

RENOVATING THE
IVORY TOWER



Canadian Universities
and the Knowledge Economy

David Laidler,
editor

C.D. Howe Institute



Renovating the Ivory Tower

*Canadian Universities and the
Knowledge Economy*

edited by

David Laidler

Policy Study 37

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Renovating the Ivory Tower: An Introductory Essay

David Laidler

This volume derives from two conference sessions that took place at the Annual Meetings of the Canadian Economics Association in Montreal on July 2, 2001. At each session, three papers were presented and then subjected to critical commentary by a single discussant.

The first session dealt with aspects of the broader debate about universities: their role in the economy, including their influence on economic growth and their current funding problems (Paul Davenport); that long-standing cause for concern, the question of equal access for men and women to higher education (Stephen Easton); and the effects of technology on graduates' transition from university to the job market, including some implications of these effects for the "brain drain" (Alice Nakamura and Joel Bruneau). Melville McMillan acted as discussant.

The second session dealt more directly with Canadian universities' productivity both in research (John Chant and William Gibson) and in the creation of human capital (papers by Ross Finnie and by François Vaillancourt and Sandrine Bourdeau-Primeau). To these three papers has been added a fourth on the creation of human capital, by Kelly-Ann Rathje and Herbert Emery, based on work carried out by the former in the course of her graduate studies at the University of Calgary, which came to the editor's attention shortly after the conference. Jeff Smith provides a critical commentary on this group of essays.

I am grateful to Clark Leith, Melville McMillan, Bill Robson, Jeff Smith, and François Vaillancourt for comments on an earlier draft.

All these papers take an economic approach to describing the activities of Canadian universities. The appropriateness of doing so derives from the simple and unquestionable fact that these institutions use scarce inputs to generate valuable outputs. From the economist's viewpoint, the university sector is a capital-goods-producing industry, and is appropriately analyzed as such. Its output consists of knowledge and of people who comprehend that knowledge and are able to put it to use. Universities produce ideas, sometimes given the label *knowledge capital*, and they also impart skills to people, creating in the process what is usually called *human capital*. Economic analysis is not capable of providing a comprehensive treatment of universities' complex role in society, but the economic approach is helpful as far as it goes — and, in many respects, it goes a long way, as I hope this volume demonstrates. As we shall see, the picture that emerges is one of a system that, while still functioning rather well, is nevertheless showing some signs of stress.

Outline of This Essay

In this introductory essay, I first outline the historical and institutional factors that frame current debates about the place of universities in Canadian life. I then turn to a brief survey of their role in what has come to be known as “the knowledge economy,” including some important caveats about certain currently fashionable ways of looking at this matter. I proceed to discuss the substantive findings of the studies in this volume, paying particular attention to what they reveal about the factual background that ought to inform public policy towards universities. Finally, I offer some suggestions of my own about the directions that policy in this area might take. They are not meant to be definitive but to provoke further debate about some vitally important questions.

Specifically, I argue the following:

- The currently healthy rates of return yielded by undergraduate education permit a significant shift toward tuition fee revenue as a source of finance for the sector.
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- Such a move would force universities to become more responsive to students' own assessments of their often diverse needs, making them less reliant on funding from the government and business sectors, which seem to be taking a dangerously narrow view of the way in which these institutions contribute to Canada's well being.
- Any such move must be accompanied by measures to ensure that financial markets provide adequate access to funding for the accumulation of human capital.
- Such a change would not preclude government and business from continuing to support both the teaching and research functions of the university sector — indeed, a strong case can still be made for such support.

My suggestions have the practical aims of increasing the overall level of funding available to universities and reducing their reliance on any one sector for support.

Canadian Universities: Some Historical Background

Historians of the university have often told us that the institution's current complexity is the outcome of a number of tendencies that have long co-existed uneasily with one another. In some times and places, the creation, preservation, and transmission of cultural and, particularly, religious understanding have been the prime function of the university; in others, pure scientific research has taken pride of place. It is these traditional activities, both of which involve the pursuit of knowledge for its own sake, that underlie the metaphor of the ivory tower.

But universities have never operated in total isolation from the economy. They have provided not just pure research but useful knowledge that allows the community at large to enhance its material well-being, and they have trained young people in productive and marketable skills. In the 1960s, the word "multiversity" came into fashion (see, for example, Kerr 1963), characterizing what many seemed to think was a newly emerging complexity in the activities

expected of such institutions. But it is worth recalling that, even in the Canada of 1836, Victoria College (now part of the University of Toronto, but then in Cobourg, Ontario) was teaching surveying and navigation in addition to divinity, and that in so doing it was following an already well-established, nonconformist, and mainly US model (Cameron 1991, 12).

What is new about modern universities and has put them in need of renovation is neither the complexity of their offerings nor the potential for conflict among the constituencies they are expected to serve, but the sheer scale of their activities as both creators and purveyors of knowledge of all kinds. Populist impulses to broaden and expand their activities under government auspices were already at work in the nineteenth century, most notably, but by no means uniquely, in the United States, when the land grant universities, which now form the backbone of the state university system, were created by the *Morrill Act of 1862*.

World War II marked another major turning point in the development of the modern university. As Franklin (2000) notes, the war itself led to a huge expansion of government support for university research in science and engineering, not least where it might lead to military applications. The war's end saw student bodies expanded dramatically as ex-servicemen reentered civilian life. Thereafter, the Cold War in general, and US–Soviet competition in the wake of the 1957 Sputnik launch in particular, provided the motive for further expansion on all fronts. Canada, like virtually every other Western country, followed the United States' lead, with governments providing most of the necessary funds.

The Economic and Political Background to Current Debates

The rapid secular postwar growth in productivity that made all this university expansion, and much else, seem affordable slowed suddenly around 1973, but this fact was not obvious until a decade or more later. Canada, like other countries, is still living with the consequences of this slowdown and of the fiscal exuberance that preceded it and persisted for awhile even after its recognition.

These consequences extend far beyond the university sectors of all the countries affected, of course, but certain features of the Canadian landscape have made the pressures on universities here particularly acute, especially compared with those experienced by post-secondary institutions in the United States.

First, the resources needed to create, maintain, and expand Canadian universities have, from the outset, come predominantly from government. There are no Canadian equivalents of the great privately endowed US research universities such as Harvard, Chicago, and Stanford, or indeed of such smaller private institutions as Oberlin or Swarthmore, which tend to specialize in undergraduate teaching. In Canada, when governments feel short of funds (for good or bad reasons is not relevant to this point) and cut back on university spending, the reduction impinges on the whole sector, not just one segment of it. Furthermore, the existence of private universities in the United States not only cushions the effects of government cutbacks on the sector as a whole, it also provides competitive pressures that constrain the extent to which it is politically prudent to cut support to publicly funded universities.¹

Second, as a direct, though surely unintended, outcome of the division of functions between the federal government and the provinces, and between the public and private sectors of the economy, Canadian universities compete directly and visibly with health care for public funding. Provincial governments are responsible for both services and, since 1977, funding in aid of these activities from Ottawa has been bundled into a single block grant. For any provincial treasurer, then, the opportunity cost of each dollar spent on universities is a dollar of health care expenditure. Given

1 Studies of the factors that systematically motivate university boards and administrations have mainly been concerned with US experience. This work strongly suggests that enhancing the prestige of the institution for which they are responsible, both absolutely and relative to that of others, ranks high among their goals (Winston 1999). Administrators of the major state universities are thus sensitive to competition emanating from their privately funded rivals, and respond to it. To some extent, they can influence politicians whose policies might undermine their ability to maintain their standing. Even so, many of the pressures currently being felt in Canada are also affecting US state universities. (See "Land Grant Universities" 2001).

the Canadian electorate's commitment to the public provision of health care and the fact that this sector directly serves the whole population rather than just one segment of it, not to mention the high political profile of its current financial difficulties, it is hardly surprising that higher education in general, and universities in particular, have come under increasing financial pressure.

Finally, the Canadian electorate remembers the fiscal excesses of the 1970s and 1980s and the measures that were needed to turn things around in the 1990s. It is in no mood to sanction any wholesale loosening of government purse strings without compelling arguments — an attitude unlikely to change in the near future. On the other hand, that same electorate seems unwilling to sanction any reduction in access to university education for young people.

As a consequence of these three factors, government funding has failed to grow in line with enrollments and there has been only a partial easing of restrictions on tuition fees, so that universities increasingly depend on funds raised from the business community to fill the resulting gap. Some may regret these facts and wish them different, and others may welcome them; but facts they are, and any practical discussion about policies toward universities must recognize them. Canadian universities are certainly under considerable financial pressure, as Davenport convincingly argues, but if they are to receive more resources, it must be shown that the money would be well spent. And if the resources are to come from government, it must be shown that there are good reasons the private sector cannot be expected to provide them.

The Standard of Living and the Knowledge Economy

A salient fact of North American economic life in the 1990s was that gross domestic product (GDP) per head of population grew faster in the United States than in Canada. It is a commonplace that this measure is not the be-all and end-all of economic and social well-being, but it is remarkable how much more attention people seem able and willing to pay to cultural and spiritual matters when their material comfort is well taken care of. So let us agree that “standard

of living” as measured by this imperfect indicator does matter and that when it tells us Canada has been falling behind its nearest neighbor and has begun to catch up only in the past two or three years, this is a cause for concern.

Productivity and Its Rate of Growth

Any country’s GDP per head is, as a matter of arithmetic, the consequence of two factors: the proportion of the population that works, and the amount of output that each working person produces on average. In turn, the level and the rate of growth of GDP per head depend on the performance of the labor market and on the level and rate of growth of the productivity of labor. Sharpe (2001) demonstrates that both these factors (the labor market and productivity) contributed to Canada’s failure to keep pace with the United States in the 1990s. In the first part of the decade, poor labor market performance, reflecting the depth of the 1991–92 recession and the slowness of the subsequent recovery, was the dominant factor at work; thereafter, labor productivity was the main culprit. As, for example, Davenport’s Figure 11 shows, output per person-hour grew more slowly in Canada up until 1998, particularly in manufacturing.²

Within manufacturing, however, the productivity growth differential between the two countries has been concentrated in the machinery and electrical equipment sectors. The popular notion that the spectacular US economic performance of the 1990s was the result of developments in high-technology activities, is well grounded in fact (see Rao and Tang 2001). And because these activities involve using highly educated workers to exploit new developments in science and engineering, it is understandable that another popular notion has developed — namely, that the key to securing a rising standard of living at the turn of the millennium lies in the creation and dissemination of knowledge, particularly technologi-

² As Davenport also tells us, recently revised data show that, since 1998, Canada’s GDP and growth of GDP per capita have actually surpassed those in the United States. Productivity growth, however, as measured by output per person hour, has continued to lag. (See Little 2001.)

cal knowledge. The “new economy” is said to be a “knowledge economy,” and within it, universities are often presented as having special roles to play as creators of new ideas in their research function and as producers of human capital capable of exploiting those ideas in their teaching function. In this way of looking at things, the output of universities is a vital input into the material progress of the market economy.

A Role for Universities

This vision of universities as primarily handmaids to material growth in a capitalist economy is quite horrifying to many within the Canadian academic community (see Turk 2000) — not entirely without cause, as we shall see in due course. It is important to recognize that some of the ideas universities produce do turn out to be valuable in the world outside their gates, that their graduates do possess superior productive powers acquired in the course of their education, that these ideas and powers do have value in the marketplace, and that the university sector’s performance is likely to be judged by taxpayers according to these criteria. But it is equally important to insist that Canadian universities cannot simply be turned into engines of economic growth, nor should they seek political support by pretending they can be.

In order to clarify the issues at stake here, it is important first to distinguish between the factors influencing the economy’s *level of productivity* and those influencing the rate at which that level *grows* over time. To the extent that a more educated and better trained labor force is able to produce more output because it embodies more human capital, the proportion of the economy’s labor force that has received higher education affects the *level* of the economy’s productivity as measured by output per person-hour of work. An increase in that proportion, therefore, will increase the level of the economy’s productivity. Such an increase will enhance the *ongoing rate of growth of productivity*, however, only if this more educated labor force also turns out to be better at generating new ideas, each of which in turn enables more output to be wrung from a given level of inputs (including human capital). This latter possibility also provides the main economic justification for universities’ involvement

in research and development (R&D) activity, as opposed to the mere transmission of already-existing knowledge.

Second, even if these possibilities are realizable in fact, they do not in themselves make a case for government involvement in promoting the knowledge economy by way of public expenditure on universities. As long as those who embody human capital obtained through university education can capture the returns this yields in the form of enhanced market incomes — including enhancements generated by new productive ideas that the possession of such capital enables them to create — and as long as there are no barriers to people investing in their own education in the first place, then the usual marketplace mechanisms should ensure that both the highly educated labor force and the font of new ideas are adequately supplied without public subsidies.

The Economic Case for Public Subsidies

In order to justify public intervention designed to increase expenditures on education and research beyond the levels private market activity would supply, the *social* returns to such intervention — particularly as they involve the effects of the creation and dissemination of ideas on the level of well-being generated by the economy and on the rate of growth of that well-being — must exceed the market incomes of those directly involved in these activities. Advocates of such intervention rest their case mainly on the claim that, once created, productive ideas become generally — and, to all practical purposes, freely — available to the economy at large, and can therefore be profitably exploited without any compensation for the original creators of those ideas.

If the *spillover effects* — often called *external benefits* or *positive externalities* — of education and research are indeed empirically significant, an economy that relies on market incentives alone to bring about investment in such activities will be inefficiently underprovided with them. To the extent that these education and research activities are located in universities, the case for supporting those institutions with public funds is made.

In recent years, proponents of so-called *endogenous growth theory* have argued that spillover effects are a significant engine of eco-

conomic growth and that they have been at work in, among other times and places, the United States in the 1990s.³ It is easy to argue further that this mechanism for promoting growth can be imitated in Canada, to the great benefit of our living standards, if only government will provide the incentives for the acquisition of human capital, and its subsequent devotion to R&D activities, that market mechanisms are now failing to deliver in adequate amounts.

Some Caveats

These arguments seem to be plausible, particularly when applied to science and technology. But a few caveats are in order before anyone jumps to conclusions about the likely desirable impact on Canada's economic prospects of further investment of funds in universities in general, and in their science and technology programs in particular.

To begin with, there is the idea that statisticians call the *regression fallacy*. In the current context, it suggests that, among any group of countries at any time, the one that is performing best is probably performing above potential as a result of transitory factors quite beyond any policymaker's control. It is therefore likely to perform less well in future. Consistent with this idea is evidence that formulas for economic success seem to be extraordinarily difficult to transfer across national boundaries or even to sustain in working order at home for very long. Over the past 40 years or so, there have been periods when the Swedish, French, and Japanese "models" seemed to be just the thing for any economically ambitious country to imitate, but we do not hear much about these anymore. It might well turn out, therefore, that the US model of productivity growth based on scientific and technological education and research will prove no more durable.⁴ If the United States has been performing

3 For a comprehensive, albeit highly technical, account of this area, see Aghion and Howitt (1997).

4 François Vaillancourt reminds me that, in recent Canadian discussion, the US model has run into some competition from the Irish model. The same warning applies to the latter.

above its potential over the past decade, then the results of Canada's seeking to reproduce that level of economic growth by making large investments in the production of scientific knowledge and technically skilled human capital might turn out to be disappointing. (Then again, Canada itself could be the lucky recipient of a random boost to economic growth!)

Furthermore, when economists look behind national data on productivity growth rates to information gathered at the level of individual industries, they find a great deal of diversity. This result is completely consistent with what we know about the narrow industrial base of US productivity growth in the 1990s, and at first sight there is nothing particularly disturbing about it. It is, however, less widely known and much more discomfiting that even more specific research, at the level of individual firms or even individual plants, finds that this huge diversity in productivity performance persists. That is why Harberger (1998) likens the appearance of productivity growth — to which he prefers to give the more down-to-earth label “real cost reduction” — to the isolated sprouting of mushrooms as opposed to the generalized rising brought about by yeast. This striking simile captures the fact that, rather than having an across-the-board effect on all aspects of an economy's performance, the ideas that drive productivity growth seem to raise output by very different amounts at different times, often in widely scattered places. Interspersed among the expanding plants and firms in industries where productivity is improving rapidly on average are to be found many where it is stagnant or even declining.

These facts suggest that the implementation of productivity-enhancing and, hence, real-cost-reducing, measures is very much a scattered and localized activity rather than one whose effects involve the general application of new ideas that radiate out from specialized “knowledge factories” to the economy at large. Those who bring about such cost reductions may well be exploiting knowledge created outside of their own establishments, but there is clearly a large element of local insight and ingenuity involved in discovering and exploiting their productive potential. It is hard to interpret the facts of real-world productivity growth as corresponding to the generalized productivity-growth spillovers that variables with names such as “knowledge” or “education” bring about in

modern endogenous growth models. They suggest, indeed, that these models, for all their *a priori* appeal, are intellectual artifacts that fail to explain some key properties of productivity growth data as we are beginning to understand them.⁵ This does not, of course, imply that knowledge and education are unimportant to economic well-being, or that universities do not create valuable ideas and educate productive graduates. It does, however, warn us that no one has yet shown that these mechanisms generate general external benefits on any significant scale. In our current state of knowledge, we ought to be extremely skeptical of popular arguments for the public subsidization of scientific and technological research in universities as a sure-fire method of raising Canadians' standard of living.

What These Studies Establish

These important caveats notwithstanding, the studies in this volume clearly demonstrate that Canadian universities are productive institutions on even the narrowest of economic criteria. If there are good reasons to question their capacity to act as engines of material growth, there can be little doubt about three other matters: that they make a major contribution to sustaining the level of Canadians' living standards; that the right policies can enhance this contribution; and that the wrong policies can undermine it.

Returns to Human Capital

The concept of human capital has been central to the economic analysis of education for about 40 years now (Teixera 2000), so the papers by Finnie, Vaillancourt and Bourdeau-Primeau, and Rathje

5 As Mark Blaug, a leading expert in the economics of education, recently remarked:

Where is the evidence that human capital generates externalities that makes growth endogenous? While the new growth theory has raised a lot of interesting technical ideas relating to the influence of economies of scale, externalities, R&D and so on, none of these are ever pinned down very precisely. (1999.)

and Emery are additions to an already well-established tradition in economic research, in Canada as elsewhere. All three investigate the returns to investment in university education, all three are particularly interesting in that they do so on a discipline-by-discipline basis, and, as Smith points out, none yields any major surprises to anyone already familiar with this line of work. But when matters of economic policy are at issue, it is critical to get, and keep, the facts straight, and the facts that emerge from these studies, or that are confirmed by them, throw important light on some currently contentious issues, and considerably strengthen our faith in the factual basis that ought to underlie any serious discussion of them.

To begin with, as Davenport points out, there has recently been a tendency for some commentators to argue that the economic value of university education in general, and of undergraduate education in the social science and humanities in particular, has been declining. It might be added that such views may also have influenced some Canadian politicians in their decisions about university funding, though Davenport offers no conjectures about this. The results presented by both Finnie and Vaillancourt and Bourdeau-Primeau suggest that there was no serious evidence to support these views, at least down to the mid-1990s. Whether one considers the private returns — measured purely in terms of subsequent wages and salaries — students realize on their own investment of time and money in education, or the broader social returns that also take account of the public subsidies they receive while in university and the taxes they pay when working (and that, hence, are particularly relevant to policymakers), undergraduate education seems to have been a profitable undertaking for both the individuals receiving it and for society in general in those years.

Rathje and Emery's results complicate this picture, however, with rather lower estimates of the returns to education than those of Vaillancourt and Bourdeau-Primeau. The differences here stem from two main sources. First, Rathje and Emery's estimates for the private returns to university education are based on more up-to-date measures (tuition fee data for 1998) of the costs students incur in undertaking education. It is evident from their results that the increase in tuition fees that had then recently taken place had a notable impact on reducing the private returns to education. Second,

their estimates for the total returns exclude income from self-employment in measuring the incomes of graduates, whereas Vaillancourt and Bourdeau-Primeau include income from this source. For reasons that both sets of authors explain, excluding such income completely probably leads to a downward bias in rate-of-return estimates, while including it creates an upward bias. Thus, between them, these studies provide lower and upper bounds to the range within which such returns probably lie.

It is significant that all three studies show that the returns, both private and total, realized by educating women are distinctly higher than those accruing to the education of men. In certain areas, in fact, notably fine arts and the humanities, the returns to men seem to fall below any reasonable benchmark that might be applied in any market test of whether the investment is worthwhile. It also seems to be the case that the returns realized in the early years of employment are higher on average, for both men and women, in certain “harder” (that is, more mathematically demanding), disciplines, such as engineering and natural sciences, and in professional areas, particularly those in commerce and health sciences, than they are in the arts and humanities. In addition, as Finnie’s work shows, graduates in some subjects at the “softer” end of the spectrum take longer to get established in the labor market. Since it is often argued that university education would be of more social value were it more directly aimed at preparing its recipients for the job market, these results are of considerable interest.

On the other hand, Finnie also shows that labor market disadvantages for humanities graduates seem to disappear within a few years of graduation, and, crucially, that there is no sign that graduates’ satisfaction with their studies is lower among those educated in the humanities and social sciences than in other fields. Moreover, Davenport presents data on student loan default rates that show these to be much lower for university students than for college or private vocational school students, whose education is, on average, much more directly aimed at preparing them for the labor market. And it is worth noting that even Rathje and Emery’s results show that, when sex differences are averaged out, rates of return to undergraduate education in all fields (except fine arts), whether private or total, remain attractively high. Taken overall, these con-

siderations argue against jumping to the conclusion that the return to an education more narrowly directed to preparation for the job market is so much higher than the return to other courses of study that a major reallocation of resources is called for.

None of these results will come as a surprise to anyone familiar with earlier work on the economics of universities. Nor will it be a surprise that both Vaillancourt and Bourdeau-Primeau and Rathje and Emery conclude that the returns to graduate work (again as measured purely by salaries) are in most areas, particularly at the PhD level, on the low side or even negative. It is a necessary implication of the productivity of undergraduate education that the costs of graduate study are very high in terms of forgone earnings, and it is this fact that largely drives the results in question. Furthermore, many PhDs work in universities, where salary levels are relatively low but the *equalizing differences* (as economists call them) that arise from the working environment are widely agreed to be quite attractive. There is, however, some disagreement about just what these differences are. Outside universities, one sometimes encounters disparaging comments about professors who use the protection afforded by academic tenure as a means of consuming more leisure than other, less fortunate, members of the labor force. Within universities, the talk is more likely to be of the opportunities afforded for research and scholarship.

Research Productivity

The essay by Chant and Gibson throws some light on this vexatious issue, for it is a path-breaking attempt to compare the research productivity of the best-performing Canadian universities, mainly in science and technology, with their US counterparts. Its results are easy to summarize, but perhaps a little harder to interpret.

The most productive Canadian universities compare very well indeed with their US counterparts as far as the quantity of research (as measured by numbers of papers published in learned journals) is concerned. But when it comes to the impact of that research, as measured by the frequency with which those papers are subsequently cited, they compare less well. Since the data used in this study mainly derive from scientific and technological disciplines,

the biases that naturally arise from the lack of interest of the US academic community in many issues in the humanities and social sciences that concern Canadians — and, hence, the infrequent citation by US researchers of Canadian work in those disciplines — are likely to be minimal. The main difficulty in interpreting these results arises from the fact that the US universities whose research is widely cited are overwhelmingly those large, well-endowed private institutions to which there is no Canadian counterpart. It is a commonplace of the anecdotal evidence on these matters that Canada has neither universities as good as the best nor as bad as the worst in the United States, so it comes as no surprise that the University of Toronto, which ranks at the top among Canadian institutions, fares relatively poorly compared with, say, Stanford, as far as the impact of its research is concerned.

Some Problems in the Sector

Even so, it would be a mistake to conclude that all is well with Canadian universities and that the ever-shrinking budgets Davenport describes have had no effect on their performance. The data analyzed by Finnie, Vaillancourt and Bourdeau-Primeau, Rathje and Emery, and Chant and Gibson are inevitably backward looking. In the main, they tell us about how well the sector was performing up to the mid- to late 1990s, and although budgets had been tightening for some time even then, they have tightened still further in subsequent years. It is therefore important to be alert to any signs of current stress revealed, or even hinted at, in the studies collected together here.

Attention has already been drawn to the significant disparities in the returns to university education earned by men and by women; Stephen Easton deals with material bearing on this matter. He presents compelling evidence that universities now admit significantly more women than men, whereas 25 years ago men were in the majority. Just as the shortfall in women's enrollment levels a quarter-century ago perhaps implied that they were failing to achieve their full educational, and, therefore, economic potential (among other things), so the shortfall among men now has the same implications. Given that these tendencies are at work in an economy that, as

Davenport shows, already educates a significantly smaller proportion of its population to university level than does the United States, they are disturbing — and all the more so because the missing men are not going into the college sector but seem to be moving straight out of high school into segments of the labor force where rewards are already low and still declining.

Easton suggests that women university graduates earn a labor market premium over high school graduates that exceeds the one accruing to men, that this premium has been increasing, and that the increase in the university enrollment rate of women relative to that of men, therefore, may reflect a relative growth in demand for university-educated women. This conjecture is certainly consistent with the results discussed earlier. McMillan, however, citing work by Riddell and Sweetman (2000), questions whether the premium accruing to women has indeed been rising, and suggests that what we are seeing here might better be interpreted as a supply-side shift. Easton does provide some preliminary information on one factor that might be at work on the supply side in the shape of data he interprets as suggesting that high schools are currently doing a better job of preparing women for further education than they are of preparing men for it. But if this is indeed the case, then this fact, in turn, needs to be explained. It is hard, therefore, not to sympathize with McMillan's view that the facts about women's increasing enrollment in universities, and their relative success once enrolled, may have altogether deeper social causes that lie well outside of the educational system. There is a major puzzle here that requires further investigation.

Things are more clear-cut in the case of the labor market problem that Nakamura and Bruneau document. They argue that the technical properties of the electronic systems now widely used by US-based employers in the process of recruiting university graduates entail economies of scale that give these recruiters advantages over their Canadian counterparts, and that these advantages in turn accrue to potential US employers of high-caliber Canadian graduates, thus making a contribution to the "brain-drain." To summarize their case at some risk of oversimplifying it, US recruiters can add the résumés of Canadian job seekers to the lists their US clients search at a low marginal cost, which their Canadian com-

petitors cannot match for their Canadian clients. Hence, information about Canadian job seekers becomes more cheaply available to potential US employers than to Canadian employers, particularly to smaller firms.⁶

As McMillan suggests, it is easy to dismiss the concerns that Nakamura and Bruneau express with phrases such as “welcome to the market.” In the increasingly integrated North American economy, big “buyers” of highly trained graduates are more likely to be found in the United States. It thus pays recruiting services to cater to them, and it is understandable that Canadian graduates respond to the incentives that result from these facts. But as McMillan also notes, there is a little more to it than that.

Nakamura and Bruneau suggest that the problems they document have arisen as unintended consequences of the withdrawal of the Canada Manpower agency from university campuses and its replacement by local placement services that, because of universities’ funding problems, are often supported on a cost-recovery basis. It goes without saying that there should be no barriers to emigration in a free country, but it is surely anomalous that Canadian firms, whose taxes help to support Canadian universities, are at a disadvantage *vis-à-vis* their US competitors when it comes to recruiting their own country’s graduates. How large and significant this problem might be is hard to say on the basis of currently available information, but it would surely be worth further study.

One other notable hint of stress in the Canadian university system emerges. Although the public perception has long been that there exists a large oversupply of well-educated PhDs ready and willing to fill any university teaching vacancies that might occur in

6 As Nakamura and Bruneau tell us, systematic evidence on the extent of this problem is not available. For what it is worth, conversations with the placement service at my own university reveal that an increase in the number of US firms approaching graduating students whose résumés they had found while scanning electronic databases has been noted in recent years. This activity, which was described as “low level” relative to the overall scale of the placement service’s operations, seemed to be concentrated in the high-tech sector and had become less frequent in 2001, when that sector was contracting. This anecdotal evidence is consistent with Nakamura and Bruneau’s fears of a “selective brain drain.”

Canada, there is overwhelming anecdotal evidence that this is not in fact the case. Certain disciplines are under considerable competitive pressure when it comes to faculty recruitment and retention as a result of the interaction of budgetary stringency with a strong demand for their practitioners in the United States. This has been the case for many years in areas such as computer science and economics, not to mention in certain specialities, notably finance, that find their home in business schools. It has, however, been hard to say whether these pressures have had seriously adverse effects on standards of research and teaching. Although business schools are not singled out for special attention in the studies in this volume, Chant and Gibson do document an apparent relative decline in the quantity and quality of research emanating from Canadian universities in computer science and economics, and Finnie finds evidence of a significant decline in satisfaction with their education among economics graduates (particularly women). One cannot help but wonder whether we are seeing the first signs of declining academic standards in Canadian universities that will spread further across the system with time as their budgets get ever tighter relative to those of their US counterparts.

Interpreting the Evidence

At first glance, the results on returns to university education presented in this book seem to support popular conceptions about the role of universities as contributors to productivity growth in a knowledge economy. At the undergraduate level, these returns, however they are measured, seem quite respectable in all but a few cases, and they are higher in, for example, science, engineering, health sciences, and commerce than in other areas. Three points, however, need to be considered before jumping to any conclusions about the desirability of encouraging further expansion in these and related fields.

Human Capital and Productivity

As was argued above, it is important to distinguish between the effects of higher education on the *level of productivity*, and those on

its *rate of growth*. There is no reasonable doubt that university education in most areas significantly increases the level of its recipients' productivity and, hence, indirectly the level of Canadians' standard of living. This is the effect that Finnie, Vaillancourt and Bourdeau-Primeau, and Rathje and Emery all measure. But none of these studies seeks or provides evidence that university education endows its recipients with human capital that enables them to contribute to the generation of economy-wide productivity growth over time. It might do that, but we do not have any hard evidence that it does. There is some empirical basis for arguing that the provision of university education in Canada on a larger scale than exists now might create a step-up in the level of labor productivity in the economy. The evidence — presented by Vaillancourt and Bourdeau-Primeau and by Rathje and Emery — that undergraduate education yields high rates of return in most areas, combined with two facts Davenport documents — the relatively high number of Canadians receiving college as opposed to university education, and the lower returns accruing to the former — are highly suggestive here. However, we do not have any evidence that such a change would contribute to the economy's ability to grow at a faster rate.

In any event, the returns to university education to which the evidence in this volume pertains are those captured as income by the individuals who received that education. Where the returns to human capital accrue solely to the individuals in which that capital is embodied, then one should presume that those individuals are intelligent enough to respond appropriately to the investment incentives they provide without the aid or encouragement of government. The fact that returns are, on balance, higher in science and technology fields and in professional programs than in arts and humanities in no way changes this conclusion. If there is any validity to the widely held perception that mathematical abilities differ among potential university students, then it is likely, as Smith wisely points out, that students who are relatively well endowed with them will choose areas of study where those abilities can be exploited. The returns to those who have already chosen such disciplines might indeed be higher, perhaps substantially so, than those observed elsewhere; but, crucially, those returns will also be higher than the returns that would be realized by any less mathematically adept

people who shifted into these areas. Indeed, since there is no evidence of a general shortage of university places in these high-return areas, the presumption must be that the students who currently could, but do not, enter them, must perceive the expected returns that face them as being no more, and perhaps less, than those in the fields they do indeed enter.

The evidence on the productivity of human capital presented in this book is, then, at least as supportive of the case for setting undergraduate tuition fees at levels that would cover all the costs of providing teaching services and then letting potential students make their own choices about whether and what to study, as it is of the argument for expanding the level of public funding of such institutions. Indeed, Auld (1996), among others, has already made a case along just these lines for permitting private universities to operate in Canada. To point this out, however, is by no means to argue for a complete withdrawal of government from the university sector. Quite apart from these institutions' research functions, not to mention the provision of postgraduate education, there is still the question of how best to enable undergraduates to pay the costs of their education. I discuss these matters below.

The Social Returns to University Education

The studies in this volume do not specify, let alone quantify, any returns to human capital that accrue to society at large over and above the market incomes earned by the individuals in whom it is embodied. But this fact does not mean that such returns do not exist — indeed, the case for public subsidies to university education rests heavily on the claim that such returns do exist. Subsidies are indeed ubiquitous in Canada. This matter therefore requires further discussion.

Here, it is worth recalling at the outset that Canada, as with every other advanced country, makes lower levels of education compulsory up to a certain age and provides education free to all recipients up to the end of high school. That these arrangements are utterly uncontroversial surely suggests that the value to society of having all its members educated up to a certain level is so high, and

is so generally perceived to be high, that we are willing to set aside the rights of families to make unconstrained choices in these matters. It also suggests that education beyond the compulsory minimum is perceived to yield external returns that are large enough to warrant society at large bearing a significant fraction of its cost.⁷ Two points follow from this. First, it is extremely unlikely that the apparently large external benefits education is so widely believed to yield disappear entirely as the transition between the secondary and postsecondary sectors is made; second, it is, therefore, understandable that society by and large seems to take for granted a large public sector role in postsecondary education — indeed, to support it.

Nevertheless, to apply economists' standard cost-benefit calculus to the design of an economically efficient scheme of subsidies to university education that takes account of these external benefits, it would be necessary to quantify and put a cash value on them. The prospect of even attempting to do this has long made economists acutely uncomfortable. Vaillancourt and Bourdeau-Primeau follow Stager (1996) in noting that the external benefits to society flowing from university education, whose nature they leave undefined, might be quite large, but that, because those benefits seem to be unmeasurable, there is nothing more to be said on the matter. In this, they follow a long tradition among economists. West (1988), for example, suggests that arguments in this area tend to be about "atmospheric effects" on such things as social cohesion, and concludes that they ought to be downplayed, while Blaug reports that "no one has ever been able to quantify the externalities from higher education in Britain, or for that matter anywhere else" (1999, 331).

Smith (in this volume) conjectures, however, that economists find externalities in this area hard to discuss simply because they have not paid much attention to investigating them systematically. After all, the externality economists call "pollution" was once hard to discuss, before a research literature developed to deal with its

⁷ The reader is reminded that forgone income is an important component of the cost of education; therefore, providing tuition-free education does not render it costless to its recipient.

quantification and the design of mechanisms to cope with it. The fact that economists have yet to undertake serious work on a problem does not necessarily mean that it is unimportant. We simply will not know how economically important are the external benefits flowing from university education until some serious work on the question is done.⁸ In this respect, Rathje and Emery's approach to the issue is of particular interest. Instead of trying to measure external effects directly, they ask how large these effects would have to be to bring rates of return in areas of study where the pecuniary benefits are low up to a benchmark level. They then speculate as to whether the subsidies implicit in these estimates seem "reasonable." There is, of course, a strong subjective element to the final step of this exercise, and readers will have to make up their own minds about whether or not they agree with Rathje and Emery's particular judgments. But the authors' approach to this issue is, to my knowledge, original, and it is surely useful as a way of organizing further thinking about these matters.

I suspect, however, that, once they venture beyond the narrow field of productivity spillovers, economists need help from other disciplines to advance their understanding of the wider social benefits of education in general, and of university education in particular. Such matters as the nature of the society in which we want to live, our relationships with fellow citizens, the obligations we feel toward them, and the ethical importance we attach to various features of societal arrangements are all at stake here. It is sometimes claimed by, for example, university teachers of the humanities and social sciences that important general benefits are conferred on a democratic society by those who can think critically about and discuss coherently competing value systems and their implications for social and political issues. The trouble with trying to subject claims of this type to conventional economic analysis is that the toolkit economics uses to evaluate externalities measures costs and benefits in

⁸ Smith has drawn my attention to a study by Barth (2001), who, using Norwegian data, looks at the influence on individuals' productivity, as measured by wages, of the average level of educational attainment of the workers in the establishments where those individuals are employed. Barth finds that influence to be significantly positive.

terms of given “tastes” on the part of the population. It is hard to see how such a metric can be used to put a value on activities whose purpose, in part, is to examine and perhaps modify those very tastes, particularly in a society where diversity in such matters is itself accorded a significantly positive value. But to say that the issue is beyond the scope of economic analysis is not to deny its social importance.

Research, Productivity, and Spillovers

Universities create knowledge as well as educate students, and the type of knowledge they create is often said to be, by its very nature, a public good, the entire benefit of which is available freely to all, and for which there is no feasible way of charging. Such a good confers all of its benefits on the whole of society, and it may be usefully thought of as representing a limiting case of a positive externality. Furthermore, such a good would not be produced by a private, for-profit enterprise. Hence, so the argument goes, there is a straightforward case for public subsidies to those who engage in the search for knowledge for its own sake.

The archetypical example of a public good, much used in the economics textbook literature, is national defense, and to have persuaded US legislators in the late 1950s that universities contributed so much to its production that they would be worthy beneficiaries of a *National Defense Education Act* was a stroke of opportunistic genius on someone’s part. Nowadays, there is little mileage to be had from this particular argument, even in the United States, let alone Canada. It has, as we have seen, been replaced by the claim that knowledge, scientific and technical knowledge in particular, is the key to increasing national prosperity, and, therefore, that its generation by researchers must have government support. It has already been pointed out that there is room for skepticism in the face of this argument.

Recall, first of all, Harberger’s (1998) study, discussed above, which looks for, but does not find, signs of economy-wide spillover effects on productivity growth, emanating perhaps from the general expansion of knowledge. Here too, it is also worth drawing attention to such work as that of Zucker, Darby, and Armstrong (1998) on

more localized spillover effects. They study the interaction between research carried out in California universities and the activities of nearby firms in the biotechnology sector. That such interaction has been important is beyond question, but apparently it has not involved generalized spillover effects. The results of university-based research in this area were not public goods available for anyone in the vicinity of their creation to exploit. Rather, there were collaborative efforts between identifiable university researchers and specific firms, with these firms rewarding the researchers in question for their efforts with private income.⁹ These findings confirm the theory that basic science yields economically productive applications, but they provide no support for its public subsidization. On the contrary, they suggest that private markets provide adequate incentives to get basic science done and then applied.¹⁰

On the other hand, the evidence just cited comes from one particular industry, and it may be that, in other areas, there are indeed significant scientific and technical ideas of great productive potential that do quickly become common knowledge and generate spillovers. In that case, public subsidies to their production would seem to be justified. There is, however, a trap in this argument. As we are so often told, Canada operates in a “global” economy, and shares a border with the most productive economy in the world. If Canada is ambitious about improving its productivity performance by exploiting new ideas that really do generate substantial external effects on productivity growth, it has a cheaper alternative to subsidizing the production of such ideas at home. It can simply take a free ride on research results produced in the United States, which, by common consent, already has the most intellectually fertile university system the world has ever known.

9 This paper is not an isolated effort, but a recent product of an ongoing research agenda. Its results are typical of those its authors and various associates have obtained in other studies, many of which are listed in its bibliography.

10 This result should not perhaps be surprising, because it has long been understood that, to the extent ideas can be protected as trade secrets, or patented, the returns they yield can be captured by their originators. There is no reason those who can establish rights to exploit the fruits of research in this way should expect anyone else to pay for it.

Externalities and Current Policies

Recent initiatives at the federal level in Canada, notably the Centres of Excellence and Canada Research Chairs programs, suggest that the argument outlined above has not been accepted in policy-making circles; and perhaps there are, after all, other external effects that would justify these programs.

For example, it is sometimes suggested that externalities arise not just from university research itself, but also from public confidence in the independence and integrity of those who carry it out. From this perspective, even knowledge that *can* be patented and privately exploited confers more benefits if it is the outcome of disinterested research and remains in the public domain. James Turk, clearly intending his argument to apply well beyond the bounds of research in science and technology, puts the matter as follows:

[T]he university's mission is the unqualified pursuit and public dissemination of knowledge and truth. The university serves the broad public interest by treasuring informed analysis and uncompromising standards of intellectual integrity. (2000, 3.)

This statement has considerable merit as a justification for disinterested public participation in the funding of research, but the operative word here is *disinterested*. Governments, no more willing than any other agents to remain at arm's length from the activities they fund, increasingly seek to influence the direction those research activities take.

It is worth noting, furthermore, that governments themselves nowadays often encourage the formation of "partnerships" between universities and private sector agents with a view to producing and then sharing the revenue generated by commercially exploitable ideas. Turk (*ibid.*) and his associates are particularly critical of such arrangements — rightly so, in view of the criteria they bring to bear on the matter. But they perhaps pay insufficient attention to the general threat to the integrity of universities that is bound to arise whenever they become too dependent on any single source of revenue, be it public or private. It is not clear to me that the integrity of the research activities of a university sector that attracts a signif-

icant proportion of its funding from multiple partnerships with private agents is under greater threat than one that relies for its support on public expenditures for strategic initiatives designed by politicians and bureaucrats. These considerations suggest that arm's-length arrangements are just as important for ensuring the integrity of government funding of research as they are in the case of the private sector.

A second argument about the external benefits created by the public funding of universities reveals an apparent contradiction in certain current policies. That argument has it that such benefits are generated not just by ideas, but also by the presence in a community of the individuals who generate them. People capable of excellence in research (as in other endeavors), so the argument goes, are a desirable ornament to any self-respecting community, and Canada is poorer if they do their work elsewhere, even if its results take the form of an immediately available public good whose material benefits Canadian free riders can readily exploit. If this argument is compelling, however, it suggests that we ought not to tolerate (as Smith notes) restrictive salary agreements in our universities, particularly those that are unionized, that make it impossible for them to compete with their US counterparts for truly excellent personnel. It also suggests that immigration restrictions that give privileges in the academic job market to merely competent citizens and landed immigrants over outstanding foreigners are damaging to Canada. Excellence, like misery, loves company, and if we restrict immigration so as to discourage the employment of excellent foreign researchers in Canada, we should not be surprised to find that excellent Canadians emigrate to the United States to work with them there. It is, therefore, a small step in the right direction that such restrictions have been relaxed a little.

Note finally, however, that some of the above arguments, notably those about opportunities for free riding on research done in other countries, apply best to technical and scientific subjects. It is one thing to take a free ride on scientific and technical research done elsewhere, but another altogether to try the same trick with the outcome of scholarly work in the humanities and social sciences. Scientific and technical truths do not change at national borders, but a country that relies on another jurisdiction to do its critical thinking

for it on matters of values, and of their application to social questions, will in due course end up with no values or distinctive policies of its own, and will cease to be a distinct entity. As with the creation of human capital, so too with the generation of new ideas: the case for public subsidies to Canadian universities is at least as strong in the humanities and social sciences as it is in science and technology. Here, too, the fact that conventional cost-benefit analysis seems not to apply implies a great deal about the limitations of that technique but nothing at all about the intrinsic significance of the problem.

Directions for Policy

Current policy toward universities in Canada seeks to provide broad access to undergraduate education by imposing stringent limits on fees. Against this background, it seems to favor scientific, technical, and professional fields over others when it comes to funding research and postgraduate study. At the same time, Canada's postsecondary education policy actively encourages a deeper involvement of business in the work of universities as a means of funding both research and teaching. Overall, this policy stance is not well justified by what we know about the economics of the matter, and I now turn to making some suggestions for change. Let it be clear that, in doing so, I do not intend to implicate the authors of subsequent essays in this volume as advocates of specific measures. These authors can and do speak for themselves on the issues raised by their own studies.

Tuition Fees and Loan Guarantees

First and foremost, note that the returns accruing to recipients of undergraduate university education in Canada are comfortably positive in most areas, even when full account is taken of the subsidies students currently receive. Vaillancourt and Bourdeau-Primeau argue on the basis of 1995 data that there was then room for a significant increase in tuition fees, a conclusion that, as Rathje and Emery show, still holds in light of 1998 data. The only area of under-

graduate study where a significant increase in tuition fees could not be absorbed by students is fine arts.¹¹

There is no reason to believe, therefore, that the system could not continue to function even if all restrictions on the fees universities charge were removed and courses of study were priced, along lines suggested by Davenport (1996), to reflect the costs of providing them. Such a step would make undergraduate students, rather than government and business, the principal source of funding for universities. They would, therefore, become the principal arbiters of what programs are offered, on what scale, and at what levels. The demand for well-educated workers seems to be still growing in Canada, and some catching up to the United States remains to be done in terms of the proportion of the population receiving university education, despite the fact that such training is already a good deal more costly to obtain south of the border. It is therefore doubtful that the increases in Canadian tuition fees implicit in this proposal would lead to an absolute shrinkage in the demand for university places. It might well lead to some significant reallocations of resources within universities, however, as students began to take more careful note than they do now of the relationship between the resource costs of various programs and the returns they can be expected to yield. It is hard to believe that the overall outcome would be anything other than an improvement in the university sector's efficiency as a producer of human capital.¹²

One important condition must be satisfied to make any such deregulation of tuition fees desirable, a condition called for by considerations both of economic efficiency and of equity. Government

11 Note however, that their calculations involve rates of return in which sex differences have been averaged out. This is appropriate, for universities could hardly charge different fees to men and women. At the same time, a move to tuition fees based on the costs of education would likely lead to some movement of men among disciplines, and perhaps out of university education altogether.

12 To the extent that students themselves were paying for undergraduate education, the potential, noted by Nakamura and Bruneau, for electronic placement services inadvertently to transfer resources from Canadian taxpayers to US employers would be reduced or even removed altogether. I am grateful to François Vaillancourt for this point.

must ensure that lack of access to funds for education does not shut any otherwise qualified and willing applicant out of the university system. Potential students who are already in possession of sufficient resources could use them to buy an education offered at its market price, but in the absence of some sort of intervention, the less wealthy would face a serious barrier arising from the simple fact that private sector financial institutions do not usually make loans without collateral. Since indentured labor is, with good reason, illegal, any loans in aid of the purchase of higher education that they would be likely to offer in the absence of government intervention would go only to those who do not need them.

There is an obvious case for repairing this important gap in the private capital market by, at a minimum, having government provide guarantees in lieu of collateral to institutions making educational loans. The reader who wonders whether this has not already been tried and found wanting is reminded that what is being advocated here is support for *university* education, and Davenport's evidence shows that the default rate in this area has been low under current arrangements. Advocacy of the general principle of making student loans readily available should not be read as support for any specific program. This is an area where many devils lurk in the details, and there is not space here to deal with them.¹³

The Role of Subsidies

Those who believe there are important social payoffs to university education will continue to favor its further support by outright public subsidies. The considerations that would justify such measures involve, as has already been noted, fundamental social and political values not amenable to economic analysis. They must, then, be debated and dealt with through political processes — and, since

13 Here the reader's attention is drawn to Finnie (2001), who provides a careful analysis of the advantages of loans over grants as means of making post-secondary education accessible, and of the virtues (of which there are many) and shortcomings of the system currently in place, together with suggestions for improving it.

the questions at stake are of national significance, there is a clear role for the federal government in coping with them.

If the outcome of these deliberations is, however, a decision in favor of tuition subsidies, the arguments advanced above for giving market power to individual students still stand, suggesting that subsidies should be given directly to those individual students rather than to provincial governments or university administrations to be spent on their behalf. They could, for example, take the form of cash grants or of interest subsidies for student loans; the tax subsidies currently offered in registered educational savings plans (RESPs) also conform to this principle.¹⁴

Since we know so little about how the value of the external benefits that would justify public subsidies varies across areas of study, it would probably be best to distribute them in proportion to student enrollments in various disciplines, thus ensuring that public support for universities does not become a covert means whereby governments divert their activities away from the mix that their customers desire. This would happen automatically if federal subsidies were given to individual students by way of vouchers, independent of their chosen fields of study. However, other donors, including individuals, firms, and industry associations, not to mention provincial and local governments, should be left free to endow scholarships and to offer other support in particular areas as they see fit, subject only to the willingness of the university in question to accept what is offered. In this way, organizations that believe certain lines of study produce human capital of a type that yields particular benefits to them can pay for its production if that seems to be in their self-interest. And universities, ever mindful of the need to attract paying students, can be expected to be vigilant against gifts that arrive with conditions attached whose implementation would undermine the integrity of their programs of study.

¹⁴ One form of subsidy that seems to have much popular support would make the repayment schedules for student loans contingent on income earned after graduation. See, however, Smith's penetrating discussion in this volume of the perverse incentives implicit in such schemes.

Graduate study presents a no more complicated set of issues. For most professional programs, arrangements similar to those suggested for undergraduates should work without problems.¹⁵ For those closer to the purely academic end of the spectrum, there might be more difficulties, but to the extent that the low material returns revealed by the Vaillancourt and Bourdeau-Primeau and Rathje and Emery studies are compensated for by intangible rewards, this would not be the case. Besides, if most PhD recipients go into university teaching, and if university revenues are to be mainly driven by undergraduate fees, then market mechanisms will work to ensure a level of reward necessary to maintain a supply of suitably qualified teachers. Even so, in the current state of knowledge, we should not rule out the possibility canvassed by Rathje and Emery that there are substantial externalities to be realized at this level that would justify the public provision of postgraduate scholarships and other forms of support.

Research Funding

Chant and Gibson suggest that universities use their research performance as a means of signaling to potential students the quality of the education they offer. To that extent, there is a case for funding research expenditures out of tuition revenue. By and large, university teachers enjoy research and other scholarly activities, and will choose to work at institutions that provide them with the time and resources to engage in them, through such means as lighter teaching loads and access to research assistants (who are usually drawn from the graduate student body).

15 Rathje and Emery's results on rates of return to medical education present a special problem in this context. To the extent that the low returns they estimate simply reflect a measurement bias stemming from the omission of self-employment income, they can be ignored. To the extent, however, that they reflect the effects of the organization of Canada's health care system, they suggest either that changes need to be made to that organization with a view to increasing the incomes of medical practitioners, or that the education of those practitioners requires subsidies. This issue raises questions far too complex to be addressed here.

If these benefits have to be paid for out of undergraduate tuition revenues, the ultimate judges of which academics will enjoy them will be their students. Professors who neglect undergraduate teaching in order to pursue research will not last long in such a system, and there can surely be no complaint about that. It might be objected that such arrangements would prove difficult to implement in institutions where faculty are unionized, and that universities constrained by such arrangements would be hard put to compete with those that are not subject to them. One can only respond that, if this does turn out to be the case, unionized institutions will be forced to contract, to charge lower fees for the services of lesser teachers, or to change their ways. It is hard to see why such an outcome would be anything other than desirable.

As with the creation of human capital, particularly at the postgraduate level, there are strong arguments that pure research and scholarship yield important social benefits. But, as I have argued, in this realm conventional economic analysis is, by its very nature, of only limited help in providing quantitative estimates of their value. Furthermore, policies regarding public funding of university-based research and its scale are also political matters of national importance, and similarly need to be debated and settled in the federal political arena. Current economic knowledge nevertheless yields two important lessons for such decisions. First, it would be unwise to premise them on productivity-growth spillover effects, the existence of which is extremely dubious. Second, if research productivity in universities is, like productivity elsewhere, a matter of “mushrooms” rather than “yeast,” then public support for research would be better concentrated on researcher-initiated and curiosity-driven projects than, as at present, on centrally designed strategic initiatives.

Philanthropic private sector support ought, of course, to be part of the picture here, too. It ought to continue to be possible for firms and industries to pay for research that will be beneficial and profitable to them, subject to whatever restrictions the universities themselves see fit to place on such arrangements. Universities that come to rely more heavily than they now do on tuition fees paid by students, who will be concerned about the integrity of the institutions they attend, can be expected to take care to defend that

integrity. To this end, it would be a matter of simple self-interest for universities to ensure that all research contracts, whether with government or the private sector, be open to public scrutiny, and that no restrictions be placed on the publication of results generated under their auspices.

The Political Context

Universities are currently a provincial responsibility, but the forgoing arguments lead to the suggestion that provincial financing take on a secondary role in supporting a system that draws its basic revenue from tuition fees, supported by federal government guarantees — and perhaps subsidies — in a student loan market, as well as from subsidies to research that emanate from both the federal government and the private sector. Something, therefore, needs to be said about the political feasibility of such a rearrangement of financial responsibilities.

Note first of all that there is no suggestion here that the provinces surrender their statutory authority over universities or the right to continue subsidizing them if they see fit. The major change advocated is that they stop using their regulatory powers to hold down fees below the levels that universities themselves would like to set. Given that there is immense pressure on governments at all levels to increase health care spending, that universities compete directly with health care in provincial budgets, and that Ottawa's grants in aid of these two sectors are bundled together into the Canada Health and Social Transfer, there is perhaps room for a federal-provincial agreement that would see the provinces deregulate university fees in exchange for the creation of a federal loan guarantee system, with the resulting public expenditure savings being partly devoted to health care funding. In this way, overall government expenditures at both levels could be cut, spending on a popular program could be increased, and a new and more secure tuition revenue base could be provided for the funding of the important, but not so politically popular, university sector. The matter is surely worth some further thought along these lines.

Finally, it would do no harm if there were freedom of entry, subject to a minimum level of oversight designed to prevent outright

fraud, into the provision of university education. This again is an area where the provinces could use their powers without incurring expenditure obligations. In this case, there is no need for federal-provincial or interprovincial cooperation. Each province can experiment with what it does and does not approve. The recent and continuing growth of online universities in Canada has, in fact, already moved us a long way toward freedom of entry in this sector, at least as far as its teaching function is concerned. In saying that this is a positive step, I should not be read as approving of the specific programs offered by particular institutions, some of which, to judge from their websites, are heirs apparent to the organizations that used to advertise on matchbooks in the days when more people smoked.¹⁶ I only mean to express the belief that the weaker ones among them will soon be weeded out by market forces, while the stronger ones will prevent the exploitation of monopoly power by existing institutions over particularly lucrative lines of business.

Concluding Comment

In this essay, I have highlighted the major results presented in the papers that follow, and tried to extract a coherent policy message from them as a whole. The main thrust of this message is easily summarized.

First, Canadian universities are productive institutions, but they have problems that need addressing. Some of these — the relative dearth of male undergraduates, and their relatively poorer performance — are probably not of their making; others — the influence of e-recruiting on their job-placement efforts — are quite specific and can be addressed in isolation. Still others, however, stemming both from methods and levels of funding, are system wide, and

16 Thus, I have considerable sympathy with Noble's (2000) opinions on the merits of these institutions. His comparison of modern internet-based "distance learning" initiatives to earlier efforts in this area that involved correspondence courses is revealing and, in many respects, compelling. I differ from him in having more faith in the capacity of prospective students to make informed choices among the better, worse, and downright fraudulent courses that are offered.

attract considerable attention because of the presumed importance of both education and research to the rise of Canadians' standard of living. Universities are undoubtedly major players in the knowledge economy, but their role stems from two facts: the majority of their graduates have useful skills that command high salaries; and the universities produce ideas that sometimes have social importance, including the potential to contribute to the economy's output.

Current public policies toward universities seem to be premised on the belief that their activities in teaching and research, in addition to the private benefits they confer, also spin off public goods capable of enhancing the economy's rate of productivity growth, the supply of which can be increased by government subsidies to a subset of their activities. This subset is concentrated in the science and technology area, where government encouragement of cooperation with the private sector is also being touted as a source of such spillovers. Unfortunately, the empirical basis for this belief is weak, and the thrust of current policies may well be misplaced.

A more realistic perception of the role of universities focuses on their well-established capacity to produce both human and knowledge capital that yields significant private returns. It follows that making use of the incentives implicit in this role would bring about an enhancement of their performance. To harness these incentives, universities must become more responsive, not to government but to their students, and the way to do that is to make those students the universities' principal source of revenue. A national educational loan program that eliminates capital market impediments to the implementation of such a change ought, therefore, to be a high priority. It may prove impossible to move policy all the way in the directions suggested in this essay. Nonetheless, current policies, some of which seem to be moving in the opposite direction, are probably rendering Canadian universities less, rather than more, efficient contributors to the knowledge economy.

References

- Aghion, P., and P.W. Howitt. 1998. *Endogenous Growth Theory*. Cambridge, Mass.: Massachusetts Institute of Technology Press.
- Auld, D. 1996. *Expanding Horizons: Privatizing Universities*. Toronto: University of Toronto Press.
- Barth, E. 2001. "External Effects of Education? Evidence from the Wage Structure." Paper presented at a Workshop on Skill Needs and Labour Market Dynamics, Wissenschaftszentrum, Berlin, November 8–9. Oslo: Institute for Social Research. Mimeographed.
- Blaug, M. 1999. "Mark Blaug." In B. Snowden and H.R. Vane, eds., *Conversations with Leading Economists: Interpreting Modern Macroeconomics*. Cheltenham, UK: Edward Elgar.
- Cameron, D. 1992. *More than an Academic Question: Universities, Government, and Public Policy in Canada*. Montreal: Institute for Research on Public Policy.
- Davenport, P. 1996. "Deregulation and Restructuring in Ontario's University System." *Canadian Business Economics* 4 (July–September): 27–36.
- Finnie, R. 2001. "Measuring the Load, Easing the Burden: Canada's Student Loan Programs and the Revitalization of Canadian Postsecondary Education." *C.D. Howe Institute Commentary* 153. Toronto: C.D. Howe Institute.
- Franklin, U. 2000. "What Is at Stake." In J.L. Turk, ed., *The Corporate Campus: Commercialization and the Dangers to Canada's Colleges and Universities*. Toronto: James Lorimer.
- Harberger, A.C. 1998. "A Vision of the Growth Process." *American Economic Review* 98 (March): 1–23.
- Kerr, C. 1963. *The Uses of a University*. Cambridge, Mass.: Harvard University Press.
- "Land Grant Universities: An Old Dream in Trouble." 2001. *The Economist*, June 2–6, pp. 29–30.
- Little, B. 2001. "Canada plays catchup despite solid growth." *Globe and Mail* (Toronto), August 13, p. B6.
- Noble, D.F. 2000. "Digital Diploma Mills: Rehearsal for the Revolution." In J.L. Turk, ed., *The Corporate Campus: Commercialization and the Dangers to Canada's Colleges and Universities*. Toronto: James Lorimer.
- Rao, S., and J. Tang. 2001. "The Contribution of ICTs to Productivity Growth in Canada and the United States in the 1990s." *International Productivity Monitor* 3 (Fall): 3–8.
-

- Riddell, W.C., and A. Sweetman. 2000. "Human Capital Formation in a Period of Rapid Change." In W.C. Riddell and F. St-Hilaire, eds., *Adapting Public Policy to a Labour Market in Transition*. Montreal: Institute for Research on Public Policy.
- Sharpe, A. 2001. "Determinants of Trends in Living Standards in Canada and the United States, 1982–2000." *International Productivity Monitor* 2 (Spring): 3–10.
- Stager, D. 1996. "Returns to Investment in Ontario University Education 1960–1990, and Implications for Tuition Fee Policy." *Canadian Journal of Higher Education* 26 (2): 1–22.
- Teixera, P.N. 1999. "A Portrait of the Economics of Education, 1960–1999." In R.E. Backhouse and J. Biddle, eds., *Towards a History of Applied Economics*, annual supplement to *History of Political Economy* 32. Durham, NC: Duke University Press.
- Turk, J.L., ed. 2000. *The Corporate Campus: Commercialization and the Dangers to Canada's Colleges and Universities*. Toronto: James Lorimer.
- West, E. 1988. *Higher Education in Canada*. Vancouver: Fraser Institute.
- Winston, G.C. 1999. "Subsidies, Hierarchy and Peers: The Awkward Economics of Higher Education." *Journal of Economic Perspectives* 13 (Winter): 13–36.
- Zucher, L.G., M.R. Darby, and J. Armstrong. 1998. "Geographically Localized Knowledge: Spillovers or Markets?" *Economic Inquiry* 36 (January): 65–86.
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