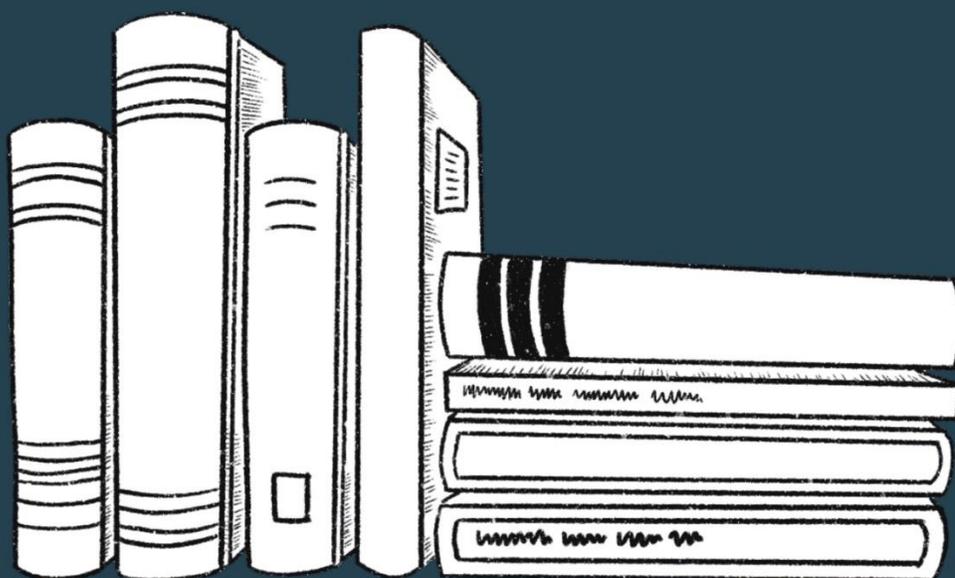


Higher Education Quality Council of Ontario



An agency of the Government of Ontario



College and University Baccalaureate Degrees: Another Look at Costs

Ken Snowdon

Published by:

The Higher Education Quality Council of Ontario

88 Queens Quay West, Suite 2500
Toronto, ON
Canada, M5J 0B8

Phone: (416) 212-3893

Fax: (416) 212-3899

Web: www.heqco.ca

E-mail: info@heqco.ca

Cite this publication in the following format:

Snowdon, K. (2022) *College and University Baccalaureate Degrees: Another Look at Costs*.
Toronto: Higher Education Quality Council of Ontario



An agency of the Government of Ontario

The opinions expressed in this research document are those of the authors and do not necessarily represent the views or official policies of the Higher Education Quality Council of Ontario or other agencies or organizations that may have provided support, financial or otherwise, for this project. © Queens Printer for Ontario, 2022

Acknowledgements

This report has benefitted from the contributions of many individuals and the work of various organizations. HEQCO staff were instrumental in pulling together information from various sources, reviewing earlier drafts and seeing the report through to publication. Sean Madden and his colleagues in the Colleges Finance Unit at the Ministry of Colleges and Universities were very helpful in providing interpretation of college finances and helping to unravel many of the details associated with the college program weights and the enrolment counting methodologies that are an integral part of the college funding formula. A special note of thanks to Teresa Alm, Queen's University, for guidance in navigating the complexities of student assistance funding and the interaction with tuition policies. Finally, a note of thanks to a number of individuals in the college and university sectors who gave generously of their time to discuss the inputs and relevant factors associated with institutional program costs.

The preceding assistance, insight, contributions and guidance have helped enormously with the research and development of this report, but responsibility for the final product with its interpretations, conclusions, flaws and foibles, rests squarely on my shoulders.

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Executive Summary

The primary purpose of this paper is to compare the cost of Ontario undergraduate degree programs in the college sector with four-year direct-entry undergraduate degree programs in the university sector. The findings and analysis from that assessment are then used to inform an exploration of costs associated with suggestions to expand degree granting in Ontario's Colleges of Applied Arts and Technology (CAATs) to include three-year degrees. With respect to the primary undertaking, the bottom line is that while college programs are often regarded as more economical, a more detailed examination suggests that view should be modified to recognize the host of factors and different perspectives that need to be considered when comparing costs between Ontario's college and university sectors. With respect to three-year degrees there are many unknowns. Nevertheless, it is clear that the level of government support for the three-year college Ontario Advanced Diploma (OAD) is currently higher than the support provided for three-year university degrees. Further, it is also reasonably clear that an expansion of three-year degrees to the community college sector would almost certainly result in additional cost — cost to students, cost to government and cost to the institutions.

To set the context, the paper begins with a brief section on methodology and an overview of the college and university objects as defined by legislation and then provides a brief primer on postsecondary finance in Ontario — the financial wherewithal to meet the objects. Subsequent sections explore the topic of cost from the perspective of students, government and institutions with the focus on four-year direct-entry baccalaureate degrees. That analysis helps inform the penultimate section on three-year degrees. The final section provides a summary of the findings and some concluding commentary. Appendix A offers a brief literature review and includes more information about specific data issues/references in the main part of the paper. Appendix B provides a brief chronicle of the evolution of government tuition policy, an important part of developing a better understanding of the interaction between tuition, government student assistance and institutional student assistance.

In terms of student costs, the paper concludes there is little difference in pursuing a four-year degree through the CAATs or through Ontario's universities. Tuition sticker prices are actually very similar for most four-year direct-entry programs in the CAATs and universities. A more detailed examination and comparison of tuition and other costs, coupled with the impact of student assistance, challenges the conventional focus on sticker price, in any case, and provides a more realistic assessment of student cost. That comparison affirms the basic conclusion and demonstrates that where there are differences in 'sticker price,' government and institutional student assistance policies/practices mitigate or eliminate the difference.

In terms of costs to government, the contribution of the Ontario government to program funding per student for four-year degree programs is lower in the CAATs for most programs, but there are important caveats that give pause to that finding. The paper delves into the details of the components that drive the funding formula operation in each sector and notes the significant differences that, when combined, translate into an "apples to oranges" comparison. While both sectors acknowledge differences in program cost by adopting the notion of "weighted enrolments," the benchmarks are different, the methodology for counting students is different, the objects or activities intended to be funded are different, the origins and intent of the program weights used to ascribe relative differences in program cost are different, the dollar value of the government funding unit is different, and basic nomenclature differs as well: **Weighted Funding**

Unit (WFU) in the college sector, and **Weighted Grant Unit (WGU)** in the university sector. The importance of those differences should not be discounted. Fundamental differences in student counting methodologies, for example, translate into an understatement of the reported cost to government of program funding per student in the CAATs relative to the universities. If the methodologies were the same it is estimated that the absolute government contribution per student would, in fact, be very similar in some programs. The difference in objects or activities the government program grant is intended to support in the two sectors (i.e., university research) makes the comparison somewhat moot, in any case, as does the difference in the origins and intent of the underlying program weights in each sector. The focus on the government's contribution to program funding does not do justice to the total cost to government of basic operating support, which also includes a set of special purpose grants. Those special purpose grants deserve further review to determine the impact on per student funding at the baccalaureate level in the colleges and universities.

For a variety of reasons, including the absence of public data at the program level, determining institutional cost poses its own set of challenges. The paper explores the major inputs of institutional cost — salaries, enrolments, workloads and class size — in both sectors and then cautiously applies the findings to arrive at a conclusion that per-student instruction cost for direct-entry baccalaureate programs is likely more similar than different. In essence, the university undergraduate model of relatively large class sizes in the foundational years and smaller classes in upper years, coupled with the increased use of teaching-stream and part-time academic staff, offset the cost advantages often attributed to the college sector. The major caveat concerning the lack of data at the program level means the results need to be seen for what they are — an estimate based on an assessment of major cost drivers, not a detailed cost analysis at the program level.

Based on the findings from the financial comparison of four-year baccalaureates in the CAATs and the universities, the paper then offers some commentary about the cost implications of expanding degree granting to include three-year degrees in the CAATs. If annual tuition for the three-year degrees was set at the same rate as CAAT four-year baccalaureate programs, for example, student cost would be similar to the university sector and considerably higher than current tuition for three-year Ontario Advanced Diploma (OAD) programs. That in turn would result in an increase in government and institutional student assistance costs. With respect to government program costs, the government's contribution to existing OAD programs is currently higher relative to its contribution to university three-year degree programs. If government applied the program-funding degree premium afforded to college four-year degrees, the cost to government would increase further. Institutional costs would increase in the CAATs to meet degree requirements, such as the hiring of more faculty with PhDs and expenditure on curriculum changes. Likely changes in admission standards would affect enrolment levels, which in turn could negatively impact income (and cost) and might also pose questions about college access policies. Other matters worthy of consideration are the implications of such a change on the current corridor funding environment and the financial sustainability implications for some institutions, particularly regional universities and colleges. The potential longer-term impact of having more CAAT faculty with research inclinations and aspirations is also an issue that has institutional cost implications and provincial funding implications.

Cost considerations are important in contemplating major changes in postsecondary education. Of course, they should not be the only considerations, nor, necessarily the most important

considerations. But this paper makes clear that the general topic of cost in higher education has layers of complexity with a number of moving parts that, when altered, can (and do) impact costs very quickly. Moreover, various parts of the paper, from the review of objects to the discussion of research and faculty appointment types, also emphasize the fact that trying to compare the two sectors, or specific parts of the two sectors, is extraordinarily difficult given some fundamental differences in objects and the absence of data at the program level.

Introduction and Purpose

Over the past ten years, HEQCO has produced a [number](#) of [reports](#) on the topic of [differentiation](#) in postsecondary education as part of its mandate regarding system design and sustainability. For the most part, those reports focused on examining differentiation *within* the college sector and *within* the university sector rather than *between* the sectors although it was recognized early on that “a fundamental decision the government must make regarding differentiation is the degree to which it is prepared to expand the mandate of the college sector to more degree granting” (Higher Education Quality Council of Ontario, 2013, p. 12).

In recent years, Colleges Ontario has advocated for further expansion of degree-granting authority, including three-year degrees (Colleges Ontario, 2012; Davidson & Ruparell, 2020). There are a variety of considerations that should be part of any evaluation framework to determine differentiated roles and, more specifically, suggestions for expanding degree offerings in the Colleges of Applied Arts and Technology (CAATs) (Hicks et al., 2013). The focus of this paper is on financial considerations: examining the cost of college advanced diploma and baccalaureate degree programs compared to university three-year and four-year baccalaureate programs and providing some insight into the financial consequences of expanding degree offerings.

In the research literature, Ontario community college degree programs are generally referred to as “more economical” (Skolnik, 2012, p. 2). The basic arguments are reflected in the following quote: “Government funding for college degrees is similar to that for diplomas which means they are cheaper to fund than university degrees (a cause of much concern for institutional leaders in colleges), and fees are mostly lower than in universities.” (Wheelahan et al., 2017)

Implicit in the “more economical” reference is an assumption that program delivery costs in the community colleges are also less than in the university sector. This paper relies on available data and examines costs from a number of perspectives to test the preceding arguments and assumptions and shed further light on postsecondary finance in Ontario.

Defining Costs

The methodology for examining the issue of costs has two basic components: defining what is meant by the term cost and compiling the necessary data for comparison. While it may be more accurate and enlightening to think of the cost of postsecondary education as an investment, both from a personal and societal perspective, the term is used here to align with the notion of “more economical.”

There are a number of ways to view the cost of postsecondary education. To students, cost is essentially the price of attending college or university and includes the direct costs (tuition, books/equipment and living expenses). The opportunity cost of attending college or university is, in fact, a major ‘cost’ (foregone income), but tends to be largely ignored in public discussions of student costs. Opportunity cost is not part of this analysis because the time-to-completion is assumed to be the same — a four-year degree in either university or college is assumed to take the same amount of time, on average. Significant amounts of student assistance are available to reduce the net student cost of college or university and are examined as part of this analysis.

To governments, cost focuses on the operating, capital and research grants provided to institutions, student assistance grants provided to institutions, and the grants and loans provided to students to help them pursue their studies. In Canada, those costs are the purview of the federal and provincial governments and are subject to various arrangements regarding the levels of contribution. Operating grants are the responsibility of the provinces. The federal government is a major contributor to sponsored research although provinces also support research directly through their own research programs and/or through cost-sharing arrangements with the federal government. Capital costs are often funded by a mix of provincial, federal and institutional funds — the latter often sourced from donations or specific fees but also, in some cases, sourced from operating revenues. Government student assistance in Ontario, primarily delivered through the Ontario Student Assistance Program (OSAP), involves a general cost-sharing approach between the federal and provincial governments. While there is an opportunity cost associated with all government subsidies/investments, that aspect of cost is seldom noted — nor is it intended to be explored in detail here. Rather, the focus will be on operating grants that contribute to the funding of core operations and student assistance provided by the province and the federal governments.¹

To institutions, cost reflects the financial resources required to deliver the program to the student, including all the associated support service costs such as library, physical plant, information technology, student services and administration. While capital costs are real, the focus of this analysis is on core operations. Institutions also incur student assistance costs for merit-based and needs-based awards.

Table 1 summarizes the major costs as seen through the lens of the student, government (provincial and federal) and the institution.

¹ The federal government also contributes to the costs of higher education via the Canada Social Transfer although the transfer is not earmarked specifically for postsecondary education.

Table 1: Summary of Costs from Various Perspectives

	Student Cost	Provincial Cost	Federal Cost	Institutional Cost
<i>Direct cost associated with delivery of the service or good</i>	Tuition and fees	Grants to institutions	Grants to institutions	Operating expenditures associated with all aspects of program delivery
	Books and equipment	<ul style="list-style-type: none"> • Operating • Capital • Research 	<ul style="list-style-type: none"> • Research • Capital • Indirect costs 	
	Living expenses	Grants administration and provincial postsecondary education regulatory and policy administration	Grants administration, regulatory and policy administration	Central service costs — library, academic support, student services, physical plant and administration
<i>Student assistance</i>	Debt servicing after completion	Scholarships	Scholarships	Scholarships
	Loan financing for non-government loans	Grants/bursaries	Grants/bursaries	Grants/bursaries
		Interest relief	Interest relief	
		Tax credits	Tax credits	
		Bad debt cost	Bad debt	
<i>Other subsidies/costs</i>	Opportunity cost	Financing loans	Financing loans	
		Tax exemptions	Tax exemptions	Foregone revenue
<i>Measures or indicators</i>	Direct out-of-pocket gross/net after student aid	Opportunity cost	Opportunity cost	
	Opportunity cost	Operating grants <ul style="list-style-type: none"> • Per student • Per credential 		Instructional expenditure per student by program
	Total cost	Operating grants and awards and assistance per student/credential		

The preceding brief categorization of costs is not intended to be exhaustive, nor will each component in Table 1 be examined as part of this exercise. It does, however, begin to capture some of the complexity associated with the topic of costs in academe. The paper is also premised on the assumption of 100% student success — that is, students successfully complete their programs and the various investments (costs) end up in the realization of personal and societal benefit. The reality is that not all students will complete their programs. While time at a college or university will likely be advantageous for a variety of reasons, leaving an institution without a credential can have noticeable impacts on career earnings and other life aspects. That cost to the individual, to society, and to institutions is only mentioned here but should be a consideration in future research.

Literature Review and Assembling the Data

Research on postsecondary costs in Canada at the program level is sparse. The brief literature review included (Appendix A) focuses on providing some references that provide background and perspectives on the many issues related to community college baccalaureate degrees, examples of college baccalaureate reviews in the United States, information about differences in program cost more generally and data references. Much of the information for this paper comes from secondary sources. Data on direct student cost was provided via the OSAP Aid Estimator, available at the individual program level for all Ontario colleges and universities and validated via college and university websites. Data on student financial assistance was provided from a variety of sources including the OSAP Aid Estimator, university financial reports compiled by the Council of Finance Officers-Universities of Ontario (COFO-UO), the Colleges Finance Unit and Colleges Ontario. Financial information about need-based awards and merit-based awards was available from public sources at a few institutions and was sufficiently detailed at one university to help illustrate the impact of student aid on student cost.

Information about government operating grants was derived from the ministry's funding formula manuals and related financial documents. Institutional costs were informed by a few reports on class size and workloads at the CAATs and universities as well as program-weight cost information from jurisdictions where expenditure studies are part of the funding regime. The lack of financial and staffing data at the program level in both sectors is an acknowledged limitation that affected the detailed analysis of institutional costs.

Background and Context

The publicly assisted postsecondary system in Ontario has two basic components — universities and community colleges, known as Colleges of Applied Arts and Technology (CAATs).² The CAATs' objects and the scope of related activities are spelled out in the *Ontario Colleges of Applied Arts and Technology Act, 2002* as follows:

(2) The objects of the colleges are to offer a comprehensive program of career-oriented, postsecondary education and training to assist individuals in finding and keeping employment, to meet the needs of employers and the changing work environment and to support the economic and social development of their local and diverse communities. 2002, c. 8, Sched. F, s. 2 (2).

(3) In carrying out its objects, a college may undertake a range of education-related and training-related activities, including but not limited to,

- (a) entering into partnerships with business, industry and other educational institutions;
- (b) offering its courses in the French language where the college is authorized to do so by regulation;
- (c) adult vocational education and training;
- (d) basic skills and literacy training;
- (e) apprenticeship in-school training; and
- (f) applied research. 2002, c. 8, Sched. F, s. 2 (3).

The revision of the act in 2002 followed the *Post-secondary Choice and Excellence Act, 2000* that established a policy designed to broaden degree-granting authority, previously the sole purview of Ontario's universities.

Each publicly assisted university in Ontario has its own act that reflects its history and sets out its objects and unique governance arrangements. In general, the objects are captured in the following excerpts from the *University of Waterloo Act, 1972* and the *York University Act, 1965*, respectively.

The objects of the University are the pursuit of learning through scholarship, teaching and research within a spirit of free enquiry and expression (Government of Ontario, 1972).

The objects and purposes of the University are, (a) the advancement of learning and the dissemination of knowledge; and (b) the intellectual, spiritual, social, moral and physical development of its members and the betterment of society (Government of Ontario, 1965).

It is reasonably clear there are major differences between the objects of the two sectors. The CAATs were established with career-oriented education and training in mind and local communities as a focus. Universities were established with an emphasis on learning that encompasses teaching and research in service to broader society. The distinction here between the main roles of the CAATs and the universities is not intended to be divisive or absolute. Many

² Private career colleges are also part of the postsecondary system in Ontario. For more information, see Ministry of Colleges and Universities: <https://www.ontario.ca/page/private-career-colleges>

CAATs are now offering four-year baccalaureate degrees, and revisions to the act in 2002 allowed and encouraged colleges to engage in applied research and build educational partnerships. The following year, five CAATs (Humber, Sheridan, Conestoga, Seneca and George Brown) were designated as institutes of technology and advanced learning (ITALs). University mandates have expanded as well, via the innovation agenda, to act as catalysts for economic and social development. Both sectors have embraced international education. Further, there are many examples of co-operation and collaboration between and among colleges and universities in the province. Improved transfer credit arrangements and joint/collaborative programs are now part of the postsecondary landscape in Ontario.

However, given the differences in their mandates, Ontario's colleges and universities have distinctly different cost realities; college operations are focused on teaching in support of career-oriented education and training. University operations are focused on both teaching *and* research to fulfill their basic mandate. Any attempt to compare the costs of colleges and universities must take the differences in mandate (objects) into account. Also, it is important to acknowledge that the diversity of the institutions in both sectors means that observations about each sector will not do justice to the wide range of institutional differences *within* each sector.

A College and University Financial Primer

From a financial perspective, the CAATs and universities bear some striking similarities. Both rely on tuition and provincial grants for a large portion of their core operations funding, and both are labour-intensive entities where salaries and benefits dominate expenditures. Both sectors operate ancillary services (e.g., residences, food services, parking services, etc.) funded on a fee-for-service basis. The CAATs and universities also have physical campuses requiring capital investments for new construction, renovation/alterations and ongoing maintenance, with funding support for the first two items often cobbled together from government and private sources. Funding for ongoing maintenance is included in core operations (meaning the funding sources are primarily tuition and government operating grants) or, in the case of ancillary services, from fees/sales of service. Additionally, a college or university may be involved with a number of specific educational projects with other partners (e.g., countries, public and/or private educational institutions, foundations and companies, etc.). Although these projects are important to the institution and may enrich both the learning environment and learning opportunities, they are generally funded on a contract basis. Both sectors have other sources of income — donations, investments/endowments — used to support a variety of activities, such as scholarships and bursaries that are complementary to the main objects. The scale of financial activity is quite different between the sectors, and among institutions within each sector, but the scope of activity, at first glance, could be seen as reasonably similar — that is, both sectors offer an array of postsecondary programs that span various levels of learning. There is, however, one striking difference: in universities, by virtue of their objects, a major component of their activity is directly related to research.

Financing the key activity of teaching (and the related support services) is relatively straightforward. In both sectors, that activity is primarily funded by provincial operating grants and tuition. Financing research activity is more complicated. All full-time faculty at colleges and universities are expected to keep up-to-date on advancements/information in the discipline and subject area as well as pedagogical research in teaching methods and curriculum. Those kinds

of, what might be considered “research activity” are very clearly intended to be funded as part of teaching — hence funded from operating grants and tuition.

Given their mandates, research in the universities takes on added dimensions, sometimes referred to as frontier/basic or discovery research, applied or innovation research and interpretative/reflective inquiry. The latter, in tandem with teaching, has been described as the “inseparable combination: teaching and reflective inquiry” (Cameron, 1994). These added research dimensions are supported in two ways: The first is through core operations as salaries and benefits of most faculty are paid from provincial grant revenue, student fees and other operating revenues as part of “instruction and **non**-sponsored research.” The second is through “sponsored” research, including competitive, peer-adjudicated grants from the federal granting councils and foundations, as well as contract research funded by both levels of government, and private business. Funding from the granting councils, for the most part, does not cover direct salary and benefit expenses of faculty³ although it does support student research assistants, non-faculty research staff, non-salary direct costs (equipment/supplies etc.) and part of the overhead or indirect cost associated with the research activity. The other part of the overhead or indirect cost is currently financed by the institution from core operations funding — operating grants, tuition and other general revenue (Canadian Association of University Business Officers, 2013). Contract research (applied research) is supposed to include provision for all direct and indirect costs including faculty time.

The cost of research is a major component of university costs. While part of the cost is reasonably easy to document — that is, the expenditures directly related to sponsored research and accounted for separately in the Sponsored Research Fund — it is more difficult to document the amount spent on research in core operations because a major part of the expense is in the form of faculty salaries and benefits, essentially accounting for the time devoted to research. In the early 1990s, the Ontario Council on University Affairs undertook a number of studies as part of a funding review, and one of those studies focused on costing the teaching, research and service activities in the university system. The study relied on a set of faculty workload estimates for the allocation of time and used COFO-UO financial information for the system, excluding capital funds. The conclusion was that teaching represented 53%, research represented 36% and service represented 11% of expenditures (Task Force on Resource Allocation, 1994). The percentages have likely changed since the early 1990s, but the point is that any cost comparisons between colleges and universities need to recognize the size and impact of the research component in some fashion because it is a core differentiator.

As noted in many reports over many years, the reality of research activity in Canadian universities is that it is actually a losing financial proposition (Weingarten & Deller, 2010, p. 13). Research activity does not generate sufficient funding on its own to cover its myriad costs — notably faculty time and overhead/indirect costs. The more successful faculty are at generating sponsored research funding, specifically grant funding from the federal and provincial governments, the more faculty time and indirect cost it incurs. And the only way to pay for it is through increasing enrolment and/or increasing tuition — both dependent on government policy. While that reality has been a characteristic of university funding for many years, it was driven home as the emphasis on research activity increased markedly in the late 1990s and early

³ University expenditure on academic salaries totaled about \$3.2 billion in 2019/20 of which \$160 million (~5%) was in the Sponsored Research Fund. In 2000/01 the percentage was similar. (Council of Ontario Finance Officers – Universities of Ontario, Table 4, 2019/20 and 2000/01.)

2000s in response to the federal government’s major investments in what was described as the innovation agenda in support of a knowledge-based economy. In effect, changes in workload to recognize the increased emphasis on research (and subsequent expansion of graduate studies) translated into a measure of unfunded activity⁴ that ultimately put pressure on already strained financial resources and has led to the adoption of expenditure and revenue strategies that are impacting universities in many ways — a point noted later when examining institutional costs.

In the CAATs, it was anticipated from the outset that research in curricular and pedagogical technique would be one of the key principles influencing their activities (Ontario Department of Education, 1967). In the case of college faculty, pedagogical and curriculum research appears to be implicitly acknowledged as part of their workload via the collective agreement provisions for professional development (College Employer Council & Ontario Public Service Employees Union, 2017), and reference in the course preparation component to “Hours for curriculum review or course development assigned to a teacher on an ongoing basis, in lieu of teaching or in a non-teaching period...” (College Employer Council & Ontario Public Service Employees Union, 2017, p. 14). Additionally, while not prescribed for reporting purposes, teaching-related research could perhaps be seen to be included in the Standard Workload Formula (SWF) under what is categorized as “complementary functions” (Workload Task Force, 2009, p. 26). It appears then, as noted previously, that this teaching-related research and the time devoted to it as part of teaching workload and professional development is funded as part of core operations like the universities.

The change in degree-granting status and the addition of applied research as one of the activities that could be pursued in carrying out its objects has led to greater interest in applied research, but the funding of such research in the CAATs is less clear. There is no explicit or implicit reference in the provincial operating grant to applied research. A premium of 2.5% is part of the weighted funding unit calculation for baccalaureate programs, but it does not appear to be specifically related to applied research. The term “applied research” is referenced in more recent collective agreements⁵ as one of the considerations each college’s Workload Monitoring Group should be aware of when reviewing workload assignments. But there is no provision in the current workload formula, nor is there reference to research — applied or otherwise — in the section of the collective agreement that outlines the responsibilities of a college professor (College Employer Council & Ontario Public Service Employees Union, 2017).

The preceding information suggests that college faculty time associated with applied research, as well as the direct and indirect costs, are actually being financed from a combination of sources — subsidies from the provincial operating grant, tuition fees and other general revenues as well as private sector or government contract research and/or research grants provided by the federal and provincial governments (i.e., through programs such as NSERC’s College and Community Innovation program, which includes industrial research chairs for colleges).⁶ Given that situation, it is not surprising to hear the college version of the university complaint about research as a losing financial proposition: “Every time we get a grant ... it is in

⁴ Determining the extent of the unfunded amount associated with the innovation agenda depends on establishing a reasonable estimate of the funded amount imbedded in core operations prior to the launch of the research expansion in the late 1990s.

⁵ See Article 11.02. C2 in College Employer Council & Ontario Public Service Employees Union (2009) and subsequent agreements.

⁶ Like the universities, the CAATs are eligible for a number of federal and provincial research grant programs.

fact costing us money because of the in-kind contributions that are required” (Rosenkrantz, 2013).

From a financial perspective, applied research in the CAATs is a relatively small, but growing, part of the overall picture. To date, it does not appear to have markedly changed average workloads in the CAATs, nor associated costs, although the previous quotation acknowledges the reality. As the emphasis on applied research increases, examples from the past suggest that institutional costs (i.e., faculty time and indirect costs) will increase as well.

The relative scale of research activity in the colleges, however, is a fraction of the activity in the universities. In 2018/19, for example, sponsored research revenue in the CAATs was about \$37 million (Statistics Canada, 2020b). Sponsored research in Ontario’s universities was about \$2.1 billion with a further \$1 billion in related institutions (such as teaching hospitals, research institutes) (Statistics Canada, 2021d). It is important to note that the data on research funding in Ontario’s colleges may not tell the full story because of reporting and definition issues. A 2017/18 Colleges and Institutes Canada survey of applied research reported that Ontario’s community colleges generated about \$100 million in total research funding, including approximately \$60 million in private sector and in-kind funding (Colleges and Institutes Canada, 2018). The reference to “in-kind funding” is likely an estimate of faculty time and institutional infrastructure costs.

Tables 2 and 3 provide a snapshot of income and expenditures in the CAATs and the universities. Universities use a form of fund accounting⁷ to reflect the fact that some resources are restricted for specific purposes and governed by terms that specify the use of the funding — for example, sponsored research funding and donations. For comparability purposes, CAAT finances are displayed in a similar fashion based on a review of information from the College Financial Information System (CFIS)⁸ and Statistics Canada. Restricted funding is presented simply to illustrate the relative scale compared to the funding for basic operations. For simplicity’s sake, capital funding has been excluded from the analysis.

There are a few key points to note from Table 2. First, the financial data is based on the 2019/20 fiscal year, which means it does not reflect the impacts of the COVID-19 pandemic on revenue, particularly tuition from international enrolment. Second, the relative sizes of provincial grants and tuition, and the relative size of international fee revenues are noteworthy. Provincial grants represent about one-third of operating income, while tuition and fees represent around 60%. Tuition and fees from international students represent about one-third of college income and almost one-quarter of university income. Analyzing the steering effect of the shift to a greater reliance on tuition in general, and a much greater reliance on international tuition,⁹ is beyond the scope of this paper but, suffice to say, those specific developments have had a marked impact on institutional finances — a matter we will touch on again later in the paper when examining institutional costs.¹⁰ The other key point to note from Table 2 is that Restricted income is a major part of the universities’ finances, with sponsored research activity generating

⁷ Each college and university prepares its own set of financial statements that are externally audited and approved by the governing board.

⁸ I am grateful to staff in the Colleges Finance Unit who helped decipher some of the inner workings of CFIS. Errors in interpretation are mine alone.

⁹ For a chronology and review of international tuition policy in Ontario, see Snowdon (2014).

¹⁰ The significant increase in international enrolment has led to various stories about the impacts on students and institutions. For example, see Teotonio et al. (2019).

well over \$2 billion in 2019/20. In addition, as noted previously, there is \$1 billion of research funding in hospitals and research institutes that are related/affiliated to the universities.

Table 2: 2019/20 Colleges and Universities Operating & Restricted Income* (\$000s)

Sources of Income	Colleges				Universities			
	Operating	%	Restricted		Operating	%	Restricted Ancillary + Trust	
			Research	Ancillary			Research	
Provincial grants	\$1,717,176	34.8%	\$9,515		\$3,735,931	33.2%	\$223,444	\$139,568
Federal grants			\$22,355		\$34,472	0.3%	\$1,272,867	\$16,764
Tuition and fees								
Domestic	\$843,170	17.1%			\$3,683,806	32.7%		
International	\$1,596,206	32.4%			\$2,618,470	23.3%		
Other student fees	\$322,689	6.5%			\$664,602	5.9%		\$405,838
Total student fees	\$2,762,065	56.0%			\$6,966,878	61.9%		
Ancillary services				\$321,975				\$660,693
All other income	\$443,883	9.0%	\$4,828		\$431,801	3.8%	\$85,547	\$273,092
Donations and non-government grants	\$10,100	0.2%			\$90,253	0.8%	\$524,789	\$287,066
Total	\$4,933,223	100.0%	\$36,698	\$321,975	\$11,259,377	100.0%	\$2,106,647	\$1,783,021
Grand total (excl. capital)				\$5,291,896				\$15,149,045

Notes: Research income for the colleges is for 2018/19 (Statistics Canada, 2020b). The research income (\$36,698) is deducted from 'All other income' in Operating to reconcile.

College information from Total College Summary, Ministry of Colleges and Universities (2021).

University income from Table 2, 2019/20, Council of Ontario Finance Officers – Universities of Ontario (COFO-UO), Total for the System.

*Excludes capital income

Table 3 summarizes the main expenditure elements for fiscal year 2019/20 by type in core operations: for colleges, this includes teaching and related services; for universities, it includes teaching, **non**-sponsored research and related services. Given the differences in accounting, and in an attempt to improve the comparability, the figures reflect a few adjustments as detailed in the notes. Table 3 is not intended to be a detailed financial accounting of expenditures but rather a simplified summary that focuses on the key elements — salaries, benefits and student awards. The important takeaways from Table 3 are the dominance of salaries and benefits — higher education is labour-intensive — and the amount of spending focused on student awards in the form of merit-based and need-based awards.

In light of the earlier overview of main objects, one could attribute most of the academic salary expenditures in the CAATs to teaching with a smaller portion attributed to service activities (e.g., serving on institutional/departmental committees). In the case of universities, the majority of academic salaries are associated with teaching **and** research with another portion attributed to service (to the institution, department, discipline and community).

Table 3: 2019/20 Operating Expenditures (\$000s)

Expenditure category	Colleges ¹		Universities ²	
	2019-20	% Dist.	2019-20	% Dist.
Academic salaries	\$1,385,217	29.5%	\$3,467,116	32.5%
Staff salaries	\$1,151,884	24.5%	\$2,798,739	26.2%
Total salaries	\$2,537,101	54.1%	\$6,265,855	58.8%
Benefits	\$546,531	11.6%	\$1,533,306	14.4%
Total salaries and benefits	\$3,083,632	65.7%	\$7,799,161	73.1%
Student awards	\$112,089	2.4%	\$1,104,606	10.4%
All other	\$1,497,518	31.9%	\$1,759,057	16.5%
Total	\$4,693,239	100.0%	\$10,662,824	100.0%

¹ Ministry of Colleges and Universities (2021). Excludes amortization expenses and ancillary services.

² Table 4, COFO-UO 2019/20. Student awards includes \$210,347 from restricted trust and \$167,470 from sponsored research.

While it may be tempting simply to use the financial information in Tables 2 and 3 and sector-level enrolment information to calculate revenue and expenditures per student, such an exercise is very misleading because of the different objects that are being funded. That reality, in turn, leads to major differences between the two sectors in terms of both the discipline mix and education levels (certificates, diploma, undergraduate degrees, professional master's degrees, research-based master's degrees and doctoral degrees). These differences in objects,

discipline mix and education levels make a simplistic sector-to-sector comparison meaningless — hence the need to drill down in each sector to compare education levels that may appear more similar (in this case, four-year baccalaureate degrees in the CAATs and undergraduate degrees in the universities). In the CAATs, baccalaureate degree enrolment represents about 9% of total full-time enrolment¹¹ while four-year degrees in universities represent about 85% of total enrolment. In both cases, drilling down to examine costs at the program level poses challenges, particularly the lack of financial information and enrolment information at the program level.

Having provided some necessary background and contextual information, the study turns to the more detailed examination of costs for college and university baccalaureate degrees as seen through the perspectives of students, government and institutions.

¹¹ In 2020/21, full-time enrolments totaled 24,000, of which approximately 10% were international students. Approximately 12% were in technology related programs, 30% in health programs (primarily collaborative nursing programs with universities), 25% in business programs and over 30% in arts programs. Over 50% of the international students are in business programs.

Student Cost

The components of student cost include the items listed earlier in Table 1 as direct cost — tuition and fees, books and equipment and living costs.¹² To aid in the comparison of direct student costs, the OSAP Aid estimator was used to provide the requisite information for a set of specific programs in both colleges and universities, including programs that were deemed to be roughly comparable in terms of subject area. It is important to note that comparing admission requirements, curriculum, learning outcomes or actual program outcomes (e.g., graduation rates, employment rates) was not a part of this analysis.

The review of student cost concludes that there is little evidence to support the contention that student cost in degree programs is more economical in the college sector. To arrive at that conclusion requires a more detailed look at tuition levels and the other components of student cost, and the interaction between those identified costs, government student assistance and institutional student assistance.

Tuition

The current mix of what are referred to as regulated, de-regulated, high-demand and cost-recoverable tuition fees is the result of decades of change to tuition policy by various governments since the late 1960s and, in particular, since the mid-to-late 1990s (Appendix B provides a brief chronological review). In terms of student costs, there are three important points to note:

- Changes in tuition policy over time have resulted in considerable investments in student assistance by the federal and provincial governments and by individual institutions. It is clear that for most students on OSAP, the net price will be considerably less than the sticker price.
- In the university sector, tuition for many direct-entry programs clusters around \$6,000 (Table 4), with the exception of business, engineering and computer science where, as a result of the government policy on differentiated tuition noted in Appendix B, there is a considerable range of tuition levels across the province. Readers should keep in mind that in those cases (and in second-entry professional programs such as law, medicine and dentistry) the institution is required to meet any 'unmet need' beyond that provided by OSAP; and
- In the case of the CAATs, tuition for degree programs ranges from about \$5,900 to \$7,000. The CAATs' tuition framework generally restricts tuition to a maximum of \$3,384 for domestic students in diploma programs with exceptions for a limited number of high-demand programs including the above-mentioned degree programs.

¹² There are at least two other costs worthy of mention: the opportunity cost of attending a postsecondary institution, and the cost associated with non-completion of postsecondary. Both of those costs could be examined in terms of personal cost and societal cost.

Table 4: Ontario University Tuition by Program Area

Program	Low	High
Arts & Science	\$5,781	\$6,128
Applied Science, Engineering	\$7,702	\$14,180
Electrical, Software Engineering	\$7,702	\$13,970
Business, Commerce	\$6,118	\$16,300
Music	\$5,800	\$6,568
Computer Science	\$5,985	\$12,870
Social Work	\$5,972	\$6,416

Note: Tuition as reported for 2019/20. Business and computer science at a few institutions are classified as second entry. In those cases, tuition is the same as arts & science in first and/or second year and then increases once the student begins the second-entry program.

Source: Common University Data Ontario (2021).

OSAP Estimates of Student Cost

The OSAP Aid Estimator provides a tool to determine tuition and estimated costs by program as well as an estimate of the non-repayable grant and repayable loan. Table 5 provides a summary of student costs as well as an estimate of the grant and loan portions of an OSAP award for a range of CAAT and university programs based on data from the OSAP estimator. The table includes a few Ontario college diploma programs and several three-year Ontario Advanced Diploma (OAD) programs for reference, but the focus is on the four-year baccalaureate degree programs. The selection of the OAD programs and the baccalaureate programs in the CAATs provides a sample from the major program areas (technology, business and arts) and a mix of institutions. The selection of programs in the universities attempts to reflect the CAATs program area selection — again, with a mix of institutions.

The first thing to note about the tuition information in Table 5 (column A) is that there is little difference between tuition in the CAAT degree programs and the university degree programs, with the exception of university business and engineering. The second thing to note is that total estimated cost (column F) is also very similar between the degree programs in the CAATs and universities. Columns X and Y illustrate the impact of OSAP on costs. Column X provides an estimate of the difference between the total OSAP award (columns G+H) and the estimated total cost (column F), including a provision for travel and living allowance. That figure is an estimate of what might be called the net out-of-pocket **total** cost associated with attending a CAAT or university in 2021/22. Column Y provides an estimate of what essentially is referred to as the Student Access Guarantee (SAG) — calculated as the difference between the Grant and Loan (columns G+H), the sum of tuition and compulsory fees, and books/supplies (columns C+D). The SAG is the financial responsibility of the institutions.

The impact of OSAP and the SAG on net cost is significant. In the case of CAAT baccalaureate degrees, for example, the mechanical engineering degree at Conestoga is estimated to have a total cost of \$15,275. After an OSAP grant of \$7,600 and a loan of \$2,300, the net out-of-pocket total cost to the student is estimated at \$5,375. The SAG is calculated excluding the travel and living allowances cost of \$4,468, so it is the difference between tuition and compulsory fees plus books/supplies ($\$8,426 + \$2,381 = \$10,807$) and the OSAP awards ($\$7,600 + \$2,300 = \$9,900$), yielding a negative difference of \$907. Conestoga would be required to provide \$907 as a SAG award, meaning that, in the Conestoga case, the student's net out-of-pocket cost is reduced from \$5,375 to \$4,468.

Using an example from the universities, a student enrolled in Brock's business communication program is estimated to have a total cost of \$12,775. After an OSAP grant of \$7,800 and a loan of \$1,300, the total net out-of-pocket cost is estimated at \$3,675. As noted in the Conestoga example, the SAG is calculated excluding the travel and living allowances cost (in this case, \$4,213) so it is the difference between tuition and compulsory fees plus books/supplies ($\$6,780 + \$1,782 = \$8,466$) and the OSAP awards ($\$7,800 + \$1,300 = \$9,100$), yielding a positive difference of \$538. In the Brock case, there is no requirement for a SAG award because the OSAP award exceeds the cost of tuition, compulsory fees and books/supplies.

The Conestoga and Brock examples in Table 5 illustrate the impact of OSAP and the SAG on net student costs. The OSAP loan has to be paid back after graduation or after leaving the college/university, of course, but it is interest-free while the student is enrolled. More importantly, as can be seen in Table 5, there is little difference between tuition levels in the CAATs and in universities, and where university tuition is higher the SAG has essentially eliminated the difference.

Table 5: Student Costs by Program Area – selected programs*¹³

Postsecondary programs		Annual cost OSAP Aid estimator						OSAP funding **			
Institution	Program name	A Tuition	B Compulsory fees	C Total fees	D Books, supplies and other costs	E Travel and living allowances	F Est. total tuition and costs	G Grant	H Loan	X Difference between (G+H) - F	Y Difference between (G+H) - (C+D)
Ontario College Diploma (2 years)											
Seneca	Comp. Systems Tech	\$2,957	\$712	\$3,669	\$954	\$4,085	\$8,708	\$5,500	\$-	\$(3,208)	\$877
Humber	Dev. Services Worker	\$2,703	\$979	\$3,682	\$1,434	\$4,341	\$9,457	\$5,800	\$-	\$(3,657)	\$684
Humber	Practical Nurse	\$2,703	\$979	\$3,682	\$2,393	\$4,341	\$10,416	\$6,800	\$-	\$(3,616)	\$725
Ontario College Advanced Diploma (3 years)											
Algonquin	Bus. Admin. (CORE)	\$2,723	\$1,137	\$3,860	\$1,991	\$4,213	\$10,064	\$6,400	\$-	\$(3,664)	\$549
Niagara	Bus. Admin. HR	\$2,715	\$1,564	\$4,279	\$2,118	\$4,213	\$10,610	\$6,800	\$100	\$(3,710)	\$503
Durham	Public Relations	\$3,266	\$973	\$4,239	\$1,932	\$4,085	\$10,256	\$6,500	\$100	\$(3,656)	\$429
Fanshawe	Comp. Sys. Technology	\$3,393	\$1,775	\$5,168	\$1,355	\$5,234	\$11,757	\$8,000	\$100	\$(3,657)	\$1,577
Mohawk St.	Comp. Eng. Tech. - Mechatronics Behavioural Sc.	\$2,708	\$1,841	\$4,549	\$848	\$4,085	\$9,482	\$5,800	\$-	\$(3,682)	\$403
Lawrence	Tech.	\$4,353	\$1,144	\$5,497	\$1,543	\$4,341	\$11,381	\$7,500	\$100	\$(3,781)	\$560
Seneca	Animation Mech. Eng.	\$7,495	\$600	\$8,095	\$1,592	\$4,085	\$13,772	\$5,900	\$1,800	\$(6,072)	\$(1,987)
Humber	Technology	\$2,703	\$979	\$3,682	\$2,058	\$4,341	\$10,081	\$6,400	\$-	\$(3,681)	\$660
Conestoga	Graphic Design	\$2,696	\$1,069	\$3,765	\$2,736	\$4,213	\$10,714	\$6,900	\$100	\$(3,714)	\$499
Baccalaureate Degree											
Colleges											
Conestoga	Mechanical Engineer	\$6,939	\$1,487	\$8,426	\$2,381	\$4,468	\$15,275	\$7,600	\$2,300	\$(5,375)	\$(907)
George Brown	Applied Business	\$6,980	\$1,053	\$8,033	\$1,918	\$4,213	\$14,164	\$6,300	\$1,900	\$(5,964)	\$(1,751)
Humber	Criminal Justice	\$5,938	\$1,198	\$7,136	\$1,650	\$4,341	\$13,127	\$6,900	\$1,200	\$(5,027)	\$(686)
Sheridan	Music Theatre Perf.	\$6,650	\$1,216	\$7,866	\$1,528	\$4,213	\$13,607	\$7,100	\$1,700	\$(4,807)	\$(594)
Conestoga	Applied Technology	\$6,804	\$1,487	\$8,291	\$1,275	\$4,468	\$14,034	\$7,300	\$1,600	\$(5,134)	\$(666)
Humber	Applied Music Commerce - Int'l	\$5,938	\$1,198	\$7,136	\$3,000	\$4,314	\$14,450	\$8,900	\$2,200	\$(3,350)	\$964
Seneca	Acct.	\$6,500	\$712	\$7,212	\$1,998	\$4,085	\$13,295	\$7,400	\$1,800	\$(4,095)	\$(10)
St. Lawrence	Behaviour Psychology	\$6,207	\$1,144	\$7,351	\$1,368	\$4,341	\$13,060	\$6,800	\$1,000	\$(5,260)	\$(919)
Seneca	Applied Technology	\$6,500	\$712	\$7,212	\$850	\$4,085	\$12,147	\$7,000	\$1,000	\$(4,147)	\$(62)
Conestoga	Design	\$6,750	\$1,626	\$8,376	\$2,736	\$4,213	\$15,325	\$7,300	\$2,800	\$(5,225)	\$(1,012)
Sheridan	Comp. Sc. - Mobile Computing	\$6,430	\$1,216	\$7,646	\$1,857	\$4,213	\$13,716	\$7,400	\$1,800	\$(4,516)	\$(303)
Conestoga	Mech. Systems Engineering	\$6,939	\$1,487	\$8,426	\$2,381	\$4,468	\$15,275	\$7,600	\$2,300	\$(5,375)	\$(907)
Simple average		\$6,548	\$1,211	\$7,759	\$1,912	\$4,285	\$13,956	\$7,300	\$1,800	\$(4,856)	\$(571)
Universities											
Brock	Bus. Communications	\$6,089	\$691	\$6,780	\$1,782	\$4,213	\$12,775	\$7,800	\$1,300	\$(3,675)	\$538
Brock	Bus. Admin.	\$8,328	\$732	\$9,060	\$2,332	\$4,213	\$15,605	\$5,900	\$2,700	\$(7,005)	\$(2,792)
Trent	Comp. Systems	\$6,118	\$1,446	\$7,564	\$1,782	\$4,085	\$13,431	\$7,800	\$1,900	\$(3,731)	\$354
Guelph	Engineering	\$11,286	\$945	\$12,231	\$2,179	\$4,085	\$18,495	\$5,500	\$4,700	\$(8,295)	\$(4,210)
Carleton	Arts	\$6,067	\$754	\$6,821	\$1,563	\$4,341	\$12,725	\$8,000	\$1,100	\$(3,625)	\$716
Queen's	Music	\$6,083	\$1,045	\$7,128	\$2,909	\$4,341	\$14,378	\$8,600	\$2,100	\$(3,678)	\$663
Western	Mgt. & Organizational Studies	\$6,050	\$1,269	\$7,319	\$1,678	\$4,341	\$13,338	\$8,200	\$1,400	\$(3,738)	\$603
Lakehead	Engineering	\$6,267	\$822	\$7,089	\$3,000	\$4,213	\$14,302	\$8,600	\$2,300	\$(3,402)	\$811
Queen's	Arts (Honours)	\$6,083	\$1,045	\$7,128	\$1,600	\$4,341	\$13,069	\$8,100	\$1,300	\$(3,669)	\$672
York	Music	\$6,118	\$814	\$6,932	\$1,782	\$4,213	\$12,927	\$7,800	\$1,400	\$(3,727)	\$486
York	Commerce	\$8,647	\$814	\$9,461	\$2,048	\$4,213	\$15,722	\$5,700	\$2,800	\$(7,222)	\$(3,009)
OCADU	Design	\$6,052	\$1,098	\$7,150	\$3,000	\$4,213	\$14,363	\$8,800	\$2,400	\$(3,163)	\$1,050
Simple average		\$6,932	\$956	\$7,889	\$2,138	\$4,234	\$14,261	\$7,567	\$2,117	\$(4,578)	\$(343)
Simple average excluding engineering/business		\$6,109	\$986	\$7,095	\$2,012	\$4,261	\$13,368	\$8,113	\$1,600	\$(3,656)	\$605

* Selected to provide a range of programs in the CAATs.

** 2021/22 OSAP grant for single, dependent student from one-child family (parents married or common-law) with family income of \$50k; student living at home; no scholarship/award, RRSP, other assets; year 1 of program.

¹³ In a few cases, tuition is different in the Aid estimator than on an institutional website. For example, tuition for Lakehead's engineering program is actually \$7,702 not \$6,267 as reported on the OSAP estimator. In this case, the OSAP award would likely be higher and the SAG would cover the difference.

The main takeaway points from Table 5 are as follows:

- Total estimated costs are very similar in the four-year baccalaureate programs (column F).
- Tuition is very similar in college and university degree programs with the major exceptions of engineering and business administration/commerce (column A). In those cases, the SAG brings the university net cost in line with similar college programs.
- Compulsory fees tend to be somewhat higher in CAAT degree programs (column B).
- Books, supplies and other costs are similar, as are living expenses.

Institutional Student Assistance

To this point, the discussion of student cost has focused on sticker price, estimated costs from the OSAP Aid estimator and an estimate of the grants and loans that would be available for a student living at home, with dependent status, and with a family income of \$50,000. Institutional student assistance, including the aforementioned SAG, affects the net cost further. At the sector level, here is what we know about institutional financial aid policies and student financial information.

- CAATs spent about \$112 million in 2019/20 on student assistance including their SAG commitments. About \$40 million was directed to scholarships while the remainder was directed to needs-based awards (Ministry of Colleges and Universities, 2021).
- Universities spent about \$1.1 billion, including their SAG commitments, of which approximately \$400 million¹⁴ is estimated to be for undergraduate student support — needs-based and merit based.
- Both the CAATs and the universities provide employment opportunities for many students — some of it financed by government work-bursary programs and some financed by institutional revenues.

A few universities provide some public information about student assistance funding. The University of Toronto (U of T), for example, sets its student assistance policies in support of a clear commitment to access as follows: “No student offered admission to a program at the University of Toronto should be unable to enter or complete the program due to lack of financial means” (Planning and Budget Office, 2021, p. 2).

Each year, U of T provides a public report on student assistance for its board that provides an indication of the financial implications of its access commitment; a few highlights about undergraduate support follow.

- 29,565 U of T undergraduate students received OSAP in 2018/19 — 64% of full-time students.

¹⁴ As noted in the data reference section of Appendix A, financial information from five universities in Ontario indicates that spending on undergraduate student awards (needs-based and merit-based) ranges from about 35% to 55% of total spending on student awards. The estimate of \$400 million represents the low end (35%) for the sector as whole.

- Of that number, 26,754 were in direct-entry programs.
- Needs-based financial support for undergraduate students was over \$70 million.
- U of T provided a further \$29 million in merit awards for undergraduate students.
- Based on ministry data, the university’s SAG expenditures averaged \$4,573 per recipient and totaled \$63.7 million in 2017/18 — over \$25 million more than required by government regulation (Office of the Vice-Provost, Students, 2020).

The reference to SAG is important because as noted previously institutions are required to fund any “unmet need” identified through the OSAP process.¹⁵ In 2019/20, the minimum SAG commitment for the universities was about \$100 million. The CAATs’ minimum figure was about \$10 million. Both sectors spent more than the required minimum.

There is no precise way to identify the impact of institutional student assistance on student cost. It should be clear, however, that since degree program costs are very similar between the sectors, and given the levels of student assistance that, by regulation, have to be spent on needs-based awards (SAG), and given the total amount of funding that is spent each year on student assistance, the net cost to students, on average, is likely to be very similar between the sectors.

The key takeaways from this section are as follows:

- Student cost extends well beyond the tuition sticker price.
- The interaction of student costs with government and institutional student assistance policy is important when trying to evaluate the net impacts.
- The key point given the purpose of this report is that at the baccalaureate level in Ontario, for direct-entry students,¹⁶ and after considering various aspects of direct cost and student aid, **there is little evidence to support the contention that student cost is more economical in the college sector.**¹⁷

¹⁵ As a reminder, unmet need is defined as the difference between the OSAP grant + loan and the sum of tuition, compulsory fees and books/supplies

¹⁶ The cost will be different if a student pursues a degree after completion of a two-year or three-year diploma. In those cases, the degree requirements often include an additional two or three years (between four and six semesters), which essentially adds an additional year to a four-year program in the CAATs or universities. Total gross tuition for the full duration of the program could be lower but foregone income becomes a salient consideration.

¹⁷ A more detailed look at differences in institutional assessment policies and administrative fees might point to some additional differences in cost. For example, differences in how tuition and fees are assessed for full-time students versus part-time students may affect actual student cost, as would differences in refund policies. Such differences may not alter the key finding but would help illustrate the limitation of relying solely on sticker price.

Cost to Government

Cost to government is defined as operating grants and student assistance. In the case of student assistance, it is reasonably clear that, all else being equal, the cost to government should be similar whether the student is in a college baccalaureate program or a similar university baccalaureate program of the same duration. Accordingly, this section of the paper focuses on operating grants and finds that the government operating cost for four-year baccalaureate degrees is more economical in the CAATs. However, there are major caveats associated with the finding that emerge in the review of the origin, intent and operation of funding formulas that govern each sector.

Operating Grants

Previously, Table 2 indicated that government grants (a combination of core grants and special purpose grants) contribute about one-third of operating revenue in both sectors. Special purpose grants are based on a separate set of formulas and are related to specific government priorities or acknowledged differences in institutional mission. These grants represent, in total, roughly 20% of CAAT provincial grant funding and somewhat less than 10% of universities provincial grant funding (Ministry of Training, Colleges, and Universities, 2019). Core grants are intended to help support institutions' basic activities or core operations as defined by their acts. Both the CAATs and universities are in the midst of a transition to funding models where a much larger proportion of government funding is projected to be performance-based. Underpinning the starting point of the transition for each institution is an existing operating grant that is essentially based on the number of eligible students enrolled in eligible programs. International students, for example, do not form part of the eligible count of students and fully cost-recoverable programs (e.g., continuing education, executive education) are not included in the list of eligible programs. Each eligible student enrolled in an eligible program generates a provincial operating grant for the institution.

The level of the grant per student differs according to relative differences in estimates or agreed-to-understandings of program costs. For example, the government operating grant for a university engineering student is higher than a grant for a university history student. The higher level of grant per student is due to the need for laboratories and technicians, compliance with engineering accreditation program standards and the fact that salaries for engineering professors are, on average, higher than salaries for history professors. The relative difference is acknowledged in a set of program weights. In Ontario universities, the weight for a doctoral program is the same for all programs, regardless of institution, and higher than the weight for a master's program, which also varies according to whether the program is in the (broadly defined) arts or sciences. In turn, the weight for a master's program is higher than the weights for most undergraduate programs. The benchmark weight reference in the university sector is the three-year general degree program. College programs also have differences in program costs that are recognized in a set of CAAT program weights. A college, for example, receives more provincial funding for a student enrolled in a two-year registered practical nursing program compared to a student enrolled in a two-year diploma in business.

In effect, prior to the transition to the new funding model, both sectors operated with an enrolment-based funding formula that recognized differences in program cost and used special-purpose grants to deal with special government initiatives and unique institutional situations.

While the general concept of a funding formula, allocated on the basis of enrolment and reflecting differences in program costs, applies to both sectors, there are differences in the way eligible students are counted, and in the origin and intent of the program weights — all factors that influence the calculation (and comparability between the sectors) of government cost per student. In the CAATs, a diploma/degree student is considered full time and attracts full government funding to the institution if the student is enrolled in two-thirds of the required courses or more than 70% of the required credits of a normal full-time course load. There is no publicly available data that captures student enrolments counted as full time but, in fact, are between 70%–100% of a full-time course load. Part-time enrolment is counted relative to a nominal full course load, and the grant calculation is based on an institutional average program weight rather than calculated at the program level.

In contrast, university enrolment counts are based on actual course registrations relative to a normal full course load; if a student takes 70% of the normal program course load, the government grant is 70% of the nominal full-load value. In the case of part-time students, the same rule applies; the government grant reflects the courses actually taken by the student relative to the nominal full-load value. Therefore, if a student takes one course and the normal full load is five courses, the grant would be 20% of the nominal full-load value.

In terms of the program weights used in the two sectors, the origins, intents and values are quite different. The college program weights were originally developed in the early 1980s and have two components. The first component reflects the estimated difference in relative program costs based on:

- i) Estimated differences in class size due to instructional setting (e.g., classroom, laboratory, clinical, field placement, etc.).
- ii) Recognized equipment, support and technology requirements.

The second component recognizes that program duration (number of hours) has a bearing on cost.

Workload and salaries for all full-time and partial-load college faculty are negotiated centrally and apply province-wide, meaning that, in general, there is little difference in the average cost of labour to the cost equation. However, differences in implicit section size (a measure of class size that reflects the ratio of student contact hours to teaching contact hours for all modes of instruction associated with the program) is a major differentiator; the lower the implicit section size, the higher the cost per student. which translates into a higher weight.

The CAAT formula uses the estimated resource requirements for a business program as the benchmark to establish relative weights for other programs. So, for example, a technology program with a combination of classroom and laboratory requirements generates a higher weight than the benchmark business program because of the laboratory requirement, which carries with it added academic staff, technician and equipment/technology costs. The exact relative extra amount is the product of a formula that includes estimates of appropriate class size for each kind of delivery method (classroom, laboratory, clinical setting and fieldwork); an estimate of other costs (equipment, staff, infrastructure, etc.) that differs by discipline cluster expressed as a percentage; and finally, the actual hours for the completion of the program.

The key point to note is that the CAATs' funding weights are based on estimates of appropriate class sizes for specific instructional delivery methods and estimates of the fixed percentages of

other costs associated with the program relative to estimates of the same parameters for a business program as a benchmark. While not a cost study *per se*, the approach does establish a relative weight that can be traced back to a set of inputs that took instruction-related factors into account.

In the university sector, program weights and the funding formula have their own distinct story; they were not the result of extensive cost studies.¹⁸

At the time it was felt that such a cost accounting approach would have presented too many difficulties and would have taken too long a time. Accordingly an alternative and much simpler approach was used. This was to find a set of weights which replicated previous grants and total operating income for a representative sample of universities. This approach would not have been practicable had Ontario not had half a dozen or more universities operating on a viable scale, with different enrolment mixes and with what were generally accepted to be equitable allocations of operating income and grants. Using the enrolment for the three fiscal years 1964–65, 1965–66, and 1966–67, it was in fact found that a relatively simple table of categories and weights replicated previous grants quite precisely. It was these categories and weights which were then recommended for the initial operating grants formula policy and which with only minor changes have been used since 1967 (Committee on University Affairs, 1969).

The committee charged with the development of the formula funding and the program weights highlighted the limitations as a guide for determining actual program costs or allocations within a given university.

It cannot be over-emphasized that the formula is designed to produce a reasonably equitable over-all distribution of basic university income. It is not intended as a pattern for spending. The formula weights do not reflect the very important differences in costs among the various subjects within a given program or among course years. These differences are averaged out in the weighting process and not significant for the relatively simple income producing formula proposed (Committee on University Affairs, 1966).

The absence of a specific Ontario-based university cost study should not discount the importance of the recognition of the relative differences in discipline cost inherent in the program weights that were implemented. There was considerable interest in cost studies in the years leading up to Ontario's adoption of program weights, and the committee charged with the development of the formula and requisite program weights was informed by research and examples from elsewhere.¹⁹ It is clear however, fine-tuning program cost differences via the weights was secondary to the primary goal of establishing an income allocation mechanism that more or less mirrored the existing distribution of income at the time: income that included provision for both instruction and research.

¹⁸ In his history of the Council of Ontario Universities, Monahan (2004) addresses this issue succinctly: "Although referenced to a program cost analysis undertaken at the University of Toronto, the value of the BIU (basic income unit) and the formula weights were not derived from any actual cost studies" (p. 37).

¹⁹ The Royal Commission on Higher Education in New Brunswick (1962), chaired by John J. Deutsch, provided a number of important recommendations for the postsecondary sector in New Brunswick including the adoption of formula funding. Deutsch, a noted economist, and Vice-Principal at Queen's University at the time, played a major role in introducing the concept of a formula framework in Ontario. The Association of Universities and Colleges of Canada (AUCC) commissioned its own report, *Financing Higher Education in Canada* (Bladen, 1965), that argued for the introduction of a formula based on weighted enrolments.

In sum, the formulas that underpin the calculation of the government grant in each sector are enrolment-driven and attempt to acknowledge differences in program cost by using a set of program weights that are unique to each sector. While both sectors acknowledge differences in program cost by adopting the notion of “weighted enrolments,” the benchmarks are different, the methodology for counting students is different, the objects or activities intended to be funded are different, the origins and intent of the program weights used to ascribe relative differences in program cost are different, basic nomenclature is different — **Weighted Funding Unit (WFU)** in the college sector, and **Weighted Grant Unit (WGU)** in the university sector — and, finally, the \$ value of the government funding unit (WFU/WGU) differs as well and is unique to each sector: simply a numerical construct reflecting the amount of funding the government provides divided by the number of eligible government funding units (WFU/WGU) in each sector.²⁰

With the caveats duly noted, one can turn to the specific weights assigned to the various programs in the CAATs and program areas in the universities and the associated level of government grant. Table 6 indicates that government core support per student is generally lower in the college sector, with the exception of music theatre performance. The general result should not be surprising given the CAATs’ sole emphasis on instructional costs. Some part of the added cost in the universities²¹ could be seen as acknowledging the government contribution to the cost of non-sponsored research. The imprecision of the college counting system means the annual grant per full-time student in the CAATs is actually understated. In the absence of CAAT full-load equivalent data, however, it is not possible to assign a specific enrolment factor to normalize the CAAT data. An analysis of the university sector indicated a difference of about 8%–9% between using a full-time student count to full-time course load count, meaning the university annual grants in Table 6 could be adjusted downwards to compensate for the difference in the counting methods. In some cases, that level of adjustment would make the operating grants very similar. Notwithstanding the preceding caveats, however, the existing data suggests government’s contribution to program operating costs²² for four-year baccalaureate degrees is more economical in the CAATs.

²⁰ Over the years, a variety of methods have been used to calculate the number of weighted funding units to be included in the denominator in each sector. In-year, slip-year, multi-year averaging, moving averages, the establishment of funding unit corridors and corridor mid-points are examples of the various methods that, in turn, have contributed to the funding lexicon in both sectors.

²¹ As noted earlier, estimates in the early 1990s suggested research accounted for 36% of total costs at the system level. The same study estimated 43% of what was considered core government operating support (Block Grant Funding) was used to fund research-related costs in core operations — primarily a portion of faculty salaries/benefits and a portion of library and academic computing expenditures (Task Force on Resource Allocation, 1994, Figure 2, p.8).

²² Excludes consideration of special-purpose grants, which should be the subject of analysis to determine whether there are sector differences in per student cost.

Table 6: CAATs and Universities Core Provincial Operating Support

CAATs Provincial Operating Grant Support

Degree program	Funding weight	Funding unit	Degree factor	Program 4-yr. total	Annual WFU	WFU value	Annual grant
Mechanical Engineering	1.3	5.0	1.025	6.663	1.67	\$4,277	\$7,125
Applied Business	1.4	2.8	1.025	4.018	1.00	\$4,277	\$4,297
Criminal Justice	1.1	2.7	1.025	3.044	0.76	\$4,277	\$3,255
Music Theatre Perf.	2.2	6.1	1.025	13.756	3.44	\$4,277	\$14,710
Applied Technology	1.2	4.2	1.025	5.166	1.29	\$4,277	\$5,524
Applied Music	2.1	3.3	1.025	7.103	1.78	\$4,277	\$7,596
Commerce - Int'l Acct.	1.0	3.8	1.025	3.895	0.97	\$4,277	\$4,165
Behaviour Psychology	1.3	2.9	1.025	3.864	0.97	\$4,277	\$4,132
Electrical Engineering	1.4	4.8	1.025	6.888	1.72	\$4,277	\$7,366
Interior Design	1.2	4.0	1.025	4.920	1.23	\$4,277	\$5,261

University Provincial Operating Grant Support

Degree program	Program weight	WGU value	Annual grant
Engineering	2.7	\$3,024	\$8,165
Business	1.9	\$3,024	\$5,746
Social Sciences	1.7	\$3,024	\$5,065
Music	2.8	\$3,024	\$8,467
Computing Sc.	2.4	\$3,024	\$7,107
Music	2.8	\$3,024	\$8,467
Commerce	1.9	\$3,024	\$5,746
Psychology	1.7	\$3,024	\$5,141
Engineering	2.7	\$3,024	\$8,165
Fine Arts	1.9	\$3,024	\$5,746

Institutional Costs

In the absence of course-level and year-level enrolment data by program and absence of expenditure data and/or staffing data at those levels as well, it is not possible to calculate an absolute comparison of instructional delivery costs between the CAAT baccalaureate programs and the university baccalaureate programs. However, a review of key factors influencing program costs suggests the program delivery cost per student for many baccalaureate programs in the CAATs and the universities would, in fact, on average, be more similar than different. But the models are quite different and caveats abound regarding the comparability of the data. We begin the review of institutional costs with a visit to Bowen's Law and a reminder of the basic drivers of postsecondary education finance and resulting impacts on resource allocation.

Bowen's Law suggests that costs, at the institutional level, are simply a function of revenue.

1. The dominant goals of the institutions are educational excellence, prestige and influence.
2. In quest of excellence, prestige and influence, there is virtually no limit to the amount of money an institution could spend for seemingly fruitful educational needs.
3. Each institution raises all the money it can.
4. Each institution spends all it raises.
5. The cumulative effect of the preceding four laws is toward ever-increasing expenditure (Bowen, 1980).

At the institutional level, Ontario's CAATs and universities fit the Bowen axiom; they generate as much revenue as possible and spend it in support of their objects. In doing so, they adopt financial strategies, with operational implications, that recognize the realities and constraints associated with government-regulated tuition and government-determined operating grants. That means, on the income side, they tend to seek out non-regulated sources of income (e.g., international students) while attempting to maximize the revenues available from government-regulated tuition (high-demand, second-entry programs) and grants (increasing enrolment). On the expense side they manage their operations with an eye to the cross-subsidies necessitated by the mismatch between revenue and labour-intensive expenditures at the program and activity level.

In the case of the universities, greater use of part-time faculty and teaching-stream faculty has become commonplace. Larger class sizes in years one and two in many discipline areas help fund specialization (smaller class sizes, seminars and laboratories) in upper years and graduate studies, as well as the consequences of the heightened emphasis on research.

The CAATs are subject to realities of their own on the income side and have adapted accordingly by expanding international enrolment and post-diploma certificate enrolments. Measures, such as larger class sizes, have less import for a variety of reasons (open-access commitment, space constraints, workload agreements, etc.) but it is clear that the CAATs have embraced the use of part-time faculty and contracting-out to manage the cost of program delivery.

In both sectors, the significant increase in international tuition revenue appears to have helped mitigate the impact of more recent tuition constraints that apply to domestic students (10% decrease in 2019/20, followed by a freeze for 2020/21 and 2021/22) and the absence of core grant increases. The international tuition revenue stream, proportionally much larger in the CAATs, has helped subsidize the expansion of baccalaureate program offerings and applied research in the CAATs over the past several years, and it has helped universities cope with their own financial challenges. It has been affected, however, by the pandemic, and the financial impacts in both sectors are still unfolding.

The preceding high-level overview does not do justice to the many factors that influence resource allocation decisions in the universities or the CAATs, but it helps set the context for an exploration of program costs at the institutional level. The key point to note is that income **sources** are not often directly linked to income **uses**.

Challenges in Determining Program Costs

Determining institutional costs at the program level and then by year of study within a program is a challenging task. First, it should be clear by this point that revenue generated from grants and fees by a student enrolled in a given program is not necessarily a good indication of institutional cost except perhaps at the institutional level, where total revenue and total expenditures have to match, if not in a particular year, then certainly over time if the institution is to balance its budget. Second, it has likely caught the reader's notice that the major expenditure associated with delivering programs is, in fact, the faculty member whose activities span, generally, a number of programs and related activities — particularly in the universities. Establishing a cost of a particular program, then, involves allocating faculty members' time to this set of activities and then attributing the related additional costs (e.g., academic services, administration, student services, physical plant, information technology, etc.) to the program based on a set of cost factors or cost drivers such as enrolment, number of faculty, number of staff, space utilization, and so forth.

In Canada, publicly available financial data for universities is seldom available below the major functional level referred to as *instruction and non-sponsored research*. If it were available, one would quickly discover that the organizational unit used for accounting purposes is not programs but rather departments. A chemistry department, for example, may offer a number of programs at the undergraduate and graduate level (MSc, PhD), and the combined costs of those programs is accounted for within the chemistry department but not likely recorded by an individual program. That is because the key cost of the program is the faculty member, and teaching in chemistry department programs is but one activity associated with the role of a full-time teaching and research faculty member. Full-time teaching and research faculty members are likely to have responsibility for three to four courses in a given year (a mix of undergraduate and graduate courses), graduate students to supervise and possibly senior undergraduate thesis students as well. They will also have a research program that will likely involve a number of projects (some in collaboration with colleagues from other universities or research centres), housed in laboratories that may involve undergraduate and graduate research assistants, technicians, staff and post-doctoral research appointments. They are accountable and responsible for managing all aspects of their research program(s). Some of the research program will likely be funded by the department in the form of salary/benefits (e.g., the non-sponsored research), but much of it is funded from external sources such as NSERC, and/or

provincial research agencies and/or foundations and/or companies that the faculty member is responsible for securing.

They may also sit on the departmental hiring committee, be a member of the university senate and perhaps serve as editor of a chemistry journal. One could allocate the faculty member's time across the various activities and programs they are involved in, and perhaps refine the time allocation to consider the number of students in each course, perhaps differentiating according to whether the course involves undergraduate, master's or doctoral students, and whether it is a core course or an elective. And there are numerous other modifications one could make in an attempt to get to the bottom line, such as a time distribution that could be used to allocate the faculty member's compensation (salary, benefits) and then used to allocate other cost components, such as staff salaries and benefits, supplies and other costs, all in the pursuit of determining how much a specific activity like teaching in a particular program actually costs. While it is technically possible to develop the methodology and fill in the boxes and then allocate the various activities to the basic duties of teaching, research and service, it quickly becomes reasonably clear that such an exercise may not be all that useful in providing meaningful representation of the costs. Peter Leslie, in his review and report on university financing some 40 years ago, argued rather eloquently about the conceptual and methodological difficulties of trying to separate teaching from research and concluded that "the radical separation of research and instructional costs is a nonsense, and that cost estimates based on any such attempt are worthless for any purpose" (Leslie, 1980, p. 250).

The fact is that efforts to scrutinize faculty activities and assign estimates of cost for each major subset of faculty activity were not dissuaded by Leslie's opinion, and over the years, a number of exercises have been undertaken in the search to uncover the mystery of what faculty actually do and then place a cost on the activities. Part of the literature review in Appendix A provides a brief reference to the topic.

The CAATs' public financial information is also seldom available at a level that allows for the determination of cost below the level of the institution proper or by some high-level functional categorization (e.g., academic programs, student services) or expenditure categorization (e.g., academic salaries, benefits, utilities, etc.). The CAAT faculty member's situation bears some resemblance to the university faculty member's situation. They will have courses to teach — likely four each term — and that activity, by itself, is the full-time job. The faculty member may be involved in an applied research project and/or implementing a curriculum that incorporates applied research experience into the classroom. And they may be asked to be involved in program planning and curriculum development or take on the role of program coordinator for a specified period. In cases where the faculty member is engaged in activities such as applied research or as a program coordinator, the teaching load would be reduced. If the financial information was available at the program level, and if the various inputs to a program costing were available, it would be easier to develop the algorithm for CAAT programs because the vast majority of the CAAT faculty member's time is, in fact, directly related to teaching and teaching-related activities.

Examining the Available Information — Labour Costs and Class Size

The bottom line is that in both sectors the absence of data at the program level leaves one to fall back on estimates derived from major inputs — salaries, enrolments and class size. What is available is some data that may shed some light on the factors influencing institutional costs

which can then be **cautiously** applied to deriving some comparative sense of costs at the level of four-year baccalaureate degrees. Given that a major input to institutional costs is, in fact, academic staff, it is important to provide some background about the different kinds of faculty categories that are part of the reality of Ontario's universities and CAATs.

In the universities, there are three major categories of faculty appointment. Full-time tenure and tenure-stream teaching and research faculty have a full set of duties that includes three main activity areas — teaching, research and service — and carry a rank of assistant, associate or full professor. The general workload expectation across those three activity areas, expressed as a percentage, is 40%/40%/20%, with a recognition that the activities can, and do, blend together, particularly at the graduate education level. Whether each activity area enriches the other or whether teaching and research enrich each other continues to be a point of debate, but it is clear that among faculty the vast majority believe “research reinforces teaching” (Gopaul et al., 2016, p. 68).

Full-time teaching-stream faculty, a group which can include both tenure-stream and limited-term faculty with duties focused primarily on teaching, can carry a rank, as above, or another moniker such as Instructor. Part-time contract faculty, for the most part, are hired specifically to teach a course (or courses), are usually referred to as instructors, and have duties that are limited to teaching. According to a study prepared by the Council of Ontario Universities (COU, 2018, p. 6), it is a diverse group that includes:

- Professionals from business, law, health, public administration, arts and other areas of professional practice who are employed full time in their own professions and bring valuable hands-on experience to their students.
- Graduate students, recent graduates and post-doctoral fellows who are getting the experience they need for the next step of their career path, providing flexibility for universities to offer more courses to students and educating students with the most current research-based knowledge.
- Other university staff from teaching and learning centres, libraries, career services, recently retired faculty or faculty who teach at one university while also teaching part time at another, whose teaching activity and expertise provides students with greater choice in specific areas of study.

Each university is responsible for setting the terms of employment for faculty and staff and will have a number of collective agreements and/or agreements/understandings/arrangements. Full-time faculty in Ontario, on average, earned approximately \$162,000 annually in 2019/20 with a range, by rank, from \$121,000 (assistant professor) to over \$190,000 (full professor). There are differences by institution — largely a function of discipline mix (business and law faculty, for example, are paid more than faculty in fine art) but also due to differences in competitive markets. Average salaries for full-time teaching-stream faculty were approximately \$114,000, with a range by institution from \$68,000 to \$133,000. The minimum rate of pay per course for part-time academic staff appears to range from about \$6,200 to \$8,500 per course (2019/20) (Canadian Association of University Teachers, 2019).

In terms of teaching loads, full-time tenure and tenure-stream teaching and research faculty generally operate on a 2+2 model²³ and can qualify for course relief depending on the level of research-related activity, number of graduate student supervisions and other factors. In the 2018 COU report cited previously, the average course load was reported as 3.2 courses per year²⁴ which includes both undergraduate and graduate courses (COU, 2018, p. 12). The average for teaching-stream faculty was five courses per year. On average, full-time faculty taught about 170 students or about 50 students per course (COU, 2018, p. 11).²⁵ Faculty in the tenure- and tenure-stream categories teach at both the undergraduate and graduate levels and have responsibility for supervising graduate students. Faculty in the teaching-stream category teach predominantly at the undergraduate level but may, subject to considerations regarding rank, educational qualifications and discipline, teach at the graduate level. The number of courses per full-time faculty member will differ by discipline with faculty in humanities/social sciences often carrying a higher course load compared to science-based disciplines.

Table 7 provides a summary of full-time faculty in Ontario since 2015/16. Specific points of interest are the differences in growth rates of ranked faculty and other faculty — the latter meaning essentially teaching-only faculty.

²³ The equivalent of five courses is the referenced norm at a few universities.

²⁴ Note: teaching-stream faculty may also be reported as tenure/tenure stream with rank at some universities.

²⁵ Includes undergraduate and graduate courses.

Table 7: Full-time Faculty in Ontario Universities

Rank	2015 - 2016	2016 - 2017	2017 - 2018	2018 - 2019	2019 - 2020	% Change
Full professor	5,160	5,313	5,478	5,607	5,718	11%
Associate professor	6,453	6,330	6,186	6,009	5,985	-7%
Assistant professor	2,901	2,967	3,078	3,234	3,366	16%
Sub-total (Full, Associate, Assistant)	14,514	14,610	14,742	14,850	15,069	4%
Rank or level below assistant professor	1,113	1,185	1,287	1,326	1,422	28%
Other (not elsewhere classified)	201	228	216	240	216	7%
Sub-total (Rank below asst. professor, other)	1,314	1,413	1,503	1,566	1,638	25%
Total (All full-time faculty)	15,837	16,026	16,248	16,416	16,707	5%

Statistics Canada (2021c).

There may be some teaching-only faculty in the assistant, associate and full ranks, but the publicly available data from Statistics Canada does not provide the level of detail to determine the number. Data considerations aside, it appears the number of teaching-stream faculty — described here as “Rank or level below assistant professor” and “Other” — has increased at a rapid pace (25%) compared to the combined total of the full-time assistant, associate and full professor faculty categories (4%).

Table 8 provides the salary data cited previously and indicates a difference of about 40% between the average salary of faculty classified as Rank or level below assistant professor versus the average salary for the combined total of Assistant, Associate and Full professors — those generally regarded as full-time teaching and research faculty. When combined with the preceding information about teaching-stream course loads, it is evident the average cost of course delivery is considerably less than if an institution relied solely on full-time teaching and research faculty to deliver all of the courses. As noted in the reference to the rates of pay for part-time faculty, it is clear that part-time faculty generally provide a lower cost per course than full-time faculty.

Table 8: Average Salary of Full-time Full, Associate and Assistant Professors Compared to Rank below Assistant Professor Faculty (2019/20)

Rank	Number	Average salary
Full professor	5,070	\$192,831
Associate professor	5,487	\$156,302
Assistant professor	2,997	\$121,356
Sub-total (Full, Associate, Assistant)	13,554	\$162,239
Ranks below assistant professor	1,521	\$114,556
\$ Difference		\$47,683
% Difference		42%

Author's calculations based on Statistics Canada (2021b). Note that Statistics Canada reporting conventions affect the reported number relative to Table 7.

What the data in Tables 7 and 8 indicates is that Cameron's "inseparable combination" of teaching and reflective enquiry quoted earlier (p. 16) has, in fact, become a bit more separable as the impacts of mass education, greater investment in research generally, and sponsored research specifically, have become more telling. Since Cameron's work in the 1990s, full-time enrolment in Canadian universities has increased markedly nationally (by approximately 85%) and more than doubled in Ontario (Statistics Canada, 2020a). Sponsored research, in financial terms, has increased from \$2.3 billion to \$6.3 billion nationally and from \$1 billion to \$2.1 billion in Ontario (Statistics Canada, 2021d).²⁶ Funding challenges (Snowdon, 2015) have meant that the number of full-time faculty has not kept pace with either; increasing by approximately 40% nationally since 2000/01 and just over 30% in Ontario (Statistics Canada, 2021a).²⁷ The result has led to inevitable trade-offs. And those trade-offs (e.g., the greater use of part-time faculty and teaching-only faculty²⁸) have cost implications that are germane to the present topic. Two of the trends in the university sector over the past 30 years or so are the increased use of full-time teaching-stream faculty and the increased use of part-time faculty. We know full-time teaching-stream faculty have higher teaching loads than full-time teaching and research faculty and are paid on a different salary grid. We also know that part-time academic staff teach about 45% of all students and about 50% of the undergraduate courses (COU, 2018).

In the CAATs, the academic workforce comprises full-time and part-time academic staff. A province-wide collective agreement covers full-time faculty and "partial-load" faculty defined as those teaching more than six hours to a maximum of twelve hours per week. A full-time academic staff member classified as a professor had a salary grid effective October 1, 2020 that

²⁶ Due to major reporting changes in the latter part of the 1990s, the current series of data begins in 2000/01. The reference period is 2000/01 to 2018/19 and to the focus is the Sponsored Research Fund entities consolidated.

²⁷ Reference period is 2000/01 to 2019/20.

²⁸ See, for example, University of Toronto Governing Council (2021), "Performance will be assessed on teaching effectiveness and pedagogical/professional development related to teaching duties" (p. 20).

ranged from \$66,555 to \$115,378 (College Employer Council & Ontario Public Service Employees Union, 2017). Partial-load academic staff are paid on an hourly basis with rates ranging from approximately \$85 to \$145 per hour or roughly \$4,000 to \$6,000 per course. A much smaller group (<1%) called Instructors have a more limited set of teaching duties, work under the direction of a professor and have a salary grid that ranges from \$43,783 to \$74,334 (College Employer Council & Ontario Public Service Employees Union, 2017). Compensation for individuals teaching six hours per week or fewer and one-year replacement appointments (sessional) are set at the institutional level.

There are approximately 7,800 full-time academic staff and 16,500 part-time academic staff in the CAATs (Colleges Ontario, 2021). In the case of full-time academic staff, the collective agreement sets a maximum number of hours that constitutes a normal workload and sets parameters that act as a cap on class size and course load. Workload information for full-time academic staff for all postsecondary programs combined (certificates, diplomas, degrees, etc.) in 2017-18 is available based on an analysis of SWF reports (Collective Bargaining Information Services, 2019) and summarizes as follows:

- Average assigned teaching contact hours for postsecondary programs was 12.6 per week in the fall term, 12.7 per week in the winter term (Table 8.3) with a range of 10.5 to 18.0 in the fall term and 11.0 to 18.0 in the winter term. The average in the institutes of technology and advanced learning (ITALs: Conestoga, George Brown, Humber, Seneca and Sheridan) ranged from 11.3 to 13.1 in the fall term to 11.4 to 13.0 in the winter term.
- The average teaching load is four courses per term with a range, by institution, from 3.2 to 4.6 in the fall and 3.1 to 4.6 in the winter term (Table 18 and Table 8.3). The ITALs range is from 3.2 to 3.9 in the fall term and 3.1 to 4.1 in the winter term.
- Approximately 25%–30% of full-time academic staff are coordinators with a reduced teaching load (Tables 3.1, 3.2). Of the ITALs, Conestoga, George Brown and Humber are in the range while Seneca and Sheridan are closer to 20%.
- Average class size overall was 29.4 students in the fall term with a range by institution from 11.2 to 45.0. Average class size was 27.7 in the winter term with a range from 9.1 to 43.4 (Table 16). Average class size in the ITALs ranged from 25.5 to 37.0 in the fall term and 25.4 to 36.0 in the winter term. Workload information for part-time academic staff in the CAATs is not publicly available, nor is enrolment information that would allow for an estimate of the proportion of baccalaureate students taught by part-time academic staff.

The preceding summary of what we know about university and college faculty is, similar to the preceding section on government cost, a difficult comparison to make for a variety of reasons including, in this case, the acknowledged differences in the job of a full-time teaching and research faculty member in a university and a full-time member of the academic staff in a CAAT. Nevertheless, academic staff costs are a major component in determining instructional cost. The summary data indicates full-time university teaching and research faculty are paid more than college full-time faculty. If one focuses solely on the teaching and service components, however, the average salary allocated to those functions would be in the order of 60% of the total — meaning it falls into the range of the college professor salary, particularly those who

would be eligible to teach in the baccalaureate programs.²⁹ Ranks below assistant have average salaries that are similar to that of college academic staff who, similarly, would be involved in baccalaureate programs.

Full-time academic staff in the CAATs teach more courses; roughly 2:1 compared to the full-time tenure/tenure stream teaching and research faculty in the universities and roughly 1.6:1 for full-time teaching-stream faculty in the universities. On the surface, those differences may seem difficult to rationalize financially, but universities have leveraged teaching assets by adopting an instruction model that takes advantage of economies of scale in a fashion that balances the class size/course load equation.

Costs vary by discipline (chemistry programs are more expensive than history programs) and level of program (undergraduate, versus master's, versus PhD). Within the undergraduate category, there are cost differences by year level. Some jurisdictions acknowledge the differences by categorizing program enrolments as lower level (years one and two) or upper level (years three and four) and by using expenditure studies to set different weights for lower-level enrolment versus upper-level enrolment.³⁰ In Ontario universities, the program weight construct acknowledges the difference by making a distinction between first year and subsequent years in most four-year arts and science baccalaureate programs.

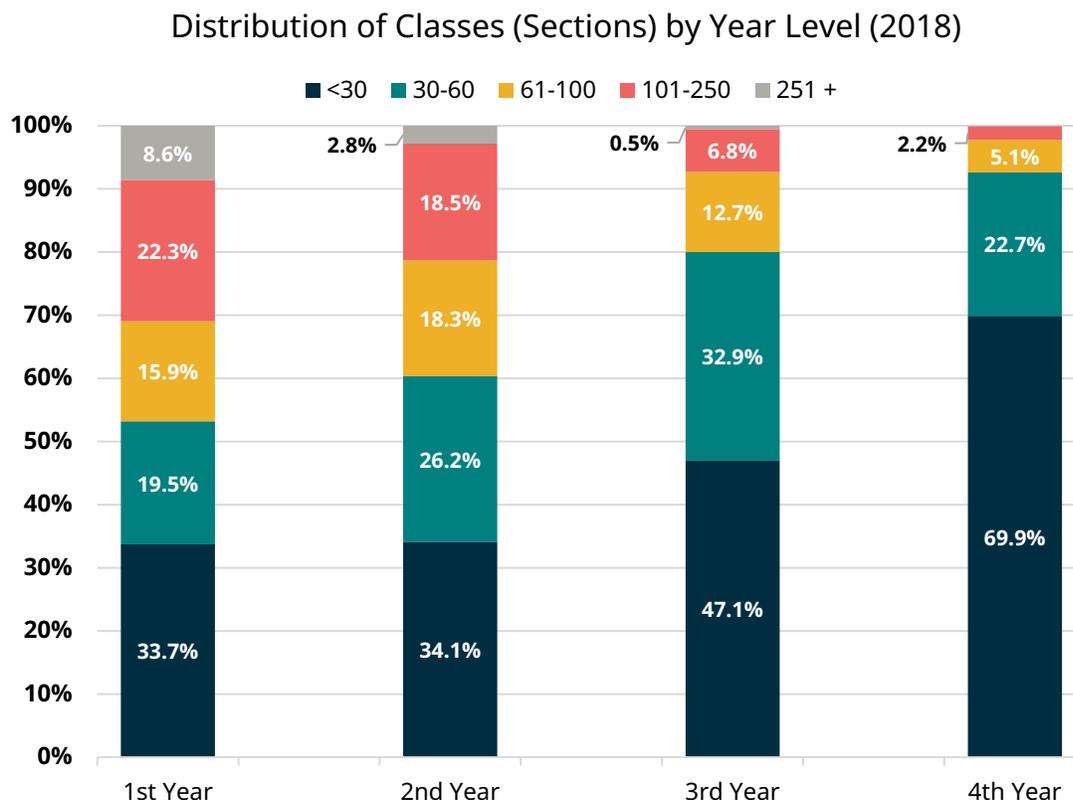
As noted earlier, the university model for baccalaureate degrees tends to focus on large class sizes in years one and two, followed by smaller class sizes in upper years. Based on data from Ontario's universities, Figure 1 indicates that, on average, about 35% of first-year classes have <30 students and a further 20% have 30–60 students; 15% of first-year classes have 61–100 students while about 20% of the classes have 101–250 students. The remaining classes (about 10%) have more than 250 students in each class. By fourth year, the numbers change dramatically. About 70% of fourth-year classes have <30 students, 20+% have 30–60 students and a further 5% of the classes in fourth year have 61–100 students. About 2% of classes have 101–250 students and very few have more than 250 students.

Readers should keep in mind that the preceding figures represent averages for undergraduate programs across all universities and programs within the universities. Class sizes will vary by discipline area with, for example, fine art and music tending to have smaller class sizes, on average, while programs in the humanities and social sciences tend to have larger class sizes, on average.

²⁹ Note that university faculty generally have a vacation of one month while CAAT academic staff have two months. Actual calculation $\$162,000 \times 60\% = \$97,200$. Average salary less research ($\$162,000 - \$64,800$) = $\$97,200$.

³⁰ See Appendix A.

Figure 1: % Distribution of Classes/Sections by Size and Year Level – 2018



Source: Common University Data Ontario (2021). Undergraduate Class Size by Year Level. Common University Data Ontario provides the class size information for each size category by year level by individual university. The number of courses/sections in each size and year category were summed for all universities. Percentages were then calculated based on the total number of courses/sections in each size category for a given year level.

Class size is a key cost driver. Each class requires an instructor, administrative/technical support and space. The course/class requirements, along with the number of students, also affects other direct academic services, such as the library and information technology. Institutions can, and do, employ full-time and part-time faculty and utilize teaching assistants to address the instructional requirements (classroom teaching, tutorials, marking and student evaluation), and therefore input costs will vary somewhat by class/section depending on how a department decides to manage its instructional demand/requirement. In general, however, the most important factor in the cost equation per student is simply the number of students per class; the larger the class size, the lower the average cost per student.

So, what we know about institutional costs is that:

- In the universities, on average, the cost of undergraduate instruction will vary by discipline and by year, with first and second year generally more economical than third and fourth year.
- The average CAAT class size taught by a full-time academic staff member is smaller than the average university undergraduate class size though data is not available at the program level to determine average class size in CAAT degree programs.

- On average, full-time CAAT faculty teach more courses compared to full-time university faculty.
- Full-time teaching and research faculty in universities have other responsibilities, including supervising graduate students, conducting research and directing/managing research programs.
- Salaries for full-time teaching and research faculty in the universities are higher than in the CAATs. If the portion for research is removed, the teaching/service portion is similar to CAAT salary levels.
- Teaching-stream faculty in the universities are paid on a scale that is similar to the upper end of the CAAT salary grid.
- Part-time academic staff in the CAATs are paid on a scale that appears to be lower than the norm for part-time academic staff in the universities.
- Part-time academic staff in the universities, on average, teach larger classes compared to part-time academic staff in the CAATs.

As noted at the outset of this section, in the absence of course-level and year-level enrolment data by program and absence of expenditure data and/or staffing data at those levels as well, it is not possible to calculate an absolute comparison of instructional delivery costs between the CAAT baccalaureate programs and the university baccalaureate programs. However, the preceding review of key factors influencing program costs suggests the program delivery cost per student, on average, for many baccalaureate programs in the CAATs and the universities would, in fact, be more similar than different.

Institutional Student Assistance — Considerations

Universities spend more on student assistance than the CAATs in absolute terms (as noted earlier in Table 3). At the undergraduate level, needs-based funding is the result of the interaction between institutional access and student aid policies on the one hand, and government funded and/or regulated policy on the other. The net effect, largely but not wholly due to the SAG, means that some university programs, such as second-entry professional programs, some business programs and some engineering programs require additional institutional student assistance funding. Changes in SAG policies for 2021/22 may alter the specific situation at some universities but, in general, the additional student assistance cost is part of the university cost for that subset of programs. How that cost is actually funded differs between the sectors because major portions of student assistance expenditure in the universities are funded from restricted funds as well as other operating revenues (refer to the note in Table 2). As noted in the Student Cost section, some student assistance costs are required by government policy (e.g., the SAG). Other student assistance costs are incurred because generous donors have provided endowed, in-year scholarship and needs-based support. Given the lack of data at the program level, it is not possible to determine the net financial impact of institutional student assistance on institutional cost; this is yet another topic for further research.

Three-year Degrees

At the outset of this paper, reference was made to college advocacy regarding the offering of three-year degrees in the CAATs. The issue is not new in that Colleges Ontario raised the possibility in 2012 and it resurfaced in a more recent publication sponsored by Colleges Ontario, cited earlier in this paper. HEQCO's 2013 paper on the diversity of the colleges outlined some of the issues that need to be addressed as Ontario grapples with future degree development in the CAATs. Many of the unknowns at that time are still unknown, but it is reasonably clear there would be cost implications.

Based on what we know about changes in CAATs with respect to four-year baccalaureate degrees, there would be added costs associated with increasing academic staff qualifications (i.e., more PhD faculty) to either introduce new three-year degree programs and/or convert some or all existing OAD programs. Additional PhD faculty would increase the capacity and internal demand for applied research, and it was noted earlier that the current arrangements for applied research actually result in added costs for the institution. There would be changes in the breadth course offerings that would likely result in additional costs (e.g., more faculty, additional investment in libraries, curriculum development, etc.). Admission standards would necessarily change, raising questions about access and likely affecting enrolment levels, which in turn have cost and income implications. If the new and/or revamped CAAT programs were deemed additional cost-recovery/high-demand programs, like the four-year baccalaureates, tuition would increase. The net impact of increases in tuition would be additional OSAP cost (government cost) and/or institutional SAG cost as an offset for all OSAP recipients (institutional cost). If tuition is not allowed to increase, then the CAATs would require other sources of funding to cover the added costs associated with the expanded degree offerings — most likely in the form of additional government support.

In terms of government operating support, the current funding for three-year degrees in the universities is lower than the CAATs' current funding for the OADs. The lower program weight and associated level of government grant in the universities is due to the recognition that the three-year degree has less specialization than the four-year degree.³¹ As pointed out earlier, the actual weights were not based on a cost study, but the original framers of the funding mechanism were aware of cost studies from elsewhere and many had experience on their own campuses.

To provide an illustration of the differing level of government grant support by sector, Table 9 compares the government operating funding for a set of OAD programs and three-year university programs in the arts and sciences. In some disciplines, where accreditation requirements set the benchmark for degree standards (e.g., engineering), three-year degrees are not available, and so the comparison with some OAD programs is not applicable. Table 9 indicates that in every case the level of government support is higher in the CAATs, and in some cases substantially higher. In keeping with the treatment of the four-year baccalaureate programs, the CAATs would likely expect to receive an additional 2.5% for a degree designation. Further, as noted previously, if regulated tuition increases are not allowed to help cover the additional costs of degree granting, it is likely the CAATs would request further government support. Alternatively, the CAATs would have to look internally for subsidies,

³¹ In some programs — primarily in the arts and sciences — the path to a three-year degree can be fluid for some students. Data limitations preclude further analysis.

perhaps through economies elsewhere, or by increasing international tuition or expanding other net-revenue generating programs. Finally, as was pointed out with the four-year degree comparison, the CAATs' student count methodology overstates the number of full-time students taking a full course load relative to the universities. Consequently, the grant per full-time student in the CAATs is actually higher than the number noted in Table 9 which, in turn, simply adds to the government cost in the CAATs.

Table 9: Illustration of Government Operating Support for CAAT Advanced Diplomas Compared to University Three-year General Degrees

College Advanced Diploma

Advanced Diploma	Funding weight	Funding unit	Degree factor	Program 3-yr. total	Annual WFU	WFU value	Annual grant
Bus. Admin. Acc'ting	1.0	2.9	1.00	2.900	0.97	\$4,277	\$4,135
Bus. Admin. HR	1.0	2.9	1.00	2.900	0.97	\$4,277	\$4,135
Public Relations	1.1	2.9	1.00	3.190	1.06	\$4,277	\$4,548
Comp. Sys. Technology	1.2	3.1	1.00	3.720	1.24	\$4,277	\$5,304
Comp. Eng. Technology	1.3	3.4	1.00	4.420	1.47	\$4,277	\$6,302
Behavioural Sc. Tech.	1.3	1.9	1.00	2.470	0.82	\$4,277	\$3,522
Animation	1.5	2.8	1.00	4.200	1.40	\$4,277	\$5,988
Mech. Eng. Technology	1.3	3.4	1.00	4.420	1.47	\$4,277	\$6,302
Music	2.3	2.8	1.00	6.440	2.15	\$4,277	\$9,182
Music Theatre - Perf.	2.2	4.8	1.00	10.560	3.52	\$4,277	\$15,057
Theatre Production	1.7	3.3	1.00	5.610	1.87	\$4,277	\$7,999
General Arts Advanced	1.0	2.9	1.00	2.900	0.97	\$4,277	\$4,135

University Degree

General Arts / Science	Funding weight	WGU value	Annual grant
General Arts / Science	1.0	\$3,024	\$3,024
General Arts / Science	1.0	\$3,024	\$3,024
General Arts / Science	1.0	\$3,024	\$3,024
General Arts / Science	1.0	\$3,024	\$3,024
General Arts / Science	1.0	\$3,024	\$3,024
General Arts / Science	1.0	\$3,024	\$3,024
General Arts / Science	1.0	\$3,024	\$3,024
General Arts / Science	1.0	\$3,024	\$3,024
General Arts / Science	1.0	\$3,024	\$3,024
General Arts / Science	1.0	\$3,024	\$3,024
General Arts / Science	1.0	\$3,024	\$3,024

In terms of institutional cost, the same factors that influenced the findings about four-year baccalaureate degrees would apply to three-year degrees. All else being equal, the larger class sizes in the lower years in the universities result in a cost per student that is estimated to be similar to the cost in the college OAD programs, where class sizes, on average, are smaller and full-time academic staff focus on instruction and teach more classes. However, all else is not expected to be equal. Institutional costs would likely increase to hire more faculty with PhDs and to staff the necessary curriculum changes. More PhD-trained faculty will likely result in added pressure for more applied research — thus resulting in more pressure on institutional finances. Likely changes in admission standards would affect enrolment levels, which in turn could negatively impact income. Tuition increases would lead to additional outlays on student assistance.

The facts then, with respect to estimating the cost of extending three-year degrees to the CAATs, seem to suggest the following.

- There would be very little difference in student cost (net) because OSAP and/or the SAG would increase to offset any tuition adjustment for OSAP recipients.
- Government cost would actually increase due to the following:
 - The current operating grants are higher for OAD programs in the CAATs.
 - OSAP costs would increase in recognition of higher tuition.
 - The CAATs would expect the 2.5% premium for four-year baccalaureate degrees to apply to three-year degrees.
 - If government does not allow tuition increases, the CAATs would very likely expect a higher level of government support.
- CAAT institutional costs would increase for a variety of reasons noted previously.

Other matters worthy of consideration are the implications of such a change on the current corridor funding environment and the financial sustainability implications for some institutions, particularly regional universities and colleges. The potential longer-term impact of having more CAAT faculty with research inclinations and aspirations is an issue that has institutional cost implications and provincial funding implications. Those topics are beyond the scope of this particular paper but help to underscore the complexity of the various components that influence costs and cost comparisons in academe.

Summary and Concluding Comments

The purpose of this paper was to examine the assertion that college baccalaureate degrees are a more economical way of providing degree-level education compared to universities. For Ontario, the available information suggests the following:

- Tuition is more or less the same in both sectors at the baccalaureate level with the exception of a few university programs. In those cases, institutional student financial assistance essentially reduces the net cost to the college level.

- Government operating support for four-year programs in the CAATs is generally lower than university support. However, there are two important qualifiers: major differences in student counting methodology and major differences in the origins and intent of the program weights underpinning the government grant.
- Government support for existing CAAT three-year advanced diploma programs is higher than support for university general three-degree programs. (The caveat regarding differences in student counting methodology also applies since it understates the level of government support per student in the CAATs — meaning the gap between the CAATs and universities would be even greater than reported in Table 9.)
- In the four-year baccalaureates, average instructional program delivery cost is estimated (cautiously) to be more or less the same on a per-student basis but is the result of quite different instructional delivery models.
- Three-year baccalaureate instructional program delivery cost in the universities is estimated (cautiously) to be roughly similar, on average, to that in the existing three-year OAD programs.
- Three-year baccalaureate degrees in the CAATs would increase costs per student based on experience to date with the four-year baccalaureates.
- In the case of the institutional program delivery costs for both the four-year and three-year analyses, a major caveat concerning the lack of data at the program level means the results need to be seen for what they are — a cautious estimate based on an assessment of major cost drivers, not a detailed cost analysis.

Cost considerations are important in contemplating major changes in postsecondary education. Of course, they should not be the only considerations, nor necessarily the most important considerations. It is clear, however, that the general topic of costs in higher education has layers of complexity with a number of moving parts that, when altered, can impact costs very quickly.

Moreover, it should also be clear that trying to compare the two sectors, or specific parts of the two sectors, is extraordinarily difficult given some fundamental differences in objects and the absence of data at the program level.

This paper sheds some light on the notion that the costs of undergraduate degrees in Ontario's CAATs is more economical than in Ontario's universities. The results challenge the conventional notion. The paper highlights and demonstrates that there are a number of factors — some simple, some quite complex — that deserve consideration before arriving at a conclusion. Tuition sticker prices are actually very similar for four-year direct-entry programs in the CAATs and universities, thus challenging the conventional view that tuition is more economical in the CAATs. The interplay between tuition and student assistance challenges the conventional focus on sticker price in any case, providing a more realistic assessment of student cost that simply affirms the basic conclusion. With respect to government operating support, differences in the details regarding the objects, origins, intent and basic inputs used to allocate government grants in the two sectors should give pause to the assertion that the cost to government is more economical in the CAATs. On the surface, the operating program grant cost for four-year direct-entry programs is lower in the CAATs, but that finding masks the impact of different student counting methodologies between the sectors which, if the data was available, would improve the

veracity of the comparison. Finally, the conventional view of major differences in program delivery cost is challenged as the various pieces of the delivery models are examined — albeit at a level that begs for program-level data.

Three final notes: First, while this paper provides some insight into the factors affecting institutional cost by sector, it is absolutely imperative to reiterate that the metrics for those same factors may well be quite different by individual program and/or by institution within the sectors.

Second, there are a number of topics that deserve further attention to better understand their impact on cost comparisons. For example, the impact of special purpose grants on government operating costs is noted in the paper, but further review is necessary to determine the full import on cost comparisons at the program level. Similarly, the impact of program level differences in institutional student assistance costs deserves further review. And, as noted early on in the paper, the cost comparison would benefit from a look at other metrics such as cost per graduate.

Third, the growth in international enrolment in both sectors is both impressive and at the same time worrying. Impressive because the sheer size of the international contingent says something about the relative attractiveness of Ontario's postsecondary system though it is clear that changes in immigration policy and proactive recruiting strategies and tactics have played major roles. It is worrying because the financial reliance on international student tuition revenue increases risk for institutions — a reality that will become more evident as the CAATs and universities file 2020/21 financial statements and prepare for fall 2021 and beyond. The international enrolment trend is also worrying because, as Derek Bok, former president of Harvard, noted in his book *Universities in the Marketplace: The Commercialization of Higher Education*, "The prospect of new revenue is a powerful temptation and can easily lead decent people into unwise compromises..." (Bok, 2003, p. 185).

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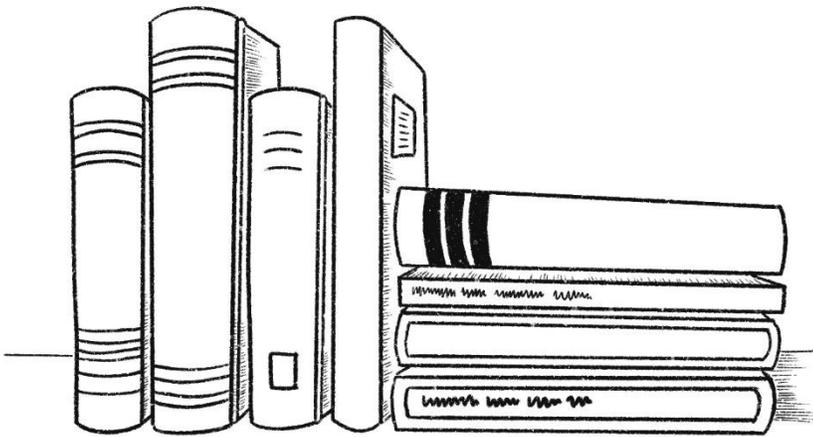
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College and University Baccalaureate Degrees: Another Look at Costs

Appendices

Appendix A: Literature Review and Data References

There are a number of papers and reports about the history and rationale for college degrees in Ontario. Professor Michael Skolnik³² has written extensively about college degrees, and his research efforts have explored various issues associated with the topic. As part of a larger review of college degree granting in Ontario led by Professor Leesa Wheelahan, Skolnik provides a historical summary and background about college degree granting that speaks directly to the underlying rationale (Wheelahan et al., 2017):

As with the nature of the non-university institutions that were allowed to offer baccalaureate programs, the rationale for the reform varied from jurisdiction to jurisdiction. However, three reasons were shared by most jurisdictions. The strongest motive was to increase accessibility to baccalaureate-level study, particularly for groups that heretofore had been under-represented in the universities. Another factor was the recognition that a higher level of formal education was increasingly required in many occupations as a consequence of technological change and advances in knowledge. Thirdly, it was thought that the goal of providing more postsecondary education for more people could be achieved in a more economical way by relying at least in part on other types of postsecondary institutions than universities (Wheelahan et al., 2017).

The rest of the report provides various insights into the impact of college degree granting on students and colleges based on qualitative and quantitative research and intended to address the following set of questions:

1. What is the location of responsibility for baccalaureates within colleges and arrangements for staffing, supporting students and providing other resources?
2. What are colleges' processes for baccalaureates' curriculum development, program approval and quality assurance?
3. What are the perceptions of policy makers, college leaders and teachers on the effects of baccalaureates on colleges' mission, identity and relations with other institutions?
4. What are students' reasons for studying a baccalaureate at a college and what is their self-identification as students? To what extent do college baccalaureates open access to students from disadvantaged backgrounds and what are college baccalaureate graduates' opportunities for postgraduate study?
5. What is the nature of the curriculum of college baccalaureates and how does this differ from the curriculum of cognate baccalaureates offered by universities? and,
6. What is the role of college baccalaureates in the labour market?

(Wheelahan et al., 2017)

An appendix to the main report also includes *A Review of Theses on College Baccalaureates* that provides useful references and is organized in support of the main research questions. The report does not address the issue of costs directly but does indicate that college degree granting is generally less expensive to students (lower tuition) and to government. A limited

³² Professors Wheelahan and Skolnik are successive holders of the William G. Davis Chair in Community College Leadership at OISE.

sense of cost pressures and cost implications is reflected in the interviews with college students, institutional leaders and faculty. The report provides an extensive set of references.

Direct comparisons of CAAT and university costs is limited. As part of its annual environmental scan, Colleges Ontario compares operating grants and regulated tuition fees with universities. However, it is difficult to make a true comparison because of differences in discipline mix (e.g., medicine, dentistry, law, education); differences in the levels of education (presence of extensive research-based and professional graduate programs in the universities); and the research mandate in the universities. The lack of available information at the program level (i.e., enrolment by year level, expenditure information) impacts the ability to probe very far into the details of college and university finances. Accordingly, reports that touch on cost comparisons between the two sectors tend to focus on two specific aspects: tuition (as a cost to students) and government grants (as a cost to government).

Academic Transformation sparked the discussion of greater differentiation in the postsecondary system based on the premise that “the present approach to the provision of baccalaureate education in Ontario is not sustainable and is need of significant modification” (Clark et al., 2009, p. 1). Written in the midst of the 2008/09 financial crisis, the authors examine some of the key factors leading to questions about the financial sustainability of Ontario’s colleges and universities. Chapter 4, “Financial Pressures and the Transformation of the Professoriate,” makes a case that universities have only been able to cope with cost pressures by increasing class sizes and increasing the use of part-time faculty. Part of Chapter 4 provides some illustration of university instruction costs, the interplay between teaching loads and class size and the use of the full-time teaching and research faculty versus part-time faculty. The authors argue that, in the universities, continued reliance on larger class sizes and increasing use of part-time faculty is not sustainable academically in the face of projected increases in enrolment (predominantly in the GTA) and an era of government constraint. Colleges, faced with many of the same financial pressures are unable to increase class sizes due to workload provisions in the province-wide collective agreement and, instead, have upped the number of part-time academic staff considerably. Again, the authors note that such an approach is not sustainable in the face of projected demand. There is no direct financial comparison between the colleges and universities in terms of the cost of baccalaureate degree production, but it is clear that universities — particularly research-intensive universities — are seen as an expensive vehicle for delivering baccalaureate education.

To bring about “transformation,” the authors provide a number of suggestions, including the establishment of a new teaching-focused university sector, the creation of an Open University and, echoing the Rae Report, the need for better college-university transfer. The authors suggest that converting existing institutions into teaching-focused universities is problematic for a variety of reasons and suggest that the new institutions required to meet the projected increase in enrolment should be teaching-only institutions that would help address the need for more baccalaureate production at less cost.

The U.S. Experience

Community college degrees have been part of the postsecondary landscape in the United States for a number of years. Community colleges in the United States are different than Ontario’s CAATs in that, one of their major objectives is to provide a vehicle for transfer opportunities to four-year state/private universities. In some states, the expansion of college

degree granting was driven by concerns about low degree attainment, in general, with a specific focus on geographic access. In other states, the emphasis has been on local labour market needs.

A number of states have undertaken reviews to determine the success of the community college degree initiatives in which costs are usually referenced. A *Policy Brief* prepared by the Education Commission of the States explores the pros and cons of community college degrees and, in terms of costs, notes that there is the potential for such degrees to be more affordable because the first two years of the program may be at a lower rate (Fulton, 2020). The policy brief acknowledges, however, that “accurately comparing tuition and fee rates for bachelor’s programs at community colleges and four-year institutions can be difficult absent cost data at the program level” (p. 5). It then goes on to note that there are higher costs, including accreditation costs, and that “[t]he colleges may have to hire faculty or perhaps raise salaries for existing faculty. In addition, the institutions may have to upgrade facilities to meet the demands and requirements of bachelor’s programs, especially in science and technology fields” (p. 5).

A state review in Florida concluded that, from a cost perspective, student costs were lower because college tuition is less than half the cost of state university tuition (Senate Committee on Higher Education, 2015, p. 8). The same review is silent on the topic of state costs. The state review of a California pilot project concluded that “the most common benefit they [students] identified was the relatively low cost of attending the pilot programs” (Petek, 2020, p. 10). The 15 California programs that were part of the pilot were industry specific (e.g., mortuary science, dental hygiene, automotive technology, respiratory care, bio-manufacturing) and offered at one or two colleges.

A report sponsored by the Lumina Foundation noted differences in the way states fund the upper years of baccalaureate degrees (Love & Palmer, 2020). In some cases, the state provides the same funding levels as it provides four-year universities; in other cases, the level of state support is the same as lower-level community college support (which may be the same or similar as lower-level university support). With respect to tuition for community college bachelor-level programs, the report noted differences in tuition policies with some states (e.g., Florida) adopting a policy of keeping the tuition very similar to existing community college tuition levels while other states have allowed tuition to be increased in upper years.

The take-away from the U.S. experience to date is that each state has its own rationale for allowing community colleges to offer bachelor’s degrees. As part of each state’s policy framework, it appears there are a number of conditions that each program proposal has to meet, including reference to resource implications. In terms of costs, the American experience varies by state depending on state policy regarding the level of community college operating support (whether it is the same as the support provided to the state universities or not), whether the state allows the colleges to increase tuition or not, and if it does, whether there are specific state student aid programs aimed at community college four-year degrees.

Program Costs — Differences in Cost by Discipline and Level

The main part of this paper makes reference to differences in program delivery costs by year level, discipline and program level. A few jurisdictions are mentioned here that have used expenditure studies to determine program weights. In more recent times, information from cost studies — or to be more specific, ‘expenditure studies’ — is used in a number of jurisdictions to

inform government decisions about postsecondary funding requirements and/or as the basis for allocating government grants. For example, the Texas Higher Education Coordinating Board collects annual expenditures by program and by institution and maintains a set of program weights to recognize differences in program costs by level (see below for details). Similarly, Ohio uses expenditure information to inform the resource allocation process (see below). In Canada, Quebec uses an expenditure study to set program weights for instructional costs, including **non**-sponsored research. Other costs, including facilities, central services and the institutional costs associated with sponsored research, are funded from separate envelopes with separate cost-related formulas of their own (Ministère de l'Enseignement supérieur, 2021). The Quebec model does not differentiate costs by year level for undergraduate programs.

Texas

Texas uses an activity-based formula to distribute roughly 50% of the available funding to institutions. Differences in program cost are acknowledged through the establishment of relative weights determined through regular expenditure studies involving the collection of detailed expenditure information. The program weights reflect differences in estimated total cost. Given that the funding mechanism uses Scheduled Contact Hours (SCH) as the activity indicator, it is important to note that the standard SCH differ by program level — that is, a full-time undergraduate student would generate 30 SCH, a full-time master's student 24 SCH and a full-time doctoral student 18 SCH. Accordingly, the difference in weights (costs) per SCH need to be discounted when converting the SCH to an FTE student — that is, there are fewer SCHs per master's or doctoral student.

The weight scheme is driven by the results of the expenditure analyses. Unique weights are calculated for each of the 20 program categories at the undergraduate level (lower level (UGL) and upper level (UGU)), at the master's (MAS) and doctoral (DOC) levels, as well as a few special program areas that have a set of unique expenditure factors. At the undergraduate lower level, the weights range from 1.00 (liberal arts) to 5.95 (pharmacy). At the upper level, the weights range from 1.82 (liberal arts) to 4.48 (pharmacy). Part of the argument in the main paper is that the lower-level courses/instruction is less costly than upper-level instruction because of class size — large class sizes in years one and two versus years three and four. The Texas data confirms the relative difference in costs via the different weights for UGL and UGU. On average, the weight increases from 1.20 to 2.19, indicating that cost per student is, on average, about 80% higher in upper years.

**THECB Texas Public University Expenditure Study Fiscal Year 2020
Institution Survey for the Year Ended August 31, 2020**

Relative Weight

Fund Code	Discipline	UGL	UGU	MAS	DOC	SP	Total
1	Liberal Arts	1.00	1.82	4.72	14.74	-	1.61
2	Science	1.38	2.75	7.67	22.30	-	2.77
3	Fine Arts	1.39	2.70	7.49	9.73	-	2.14
4	Teacher Education	1.40	1.91	2.34	8.70	-	2.52
5	Agriculture	1.64	2.33	8.51	15.18	-	2.94
6	Engineering	1.83	2.85	7.28	19.68	-	4.31
7	Home Economics	1.04	1.82	3.65	13.66	-	1.71
8	Law	-	-	-	-	5.56	5.56
9	Social Service	1.63	1.91	2.41	28.72	-	2.32
10	Library Science	2.73	1.99	3.50	16.55	-	3.44
11	Veterinary Science	-	-	-	-	22.77	22.77
12	Vocational Training	1.38	3.46	-	-	-	1.76
13	Physical Training	1.54	1.60	-	-	-	1.55
14	Health Services	0.93	1.60	2.72	11.99	3.17	1.80
15	Pharmacy	5.95	4.48	47.05	48.02	4.69	7.31
16	Business Administration	1.13	1.82	3.47	35.95	-	2.21
17	Optometry	-	-	-	-	5.76	5.76
18	Teacher Ed-Practice Teaching	1.98	2.30	-	-	-	2.30
19	Technology	1.89	2.42	4.86	36.15	-	2.42
20	Nursing	1.35	2.07	2.68	10.71	-	2.30
	Totals	1.20	2.19	4.50	17.87	6.36	2.35

VetMed calculated with estimated SCH (Headcount X 24).

The Texas expenditure study has been in existence for many years and the dataset includes a history of the relative weights. Weights change over time due to differential changes in costs per student (higher/lower labour costs, technology, etc.) and relative changes in enrolment levels.

<https://www.highered.texas.gov/institutional-resources-programs/funding-facilities/formula-funding/expenditure-study/>

Ohio

The Department of Higher Education collects detailed expenditure and enrolment data from each of the campuses (all sectors) that forms the basis of the relative weights by year level for all postsecondary institutions and is used to establish the relative state subsidy (grant). The Ohio expenditure analyses provides the basis for determining expenditures by year level

Imputed relative weights by major program area - OHIO

	Science, Tech., Eng., Math, Med.	Arts & Humanities	Business, Education and Social Sc.
Year 1	1.00	1.00	1.00
Year 2	1.34	1.42	1.10
Year 3	2.50	1.77	1.40
Year 4	3.07	2.71	1.63
Year 5	3.31	4.76	2.72
Year 6	4.55	4.74	2.85
Year 7	4.19		4.34
Year 8	7.40		
Year 9	7.64		

The imputed relative 'weights' reflect the expenditures per student using year one as the reference point in each program category. Keep in mind that the Ohio approach includes community colleges and universities hence the year one-through-year-nine categorization — essentially, first-year community college through professional graduate programs in the universities. Doctoral programs and medical programs are dealt with separately.

https://www.ohiohighered.org/sites/ohiohighered.org/files/uploads/financial/FY2018_SSIHandbookUniversity.pdf

Faculty Workload

Workloads for full-time academic staff in the CAATs are spelled out in the province-wide collective agreement and referenced in the main paper. Workloads for full-time academic staff in the universities are set at the institutional level and, for the most part, determined at the department level. The main references for workload studies are reviewed in HEQCO's 2014 report on *Teaching Loads and Research Outputs of Ontario University Faculty Members: Implications for Productivity and Differentiation*. One of the important caveats noted in that report follows:

The Canadian and U.S. studies cited above have used a variety of approaches to measure teaching and research workloads and impacts. Looking at them collectively, there is some suggestion that, despite a general expectation that faculty members will apportion their time to the 40/40/20 normalized distribution of work between teaching and research and service, there may be considerable workload variations both between institutions and between individual faculty members.

(Jonker & Hicks, 2014, p. 12)

Data References

College Enrolments

College Finance Unit, Full-Time Domestic Headcount by Area of Study - Baccalaureate Degree fall 2012/13 – 2019/20

College Funding

Ministry of Advanced Education and Skills Development, *Ontario College Funding Model, Technical Manual, May 2017, Version 1.1* (See APPENDIX 2: College Funding Formula as reference for the use of \$4,277 as the base WFU value prior to any adjustments associated with the 'new' model.)

University Funding

Ministry of Advanced Education and Skills Development, *University Funding Model, Technical Manual, May 2017 Version 1.0*. See Table 3, p.30 for reference to the base value prior to implementation of the 'new' model.

Undergraduate Student Assistance

Some institutions provide a breakdown of student assistance expenditures or budget allocations in their annual budget reports or in other stand-alone reports. The following information about need-based and merit-based undergraduate student awards has been compiled from such reports as well as the annual COFO-UO Financial Report (Table 4) for each university.

University of Toronto

Total spending on scholarships and assistance (excluding employment) was \$268.2 million in 2018/19 based on COFO-UO Financial Report, Table 4, Consolidated Report. The U of T Annual Report on Student Financial Support – 2018/19 indicated that undergraduate need-based spending was approximately 72% of the total need-based funding (\$99.162 million) or about \$71.4 million ($\$99.162 \times .72 = \71.397) (p. 7). Merit-based awards for undergraduate students is reported as \$29.2 million. Total undergraduate spending on student assistance is estimated to be about \$100 million. Undergraduate spending represents about 37% of total scholarships and student assistance spending.

Office of the Vice-Provost Students, *Above and Beyond: Ensuring Access to a U of T Education*, 2018/19 Annual Report on Student Financial Support, University of Toronto

https://governingcouncil.utoronto.ca/sites/default/files/agenda-items/2020402_GC_3i.pdf

Western

Total Spending on scholarships and student assistance (excluding employment) was \$80.471 million in 2019/20 based on COFO-UO Financial Report, Table 4. Western's 2019/20 Budget allocates approximately \$30 million in undergraduate student aid. Undergraduate spending represents approximately 35% of total scholarships and student assistance spending.

https://www.ipb.uwo.ca/documents/2019_budget.pdf

York

Total Spending on scholarships and student assistance (excluding employment) was \$98.194 million in 2019/20 based on COFO-UO Financial Report, Table 4. York's Quick Facts reports

2019/20 expenditures of \$34.845 million in undergraduate student awards. Undergraduate spending represents about 35% of total scholarships and student assistance spending.

<https://oipa.info.yorku.ca/data-hub/quick-facts/quick-facts-undergraduate-bursaries-and-scholarships/>

Queen's

Total Spending on scholarships and student assistance (excluding employment) was \$67.909 million in 2019/20 based on COFO-UO Financial Report, Table 4. Queen's 2019/20 budget reports expenditures of \$34.516 million in undergraduate student awards (p.23). Undergraduate spending represents about 50% of total scholarships and student assistance spending.

[https://www.queensu.ca/financialservices/sites/webpublish.queensu.ca/files/files/Budget%20Report%202020-21%20to%202022-23%20-%20Final%20Updated\(1\).pdf](https://www.queensu.ca/financialservices/sites/webpublish.queensu.ca/files/files/Budget%20Report%202020-21%20to%202022-23%20-%20Final%20Updated(1).pdf)

Brock

Total Spending on scholarships and student assistance (excluding employment) was \$24.680 million in 2019/20 based on COFO-UO Financial Report, Table 4. Brock's 2020/21 budget reports expenditures of \$13.5 million in undergraduate student awards. Undergraduate spending represents about 55% of total scholarships and student assistance spending.

https://brocku.ca/about/wp-content/uploads/primary-site/sites/8/2020-21-Budget-Report_SCREEN.pdf

Appendix B: Tuition and Student Assistance: A Brief Chronological Review

As noted in the main body of the paper, student costs are directly impacted by tuition and student assistance policies. This chronological review is intended to provide a brief overview of tuition policy in Ontario with a focus on both tuition and student assistance policy from the mid-to-late 1990s onwards.

Prior to the mid-1960s, individual universities set their own tuition fees based on their own circumstances and with an eye to other institutions in the province. By the late 1960s, the impact of the 'baby boom' on enrolment demand led to greater government involvement in the postsecondary sector. Existing universities were expanded, new universities were created and the CAATs were created. New financing arrangements were established and that included government regulation of tuition in the university sector. Tuition fees in the CAATs were fully regulated from their inception, and tuition levels, by program, were the same or very similar, at every institution.

In the universities, the establishment of what were referred to as "formula fees" essentially resulted in the same government grant support and similar tuition levels *by program* across the province; that is, the provincial grant and tuition was essentially the same for a student studying history at the University of Toronto as it was for a student studying history at Western or Lakehead University. In 1980, the province allowed for a bit of latitude in the tuition regime by introducing 'discretionary fees,' whereby each university could elect to charge an additional 10% above the formula fee. Most universities took full advantage of the latitude. That allowable discretion was expanded to 13% in 1987, and again, most institutions took full advantage of the additional three percentage points. Beginning in 1977, the Ontario government introduced the concept of differential fees for international students, and in 1982 set the rate at one-half of the estimated program cost³³ before increasing it to two-thirds of estimated program cost in 1983. The additional revenue was 'pooled' and allocated to all universities.

Beginning in the mid-1990s, changes in government tuition policy, along with implementation decisions at the institutional level, resulted in what we now see as considerable variation in tuition by program and by classification of students (i.e., international or domestic). The following descriptive chronology focuses on the university sector but, with minor differences, the CAATs experienced the same changes in government policy and similar implementation issues.

After an election in 1995, a new government (Hon. M. Harris) began making major changes in the PSE tuition landscape. In 1996/97, tuition for international students was "de-regulated," meaning institutions could set their own tuition levels and, importantly, retain the income. In recognition of that de-regulation the province ceased providing operating grant funding for international student enrolments. Based on the tenor of recommendations and ideas emanating from *Excellence, Accessibility, Responsibility. Report of the Advisory Panel on Future Directions for Postsecondary Education*, the government began markedly increasing the level of the allowable discretionary fee for domestic students with the proviso that institutions had to "set aside" a specified amount of the fee increase for student assistance (Ministry of Education and Training, 1996). Government also introduced the Ontario Student Opportunity Trust Fund

³³ Based on the program weights and funding unit values in the operating grants funding formula at the time.

(OSOTF) — a matching fund to build student assistance endowment.³⁴ In 1998, the government introduced the concept of Additional Cost-Recovery (ACR) for all graduate and some undergraduate programs in the universities, as well as high-demand and post-diploma programs in the CAATs. In effect, tuition levels in those specific programs could be determined by the institutions, subject to annual increase caps and limits on the number of ACR programs. The caveat, though, was institutions had to provide more student assistance in those programs and a series of measures were put in place to manage that requirement. The changes in tuition policy meant that, within a few years, tuition levels not only increased markedly, particularly in university professional programs, but differing implementation strategies and timelines at the institutional level meant that tuition levels were no longer as uniform by program. Some institutions moved quickly to take advantage of the additional tuition flexibility, revamping and expanding their student assistance policies accordingly to offset much, or all, of the tuition increase for low- to middle-income students; others moved more slowly, seeking consensus on the development of their own tuition fee and student assistance policies.

A change in government in 2003 (Hon. D. McGuinty) brought with it a tuition freeze for 2004 and 2005 — a major plank of the winning election platform. Tuition was frozen at existing levels, meaning that the variations by program/institution that had emerged in the previous period were now locked in pending a review. After the review the government introduced its own tuition policy in 2006, based on the framework recommended in the *Rae Report* (Rae, 2005), essentially re-regulating domestic tuition fees and announcing differential rate increases for first-entry programs (4.5%) versus second-entry, professional, graduate and high-demand programs (8%) — the latter effectively being the ACR programs identified in the previous regime. Other tuition regulations were added to limit the impact of increases on specific cohorts of students and to limit the overall increase in a particular institution (5%). International tuition remained de-regulated. At the same time, the government introduced major changes to OSAP, including up-front grants and a student access guarantee (SAG) that required universities and colleges to fund any unmet need as determined by the government. The Liberal government also replaced the existing OSOTF initiatives with its own Ontario Trust for Student Support (OTSS) program in 2006.

Influenced by the consequences of the 2008 financial crisis, as well as specific pressure to address concerns about the rates of increase in tuition fees, the government introduced the Ontario Tuition Grant (OTG) in the winter term of 2011/12 to reduce the “sticker price” for many Ontario students by 30%. While the OTG had an immediate impact on the net cost of pursuing a postsecondary education, tuition differentials by program among institutions continued to grow as institutions implemented the differential rates of allowable increase within the overall increase cap.

In 2013, under a new leader (Hon. K. Wynne), the government retained the basic framework but lowered the annual increases to 3% and 5% respectively with an institutional ‘cap’ of 3%. International tuition remained de-regulated. The new government was re-elected in 2014 and revamped student assistance in 2017 by providing the Ontario Student Grant (OSG), which aimed to cover tuition costs for students of families with a family income under \$50,000 (or \$30,000 for independent students) and a sliding scale above that up to \$160,000 with a

³⁴ The program was modified in 2003 (OSOTF II).

minimum OSG of 30% of tuition costs (Ministry of Finance, 2016): “All students will be the same or better off as under the Ontario Tuition Grant” (Ministry of Finance, 2016).

The election of a new government (Hon. D. Ford) in 2018 led to a 10% reduction in regulated tuition in 2019/20 and a tuition freeze for 2020/21 that has now been extended to 2021/22. At the same time, the new government announced changes to the OSAP program that effectively reduced the provincial government’s financial commitment. Additional federal investment has helped maintain the overall levels of support.

The preceding brief chronology of changes in tuition fee policy and student assistance policy is not intended to be exhaustive.³⁵ Rather, it illustrates the nature and pace of the changes in tuition policy and student assistance policy, particularly since the mid-to-late 1990s.³⁶ It provides context necessary to understand the differentials in tuition among programs and the range of tuition within the same program areas across the university sector. Moreover, it highlights some of the key student assistance policies that act to reduce differentials, particularly for students with financial need.

³⁵ For example, scholarships and bursaries were deemed non-taxable income in the mid-2000s and some tax credits were eliminated in 2017.

³⁶ Two references are of particular note regarding the history of tuition policy in Ontario: Stager (1989) and Boggs (2009).