

Final Report

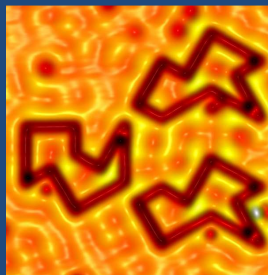
CIFAR Performance Audit and Evaluation

Prepared for:
Canadian Institute for Advanced Research

25 May 2010



CIFAR
CANADIAN INSTITUTE
for ADVANCED RESEARCH



HAL Ref: 7855

**HICKLING
ARTHURS
LOW**
INNOVATION POLICY ECONOMICS

Executive Summary

Background

The Canadian Institute for Advanced Research was established in 1982 as a private non-profit organization to create and manage research networks among eminent researchers in Canada and internationally. Its resources are used to develop interdisciplinary research programs addressing fundamental questions, and then, support the interactions among its members through meetings and related initiatives to answer these questions.

The research that is supported by CIFAR is neither basic nor applied, but rather fundamental in nature. The questions that are identified and developed into programs address critical gaps in understanding in areas identified as being fundamentally relevant to society, and where CIFAR's engagement can potentially make a large impact - be it through new technology, changes in policy, or in improving how we understand the world.

As a research institute, CIFAR is unique in both the Canadian and international research world in its focus on fundamental questions which are addressed in a highly interdisciplinary manner. CIFAR programs cover a broad range of subjects, some explicitly aligned with potentially disruptive technology such as nanotechnology, quantum computing, and superconductivity, and others, like the Institutions, Organizations and Growth program, more closely aligned with policy and economics. And while a few of CIFAR programs do concern themselves with life sciences, the institute has not historically supported medically focused programs in the area of human health, choosing to leave this well funded area to other funding organizations.

In 2007, CIFAR created a new five-year strategic plan to position the organization for the next stage of its evolution. The plan identified five main goals:

- **Research:** Expand and enhance CIFAR research – build programs, extend and expand global reach, develop the methods used to support interdisciplinary research, and expand knowledge transfer.
- **Young Researchers:** Support, celebrate and build interdisciplinary capacity in gifted young researchers, particularly in Canada.
- **Positioning:** Position CIFAR to benefit Canada within the global research community.
- **Organization:** Develop the 2012 CIFAR organization: capabilities, capacity, and international reach.

- Financial: Establish stable and balanced funding capable of sustaining growth.

In its funding agreement with Industry Canada, CIFAR has committed to meeting objectives that are aligned with these strategic goals.

Study Purpose and Scope

The purpose of this evaluation and performance audit is to:

- Provide CIFAR with a mid-point assessment of the progress towards meeting the strategic goals established in the 2007-2012 Strategic Plan.
- Provide CIFAR with a formal evaluation of operational and management strengths and areas for improvement in advance of the next five-year strategic planning period.
- Comply with the agreement between the Government of Canada and CIFAR which requires the Institute to submit a completed independent third-party evaluation report by June 30th, 2010.

This study reviewed CIFAR's activities from 2007 up to March 1st 2010 with the exception of CIFAR's supported research that is examined every five years by expert peer review panels. The results of those reviews have, however, been taken into account.

Approach and Methodologies

As a small organization, CIFAR decided to have the evaluation and performance audit requirements fulfilled simultaneously so as to minimize cost and lessen stakeholder fatigue that would result by having to interview the same individuals twice for similar information. To this end, HAL undertook an approach that preserved the integrity of both the evaluation and performance audit.

Performance audits and evaluations are both systematic, purposeful, organized and objective examinations of an organization's activities. Where they differ is in their emphasis. Evaluations are focused primarily on the rationale for the activities undertaken and their success in achieving objectives whereas performance audits are concerned primarily with cost-effectiveness and efficiency as well as the processes and structures that ensure effectiveness and accountability. There is, however, overlap between the two. By Treasury Board guidelines, evaluations are also to address design and delivery and cost effectiveness and efficiency. To avoid repetition, design and delivery issues are addressed in depth in the performance audit along with cost-effectiveness.

The evaluation matrix in CIFAR's performance audit and evaluation framework 2009 laid out the methodologies that were used. They included document, file and literature review; interviews (60); survey of research program members (181 – 67% return rate);

and benchmarking against three other comparable institutes (covering operating costs and cost-effectiveness).

Findings and Conclusions

Evaluation

Relevance

CIFAR fills a niche in Canada's research system as an organization committed to supporting fundamental research at the highest level that is interdisciplinary in scope. In so doing, it has maintained its relevancy among the many research institutions and programs in Canada, none of which have duplicated the role that CIFAR carries out in supporting interactions among some of the very best researchers in Canada and from around the world. Moreover, with a focus on research framed by research questions that address fundamental problems and issues, be they social or technological or biological, CIFAR has also maintained alignment with Canada's longer term economic and social interests, as well as to the goals related directly to science and innovation. We, therefore, find that there is a continued need for CIFAR in Canada and, indeed, in the wider research community which has no equivalent organization similarly committed to interdisciplinary research.

Success

Corporate Governance and Planning

In assessing the success of CIFAR, the evaluation focused on whether expected outputs and outcomes were achieved in three areas: governance, the research programs and related activity; and advancement and communication activities. In the area of governance, we found that CIFAR is on track to achieving related outcomes, a finding that is confirmed in the performance audit. We note, however, that there are ongoing challenges in working towards financial stability in the current economic conditions, challenges that are fully recognized by CIFAR management.

In terms of planning, CIFAR is entering year four (2010-11) of its five year strategic plan and has made notable progress towards achieving stated objectives and fully implementing the plan. Reviews of the plan's implementation are undertaken by CIFAR staff on a quarterly basis and are reported each year in the annual corporate plan.

Research Program

As for the research programs, CIFAR has shown notable success in achieving outcomes. From all sources of data analyzed for this study, it is clear that CIFAR's research model is very effective in supporting cutting edge research with the goal of answering complex

questions. Evidence indicates CIFAR has increased research interactions and collaboration, increased research excellence in Canada, helped attract and retain highly qualified researchers, and supported young researchers. CIFAR's new initiatives, notably its Junior Fellow Academy which involves young researchers in CIFAR's programs, and its knowledge transfer activities which are designed to enhance research, while new, are also on track to achieving objectives. In addition, we found support among Junior Fellows for the February 2010 decision of the CIFAR Board to revise the selection process for Junior Fellows to ensure transparency in the process and, at the same time, to enhance CIFAR's profile.

Advancement and Communications

With regard to CIFAR's advancement and communication activities, these are well established with a strong track record for professional delivery and meeting goals and objectives. The annual campaigns are proceeding as planned although the results are being affected by the economic climate and changes to corporate donation policies and practices. The capital campaign is now in place, although delayed in execution by about one year. A communications strategy is needed to provide a necessary framework for positioning and branding directions and activities as well as advancement activities.

Efficiency

The CIFAR model is a very efficient approach to conducting research. CIFAR engages top scientists and scholars from around the world in its programs at low incremental cost, an approach that receives a very positive response from research program members. If CIFAR were to have fewer resources and therefore unable to support the same number of programs and researchers, its level of success would be diminished in terms of achieving objectives such as advancing Canada's research capacity and better positioning Canada in the international research community. Thus the evidence presented in the report suggests that the productivity and efficiency of CIFAR's research program would be difficult to improve upon.

Performance Audit

Corporate Governance and Planning

We found that CIFAR is a well-governed organization with good corporate structures and processes in place for planning and setting strategic direction. A strong Board of Directors and senior management has been beneficial to CIFAR as it adjusts to its expanding set of activities as set out in its strategic plan. We note that there is an opportunity to strengthen governance further by linking the Board with the Research Council, thereby enhancing the information base of the Board's decision-making.

With regard to CIFAR's overall strategic direction, we feel that having a more concise vision statement could better help guide the organization's strategic planning. We also find a need to simplify two components of the Results-Based Management Accountability Framework (RMAF) - the logic model and data collection matrix – so as to make them more useful for decision making and a more effective communication tool for demonstrating what CIFAR is, and what it does, to government stakeholders.

In terms of planning, CIFAR is in year four (2010-11) of its five year strategic plan and has made notable progress towards achieving stated objectives and fully implementing the plan. Reviews of the plan's implementation are undertaken by CIFAR staff on a quarterly basis and are reported each year in the annual corporate plan.

Program Design and Delivery

In adapting to the growth for CIFAR set out in the Strategic Plan, CIFAR has built up its organizational capacity through formalizing its administrative and management processes. In evolving to a more formalized institution, CIFAR has been in a learning phase, preparing strategic plans, developing a results management and accountability framework, and adjusting internal processes to address new needs. In examining program design and delivery, we identified a number of issues related to these developments that deserve attention.

Two aspects of CIFAR's operations that are central to its growth plans are advancement and communications. Advancement objectives in the Strategic Plan are clearly set out, with operational plans for both the annual and the new capital campaigns being well executed. However, fund raising is challenging as a result of the economic downturn over the last two years that has kept private sector donations flat and the funding environment in the federal and provincial governments difficult. In terms of the capital campaign, the target was amended in 2009 from \$40-50 million by 2012 to \$100 million over time.

On communications, we found a need for CIFAR to develop a communications strategy that extends beyond advancement, which CIFAR's communications approach has traditionally supported, to address the broader range of communication needs related to the Strategic Plan. There is also an opportunity to make better use of the CIFAR website and web based tools to increase the impact of CIFAR program research within the broader research community by making the website a resource for CIFAR's interdisciplinary research. We note that our findings on communications are very similar to those of the CIFAR commissioned communications review.

CIFAR's management of research programs is to be commended. We found that CIFAR has been adept at adapting to an ever changing research landscape while maintaining a flexible and effective approach to managing a dispersed network of eminent researchers in Canada and from around the world. CIFAR should be careful to ensure that as it

becomes a more institutionally based organization, its flexible and tailored approach to managing its research programs is not lost.

Cost-Effectiveness

With regard to cost-effectiveness, our comparisons with three other advanced research organizations all indicate that CIFAR is a cost-effective organization. Its advantage rests with being a virtual institute that leverages considerable resources from across a large number of research organizations around the world towards achieving its goals. While there are, in principle, shortcomings to this model, namely loyalty and commitment from members who receive salaries from their home institutions, this does not appear to be an issue for CIFAR members. An issue that does arise, however, is a lack of appropriate attribution being accorded CIFAR in members' publications due in part to publications being limited to the acknowledgement of only one institution and that tends to be the members' home institution.

Recommendations

Corporate Governance and Planning

Recommendation 1. The Board of Directors should meet with the Research Council at least once a year to deepen its knowledge of current and planned CIFAR research thereby strengthening the basis of its corporate decision-making.

Reference: Section 7.1.1, page 47

Recommendation 2. CIFAR should develop a more concise vision statement that can provide stronger direction for CIFAR's strategies and operations and set out measurable expectations.

Reference: Section 7.2.2, page 49

Recommendation 3. As decisions are taken to modify its Strategic Plan, CIFAR staff should periodically consolidate these changes to allow for a clearer status of implementation and help support decision-making.

Reference: Section 7.2.2, page 50

Recommendation 4. CIFAR should simplify its logic model and corresponding Data Collection Matrix so as to link to its vision and to give greater clarity and focus to its core functions, making the logic model

more useful for decision-making and for communicating CIFAR,s outcomes to stakeholders.

Reference: Section 7.5.2, pages 59 and 60

Communications

Recommendation 5. A strategic plan for communications is needed that takes into account all of CIFAR’s communication needs, clarifying the role of communications across the corporations functions.

Reference: Section 7.2.3, page 51

Recommendation 6. The implementation of a proposed knowledge transfer (KT) plan should establish priority activities for KT, explore ways to support CIFAR members in their KT activities and link to the communications strategy.

Reference: Section 5.2.2, page 35

Recommendation 7. As part of its KT efforts, CIFAR should further develop its website to list and, or, make available CIFAR related research publications by program, thereby making the website a useful reference for leading research and potentially enhancing its profile among the broader research community.

Reference: Section 7.2.3, page 52

Recommendation 8. CIFAR should consider establishing a major prize with appropriate sponsorship for outstanding interdisciplinary research.

Reference: Section 5.3.2, page 41

Research Program

Recommendation 9. CIFAR should review its approach to developing relationships with international institutions in emerging science nations to ensure that top researchers in these nations are being identified.

Reference: Section 5.2.2, page 34

Recommendation 10. CIFAR should ensure that its current flexible approach to managing its research programs is maintained as it transitions to a larger organization.

Reference: Section 7.3.3, page 54

Recommendation 11. To improve the visibility of CIFAR, Program Directors should reinforce the attribution of program research outputs to CIFAR, and recognize CIFAR as an institution, as opposed to a funding program.

Reference: Section 5.3.2, page 41

Recommendation 12. To improve the Junior Academy, (i) CIFAR should open up the competition for junior fellows to ensure greater transparency within research programs and enhance CIFAR's profile; (ii) CIFAR should involve junior members in planning Junior Academy events to ensure they are of value to participants.

Reference: Section 5.2.2, page 35

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1. Introduction

The Canadian Institute for Advanced Research (CIFAR) was established in 1982 to foster advanced research at a world class level across a broad spectrum of human knowledge through a cooperative, interdisciplinary approach that attracts and retains outstanding researchers to Canada, and strengthens Canada's research base. Underlying this approach is a research model that involves CIFAR playing a central role in defining the major questions to be addressed by the researchers, selecting the initial advisors and researchers to be involved in the programs, and undertaking five-year reviews. This model of operation has brought CIFAR considerable success from some 19 research programs conducted over the past 27 years. Currently CIFAR has 12 active programs.

In 2007, CIFAR created a new five-year strategic plan to position the organization for the next stage of its evolution. The plan identified five main goals:

- Research: Expand and enhance CIFAR research – build programs, extend and expand global reach, develop the methods used to support interdisciplinary research, and expand knowledge transfer.
- Young Researchers: Support, celebrate and build interdisciplinary capacity in gifted young researchers, particularly in Canada.
- Positioning: Position CIFAR to benefit Canada within the global research community.
- Organization: Develop the 2012 CIFAR organization: capabilities, capacity, and international reach.
- Financial: Establish stable and balanced funding capable of sustaining growth.

In its funding agreement with Industry Canada, CIFAR has committed to meeting objectives that are aligned with these strategic goals.

1.1 Purpose

The purpose of this performance audit and evaluation is to:

- Provide CIFAR with a mid-point assessment of the progress towards meeting the strategic goals established in the 2007-2012 Strategic Plan.
- To provide CIFAR with a formal evaluation of operational and management strengths and areas for improvement in advance of the next five-year strategic planning period.

- To comply with the agreement between the Government of Canada and CIFAR which requires the Institute to submit a completed independent third-party evaluation report by June 30th, 2010.

1.2 Report Structure

The report is in five parts: Introduction; Background; Evaluation; Performance Audit; Conclusions and Recommendations. The terms of reference of the study call for the evaluation and performance audit functions to be carried out in a combined manner but to be reported on separately within the same document.

BACKGROUND

2. CIFAR Profile

2.1 Overview

The Canadian Institute for Advanced Research was established in 1982 as a private non-profit organization to create and manage research networks among eminent researchers in Canada and internationally. Its resources are used to develop interdisciplinary research programs addressing fundamental questions, and then, support the interactions among its members through meetings and related initiatives to answer these questions.

The research that is supported by CIFAR is neither basic nor applied, but rather fundamental in nature. The questions that are identified and developed into programs address critical gaps in understanding in areas identified as being fundamentally relevant to society, and where CIFAR's engagement can potentially make a large impact - be it through new technology, changes in policy, or in improving how we understand the world.

CIFAR programs cover a broad range of subjects, some explicitly aligned with potentially disruptive technology such as nanotechnology, quantum computing, and superconductivity, and others, like the Institutions, Organizations and Growth program, more closely aligned with policy and economics. And while a few of CIFAR programs do concern themselves with life sciences, the institute has not historically supported medically focused programs in the area of human health, choosing to leave this well funded area to other funding organizations.

As a research institute, CIFAR is unique in both the Canadian and international research world in three main respects. First, the research that CIFAR supports is focused around fundamental questions which are addressed in a highly interdisciplinary manner. This requires that CIFAR identify researchers that are not only leaders in their respective disciplines but also willing to learn new methods and knowledge from other disciplines. Second, it provides an intimate and productive research environment for Canada's very best researchers to learn, share knowledge and collaborate with some of the world's most eminent scientists. And third, it is an institution 'without walls', leveraging resources from across CIFAR member universities and institutes towards goals that are in the long term interest of Canadian society and international science more generally. This reach now spans some 25 Canadian and 110 research institutions in 15 countries around the world. CIFAR therefore plays a niche role in Canada's research system and internationally that has not been replicated elsewhere.

2.2 Vision and Mission

CIFAR's Strategic Plan 2007/08 – 2011/12 sets out a Vision and Mission as well as Guiding Principles that are intended to guide the activities of the organization over this period.

Vision: to create knowledge that enriches human life, helps people understand their world, and advances Canada's research community.

Mission: to lead the world in framing and answering complex questions at the frontiers of understanding.

Guiding Principles

- Value knowledge for its own sake. CIFAR's research agenda is independent and unbounded by geography or academic discipline.
- Embrace intellectual curiosity and support researchers as they take whatever academic risks are necessary to pursue advanced research of global importance.
- Know that deep collaboration requires respect, trust and the freedom to be inspired.
- Create environments that celebrate excellence, inspire boldness of ideas and foster a unique spirit of collaboration for teams of elite scholars from around the world.
- Strive to extend the impact of CIFAR's research on the world to inform and improve the quality of human life.
- A perspective that is both intensely Canadian and enthusiastically global as CIFAR connects Canada's leading researchers with their peers around the world.

2.3 Governance

The **Board of Directors** is responsible for the governance of CIFAR. The Board can have between 15 and 24 members according to CIFAR's bylaws and currently has 21 members. Directors are distinguished individuals drawn from the Canadian business, research and professional communities. There are four committees of the Board: Governance; Advancement and Communications; Audit and Finance; and, Investment.

The Board's principal functions include:

- Direction of CIFAR's financial affairs
- Appointment of CIFAR's President
- Appointment of Fellows of the Institute on the recommendation of the President

- Approval of the Institute’s research programs and working agreements with universities and other institutions in Canada and internationally.

The **Research Council** is responsible for monitoring the overall direction and quality of CIFAR’s research, advising the President on the approval and renewal of research programs and providing insight into the Canadian and international research environment. The Council is appointed by and chaired by the President. It currently has 12 members drawn mainly from the senior ranks of Canadian and more recently non-Canadian universities.

The principal functions of the Research Council are to:

- Identify high priority areas of advanced research for existing and potential programs, taking into account CIFAR’s objectives and resources;
- Identify existing, emerging, and latent research strengths in Canada;
- Identify individuals to form task forces to explore potential new research areas for support by CIFAR;
- Evaluate findings of task forces regarding the creation of new Institute programs;
- Evaluate findings of external program reviews and make recommendations for Board approval on the renewal/termination of Institute programs;
- Act as one channel of communication between CIFAR and the Canadian and international research communities by informing the President of opportunities, issues, and problems related to research, and by fostering an understanding within the research community of the CIFAR’s aims and priorities.

The **Council of Advisors** assists the Board of Directors and the President by providing advice as requested. The Council is composed of former members of the Board of Directors and the Research Council, and past participants in CIFAR’s research programs, each of whom has shown a commitment to the mission, goals, and values of CIFAR. Currently, there are 24 members of the Council.

2.4 CIFAR Research Model

The CIFAR research model is virtual in nature. The essence of CIFAR’s approach is to develop a network of eminent researchers from different national and international institutions and to facilitate and support interaction among the researchers on research questions of broad interest at the interface of disciplines. In other programs of advanced research, the approach is different - researchers come to an institute and conduct research collaboratively on research questions of their choice. There are four components to CIFAR’s unique model – the search for a research question, the approval process, the research program, and program review.

Search for research questions: Research questions may originate from any source. The questions are reviewed by the President and senior staff of CIFAR with advice from Research

Council members and questions of interest are then the subject of a series of workshops that refine the questions. A task force is struck to lead the initiative. Potential researchers, Program Director and senior advisors are identified in the course of the search process that usually takes two to four years.

Approval process: Following a successful search process, a proposal is developed by the task force for the proposed program that outlines a research plan for the first five years, and proposes the identified researchers, Program Director and Advisory Committee members for the program.. The Research Council assesses the program against the following criteria:

- Adds significant value to its research area and answers big questions;
- Does not duplicate an already well understood area;
- Addresses a research question that cannot be answered by a single researcher or any one discipline or by researchers at a single institution; and
- Leads to advances that would positively impact Canada and the world, involve a significant number of Canadian researchers, and possibly draw researchers back to Canada.

Research program: CIFAR establishes research programs for a five-year term and a research plan for the term. CIFAR provides program members with five year, individually arranged, discretionary funds designed to facilitate their research as related to the program and complement any other funding they may receive. CIFAR arranges and supports meetings of program members, usually two or three meetings a year for each program. Currently, CIFAR has 12 programs.

Figure 1: CIFAR Research Programs, 2010

Research Program	2009-10*					
	Established	Paid Members	Unpaid Members	Total [†]	Junior Fellows	Adv. Com.
Cosmology and Gravity	1986	17	23	40	2	6
Quantum Materials	1987	28	34	62	2	6
Earth System Evolution	1992	12	13	25	2	5
Nanoelectronics	1999	27	3	30	1	5
Quantum Information Processing	2002	22	3	25	2	5
Successful Societies	2002	13	0	13	2	6
Experience-based Brain & Biological Development	2003	13	4	17	2	6
Institutions, Organizations and Growth	2004	18	2	20	1	3
Neural Computation & Adaptive Perception	2004	12	21	33	1	4

Research Program	2009-10*					
	Established	Paid Members	Unpaid Members	Total [†]	Junior Fellows	Adv. Com.
Genetic Networks	2005	14	0	14	1	4
Social Interactions, Identity, and Well-Being	2005	15	0	15	3	6
Integrated Microbial Biodiversity	2006	14	6	20	2	5
Totals		205	109	314	21	61

* Member counts at May 10, 2010.

[†]Note: Nine members are cross-appointed to two programs; and one member is cross-appointed to three programs, so the actual number of program members (Fellows, Scholars and Associates) is 303.

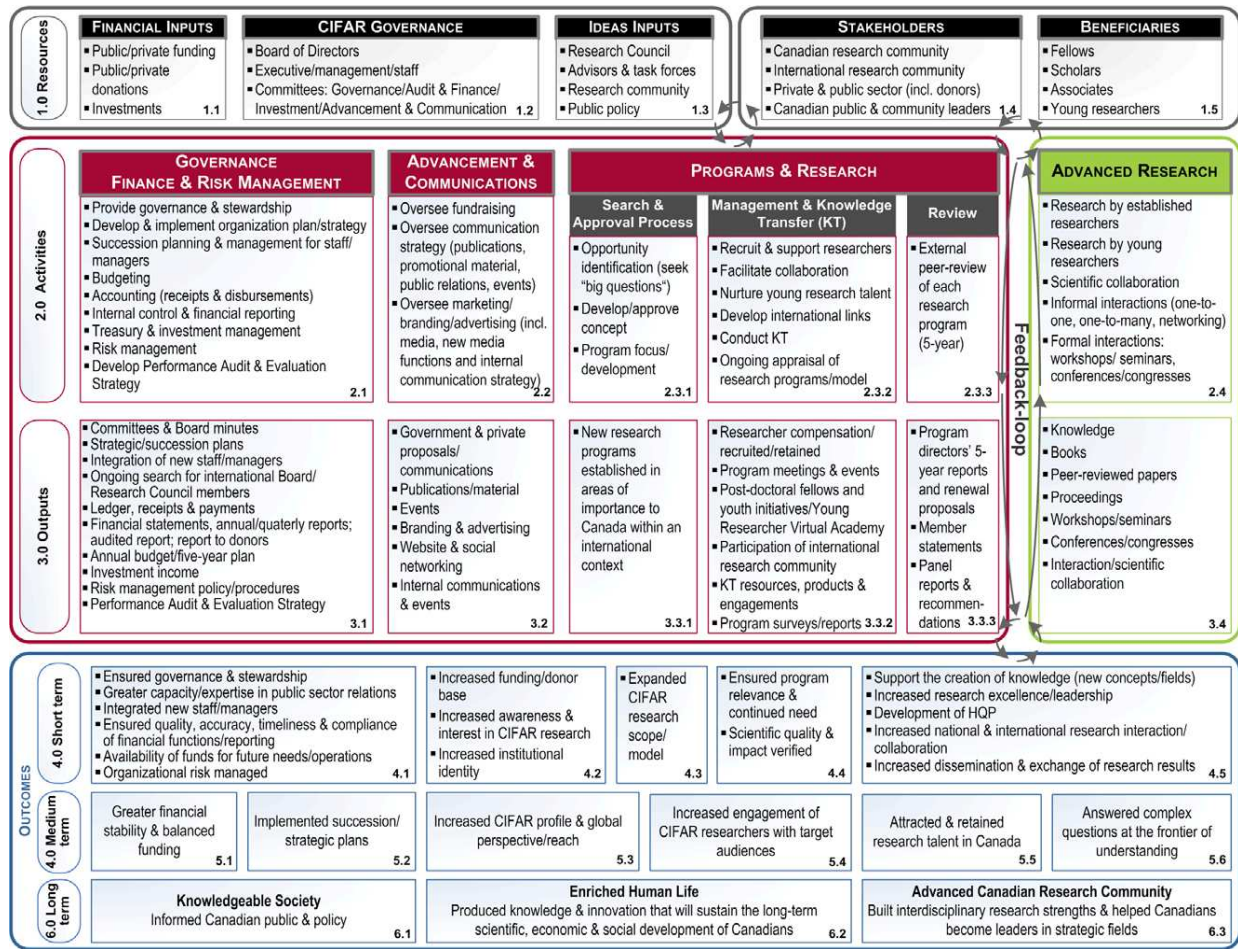
Program review: Programs are reviewed after four years into the five-year term through a formal peer-review process by a panel of eminent researchers selected by CIFAR. The review considers the results of the program and the plans for the next five years as presented by the Program Director. In addition to assessing the programs against criteria of excellence and relevance, the peer-review also evaluates the performance of individual program members both in terms of the excellence of their work but also in terms of their overall contribution to the success of the program. The reviews can lead to a program's continuance or to its termination and the continuation or termination of the involvement of individual members.

CIFAR's Strategic Plan notes that the growth of its programs in the social sciences and humanities has not kept pace with growth in the natural sciences. CIFAR is, consequently, examining how its research model might be adapted to research in these disciplines with a specific focus in this five-year period on the humanities.

2.5 Logic Model

CIFAR developed a logic model as part of its Performance Audit and Evaluation Strategy (PAES) approved by the Board of Directors in 2008. The logic model (Figure 2) ties together resources and activities with outcomes and is the basis for the evaluation and performance issues addressed in this study. The logic model is being modified by CIFAR with the assistance of HAL to be used in the fall of 2010 as part of the start of the 2012-2017 Strategic Planning process.

Figure 2: CIFAR Logic Model



2.6 Financial Profile

Projected Budget

CIFAR research programs are approved for periods of five years and thus long-term support is required to maintain the CIFAR model. CIFAR seeks a balance in this funding between private and public sources, a task that has been difficult in the current economic environment. In 2010, the ratio stands at 18% private funding that CIFAR is intent on raising to 30% by 2012.

Revenue

CIFAR's expects revenues of \$14.45 million for 2010, of which 19% is expected to come from private sources and 73% from public sources (Figure 3).

Figure 3: Revenue, 2010

Source	Amount
Private donors	\$2.5 million
Federal Government	\$5 million in arrears, third year of five year agreement
Provincial	\$5 million
Ontario	\$2 million, operating grant
British Columbia	\$2 million, 3 rd year of \$10 million, five year agreement
Alberta	\$500,000, 3 rd year of three year, \$2 million funding agreement
Quebec	\$500,000, 3 rd year of three year, \$1.5 million agreement
Other Sources	
Sponsorship	\$200,000
Investment	\$750,000

Expenses

CIFAR's operating budget for 2010 is \$16.9 million, with program expenditures accounting for 79% of the budget, followed by advancement and communication at 13%. More detailed expenditures are presented in Figure 4. CIFAR anticipates an operating deficit of \$2.45 million¹ for 2010 which will be funded from its accumulated surplus. Figure 5 breaks down existing program expenditures by CIFAR sector and program

Figure 4: Expenses, 2010

Expense	Expenditure
Research programs	Total cost \$13.3 million
Existing programs	\$9.6 million
New programs	\$1.2 million including knowledge transfer (\$100k), international reach (\$80k), junior academy (\$1 million), and study of CIFAR's research model (\$60k final payment).
Program support	\$2.5 million
Advancement and Communications	\$2.2 million
Governance and Administration	\$788k
Special events	\$400k
Performance Audit and Evaluation	\$150k

¹ While the 2009-10 operating deficit was forecast to be \$2.45 million, the actual figure is expected to be \$1 million.

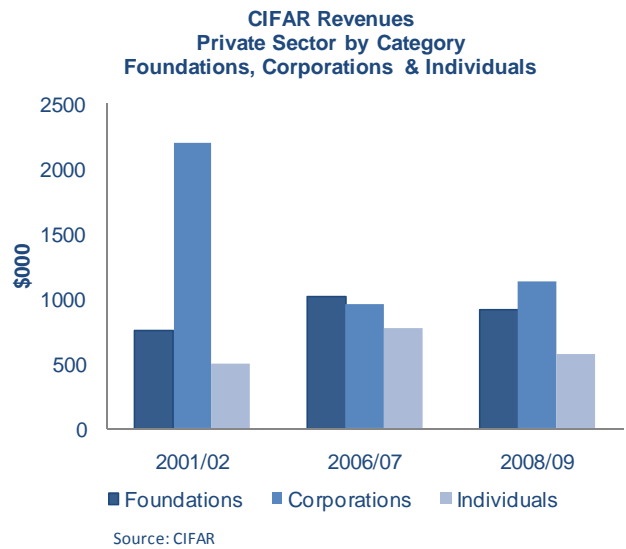
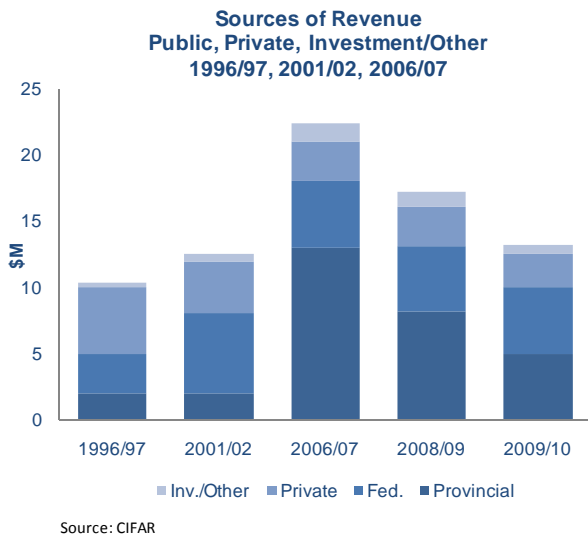
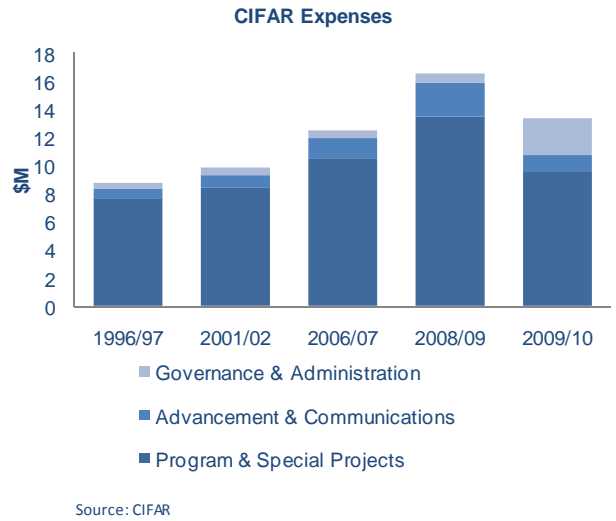
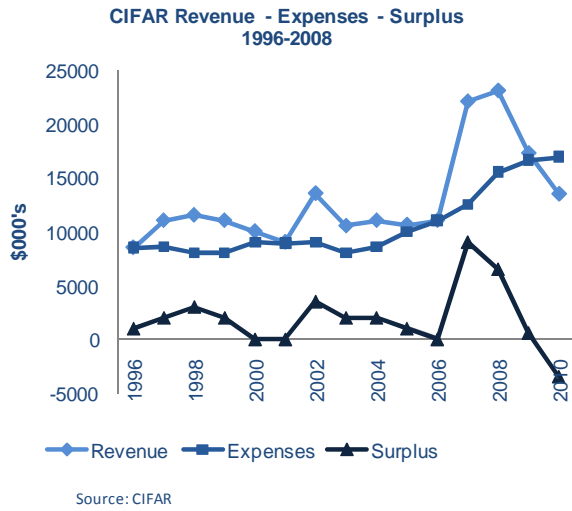
Figure 5: 2008/09 Budget by Research Program

Research Program	2008-09 Budget (\$'000)	Expenditures / paid program member
Cosmology and Gravity	1139	\$56,950
Earth System Evolution	849	\$53,063
Experience-based Brain & Biological Development	524	\$37,429
Genetic Networks	502	\$38,615
Institutions, Organizations and Growth	729	\$36,450
Integrated Microbial Biodiversity	696	\$53,538
Nanoelectronics	1078	\$41,462
Neural Computation & Adaptive Perception	517	\$39,769
Quantum Information Processing	821	\$37,318
Quantum Materials	1169	\$37,710
Social Interactions, Identity, and Well-Being	676	\$52,000
Successful Societies	840	\$60,000
Total	\$9540	N/A

2.6.1 Trends in CIFAR Budgets

The current fiscal climate in which CIFAR operates is challenging. The changes in CIFAR's financial profile over time are illustrated in the following figures:

Figure 6: Financial Trends



3. Approach and Methods

3.1 Overall Approach

Though similar in their focus on performance, evaluations and performance audits are normally carried out separately, each with their own accepted methodologies, analytical approaches and standards. Evaluations are conducted in accordance with the guidelines set out by the Treasury Board Secretariat, and often with the involvement of the organization and program being evaluated, whereas performance audits are conducted in accordance with the policies and guidelines of the Office of the Auditor General of Canada and the standards for assurance engagements set by the Canadian Institute of Chartered Accountants, and with stronger independence from the organization and program being audited.

It is, however, in the interest of small organizations such as CIFAR to have these requirements fulfilled simultaneously so as to minimize cost and lessen stakeholder fatigue that would result by having to interview the same individuals twice for similar information. To this end, HAL devised an approach that preserves the integrity of both the evaluation and performance audit. This approach is presented in the Figure below.

Figure 7: Integration of Performance Audit and Evaluation

	Performance Audit	Evaluation
Data Collection – Phase 1	Document Review	Document Review
	Preliminary Interviews	
Methodology Adjustment	Examination Plan Audit Objectives Audit Criteria	Evaluation Framework Evaluation Issues
Data Collection – Phase 2	Survey Interviews Benchmarking	
Analysis	Examination	Analysis
Reporting	Audit	Evaluation
	Performance Audit & Evaluation Report	

Overlap between the Performance Audit and Evaluation

Performance audits and evaluations are both ‘systematic, purposeful, organized and objective examinations of government activities’. Where they differ is in their emphasis. Performance audits are concerned primarily with cost-effectiveness and efficiency as well as the processes and structures that ensure effectiveness and accountability, whereas evaluations are focused primarily on the rationale for the activities undertaken and their success in achieving objectives. There is, however, overlap between the two. By Treasury Board guidelines, evaluations are also to address design and delivery and cost effectiveness and efficiency. To avoid repetition, design and delivery issues are addressed in depth in the performance audit along with cost-effectiveness.

3.2 Study Scope

This study was concerned with CIFAR’s internal activities from 2007 up to March 1st 2010. Our study did not include a review of the quality of CIFAR supported research. Such reviews are arranged by CIFAR and conducted every five years by expert peer review panels. The results of those reviews undertaken in the period examined for this audit have, however, been taken into account.

3.3 Evaluation

The evaluation was guided by the evaluation framework set out in the CIFAR’s performance audit and evaluation strategy (PAES) 2009. Preliminary interviews were carried out to identify particular issues in CIFAR operations, and validate the scope and evaluation issues and areas for in-depth review.

The evaluation objectives were as follows:

- To determine whether CIFAR is likely to achieve the governance, finance and risk management outputs and measurable outcomes set out on its Strategic Plan (2007/08-2011/12); and
- To assess whether CIFAR is likely to meet the operational objectives of its Strategic Plan (2007/08-2011/12) and the objectives of its funding agreement with Industry Canada.

Evaluation criteria were based on the evaluation policy and standards set by the Treasury Board of Canada Secretariat. These include evidence that:

- Objectives of the Strategic Plan were clearly stated and understood by CIFAR stakeholders; and
- Progress was being made toward meeting the objectives of the Strategic Plan and Industry Canada as stated in the funding agreement.

3.4 Performance Audit

The performance audit has been carried out in accordance with the Performance Audit Policies of the Office of the Auditor General of Canada (2004) and informed by CIFAR's Performance Audit and Evaluation Strategy. It involved a broad based appraisal of CIFAR operations (i.e. audit survey) through preliminary interviews of selected CIFAR executives and Board members. Information from the preliminary interviews was used to fine tune initial decisions with respect to scope, audit objectives, areas for in-depth review, audit criteria and the examination stage. The audit was also enabled by the document review in identifying the management structures, practices and procedures that were expected to be in place that could then be verified.

Our audit objectives were as follows:

- To assess whether CIFAR's corporate structures and processes for governance, planning, and setting strategic direction are adequate and are well suited to its expanding organizational capacity now underway to achieve its growth objectives;
- To assess whether CIFAR practices and processes are adequate and managing its research programs
- To assess the cost-effectiveness of CIFAR activities;² and
- To verify that its performance monitoring processes are working as intended.

3.5 Methodologies

The evaluation matrix in CIFAR's performance audit and evaluation framework 2009 laid out the methodologies that were used. They are described below.

3.5.1 Document, File and Literature Review

Our study was informed by an extensive document, database and literature review. CIFAR provided us with a website containing requested materials relevant to the performance audit and evaluation. These documents, which included meeting minutes, program reviews, performance indicators and reports, provided a thorough basis for assessing CIFAR's ongoing operations including the administration of its research programs, advancement and communication activities and of its financing. It also provided evidence and understanding for CIFAR's decision-making processes and the impact of its programs. In particular, previous evaluations, bibliometric studies and peer reviews of CIFAR's research programs assisted our assessment of outcomes of CIFAR's activities. The document review also examined indicators of CIFAR's performance as outlined in the logic model and CIFAR's data collection matrix (DCM), and compiled in progress and performance reports.

² Efficiency of CIFAR activities is addressed in the Evaluation Section

3.5.2 Interviews

The interviews provided an opportunity for in-depth discussions with key informants focusing on key evaluation and performance audit issues. In-person interviews were held in Toronto with CIFAR senior staff and CIFAR Directors while other interviews listed by category in the figure below were by telephone. Figure 8 shows the number of interviews completed, and declined, by interview group. As indicated in the figure, a total of 60 interviews were completed.

Figure 8: Interviews

Interview Group	Completed	Declined
Board of Directors, Research Council, CIFAR Executives and Staff	22	
Program Directors, Junior Fellows, Advisory Committees, Task Forces	17	
Donors: Government, Private Sector, Foundations, Individuals	11	2
Granting Councils, Research Advisors, Universities	7	1
Comparable Research Institutes	3	
Grand Total	60	3

3.5.3 Survey of CIFAR Program Members

The study draws on data from a web-based survey of CIFAR program members. Figure 9 shows the size of the population, survey population, number of completed responses and the response rate. A total of 181 completed responses were received out of a survey of 270, for a response rate of 67%.

Figure 9: Survey response rate

Total returns		
Population		270
Responses [n]		181
Return Rate		67%
Returns by program		
	#	% n
Cosmology & Gravity	22	12%
Earth System Evolution	14	8%
Experience-based Brain & Biological Devt.	9	5%
Genetic Networks	5	3%
Institutions, Organizations & Growth	15	8%
Integrated Microbial Biodiversity	10	6%
Nanoelectronics	18	10%
Neural Computation & Adaptive Perception	14	8%
Quantum Information Processing	15	8%
Quantum Materials	32	18%
Social Interactions, Identity & Well-Being	11	6%
Successful Societies	11	6%
Member of more than one program	5	3%
Returns by member status		
Associate	41	23%

Fellow	97	54%
Scholar	43	24%
Returns by location		
In Canada	120	66%
Outside of Canada	59	33%
#N/A	2	1%
Returns by seniority		
Less than a year	13	7%
1-3 years	35	19%
Over 3 years	132	73%
#N/A	1	1%

3.5.4 Benchmarking

CIFAR has an interest in comparing the cost-effectiveness of its operations with other institutes of advanced research and other programs that have characteristics similar to CIFAR. Within the performance audit and evaluation framework, cost-effectiveness questions that needed a benchmarking approach to determining their response included:

- How do CIFAR’s operating costs compare to that of comparable initiatives/organizations (accounting and finance, fundraising, program management)?
- How cost-effective is CIFAR in generating outputs and achieving outcomes when compared to alternative approaches (e.g., those used by similar organizations)?

Three institutes were identified as being comparable and suitable for the benchmarking exercise. They included: the Perimeter Institute for Theoretical Physics (PI), Waterloo, Ontario, Canada; the Sante Fe Institute (SFI), Sante Fe, New Mexico, USA; and the International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria.

Information for the benchmarking exercise was obtained from a review of documents available on the institute’s web site (e.g., financial statements), financial and other information obtained by CIFAR, interviews with a senior representative (president, vice president, director of communications), and any additional documents provided by the senior representative of the institute. The exercise compared each institute’s financial performance in the years from 2002-2004 and in the years 2008-2009. Information obtained through the interviews provided a qualitative context to the quantitative (financial) data.

A limitation of the benchmarking exercise is that each institute’s fiscal year is different, definitions varied between institutes (e.g., breakdown of operating costs into fundraising, program management), and comparable financial data for each institute was not always available for the same year. The study did manage, however, to obtain data for at least two years (early 2000s and the most recent data) for each institute, which served as a proxy for a trend.

3.6 Study Challenges

Combined Evaluation and Audit

The project faced a number of challenges. A first challenge was to manage the study as a combination of an evaluation and a performance audit. While our approach, as mentioned, involved collecting data on both components jointly through the interviews and the surveys, in the analysis and reporting phases the components were treated separately. This separation in these latter phases of the study was necessary in order to fully respond to the evaluation objective of “measuring the overall performance of CIFAR in delivery of its activities in relation to CIFAR’s objectives”, and the audit objective of “examining how CIFAR’s outputs and outcomes were achieved considering the resources used to design, implement and manage its activities”. In order to address this challenge, we assigned two groups to conduct the analysis phase; these groups provided separate analyses of the two issue areas.

Linking Program Outcomes to Longer-Term Objectives

A second challenge concerned making the links between the outputs of CIFAR’s activities and the short, medium, and long-term outcomes as expressed in CIFAR’s logic model. An aspect of this challenge, for example, was how the collection of separate, individual CIFAR research programs contribute to these higher-level CIFAR objectives. The five-year strategic plan has identified the long-term outcomes as a vision, that is a statement of the desired, perhaps somewhat idealistic, outcome intended as an inspiration, and focused on specific goals to be achieved in the five-year period. Our response to this challenge, therefore, was to adopt the reasoning behind the Strategic Plan and determine the linkages of CIFAR activities to the short and medium term objectives in the context of the goals and the annual objectives set to reach these goals.

Results Attribution

Attribution of the “successes” to the provision of CIFAR funding can be difficult because (i) the CIFAR Research Programs span broad topic areas with diverse teams affiliated with a number of universities, both inside and outside Canada, (ii) these world class researchers usually have multiple sources of funding, and (iii) knowledge is shared among and beyond the team members. Attempts were made during the interview and survey data collection stage to address the attribution issue to the extent possible.

EVALUATION

4. Relevance

4.1 Longer-term Economic and Social Interests

4.1.1 Evaluation Question

How relevant are CIFAR’s research programs and activities to Canada’s longer-term economic and social interests? How relevant are they to longer-term global economic and social interests?

From its beginning in 1982, CIFAR has supported a range of programs (see Figure 10) concerned with understanding the sources of economic and social development not only with respect to Canada’s interests but also to the interests of other nations globally.

Figure 10: CIFAR Research Programs

Name	Search Started	Initial Year	Final Year	Current Term End	Length
1. Artificial Intelligence and Robotics	?	1983	1995		13
2. Cosmology and Gravity	1983	1986		2012	27
3. Evolutionary Biology	1983	1986	2007		22
4. Law and the Determinants of Social Order	?	1986	1996		11
5. Population Health	1983	1987	2003		17
6. Quantum Materials	1987	1987		2012	26
7. Economic Growth and Policy	1989	1991	2002		12
8. Earth System Evolution	1987	1992		2014	23
9. Human Development	1991	1993	2003		11
10. Science of Soft Surfaces and Interfaces	1990	1993	2000		8
11. Nanoelectronics	1998	1999		2014	16
12. Quantum Information Processing	2000	2002		2012	11
13. Successful Societies	2000	2002		2012	11
14. Experience-based Brain and Biological Development	2002	2003		2013	11
15. Institutions, Organizations and Growth	2002	2004		2014	11
16. Neural Computation and Adaptive Perception	2002	2004		2014	11
17. Genetic Networks	2005	2006		2011	6
18. Social Interactions, Identity and Well-Being	2002	2006		2011	6
19. Integrated Microbial Biodiversity	2005	2007		2012	6

The report highlights two examples to illustrate the relevance of the programs. The CIFAR Institutions, Organizations and Growth (IOG) Program was launched in 2004 to explore the impact of institutions such as governments, legal systems, and corporations on economic growth. The program has made fundamental contributions to our understanding of which features of societies create environments that are conducive to investment in physical and human capital and R&D, and what explains the remaining variation in growth rates across countries and time. The IOG Program developed from an earlier CIFAR program, Economic Growth and Policy (EGP) which provided important insights into the role of technological progress in explaining the large variation among nations in levels and growth rates of income per capita.

The Successful Societies (SS) Program, started in 2002, seeks a better understanding of how social relations influence the capacities of individuals and communities for effective action underpinning collective development at both the national and local levels. This program was inspired by the accomplishments of CIFAR's programs in Population Health (1987-2003) and Human Development (1993-2003). These research programs produced major advances in understanding the significance of early childhood development and how it affects health and developmental outcomes throughout a person's life. The next generation of research questions related to these areas continue in the Successful Societies and Experience-based Brain and Biological Development programs.

Interviewees with a deep understanding of the Canadian government considered the impact of CIFAR's research on government thinking and actions in both the economic and social arenas to be impressive. In their view, the most telling argument in favour of CIFAR is that its model and its performance have been the best at the leading edge of research where the research has been testing the limits. One interviewee commented that in the case of the economic growth programs, while it was difficult to attribute policy changes to the CIFAR work, the programs were clearly on the leading edge in a difficult area. In the case of the Population Health Program, the comment was definitive that the program had changed the way not only Canadian but other governments have dealt with the subject - 'the impact paid for CIFAR's entire research program'.

CIFAR's programs on economic growth and social development, as well as its natural science programs as indicated in response to the next question, have been very relevant to advancing Canada's and, more generally, global economic and social interests. For Canada, the impact has not only been in terms of improved policies and programs by governments but, also, in the opportunities the programs have afforded universities to strengthen the quality and capacity of their research across the disciplines involved in the CIFAR programs.

4.2 Goals in Science and Innovation

4.2.1 Evaluation question

Are CIFAR's research programs and activities relevant to Canada's goals in science and innovation and, if so, in what way?

CIFAR's activities supporting advanced research align closely with the Federal government's 2007 S&T Strategy, *Mobilizing Science and Technology to Canada's Advantage*. In addition to being given explicit recognition as part of the government's efforts to create a 'Knowledge Advantage', CIFAR is central to creating a 'People Advantage', enhancing opportunities for graduates and attracting and retaining highly skilled individuals in Canadian universities. Furthermore, CIFAR's model of engaging eminent scientists through networks exemplifies one of the four principles outlined in the Strategy to guide the federal government's S&T investment decisions, that of promoting world class excellence.

CIFAR is also relevant to provincial programs in support of science and innovation including Alberta's Ingenuity Accelerator initiative designed to attract outstanding researchers to work in areas important to Alberta's economic future, and Ontario's Innovation Agenda whose goal is to invest in, generate and attract a workforce with first-rate skills in science, engineering, creative arts, business and entrepreneurship, and stimulate increased private-sector investment in knowledge-based companies and capital that boosts productivity.

CIFAR's focus on advanced interdisciplinary research pioneers the bringing together of world-recognized scientists and scholars from different disciplines to consider complex questions concerned with nature and society. Though 'advanced', the research addresses questions that, while fundamental, have a potentially very important applied context that is of interest to a range of stakeholders. Research programs on, for example, Quantum Materials, Nanoelectronics, Quantum Information Processing, and Institutions, Organizations and Growth, all hold the prospect of having very significant socio-economic impacts.

The following charts (Figures 11 and 12) provide some insight into the interest from the stakeholder community in CIFAR research, and the type of socio-economic impacts that the researchers themselves recognize from their research. Indeed as Figure 11 indicates, half the members surveyed interact a few times a year with individuals and groups interested in the application of their research, a figure that is more pronounced in the social sciences than in the natural sciences.

Figure 11: Interest in CIFAR fundamental research

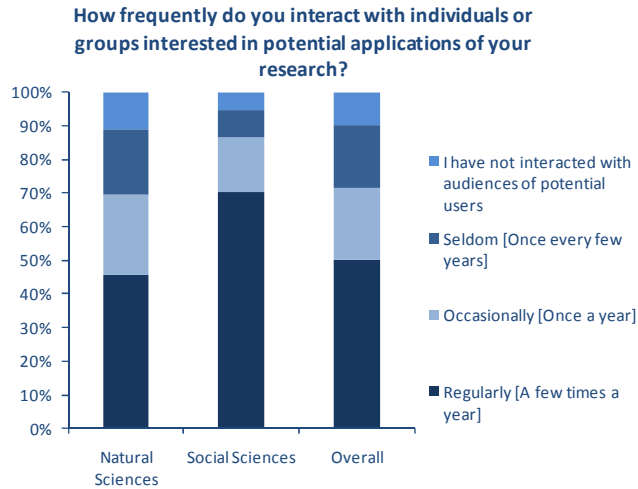
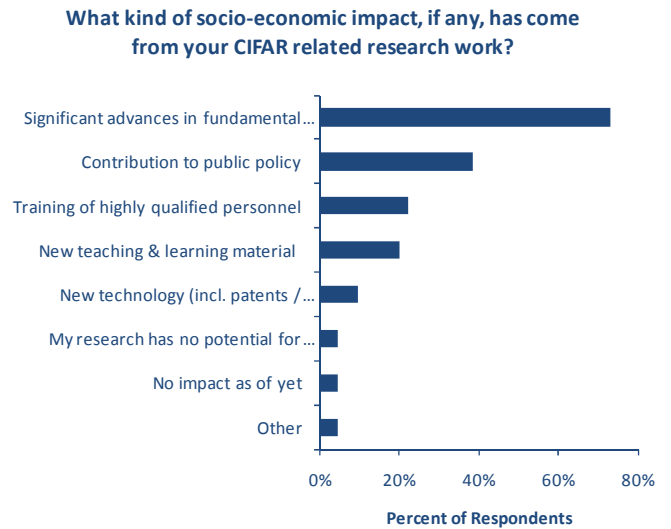


Figure 12: Socio-economic impacts of CIFAR research



4.3 Positioning Canada in Global Research

4.3.1 Evaluation Question

Are they relevant to positioning Canada in the global research picture and, if so, in what way?

Through a few of CIFAR’s programs, notably the more established ones such as Quantum Materials and Cosmology and Gravity, Canada has achieved international standing as being among the best, if not the best, in their program’s respective fields. This has given CIFAR an international profile, though one that varies in prominence by research area. The CIFAR model itself, by engaging some of the most eminent researchers both as part of research programs and through the Research Council and peer review processes, ensures CIFAR a degree of international status among the scientific elite. CIFAR also positions itself internationally through regular meetings and workshops of its programs held in different countries.

The extent of CIFAR’s international reach is evident from the number of countries and institutions where program members and advisory committee members are based. As the figure below indicates, this international leveraging has increased since 2007 both in terms of the number of countries and number of institutions represented.

Figure 13: Interational Reach of CIFAR members and advisory committee members

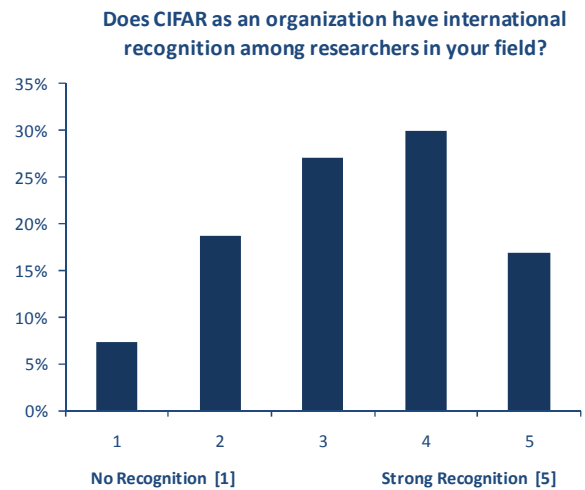
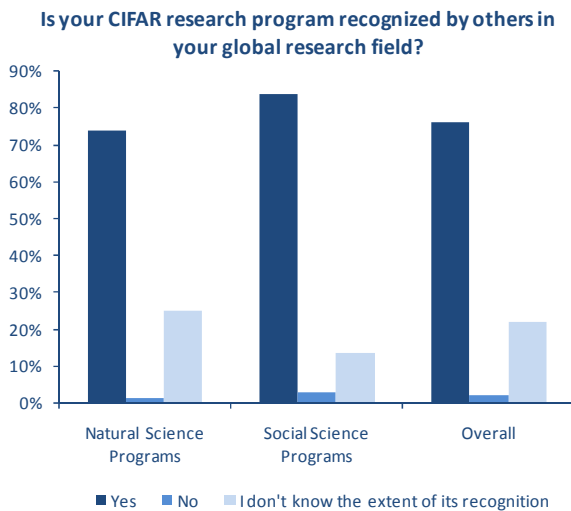
Countries and institutions affiliated with CIFAR members	2007	2008	2009	% Change
Number of Countries	13	14	15	15%

Number of Institutions	103	101	110	7%
------------------------	-----	-----	-----	----

CIFAR has recently strengthened its international reach objective to increase its international relationships through systematic engagement with research communities outside of Canada, in particular in India and China. According to survey results from this study, CIFAR program members consider CIFAR research in both the natural sciences and social sciences to have high recognition in other countries. CIFAR, as an organization, is considered to be somewhat less well known as shown in Figure 14 and Figure 15. From internal CIFAR documents, it is noted that this build-up of its international profile is being balanced by a continuing focus on improving public recognition in Canada, a balance that CIFAR fully intends to maintain.

Figure 14: International recognition of research program

Figure 15: International recognition of CIFAR



4.4 Upcoming Changes and Challenges

4.4.1 Evaluation Question

What are the current and upcoming changes and challenges that may affect CIFAR’s relevance? How can CIFAR adapt to these changes and meet these challenges?

In the last decade, the Canadian research landscape has changed significantly. Along with increases in funding to the three granting councils core programs, Canadian researchers have witnessed a myriad of new types of programs emerge ranging from endowed chair programs such as the Canada Research Chairs (CRC) and Canada Excellence Research Chairs (CERC), to new high profile scholarships such as the Vanier Canada Graduate Scholarship, to strategic

programs aimed at commercialization. CIFAR has adapted well to the introduction of these programs by demonstrating to universities how CIFAR's initiatives complement rather than compete with the programs.

In the case of CERC, two of the four identified priority research areas, specifically health and related life sciences technologies and information and communication technologies, map onto content pursued within the CIFAR portfolio, that is, Genetic Networks, Quantum Materials and Quantum Information Processing. CIFAR has collaborated with universities in support of the CERC nominees based on ongoing and future involvement of the nominees in CIFAR programs. We understand that 3/20 CERC positions awarded so far in the competition are directly involved in CIFAR programs and two of these researchers are currently international members of the programs who have now chosen to come to Canada in no small part because of their participation in CIFAR. This reflects the standards of excellence and quality of researchers that are attracted to CIFAR programs.

CIFAR faces major shifts in public perceptions of research on major issues from, as stated by one interviewee, a dependence on 'expert wisdom' to 'crowd wisdom' with an emphasis on speed rather than content (i.e. deep, considered and profound). The interviewee considered this change to have institutional repercussions presenting a challenge to 'an elite organization like CIFAR whose programs do not lend themselves to quick responses'. CIFAR's adaptation to the change will have to involve improved communications to the public, reaching out to a broader audience, and maintaining its image as a highly respected organization associated with world-class excellence in research. CIFAR's knowledge transfer activities have been a key element of its public outreach through the CIFAR researcher interactions in public events such as the Next Big Question series of meetings across Canada. While there is a cost to such activities that has to be weighed against the benefits, public outreach as noted in the Communications Review Report³ creates a public profile that can be influential in maintaining and possibly increasing support to CIFAR from government and the private sector.

Other observations from interviews were that the public sector in Canada is less focused than it used to be on the policy and paradigm shifts that a number of CIFAR's programs in the economic and social domain have been concerned with such as the Population Health, Economic Growth, Human Development, Successful Societies and Institutions, Organizations and Growth programs. There is, therefore, some loss of relevance of CIFAR to the public sector. At the same time, some interviewees commented on an enlightened interest shown by the corporate world in Canada supporting the kind of long run thinking exemplified by CIFAR. The answer for some to this challenge is for CIFAR to maintain a balanced portfolio such that its programs have relevance to a broad spectrum of public and private audiences. The challenge for CIFAR is, given a perceived decline in its public policy influence, how to boost its relevance and appeal to the business sector. Some believe that the influence of all CIFAR programs needs to be measurable to ensure CIFAR's continuing relevance.

³ Communications Review Report, Sherry McPhail, Ketchum Canada Inc., January 2010

Finally, a key challenge to CIFAR's relevance is the current and future economic environment. The global recession has had a major impact on the financial situations of governments, corporations, foundations and individuals. This may have an impact on their ability to contribute to organizations like CIFAR. Governments have made large expenditures on "stimulus" investments and, in efforts to reduce government deficits, some budget tightening has been evident. Many corporations have encountered downturns and this may have an impact on their corporate donations in the short to medium term. Foundations and individuals have recorded major declines in their investment portfolios which are only now beginning to recover. The ongoing relevance of CIFAR will be affected if it is unable to continue to raise the funding necessary for its programs.

CIFAR is well aware of the financial challenges in both the public and private sectors and is strategically shifting its advancement campaigns from past approaches, for example in its ongoing stewardship of past and current donors and in finding innovative ways to keep lapsing or potentially lapsing donors engaged until their ability to contribute returns. Reducing or holding the line on costs wherever possible is also clearly important.

4.5 Continued need for CIFAR

4.5.1 Evaluation Question

Is there a continued need for CIFAR and, if so, why? Has the need for CIFAR changed since the organization was launched in 1982 and, if so, how?

For program members, arguably the biggest benefit of CIFAR is having the opportunity to engage on a regular basis with some of the very best scientists and scholars world-wide in intimate and informal settings that are conducive to in-depth discussions and mutual learning. Indeed, many members commented in the survey on their own surprise at what they have learned from these interactions over the years, supporting the often observed point that science is very much a conversation with other scientists. Typical scientific conferences, as several of those interviewed noted, are too large for these kinds of interactions and do not allow for substantive debate or much learning. CIFAR's five-year terms build trust and relationships, not possible to do in the one-off nature of conferences. In Canada, there is no other research program that is dedicated to supporting interactions among scientists for the purpose of addressing fundamental questions. CIFAR is, thus, very much unique not only in Canada but internationally and fills a very important gap in the research system.

Results of the interviews and survey are unanimous on the continuing need for CIFAR but also recognize that the need has changed. In fact, the need is more pronounced for a number of reasons: (i) CIFAR, today, is having an increasing impact on the growth of Canada's research capacity through the researchers attracted to Canada by CIFAR and researchers retained in Canadian universities, increasing in number due to the increasing number of CIFAR research programs over the years (see Figure in Section 7.3.4); (ii) CIFAR, through the introduction of the

Junior Fellows program, is also having a greater impact within that expanding research capacity on the number of young Canadian researchers of exceptional quality doing interdisciplinary research; (iii) CIFAR's expanding international reach, particularly into India and China, has made CIFAR an important factor in raising Canada's profile globally as a science and technology nation; and (iv) the increasing breadth of CIFAR's research programs is attracting attention from a wide range of countries with shared interests in the results.

Common to these points is the fact that CIFAR's research model with its longer-term, collaborative approach is increasingly suited to the greater complexity of key research issues made possible through scientific breakthroughs and technological advances. For example, CIFAR has increased the number of programs with a biology theme as a result of these advances such as Integrated Microbial Biodiversity and Genetic Networks that follow-on from the research findings of the Evolutionary Biology program. CIFAR has evolved since its founding in 1982 and continues to demonstrate an ability to respond to new challenges commensurate with its special place in the Canadian and global research environment.

Despite the change, CIFAR's continuing focus on having excellent researchers in all its programs is seen by respondents as the future of scientific investigation and certainly the best way to conduct advanced research. Furthermore, respondents believe that as a world-class institution, CIFAR brings recognition to Canada as a supporter of research at the frontiers of human knowledge.

5. Success

5.1 Governance, Finance and Risk Management

5.1.1 Evaluation Question

To what extent have the governance, finance and risk management activities produced their intended outputs and achieved measurable outcomes?

Summary Findings: Based on evidence from CIFAR's annual progress reports and corporate plans, and on interview results, CIFAR is on a track to achieving its planned outcomes in terms of governance and stewardship, financial stability, and managing organizational risk. In particular, CIFAR is addressing the requirements of a balanced budget in the future in the context of a difficult economic environment.

Governance Outcomes

The main planned outcomes of CIFAR's activities in the areas of governance, finance and management over the period of the Strategic Plan, according to its logic model, are to (i) achieve greater financial stability and balanced funding, and (ii) implement succession and strategic plans. Other planned outcomes include:

- Ensured governance and stewardship
- Greater capacity/expertise in public sector relations
- Integrated new staff/managers
- Ensure quality, accuracy, timeliness and compliance of financial functions/reporting
- Availability of funds for future needs/operations
- Organizational risk managed

The evidence on the extent that CIFAR is on a track to achieving these outcomes is based on annual progress reports and corporate plans prepared by CIFAR, and on the interviews conducted as part of this evaluation.

Financial Stability/Balanced Funding

The financial profile given in Chapter 2 indicates that revenues have been dropping since 2007/2008 and in 2009/2010 are expected to be below expenses leading to an operating deficit of \$2.45 million (see footnote on page 10). The decline in revenues over the period is largely the result of a bulge in the Ontario government grant received in 2006/2007 and 2007/2008 with some decrease also experienced in private sector contributions. CIFAR had anticipated deficits

in 2010 and beyond and will be covering the 2010 deficit through an unrestricted surplus and the internally restricted See Far Fund, drawn from a total surplus of \$27 million at June 2009.

In working towards financial stability and balanced funding, efforts are underway to maintain existing donors through Board contacts and CIFAR events including presentations by program members, and to attract new donors through the Next Big Question series of events in 2010. Funding proposals to the provinces of Ontario, Quebec and Alberta were submitted in late 2009. A first approach for funding to the government of Nova Scotia is planned for 2010.

The CIFAR Board of Directors and management realize the risks and uncertainties in trying to achieve a balanced budget into the future and regularly explore the subject at meetings of the Board and through ongoing consultations of the President and senior CIFAR management with government, private industry and foundations. The advancement and communications activities including the endowment/capital campaign to be initiated in 2010 are focused on at least maintaining the current level of revenues and possibly on increasing them. These activities are reviewed in a later evaluation question.

Implement Succession and Strategic Plans

CIFAR has implemented the human resources and organizational strategies set out in the Strategic Plan including the restructuring and hiring of key staff, the development of standardized CIFAR job descriptions and an annual performance management process, and established a Human Resources Committee to monitor CIFAR's capacity to meet its needs. For 2009/2010, CIFAR is working with its Board on a plan for succession and renewal of the Board and senior management. The CIFAR Human Resource Plan for 2009/2010 indicates that the following organizational changes have taken place in CIFAR departments:

- The Advancement & Communications Department developed a new staffing strategy, reviewed and updated all job descriptions and hired new staff in events management & coordination and advancement coordination.
- The Programs & Research Department reviewed and updated all job descriptions and hired a Senior Vice-President Research, a Research Officer and Programs Department Coordinator.
- The Finance & Administration Department developed a new staffing strategy, reviewed and updated all job descriptions and hired a new Controller, Junior Accountant and Administrative Coordinator and restructured other functions and reporting relationships in the Department.
- Reviews of key processes in each department and implications for staff are ongoing. Changes have been made in response to the new hires and additional reviews will take place in 2009-10.

5.2 Research Programs

5.2.1 Framing and answering complex questions

Evaluation Question

To what extent has CIFAR supported research contributed to CIFAR's ongoing mission of identifying, framing and answering complex questions at the frontiers of understanding?

Summary Findings: CIFAR's research program has been successful in answering complex questions at the frontiers of understanding. The four review panel reports conducted since 2006 and examined for this study each find the respective programs to have been successful in achieving their objectives and are all very positive about the direction and quality of the research. Many of CIFAR's research programs have contributed to the identification and framing of new programs, for example the Economic Growth program lead to the Institutions, Organizations and Growth program.

Identifying/Framing Complex Questions

There is no set process at CIFAR for identifying new question opportunities. They can arise from internal conversations among CIFAR staff, Research Council and Advisory Council members, external input from research program members, researchers at large, the public or private sector or from the public itself. The experience gained from current and past programs both in terms of the content and structure of these programs has also been important in the identification and framing of new programs. For example the Economic Growth program lead to the creation of the Institutions, Organizations and Growth program; similarly, the Successful Societies program was an outcome of the very successful Population Health program.

Answering Complex Questions

For each program, CIFAR convenes a peer-review panel every five years comprising of leading researchers from in and outside of Canada who are asked to assess both the quality of the program and the quality of individual program members. This review process, which provides the best evidence for whether CIFAR supported research has contributed to answering complex questions at the frontier of understanding, is the basis for determining whether programs are to be continued.

Each program is assessed on its own merits and in comparison with other initiatives in the field, and is evaluated against the following criteria:

- Accomplishments of the program in relation to its objectives as stated at the outset of the five-year term;

- Evolution of the program's intellectual focus;
- Impact of the program in relation to the field as a whole (i.e. did the group change or lead the field);
- Effectiveness of the interaction of the Fellows, Scholars and Associates;
- Impact on undergraduate/graduate/post-doctoral training;
- Value-added of CIFAR's role in supporting the program.

The panel is also asked to reflect on future directions of the program, including the program's plans for future research in relation to the overall prospects for the field, and to comment on whether the future focus requires (a) additional individuals to the current group or (b) a new mix of individuals.

The four review panel reports conducted since 2006 and examined for this study each find the respective programs to have been successful in achieving objectives and are all very positive about the direction and quality of the research. Reviews of the Institutions, Organizations & Growth (IOG) Program (2008), the Experience-Based Brain & Biological Development (EBBD) Program (2007), the Quantum Materials Program (2007) and Successful Societies Program (2006) all recommend a continuation of the programs with minor changes to program membership or advisory panels.

5.2.2 Achievement of Outputs and Outcomes

Evaluation Question

Have the research programs and activities produced their intended outputs and achieved measurable outcomes? Have CIFAR's new initiatives (i.e., international outreach, young researchers and KT) met the objectives stated in the Strategic plan and RMAF?

Summary Findings: Evidence from the survey of research program members clearly shows that CIFAR has achieved measurable outcomes in research collaboration, research excellence, attraction and retention of highly qualified people, and increased involvement of young researchers.

Increased research interactions & collaboration

The essence of CIFAR's model is to support interactions among eminent scientists both from Canada and internationally so as to foster joint learning through discussions and undertake collaborative research which together allow for answers to fundamental questions. The main mechanism for supporting such interactions is the program meetings, organized by CIFAR, and held two or three times a year, depending on the program. In addition to holding annual program meetings, some programs choose to support smaller subsets coming together more frequent frequently throughout the year. Figure 16 summarizes the number of main interactions events from 2007-2009.

Figure 16: Program related interactions, 2007-2009

Events	2007	2008	2009
No. of Program Meetings	27	27	27
# of special topic workshops or focus Groups	1	4	3
# of interstitial workshops	1	1	2

From the feedback from the survey, we find these meetings to be very strongly supported and well attended among members. A typical comment on quality of meetings was as follows: “I always get some precious nuggets out of each meeting. This is a smart group of people, who I would otherwise have little opportunity to interact with and learn from. Several of us are beginning collaborations that simply wouldn’t have occurred without CIFAR.” The survey results also highlight the impact that research programs have on achieving interactions and collaboration beyond the two or three annual meetings (see Figure 17). As indicated, over 60% of CIFAR members are interacting with one another either frequently or regularly outside of CIFAR meetings.

Figure 18 shows the impact of CIFAR membership on collaboration, and in particular on co-authored publications, of which there were 236 in 2009. Co-authorship among CIFAR members jumped on average by over 90% since the researchers became members, which gives an indication of the effectiveness of the CIFAR model with respect to promoting research collaborations.⁴ This finding is supported by many comments from survey respondents that note the opportunity for collaboration that CIFAR membership has brought.

Because each program comprises both Canadian and international researchers, CIFAR has therefore been remarkably effective at encouraging closer links between the research activities of Canadian and international researchers, a key objective under the funding agreement with the federal government.

⁴ Baseline: as compared to co-authorship publications five years prior to becoming a member.

Figure 17: Frequency of member interactions

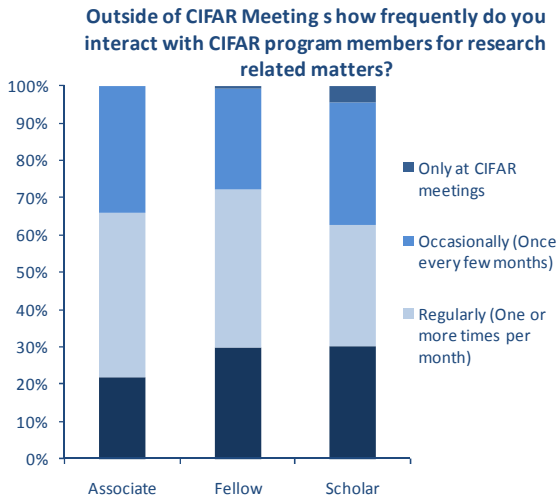
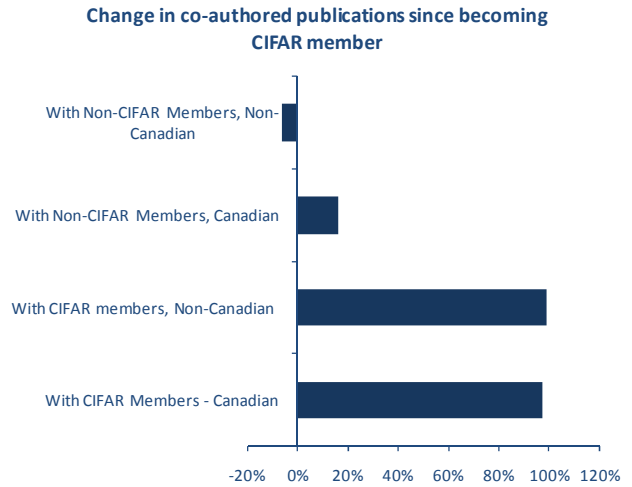


Figure 18: Impact of CIFAR membership on research collaboration

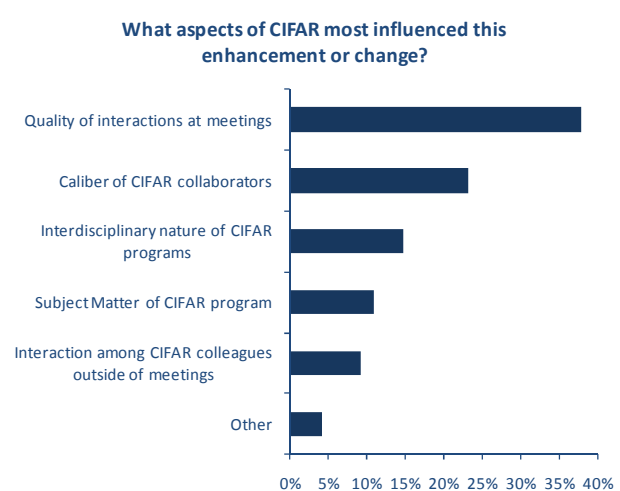
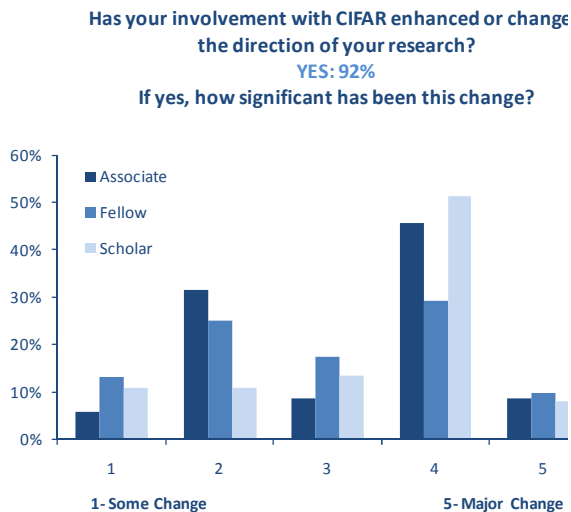


Increased research excellence

Figure 19 presents another indicator showing CIFAR’s impact on learning among members. Asked whether their involvement with CIFAR has enhanced or changed the direction of their research, some 92% responded yes and over half noted that the change was significant (4 or 5 on a scale of 1-5). Asked what aspects of CIFAR most influenced this enhancement or change, the majority cited the quality of interactions at meetings followed by the calibre of CIFAR collaborators (Figure 20).

Figure 19: Impact of CIFAR on member research

Figure 20: Role of CIFAR in influencing research



CIFAR's focus on excellence is also reflected in the citation rates of members and advisors and in the number of Canadian and International awards and honours. In 2009, 41% of members and 53% of advisory committee members were in the top one percent of the world's most highly cited researchers.⁵ And in 2008/09, CIFAR members received 16 international and 22 Canadian awards and honours in addition to two new Canada Research Chairs (CRC) and 13 CRC renewals.

It was noted in interviews with Research Council and program members that CIFAR's exploration of new institutional relationships in emerging science nations might be reviewed to ensure that the approach is the most appropriate for identifying top researchers in these nations.

Attraction and retention of highly qualified people

One of the main objectives of CIFAR, as outlined in its funding agreement with the federal government, is to attract and retain highly qualified people in Canada. The benefit of interacting on a regular basis with eminent colleagues in intimate and informal scientific forums can be very attractive for researchers, and is often a factor in their decisions to take up a position at a Canadian institution or turn down offers from outside institutions and stay in Canada. Figure 21 and Figure 22 show the percentage of program members from the survey citing CIFAR as having influenced their decision to accept or stay in their current position.

And while CIFAR membership in and of itself supports the attraction and retention of leading researchers, CIFAR staff often work actively towards these objectives by collaborating with universities and funding bodies, to address individual needs of current or prospective members and broker hiring opportunities.

⁵ Data provided by CIFAR.

Figure 21: Talent attraction

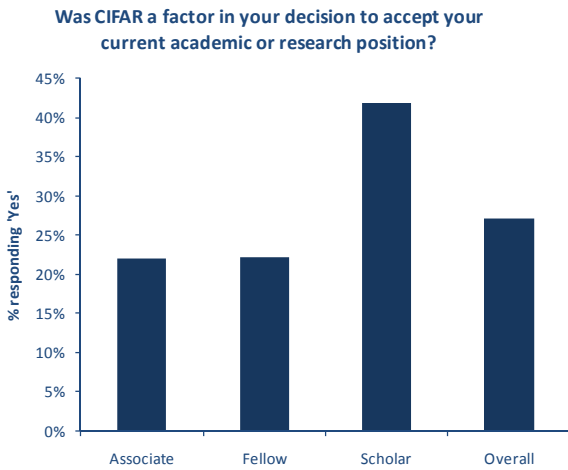
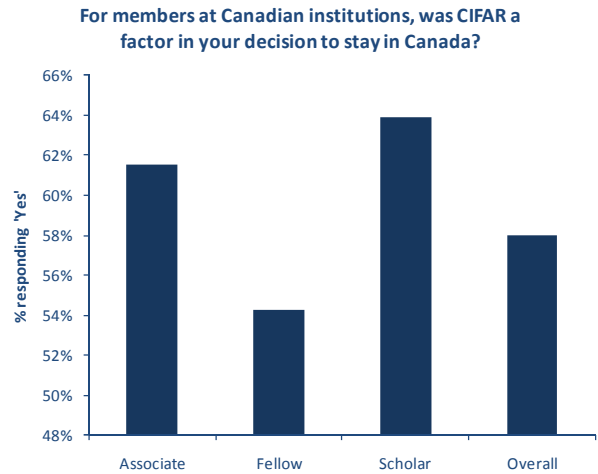


Figure 22: Talent retention



Young researchers

One of the objectives of CIFAR is to involve young researchers in its programs with the goal of supporting, celebrating and building capacity in gifted young researchers. To this end, CIFAR established its Junior Fellow Academy in 2008 that now comprises 22 junior researchers. As Junior Fellows, these 22 individuals, mostly in Canadian universities, have similar expectations to CIFAR members including attendance at meetings of their research program as well as special events organized for the Junior Fellow Academy, and interacting and collaborating with program members. Though in its infancy, this new initiative has thus far been viewed favourably by CIFAR members.

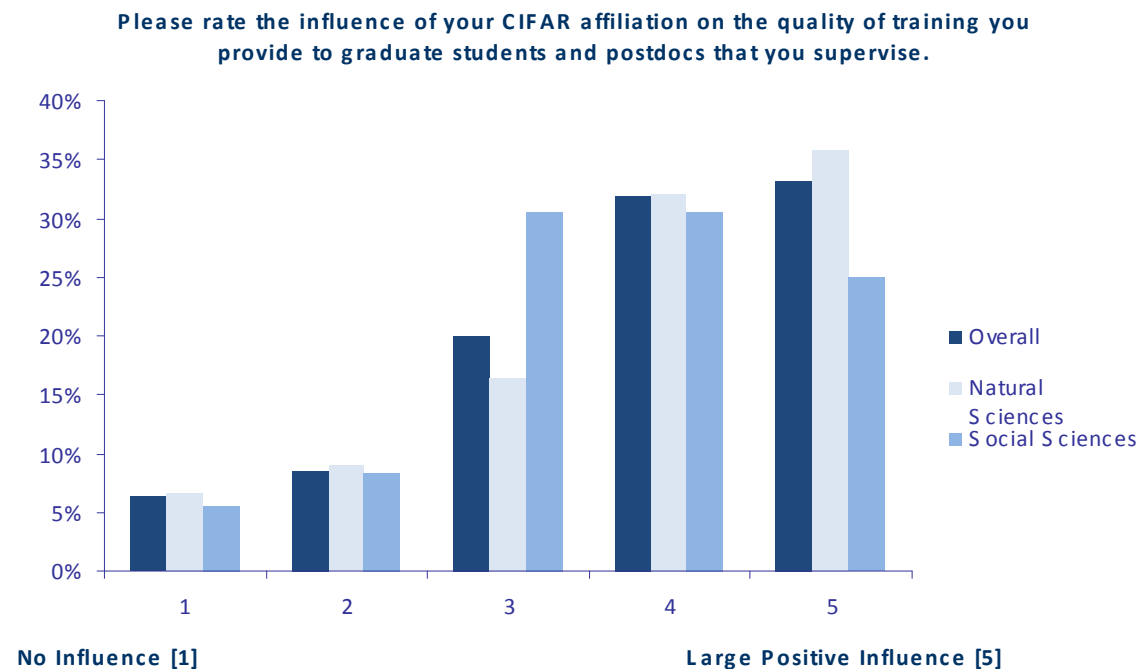
Some Junior Fellow interviewees suggested the opening up of the competition to ensure greater transparency in the selection process and as a means of enhancing CIFAR’s profile. This suggestion parallels the decision of the Board of Directors in February concerning the appointment of Junior Fellows. In terms of Junior Fellow Academy events, another suggestion from the Junior Fellow interviews was that the topics for discussion be chosen to add value to the research of the Fellows in a multi-disciplinary context. An example of a possible topic was the analysis of complex data, an issue of interest to Junior Fellows in both the natural and social sciences.

CIFAR is also having an impact on young researchers through the traditional graduate supervisory role that CIFAR members have at their respective institutions. According to CIFAR statistics, program members supervised close to 1000 graduate students, some 400 post-docs and helped graduate another 209 Ph.D. students in 2008/09. Figure 23 gives an indication of the impact that CIFAR affiliation has on graduate training. Over 65% rated CIFAR as having a notable positive influence on the quality of training they provide to their graduate students and postdocs (4 or 5 on a scale of 1-5).

Knowledge transfer

Previous evaluations of CIFAR and CIFAR’s Strategic Plan have stressed the importance of knowledge transfer to CIFAR in informing industry and government of the results of its research. The Plan also points out that while CIFAR researchers have engaged in KT, the activity has not been systematic and has not always brought adequate recognition to CIFAR. To create a greater focus on KT, CIFAR commissioned a study that has resulted in the acceptance by CIFAR management of a more strategic approach based on the premise that researchers and stakeholders should be engaged in KT activities with clarity on expected outcomes. Interviews conducted for this study lead to suggestions for a KT plan that would establish KT priorities, make use of web-based tools to support KT and link KT to the proposed communications strategy. A further step in giving more emphasis to KT is the recent hiring of a Director of Programs and KT, an initiative that was deferred until the needs of KT activities were understood.

Figure 23: The impact of CIFAR membership on graduate training



5.3 Advancement and Communications

5.3.1 Advancement: Achievement of Outputs and Outcomes

Evaluation Question

Have the advancement activities produced their intended outputs and achieved measurable outcomes? And, has CIFAR’s new fundraising endowment/capital initiative met the objectives stated in the Strategic Plan and RMAF?

Overall Findings: CIFAR's advancement activities are well established with a strong track record for professional delivery and meeting goals and objectives. The annual campaigns are proceeding as planned although the results are being affected by the economic climate and changes to corporate donation policies and practices. The capital campaign is now in place, although delayed in execution by about one year.

Advancement objectives

The Board of Directors establishes the financial plan for the organization. The five-year Strategic Plan establishes the overall objectives for advancement and the Annual Operational Plan sets the specific plans and targets for the variety of campaigns and activities within the advancement function of CIFAR.

There are two major aspects to the advancement objectives as contained in the Strategic Plan: the annual campaigns (ongoing for over two decades) and the relatively new capital campaign. The annual campaigns are directed at essentially four sets of donors: individuals, corporations, foundations and governments, with each category having internally planned targets. The capital campaign had, in 2007, a target of \$40-50 million by 2012, a target that was amended in 2009 to \$100 million over time.

The objectives are clearly stated and the operational plans are fully developed. The plans have been well executed, even if the capital campaign has been somewhat delayed. The success to date can be described as narrow and deep: CIFAR has approximately 250 private sector donors each of which gives, on average, about \$10,000. They contribute about 20% of the funding. However, there is some evidence that over the last 5 to 10 years, corporate donations have fallen by as much as 50%. This situation means that the loss of only a few donors (or the gain of a few) can have a major effect on the level of private donations to CIFAR. And, the economic climate over the last two years has exacerbated the risk associated with this portion of the donation base.

The Strategic Plan contains a number of specific objectives for the advancement function of CIFAR.

Change public-private ratio from 80-20 to 70-30 by 2011-12

This objective has not been met. The current ratio (2009-10) is about 83-17. However, this is a function of two items: first, private sector donations have remained reasonably flat or decreased somewhat over the past few years and, second, provincial governments made significantly larger short term contributions. Private donations have remained at or near \$2.6 million over the past three years.

Plan for government funding renewals

Both federal and provincial governments are facing large deficits for several years. The federal government Budget 2010 has no new funding over the next few years and calls for the strategic review of all program expenditures over the next year. This funding environment is, therefore,

extremely difficult. Planning for Alberta and Ontario renewals has proceeded well. In February 2010, the agreement with Alberta was renewed at \$600,000 per year or \$1.8 million over three years. Planning for the federal renewal campaign is beginning.

It is noted that experience in government relations is spread throughout CIFAR's organization, a distinct asset to CIFAR as it faces tight circumstances in public funding. The President of CIFAR has government relations and advancement as among her primary responsibilities. In addition, CIFAR has a Government Relations Committee comprised of Advancement, Programs and Finance staff that meets quarterly. The Board also recruits members who have extensive government experience, currently including David Dodge (former Governor of the Bank of Canada and federal Deputy Minister of Finance) and Carole Taylor (former Minister of Finance in BC).

Capital campaign targets

As noted above, the campaign is delayed by about one year. This may be beneficial given the serious economic downturn that occurred in 2008 and 2009. Some philanthropic umbrella organizations predict that 2010 could also be a poor year for corporate and foundation donations as they recover from the recession and the major stock market losses. In the meantime, the campaign is proceeding to plan. Potential donors have been identified, the principal messages have been crafted, the Chair for the campaign has been appointed and the first donation has been obtained. While the specific targets for 2008-09 and 2009-10 will not be met, it is not possible to say at this time if the overall target will be achieved.

Funding from capital to deliver 10% of revenue by 2012

The current revenue from investment sources is about 5% of total revenue. Because the Capital Campaign was itself delayed, it is likely that the target of 10% will also be delayed. However, given that the ultimate success of the campaign is still not possible to determine, it is therefore not possible to determine if this target will be met, since it flows directly from the first.

Possible new revenue opportunities

International

International revenue opportunities are being investigated initially within the context of the capital campaign.

Corporate Memberships

Corporate memberships may present a future fundraising opportunity for CIFAR. The Sante Fe Institute (SFI) provides an example in its Annual Business Network where companies are offered memberships in the Network for an annual fee of US \$40,000. In 2008, membership fees in the Network accounted for US \$1.6 million of revenue, approximately one-third of private sector contributions or 17% of total revenues (see Figure in Section 7.4.1). Some of the benefits of

membership include: hard copies / DVDs and online access to SFI Working Papers, videos, and selected articles and publications; attendance at the Annual Business Network and Board of Trustee's Symposium held each November; and at the Business Network Topical Meetings on subjects of interest suggested by members.⁶ These latter meetings that are held throughout the year and at a variety of locations are seen by members as the main benefit of belonging to the Business Network. Topics cover research conducted/facilitated by SFI and / or other issues selected by members.

5.3.2 Communications: Achievement of Outputs and Outcomes

Evaluation Question

Have the communication activities produced their intended outputs and achieved measurable outcomes? What are the strengths and weaknesses in the way CIFAR's communication activities are implemented and managed? Has CIFAR's new positioning strategy and communication activities met the objectives stated in the Strategic Plan and RMAF?

Summary Findings: While CIFAR's communications activities support all aspects of the work of the organization, from the programs themselves to advancement and from public outreach to international positioning, historically, the focus has been on advancement. Given that the communications function does not have a distinct strategy, it is not possible to describe the outputs and outcomes of its activities against a predefined set of objectives. However, communications has created excellent published materials (for example, the Reach Magazine) and supported successful public outreach events (for example, "The Next Big Question" series). The new website is a significant improvement; however, web-based tools including the website could be used more effectively for interaction within and among the programs and for links to the external academic community.

Communications outputs and outcomes

CIFAR commissioned a review of its communications function which was completed in January 2010. That review studied the capacity and structure of the communications function and interviewed the CIFAR Board and staff. Its purpose was to assist CIFAR in the improvement of the function. For this report, the communications function was examined from an audit and evaluation viewpoint. This review also looked at the materials and other outputs and interviewed others, including donors, about the communications function. The conclusions of this report are very similar to those of the communications review.

CIFAR communications are directed at three audiences:

⁶ A complete list of SFI Business Network membership benefits is available at: <http://www.santafe.edu/network/business-network-membership-benefits/>

Academics and researchers both within and outside of the programs: There are a number of purposes for these communications, from keeping program members up-to-date on program and CIFAR events, meetings and announcements, to more formal knowledge transfer within programs, between programs and to the external, national and international academic community.

The program survey respondents are satisfied with the organizational communications they receive from CIFAR. They are happy with the nature and quality of the publications produced by CIFAR to which they contribute. On the other hand, for the most part, they continue to use traditional methods for academic knowledge transfer. While not strictly a “communications” vehicle, the program meetings are highly praised as places where valuable learning and exchanges take place.

Media and the general public: As noted above, the quality of the public materials, including the website, and the public events are seen as very high. There is a general sense that CIFAR could do more media and public relations, although the question then is raised as to the cost-benefit of the activity. This question is related to the assumption that the CIFAR model and research activity are not necessarily something that would have appeal or interest to a general, mass audience. In addition, it is not clear or necessarily agreed as to what the appropriate messages would be for this audience. Finally, the use of Web 2.0 tools continues to be debated as a tool for reaching this group.

Activities related to this audience would benefit from further strategic planning as to specific objectives, messages and any necessary refinement of the scope of this audience.

Donors and potential donors: Traditionally the major role of the communications function has been to support the fundraising activities of CIFAR. In this function, the Communications group has delivered promotional materials and events to support fundraising. In addition, the group supplies or contributes to the “Case for Support” document, generalized materials in support of the specific donor campaigns, and specialized materials in support of approaches to specific existing or potential donors.

The position of Director, Communications reports to the Vice-President, Advancement and Communications even though this function provides direct services to both the program function and corporate management. Given increasing demands on the communications function related to maintaining or increasing CIFAR’s profile nationally and internationally, some have suggested CIFAR consider adjusting its organizational structure so that the communications function is separate from the advancement function. In the short-term, a clarification of roles and responsibilities and the creation of a strategic communications plan are more urgent.

Positioning strategy

CIFAR has clarified the positioning goal in the Strategic Plan – to benefit Canada within the global research community – to address how CIFAR changes its relationships with the broader international community through pursuing the following objectives:

1. Determine the base-year position and then track progress in 2010 and 2012.
2. Strengthen outreach by supporting programs and events that reinforce CIFAR's reputation for excellence.
3. Strengthen national and international relationships.
4. Achieve more mentions in scientific publications and the popular press per year than in previous years.

Limited evidence suggests it is too early in the restatement process to assess whether all the objectives are being achieved. While good progress has been made against some of the objectives, notably expansion of CIFAR's international relationships (see section 3.3.1) and increased mention in the general press, the lack of attribution accorded to CIFAR in scientific publications by program members is a concern. It means CIFAR is not gaining the visibility it might have as sponsor of the research and being viewed solely as a funding source and not an institution. Interviews with program members indicate this lack is in part a result of Program Directors not pressing program members on the matter but also limitation placed by journals on the number of affiliations given in submitted papers to one institution only, usually the author's university.

Branding

CIFAR's successful new website and corporate logo was seen by respondents as an important step in updating and unifying the image that CIFAR presents to the outside world. A better understanding of the CIFAR brand would, however, inform the future upgrading of the website and promotional materials. Consultations with Board and Research Council members and donors pointed to the value of a clearer perception of what CIFAR is and represents as an institution particularly in the context of enhanced advancement activities.

Branding is most directly related to the vision and the mission statements of an organization in that they are designed to capture how the organization sees itself and what it intends to do to get there. If and as the vision and mission of CIFAR become realized, the brand of CIFAR as it is experienced externally should merge with the internal perception. The communications strategy could be a means of clarifying the respective objectives of positioning and branding in furthering CIFAR's image nationally and internationally.

Annual Prize

It was suggested by a number of interviewees that one means to give CIFAR a broader profile in the public domain and among researchers nationally and internationally would be to create a special prize that might be awarded annually. The purpose of the prize would be to recognize an

outstanding achievement by a researcher from Canada or abroad whose work has contributed to significant advances in an interdisciplinary research area. The prize, to be known as the CIFAR award but might also be sponsored by a donor or donors, would be modeled on the Gairdner Awards that over a period of 50 years have become highly prestigious internationally leading in a number of instances to the Gairdner award holder winning a Noble prize as well.

5.3.3 Unexpected Outcomes

Evaluation Question

Have there been any unexpected outcomes or impacts of CIFAR activities?

Summary Findings: Other than the risks and variances expected in CIFAR's types of activities, especially given the current economic climate, there have been no unexpected outcomes associated with the advancement and communications functions.

5.4 Efficiency

Evaluation Questions

Could CIFAR achieve the same level of success with fewer resources? If so, how? Could CIFAR achieve greater success with the same resources and approach/initiatives? If so, how? Could CIFAR deliver greater value-for-money and, if so, how?

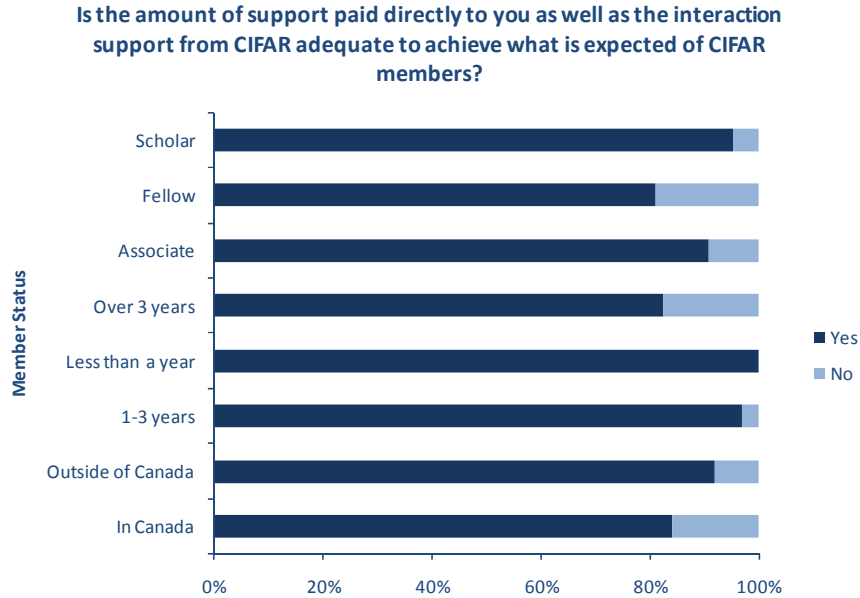
Summary Findings: The CIFAR model is a very efficient approach to conducting research. CIFAR's success in supporting the highest level of excellence in its research programs over more than 25 years is a testament to the ability of the model to generate success. Having fewer resources would diminish the level of success, and operating with the same resources would not increase its success because it is now functioning very efficiently. If CIFAR's mission, 'to lead the world in framing and answering complex questions at the frontiers of understanding', is, in essence, a statement of its value, the evidence presented in this report suggests that CIFAR's value-for-money could not be improved upon.

These three evaluation questions are all concerned with the efficiency of CIFAR's operations. The starting point for considering CIFAR's efficiency is CIFAR's research model. In Chapter 2 in presenting a profile of CIFAR, it is pointed out that CIFAR is a virtual institute in that its researchers are located in other institutions in Canada and abroad and under its model CIFAR contributes to the cost of research on issues selected by CIFAR and funds the interaction among the researchers on these issues. This approach differs from other programs of advanced research where researchers come to an institute and conduct research collaboratively on research questions of their choice.

The efficiency of the model is evident. CIFAR is engaging top scientists and scholars from around the world in its programs (see Figure 1 in Chapter 2 for a list) at low incremental cost, both those involved as program members (they receive a modest stipend) and as non-program

members (they receive no stipend). The survey result in Figure 23 below indicates the very positive response of program members to the CIFAR approach.

Figure 23: The adequacy of the CIFAR stipend to program members



Advancement and communications is an area of some concern in terms of efficiency. This function currently has about 14% of the total CIFAR budget and 10 of the 30 CIFAR staff. From the benchmarking exercise, it is noted that the Santa Fe Institute spends about 6% of its budget on fundraising. While the two figures are not directly comparable because CIFAR’s figure includes an allocation for overhead and the President’s time and Sante Fe’s does not, they do lead to a question on whether CIFAR has achieved an appropriate balance in its budgetary outlay on fundraising.

CIFAR’s concentration of limited resources on advancement is understandable because of the increased difficulties in obtaining donations and the response of CIFAR in running not only its regular annual fundraising campaigns but also its major capital campaign. The focus may be short term if the economic environment continues to improve and the impact of the increased staffing level takes effect (seven were hired in the last three years – four were new positions and three were replacements) but it does bear monitoring to see that the cost is commensurate with the financial returns.

If CIFAR were to have fewer resources, its level of success would be diminished in terms of achieving objectives such as advancing Canada’s research capacity and better positioning Canada in the international research community because it would not be able to support the same number of programs and researchers. Given the current efficiency of its approach, it is difficult to see how greater success could be achieved at the same level of resources. The third evaluation question on value-for-money is more difficult to respond to because the answer depends on how

value is defined. If CIFAR's mission, 'to lead the world in framing and answering complex questions at the frontiers of understanding', is, in essence, a statement of its ultimate value, the evidence presented in this report suggests that the productivity and efficiency of its research program would be difficult to improve upon.

PERFORMANCE AUDIT

6. Audit Focus

6.1 Audit Objectives

This performance audit has been prepared to fulfill CIFAR's obligations under Article IX of its funding agreement with Industry Canada and is intended as a standalone section from the evaluation. The observations and recommendations presented below are therefore independent from those of the evaluation, in keeping with the standards of independence and objectivity maintained in carrying out this performance audit.

The audit objectives are set out in Section 3.4. Though the combined audit and evaluation responsibilities have necessitated common data collection methodologies, the audit itself has been carried out in accordance with the performance audit policies of the Office of the Auditor General of Canada (2004) and informed by CIFAR's Performance Audit and Evaluation Strategy.

6.2 Scope

The focus of this audit was on CIFAR's internal activities from 2007 up to March 1st 2010. CIFAR undergoes a financial audit on an annual basis that attests to CIFAR's financial statements and internal financial control systems. The performance audit reported on here differs from the financial audit in that it is concerned with CIFAR's performance. In this context, four lines of enquiry were identified for examination: corporate governance; corporate planning, management of research; and performance monitoring.

Our audit did not include a review of the quality of CIFAR supported research. Such reviews are arranged by CIFAR and conducted every five years by expert peer review panels. The results of those reviews undertaken in the period examined for this audit have, however, been taken into account.

7. Observations

7.1 Corporate Governance

7.1.1 Audit Criterion

Governance structures and processes should be clearly defined and working as intended to ensure that CIFAR is being managed efficiently and cost-effectively.

CIFAR in transition

Through implementation of the Strategic Plan, CIFAR has been working to enhance its institutional capacity by formalizing in documents its management and governance processes and procedures. In building this capacity, CIFAR is evolving into a more formalized institution established on the basis of a vision, broad goals and five-year objectives that position CIFAR for the longer-term. A key document in this respect is its Performance Audit and Evaluation Strategy (PAES) that was developed as part of its 2008 funding agreement with Industry Canada. In addition to setting out CIFAR's activities and organizational structures for the period 2007-2012, the PAES outlines its governance, finance and risk management processes, its search process for new questions, and its external peer review process. The PAES has been an important step in bringing greater transparency to CIFAR management practices that, from interviews with CIFAR researchers, appear not to be widely understood.

CIFAR is well governed

We found the governance of CIFAR, as set out in the PAES and structured through the Board of Directors and Board Committees, to be well defined and working smoothly. The current CIFAR Board comprises 21 directors in keeping with its 2004 Consolidated and Revised By-Laws of between 15 and 24 directors. These include 13 representatives from the private sector, 5 from the public sector including universities and another two from the community. Interviews with board members and senior CIFAR staff indicate that there is a strong commitment to the success of CIFAR. The Board is of high quality, and together with management, provides CIFAR with a good corporate culture, and strong experience and capability to draw upon.

We note that board membership continues to be strengthened with broad national and recently international representation and, with now six women appointed, an improved gender balance.

While Board members have a good awareness of CIFAR activities, we find that their knowledge base for decision-making on matters pertaining to research appointments and future research questions could be deepened through at least one joint meeting a year with the Research Council.

There is also interest in having Board meetings outside of Toronto to reflect national reach and address concerns that CIFAR is Toronto-centric.

There are four committees that report to the Board: a Governance Committee that meets at least twice a year to advise the Board on matters of governance and ensure the other committees are carrying out their duties; an Audit and Finance Committee which meets at least four times a year to review budgets and financial statements for recommendations to the Board; an Advancement and Communications Committee that meets two to three times a year or as required; and, an Investment Committee that meets at least twice a year to oversee the management of CIFAR investments and approve related policy. Minutes of meetings indicate that that these bodies are functioning as intended.

7.2 Corporate Planning

7.2.1 Audit criterion

Planning processes and documents should be well designed and implemented.

7.2.2 Strategic Planning

In fall of 2007, CIFAR finalized its five-year strategic plan after wide consultation. This document represented its first comprehensive, long-term, strategic planning effort since its founding in 1982. The plan sets out the longer term vision and mission for CIFAR along with five goals and corresponding objectives to be achieved in the period 2007-2012. These are related to research, young researchers, positioning, organization, and financial growth and stability.

We note that these new goals differ from the previous objectives that currently make up the funding agreement with Industry Canada and which were CIFAR's original objectives prior to the development of the Strategic Plan. Given this study's obligations to ensuring that the objectives set out in the funding agreement are met, we consider both sets of priorities as being relevant. A concordance table showing how the objectives relate to the goals is provided below.

Figure 24: CIFAR Goals and Industry Canada Agreement Objectives

Current Goals	Objectives from Industry Canada Agreement
1. Research: Expand and enhance CIFAR research – build programs, extend and expand global reach, develop the methods used to support interdisciplinary research, expand knowledge transfer	Attract and retain highly qualified people in Canada (CIFAR Goals 1, 2)
2. Young Researchers: Support, celebrate and build interdisciplinary capacity in gifted young researchers, particularly in Canada	Encourage greater private sector and provincial government investment in basic research and development activities in Canada (CIFAR Goal 5);

3. Positioning: Position CIFAR to benefit Canada within the global research community	Build interdisciplinary research strengths in areas of importance to the long-term scientific, economic and social development of Canada (CIFAR Goals 1, 2, 3);
4. Organization: Develop the 2012 CIFAR organization: capabilities, capacity, and international reach	Encourage closer links between the research activities of Canadian and international researchers (CIFAR Goals 1, 2, 3);
5. Financial: Establish stable and balanced funding capable of sustaining growth	Involve young researchers in CIFAR's programs (CIFAR Goal 1, 2, 3)

Need for clarifying Strategic Plan

We expected that the Strategic Plan would identify strategic priorities, or goals, that are derived from a thorough analysis of its operating environment, options, risk and future impact. It was also expected that the strategic goals would be clearly aligned with its vision and mission statements.

One of the five goals deserves comment. For CIFAR's goal of expanding and enhancing CIFAR research, achieved primarily by establishing two to three new programs, we found that there was no clear rationale set out in the strategic plan for such growth. Given the importance of maintaining quality, organizational flexibility and fiscal stability, these growth plans could benefit from a more strongly substantiated rationale that assesses associated risks.

As for the vision statement, we note that it does not provide sufficient direction for the goals. In its current formulation, CIFAR's vision is "to create knowledge that enriches human life, helps people understand their world, and advances Canada's research community". For a vision statement to guide strategic development, it needs to be a concise statement that sets out CIFAR's mid- to long-term goals. In its current form, the vision statement is too general to differentiate CIFAR from other research support organizations, and does not provide for measurable expectations within which the strategy can be framed.⁷

Implementation

CIFAR is entering year four (2010-11) of its five year Strategic Plan and has made notable progress towards achieving stated objectives and fully implementing the Plan, reviews of which are undertaken by CIFAR staff on a quarterly basis and are reported each year in the annual corporate plan.

In the area of research, three new programs are in development, peer reviews of existing programs are on track, and a commitment to knowledge transfer (KT) has been made with the recent hire of a new Director of Programs and KT. Under the goal of supporting young researchers, CIFAR has launched its Junior Fellow Academy, a new initiative that currently

⁷ See R. Kaplan, D. Norton and E. Barrows. 2008. *Developing the Strategy: Vision, Value Gaps, and Analysis*. Balanced Scorecard Report. Harvard Business School Publishing Corp.

supports 22 young researchers and which is widely viewed among those interviewed as a success. Towards the positioning goal, CIFAR has undertaken a number of public outreach initiatives and is now exploring the viability of establishing relationships with international institutions. On branding, CIFAR has created a new logo and website.

As for the organization goal, CIFAR has made important strides to strengthening its organizational capacity, having made several critical hires over the last few years including the appointment of a Senior Vice-President, Research. And finally, towards the financial goal of stable and balanced funding, CIFAR has recently launched its capital campaign to enhance its donor base.

Thus while good progress has been made towards implementing the strategy, it should be noted that not all supporting objectives have been met. We do not feel, however, that the gaps are due to a management shortcoming. CIFAR management has demonstrated a healthy degree of flexibility in implementing its strategy through a willingness to critically re-evaluate and adapt objectives as it seeks to achieve its goals. For example, its objective of establishing new international institutional relationships so as to improve its positioning is new to CIFAR and is being pursued with caution to ensure that benefits to CIFAR outweigh the costs of this new endeavour. Within this context, CIFAR has explored the possibility of two institutional relationships, coming short of its goal of having ten such relationships established by 2009/10.

These and other changes, which have been recorded in annual corporate plans and senior management memoranda, could benefit from being consolidated periodically in a revised strategic plan. Such consolidation would allow for a clearer status of implementation and help support strategic decision-making.

7.2.3 Advancement & Communication

Advancement and communication activities are grouped together within the CIFAR organization in recognition of the role that communications plays as a supporting function of advancement. Interviews with CIFAR staff indicate, however, that there is a growing need for functional separation as the communications group is called upon to support a greater range of CIFAR communication needs. Currently each of the groups develop their own plans; the advancement group maintains both strategic and operational plans while the communications group currently maintains only operational plans. Given this growing functional separation and differentiated planning, this audit addresses advancement separately from communications.

Advancement group has well defined documents and processes

We found that the senior advancement staff is a highly professional and dedicated group. They have clear strategic and operational plans with carefully elaborated objectives and targets. The group is adaptable and flexible and has demonstrated the ability to adjust quickly and as necessary to changing circumstances. For example, when planned fundraising events did not

show the expected results, planning was adjusted to give greater consideration to the types of people invited.

Two observations are warranted with respect to the plans and related documents supporting CIFAR's advancement activities. First, CIFAR maintains an internal discussion document outlining the rationale for a capital/endowment campaign. We feel this document, which is 15 pages in length, is too diffuse to be fully effective as a guide in communicating a case for support that is the basis for the promotional pieces individually designed to match the interests of specific prospects.

Second, the advancement group has recognized that corporate donations are now made in a different way than in the recent past with greater attention on the part of the donor to advancing their corporate interests through their contribution to CIFAR. In this respect, the group has made good progress in developing and providing opportunities for the recognition of donors within the CIFAR publications and internal events. Evidence gained in this study, however, suggests that corporate donors see recognition of their support being publicized more broadly through public communication channels, perhaps using a part of the donated funds to do so. This suggestion might be explored in the context of a strategic communications plan as discussed in the next section.

Each year, CIFAR embarks on its annual campaign for CIFAR which comprises six components: Ongoing Pledges Campaign, Board of Directors Campaign, Expired Pledges from 2007-08, Annual Gift Campaign, Major Lapsed Donors Campaign, and the Acquisitions Campaign. Each component has a separate fundraising strategy and approaches are tailored for each segment.

A key initiative for 2010 is a new Capital Campaign, which will work towards raising long-term capital and endowment funds for the Institute. Though there have been delays in establishing the Capital Campaign, owing in part to the current economic climate, we found that the initiative is based on a sound plan and solid fundraising principles and techniques. The necessary preparations have been taken including appointing a known and respected Chair, establishing a committed and knowledgeable Cabinet, and developing a solid intelligence in respect of potential donors.

Communications group lacks a strategic communication plan

We found that the communications group provides focused, high-quality support to the programs, advancement and corporate functions of the organization. The group produces high-quality publications and manages a website that is clear, easily navigable and focused on the programs and current and upcoming events. The events (dinners, the "Next Big Question, etc.) are well organized and valuable as profile raising vehicles.

There lacks, however, a strategic communications plan for all of its activities which include support to the programs, support to advancement and media and public relations, and to strategies on positioning and branding. From interviews with staff and with a consultant hired to address communications issues for CIFAR, we heard that this lack of a strategic plan for

communications has led to a reactive approach to issues rather than a proactive approach in both its advancement and broader roles of branding and positioning CIFAR.

And while we note that the CIFAR website is easily navigable and clear, we feel that the website is underutilized as a tool for knowledge transfer and interaction, especially within the academic community. The CIFAR website could be made a more valuable resource to the research community beyond just CIFAR members by listing research papers and books stemming from CIFAR research by program, and having any relevant lectures and scientific presentations available as podcasts or video streams. CIFAR research reflects the frontier of knowledge and being able to identify, reference, and, or, access relevant publications would be of value to students and researchers alike and potentially enhancing CIFAR's national and international profile.

7.3 Research Management

7.3.1 Audit Criterion

Appropriate systems and practices for management and decision-making should be in place for selecting, monitoring and terminating research programs.

7.3.2 Program Management

Management practices related to research programs are very effective

CIFAR's approach to managing their research program is the product of many years of experience and one which continues to respond and adapt to new challenges. Indeed, CIFAR's running of their programs stands out as exemplary for the wide majority of CIFAR members interviewed and surveyed. Two factors figure prominently in its success to date in managing its 12 networks of close to 300 eminent scholars. Foremost has been its flexibility in attending to the particular resource and support requirements of each of the research programs as well as of the individual researchers, and, secondarily, the meetings themselves.

At the program level, this flexibility is evident from a tailored management approach that has been effective in accommodating the disciplinary and interdisciplinary differences that differentiate each of the research programs. How much resources are required, how best to allocate them and how often to meet, for example, are determined in consultation with the Program Directors of each research program who typically consult themselves with their own members. This has resulted in programs that are generally well adapted to the preferences and requirements of program members, despite differences in the number of meetings each year, the number of members, and respective status of members. Flexibility at the researcher level, particularly with respect to financial support for members, allows CIFAR to accommodate the

demands and arrangements at the institutional level and the preferences of each of the researchers. This approach is supported further by CIFAR's efforts to maintain one-on-one relationships with each of its members.

Survey results indicate that CIFAR members are satisfied with this approach (See Figure 25) and indeed are often highly complimentary of CIFAR administration. Administrative support, together with communications from CIFAR to its members, is deemed to be very good to strong by over three quarters of members.

The second factor that has underpinned the CIFAR model is the organization's responsibility for organizing the scientific meetings themselves. These meetings represent the main experience that researchers have of being CIFAR members and are the basis of the organization's success to date. According to the survey results, members overwhelmingly find the quality and organization of these meetings to be very good to strong (4 or 5) with a large majority (95%) content with the number of meetings held each year.

Figure 25: CIFAR member ratings of research management functions

Please rate and comment on the following aspects of CIFAR				
	Organization of Program Meetings	Quality of Program Meetings	Administrative Support	Communications from CIFAR
1 [Weak]	1%	0%	1%	1%
2	2%	2%	1%	2%
3	13%	4%	6%	18%
4	31%	28%	24%	41%
5 [Strong]	51%	66%	52%	34%
Not Applicable	1%	1%	17%	4%
	Reporting Requirements		Frequency of Program Meetings	
Insufficient	0%		3%	
Appropriate	93%		95%	
Onerous	2%		2%	
Not Applicable	5%		0%	

Internal monitoring of program excellence

Each of the 12 research programs maintains an international program advisory committee comprising highly accomplished senior researchers with expertise related to the program. In addition to attending meetings, and contributing to both the scientific and business discussions, advisory committee members monitor the progress and direction of the program, providing advice to the director as needed, working with the director to identify new potential program members, and supporting the five year peer review process.

From interviews with program directors and advisory committee members, we found this monitoring process to be working well. The committee members are typically as enthusiastic of, and committed to, CIFAR as are the members themselves, despite receiving no stipend, and provide an effective support mechanism for the programs as well as strong international perspective. Of the 58 committee members, some 77% are based at institutions outside of Canada, from the US, Germany, Japan, the Netherlands and the UK.

Need to maintain flexibility while transitioning to more formal operational processes

Given the importance of flexibility to the management success of its research programs, we feel that CIFAR needs to be careful to maintain this flexibility as it proceeds with formalizing its institutional processes and meeting its growth goals. Organizational changes stemming from expansion of programs, new initiatives and new programs can potentially put at risk a management approach that we find to be at the core of CIFAR's overall success.

7.3.3 Identification and Development of New Questions

A central element to CIFAR's model is the framing of fundamental research questions. Considerable effort and time - upwards of four years - goes into identifying an opportunity, forming a task force to develop the concept, holding workshops with prospective interdisciplinary program members, developing a proposal, and finally approving and developing the program. At any stage prior to final approval by the Board, the new question opportunity can be dismissed if found to be unable to meet CIFAR's goals and standards. As for identifying new question opportunities, they can in principle arise from any manner of sources – from internal conversations among CIFAR staff to external input from research members, researchers at large, the Research Council, the public or private sector or from the public itself.

We found this process, as set out in the PAES, to be working well and benefiting from long experience in shaping new research programs. It is a process that, over the years, has become more formalized and come to rely more on internal direction than on external counsel. The Research Council continues to play an important role in establishing new programs, through its involvement in taskforces, reviewing of proposals and making recommendations on whether proposed programs should be established, but interviews with Council members suggest its role is evolving. It should be noted, however, that while the selection approach has now been codified as part of the PAES, awareness as to how this process works is very low among those that have not been involved in establishing new programs. For those with knowledge of the process, it is credited with being open to ideas for new questions from all sources as noted above.

7.3.4 Termination of Programs

Since CIFAR was established in 1982, seven programs have been terminated or have evolved with a new program mandate and a new name (see Figure 10). The decision to terminate a program rests with the CIFAR President who relies on the five-year peer review process for

advice on whether a program should be renewed or terminated. We found that the use of peer review panels, which have a mandate to make recommendations on program renewal and program appointees, has been an effective mechanism for ensuring that programs remain relevant. Reports stemming from these reviews provide comprehensive and frank assessments of the accomplishments and potential for future contributions by top scientists who are generally accustomed to peer reviews of research programs.

7.4 Cost Effectiveness

7.4.1 Audit Criterion

CIFAR should be a cost-effective organization in comparison to organizations with similar objectives and level of achievement.

Comparable cost-effectiveness

While CIFAR is unique both nationally and internationally in the way in which it supports advanced research, comparisons with other advanced research organizations are nonetheless instructive for assessing cost-effectiveness. We identified, in consultation with CIFAR, three advanced research organizations for comparisons, all of which support leading edge research and depend on non-government sponsors to a degree for financing their operations: the Sante Fe Institute (SFI - New Mexico), the Perimeter Institute for Theoretical Physics (PI - Waterloo), International Institute for Applied Systems Analysis IIASA – Vienna).

We found that CIFAR's operating costs are indeed comparable. In absolute terms, CIFAR's operating costs are similar to the SFI and PI, and almost half of those of IIASA. In relative terms, all four institutes are comparable with non-program (accounting and finance, fundraising, program management) costs accounting for roughly 20% of program expenses.

CIFAR is cost-effective against comparable organizations

The financial performance of CIFAR and the three comparable institutes is provided in Figure 26 below. We first compare income trends and their sources, and then compare operating costs for these four institutions.

Figure 26: Financial Performance of CIFAR, SFI, PI and IIASA, early 2000s and most recent year data available (000s)

	CIFAR		Santa Fe Institute		The Perimeter Institute		IIASA	
	June 2009 (CAD \$)	June 2004 (CAD \$)	July 2008 (US\$)	Dec. 2002 (US\$)	July 2008 (1) (CAD \$)	July 2003 (CAD \$)	2008 (2) €	2004 (2) €
Income								
Unrestricted Contributions								
Private Sector *	2,612	2,714	3,200	7,297	50,005	3,070		
Government	11,700	7,090	3,931	1,952	21,290	11,676	7,998	3,367
Member organizations			1,554	1,432			6,980	7,408
Other	22	195	91	2,284		1,788		
Investment Income	1,049	721	366	(575)	(2,036)	1,103	442	125
Total income	15,383	10,720	9,142	12,390	69,259	17,637	15,420	10,900
Expenses								
Program								
Active programs	9,601	5,322	8,933	4,961	8,778	3,731	10,727	5,941
New programs & program searches	117	401						
Program support and projects	1,992	1,836			2,078		1,754	1,309
Education/Outreach				597	2,001			
Total program expenses	11,711	7,559	8,933	5,558	12,857	3,731	12,481	7,250
Non-program								
Advancement & Communications	2,098	1,083	766	165		65		
Governance & Administration	690	420	3,063	1,783	1,277	345	2,985	2,304
Other, including Depreciation	25			501	1,728	128		
Total non-program expense	2,813	1,503	3,829	2,449	3,005	538	2,985	2,304
Total expenses	14,524	9,062	12,762	8,007	15,862	4,269	15,466	9,554
Excess/(shortfall) of income over expenses	859	1,658	(3,620)	4,383	53,397	13,368	(46)	1,346

Notes:

- 1) \$50 million of PI's \$50,005,000 private sector contribution is from one donor: Lazaridis
- 2) IIASA data groups grants, donations and contracts. Most of the agencies listed under grants were government agencies, however, we don't know how large the various donations and grants were.

As indicated in Figure 26, CIFAR's income is comparable to SFI and to PI, and roughly half of IIASA income, when accounting for the exchange rates at the time, and taking into account PI's \$50 million contribution from one donor in 2008.

Income from government sources for all four institutes has increased in absolute and relative terms. Both institutes outside Canada (SFI and IIASA) indicated that government funding is accounting for a larger proportion of their income, and there is increasing pressure from government to conduct more applied research. For SFI, government funding increased from 16% of total income in 2002 to 43% in 2008, and for IIASA from 31% in 2004 to 52% in 2008. In the US, it appears that the National Science Foundation (NSF) will be discontinuing or significantly cutting back on institutional grants in favour of project/contract grants. This, according to SFI, may push the institute towards more applied research.

IIASA has a similar concern, as its proportion of European Union (EU) grants has increased significantly over the 2004-2008 period. According to IIASA, EU grants have more deliverables associated with them and tend to focus on applied research. By comparison, government funding accounted for 76% of CIFAR's income in 2009, up from 66% in 2004. Figure 27 shows the proportion of funding from government and private donors, and from investment income. It should be noted that in 2008, without the \$50 million contribution from Mike Lazaridis cofounder of RIM, government contributions would have accounted for nearly 100% of PI's income.

In 2008, private sector donations to SFI which included fees from Business Network Memberships fell by nearly half compared to 2002, due to the economic downturn affecting the US. SFI had anticipated this drop in private sector donations and used contingency funds to cover expenses.

Figure 27: Proportion of Funding from Government and Private Sources, and from Investment

	CIFAR		Santa Fe Institute		The Perimeter Institute		IIASA	
	June 2009	June 2004	July 2008	Dec. 2002	July 2008	July 2003	2008	2004
Government Support as % total revenue	76%	66%	43%	16%	31%	66%	52%	31%
Private donor support as % total revenue	17%	25%	52%	70%	72%	17%	45%	68%
Investment Income as % total revenue	7%	7%	4%	-5%	-3%	6%	3%	1%
Percent Change in Government Contributions	65.0		101.4		82.3		137.5	
Percent Change in Private Sector Contributions	-3.8		-45.5 (1)		-99.8 (2)		-5.8 (3)	

Notes:

(1) Includes member organizations, as most of SFI's business network members are private firms

(2) Excludes \$50 million contribution from Lazaridis

(3) Used "member organizations" as a proxy for private sector contributions

Comparisons of program spending (e.g., scientists) to non-program spending are presented in Figure 28. CIFAR's expenses are comparable to SFI and PI, and roughly half of IIASA's in absolute terms. In relative terms, non-program expenses for the four institutes are comparable at just under 20% of total expenses in 2008 and 2009. The exception is SFI, where non-program expenses accounted for 30% of total expenses. Due to demands of member countries, IIASA is spending proportionately more on scientists (program expenses) and reduced its budget for non-program expenses. In 2000, IIASA supported 5 scientists and 4 support staff, whereas in 2007-08, the ratio had increased to 12 scientists and 4 support staff. This, according to IIASA, has placed a considerable strain on non-program activities including support staff.

Figure 28: Proportion of Program and Non-Program Expenses

	CIFAR		Santa Fe Institute		The Perimeter Institute		IIASA	
	June 2009	June 2004	July 2008	Dec. 2002	July 2008	July 2003	2008	2004
Direct program spending as % total expenses	67%	63%	70%	62%	55%	87%	69%	62%
Total program spending as % total expenses	81%	83%	70%	69%	81%	87%	81%	76%
Non-program as % total expenses	19.4%	16.6%	30.0%	30.6%	18.9%	12.6%	19.3%	24.1%
Advancement as % total expenses	14.4%	12.0%	6.0%	2.1%	0.0%	1.5%	0.0%	0.0%
Administration as % total expenses	4.8%	4.6%	24.0%	22.3%	8.1%	8.1%	19.3%	24.1%

In summary, taking into account income and expenses, CIFAR's financial situation compares well against the three institutes. In the early 2000s, all four institutes showed a surplus, but due to the economic downturn by the late 2000s the financial situation had deteriorated. SFI, which experienced a dramatic decline in private sector donations, had a deficit in 2008 in spite of relying on contingency funds. IIASA and CIFAR essentially broke even in 2008 and 2009 respectively, with IIASA showing a small deficit and CIFAR a small surplus. PI was the exception; even without a \$50 million donation from one donor, PI would have shown a small surplus in 2008.

CIFAR is cost-effective on a per researcher basis

When assessed in terms of the amount of total expenses (program and non-program) per researcher, CIFAR stands out as being very cost effective.⁸ Figure 29 below compares expenses per researcher by institute. This comparison shows that CIFAR spends the least amount per researcher at roughly \$48,000 compared to SFI (\$86,000), IIASA (\$121,000), and Perimeter (\$158,000). CIFAR has a strong comparative advantage on this indicator due to the fact that CIFAR supports only non-resident researchers, while SFI and IIASA support a mix of resident and non-resident researchers, and PI only supports resident researchers.⁹

Figure 29: Estimated Amount of Expenses Per Researcher by Institute

	CIFAR		Santa Fe Institute		The Perimeter Institute		IIASA	
	June 2009	June 2004	July 2008	Dec. 2002	July 2008	July 2003	2008	2004
Total expenses (original currency, thousands)	14,524	9,062	12,762	8,007	15,862	4,269	15,466	9,554
Exchange Rate*	1	1	1.0131	1.5594	1	1	1.5603	1.6169
Total expenses (Canadian \$000)	\$14,524	\$9,062	\$12,929	\$12,486	\$15,862	\$4,269	\$24,132	\$15,448
Approximate Number of Researchers (Resident & Non)	300		150		100		200	
Expenses per Researcher	\$48,413		\$86,195		\$158,620		\$120,658	
Approximate Non-Resident Researchers	300		100					
Approximate Resident Researchers (Equivalent Non-Resident Researchers)	0		50		100		200	
Total Equivalent Non-Resident Researchers	300		150		300		600	
Expenses per Equivalent Non-Resident Researcher	\$48,413		\$51,717		\$52,873		\$40,219	

* Average exchange rate for the period, Bank of Canada Exchange Rate, web: <http://www.bankofcanada.ca/en/rates/exchange-look.html>

7.5 Performance Monitoring

7.5.1 Audit Criterion

CIFAR's performance management framework should be well designed and supportive of on-going performance monitoring and reporting and be useful for corporate decision-making.

⁸ To determine cost effectiveness per researcher, we used the number of researchers supported as a proxy for results (outputs and outcomes) as performance data was not available for comparable institutions. In converting total expenses to Canadian dollars we used the average exchange rate for the period; e.g., the 2008 exchange rate was based on the average over the period from January 1 to December 31, 2008, or for July 2008 from July 1 to 31.

⁹ To arrive at a comparable figure, it was assumed that supporting three non-resident researchers is roughly equivalent to supporting one resident researcher. When resident researchers are converted to 'non-resident equivalent', assuming that "1 resident" is more or less equal to "3 non-residents", CIFAR spends approximately the same amount per non-resident equivalent researcher as the other institutions. It should be noted this is still a rough approximation as SFI and IIASA use a sliding scale of resident to non-resident researcher; As shown in Figure 7, when resident researchers are converted to 'non-resident equivalents', CIFAR spends approximately the same amount per 'equivalent researcher' as the other institutions. It does, however, indicate that the CIFAR research model is more cost-effective as it can support more researchers than other approaches.

7.5.2 Performance Management Framework

A component of the PAES is a Results-Based Management and Accountability Framework (RMAF) which serves to: describe clear roles and responsibilities in governance; ensure clear and logical design that ties resources to expected outcomes; and determine appropriate performance measures and a sound performance measurement strategy. To support these objectives, the RMAF includes both a logic model and a data collection matrix (DCM) both of which deserve comment.

CIFAR logic model is unclear

A logic model is a simplified systematic and visual representation of CIFAR that establishes the relationships between resources, organizational activities and their outputs and impacts. Its purpose is as a learning and management tool that brings focus to how an organization is to work and what it is to achieve. In its current form, we feel that the CIFAR logic model compromises the usefulness of the PAES as a decision-making tool. In particular the following issues have been identified as problematic:

- *It is overly complex.* The purpose of a logic model is to bring clarity to how funded activities support intended outcomes, while balancing the need for simplification with the need for comprehensiveness. In its current design, these basic relationships are not readily apparent due in part to excessive detail within the model itself, and to unclear relationships between activities and outcomes. For example, it is not clear from the diagram how international links relate to outcomes, nor is it clear why review activities relate to expanded CIFAR research as opposed to ‘relevance and continued need’.
- *Flow of model is inconsistent with bringing clarity to CIFAR core objectives.* The logic model is not organized in way that gives focus to the core CIFAR activities, namely identifying fundamental and complex questions and supporting interactions of eminent researchers committed to these questions. Currently more space is given to supporting activities than to these core activities.
- *Outcomes do not correspond to the Strategic Plan.* Currently the activities and outcomes of the logic model are not fully aligned with the goals, mission and vision outlined in CIFAR’s strategic plan. One would expect that the new activities and goals of the strategic plan to be more clearly represented in the logic model so as to bring greater clarity as to how the two documents relate to one another.
- *Items are misclassified.* In a number of areas, items typically associated with one category appear in another. For example, ‘program meetings and events’, which is currently classified as an output, would in the CIFAR context be more appropriately be identified as an activity. Similarly, the ‘young researcher academy’ is a CIFAR activity whose output or outcome is to nurture young research talent.

Data collection matrix is over-designed

The data collection matrix (DCM) is a sophisticated spreadsheet document that allows for some 300 indicators to be collected on all aspects of CIFAR activity, outputs and outcomes. One reason for such a high number of indicators in the DCM is that it is simply a reflection of an overly complex logic model to which it corresponds. A simplified logic model that included only core activities, outputs and outcomes would result in a fewer number of indicators. Another reason is the matrix was designed to capture all of the data that CIFAR staff collect in order to respond to the needs of different audiences, not least the federal and provincial government sponsors.

A review of the reporting requirements outlined in the current Funding Agreements with federal and provincial governments, and shown below in Figure 30, indicates that only one-third of the indicators in the DCM need to be collected for reporting purposes. It is recognized that many of the indicators arise in the advancement function for planning and decision-making purposes related to the depth of their donor categories (individuals, foundations, corporate, and government, both renewals and new prospects). While CIFAR does roll up its indicators to a higher level in its performance and annual reports to governments, it is conscious that more work could usefully be done to identify and create a smaller number of key indicators.

Figure 30: Number of Indicators in the DCM and Required for Reporting Purposes by Current Federal and Provincial Funding Agreements

Indicator Type	DCM	Total Federal & Provincial Governments	Federal	Alberta	British Columbia	Ontario	Quebec
Activity (process)	31	11	3	9	9	9	3
Output	131	50	15	7	3	5	46
Outcome	141	42	39	32	0	8	8
Total	303	103	57	48	12	22	57

CONCLUSIONS AND RECOMMENDATIONS

8. Conclusions

8.1 Evaluation

Relevance

CIFAR fills a niche in Canada's research system as an organization committed to supporting fundamental research at the highest level that is interdisciplinary in scope. The goal of this research is to address complex questions in order to expand the boundaries of knowledge and transform fields of research. In so doing CIFAR has maintained its relevancy among the many research institutions and programs in Canada, none of which have duplicated the role that CIFAR carries out in supporting a broad range of research questions and interactions among the some of the very best researchers in Canada and from around the world. Moreover, with a focus on research framed by research questions that address fundamental problems and issues be they social or technological or biological, CIFAR has also maintained alignment with Canada's longer term economic and social interests, as well as to the goals related to science and innovation. We therefore find that there is there is a continued need for CIFAR in Canada and indeed, in the wider research community which has no equivalent organization similarly committed to interdisciplinary research.

Success

Corporate Governance and Planning

In assessing the success of CIFAR, the evaluation focused on whether expected outputs and outcomes were achieved in three areas: governance, the research programs and related activity; and advancement and communication activities. In the area of governance, we found that CIFAR is on track to achieving related outcomes, a finding that is confirmed in the performance audit. We note however that there are ongoing challenges in working towards financial stability in the current economic conditions, challenges that are fully recognized by CIFAR management.

Research Program

As for the research programs, CIFAR has shown notable success in achieving outcomes. From all sources of data analyzed for this study, it is clear that CIFAR's research model is very effective in supporting cutting edge research with the goal of answering complex questions. Evidence indicates CIFAR has increased research interactions and collaboration, increased research excellence in Canada, helped attract and retain highly qualified researchers, and supported young researchers. CIFAR's new initiatives, notably its Junior Fellow Academy which involves young researchers in CIFAR's programs, and its knowledge transfer activities which are designed to enhance research, while new, are also on track to achieving objectives. In addition, we found support among Junior Fellows for the February 2010 decision of the CIFAR

Board to revise the selection process for Junior Fellows to ensure transparency in the process and, at the same time, to enhance CIFAR's profile.

Advancement

CIFAR's advancement activities are well established with a strong track record for professional delivery and meeting goals and objectives. The annual campaigns are proceeding as planned although the results are being affected by the economic climate and changes to corporate donation policies and practices. The capital campaign is now in place, although delayed in execution by about one year.

Communications

While CIFAR's communications activities support all aspects of the work of the organization including the research programs, advancement, public outreach, and international positioning, historically, the focus has been on advancement. Given that the communications function does not have a distinct strategy, it is not possible to describe the outputs and outcomes of its activities against a predefined set of objectives. However, communications has created excellent published materials (for example, the Reach Magazine) and supported successful public outreach events (for example, "The Next Big Question" series). The new website is a significant improvement; web-based tools including the website could be used more effectively for interaction within and among the programs and for links to the external academic community.

Efficiency

The CIFAR model is a very efficient approach to conducting research. CIFAR engages top scientists and scholars from around the world in its programs at low incremental cost, an approach that receives a very positive response from research program members. If CIFAR were to have fewer resources and therefore unable to support the same number of programs and researchers, its level of success would be diminished in terms of achieving objectives such as advancing Canada's research capacity and better positioning Canada in the international research community. Thus the evidence presented in the report suggests that the productivity and efficiency of CIFAR's research program would be difficult to improve upon.

8.2 Performance Audit

Corporate Governance and Planning

We found that CIFAR is a well-governed organization with good corporate structures and processes in place for planning and setting strategic direction. A strong Board of Directors and senior management has been beneficial to CIFAR as it adjusts to its expanding set of activities as set out in its Strategic Plan. While Board members have a good awareness of CIFAR activities, we find that their knowledge base for decision-making on matters pertaining to research

appointments and future research questions could be deepened through at least one joint meeting a year with the Research Council.

With regard to CIFAR's overall strategic direction, we feel that having a more concise vision statement could better help guide the organization's strategic planning. We also find a need to simplify two components of the Results-Based Management Accountability Framework (RMAF) - the logic model and data collection matrix – so as to make them more useful for decision making and a more effective communication tool for demonstrating what CIFAR is, and what it does, to government stakeholders.

In terms of planning, CIFAR is entering year four (2010-11) of its five-year strategic plan and has made notable progress towards achieving stated objectives and fully implementing the plan. Reviews of the plan's implementation are undertaken by CIFAR staff on a quarterly basis and are reported each year in the annual corporate plan.

Program Design and Delivery

In adapting to the growth for CIFAR set out in the Strategic Plan, CIFAR has built up its organizational capacity through formalizing its administrative and management processes. In evolving to a more formalized institution, CIFAR has been in a learning phase, preparing strategic plans, developing a results management and accountability framework, and adjusting internal processes to address new needs. In examining program design and delivery, we identified a number of issues related to these developments that deserve attention.

Two aspects of CIFAR's operations that are central to its growth plans are advancement and communications. Advancement objectives in the Strategic Plan are clearly set out, with operational plans for both the annual and the new capital campaigns being well executed. However, fund raising is challenging as a result of the economic downturn over the last two years that has kept private sector donations flat and the funding environment in the federal and provincial governments difficult. In terms of the capital campaign, the target was amended in 2009 from \$40-50 million by 2012 to \$100 million over time.

On communications, we found a need for CIFAR to develop a communications strategy that extends beyond advancement, which CIFAR's communications approach has traditionally supported, to address the broader range of communication needs related to the Strategic Plan. There is also an opportunity to make better use of the CIFAR website and web based tools to increase the impact of CIFAR program research within the broader research community by making the website a resource for CIFAR's interdisciplinary research. We note that our findings on communications are very similar to those of the CIFAR commissioned communications review.

CIFAR's management of research programs is to be commended. We found that CIFAR has been adept at adapting to an ever changing research landscape while maintaining a flexible and effective approach to managing a dispersed network of eminent researchers in Canada and from

around the world. CIFAR should be careful to ensure that as it becomes a more institutionally based organization, its flexible and tailored approach to managing its research programs is not lost.

Cost-Effectiveness

With regard to cost-effectiveness, our comparisons with three other advanced research organizations all indicate that CIFAR is a cost-effective organization. Its advantage rests with being a virtual institute that leverages considerable resources from across a large number of research organizations around the world towards achieving its goals. While there are, in principle, shortcomings to this model, namely loyalty and commitment from members who receive salaries from their home institutions, this does not appear to be an issue for CIFAR members. An issue that does arise, however, is a lack of appropriate attribution being accorded CIFAR in members' publications due in part to publications being limited to the acknowledgement of only one institution and that tends to be the members' home institution.

9. Recommendations

Corporate Governance and Planning

Recommendation 1. The Board of Directors should meet with the Research Council at least once a year to deepen its knowledge of current and planned CIFAR research thereby strengthening the basis of its corporate decision-making.

Reference: Section 7.1.1, page 47

Recommendation 2. CIFAR should develop a more concise vision statement that can provide stronger direction for CIFAR's strategies and operations and set out measurable expectations.

Reference: Section 7.2.2, page 49

Recommendation 3. As decisions are taken to modify its Strategic Plan, CIFAR staff should periodically consolidate these changes to allow for a clearer status of implementation and help support decision-making.

Reference: Section 7.2.2, page 50

Recommendation 4. CIFAR should simplify its logic model and corresponding Data Collection Matrix so as to link to its vision and to give greater clarity and focus to its core functions, making the logic model more useful for decision-making and for communicating CIFAR's outcomes to stakeholders.

Reference: Section 7.5.2, pages 59 and 60

Communications

Recommendation 5. A strategic plan for communications is needed that takes into account all of CIFAR's communication needs, clarifying the role of communications across the corporations functions.

Reference: Section 7.2.3, page 51

Recommendation 6. The implementation of a proposed knowledge transfer (KT) plan should establish priority activities for KT, explore ways to support CIFAR members in their KT activities and link to the communications strategy.

Reference: Section 5.2.2, page 35

Recommendation 7. As part of its KT efforts, CIFAR should further develop its website to list and, or, make available CIFAR related research publications by program, thereby making the website a useful reference for leading research and potentially enhancing its profile among the broader research community.

Reference: Section 7.2.3, page 52

Recommendation 8. CIFAR should consider establishing a major prize with appropriate sponsorship for outstanding interdisciplinary research.

Reference: Section 5.3.2, page 41

Research Program

Recommendation 9. CIFAR should review its approach to developing relationships with international institutions in emerging science nations to ensure that top researchers in these nations are being identified.

Reference: Section 5.2.2, page 34

Recommendation 10. CIFAR should ensure that its current flexible approach to managing its research programs is maintained as it transitions to a larger organization.

Reference: Section 7.3.3, page 54

Recommendation 11. To improve the visibility of CIFAR, Program Directors should reinforce the attribution of program research outputs to CIFAR, and recognize CIFAR as an institution, as opposed to a funding program.

Reference: Section 5.3.2, page 41

Recommendation 12. To improve the Junior Academy, (i) CIFAR should open up the competition for junior fellows to ensure greater transparency within research programs and enhance CIFAR's profile; (ii) CIFAR should involve junior members in planning Junior Academy events to ensure they are of value to participants.

Reference: Section 5.2.2, page 35

A. CIFAR References

Governance & Management Documents

- 1.1 Letters Patent, Objectives & By-laws
- 1.2 Strategic Plan
- 1.3 Annual Corporate Plan
- 1.4 Progress Reports on the Implementation of the Strategic Plan
- 1.5 Annual Results Report - Board of Directors
- 1.6.1 Annual Reports to Federal Governments
- 1.6.2 Annual Reports to Provincial Governments - ON 07-08
- 1.7 Risk Management Policies
- 1.8 HR Plan & Succession Plans
- 1.9.1 HR & Administrative Policies - HR
- 1.10 Board of Directors Minutes
- 1.11 Audit and Finance Committee Minutes
- 1.12 Investment Committee Minutes
- 1.13 Research Council Minutes
- 1.14 Data from 2005 Evaluation (report, web survey data, benchmarking report, case study report)

Financial Documents

- 2.1 Annual budget
- 2.2 Annual statements
- 2.3 Audited Reports
- 2.4 Fundraising Targets & Statements
- 2.5 Investment Performance Reports

Operational Performance Data And Other Performance Indicators

- 3.1 Logic Model
- 3.2 Data Collection Matrix
- 3.3 Benchmarking 2005 - 2007update

Research & Program Management Documents

- 4.1.1 Task force & Workshop reports & Proposal - IMB
- 4.1.2 Task Force and Workshop Reports and Proposal - GN
- 4.1.3 Task force & Workshop Reports - Oceans
- 4.3.1 Program Meeting Details & Reports - EBBD
- 4.3.2 Program Meeting Details & Reports - IOG
- 4.3.3 Program Meeting Details & Reports - IMB
- 4.3.4 Program Meeting Details & Reports - QM
- 4.3.5 Program Meeting Details & Reports - SS
- 4.6.1 Annual Program Director Report - EBBD
- 4.6.10 Annual Program Director Report - NANO
- 4.6.11 Annual Program Director Report - QIP
- 4.6.12 Annual Program Director Report - SIIWB
- 4.6.13 Annual Program Directors Report - EVO BIO
- 4.6.2 Annual Program Director Report - IOG
- 4.6.3 Annual Program Director Report - IMB
- 4.6.4 Annual Program Director Report - QM
- 4.6.5 Annual Program Director Report - SS
- 4.6.6 Annual Program Director Report - COS
- 4.6.7 Annual Program Director Report - ESE
- 4.6.8 Annual Program Director Report - GN
- 4.6.9 Annual Program Director Report - NCAP

4.8.1 Appointments - Program Advisors & Members

4.8.2 Appointments - Reporters

4.9 Knowledge Transfer

Program Review Documents

5.1 5-year external review "Process & Timeline" guidelines

5.2.1 Program Review - EBBD

5.2.2 Program Review - IOG

5.2.4 Program Review - QM

5.2.5 Program review - SS

Harvard Comparative Study Results And CIFAR Assessment Of These Results

6.1 Harvard comparative study

Junior Fellow Academy

7.1 Project Plan

7.2 JF Recruitment

7.3 JF Appointments

7.4 JF Academy Meetings

7.6 JF Steering Committee

Advancement Related Documents

8.1 Operational Plans

8.2 Donor Benefits Chart

8.3 Donors Lists & Giving Levels

8.4.1 Donor Profiles and Research Material -Individuals

8.4.2 Donor Profiles and Research Material - Foundation

8.4.3 Donor Profiles and Research Material - Corporation

8.5.1 Briefing Notes - Individual

8.5.2 Briefing Notes - Foundation

- 8.5.3 Briefing Notes - Corporation
- 8.6.1 Proposals - Foundation
- 8.6.2 Proposals - Corporation
- 8.7 Annual Fund Solicitations
- 8.8.1 Donor Agreements - Individual
- 8.8.2 Donor Agreements - Foundation
- 8.8.3 Donor Agreements - Corporation
- 8.9 Researcher Thank You Letter
- 8.10.1 Annual Results report - Federal Gov.
- 8.10.2 Annual Results Report - Ontario
- 8.10.3 Annual Results Report - Alberta
- 8.10.4 Annual Results report - Quebec
- 8.11 Results Reports - Donors
- 8.12 Ketchum Canada Report
- 8.13 Capital Campaign

Events

- 9.1.1 Next Big Question 2007
- 9.1.2 Next Big Question 2009
- 9.2.1 Events General

Communications Documents

- 10.1 Press Releases
- 10.2 Infomart media monitoring report
- 10.3.1 Results of surveys
- 10.4 Branding Plans & Documents
- 10.5 CIFAR Annual Report
- 10.6 Reach



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