,360,056
Evolution & Ecology	488,250	674,467	814,850	993,961	1,133,700	1,301,830	1,552,100	1,857,900	2,258,640	3,282,175
Cell Biology	541,000	653,210	716,950	798,160	861,320	962,796	998,890	1,151,060	1,330,400	1,880,571
Molecular & Developmental Genetics	482,492	576,200	664,470	714,380	822,130	946,270	971,570	1,127,890	1,256,610	1,716,890
Solid Earth Sciences	331,642	509,110	613,800	740,900	846,020	963,680	1,044,120	1,199,750	1,390,450	2,332,800
Environmental Earth Sciences	366,200	445,494	550,380	591,160	670,750	715,150	842,770	927,910	1,193,197	1,923,860
Space & Astronomy	125,420	259,220	334,724	387,170	492,384	546,053	611,840	790,948	932,955	1,244,811
Analytical & Physical Chemistry	471,578	785,308	978,608	1,126,580	1,271,308	1,421,388	1,547,250	1,829,432	2,165,538	3,361,244
Inorganic & Organic Chemistry	586,000	812,000	1,022,500	1,120,830	1,262,790	1,551,970	1,725,395	2,089,200	2,347,300	3,235,349
Condensed Matter Physics	211,115	328,277	437,312	585,160	631,660	701,016	834,266	897,191	1,095,202	1,719,967
General Physics	122,474	228,536	268,568	320,914	352,850	425,584	485,600	585,931	724,590	1,053,396
Pure and Applied Mathematics	277,800	395,600	484,000	581,750	679,000	751,000	863,500	1,048,000	1,375,000	1,969,334
Statistical Sciences	182,369	256,703	304,500	353,000	374,900	433,000	472,000	555,000	650,000	935,500
Computing and Information Sciences	801,700	1,035,600	1,207,392	1,387,145	1,625,933	1,839,900	2,067,050	2,306,010	2,762,300	4,391,956
Chem. & Metallurgical Eng	821,939	953,115	1,065,561	1,184,473	1,253,926	1,354,521	1,511,363	1,623,004	1,950,245	3,127,078
Civil Engineering	638,630	744,510	799,230	878,840	986,850	1,094,540	1,219,170	1,355,818	1,568,483	2,333,960
Mechanical Engineering	674,788	814,870	919,500	989,010	1,084,220	1,163,020	1,247,370	1,460,934	1,678,750	2,403,380
Industrial Engineering	211,052	278,870	341,370	374,390	404,952	473,803	517,211	624,510	701,706	1,082,190
Communications, Computers & Components Engineering	463,600	557,900	648,726	697,650	809,862	903,876	1,071,395	1,191,111	1,545,510	2,120,120
Electromagnetics & Electrical Systems Engineering	449,045	545,055	607,990	688,540	754,423	838,473	976,252	1,068,735	1,225,040	1,622,184
Interdisciplinary	85,063	121,798	144,065	182,263	169,980	182,883	235,685	239,393	290,500	523,840
Total	9,901,185	12,961,403	15,249,827	17,312,000	19,412,735	21,868,289	24,547,750	28,156,606	33,677,651	49,923,939

Table A1
Established Researcher Funding from Other NSERC Programs and Leverage Ratios (Continued)

Grant Selection Committee (GSC)	Leverage Ratio (A/B) by Decile									
	0-10	10-20	20-30	30-40	40-15	50-60	60-70	70-80	80-90	90-100
Integrative Animal Biology	0.128	0.291	0.621	0.346	0.470	0.259	0.470	0.373	0.227	0.270
Plant Biology & Food Science	1.023	0.588	0.953	1.261	0.814	0.571	0.990	0.623	0.740	0.347
Psychology: Brain, Behaviour & Cognitive Science	0.029	0.028	0.032	0.000	0.186	0.047	0.135	0.069	0.083	0.018
Evolution & Ecology	0.424	1.294	0.891	0.750	0.612	0.923	0.548	0.960	0.398	0.621
Cell Biology	0.325	0.023	0.267	0.204	0.219	0.557	0.212	0.380	0.257	0.248
Molecular & Developmental Genetics	0.928	0.487	0.122	0.396	0.236	0.296	0.281	0.353	0.171	0.231
Solid Earth Sciences	0.137	0.390	0.566	0.540	0.168	0.429	0.330	0.294	0.217	0.158
Environmental Earth Sciences	0.888	0.601	0.478	0.821	1.591	1.242	0.619	0.824	0.800	0.970
Space & Astronomy	0.288	0.265	0.124	0.131	0.291	0.316	0.167	0.161	0.331	0.108
Analytical & Physical Chemistry	0.216	0.556	0.559	0.270	0.257	0.362	0.425	0.487	1.057	0.521
Inorganic & Organic Chemistry	0.225	0.291	0.831	0.327	0.166	0.470	0.483	0.411	0.777	0.364
Condensed Matter Physics	0.000	0.150	0.160	0.421	0.795	0.171	0.614	0.325	0.511	1.148
General Physics	0.000	0.337	0.441	0.440	0.126	0.360	0.653	0.638	0.650	0.628
Pure and Applied Mathematics	0.000	0.007	0.166	0.046	0.129	0.000	0.000	0.075	0.097	0.147
Statistical Sciences	0.042	0.087	0.000	0.072	0.028	0.034	0.626	0.000	0.034	0.003
Computing and Information Sciences	0.252	0.084	0.072	0.147	0.317	0.229	0.553	0.669	0.423	0.270
Chem. & Metallurgical Eng	1.007	1.527	0.934	1.288	1.085	1.659	1.856	1.513	1.534	1.144
Civil Engineering	0.439	0.203	0.431	0.383	1.144	0.715	0.891	1.244	1.253	1.098
Mechanical Engineering	0.353	0.420	0.649	0.401	0.684	0.614	0.637	0.704	0.878	0.761
Industrial Engineering	0.000	0.193	0.000	0.377	0.340	0.000	0.029	0.557	1.299	0.234
Communications, Computers & Components Engineering	0.242	0.333	1.190	0.487	0.652	0.562	1.073	1.561	1.189	1.121
Electromagnetics & Electrical Systems Engineering	0.514	0.305	0.800	0.390	0.141	0.366	0.472	0.517	0.968	1.138
Interdisciplinary	0.166	0.331	0.660	0.395	0.132	0.812	1.094	0.203	0.792	0.367
Total	0.401	0.434	0.523	0.459	0.494	0.508	0.597	0.619	0.651	0.533

**Table A2
Expenditures Per Thousand Dollar Grant by Established Researchers and Decile on Training - Undergraduate Students (Canadian)**

Grant Selection Committee (GSC)	Expenditures per Thousand Dollar Grant (\$)									
	0-10	10-20	20-30	30-40	40-15	50-60	60-70	70-80	80-90	90-100
Integrative Animal Biology	86	113	72	61	64	45	68	79	44	44
Plant Biology & Food Science	97	83	66	93	59	59	37	33	84	53
Psychology: Brain, Behaviour & Cognitive Science	178	165	153	152	117	136	114	134	117	79
Evolution & Ecology	128	133	117	129	101	47	97	85	102	84
Cell Biology	66	65	62	65	75	87	48	52	49	43
Molecular & Developmental Genetics	47	78	50	47	68	66	84	67	46	54
Solid Earth Sciences	79	23	79	58	40	40	36	39	11	19
Environmental Earth Sciences	75	59	64	80	50	73	87	48	25	46
Space & Astronomy	62	84	111	72	78	60	55	53	67	21
Analytical & Physical Chemistry	96	143	110	89	99	67	42	40	34	31
Inorganic & Organic Chemistry	223	87	49	83	64	65	39	46	29	30
Condensed Matter Physics	107	77	111	41	57	64	56	67	47	48
General Physics	44	127	58	30	30	73	40	85	26	24
Pure and Applied Mathematics	60	88	72	58	70	47	54	31	39	35
Statistical Sciences	37	29	20	40	8	28	30	27	16	19
Computing and Information Sciences	78	55	37	45	59	36	31	36	25	32
Chem. & Metallurgical Eng	75	41	34	36	44	38	47	23	21	23
Civil Engineering	65	44	38	42	32	37	41	39	35	26
Mechanical Engineering	69	72	30	43	29	38	60	28	36	37
Industrial Engineering	33	41	23	73	30	45	54	45	12	25
Communications, Computers & Components Engineering	14	45	26	20	27	27	19	39	27	13
Electromagnetics & Electrical Systems Engineering	18	33	20	36	16	30	31	26	29	42
Interdisciplinary	86	55	57	57	63	86	128	145	66	53
Total	84	77	62	64	59	55	54	52	44	39

Table A3
Expenditures Per Thousand Dollar Grant by Established Researchers and Decile on Training - Undergraduate Students (Foreign)

Grant Selection Committee (GSC)	Expenditures per Thousand Dollar Grant (\$)									
	0-10	10-20	20-30	30-40	40-15	50-60	60-70	70-80	80-90	90-100
Integrative Animal Biology	0	4	0	3	0	0	2	1	4	0
Plant Biology & Food Science	0	1	1	0	8	7	1	1	3	0
Psychology: Brain, Behaviour & Cognitive Science	2	5	0	16	2	1	4	2	2	3
Evolution & Ecology	-3	2	5	5	1	2	-1	3	5	6
Cell Biology	0	1	7	1	0	3	1	8	0	0
Molecular & Developmental Genetics	0	3	2	4	13	4	2	2	2	0
Solid Earth Sciences	1	0	3	0	0	1	5	1	0	0
Environmental Earth Sciences	3	0	2	4	5	0	6	0	0	1
Space & Astronomy	0	0	0	2	2	4	0	0	2	2
Analytical & Physical Chemistry	0	7	10	7	5	3	4	2	0	0
Inorganic & Organic Chemistry	8	0	2	2	3	1	2	4	2	0
Condensed Matter Physics	3	0	4	0	4	3	0	0	2	2
General Physics	2	0	0	0	0	0	-1	0	4	1
Pure and Applied Mathematics	0	0	4	0	1	1	1	1	1	0
Statistical Sciences	16	4	15	0	1	0	6	9	4	2
Computing and Information Sciences	5	2	0	5	7	4	0	10	2	3
Chem. & Metallurgical Eng	18	0	2	3	7	8	4	2	3	4
Civil Engineering	1	3	0	3	1	7	3	6	2	6
Mechanical Engineering	7	4	7	10	6	8	3	3	6	1
Industrial Engineering	18	1	0	4	9	1	8	1	1	11
Communications, Computers & Components Engineering	11	13	5	18	1	1	4	1	5	2
Electromagnetics & Electrical Systems Engineering	2	0	5	14	0	1	0	0	2	4
Interdisciplinary	0	0	3	13	0	2	0	0	0	0
Total	4	3	3	5	4	3	2	3	2	2

Table A4
Expenditures Per Thousand Dollar Grant by Established Researchers and Decile on Training - Master's Students (Canadian)

Grant Selection Committee (GSC)	Expenditures per Thousand Dollar Grant (\$)									
	0-10	10-20	20-30	30-40	40-15	50-60	60-70	70-80	80-90	90-100
Integrative Animal Biology	178	114	145	131	127	162	115	146	136	90
Plant Biology & Food Science	199	119	216	164	162	149	106	87	111	94
Psychology: Brain, Behaviour & Cognitive Science	109	90	90	119	110	109	87	89	65	50
Evolution & Ecology	90	168	150	157	181	134	108	101	159	133
Cell Biology	164	153	155	153	143	135	162	151	167	114
Molecular & Developmental Genetics	142	203	151	148	185	147	131	86	113	126
Solid Earth Sciences	97	130	81	108	106	129	66	98	120	82
Environmental Earth Sciences	204	163	124	208	85	114	134	153	96	119
Space & Astronomy	29	115	147	207	93	135	148	128	96	49
Analytical & Physical Chemistry	62	115	117	146	105	50	144	103	123	59
Inorganic & Organic Chemistry	156	159	111	151	138	99	76	130	98	96
Condensed Matter Physics	159	160	132	129	153	105	91	141	71	52
General Physics	125	87	236	229	82	151	85	96	143	86
Pure and Applied Mathematics	58	53	35	96	52	97	77	78	74	64
Statistical Sciences	158	110	123	200	135	236	89	122	121	96
Computing and Information Sciences	210	217	258	213	246	196	160	203	160	141
Chem. & Metallurgical Eng	206	170	233	242	163	181	172	151	173	125
Civil Engineering	188	196	178	204	176	167	141	190	102	199
Mechanical Engineering	247	286	314	254	242	210	230	197	209	165
Industrial Engineering	54	126	165	198	152	154	96	144	166	110
Communications, Computers & Components Engineering	280	226	256	199	200	242	160	166	176	190
Electromagnetics & Electrical Systems Engineering	276	198	220	221	227	188	223	141	261	195
Interdisciplinary	181	129	255	350	133	352	161	56	166	84
Total	169	162	173	178	157	148	131	134	135	111

Table A5
Expenditures Per Thousand Dollar Grant by Established Researchers and Decile on Training - Master's Students (Foreign)

Grant Selection Committee (GSC)	Expenditures per Thousand Dollar Grant (\$)									
	0-10	10-20	20-30	30-40	40-15	50-60	60-70	70-80	80-90	90-100
Integrative Animal Biology	2	3	15	23	40	18	8	13	4	6
Plant Biology & Food Science	0	37	48	21	32	31	33	22	21	21
Psychology: Brain, Behaviour & Cognitive Science	13	16	9	15	5	8	0	1	6	16
Evolution & Ecology	23	16	9	18	7	18	21	28	24	15
Cell Biology	1	7	31	1	10	9	35	13	7	40
Molecular & Developmental Genetics	18	21	20	32	13	61	36	21	16	8
Solid Earth Sciences	29	20	13	23	38	56	24	14	56	18
Environmental Earth Sciences	14	16	42	25	31	38	32	18	22	24
Space & Astronomy	33	0	34	9	17	59	27	31	30	39
Analytical & Physical Chemistry	11	30	70	46	29	50	27	28	55	22
Inorganic & Organic Chemistry	105	59	63	36	23	24	30	12	43	27
Condensed Matter Physics	91	71	47	60	31	23	27	55	36	57
General Physics	32	73	24	13	22	18	61	6	15	27
Pure and Applied Mathematics	14	23	21	45	39	40	42	28	42	48
Statistical Sciences	28	75	45	65	34	53	55	80	43	46
Computing and Information Sciences	92	55	94	68	64	48	83	80	79	109
Chem. & Metallurgical Eng	72	77	144	90	52	91	48	49	52	40
Civil Engineering	31	129	60	83	125	81	81	48	73	72
Mechanical Engineering	45	37	61	78	61	54	49	83	80	64
Industrial Engineering	29	104	119	120	99	45	36	29	21	75
Communications, Computers & Components Engineering	78	76	128	144	141	90	75	59	59	72
Electromagnetics & Electrical Systems Engineering	102	57	104	49	74	62	65	101	79	70
Interdisciplinary	4	0	27	59	36	48	31	18	7	21
Total	42	45	57	50	45	44	41	37	41	41

Table A6
Expenditures Per Thousand Dollar Grant by Established Researchers and Decile on Training - Ph.D. Students (Canadian)

Grant Selection Committee (GSC)	Expenditures per Thousand Dollar Grant (\$)									
	0-10	10-20	20-30	30-40	40-15	50-60	60-70	70-80	80-90	90-100
Integrative Animal Biology	60	86	83	68	40	41	55	73	61	69
Plant Biology & Food Science	58	121	101	53	72	85	102	41	35	65
Psychology: Brain, Behaviour & Cognitive Science	47	22	50	36	34	60	65	62	35	32
Evolution & Ecology	38	52	93	58	64	56	94	92	34	59
Cell Biology	63	63	90	112	104	104	83	58	62	80
Molecular & Developmental Genetics	47	88	82	60	75	42	78	85	100	112
Solid Earth Sciences	41	21	12	73	46	25	59	37	41	37
Environmental Earth Sciences	49	83	114	37	36	86	72	93	89	67
Space & Astronomy	3	69	94	26	131	99	67	139	114	50
Analytical & Physical Chemistry	64	85	151	51	72	108	80	79	68	62
Inorganic & Organic Chemistry	17	48	89	82	90	113	84	101	95	75
Condensed Matter Physics	46	32	49	91	85	112	79	96	83	64
General Physics	0	76	135	27	130	47	123	106	60	153
Pure and Applied Mathematics	21	52	47	25	43	43	57	47	58	46
Statistical Sciences	41	29	79	50	88	95	73	47	90	134
Computing and Information Sciences	34	91	97	114	83	130	130	114	153	103
Chem. & Metallurgical Eng	117	139	46	86	90	57	87	127	95	98
Civil Engineering	72	103	146	108	128	65	121	106	135	126
Mechanical Engineering	169	74	114	131	123	86	108	95	86	93
Industrial Engineering	76	122	74	123	166	170	172	152	177	100
Communications, Computers & Components Engineering	172	142	109	87	108	111	160	155	111	114
Electromagnetics & Electrical Systems Engineering	62	106	113	207	117	160	100	121	120	138
Interdisciplinary	107	9	61	51	51	64	70	81	6	64
Total	68	82	92	81	84	86	92	92	83	81

Table A7
Expenditures Per Thousand Dollar Grant by Established Researchers and Decile on Training - Ph.D. Students (Foreign)

Grant Selection Committee (GSC)	Expenditures per Thousand Dollar Grant (\$)									
	0-10	10-20	20-30	30-40	40-15	50-60	60-70	70-80	80-90	90-100
Integrative Animal Biology	18	3	21	5	28	4	37	14	17	8
Plant Biology & Food Science	37	35	33	15	105	46	4	16	9	26
Psychology: Brain, Behaviour & Cognitive Science	0	10	4	6	15	0	5	11	7	11
Evolution & Ecology	58	13	29	17	58	22	20	29	19	17
Cell Biology	0	10	13	9	26	29	19	8	7	12
Molecular & Developmental Genetics	5	11	8	65	2	47	38	42	5	29
Solid Earth Sciences	26	15	13	42	45	35	25	58	52	19
Environmental Earth Sciences	11	38	19	65	23	45	46	8	45	60
Space & Astronomy	0	0	52	31	7	39	29	5	55	29
Analytical & Physical Chemistry	35	67	68	9	60	65	65	31	32	51
Inorganic & Organic Chemistry	33	63	39	53	52	39	66	34	68	25
Condensed Matter Physics	7	62	47	91	91	57	85	64	43	89
General Physics	43	44	0	53	126	47	64	64	25	41
Pure and Applied Mathematics	36	64	23	82	78	69	57	81	65	51
Statistical Sciences	45	44	34	47	64	46	63	50	105	67
Computing and Information Sciences	30	67	32	54	57	55	66	35	79	53
Chem. & Metallurgical Eng	51	87	72	73	133	101	55	87	109	72
Civil Engineering	50	117	120	79	49	109	100	93	94	88
Mechanical Engineering	21	41	57	81	71	70	65	82	46	70
Industrial Engineering	28	45	67	50	43	90	45	112	89	114
Communications, Computers & Components Engineering	36	83	86	110	59	75	76	97	36	93
Electromagnetics & Electrical Systems Engineering	59	46	64	56	54	101	38	68	44	61
Interdisciplinary	24	0	20	15	28	32	14	38	0	10
Total	30	47	43	48	58	53	49	46	47	46

Table A8
Expenditures Per Thousand Dollar Grant by Established Researchers and Decile on Training - Postdoctoral Fellows (Canadian)

Grant Selection Committee (GSC)	Expenditures per Thousand Dollar Grant (\$)									
	0-10	10-20	20-30	30-40	40-15	50-60	60-70	70-80	80-90	90-100
Integrative Animal Biology	28	23	43	17	17	10	22	32	18	85
Plant Biology & Food Science	81	0	49	89	17	42	24	98	92	65
Psychology: Brain, Behaviour & Cognitive Science	14	4	6	7	21	21	13	53	51	37
Evolution & Ecology	3	0	1	21	7	11	50	17	27	51
Cell Biology	32	0	12	24	1	17	42	24	30	24
Molecular & Developmental Genetics	8	14	40	11	0	9	93	29	22	18
Solid Earth Sciences	27	5	7	73	30	5	32	31	57	61
Environmental Earth Sciences	2	20	11	4	12	8	2	8	31	44
Space & Astronomy	43	57	37	63	38	34	46	80	28	101
Analytical & Physical Chemistry	40	33	31	64	30	85	66	107	104	125
Inorganic & Organic Chemistry	4	55	73	72	44	49	78	47	115	98
Condensed Matter Physics	102	28	14	7	67	89	57	84	26	23
General Physics	0	10	25	153	87	36	81	16	103	76
Pure and Applied Mathematics	19	54	28	41	19	50	118	83	119	141
Statistical Sciences	11	20	0	0	24	11	46	23	38	74
Computing and Information Sciences	5	11	20	12	13	14	32	10	21	32
Chem. & Metallurgical Eng	25	39	29	30	19	32	38	21	40	50
Civil Engineering	37	9	12	7	18	17	20	4	23	31
Mechanical Engineering	20	5	14	23	18	37	19	19	33	55
Industrial Engineering	148	4	17	0	8	17	54	43	30	74
Communications, Computers & Components Engineering	10	21	10	6	5	23	20	19	45	49
Electromagnetics & Electrical Systems Engineering	20	46	9	29	19	46	35	43	35	43
Interdisciplinary	0	51	72	32	10	25	180	147	0	88
Total	27	22	25	32	22	31	45	41	51	62

Table A9
Expenditures Per Thousand Dollar Grant by Established Researchers and Decile on Training - Postdoctoral Fellows (Foreign)

Grant Selection Committee (GSC)	Expenditures per Thousand Dollar Grant (\$)									
	0-10	10-20	20-30	30-40	40-45	50-60	60-70	70-80	80-90	90-100
Integrative Animal Biology	18	15	1	2	13	5	3	1	7	17
Plant Biology & Food Science	32	59	0	21	7	27	30	31	13	63
Psychology: Brain, Behaviour & Cognitive Science	0	0	0	9	0	0	39	29	19	21
Evolution & Ecology	0	5	5	3	0	7	1	9	12	25
Cell Biology	4	15	34	9	3	1	16	20	49	4
Molecular & Developmental Genetics	0	0	0	20	0	46	15	15	20	30
Solid Earth Sciences	5	13	-1	1	2	1	18	30	25	39
Environmental Earth Sciences	6	0	16	7	2	22	0	15	44	37
Space & Astronomy	0	21	12	52	0	65	115	99	84	112
Analytical & Physical Chemistry	28	43	34	33	37	34	71	99	138	106
Inorganic & Organic Chemistry	16	12	32	14	18	54	62	40	50	114
Condensed Matter Physics	0	85	77	81	8	38	56	50	188	108
General Physics	0	7	44	1	36	68	132	37	64	33
Pure and Applied Mathematics	0	16	23	75	63	53	32	72	80	148
Statistical Sciences	8	0	11	0	0	2	1	18	23	15
Computing and Information Sciences	3	2	6	21	3	15	26	16	11	41
Chem. & Metallurgical Eng	6	9	5	32	2	11	13	19	42	23
Civil Engineering	0	1	1	8	8	11	9	2	10	8
Mechanical Engineering	1	2	4	2	3	10	21	7	12	18
Industrial Engineering	0	40	0	0	0	12	51	25	20	33
Communications, Computers & Components Engineering	11	0	2	0	28	2	8	23	27	20
Electromagnetics & Electrical Systems Engineering	13	12	0	27	24	3	47	12	22	6
Interdisciplinary	0	0	0	0	0	0	0	0	4	18
Total	8	15	12	18	11	21	31	29	41	47

APPENDIX B – PROGRAM DELIVERY

PROGRAM DELIVERY

a) Review Procedures

Applications are reviewed by Grant Selection Committees (GSCs). There is also input from external referees from Canada and abroad.

NSERC assigns applications to GSCs on the basis of research field, the objectives of the proposed research program, and input from applicants and committees. If the research is interdisciplinary, a process is used to ensure an appropriate review of all aspects of the application. For instance, if the application is reviewed by a discipline GSC, input from other disciplines will be gathered, as needed, through an appropriate selection of external referees or through consultation with other discipline GSCs. Alternatively, the application will be reviewed by the interdisciplinary GSC.

Applicants cannot submit the same NSERC proposal concurrently to the Social Sciences and Humanities Research Council (SSHRC) or the Canadian Institutes of Health Research (CIHR). The review of applications follows an annual cycle beginning in June of each year with nominations of new members to GSCs, one-third of whose membership changes each year. The full cycle is outlined in Table B1:

Table B1
Discovery Grants Program Funding Cycle

Month	Activity
June	Nominations of new members to Grant Selection Committees.
July-August	Preparations for the competition. Applicants notify intention to apply.
September	Assignment of internal and external reviewers.
November	November 1 – Deadline for applicants. Orientation of new members. Final assignment of applications to GSCs.
December-January	GSCs and external reviewers receive applications and related documents for review. External reviewers submit their report.
February	Adjudication of applications.
March-April	NSERC communicates results directly to applicants.

The Discovery Grants program is unique in that recipients (with the exception of SAP project grants) are not restricted to the specific activities described in the application, but may pursue new research interests, provided they are within NSERC's mandate. The evaluation of proposals to the DGP focuses on the determination of quality by means of peer review through the process described above.

b) Selection criteria

Applications are judged according to the criteria in Table B2. The onus is on applicants to address these explicitly in their proposals. No explicit weighting of criteria is provided to applicants or used by the application evaluators.

Table B2
Discovery Grants Program Selection Criteria

Criteria	Measures
Scientific or Engineering Excellence of the Researcher(s)	Knowledge, expertise and experience;
	Quality of past or potential contributions to, and impact on, the proposed and other areas of research;
	Importance of contributions to, and use by, other researchers and end-users;
	Complementarity of expertise of the members of the group and synergy (where applicable).
Merit of the Proposal	Originality and innovation;
	Significance and expected contributions to research;
	Clarity and scope of objectives;
	Clarity and appropriateness of methodology;
	Feasibility;
	Extent to which the scope of the proposal addresses all relevant issues, including the need for varied expertise within or across disciplines.
Contribution to the Training of Highly Qualified Personnel	Quality and extent of past and potential contributions to the training of highly qualified personnel (e.g., postdoctoral fellows, graduate and undergraduate students, technicians);
	Appropriateness of the proposal for the training of highly qualified personnel; and
	Enhancement of training arising from a collaborative or interdisciplinary environment (where applicable).
Need for Funds	Appropriateness of, and justification for, the budget;
	Availability of other sources of funding and their relationship to the current proposal;
	Special needs related to the nature of collaborative activities or infrastructure costs such as user fees.

c) Committee Structure

As previously mentioned, applications for DGP funding are reviewed by Grant Selection Committees (GSCs). The GSCs are structured along traditional disciplines in the natural sciences and engineering. The GSCs vary in size and over time have developed different approaches to funding the university community in their respective areas. For example, the chemistry GSCs have tended to fund fewer individuals at higher grant amounts versus the typical engineering GSCs that have funded more individuals with lower grants. The GSCs and the number of professors funded in 2006-07 is presented in Table B3.

Table B3
Discovery Grants Expenditures¹ by Grant Selection Committee, 2006-07

Grant Selection Committee (GSC)	Number of Grantees	Amount
Analytical and Physical Chemistry	376	18,499,541
Cell Biology	388	14,501,925
Chemical and Metallurgical Eng	616	19,113,715
Civil Engineering	558	14,286,331
Communications, Computers and Components Engineering	517	14,178,727
Computing and Information Sciences	1,019	25,996,292
Condensed Matter Physics	280	10,842,154
Electromagnetics and Electrical Systems Engineering	337	11,079,628
Environmental Earth Sciences	411	11,173,603
Evolution and Ecology	624	19,444,445
General Physics	183	6,066,187
Industrial Engineering	278	6,516,598
Inorganic and Organic Chemistry	348	19,315,634
Integrative Animal Biology	541	19,450,096
Interdisciplinary	127	3,456,529
Mechanical Engineering	647	16,424,324
Molecular and Developmental Genetics	308	12,472,521
Plant Biology and Food Science	361	14,411,782
Psychology: Brain, Behaviour and Cognitive Science	496	13,324,625
Pure and Applied Mathematics	667	14,406,470
Solid Earth Sciences	355	11,699,162
Space and Astronomy	194	8,269,988
Statistical Sciences	321	5,708,772
Subatomic Physics	218	17,683,665
Total	10,153	328,322,714

1. Includes all Discovery Grants funding.