
Introduction

Charles M. Beach, Robin W. Boadway
and R. Marvin McInnis

Background Context and Major Issues in Postsecondary Education in Canada

Higher education has been under strain for a number of years in Canada and has reached the point where the system is fraying. Years of underfunding have threatened the quality of university education and research. Large increases in student tuition levels have threatened access to a university education in Canada and dramatically increased student debt levels upon graduation. And there is a looming shortage of new faculty to sustain the system as large numbers of older faculty retire over the next ten years.

Governments in Canada and abroad are re-examining their policies towards higher education. Ontario has recently set up the Rae Review to report in January 2005 on the design and funding of Ontario's postsecondary education system, the largest in Canada. This follows the earlier oft cited Smith Report on "Excellence Accessibility Responsibility: Report of the Advisory Panel on Future Directions for Postsecondary Education" (1996). Other comprehensive reviews have been recently undertaken in Great Britain ("The Future of Higher Education" [2003] white paper on postsecondary education reform), as well as in Australia, New Zealand and the OECD. In 2004, Great Britain passed legislation to bring in major changes to student support and the funding of their university system. In the United States, cut-backs in state budgets have forced re-

examination of how public universities there are funded and their implications for access, and a full issue of the *Journal of Economic Perspectives* has been devoted to a symposium on “The Economics of Higher Education” (Winter 1999).

Several major trends or factors are driving this re-examination and are discussed in the papers of this volume. Governments and analysts are paying much greater attention to possible linkages (and the channels through which these linkages operate) between growth of colleges and universities on the one hand and innovation, productivity and economic growth on the other, so a healthy postsecondary education sector is viewed as a contributor to prosperity and economic growth in the country, both locally and to the economy at large. As the economy shifts away from traditional primary sectors and old-line heavy manufacturing, individuals increasingly see the growing need of a postsecondary education to get ahead and make use of the new job opportunities opening up in the economy, so that college and university enrolment rates among university-age cohorts have been steadily rising in Canada, the United States and other industrialized countries. Thus even for a stable population, there is a growing demand for college and university training. Between 1990–91 and 2000–01, university participation rates among Canadians aged 18–24 rose from 15.4% to 18.4%.¹ There is also a great deal of evidence — across all these countries — that the graduates of colleges and universities benefit substantially from their education through better jobs, higher earnings and less time unemployed. So in a period of severe pressures on the public purse, graduates should be expected to help shoulder the costs of their postsecondary education. Studies have also documented a growing shift of emphasis in university research towards science, technology and medical areas and of rising costs of equipment and personnel in these areas. Universities thus face rapidly rising costs of just maintaining quality of research and training. If external research funding does not fully cover these costs, then incentives arise to reallocate internal funds to support these activities which can have the effect of increasing student-faculty ratios and reducing quality of education elsewhere in the universities.

In Canada itself, additional factors are at work. Provincial government budgets are being continually squeezed by the growing costs of health care and other infrastructure and social needs while trying to maintain competitive tax rates, so the proportion of their budgets being allocated to

¹Specific figures in this section come from the *CAUT Almanac of Post-Secondary Education in Canada, 2004*.

higher education has been declining for some years. This has meant the real value of government funding per capita to universities has markedly declined and the costs of program delivery are increasingly being born by students through rapidly rising tuition fees. At the same time, provincial student support programs have become less generous, student financing options are becoming complex when linked with federal sources, and the students are increasingly turning to private sector borrowing and are graduating with dramatically higher debt loads than even a few years ago. Canadian universities face competition from United States schools for top talent and have experienced a considerable brain drain of their best scholars to the United States as they have been hobbled by on-going provincial funding cuts and a low Canadian dollar. Provincial funding rules also are geared to squeezing more students into the classrooms rather than improving the quality of the education that is delivered, and support uniformity of product rather than differentiation and specialization of universities into different areas or missions. There is also a large number of older faculty at Canadian colleges and universities who will be retiring over the next decade and the Canadian postsecondary education system is simply not producing enough replacements for them. Where the needed new faculty will be found is a very severe problem that has not at all been adequately planned for.

A number of recent studies and commentaries have highlighted various of these concerns. In the United States, concern has been raised about the growing commercialization and marketing of universities (Derek Bok, "Universities in the Marketplace: The Commercialization of Higher Education" [2003]; David Kirp, "Shakespeare, Einstein, and the Bottom Line: The Marketing of Higher Education" [2003]). In the United Kingdom, *The Economist* has repeatedly highlighted the situation of British universities ("On the Road to Ruin" [2002]; "Pay or Decay" [2004]). In Canada, a flock of recent books have drawn attention to the growing problems in Canadian universities (Paul Axelrod, "Values in Conflict. The University, the Marketplace, and the Trials of Liberal Education" [2002]; David Bercuson, Robert Bothwell and J.L. Granatstein, "Petrieved Campus: The Crisis in Canada's Universities" [1997]; David Laidler, ed. "Renovating the Ivory Tower: Canadian Universities and the Knowledge Economy" [2002] including Paul Davenport's commentary on the challenge of accessibility and quality; and Tom Pocklington and Allan Tupper, "No Place to Learn: Why Universities Aren't Working" [2002]), an entire issue of *Policy Options* (September 2003) has been devoted to papers on concerns about Canadian universities (e.g., Bernard Shapiro, "Canada's Universities: Quantitative Success, Qualitative Concerns"), and *Maclean's* news

magazine, the source of Canada's annual university rankings, has repeatedly raised the alarm about declining quality on Canadian campuses (e.g., "A Lament for Quality" [May 6, 2002] and "The Crisis in Quality" [June 10, 2002]).

The major problems facing higher education in Canada — and the motivation for the research studies appearing in this volume — can be gathered under three broad headings: underfunding, student access, and faculty shortage. First is the funding shortfall under which the postsecondary sector — and especially universities — in Canada have been operating for more than a decade now. Provincial funding transfers to universities and colleges have significantly declined in real (inflation-adjusted) per-student terms, in per capita terms, as a percent of GDP, and most markedly relative to public universities in the United States. Indeed, funding levels in Ontario have slipped from being among the highest in Canada to being at the bottom among all provinces and among the lowest across all ten provinces and fifty states in the United States. Since the early 1980s, real per-student funding transfers in Canada as a whole have fallen by about 30% while increasing by about 20% in the United States. In Ontario, for example, between 1992–93 and 2002–03, provincial (real dollar) transfers to colleges and universities per FTE student enrollment fell by 36%. As a result, classes are overcrowded, numbers of full-time faculty have declined or barely held constant, student-faculty ratios have shot up dramatically, and methods of teaching have shifted to accommodate large student numbers, so that quality of undergraduate education has noticeably declined. For example, between 1991–92 and 2000–01 university students per full-time faculty rose in Canada from 17.5 to 22.5 while the number of full-time university teachers declined from a peak of about 33 thousand to under 30 thousand by the late 1990s. Universities could not offer positions to all those students seeking entrance and, with student fees being capped, rationing of positions has been done on the basis of entrance grades, so that entering grade point averages have risen to historic levels, particularly at the most selective institutions. Growing Canada-US faculty salary gaps and reduced resources and opportunities in Canada have resulted in many of the best faculty being attracted to positions in the United States — especially in the mid 1990s and especially in the most internationally marketable disciplines such as computer science and economics. When scholars left the country, moved out of academics or retired, their positions were often closed down in the name of salary savings. Many of the faculty leaving or retiring were experienced researchers and supervisors. There are distinct signs of slippage in the quantity and quality of research produced again in the most marketable disciplines. As the economy prospered and offered lots

of jobs to university graduates, fewer students carried on for doctoral training with an eye for academic work. In order to be sustainable without continuing severe declines in quality, clearly greater resources need to be directed to the operations of the postsecondary education sector in Canada.

The funding environment also came with non-neutral incentives. Universities faced tuition caps and uniform funding rules which inhibited differentiation of focus and specialization of programs, so institutions could not readily compete on the basis of price and product delivery and concentrate on which they could do best. Recent federal research funding has largely been concentrated in the science/technology/medical areas and not in the humanities and social sciences where most students are located. Federal programs such as the Canada Foundation for Innovation or provincial programs such as Ontario's Super-Build and its Research and Development Challenge Fund require universities to find funding partners or matching grants such as from the private sector (so-called public-private partnerships) or including internal funds. These have the effect of privileging applied practical scientific research, diverting funds away from fundamental and long-horizon research, leveraging university activities to become more aligned with specific corporate research priorities, and shifting resources from non-science/technology/medical areas which have traditionally provided liberal education training and where most undergraduates and faculty are located. Granting council policies that do not fully cover overheads and indirect costs again require universities to short-change undergraduate training in order to ease up funds for prestige research projects. It has also long been the case that it is easier to raise funds for bricks and mortar than for people, programs and general operating expenses.

The second broad set of issues that needs to be addressed revolve around student access and affordability of a postsecondary education. On average, tuition fees have more than doubled over the past decade in Canada, with even higher increases in some provinces. Between 1991–92 and 2003–04, average undergraduate Arts tuition rose by 122% for Canada as a whole, by 138% in Ontario and by 187% in Alberta. But the job opportunities and income benefits of a higher education are so great that it is still an excellent investment in the future to graduate from a college or university. So the problem is how to allow all qualified students the opportunity to gain these benefits in spite of the greatly increased expense. The worry is that a postsecondary education may simply be unaffordable for students with the requisite ability, so the higher fees (and associated costs of books, computers, residence fees, etc.) will limit access. As well, students from low-income households may face psychological barriers to

taking on heavy debt loads in order to meet these high costs. Comparing Canada and the United States, Swail (2004) finds that, while the postsecondary participation rates are very similar between the two countries, university participation rates are considerably higher in the United States (29.4 vs 22.8% in 2000). He also finds that, while costs of attendance at universities are still considerably lower in Canada, student aid (from all sources) covers only 48% of the bill in Canada compared to 60% in the United States, so that out-of-pocket expenses to be covered by the student (and family) are 25% higher in Canada than in the United States.

This situation has both an efficiency cost to the economy if some of the most productive members cannot attain their full potential, an equity concern if access is effectively unavailable to the poor and even middle class, and an individual dimension if one of the most traditional channels of personal advancement and improvement and social inclusion falls into jeopardy. Modern advanced economies are all experiencing a rising demand for postsecondary education by a growing fraction of their university-age workforce, and now is not the time for Canada to throttle down this advance by restricting student access through unaffordable fees. This is not to say that, if postsecondary graduates are the principal beneficiary of such training, they should not make a major contribution to covering its cost. Indeed, it has been argued that making tuition fees the major source of postsecondary funding would make universities and colleges more responsive to student needs and work to provide better quality programs as they compete for student revenue.

The issue should be how to overcome credit constraints and help students to afford a postsecondary education. The current system of overlapping provincial and federal student support programs is inadequate to the current level of fees, overly complex, and in the case of Ontario's OSAP program has faced substantial funding cuts and more restrictive eligibility criteria. A number of suggestions should be examined. While again we need to be mindful of overlapping federal-provincial roles, one should work towards a simpler student funding program that would include, perhaps, a mix of grants, fellowships and publicly provided loans that would meet certain criteria. For example, initial funding for each eligible student could be in the form of a grant (with fellowships available for the most able) and additional support in the form of government loans. Repayment conditions on the loans could be made income contingent and payable by graduates. The size of the initial grant, for example, could be means-tested for family income as reported in income taxes, so students from poorer family backgrounds benefit from a degree of progressivity in the system. Just such a system has been passed into law this year in Great

Britain and extensive discussions has been undertaken on variations of such a scheme.

The relationship between colleges and universities should also be re-examined. Colleges (with their lower fees and less academic admission requirements) could serve some students as conduits into the university system where they might not go in directly. This could involve rethinking of the greater differentiation of programs, possibly wider eligibility for student support at colleges, and broader university recognition of some college programs. Income tax-based educational saving incentives (such as the current RESP) could be enhanced, again perhaps with a progressive component. Finally, Canada could do a better job of attracting international students and enhancing foreign-exchange programs so that Canadian schools and programs become better known internationally.

The third major concern is the challenge of faculty renewal over the next decade. Retirement of the large wave of faculty hires in the sixties and seventies has already begun, indeed it began early because of early-retirement buy-out packages offered by universities in the name of salary savings in the 1990s. On the other hand, rising numbers of postsecondary students are being driven by the demographics of the Baby Boom echo and on-going large immigration flows, especially in the large cities, and by rising Canadian participation rates in postsecondary education. Projected demand figures for new faculty have been estimated at 30,000 to 40,000 by 2020. But where are the new faculty to come from? While the number of undergraduates has burgeoned, the number of PhDs awarded by universities in Canada over the last decade has barely remained constant and in many disciplines has significantly declined since PhD-training is very resource-intensive. Of these numbers, a large fraction of Canadian-produced PhDs have moved to the United States where there has been much more faculty hiring due to greater resources at US universities and to a stronger and slightly earlier Baby Boom echo than in Canada. Also a substantial proportion of new PhDs in more marketable disciplines move out of academics to better job opportunities elsewhere. Thus there is a problem of retention as well as production of PhDs in the Canadian academic sector. Also as already noted, in the fields where most students and faculty are, funding incentives have been to shift resources away from them, and many graduate training capabilities in these programs have been significantly weakened. Recreating good graduate training programs does not happen over night and may take years of effort to rebuild. US schools have already started on renewal programs to hire new young faculty, so international competition for new young scholars will be a challenge to Canadian schools.

Incentives and initiatives need to be put in place as soon as possible to attract good students into PhD programs in Canada and to help retain them in academics once they graduate. For example, the number and value of doctoral fellowships could be increased and they could be made more readily available to non-Canadian citizens so as to attract more international graduate students to Canadian universities. If some form of income-contingent loan system is brought in, more generous and flexible terms could be made available to those who go on for PhDs and carry on in academic positions (Great Britain currently does this to attract young people into the teaching profession). More generous university funding grants could be directed to graduate faculties or graduate programs, so it becomes worthwhile for universities to build up their capacity to run such programs.

The papers in this volume are selected to throw light and further policy debate on these three major sets of issues.

Overview of the Contributing Papers

In setting the scene, the two contributions by Ronald Ehrenberg and David Laidler identify some key issues facing higher education in the United States and incentive concerns facing universities in Canada. Academic trends in the United States provide a background academic environment within which Canadian schools must operate and compete. Ehrenberg points out four major trends affecting higher education in the United States. Tuition and costs in the postsecondary education sector have for some while been rising at rates significantly higher than the rate of inflation. The increased costs are being driven by higher costs of technology, student services and financial aid, increasing institutional contributions to scientific research and the on-going withdrawal of state support to public schools of higher education. Second, the share of state governments' budgets going to public academic institutions has declined over time as states devote a greater share of their higher education expenditures to providing grant aid directly to students, and increasingly this aid is non-needs based. This affects who gets higher education and increasingly students from lower-income families are being financially forced to enter higher education through public two-year colleges rather than directly into universities. Third, scientific research — in areas such as genomics, advanced materials and information technology — has grown in importance in American universities with real average research and development expenditure per faculty member doubling since 1971. Over the same time, average

institutional expenditures per faculty member paid out by the universities themselves has more than tripled. So individual academic institutions are bearing a greater share of the rising costs of the scientific research activity. In order to do so, they have increased student-faculty ratios and substituted part-time and full-time non-tenure-track faculty for tenure-track faculty. Ehrenberg's work suggests that these changes result in higher undergraduate attrition rates and lower student graduation rates, not signs of increased quality of undergraduate training. Fourth, a major problem facing American higher education is where the next generation of faculty will come from to replace the wave of on-coming retirements since the total number of PhDs produced in the United States has been declining and the share of Americans among out-coming PhDs has also been declining, and quite dramatically so in key science areas. Consequently, there will be a rising demand by US institutions to hire faculty from abroad to fill their own needs.

David Laidler focusses on incentives facing Canadian universities within the current funding environment. He notes the shift in basis behind government funding of universities towards arguments around the "knowledge economy" and an economic productivity agenda. While such a linkage has yet to be convincingly demonstrated in the research literature, this shift in argument has resulted in a broad shift in funding emphasis towards science and technology fields. It has also created worrisome incentives for resource reallocations within universities as emphasis is focused on applied and results-oriented research, inter-disciplinarity and a corporatist agenda as government research and building grants require matching funds from other sources such as the business sector. Science and technology research also involves substantial overheads and maintenance budgets which result in resources being drawn away from elsewhere within universities. This sets up incentives to operate humanities and social science programs possibly at lower academic standards as "cash-cow" sources of internal subsidies to support activities that governments and other donors favour.

Laidler also considers ways to foster greater efficiency in resource allocations in universities. Allowing tuition revenue to become the main source of universities' income would allow students to seek out good quality academic programs and universities to compete more directly to offer such programs as a counterweight to current reliance on government and business sectors in setting universities' priorities. Allowing fees for different programs to better reflect actual program costs while allowing students to choose among these differently priced programs would end up allocating resources within universities efficiently without the need for

central or ministry direction. This would also foster greater differentiation and specialization across different universities with students playing a significant role in this resource allocation process. If the higher tuition fees in such an approach were addressed by some form of income-contingent loan scheme, the scheme would also need to be supplemented with student grants that vary with the students' income background so that qualified students from low-income backgrounds are not priced out of the system by unaffordably high tuition levels.

Michael Skolnik in his paper reminds us that, in the recent attention to performance and financing of post-secondary education, an earlier concern for what should be the make-up of the post-secondary sector by type of institution may have slipped out of view. This issue is now reasserting itself as governments are being pressured to alter the structure without consideration of the whole picture. Skolnik draws our attention mainly to two issues. One is accrediting the granting of degrees by private, mainly for-profit institutions. The other is the blurring of the lines between universities and community colleges. Both are being driven by demands for more technically sophisticated, market-oriented education in the post-secondary sector.

Throughout the world, and notably in Canada, there is a burgeoning demand for accreditation and technically-sound, marketable training at a level sufficiently advanced to claim degree status. Private, for-profit organizations claim to be able to provide that. Governments have come under pressure to allow them, and first steps are being taken in several Canadian provinces.

The second issue concerns the division of post-secondary education between traditional universities and community colleges. Two models of the latter have been pursued. British Columbia has opted for a model that is well-developed in the United States in which the colleges offer a cheaper and more convenient way of providing the first two years of university-level education. They accord a modest accreditation to some of their students and pass others on to the universities to complete the baccalaureate. An alternative model has been pursued by Ontario and other Canadian provinces. There the colleges were intended to offer more technically-based, career-oriented training beyond secondary school. Some of the programs have been eminently successful in doing just that. Yet, overall, college graduates appear to have lower earnings than university graduates. That has led some critics to argue that Ontario, especially, has overinvested in colleges and underinvested in universities. But the debate does not adequately take into account that universities have long had a strong career-orientation and still have a lock on preparation for the traditional, high-

paying professions — medicine, law, engineering, and accountancy. The colleges have picked up on the technical side of career preparation. The question remains, how far should the general education go of students who wish to pursue fairly specific technical careers. Many students should perhaps do two years of liberal arts at a university and then transfer to a college for technical training. That would strengthen the claim that colleges would like to make on the offering of baccalaureate degrees.

At present, the colleges turn out some well-trained, technically-oriented graduates. They also keep up their enrolments by accrediting students in trade courses that formerly were offered by high schools and by proprietary colleges. The large number of these lower-level accreditations serves to depress considerably the reported earnings of college graduates. For many students the college has been made the vehicle for a significant economic transfer as it provides publically subsidized training of a sort that formerly was done, for a price, by the private sector. The upshot is that the colleges are providing a mix of outcomes which have not yet been fully evaluated by careful economic analysis.

As Skolnik points out, the assessment of resources directed to post-secondary education calls for good estimates of rates of return to investment in both university and community college education. For economists, the natural way to look upon the allocation of resources to higher education is in an investment framework. It focuses on whether the rate of return to resources invested in college and university education compares favourably with what might be returned in other uses. A complication is that the higher education sector turns out two products — educated graduates (human capital in current parlance) and new knowledge. These are joint products and there is no unambiguous way of separating the costs of the two functions. The more developed literature concerns the rate of return on instruction. That is reviewed in the paper by Herb Emery who offers an overview and synthesis of a relatively large number of estimates of the rate of return to postsecondary education.

Emery tackles the subject first by examining the component elements of rate of return estimates. Those are the employment and income benefits to graduates, and the costs of becoming graduates. Previous studies have almost all found post-secondary education to be worthwhile in purely economic terms. Emery's concern is more with trends. Has the rate of return on higher education declined as the number of graduates has increased so greatly? His answer is no. The returns to university education may have sagged a bit after the big enrolment increases of the 1960s and early 1970s, but in recent years have risen again. A rise in the ratio of earnings of university graduates to those who had only completed high school has

enhanced the income gains from a university degree while at the same time lowered the opportunity cost of acquiring the degree. From the point of view of the individual prospective student, a university degree is a worthwhile investment, and has become even better in recent years. That is, the private rate of return to university education remains strong. The labour market has not, evidently, become overly-crowded with university graduates, as some observers have supposed.

University education is quite heavily subsidized. Tuition costs are well below the overall costs of instruction. Hence, what Emery calls the “total” returns to higher education are lower than the private returns. These “total” rates of return are still well above what could be obtained on alternative investments generally and so publically supported higher education appears still to be a worthwhile use of resources. The qualifications that one might apply to Emery’s calculations suggest that the, albeit healthy, rates of return that he reports may be lower bound estimates. There are two reasons for this. One is that there are consumption benefits to a university education. Few who have had the experience would deny that it carries with it considerable enjoyment. Those benefits are overlooked in the calculation. The second reason is that, at least in the opinion of many observers, there are intangible and probably unmeasurable benefits to society of having a highly educated population. A skeptic might want to see a more careful and thorough articulation of those supposed benefits. They do not lie just in the provision of highly educated manpower to private and public enterprises. Those benefits are very largely captured by the educated persons and are counted in the income gain. What is also involved are uncounted spill-over effects. One suspects that many of the claims made for them are overblown. Nevertheless, they are frequently claimed by commentators on higher education so we should presume that they have positive value at least. If so, the true “social rate of return” on university education would be above the levels that Emery reports as the “total rate of return”. His principal conclusion is that, however one looks at it, university education continues to be a worthwhile investment.

Much less has been done in the way of estimating rates of return to community college education. College programs are highly varied and so it is especially difficult to generalize about them. Emery makes a stab at it by using very aggregate information. He points out that in recent years public funding has shifted away from universities towards the colleges. This has been in response to a widespread perception that college programs are “more relevant”, particularly as viewed in the labour market. The rates of return reported by Emery do not support that. Universities still appear to be the superior investment. What we do not know is the extent to which the

overall rate of return to a college diploma is pulled down by the inclusion of shorter, vocational courses that used to be offered by high schools, such as secretarial training. There are other popular, but relatively low-paying programs offered by the colleges such as infant day care and hair dressing, although the shorter duration and lower costs of some of those may offset the smaller income gain. There are also some college programs that may be as remunerative as university education. What is seriously needed is a thorough study of the outcomes of narrowly specified college courses.

Universities also produce new knowledge. It is widely recognized in the economics literature that therein lies the major rationale for their subsidization. That much is well known, although it has not yet effectively permeated Canadian policy on the support of universities. The external benefits of university research accrue to the nation as a whole (or for that matter to the world as a whole). That should make the support of research a federal government responsibility. It should be pointed out that the facts of the case in Canada have not really been carefully explored. That could well be the topic for further research.

Quite apart from the broad national, or even international, benefits from university research, there has been increasing recognition that university research may have important local benefits as well. That is the topic taken up by Julian Betts and Carolyn Lee in their contribution. They identify five avenues or pathways by which universities may benefit the local economies in which they are situated: as a trainer of skilled young graduates; as an innovator through the direct generation and commercialization of knowledge (working fairly independently of the private sector); as a partner to the private sector through providing technical know-how, consulting advice or joint ventures; as a regional talent magnet that increases the general attractiveness of a region to bringing in talented and innovative personnel; and as a facilitator to foster networking among those involved in the local high tech community. The last four of these involve primarily the role of universities as producers of new knowledge. The first is that universities may contribute to the local supply of highly educated manpower. The authors review the evidence for each of these pathways and find extensive circumstantial evidence supporting the four knowledge pathways — “[i]n short, universities appear to matter importantly”. But the evidence leads them to be skeptical about the training effect. The mobility of highly educated manpower is high, and in the absence of other attractions, local universities see their graduates readily drain away to other locales. Universities’ local impact, then, is largely through their research function.

However, Betts and Lee point out that there appears to be no single or simple recipe for success. They put considerable emphasis upon the interaction between cutting-edge research and the transmission of knowledge to local workers and entrepreneurs. They draw evidence from the experience of the successful case of San Diego, California, where the University of California, San Diego is located. More broadly, in the United States, universities have attracted talent at the faculty level who have played an important role in local industrial development. This has often been by spawning new enterprises through the entrepreneurial activities of either faculty members themselves or persons with whom they have direct interaction. Just having a research university is not sufficient. Some American universities have stimulated their nearby economies much more than others. There are some great research universities that have had little local impact in the way of generating new, high-tech, economic activity. Others have done famously. Quite evidently it is not research output *per se* that matters but the interaction between research success and other factors “such as smart sources of financing that understand the needs of emerging high tech firms, managerial talent savvy in these industries, as well as the scientists and engineers who innovate in these firms. Technology commercialization is a very different beast than knowledge creation; a region needs *both* to survive. To be blunt, if anything, there is a tendency in the literature to perhaps overplay the role of universities and underplay the role of the private sector in generating innovative technology clusters”.

The postsecondary education sector relies heavily on both the federal and provincial governments for financial support. This support comes in a variety of ways and has a significant influence on the way that post-secondary education services are delivered. The next set of papers address various dimensions of the role of governments in post-secondary education. A prerequisite for any assessment is to have accurate and transparent information on the sources and adequacy of finance, a topic that is explored by Ken Snowdon for the university sector. He begins by expressing caution about the quality of data that are available on university financing. These generally lead to an under-statement of the already precarious financial position of universities. For example, costs of raising trust revenues and the requirement for a portion of fee increases to be devoted to student aid have not been included: university finances are in worse shape than they appear to be. This leads him to plea for better financial accounting of university financing, with more consistency imposed across institutions and sources of finance.

Nonetheless, some trends and stylized facts can be discerned from the data that are available. Snowdon focuses on three funds: operating funds,

trust funds and research funds. Operating funds, which in Canada are mostly provincial grants and tuition fees, have grown considerably less than research funds, and much less than trust funds. By source of funds, federal finance, which is largely devoted to research support, has increased relative to provincial government finance, which tends to support operating expenditures. A serious concern of this is that research funding carries with it additional overhead and indirect costs that encroach on operating costs. This, combined with the fact that provincial operating grants are not even keeping up with inflation, puts considerable financial pressure on the university sector. Moreover, as governments provide more and more financing to the universities, the demand for accountability increases. Snowdon argues that universities would do well to take it upon themselves to improve their financial reporting.

The role of the federal government in postsecondary education and the manner in which federal funding has been made available are chronicled in the contribution by David Cameron. Despite the fact that education is a provincial responsibility in the Canadian federation, the federal government has over the postwar period used its spending power to provide financing directly to universities and to students, and indirectly via transfers to the provinces. The national interest in postsecondary education arises from the fact that there are inter-provincial spillover benefits from postsecondary education. Students and graduates are mobile among provinces: residents of any one province may attend postsecondary institutions in any other, and graduates of institutions in one province can seek employment in any other. Moreover, research undertaken in one province creates knowledge that is available to residents in other provinces. More generally, the constitutional commitment of provincial and federal governments to equality of opportunity implies a federal interest in postsecondary education.

Federal support has evolved over the years. Originally, the federal government made direct contributions to postsecondary institutions and operated training programs. During the 1970s, direct contributions gave way to virtually unconditional grants to the provinces in support of postsecondary education, and later the federal government began to withdraw from the training field in favour of the provinces. More recently, unconditional grant support has waned, but the federal government has increasingly taken an array of more direct initiatives. These include direct support for students (e.g., the Millennium Fund), tax assistance for educational financing, enhanced student loans, the competitive funding of faculty research chairs, and increased support for research and infrastructure.

Cameron cautions that, with the federal government having set the agenda for universities in recent years and the universities having willingly accepted that, the provinces might have ceded too much responsibility. In the end, it is they who have the legislative responsibility for postsecondary education, and it is they who will ultimately bear the cost if federal funding takes another abrupt turn for the worse.

Accountability for university spending is the theme of David Leyton-Brown's paper, with the focus on quality assurance. He argues that quality assurance is a necessary feature of university governance. Not only does it serve as a check that value for money is being achieved, but it also encourages those persons, units or institutions being evaluated to discover ways of improving the work they undertake and the programs they offer. He sets out in a systematic way the role of quality insurance, the activities to whom it should apply, the authority responsible for quality assurance, and the elements of good quality assurance processes, including best practices. Above all, quality assurance will work best when those being evaluated believe in the benefits of the process and participate in it with enthusiasm rather than resentment.

Problems of financing postsecondary education are universal, and lessons might be learned from experience elsewhere. A particularly pertinent case is that of the United Kingdom, where universities have faced comparable funding problems to those in Canada. Nicholas Barr outlines the recent comprehensive reforms undertaken in the United Kingdom to improve the quality of the universities and their financial viability and to improve student access to the postsecondary system, and to do so in a way that is fair to those who do and do not attend while ensuring that financial constraints do not preclude able students from attending. His discussion reviews the lessons from the UK debate. The approach taken by the UK reforms is multi-faceted. It reduces central direction of universities by allowing them freedom to set their own fees. It commits more public resources to universities while at the same time allowing fees to rise. Most significantly, it introduces an income-contingent loan system whereby a generous amount of loan finance is made available so that students can obtain upfront funds to cover the cost of fees and living costs, with repayment based on a fixed proportion of earnings after graduation. Barr identifies a well designed student loan program as having three core characteristics: income-contingent repayments, loans that are large enough to cover all fees and student living costs, and a repayment interest rate that is broadly equal to the government's cost of borrowing. Finally, there are supplementary grant funds and fee remission available to students from low-income families to ensure their access. He sees income contingency of

the loan repayment as fundamental to the politics of implementing such a reform. People making low earnings after graduation make low or even no monthly repayments, so that repayments operate like an income tax or payroll deduction. Student loans should thus be regarded not as a lump-sum debt but as a tax on future earnings. Barr outlines carefully the rationale for such a system and compares it with alternatives. He comes down foursquare in favour of the UK reforms.

In a commentary on the session, Clément Lemelin offers some cautionary views about income contingent loan schemes such as that introduced in the United Kingdom. He wonders, for example, if the scheme is self-financing as an insurance scheme would be, and if not, who is responsible for the payment of unpaid loans, which could be sizable. He asks some pertinent questions about the details of the scheme, such as what interest rate should be charged on the loans, what income should be used as the basis for repayment, whether all students should be forced to participate, and whether the funding terms should differ by type of study. These are all details that need to be addressed explicitly when designing such a scheme.

The next four papers examine, in different ways, factors affecting access to, demand for, and participation in postsecondary education in Canada. The study by Miles Corak, Garth Lipps and John Zhao looks at the relationship between family income and participation of youth (age 18–24) in postsecondary education, and how this has changed since the 1980s. Using several Statistics Canada data sources, the authors find that overall participation rates (in higher education) reached historic highs, but their rates of growth have flattened or stalled over the 1990s, particularly for universities, while college participation rates have continued to grow. In response to rapidly rising tuition fees during the 1990s, student debt levels rose significantly, and for male students there was a tendency to choose (lower cost) community colleges rather than universities as university participation rates for men declined steadily after 1993 and college attendance went up. Their Figures 9 and 10 document participation rate changes by level of (real) family income. University participation rates increase with family income. Participation rates in the top broad family income group (\$100,000 or more) varied from year to year at around 40%, but have not changed much since the later 1980s. The lowest income group (\$25,000 or less) participation rates are much lower but have been rising fairly steadily over the entire period — from less than 10% in the early 1980s to 19% by 1997. So the gap in participation rates between top and bottom income groups has noticeably narrowed. University participation rates among the three middle income groups, however, trended up through the 1980s then stopped growing in the early 1990s and have noticeably

declined since 1993. Thus the fall off in university participation rates over the 1990s was felt most among middle-class families. The pattern for college participation is very different. College participation rates are quite similar across family income groups. And while college rates are not as closely tied to family income as university participation rates, it is again the case that the lowest income group experienced the most consistent growth over the full period. The authors also use regression analysis to find that the association between family income and university participation became stronger over the 1980s up until the early to mid 1990s. But from the mid-1990s, when borrowing limitations were eased on a number of loan programs, the strength of the relationship weakened.

The second paper on family background effects on access to postsecondary education by Ross Finnie, Eric Lascelles and Arthur Sweetman acts as a companion piece to that of Corak *et al.*, but takes a more structural approach of identifying direct and indirect channels through which family background effects can operate. Using Statistics Canada's 1991 School Leavers Survey and its 1995 Follow-Up Survey of youth aged 18–20 in 1991, the authors find that family background variables such as parental education levels, family type, ethnicity and location have important direct and indirect effects on postsecondary participation. The indirect effects of family background operate through a set of intermediate variables including high school outcomes (such as grades) and related attitudes and behaviours. They look at both university participation and all postsecondary participation and find much stronger effects on university participation. For example, “[e]ach additional year of parental education increases the likelihood of university attendance ... as much as about five percentage points. The relative university attendance rates for those whose parents have a high school diploma and those with at least some university education are 29 versus 53% in the case of men, and 37 versus 65% for women (holding other factors constant)”. Approximately 40% of these effects operate indirectly through the various intermediate variables. The major direct effects indicate a continuing role for policy measures to expand postsecondary opportunities for those from less privileged backgrounds. The sizeable indirect effects point to important inequalities being generated during high school and even before, consistent with postsecondary access being affected by social and economic factors well before issues of affordability arise at time of entrance to postsecondary education.

Richard Mueller and Duane Rokerbie look at how *Maclean's* magazine rankings of Canadian universities affect students' choices and hence enrollment demand at the universities. They develop a simple demand-supply model where tuition does not adjust to clear the market for

university admissions resulting in excess demand for university positions. As a result, rationing is based on high school grades to fill the limited number of positions relative to demand. The authors estimate their model from applications and admissions data over seven years for Ontario, and find that the *Maclean's* rankings do have a statistically significant and strong effect in determining excess demand for positions across universities and hence the height of average high school entrance grades among universities. An “improvement in the ranking increases the mean grade point average and thus improves the average quality of admitted students ... The effect is the strongest for medical/doctoral schools where a 1 position improvement in the ranking increases the mean GPA of those admitted by 0.96 percentage points for males and 0.85 percentage points for females. The effect of the ranking is reduced as we move to comprehensive schools (0.70 percentage points for males and 0.60 percentage points for females), then primarily undergraduate schools (0.33 percentage points for males and 0.29 percentage points for females) ... The *Maclean's* rankings appear to have a strong effect on where students choose to apply to (and end up)”.

The study by Nicole Fortin looks at access restrictions arising from *both* sides of the higher education market — both higher tuition fees and lower university funding levels are found to have restricted enrollment rates at Canadian universities. Underlying these policy levers are the on-going demographics of the changing size of the college-age population and the upward trending demand for greater postsecondary education by the college-age population. Fortin uses US state and Canadian provincial data over 1973–1999 in a reduced-form regression analysis to obtain estimates of the effects on university (four-year college) enrollment rates of (i) higher tuition fees and (ii) provincial/state funding levels to universities, while controlling for on-going demographic shifts. Her analysis looks both at demand-side effects for university positions by potential students for whom higher tuition levels may result in a reduction in demand for university positions, and at supply-side effects on university positions by the university system itself for which reductions in provincial funding levels (their largest revenue source) result in fewer university positions being made available than otherwise. Fortin notes that total enrollment at Canadian universities increased at an annual rate of 4.1% from 1973 to 1990, but basically stalled to no growth in the 1990s. In the United States, on the other hand, enrollment growth at four-year colleges continued to grow over the 1990s though at a lower rate than in previous decades. Like Mueller and Rockerbie, she takes the higher education system to be in disequilibrium where tuition does not adjust to clear the market, rationing of university positions is done on the basis of grades, and total enrollment

rates are determined by the short side of the market. If tuition levels are too low to clear the market because of the high demand, the short side of the market will be the supply side and provincial/state funding to universities will, in effect, determine enrollment rates.

Fortin estimates that (i) an increase of 1% in university tuition levels reduces university enrollment rates by about 0.15%, while (ii) a 1% decrease in provincial funding levels to universities (measured by provincial funding per college-age person in the population) yields a 0.25% decrease in enrollment rates. The negative funding effect to universities is almost twice as large as the negative tuition effect on students. The latter effect on students is found to be virtually the same in Canada and the United States. The negative funding effect on universities, however, is found to be about three times larger in Canada than in the United States. So a 50% increase in (real) tuition levels is estimated to reduce university enrollments by about 7%, and a 20% reduction in (real) university funding levels is estimated to reduce enrollments by about 5%. She thus finds that supply-side institutional restrictions had a major constraining effect on enrollment growth of Canadian universities in the 1990s, quite different from the experience in the United States over this period where student-faculty ratios actually declined.

Students are bearing an increasing financial burden in meeting the costs of post-secondary education, and there is no indication that this is likely to change. At the same time, there are a large number of ways that provincial and federal government policies mitigate these costs. These include direct grants and scholarships, loans at preferred rates, and a number of measures in the tax system, including tax credits, tax deductions and tax-assisted schemes to save for postsecondary education. Naturally there is concern with the effectiveness of these measures. Do all able students have adequate access to funds so that they are not deterred from higher education? Do the schemes systematically favour some groups over others? Will students be left with large levels of debt on graduation that they will find burdensome to repay? To what extent are those fortunate enough to attend postsecondary education be subsidized by those who are not? Will the current schemes be able to support the increased tuition costs that are likely to be imposed on students in the future? The next set of papers assess the current complex system of student financing, and propose some alternatives.

The careful study by Kirk Collins and Jim Davies focuses solely on the manner in which the tax system influences the incentive to undertake postsecondary education. The tax system includes some specific measures aimed at supporting the financial costs of education, including educational tax credits, Registered Educational Savings Plans (RESPs), and Canada

Educational Savings Grants (CESGs). At the same time, since a significant part of the cost of education is forgone earnings and part of the reward for education is increased earnings, the manner in which the system of personal and other taxes impinges on earnings can influence the incentive to undertake higher education. Collins and Davies devise measures that capture the cumulative effect that the tax system has on the incentive to invest. In fact, they devise two such measures. One, the effective tax rate (ETR), measures the difference between the before- and after-tax rate of private return to education, comparable to effective tax rates that have been calculated for physical investments. The ETR measures that disincentive or distortion that the tax system imposes on the private decision to invest in human capital, taking into account only the private costs of education. The second measure, the effective subsidy rate (ESR), measure the difference between the public versus private return to education, now taking account of the costs borne by the public sector. The difference between ETR and ESR measures the overall net effect of the fiscal system on the incentive to invest on higher education.

Collins and Davies find that private rates of return on education are lower than in previous studies, and are lower for males than for females, but that the ETR is higher for males. Moreover, between 1998 and 2003, ETRs decreased substantially — from about 19% to 11% for males and from 13% to 8% for females — owing both to the introduction of CESGs and the flattening of the income tax structure, which reduced the penalty from increased future earnings. At the same time, the ESR exceeds the ETR, implying that there is a net subsidy on higher education. The authors discuss at some length the sources of these effects and their consequences for student financing policy.

In a commentary on the Collins-Davies paper, John Burbidge puts the tax treatment of human capital accumulation into a broader context by noting that tax support for human capital investment is part of a larger system of incentives for asset accumulation that includes as well Registered Retirement Savings Plans and Registered Pension Plans. He argues that taking account of how these programs interact with incentives for human capital accumulation may well mitigate the incentive effects of the ETRs that Collins and Davies have measured. Moreover, he argues that RESPs may in fact serve to distort household asset accumulation decisions by contradicting the effects of tax-sheltered retirement savings systems.

Kevin Milligan studies RESPs and CESGs from the perspective not of their effect on the incentive to invest in human capital — that is, their efficiency effect — but of their effect on households of different income, wealth, and family types. Using very detailed data from the Survey of

Financial Security, he finds that the use of RESPs, and therefore CESGs, is highly concentrated in high-income households and in households in which parents are highly educated. He argues that this is in direct conflict with the intent of the program of increasing access to postsecondary education, as well as with the goals of the Canadian Opportunities Strategy, which is to direct aid to lower-income families. His results constitute a serious indictment of these programs as vehicles for improving access to higher education. He suggests, provocatively, that Canada might be better served by abandoning CESGs and diverting the funds saved to those who truly need them.

Lorne Carmichael's paper is also concerned with both accessibility and fairness. He explores an innovative approach to student financial assistance that is designed to ensure that all students who are capable of achieving a postsecondary education have the resources to do so, and that the burden of financing those resources is primarily borne by those who stand to benefit rather than society at large. The idea is disarmingly simple in concept. Students would have access to a sufficient sum of money to finance their education (or at least that part of their education that is deemed to provide private benefits to them rather than general benefits to society). This sum would be provided by the government directly to the student, who would then be responsible for making tuition payments to the institution in which they enroll. Then, on graduation, all students would pay a 'graduate tax' that would be based on their earnings. The tax rate would be such that the scheme is self-financing so the burden is borne by those who take advantage of post-secondary education. Carmichael makes a persuasive case for such a system, which bears much resemblance to an income-contingent loan system discussed earlier.

A final paper by Ross Finnie, Alex Usher and Hans Vossensteyn takes a very broad and ambitious perspective. They argue that the existing system of financial support to students is unnecessarily complicated. It includes far too many different elements that taken together do not succeed in meeting the basic objectives of ensuring accessibility to all potential and able students regardless of need. They propose a sweeping overhaul — what they refer to as a “new architecture” — in which the myriad of existing programs is replaced by one overarching one that targets funds better to those in need and ensures that all able students have sufficient funds to cover the full costs of attending a postsecondary institution. The program would first assess each student's financial need, taking account both of the costs they bear as a result of attending a postsecondary institution and the resources, including parental, that they potentially have available. This would be made available to all students by a combination of loans and

grants. They discuss the details of such a scheme, including how the federal government and the provinces could be persuaded to accept a single comprehensive scheme in place of their currently very different and fragmented ones.

The volume wraps up with the reflections of a panel of persons with substantial experience in the Canadian postsecondary scene. There was a common note of concern for the present state of affairs and for the little public concern for the deteriorating quality of the universities. Peter George, the president of McMaster University, and speaking from the viewpoint of the chair of the Council of Ontario Universities' Task Force on Quality and Financing, describes the endeavour of the Task Force to articulate the dimensions of quality. He also recounts optimistically the findings of an Ontario Task Force on Competitiveness, Productivity, and Economic Progress which has placed a strong emphasis on the value of higher education. One may hope that his optimism is born out with beneficial changes in government policy.

John Chant, a panelist with long experience at several Canadian universities, raises the matter of research quality in Canada. But as Chant points out, the overriding concern of governments, and with public discussion of the university issue, has been access, and the policies being pursued are aimed at promoting access at the expense of a continuing dilution of the university education being offered. Little attention has been devoted to the question "access to what?".

Panelist John Greenwood takes up the question of access in a more narrowly focused way. His concern is with ways of assuring access by those with low-income backgrounds who tend not even to think of university as an option. He sketches two experimental approaches to drawing in students who might otherwise not attend university. The issue is not just one of transcending financial barriers but of inducing people to think beyond those barriers.

Elizabeth Parr-Johnston, having completed terms as presidents of two universities in Atlantic Canada, reviews some problems that have already been identified as well as raising several other important issues on the direction in which we are headed. She argues that we are no longer in a world where there will be large increases in government funding. It is a world in which governments are determined to play a more directive role. In that context she raises an issue, where a greater emphasis is being placed on applied research, of ownership of intellectual property which will become increasingly important.

All of the panelists agree that the universities currently are seriously underfunded. Peter George explains that one of the main objectives of the

task force which he chairs is to generate proposals for appropriately augmenting the funding of the universities. John Chant argues, however, that the real problem lies in the centrally-directed, overly-regulated nature of the Canadian university system. Major pressures are being exerted by provincial governments whose objectives are more concerned with seeing that large numbers of young people get admitted to some sort of higher education and that they receive substantially subsidized education which has broad voter appeal.

Chant's point is that, in the area of higher education, Canadian governments continue to engage in central planning long after the failure of central planning has been made evident. The simple solution that Chant puts forward is for governments to fund students, not universities. In his role as wind-up speaker, Douglas Auld, the president of an Ontario community college, concurs with Chant and sees value in incorporating more market-type influences into the higher education system. Auld also raises the matter of the mix of institutions. Sorting out the division of resources between colleges and universities is not something that can be satisfactorily done by central planning. A task for economic policy analysts will be to convince governments that competitive market-like solutions have some advantages in getting resources efficiently allocated. However, access to higher education is strongly influenced by the existing distribution of income and it has an important bearing on the future distribution. It is only appropriate, then, that much of the attention of the presentations is directed to mechanisms for better financing of students so as to ensure that they obtain the type and extent of higher education that allows them to achieve their opportunities.

The scope of topics that can be covered in a two-day conference on which this volume is based is necessarily limited. We have chosen to focus on those topics that are of immediate interest to current policy debates, and that therefore are amenable to remedial action. There remain, however, some overriding issues that, even if they are not resolved, should inform that debate. One concerns the very role of the public sector in the financing and delivery of post-secondary education. In principle, education could be left to the private sector. Arguments for public intervention ultimately rely on failure of the private sector to achieve socially acceptable outcomes. Such arguments include a) classic market failures arising from external benefits provided to society from the dissemination of knowledge associated with university education, whether resulting from research or embodied in graduates; b) shortcomings in credit markets or markets for risk-sharing that inhibit potential students from acquiring post-secondary education; and c) social objectives like equality of opportunity and

redistributive equity that private provision cannot address. Then given that a case is made for public intervention, what are the most appropriate forms of that intervention? Should PSE institutions be public, private, or some combination? Should finance be directed to students or to institutions, or both? To what extent should universities be regulated? More generally, what kinds and mixes of services should these institutions provide? Finally, given that PSE institutions are partly publicly funded, how should they be made accountable for the use of those funds? This raises issues of university governance that the conference only briefly addressed. What policies can ensure that the interests of universities are aligned with those of all other stakeholders, including the students? This volume only scratched the surface of these important issues. Clearly there is more work to be done.

References

- Association of Universities and Colleges of Canada. 2002. *Trends in Higher Education*. Ottawa.
- Axelrod, P. 2002. *Values in Conflict: The University, the Marketplace, and the Trials of Liberal Education*. Montreal: McGill-Queen's University Press.
- Barr, N. 2004. "Higher Education Funding", *Oxford Review of Economic Policy* 20(2), 264-283.
- Barr, N. and I. Crawford. 2005. *Financing Higher Education: Lessons from the U.K.* London: Routledge.
- Bercuson, D., R. Bothwell and J.L. Granatstein. 1997. *Petrified Campus: The Crisis in Canada's Universities*. Toronto: Random House of Canada.
- Bok, D. 2003. *Universities in the Marketplace: The Commercialization of Higher Education*. Princeton, NJ: Princeton University Press.
- Canadian Association of University Teachers. 2004. "CAUT Almanac of Post-Secondary Education in Canada, 2004".
- Card, D. 2003. "Canadian Emigration to the United States", in C.M. Beach, A.G. Green and J.G. Reitz (eds.), *Canadian Immigration Policy for the 21st Century*. Kingston: John Deutsch Institute, Queen's University, 295-312.
- Chant, J. and W. Gibson. 2002. "Quantity or Quality? Research at Canadian University", in D. Laidler (ed.), *Renovating the Ivory Tower: Canada University and the Knowledge Economy*, Policy Study No. 37. Toronto: C.D. Howe Institute.
- Council for Employment, Income and Social Cohesion. 2003. *Education and Redistribution*. Paris.
- Council of Ontario Universities. 2003. "Advancing Ontario's Future Through Advanced Degrees". Report of the COU Task Force on Future Requirements for Graduate Education in Ontario.

- Davenport, P. 2002. "Universities and the Knowledge Economy", in D. Laidler (ed.), *Renovating the Ivory Tower: Canadian Universities and the Knowledge Economy*. Policy Study No. 37. Toronto: C.D. Howe Institute.
- Department of Education and Skills (UK). 2003. *The Future of Higher Education*. London, UK.
- Drummond, D. 2004. "TD Economics Special Report on Post-Secondary Education in Canada". T.D. Financial Group (March 11).
- Ehrenberg, R.G. 2003. "Studying Ourselves: The Academic Labor Market", *Journal of Labor Economics* 21(2), 267-287.
- _____. 2004. "Prospects in the Academic Labor Market for Economists", *Journal of Economic Perspectives* 18 (Spring), 227-238.
- _____, ed. 2004. *Governing Academia: Who is in Charge at the Modern University?* Ithaca: Cornell University Press.
- Johnston, A. Dowsett. 2002. "A Lament for Quality" in *Maclean's* (May 6); and "The Crisis in Quality" in *Maclean's* (June 10).
- Junor, S. and A. Usher. 2004. *The Price of Knowledge: Access and Student Finance in Canada*. Canadian Millennium Scholarship Foundation. Montreal: Renouf Publishing Co.
- Kirp, D.L. 2003. *Shakespeare, Einstein, and the Bottom Line: The Marketing of Higher Education*. Cambridge, MA: Harvard University Press.
- Laidler, D., ed. 2002a. *Renovating the Ivory Tower: Canadian Universities and the Knowledge Economy*. Policy Study No. 37. Toronto: C.D. Howe Institute.
- _____. 2002b. "Renovating the Ivory Tower: An Introductory Essay" in D. Laidler (ed.), *Renovating the Ivory Tower: Canadian Universities and the Knowledge Economy*. Policy Study No. 37. Toronto: C.D. Howe Institute.
- Linsenmeier, D.M., H.S. Rosen and C.E. Rouse. 2002. "Financial Aid Packages and College Enrollment Decisions: An Econometric Case Study", National Bureau of Economic Research, Working Paper No. 9228 (September).
- Pocklington, T. and A. Tupper. 2002. *No Place to Learn: Why Universities Aren't Working*. Vancouver: UBC Press.
- Shapiro, B. 2003. "Canada's Universities: Quantitative Success, Qualitative Concerns", *Policy Options* (September).
- Smith, D.C. 1996. *Excellence Accessibility Responsibility: Report of the Advisory Panel on Future Directions for Postsecondary Education*. Toronto: Ontario Ministry of Colleges and Universities.
- Spencer, B.G. 2002. "The Double Cohort and the Shortage of Faculty: How Big Are the Problems?" Backgrounder No. 64 (October). Toronto: C.D. Howe Institute.
- Statistics Canada. 2003. "Changing Patterns of University Finance", *Education Quarterly Review* 9(2).
- Swail, W.S. 2004. *The Affordability of University Education: A Perspective From Both Sides of the 49th Parallel*. Washington, DC: Educational Policy Institute.
- The Economist*. 2002. "Britain's Universities: On the Road to Ruin" and "Higher Education: The Ruin of Britain's Universities", November 16.

_____. 2004. “Universities: Pay or Decay” and “Special Report: Financing Universities — Who Pays to Study?” January 24.
The Journal of Economic Perspectives. 1999. “Symposium: The Economics of Higher Education”, Vol. 13 (Winter).