

Understanding Research Costs

Working Paper #3

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Abstract

This Working paper examines research costs in the context of basic funding mechanisms that underpin the work of the university. The basic contention is that two major components of the 'innovation agenda' (indirect costs and faculty time) have not been adequately funded; that reality has contributed to the deterioration of 'core operations' in the Operating Fund.

The 2015 Working Paper series is intended to provide a relatively brief review of some key issues that affect higher education – particularly university education – in Canada. Faced with the twin realities of financial constraint and a decline in the 'traditional age' PSE cohort, universities are faced with major financial challenges. As universities, and the PSE sector as a whole, grapple with the challenges the need for more in-depth analysis of particular issues is critical. The Working Papers draw on the observations and insights gleaned from years of hands-on experience in the PSE sector and the many consulting and research projects completed by Snowdon & Associates. All of the Working Papers will use excerpts from previous reports, updated, augmented and modified as necessary. The first Working Paper – "Cost pressures and cost theories" – sets the stage for working papers that examine key issues such as "Compensation in Academe" (April) "Understanding Research Costs" (May, 2015) and "Faculty Workloads and the Innovation Agenda" (May 2015). The intent is to complete the series over the summer 2015 with commentary and observations about ways to deal with the complex set of challenges that face higher education institutions. Comments and questions about the Working Papers are welcome. Ken.SnowdonandAssociates@gmail.com.

Introduction

Research is an integral part of the academy and it is an integral part of being a full-time faculty member. The growth in research activity, especially since the latter part of the 1990s, has been significant and the associated funding has benefitted Canadian universities in many ways. Through initiatives such as the Canada Foundation for Innovation (CFI), Canada Research Chairs (CRCs), the Knowledge Infrastructure Program (KIP), tri-council programs and other federal and provincial investments, Canadian universities have considerably better research facilities and more faculty to expand research activity and benefit the learning environment. The various measures over the past fifteen years or so have increased Canada's R&D capacity and provided living laboratories to enrich the educational product. Moreover, the presence of a robust research enterprise provides added benefits including the direct links to economic activity via discovery and innovation and the presence of peer-adjudicated, competitive allocation mechanisms that reinforce both quality and differentiation.

Building the capacity, however, is a far cry from supporting the full costs of research on an on-going sustainable basis. It is increasingly evident that funding levels, and funding mechanisms utilized to support research in Canadian universities, are not addressing the full direct and indirect costs of research at the institutional level. This 'working paper' examines various aspects of research 'costs' to help provide a better understanding of one of the key 'cost drivers' in academe and the disconnect between higher education funding mechanisms and costs. Much of the basic information regarding research costs and how research is 'funded' applies to all provinces in Canada. However, the paper focuses on Ontario to illustrate how the funding mechanisms actually operate in one province.

Costs of Research

What are the 'costs' of research? Essentially there are three categories of research costs – direct, indirect and capital. This paper focuses on direct and indirect costs with limited reference to capital costs.

- The *direct* costs of research – sometimes referred to as institutional costs – are the various operational costs essential to the conduct of a research project/program such as the cost of research assistants, equipment, supplies, related travel, research technicians, administrative staff, and faculty – the principal investigator as well as other faculty members who are part of the research project/program.
- The *indirect* costs are the institutional costs that are difficult to attribute to a specific research project/program and run the gamut from “operating, maintaining, and sustaining research facilities such as libraries and computer networks” to “ensuring regulatory and safety compliance including human ethics issues, animal care, biohazards and environmental assessment” to “managing intellectual property and promoting commercialization and knowledge

mobilization” and include “managing the research process, from preparing proposals to accountability and reporting”.¹

- *Capital* costs refer to the initial costs for capital infrastructure, including major equipment and furnishings, and the costs of sustaining the infrastructure investment - e.g., major maintenance, major equipment renewal.

Funding research

In Canada funding the preceding costs relies on a combination of sources and mechanisms as follows:

- General Operating revenues (tuition and provincial grants distributed largely on an enrolment based formula) fund a portion of faculty time and a portion of indirect costs;
- special grants (i.e., Federal Indirect Costs of Research (FICR), Provincial Research Overhead and Infrastructure Envelope (ROIE)) fund part of the indirect costs with a distribution related to the level of tri-council funding.
- restricted grants (i.e., tri-council) fund non-faculty direct costs with the distribution based largely on peer-adjudicated competition and provided to the principal investigator via the institution.
- restricted grants fund specific research faculty (i.e., Canada Research Chairs) distributed based on ‘shares’ of tri-council funding.
- Restricted funding from Charities, Foundations, and Non-government organizations (NGOs), support the direct costs of sponsored research and are allocated based on organization controlled allocation mechanisms. Indirect cost reimbursement is estimated to range from 10%-15% depending on the organization and type of research.²
- contracts with private / government entities that may (or may not) cover all of the direct and indirect costs; and
- Capital funding that tends to require contributions from multiple sources including governments, the institution, and the private sector with government allocations often dependent on a variety of factors – political, economic development, institutional need and institutional equity etc.

¹ Association of Universities and Colleges of Canada, *Funding the Institutional Costs of Research: An International Perspective*, May 2009

² Canadian Association of University Business Officers and Canadian Association of University Research Administrators, *Indirect Costs of Research*, Table 2, p. 25, October 2013

The first point, in particular, deserves a bit more explanation. In general, faculty time is not recognized by granting agencies as an eligible expenditure for inclusion in the calculation of 'direct' cost.³ Rather, research time for the vast majority of faculty is actually 'funded' from General Operating revenues. Similarly, while indirect costs are acknowledged by granting agencies and other 'funders', there is little acknowledgement of the 'full cost' – hence the reference to General Operating revenues as a source to fund some portion of the 'indirect costs'. Together, those two realities create considerable funding pressure for universities and represent the major disconnect between 'funding' and 'costs'; with a major part of the research 'cost' not actually reflected (nor funded) in sponsored research funding.

The disconnect between funding and costs – Ontario

Tuition and Government operating funding tends to be seen as attributable to the teaching 'function' in universities and the amount of funding from either source is largely related to enrolment. Yet the other two 'functions' in universities – research and service, particularly professional and community service, – have taken on added significance, fuelled by the 'innovation agenda' and an expectation that universities will act as the social and economic catalysts for a given region and the country as a whole. The sustainability of the 'business model' to support the increased emphasis on research and service appears to have been relegated to the 'back seat' in the initial euphoria of major federal and provincial investments in research in the latter part of the 1990s and at the turn of the new millennium. As noted earlier, those investments clearly improved research capacity and benefitted the 'learning environment' but did not address, or adequately address, the on-going operating costs.⁴

Faculty workloads shifted to accommodate the research/service demands but operating resources were insufficient to fill the teaching void with full-time faculty and to meet increasing enrolments. In a nutshell, the revenue part of the 'business model' did not recognize the cost implications of the shift in faculty workloads nor the substantial indirect and direct costs of research and community service.⁵ Coping with that reality is one of the major challenges facing universities and the results have had significant consequences for institutions. During a period of funding expansion universities were

³ The rationale for not recognizing faculty time (i.e. faculty salary expenditure) by the granting agencies is directly related to the federal transfer payment arrangements and an assertion/belief that some portion of faculty time is paid by the federal government via the transfer payment arrangements. Therefore, the argument goes, to pay for faculty time associated with the tri-council grants would, in effect, be 'double dipping'. The same argument applies to indirect costs of research and helps explain why the federal government is only prepared to finance part of the imputed indirect costs of research; the remainder, is seen as a provincial responsibility and the funding wherewithal is firmly in the hands of the province.

⁴ For a more detailed review of 'workloads' and the impact of the 'innovation agenda' see Working Paper #4.

⁵ Some may argue that the funding requirement is recognized via the grant funding associated with graduate enrolment (and perhaps the upper year undergraduate enrolments), which has an implicit research component imbedded in the program weights. That argument assumes the current program weights and funding values actually approximate cost – an assumption worthy of further examination.

able to mask the structural realities but over the past several years, financial strains have emerged as the rate of expansion slowed and, in some institutions, turned negative. Class sizes have increased. The student to full-time faculty ratio increased. More sessional, part-time, and teaching-only faculty were employed. Working conditions, for some, deteriorated and collective bargaining units multiplied.

At this point it is important to note that the preceding occurred even as General Operating revenues in Ontario more than kept pace with FTE enrolment and actually outpaced the increase in tri-council funding (as a measure of research activity). If that was the case, why did the funding environment lead to the preceding results? In thinking about the adequacy of the level of funding there are four key points to consider.

- First, as noted previously, there was no recognition of the workload 'shift' associated with the innovation agenda and the need to replace the 'teaching' resources shifted to research.
- Second, there is a major difference in the rate of increase in government grants versus tuition, with the former actually decreasing by 34% in real terms since 1987 (-7% since 2000) and the latter registering almost a three-fold increase in real terms since 1987 (+30% since 2000).
- Third, the use of FTE enrolment does not reflect the shift in enrolment by program and level (professional and graduate students) and the associated cost increase.
- And fourth, the use of Ontario CPI as the estimate of inflation, seriously understates the inflation pressures in the university sector where labour costs constitute over 75% of the costs.

Each of the preceding points could be the topic of a separate paper but the first and second points are key to understanding the financial challenge associated with funding the real costs of the 'innovation agenda'. As noted previously the 'workload shift' created a teaching void, quite independent of the funding requirements associated with enrolment increases; that 'teaching void' funding requirement was not explicitly addressed and perhaps could be and should be referred to as the innovation agenda claim on faculty time. The greater reliance on tuition carried with it an implicit (and at times explicit) understanding that the tuition increase would be used to improve quality – more faculty, more course offerings, smaller classes, and more opportunity for faculty/student engagement (the cornerstone of a quality learning experience) – and to help fund inflation. As government reduced its share of funding per FTE, however, tuition revenue was, in fact, increasingly used to 'make-up' the funding reduction. The combined pressure from students (who were paying 'more') and government (who was expecting more access and the implementation of the 'innovation agenda') combined to create the makings of an unsustainable financial challenge. Through to about 2007-08, Ontario universities managed to meet the challenge because the absolute revenue increase associated with the 'double cohort' exceeded the rate of inflation by a considerable margin. From that point onwards, however, the rate of revenue increase slowed and when coupled with the impacts of the 2008 financial crisis (reduced investment yields and pension deficits) financial challenges emerged.

In terms of the 'innovation agenda' the cost of the shift in workloads was masked by the overall change in General Operating revenue. While increases in Operating funding were not sufficient to cover the cost of the shift in workloads **and** the costs associated with increased enrolment and university sector inflation (hence the resulting need to hire more part-time faculty, increase class sizes etc.), it was robust enough to mask a growing structural deficit. More importantly, from a purely 'innovation agenda' perspective, research funding also increased markedly in the late 1990s through to about 2007-08 and some part of the 'indirect costs' incurred by universities was offset by the federal provision for the indirect costs of research). Coupled with new initiatives such as CFI and CRCs the 'innovation agenda' developed a momentum of its own.

But the situation has changed somewhat in the past five years or so. The rate of increase in research funding has slowed, the focus of research funding has shifted somewhat from discovery or basic research to more targeted research areas, and since there are more faculty competing for research grants, success rates for tri-council funding have declined. The implications for the General Operating fund are significant. As research funding becomes more difficult to obtain, faculty members fall back on departmental and institutional funds to support their research programs, graduate 'funding packages' that relied on contributions from research funds (via research assistantships) need to be reconsidered and the inevitable result is a cut-back in the number of graduate students or greater reliance on General Operating revenues.

There are other implications as well. The general funding constraint in both the Operating and Research spheres, pits institutional aspirations against fiscal reality. Coupled with the provincial government's interest in supporting differentiated mandates the fiscal situation creates the opportunity, and perhaps the necessity, to re-think the funding mechanisms (and funding levels) that underpin the existing the financial framework – particularly with respect to research.

Recognizing and funding 'indirect costs'

Both the federal and Ontario government have acknowledged the validity of indirect costs; the federal government through its Federal Indirect Cost Recovery (FICR) program and the Ontario government through the Research Overhead Infrastructure Envelope (ROIE). Both governments use tri-council funding to help determine the allocation to individual institutions. Additionally, both levels of government have guidelines in place for acknowledging indirect costs associated with other government sponsored research although the application of those guidelines varies by agency.

In Ontario the ROIE was introduced in the mid-1980s in recognition of the increased levels of research associated with relatively new provincial and federal initiatives. ROIE was

intended to supplement research infrastructure funding provided through formula grants and provide partial support for the overhead costs of existing sponsored research activity.⁶

⁶ Ontario Council on University Affairs (OCUA), *Advisory Memorandum 87-X*.

At the time the term ‘research infrastructure’ referred to what is now referenced as ‘indirect costs’. Initially set at \$25 million, the ROIE represented 20% of the total peer-adjudicated funding from the federal tri-councils or approximately one-half of the *estimated* costs associated with the indirect costs of research based on the assumption that indirect costs totalled 40% of direct costs. Increases in the ROIE allocation were to be considered as part of OCUA’s annual deliberation of changes in operating grants and advice to the Minister. Implicit in the introduction of the ROIE was the recognition that OCUA would consider recommending increases in the ROIE envelope related to changes in tri-council funding. The distribution formula was based on institutional shares of tri-council competitive peer-adjudicated funding using a three year rolling average.

Table 1 summarizes the level of the ROIE since its inception and the change in eligible tri-council grant funding over the same period. Current estimates indicate that the level of support for tri-council research has decreased to less than 6% of the estimated costs. The “gap” between the original 20% figure and the current reality represents approximately \$68 million annually in the most recent year and a cumulative funding shortfall of well over \$700 million.

Table 1: Ontario ROIE Historical Summary

	A	B	C	D		
Year	ROIE	Tri-Council Funding	3 Yr.Avg Slipped 2	ROIE as % A/C	ROIE at 20%	Difference (\$000's)
1987-88	\$ 25,000.0	\$ 147,094	\$ 124,191	20.1%	\$ 25,000.0	
1988-89	\$ 25,125.0	\$ 157,694	\$ 132,706	18.9%	\$ 26,541.2	\$ (1,416)
1989-90	\$ 27,170.0	\$ 173,675	\$ 139,691	19.5%	\$ 27,938.2	\$ (768)
1990-91	\$ 28,447.0	\$ 175,003	\$ 147,633	19.3%	\$ 29,526.6	\$ (1,080)
1991-92	\$ 30,296.0	\$ 176,281	\$ 159,488	19.0%	\$ 31,897.6	\$ (1,602)
1992-93	\$ 30,569.0	\$ 182,303	\$ 168,791	18.1%	\$ 33,758.2	\$ (3,189)
1993-94	\$ 28,337.0	\$ 187,351	\$ 174,986	16.2%	\$ 34,997.2	\$ (6,660)
1994-95	\$ 27,839.0	\$ 187,354	\$ 177,863	15.7%	\$ 35,572.6	\$ (7,734)
1995-96	\$ 27,477.0	\$ 182,687	\$ 181,979	15.1%	\$ 36,395.8	\$ (8,919)
1996-97	\$ 22,990.0	\$ 178,853	\$ 185,670	12.4%	\$ 37,134.0	\$ (14,144)
1997-98	\$ 27,477.0	\$ 178,103	\$ 185,798	14.8%	\$ 37,159.6	\$ (9,683)
1998-99	\$ 27,477.0	\$ 195,565	\$ 182,965	15.0%	\$ 36,593.0	\$ (9,116)
1999-00	\$ 27,751.8	\$ 216,157	\$ 179,881	15.4%	\$ 35,976.2	\$ (8,224)
2000-01	\$ 27,751.8	\$ 253,307	\$ 184,174	15.1%	\$ 36,834.8	\$ (9,083)
2001-02	\$ 27,751.8	\$ 279,800	\$ 196,608	14.1%	\$ 39,321.6	\$ (11,570)
2002-03	\$ 27,751.8	\$ 316,568	\$ 221,677	12.5%	\$ 44,335.4	\$ (16,584)
2003-04	\$ 27,751.8	\$ 341,949	\$ 249,755	11.1%	\$ 49,951.0	\$ (22,199)
2004-05	\$ 27,751.8	\$ 357,443	\$ 283,225	9.8%	\$ 56,645.0	\$ (28,893)
2005-06	\$ 27,751.8	\$ 393,802	\$ 312,772	8.9%	\$ 62,554.4	\$ (34,803)
2006-07	\$ 27,751.8	\$ 429,321	\$ 338,653	8.2%	\$ 67,730.6	\$ (39,979)
2007-08	\$ 27,808.0	\$ 453,089	\$ 364,398	7.6%	\$ 72,879.6	\$ (45,072)
2008-09	\$ 27,751.8	\$ 472,356	\$ 388,156	7.1%	\$ 77,631.3	\$ (49,879)
2009-10	\$ 27,751.8	\$ 474,377	\$ 425,404	6.5%	\$ 85,080.8	\$ (57,329)
2010-11	\$ 27,751.8	\$ 489,390	\$ 451,589	6.1%	\$ 90,317.7	\$ (62,566)
2011-12	\$ 27,751.8	\$ 477,944	\$ 467,606	5.9%	\$ 93,521.2	\$ (65,769)
2012-13	\$ 27,751.8	\$ 469,194	\$ 478,707	5.8%	\$ 95,741.5	\$ (67,990)
2013-14	\$ 27,751.8		\$ 480,570	5.8%	\$ 96,114.0	\$ (68,362)
2014-15	\$ 27,751.8		\$ 478,842	5.8%	\$ 95,768.5	\$ (68,017)
					Cumulative	\$ (720,629)

The ROIE funding ‘gap’ can be attributed to a number of factors including, perhaps, the perception that federal initiatives such as the Federal Indirect Cost Recovery (FICR) program - since its introduction in the early 2000s - adequately addressed the issue. While it is clear that federal government investments through the tri-councils and through vehicles such as Canada Research Chairs (CRC) and Canada Foundation for Innovation (CFI) have expanded research *capacity* and furthered the innovation

agenda, it is equally clear that the associated indirect costs have only been partially supported. The FICR program, for example, provides approximately one-half of the *estimated* indirect costs – that is roughly 20% of the direct costs (excluding faculty time). The shortfall is clearly on the provincial side of the ledger.

To put the Ontario ROIE in perspective, and in a broader context, Table 2 provides a summary over the same period of changes in key institutional metrics aggregated for Ontario’s universities. Financial information is displayed in nominal and ‘real’ terms with the latter based on Ontario CPI. Key points to note (as expressed in real terms):

Table 2: Universities Metrics since Inception of ROIE*

	1987-88	2012-13	% Change
FTE enrolment	229,929	456,460	99%
General Operating Revenue	\$ 1,897,216	\$ 8,205,730	
	\$ 3,408,273	\$ 8,205,730	141%
Sponsored Research Revenue	\$ 397,350	\$ 2,776,329	
Total incl. Non-consolidated	\$ 713,823	\$ 2,776,329	289%
Sponsored Research Revenue Consolidated Entities Only	\$ 397,350	\$ 1,747,886	
	\$ 713,823	\$ 1,747,886	145%
Tri-Council Grants	\$ 147,094	\$ 469,194	
	\$ 264,249	\$ 469,194	78%
ROIE	\$ 25,000	\$ 27,752	
	\$ 44,912	\$ 27,752	-38%
MTCU Grants (Operating)	\$ 1,460,512	\$ 3,448,774	
	\$ 2,623,752	\$ 3,448,774	31%
MTCU Grants per FTE (ineligible and eligible FTE)	\$ 6,352	\$ 7,555	19%
	\$ 11,411	\$ 7,555	-34%
BOI / BIU	\$ 4,491	\$ 5,442	21%
	\$ 8,067	\$ 5,442	-33%
	Adjusted for Ontario CPI Inflation in 2012 \$		
Sources:			
Committee of Finance Officers - Universities of Ontario, Financial Reports			
FTE Enrolment - Council of Ontario Universities (eligible and ineligible)			
ROIE - Ministry of Training, Colleges and Universities			
BOI/BIU - Ministry of Training, Colleges and Universities, The Ontario Operating Funds Distribution Manual. 1987 figure = 1986/97 'new formula' plus 4%. 2012-13 from MTCU FTOT calculations.			

*Readers should keep in mind that due to reporting changes in COFO-UO the financial information may not be strictly comparable – particularly given the broadening of the definition of General Operating and the change from net to gross reporting in 2000.

- Total sponsored research funding (+289%) far outpaced the increase in Operating Grants (+31%) and the increase in Operating Revenue (+141%).

- It is clear that hospital based research – essentially ‘entities not consolidated’ using COFO-UO terminology – has grown markedly relative to sponsored research generally reflecting the interest and investment in health sciences and the more pronounced role of ‘teaching hospitals’ in the research enterprise.
- Tri-council funding recognized in the calculation of ROIE increased by 78%.
- Per student (eligible and ineligible FTEs), MTCU Operating Grants decreased by 34%.
- BOI/BIU – a measure of government funding support for ‘core operations’ – decreased in real terms by a similar amount as the Operating Grant.

Before leaving the topic of indirect costs, it is important to note that the figure of 40% that is often used as an estimate of indirect costs is based on the findings of a CAUBO sponsored study from the early 1980s.⁷ A more recent survey (2013) conducted by CAUBO and the Canadian Association of University Research Administrators (CAURA) indicated that

those respondents that provided an estimate of indirect costs indicated that they were between 40% and 60% of the direct costs. Although differences in methodology make comparison difficult, this is similar to the results seen in other countries that have established more consistent and robust standards for measurement of ICR (Indirect Costs of Research).⁸

A comparative review of the indirect (institutional) costs of research conducted by the Association of Universities and Colleges of Canada found that both the ‘rate’ used to calculate the ICR and the breadth of coverage in the applicable expenditure base were greater than the “40%” figure.⁹

The bottom line... indirect costs of research are real, have outpaced the general increase in Operating **grants**, and have claimed Operating resources that otherwise would have been spent on sustaining and improving the student learning environment. The ROIE was established to recognize the indirect cost implications of expanded research activity but the funding allocations have not kept pace with the universities’ ability to compete and win federal granting council funding. Moreover, while it is common practice in Canada to refer 40% as an estimate of the indirect costs of research, the evidence from updated studies suggests that the figure significantly

⁷ Canadian Association of University Business Officers (1982) *Report of the Study on the Costs of University Research*.

⁸ Canadian Association of University Business Officers and Canadian Association of University Research Administrators (2013) *Indirect Costs of Research. Foreword p.2*

⁹ Association of Universities and Colleges of Canada, *Funding the Institutional Costs of Research: An International Perspective*, May 2009. “We found that, where programs and policies are in place to meet institutional costs, universities are reimbursed at a much higher rate than in Canada – normally between 40 and 60 percent. The discrepancy is probably even higher than it seems – in most cases and unlike in Canada, direct research grants cover faculty salaries; thus, the institutional costs are calculated on a wider base.” p.2

understates the real cost. The financial data also underscores the disconnect between government operating grants and the increased research activity since the latter part of the 1980s. And that reality leads us to examine how the 'shift' in faculty time has affected 'core operations'.

Faculty time and the costs of research

Increased emphasis on research and innovation activity has resulted in individual faculty members devoting more time to the multitude of activities that are part of the research agenda (proposal writing, adjudicating, developing partnerships, project activity, accountability, dissemination of findings, commercialization). This increase in the **direct** cost of research and innovation has not been recognized in the existing funding formula. The amount of funding actually imbedded in the formula grants for research is a mystery number buried in the original construct of the BIU program 'weights' which were loosely related to expenditures (costs) in the mid-1960s at a time when 'sponsored research' represented a smaller fraction of overall activity. Comparable, reliable data is not readily available from the mid-1960s but is available from the 1970s onwards. Beginning in 1971-72 CAUBO reported that sponsored research income in Ontario represented approximately 13% of Operating Income. Today (2012-13) the similar figure is in the order of 21% and increases to almost 35% if 'entities not consolidated' are included.¹⁰

On the surface, the increase from 13% to 21% may not seem significant – especially since it is calculated over a 40+ year period. But if the Ontario funding formula 'weights' were constructed in a fashion that were generally accepted as a 'proxy' for the combined activities of teaching, research and service in the mid-1960s, what happens if, in the interval, one component – research – actually increases at a rate that outpaces the others? If one wanted to change the teaching / research balance in place today to the mid-1960s level, then either research activity would need to decline from 21% of Operating income to 13% of Operating income or Operating income would have to increase such that Research income represented 13% of Operating income. The former approach would mean a reduction of \$700 million in research funding to Ontario. The latter approach would require total Operating income to increase by well over 50% from current levels.

The preceding 'arithmetic' helps illustrate the 'unfunded' cost of research in the Operating Fund. There are, of course, various methodologies one could use to

¹⁰ Another point to note that is directly related to research capacity is the "quality" of faculty. In considering the factors that have influenced the expansion in research the increase in the proportion of faculty with PhDs is a key metric. According to AUCC "in 1976 only 60 percent of full-time faculty had a doctoral degree, whereas in 2006, 80 percent of full-time faculty hold a Ph.D." AUCC, Trends in Higher Education, Vol. II, 2007, p.25

construct estimates of the ‘unfunded’ costs but the key point to note is that institutions have incurred real costs in pursuit of the ‘innovation agenda’ and those costs have not been fully acknowledged in the funding mechanisms.

While it is clear institutions incur costs to pursue the ‘innovation agenda’, it is equally clear there are benefits to the researcher, to the institution, and to the province.

The following table illustrates the relationship between General Operating and Research expenditures.

Table 3: General Operating and Research Expenditures – 2012-13

	General Operating	% Distribution	Research Expenditures	% Distribution	Combined Operating+Research	% Distribution	Research as % of Combined
Salaries and Wages							
Academic Ranks	\$ 2,246,504	29.3%	\$ 140,179	5.0%	\$ 2,386,683	22.8%	5.9%
Other Instruction & Research	\$ 446,556	5.8%	\$ 561,417	20.0%	\$ 1,007,973	9.6%	55.7%
Other Salaries & Wages	\$ 1,999,323	26.1%	\$ 431,055	15.4%	\$ 2,430,378	23.2%	17.7%
Total Salaries and Wages	\$ 4,692,383	61.3%	\$ 1,132,651	40.4%	\$ 5,825,034	55.7%	19.4%
Employee Benefits	\$ 1,163,300	15.2%	\$ 142,113	5.1%	\$ 1,305,413	12.5%	10.9%
Total Salaries and Benefits	\$ 5,855,683	76.5%	\$ 1,274,764	45.5%	\$ 7,130,447	68.2%	17.9%
Library Acquisitions	\$ 136,758	1.8%	\$ 2,531	0.1%	\$ 139,289	1.3%	1.8%
Furniture and Equipment Purchases	\$ 165,993	2.2%	\$ 275,781	9.8%	\$ 441,774	4.2%	62.4%
Equipment Rental and Maintenance	\$ 96,870	1.3%	\$ 16,709	0.6%	\$ 113,579	1.1%	14.7%
Printing and Duplicating	\$ 39,457	0.5%	\$ 8,468	0.3%	\$ 47,925	0.5%	17.7%
Materials and Supplies	\$ 161,021	2.1%	\$ 412,453	14.7%	\$ 573,474	5.5%	71.9%
Communications	\$ 39,118	0.5%	\$ 9,051	0.3%	\$ 48,169	0.5%	18.8%
Professional Fees	\$ 91,465	1.2%	\$ 28,617	1.0%	\$ 120,082	1.1%	23.8%
Travel	\$ 125,156	1.6%	\$ 106,594	3.8%	\$ 231,750	2.2%	46.0%
Utilities	\$ 192,622	2.5%	\$ 6,869	0.2%	\$ 199,491	1.9%	3.4%
Renovations and Alterations	\$ 79,129	1.0%	\$ 36,792	1.3%	\$ 115,921	1.1%	31.7%
Externally Contracted Services	\$ 144,166	1.9%	\$ 120,694	4.3%	\$ 264,860	2.5%	45.6%
Scholarships, Bursaries, etc.	\$ 517,235	6.8%	\$ 122,435	4.4%	\$ 639,670	6.1%	19.1%
Debt Repayments	\$ 5,409	0.1%	\$ -	0.0%	\$ 5,409	0.1%	0.0%
Interest	\$ 79,823	1.0%	\$ 2,592	0.1%	\$ 82,415	0.8%	3.1%
Building, Land and Site Services	\$ 33,687	0.4%	\$ 101,632	3.6%	\$ 135,319	1.3%	75.1%
Other Operational Expenditures	\$ 267,402	3.5%	\$ 138,709	4.9%	\$ 406,111	3.9%	34.2%
Internal Cost Allocations	\$ (162,599)	-2.1%	\$ 149,350	5.3%	\$ (13,249)	-0.1%	-1127.3%
External Cost Recoveries	\$ (213,477)	-2.8%	\$ (11,304)	-0.4%	\$ (224,781)	-2.1%	5.0%
Total	\$ 7,654,918	100.0%	\$ 2,802,737	100.0%	\$ 10,457,655	100.0%	26.8%

Source: COFO, Operating Expenditures – Table 4, Research Expenditures – Entities Consolidated, Table 4

Research expenditures represent 26.8% of the combined expenditure total, but it is clear that the distribution of Research expenditures differs from the distribution of General Operating expenditures. While the expense category ‘Academic Ranks’ represents 29.3% of General Operating expenditures, it represents 5% of Research expenditures (mostly CRCs and research chairs) reflecting the fact that ‘faculty time’ is largely funded from General Operating revenues. In terms of the Combined General Operating and Research expenditures, the Research expenditure on ‘Academic Ranks’ is 5.9% of the total. Total Salaries and Benefits represents 76.5% of General Operating

expenditures but less than ½ (45.5%) of Research expenditures. Other than the expense type 'Other Instruction & Research' (payments to research technicians, staff, research assistants (students) and post-doctoral appointments) the expenditures for each category of salaries and benefits is well below the absolute level and proportion relative to General Operating expenditures. That is not the case with respect to a number of non-salary expenditures. For example, the proportion of expenditure and absolute level of expenditure are higher in the Research area in 'Furniture and Equipment Purchases', 'Materials and Supplies', and 'Building, Land and Site Services'. And the proportion of Research expenditures is higher in 'Travel', 'Renovations and Alterations', 'Externally Contracted Services', and 'Other Operational Expenditures'. 'Internal Cost Allocations' is also considerably higher in Research Expenditures' reflecting departmental 'charge-outs' to recover departmental operating expenses from Research accounts.

What to make of the Table and preceding descriptions? On the one hand the Research expenditures contribute to the expenditure total and therefore contribute to the overall scale, breadth and depth of the learning environment. Faculty members are better able to 'get on' with their research work which is an integral part of being a faculty member, and it is clear the Research expenditures are focused on some of the 'direct costs' of research – research staff, physical infrastructure, materials and supplies, and travel. At the same time expense items such as 'Other Instruction and Research' and 'Scholarships, Bursaries etc.' help fund graduate student support – a critical ingredient in the research enterprise.

On the other hand, the Research expenditures do not reflect 'total costs' since a large portion of faculty time is actually reflected in the General Operating expenditures as are the various components of Indirect or Institutional costs such as Library Acquisitions, Library staff, Information Technology and Information Technology staff and general administrative support.

And so we return to the 'disconnect'.

Concluding comments

This Working paper is intended to help provide a better understanding of the 'costs of research' and the impact of the 'innovation agenda' on higher education finance and cost pressures. The challenge with respect to 'indirect costs' is reasonably clear and augmenting the existing ROIE provides a vehicle to address one part of the 'disconnect' noted in the paper. Addressing the topic of faculty time and the direct cost of the 'innovation agenda' is more challenging both in terms of scale and implications. However, to the extent, the Working paper stimulates discussion of the topic it will have served a useful purpose.