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Room at the Top:

*Strategies for Increasing the
Number of Graduate Students
in Canada*

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In this issue...

The knowledge economy requires more people with advanced degrees. Policies that attach funding to students hold the greatest promise for increasing both the quantity and quality of graduate education.

The Study in Brief

The demands of the new knowledge economy require nations to have increasing numbers of highly skilled workers, including those with graduate degrees. Expanding graduate education will inevitably be an expensive proposition, but how would this money be spent best?

On the demand side, modifications have to be made to the student financial aid system and other bursary/scholarship programs in order to help students pay for their studies and otherwise make graduate education an attractive proposition, especially for the most qualified candidates and those in the disciplines that need to draw more students. Changes should include:

- expanding (graduate) student loan eligibility and generally raising loan limits;
- increasing grants, scholarships, and bursaries to help make graduate education affordable and appealing as a career investment;
- varying awards by discipline, depending not only on schooling costs, but also outside employment opportunities and the social (and economic) value of the schooling.

Such measures should look after increasing the demand for graduate school education among qualified candidates. Policy initiatives on the supply side would, however, also be necessary so that the system can provide the places required for these extra students.

Traditional measures such as increasing government-to-government or government-to-institution transfers could be a part of the solution, as would increasing the money available for research. But such approaches offer few guarantees that the money will be spent in the manner most likely to expand the system where its quality is greatest. Nor do they ensure that we have the best graduate education system possible for the money spent.

Alternative approaches include attaching funding to students directly, and varying the amounts awarded according to the standing of the student (based on grades, exams and other criteria). Such a voucher-type system could create incentives for institutions to improve the quality of their programs as they compete for top students, while also giving them the financial means to expand.

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The economic advantage enjoyed by developed nations is largely rooted in their stocks of human capital, and if Canada is to be competitive at the international level it must have highly skilled people who are able to lead its R&D efforts, pass on its advanced knowledge and skill to the next generation of students seeking higher education, and otherwise spearhead the country's economic dynamism.

It is, however, no longer enough just to expand access to postsecondary education generally or to increase the number of persons with undergraduate degrees. With the worldwide growth of higher education in the past two decades,¹ these levels of education no longer give Canada — or indeed any other country — a sufficient human-capital advantage. Maintaining a competitive position in the knowledge economy now requires that large numbers of students acquire advanced degrees.

In its last major policy statement on innovation and competitiveness, *Achieving Excellence*, the federal government discussed the importance of higher education and committed itself to increasing the number of graduate students² (in both master's and PhD programs) in this country by 5 percent a year through 2010 (Canada 2002b, 60). Other reports, including the recent Rae Review in Ontario, have sounded similar clarions and have proposed similar goals. Clearly, Canadian governments are getting the message about the growing importance of advanced degrees. But the expansion of graduate education poses a number of challenges that governments — and to a certain extent universities themselves — have yet to solve or perhaps even fully appreciate.

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- 1 Since 1975, worldwide enrolment in tertiary education has grown from 39.6 million, 45 percent of which was in North America and Western Europe, to 126.1 million, only 24.4 percent of which was in North America and Western Europe (Usher and Mildeburger 2007, forthcoming).
 - 2 In this paper we use "graduate students" and "graduate programs" to mean what are sometimes referred to as "post-graduate" studies, ie. beyond the first degree level.
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This paper has four goals. The first is to sketch the very real financial challenges involved in expanding graduate education. The second is to present a framework for thinking about the supply of and demand for graduate education that provides a basis for the ensuing discussions. The third is to discuss the broad policy levers as well as specific policy initiatives that might allow us to increase the number of graduate students as effectively and efficiently as possible. The fourth and final goal is to outline some of the related policy implications of expanding graduate education, particularly as they pertain to teaching and learning at both the graduate and undergraduate levels.

At the heart of the paper is a simple demand-supply analytical framework that provides a useful basis for considering the factors that determine the number and quality of graduate students. One of the implications of this framework is that policies will be needed on both sides of the graduate student equation: measures to expand the capacity of the system as well as greater incentives for more (and perhaps different) people to enrol. The importance of the supply-side factors means, in particular, that offering more graduate scholarships and bursaries, as the federal government did in its 2003 budget, is unlikely to get the job done on its own. The more difficult and central task, in fact, is to increase capacity.

One possible means of achieving the expansion proposed here is essentially to attach graduate school funding to meritorious qualified students, who will then take that funding with them to their institutions and programs of choice and thus provide the means for expanding the system where it will best serve students — and society.

While such an approach would imply various design challenges, it is also quite practical and could be put into place fairly quickly and efficiently by using existing structures that award scholarships on the basis of students' merit. In this way, the proposed system would incorporate the much-vaunted benefits of the "single-payer" approach that generates such efficiencies for our public health system, and yet at the same time open up the "market" for graduate education and thus serve the goals of more and better schooling with improved efficiency. In short, such an approach should allow the system to create the best possible graduate programs of the desired size for the money invested.

The Cost of Expanding Graduate Education

Before we turn to discussions of policy mechanisms for increasing the number of students pursuing advanced degrees, it is worth stopping to consider the size of the sector we are discussing and the likely financial cost of expanding it.

The most recent statistics show that there are 148,000 graduate students in Canada, of whom 71 percent are full-time and 29 percent are part-time. Men are slightly more numerous among doctoral students and full-time students; women predominate among master's level and part-time students (Statistics Canada 2006). Roughly 74 percent of graduate students are studying at the master's level; the rest are studying at the doctoral level (CAGS 2005). Quebec has 30 percent of all Canadian graduate students, which is a disproportionately high number since it has only about one-quarter of the country's university students at all levels.

Although graduate students at the master's and doctoral levels are frequently lumped together, it is instructive to note the very large differences in concentrations of enrolments by field of study at the two levels. At the master's level, the largest fields of study are business and administration (25 percent of all enrolment), engineering (15 percent), social sciences (13 percent), and education (12 percent). At the doctoral level, the largest fields of study are physical and life sciences (22 percent of all enrolment), social sciences (20 percent), engineering (16 percent), and the humanities (12 percent) (CAGS 2005).

The cost of this education is highly variable; there is no single set cost of educating a student at any particular level or in any particular place. The cost depends on such things as instructors' salaries, teacher-student ratios, and the intensity of capital inputs, such as building construction and maintenance, IT infrastructure, and library acquisitions. Significant differences between institutions or jurisdictions — or changes (over time) — in these inputs will alter per-student costs. Of course fundamental to variations in cost are differences in quality, but efficiency also counts, and cost is not necessarily a direct indicator of quality.

At the global level, there are countries (in much of Asia and East Africa) where the cost of educating an undergraduate student is about \$1,000 a year, whereas in the OECD countries the average is over \$10,000, and in elite private colleges and universities in the United States it is \$30,000 or even higher (Usher 2005). In Canada, the amount of per-student funding varies significantly from province to province. A recent publication by the Canadian Policy Research Networks calculates that per-student funding from all sources ranges from \$14,300 in New Brunswick to over \$35,000 in British Columbia (Snowdon 2006). The average per-student funding is calculated to be about \$23,000.

All observers agree that it costs more to educate graduate students than undergraduate students because more advanced students require greater contact with their professors and greater access to equipment, laboratories, and other resources. How much more depends on the institution, the field of study, and the level of study, with doctoral students generally needing more resources than master's students. Although there are no Canadian studies on costs per student, certain rules of thumb are embodied in provincial funding formulas. Ontario, for instance (which has one of the more explicit and sophisticated funding models) funds master's students at anywhere between 1.5 and 3 times the level of undergraduate students, depending once again on the field of study, and PhD students at between 3 and 6 times the level of undergraduate students (Ontario 2003). Assuming that these kinds of funding ratios bear some relationship to actual costs, an increase in the number of graduate students will create a much greater burden for universities than would a similar increase in the number of undergraduate students.

Imagine for a moment that graduate enrolment were to increase by 7 percent a year. This may seem large (and indeed, it is more than some government targets), but even that rate of increase, sustained for a decade, would still leave Canada trailing the United States in the proportion of graduate students. Such a rate of growth does not even seem particularly large when compared to recent trends: over the period 1999/2000 to 2004/05, graduate enrolment rose by 28 percent, or a simple average of about 5.6 percent a year — which was far ahead of the average

increase for undergraduate students of just under 4 percent a year, itself a total that is significantly inflated by the distorting effects of Ontario's double cohort (Statistics Canada 2006).

Such an increase would lead to a doubling of graduate students in 10 years, to just under 300,000. Assuming, on the basis of the Ontario funding numbers, that on average one graduate student costs 2.5 times as much as an undergraduate, then the cost of doubling graduate numbers would be roughly equal to the cost of adding 375,000 undergraduates to the country's colleges and universities. To put it another way, it would be almost like adding the equivalent of another Ontario to the national system of postsecondary education. To put this in perspective, the collective operating budgets of Ontario universities now total about \$5 billion a year (Council of Ontario Universities 2006).

This is, of course, a large sum of money and not one that will be easily borne by the public purse (even if it pales somewhat in comparison to recent increases in health care costs). The costs could be reduced somewhat by changes in instruction methods and could to at least some extent be defrayed by higher tuition fees. Neither of these two alternatives is problem-free, however, and we will turn to the secondary policy challenges posed by each one later in this paper.

For now, having established the financial context of the policies being discussed, let us concentrate on the first challenge of how we might attract and keep substantial numbers of new graduate students in Canadian universities in the years to come.

An Analytical Framework

This section presents a relatively simple demand-supply framework that is useful for thinking about the number and "quality" of graduate students in Canada and how these two underlying factors could be influenced by various policy measures. It first develops each of the demand-and-supply concepts individually, and then puts them together with a stylized treatment of tuition policies to portray an equilibrium that identifies the number and certain characteristics of students in the system.

Despite its simplicity, the framework helps to clarify a number of important practical issues. In particular, it emphasizes the importance of the supply side of the system as much as the demand side — in other words, the need not only to encourage students to pursue graduate studies, but to ensure there are enough places for them. The development of this framework sets the stage for the following sections, which deal with specific policies that could be used to increase the numbers and quality of graduate students in Canada. That said, some readers may wish to go straight to the policy discussions that follow — even though those discussions depend on the material presented here.

The Demand for Graduate Education

The demand for graduate education may be defined as representing the number of qualified people who (i) would like to pursue studies at this level, and (ii) are able to do so in that they can afford the tuition fees and living costs during their studies and can overcome other potential barriers. The classic demand "curve"

shows the relationship between price and quantity demanded on the part of “consumers.” In this case, demand can be thought of as the number of places sought in graduate schools at any given level of tuition fees.

The demand curve for graduate education — like virtually all demand curves — would be expected to have a negative slope, meaning that at higher tuition levels, fewer people would want to pursue higher studies or have the means to do so, and vice versa. This is for two general reasons. First, a higher price reduces the rate of return to schooling because of the increased costs of the investment represented by the higher fees, so that some people will no longer wish to attend; and second, a higher price also makes it more difficult for some individuals to afford attendance.

Given these fundamental characteristics of the price-demand relationship for graduate education, its specific form and position will be affected by the various factors that determine demand at any given price. An appreciation of some of the most important of these is useful for understanding “the market for graduate education” — or, in terms of the issue at hand, for identifying measures that could increase the number of people who are willing, and able, to pursue graduate studies.

Broadly, four sets of factors influence the demand for education, which are now considered in turn.

Labour Market Opportunities

To the extent that graduate studies improve a person’s lifetime earnings or otherwise lead to desirable jobs, this should increase the demand for graduate education.³ A related, shorter-run labour market influence on graduate-school attendance is the immediate availability of jobs for those who choose not to continue with their studies. When unemployment declines, for example, the demand for postsecondary education tends to decrease, since the opportunity cost of going to school in terms of the alternative uses of individuals’ time (earning money in a job) falls, and this dynamic appears to hold at the graduate level as elsewhere.⁴

3 It is important to recognize that the private returns to graduate education, at the PhD level in particular, are often estimated to be low, or even negative, at least in some fields (e.g., see Vaillancourt and Bourdeau-Primeau 2002). One reason is that the future job benefits often come in non-monetary forms, such as the greater independence enjoyed by people with graduate degrees, the rewards from doing research, often of one’s own choosing, and other such advantages. But even if the private benefits of going to graduate school are relatively low in financial terms, anything that affects the labour-market opportunities for those with graduate degrees will affect the demand for graduate education. In short, regardless of the prevailing situation, any improvement in future job opportunities for people with graduate degrees should increase the demand for graduate school.

4 See Finnie (2004b) for evidence that going to graduate school appears to vary inversely with prevailing macro conditions: that is, when the economy slows down (and unemployment rises), attendance increases, and vice versa. This leads to speculation as to what sort of people tend to enrol in graduate school as job opportunities decline: perhaps it is those who have not succeeded in finding or keeping a good job after graduating with a first (or second) degree rather than those who would make the best graduate students per se and would then go on to have the most productive careers with those higher levels of education.

Affordability and Student Financial Aid

No amount of demand for graduate education will be effective — even for those for whom it might be a good investment in terms of career earnings and the other benefits it provides — unless the person is able to pay the tuition fees and other direct costs and cover his or her living expenses while in school. For this reason, student financial aid in all its forms is a primary policy tool for influencing the demand for graduate education, and it will therefore figure prominently in the discussions to follow.

The Nature of the Educational Experience

Another set of factors that determine the demand for graduate education pertains to the quality of the programs offered. This can be thought of in two ways. First, are graduate programs good at imparting the knowledge and skills that will prove useful in a person's subsequent career or otherwise make graduate school a worthwhile investment? And second, is the schooling an inherently positive and enjoyable experience for students? The more these questions can be answered in the affirmative, the greater will be the demand for graduate education.

Awareness and Preparation

The more students are aware of the benefits of graduate education, the greater will be the demand for it. Similarly, to the extent that students considering graduate level education are better prepared to succeed in and benefit from such programs, the greater should be the demand for it.

The Supply Side

It is difficult to describe precisely the supply of postsecondary education in Canada because of the diversity of systems operating across the country — diversity resulting from the fact that postsecondary education, unlike in many other countries, is constitutionally a provincial matter. It is, however, possible to describe the essential elements of the system in a way that is useful to this analytical framework and, ultimately, to the policy issues addressed here.

The postsecondary system in Canada may be considered to have a classic upwards-sloping supply curve, which represents a situation where higher prices — in this case the tuition fees paid by students (thus corresponding to the price concept used on the demand side) — result in more places being offered. In short, higher tuition fees make it feasible and worthwhile for universities to expand their capacity.

The shape and position of the supply curve is determined by two main factors.

Core Funding

In addition to receiving a certain share of the tuition fees taken in (depending on the particular jurisdiction's funding formula), universities receive various kinds of

core funding from their provincial governments.⁵ Generally, the greater the core funding for institutions, the more able they are to expand their graduate-student capacity.

The effect of increasing core funding can be thought of as shifting the supply curve outward: that is, increasing the number of places available for graduate students in the system at any given price (tuition fee).

Research Funding

The resources available for research represent another important determinant of the supply of graduate student places, since the two activities — research and graduate education — are significantly related. To the extent that a graduate degree involves research, the more abundant the resources available for research at a university, the greater the number of students that can be trained. Increasing research funding can again be considered as causing the supply curve for graduate education to move outward.

Equilibrium, Supply, and Demand

The Basic Equilibrium

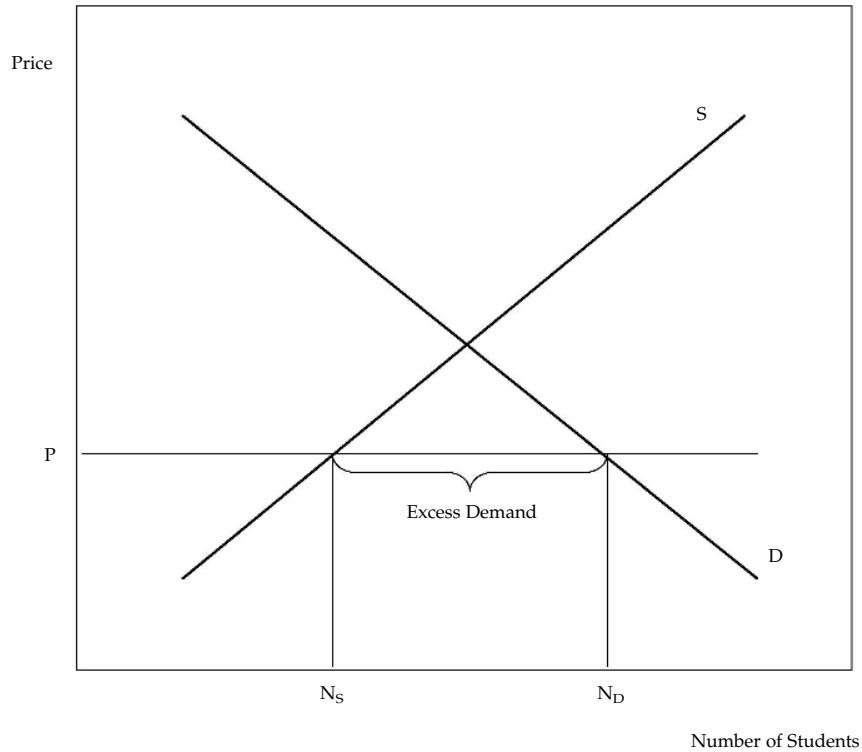
Demand and supply can now be put together to show a typical “equilibrium” situation for graduate education. Figure 1 shows the sort of upward-sloping supply curve and downward-sloping demand curve just discussed. It also shows tuition fees as an exogenous given, as represented by the horizontal line at P , corresponding to the standard situation in Canada, where fees are generally set by provincial education ministries rather than by individual institutions in response to market forces. The number of places for graduate students that institutions are willing and able to supply is represented by the point where the price intersects the supply curve, or N_S . The demand for places on the part of applicants is represented by the point where the price intersects the demand curve, or N_D .

As drawn, the figure shows what is probably the typical situation in Canada, where at prevailing fee levels, demand is greater than supply ($N_D > N_S$); that is, there are more people who would like to go to graduate school than there are places.⁶

We will now consider how changes to various underlying factors that determine the shape and position of the demand and supply curves will affect the

5 Provinces receive a certain amount of funding for these purposes from the federal government through the Canada Social Transfer (CST), though in the last federal election the three national parties all promised to create a separate transfer specifically for postsecondary education.

6 In some provinces, tuition fees are not regulated, or at least can be set by the institutions within a certain range. Supply, though, is usually controlled in one fashion or another, and there is usually excess demand. The framework presented here thus provides at least a good starting point for thinking about the number of students, their characteristics, and the effects of changing any of the factors that affect supply and demand.

Figure 1: *Supply and Demand for Graduate Level Education*

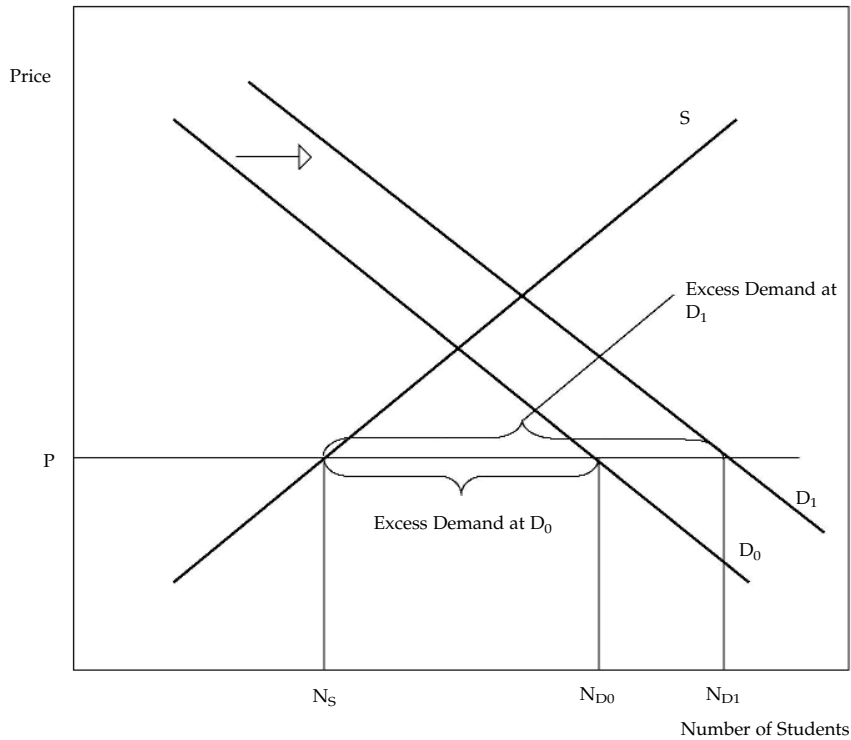
number of students in the system and their characteristics with respect to financial need and ability.

The Effects of Increasing Student Financial Aid

Consider, first, an increase in student financial aid (such as grants or scholarships), which is the most common suggestion when there is talk of increasing the number of graduate students.

An increase in the financial support available to graduate students will shift the demand curve for graduate school to the right — from D_0 to D_1 as shown in Figure 2. This will occur for the two reasons previously discussed: (i) some of those who receive the assistance will thus acquire the means of going to graduate school, and (ii) for those who receive assistance, the reduction in schooling costs will make the investment more worthwhile. Thus, the number of places sought at the prevailing fee levels increases to N_{D1} .

There will, however, not be any change in supply, which remains at N_S , precisely because tuition fees have not changed, meaning that — again in the absence of any other supply-side changes (such as more core funding or research money available) — universities will not have the additional money required to pay for a general expansion and, therefore, will not grow. Since the number of

Figure 2: *The Effects of Increasing Student Aid*

Note: The figure shows the importance of the unchanged tuition fee levels, which mean that the incentive to admit more students at the margin has not changed — even as more students would *like* to attend.

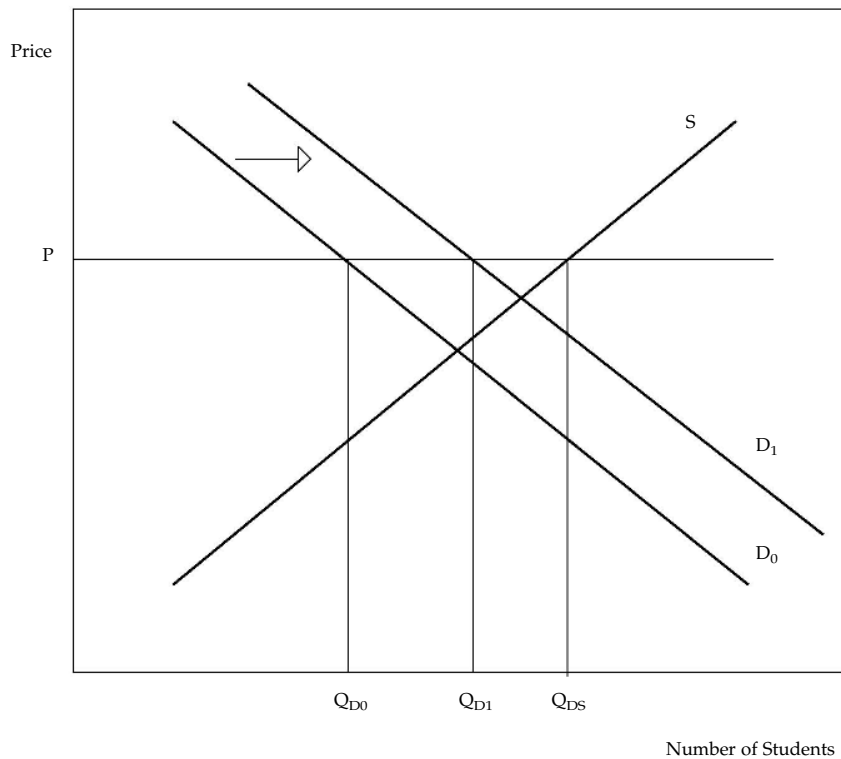
places in the system remains unchanged, the number of students will not change either, remaining at N_S .

This is a simple but very important finding. That is, an increase in aid for graduate students, and thus in the demand for graduate education, will not generally change the number of students. It may change the *kind* of students who are in the system. For example, there should be higher participation among the pool of students receiving the increased aid, who will crowd out others. But if graduate schools are already operating at capacity, they will generally not create *additional* places. Expanding their capacity would require an increase in tuition fees, changes in other elements of the funding formulas, or some other change in the resources they have available.

Changes in Other Demand-Side Factors

A change in demand stemming from any of the other underlying factors discussed above — higher labour-market returns to graduate school, an improvement in the quality of education offered, and so on — would have effects similar to an increase in student financial aid in terms of the number of graduate students. The characteristics of the student body might again change, but overall numbers would not change.

The exception to this rule is where the system is not constrained by its capacity and where the number of places outstrips the number of good candidates. The

Figure 3: *Demand-Constrained Situation*

effect of increasing demand in such circumstances is shown in Figure 3. In such cases, the number of students in the system will in fact increase in response to the demand shift.⁷

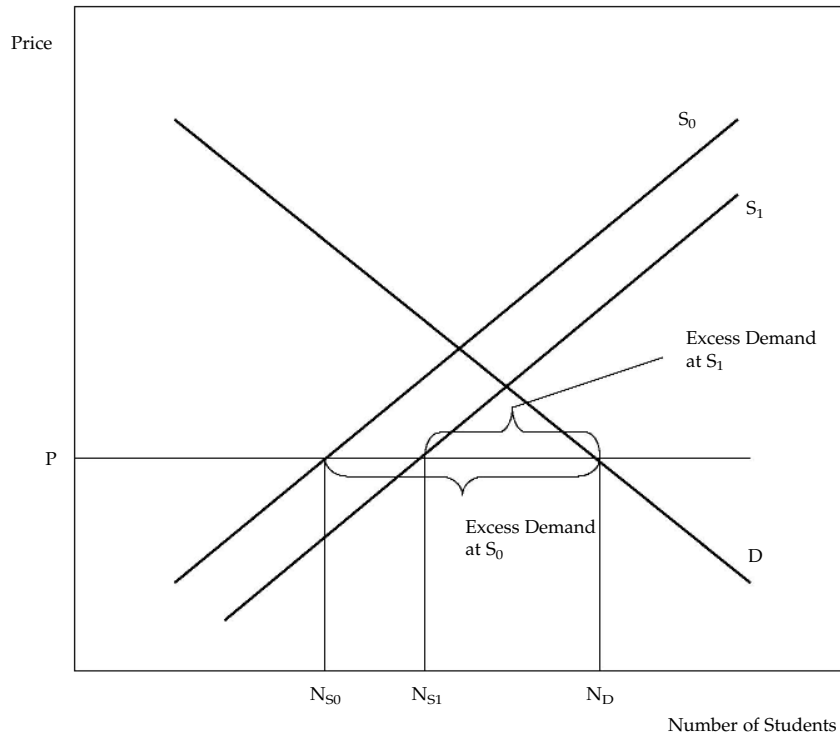
Expanding Capacity

The model presented here suggests that governments would generally have to take supply-side measures to cause the number of graduate students to rise.

The effects of measures that would increase universities' capacity for graduate students can be represented by the outward shift in the supply curve from S_0 to S_1 in Figure 4. Such an expansion could come from increases in per capita funding formulas, from larger block grants, or from any other change that essentially made it possible for institutions to admit a greater number of graduate students.

With such a shift in the supply curve, the number supplied at prevailing tuition fees (P) would increase from N_{S0} to N_{S1} . In the absence of any change in

⁷ This would indeed appear to be the situation in at least certain disciplines, at certain schools. Engineering seems to be a good case in point: at least some universities are crying for good candidates, but it is not worthwhile for many of the best potential students to attend since they can have very good careers without a higher degree. More generous student assistance could, of course, improve this situation, as will be discussed below.

Figure 4: *Expanding Capacity*

tuition fees or in any other underlying demand-side factors, demand would remain at the same level as before (N_D). There would be, as a result, an increase in the number of students in the system as institutions admitted more people to fill the greater number of places now available. The characteristics of the student body would (as with the demand-side changes) also change, depending on the composition of those admitted due to the expansion (ie. the “marginal” students who now gain places in graduate schools).

Policy Options

What are the policy options for increasing the number of graduate students in this country, and ideally, for increasing the numbers where the resulting quality of education is likely to be greatest? The following discussion considers first those initiatives that would operate on the demand side, and then those that would affect the supply side.

Demand-side Options

Labour-Market Returns to Graduate Education

Any measures that increased the labour-market returns to graduate education should lead to greater demand for this level of schooling. These returns, however,

are but one outcome of the entire economic system and are thus generally difficult to affect in isolation. It can be argued that the entire Canadian economy needs to be made more technologically and research-oriented (Lavoie and Finnie 1999), and presumably that would improve the labour outcomes of higher-level university graduates. But this takes us into broader policy issues that lie beyond the specific scope of this paper. Suppose instead that we take the economic system as more or less given; what can we do inside of these bounds to increase the labour market outcomes of master's and PhD graduates, make such an education more attractive, and thus potentially lead to an expansion from the demand side?

Straightforward earnings subsidies for upper-level graduates would be possible, but such measures would likely be less efficient than other more targeted initiatives and might be quite controversial since graduates tend to have relatively high earnings to start with, and the rates of return at the master's level, in particular, are already quite high (as previously discussed).

One common suggestion regarding the doctoral level is to increase the number of postdoctoral fellowships available in order to help graduates get a good start in the labour market and go on to productive and rewarding careers. Other narrowly career-related interventions of this type — as opposed to, say, earnings subsidies (or tax breaks) — might be possible.

Finally, it is important to note that while labour-market outcomes undoubtedly help to determine the demand for graduate studies, incentives for students do not necessarily need to be related to the labour market. Human capital theory teaches that investments are based on the net returns to a given investment, which is partly based on cost. It is to issues of costs and related subsidies that we now turn.

Affordability and Student Financial Aid

Tuition fees for graduate studies are currently at reasonable rates and should probably not be lowered for various reasons, including important equity and efficiency considerations. Nor do we wish to get into the debate regarding what levels fees should be. That leaves us to focus our concerns regarding affordability and the need for improved financial incentives for going on to graduate school on student assistance.

Student assistance may (as previously discussed) have two kinds of effects on the demand for graduate school. First, it can make the schooling more affordable. Secondly, it can raise the rate of return to education and, hence, make the education more worthwhile for students.

In so far as there is insufficient demand for graduate education because it is not affordable for some, student loans are one obvious remedy. An expanded loan system for graduate students with wider eligibility and higher borrowing limits should, therefore, be put in place to ensure that all those who want to go to graduate school and who qualify for established programs are able to do so.

In so far as the demand problem is due to inadequate rates of return — which is probably more likely at the doctoral level than at the master's level — then grants, bursaries, scholarships, and other forms of non-repayable support should be considered (as indeed they have been in the new Canada Graduate Scholarships).

One policy implication regarding the mix of loans and grants is that, whereas loans should be made available on a relatively uniform basis, while reflecting differences in costs among different disciplines, levels, or places of study, scholarships (and other non-repayable forms of support) should in general not be so uniform. In fact, where possible, these subsidies should be awarded on a field-by-field, or at least faculty-by-faculty basis that recognizes the different circumstances that characterize the different areas of study.

For example, it may be difficult to attract worthy candidates to certain disciplines because of the high starting wages for those with only undergraduate degrees. In that case, stipends of one sort or another (or scholarships or some other such kind of non-repayable financial assistance) might be needed to attract students into graduate studies in those disciplines. Alternatively, if the external or social benefits of a particular discipline are deemed to be substantially higher than in other disciplines, higher awards might again be helpful — above and beyond what is needed simply to make the schooling affordable. In either case, the underlying strategy is the same: to make the schooling more attractive to a greater number of qualified candidates.

In general, if we think of student financial aid only in terms of it being sufficient to make the schooling affordable, we might not give as much assistance as is needed in disciplines where (i) it is difficult to attract students because they enjoy attractive labour market opportunities without going on to graduate school; or (ii) where there are other conditions which impinge on the number of individuals wanting to pursue graduate level — whether or not it is affordable.

A good case in point is the current situation in Alberta, where the labour market is so overheated that the opportunity costs of graduate school in terms of foregone labour market earnings are very high. Another is engineering more generally, a field where undergraduates (or master's-level graduates) can have productive and well-paying careers, these careers thus offering relatively stiff competition to graduate programs, especially at the doctoral level. Similar situations are found in other disciplines and jurisdictions. In short, if students are to be attracted to graduate studies, the enticements will — among other factors — have to be sufficient, and the financial aid system has a key role to play in this dynamic.

Such a differential award policy might raise cries of unfairness, which would be correct only if we interpret different as unfair. But if the goal is to devise policies that will attract greater numbers of high-quality candidates to graduate school where it is important (and difficult) to do so, such a flexible, asymmetric approach to award levels would be required. To some extent, such a system already exists, for the awards from the various granting agencies already vary considerably. This flexibility need only be further built upon.

It is beyond the scope of this paper to specify the precise number, form, and value of financial awards that should be offered to help make graduate school not only affordable, but also attractive in relation to students' other possible activities. Only further empirical research and consultations with representatives of the various interested parties — graduate schools, student groups, employer associations, and so on — can do this. It is, however, worth raising one specific issue that should figure in this discussion: namely, the simplification of the system of financial support for graduate students.

The current financial aid system for graduate students — and undergraduates as well, for that matter — is extensive and complex. Financial support comes in the form of scholarships, bursaries, grants, research and teaching assistantships, loans, tuition remission, tax credits, debt remission, and more. Some is based on merit; that is, on marks, awards, and other such criteria. Some, including many grants and all government student loans, is determined principally according to need (as long as the person is in an eligible program). Some, such as tax credits, is totally untargeted, being based on neither need nor merit. The sources are also varied: aid is available from the major federal granting agencies (the NSERC, the SSHRC, and the CIHR), provincial education ministries, universities themselves, federal and provincial loan programs, research projects, and other federal, provincial, and other sources.

These complexities and resulting inefficiencies of the current financial-aid system create high transaction costs, leave students with considerable uncertainty about funding until the last minute, and perhaps most important, do not ensure that the money goes where it is most needed or is otherwise put to best use.⁸ A complete and thorough overhaul of student assistance would undoubtedly help to ensure that the system delivered money in the most equitable, efficient, and effective manner.

The Nature of the Educational Experience

Any improvement in the quality of teaching or the educational experience generally would normally increase the demand for the schooling offered, resulting in more and better applicants as graduate education became more rewarding and more enjoyable. Yet, while universities generally try to provide the best programs possible with the resources at their disposal, there is almost certainly room for improvement in many situations.

And yet the means by which governments can directly effect improvements in the quality of the educational experience are extremely limited and usually they are left with few options but to pump in more money and wish for the best. Sometimes this may work, but it is a generally unsatisfactory approach. Indeed, the best hope we have of creating improvements on this front is probably to put more power in the hands of the students themselves — a topic to which we return below.

Preparedness, Awareness, and Preferences

There are probably a good number of simple, relatively low-cost measures that could improve the preparedness for, awareness of, and preference for graduate school among undergraduates that would in turn increase the demand for upper-level studies. For example, more “think-about-graduate-school-as-a-career-option” sessions could be held for undergraduates — or those held made more effective — so that students gained more early exposure to the idea of going to graduate school and even planned their undergraduate careers with that goal in mind.

⁸ See Finnie, Usher, and Vossensteyn (2004) for a description of the different forms and sources of student financial aid at all levels of postsecondary education, as well as a proposal for reform.

Another idea would be to establish programs that gave undergraduates hands-on research experience, thus helping to prepare them for graduate school and perhaps allowing them to find out at an early stage whether the sort of research career this might prepare them for was something that might appeal to them.

These are, of course, merely sketches of examples to illustrate the sort of initiatives that might be tried. Any actual programs should be based on an examination of the areas of greatest need and an assessment of the sorts of programs that have proved most effective in the past.

Conclusions about Improving Demand-side Factors in Graduate Education

Having discussed these various policy levers, it should be noted that we don't currently know very much about the relative importance of these different factors in affecting the demand for graduate school. How many good potential candidates are deterred by the costs or are simply unable to afford to go? How many have the means to attend but choose not to because they do not consider the long-run career opportunities to be worth the investment? How many have the money and are attracted by the jobs options that would result but are dissuaded by the graduate school experience itself? How many aren't sufficiently well prepared or haven't made the effort to enter graduate school because they have not been exposed to what graduate school offers or do not understand what is required of them if they want to be accepted into the sort of program they would like?

In order to develop the right policy response, it would obviously be helpful to know the answers to these and related questions. Such knowledge would allow us to use judiciously the policy instruments best suited to removing each particular impediment to graduate school attendance. Therefore, an early step in the development of any policy for increasing graduate school enrolment should probably be to obtain information on the barriers to graduate level schooling through a good national student survey and other kinds of analysis with this goal.

Supply-side Measures

Increased Transfers to Institutions

If capacity is to expand significantly, universities will need more money, and given the existing fiscal structures, at least some of that money would normally come from the federal government in the form of block transfers to the provinces (as part of the CST or otherwise). The obvious problem is that even if the federal government increased those transfers, the money would henceforth be under the control of individual provinces, which, through their ministries of education, subsequently transfer funds to individual institutions. In other words, for federal block grants to have any purpose, provincial governments would also have to make graduate education a priority and ensure that all additional federal dollars were added to the pre-existing levels of graduate school funding.

It is not inconceivable that federal funds could be fully passed on to where they could best facilitate growth in graduate education at the system or institution level, and perhaps a federal-provincial set of agreements could highlight the need for such spending and provide for as many controls as possible to make sure the money went where it were supposed to. However, since one dollar is interchangeable with another and government budgets are constantly in a state of flux, the notion that specific pots of money can be precisely identified and directed in this manner strains one's credulity.

Even if such an accord were to emerge or the funds were otherwise transferred to the institutions, there would be the problem of ensuring that the money was spent on graduate education rather than on undergraduate education (or was not simply used for professors' salaries or other cost increases). This problem is especially pertinent where there is such overlapping of universities' functions (for example, the same professors, buildings, and equipment are generally involved in each of its activities) that spending can never be specifically attributed to one particular purpose rather than another. Again, systems of agreements between, say, provincial authorities and specific institutions or their representative bodies could help ensure that the money went primarily where it was intended. But again it would be difficult to monitor or enforce such agreements, and slippage would undoubtedly occur.

If money were transferred directly from the federal government to educational institutions, as was the practice in the late 1950s and early 1960s, one source of money slippage might be prevented (that is, the provinces could not spend the money in other areas). However, there would still be no control over how the institutions spend the money. Furthermore, since the federal government is not responsible for the general operation of universities, the provinces would likely balk at such an intrusion into their jurisdiction.

The fundamental problem is one of incentives. Block grants — from one level of government to another or from governments to institutions — simply do not provide a sufficiently targeted set of incentives to ensure that individual institutions, or the system in total, grow in a way that is aligned with the government's goal of increasing the quantity and maintaining the best possible quality of graduate education.

Attaching Money to Students

An alternative approach would be to attach money to graduate students themselves — a measure that could be adopted by the federal government, the provinces, or both. With such a system, students could arrive at their programs of choice with what amounted to vouchers that their chosen institutions could redeem for cash payments. From a federal point of view, this might be an ideal solution since payments to individuals are a recognized use of the federal spending power, even in areas that are ostensibly within provincial jurisdiction.⁹

One significant advantage of such an arrangement is that it would get the money immediately and directly to where it was needed to expand the graduate

⁹ That is indeed the case with the Canada Student Loans Program and the Canada Millennium Scholarship Foundation, neither of which has ever been legally challenged as unconstitutional. ...

education system — the institutions themselves. And in so far as such transfers were given to students holding scholarships, bursaries, or other awards, the demand and supply problems could be largely solved at the same time. The demand-side problem of access for graduate education would be solved as students received financial assistance, and the means of increasing the supply of places would be provided to institutions via the resources they received through students.

The growth of the system would be facilitated by targeting more money of both sorts, at least mostly on the same individuals, using roughly the same (existing) mechanisms for determining both students' awards and institutions' transfers. And since students could generally be counted upon to choose the best programs for themselves, the money would in general go to the generally superior programs, where growth would presumably be most desired.

One potential objection to this kind of direct-to-student funding scheme is that it could create instability in institutional finances and preclude the kind of long-term planning facilitated by block grants, but in the case of graduate funding that objection is only partly valid. First of all, block grants would still presumably exist for capital expenditures and undergraduate education and even for a share of graduate student funding (depending on the degree to which the proposed scheme was added to existing structures or came to replace them more fully), thus giving institutions a very large base upon which to build. Second, most existing block grant transfers are to some extent dependent on student numbers (in Ontario and Quebec student enrolment figures are put directly into the funding equation); so changing the method of linking funds to students from an indirect link to a direct one would not necessarily alter institutional budgeting processes a great deal. Third, because of the length of graduate programs (especially at the doctorate level), enrolment is unlikely to fluctuate very much from year to year. And finally, the size of any particular graduate program is generally quite stable from one year to the next because whatever attracted students in one year is likely to attract approximately the same number in another year. In short, programs could more or less count on receiving a certain amount in student-attached transfers on the basis of past enrolment, and they could plan — and spend — accordingly.

Another objection might be based on a skepticism that putting money in the hands of users (in this case students) necessarily makes a system more responsive — or otherwise responsive in the right ways.¹⁰ Supporters of the kind of system we propose would argue that it would give institutions greater incentives to attract students, and that they presumably could do that only by offering high-quality programs. As a result, a desirable set of incentives regarding the quality of graduate school programs should prevail.

footnote 9 cont'd

... Moreover, to the extent that graduate students are related to "research," such payments may be seen as constitutionally benign, since provincial governments have conceded to federal governments the right to make payments in support of research through mechanisms such as the federal granting councils and, more recently, to cover the indirect costs of research.

10 See, for instance, Laidler (2005) or Pakravan (2006) for the application of the consumer-choice model as applied to postsecondary education more broadly, including undergraduate education.

Professors who were good teachers and good advisers would, for example, become more valuable and perhaps be better rewarded in terms of tenure decisions, salaries, and in other ways. Departments that were successful in attracting transfer-bearing graduate students would be similarly valued within their institutions and could be expected to receive more resources than others that were not. Universities as a whole that were able to attract students and the funds that went with them might become more favoured within each provincial system. In short, students would bring in money, quality would attract students, and so the incentive structure would be to provide quality schooling in order to attract quality students.

One valid rebuttal could be made here. Once a graduate student had enrolled in a university, the institution could still simply pocket the money and invest it wherever it liked. And to the extent that the supply of graduate student places was limited, and students were lining up to get in, institutions would not necessarily need to invest in quality, but merely in quantity to get more students — and more money. Hence, at least some of the vaunted benefits of competition might not be realized.

If we were, however, to vary the size of the voucher (or at least some vouchers) according to merit and make such “preferred” vouchers large enough, institutions would have an additional incentive to provide high quality education in order to pursue the more “lucrative” students. They might not be quite as keen to pursue less-funded students, but these students would still benefit from the school’s quality improvements and would in any event find themselves a place in the program if the funds were sufficient to accommodate them. The design details of this system would be important to achieving the desired incentive structures, but well-working systems can at least be imagined.

In short, capacity increases and improvements in the quality of graduate programs, should result from a happy convergence of well-designed incentives: professors, departments, and institutions like to attract better students for their own sake, since they make teaching more interesting, result in higher-quality research (as students act as research assistants and junior colleagues), and enhance the institutions’ reputation; but better students would also attract more money; and students — “top-quality” and otherwise — would bring with them the financing required to pay for the graduate-program places they occupy.

One of the main challenges of designing such a system would be the choice of means used to decide the size of the subsidy attached to each student. In Russia’s Government Individual Finance Obligations (GIFO) system, the size of the voucher is based on the student’s results in a high-stakes, high-security standardized test (which is necessary because more local and less standardized methods of assessment are vulnerable to bribery and corruption).¹¹ Such a method could be used in Canada as well — Graduate Record Exams (GREs) are already widely employed here, and this exam or something like it could easily be pressed into service for this purpose. But it is not the only possible option. Large-scale exercises in evaluating students’ merit are in fact already carried out in order to award the scholarships provided by the national granting agencies (such as the

11 See Smolentseva (2005).

SSHRC, the NSERC, and the CIHR), as well as their provincial counterparts, as well of course as by the institutions themselves when they are deciding which students to accept, so the issue would be one of scale and of adapting such existing evaluation systems to this particular purpose rather than inventing a new system.

Another design issue pertains to where exactly the transfers should go: to the particular department, to the associated graduate school, to the university as a whole, and so on. This would not, however, necessarily be as important an issue as might appear. Departments that attracted students bearing such transfers should, because of the incentive effects just enumerated, ultimately receive at least a good share of the funds brought in even if they went first to a higher level of the institution (for example, the faculty or graduate school or even above this). It would make little sense for institutions not to support the departments or faculties that were successful in bringing in such transfers because this would diminish the department's or faculty's ability to continue to bring in additional transfers.

A final design issue pertains to the size of the relevant transfers, including any differences by discipline that might be appropriate, such as those related to how expensive programs are to run. But this is a matter of design detail, not a fundamental barrier to adopting such a system. Again, since decisions are already being made in this regard across the postsecondary-education system, it would be a matter of adapting what is already known and done.¹²

In short, an intelligently structured set of transfers to universities based on the number of highly qualified graduate students they had enrolled should create new incentives for offering high-quality graduate education, and the resources brought into the institution as a result could then help expand the system precisely where the quality was best — that is, where students chose to attend. Students, who are presumably in the position to judge program quality and who have the incentives to enrol in the best programs they can, would themselves direct the funds towards the higher-quality programs. It would be a market-type solution, with market-type efficiencies, even though it would be conducted entirely with public money.

Universities and faculty associations might object to such a proposal because it would essentially shift power from them to students. They would become more accountable to the interests they are meant to serve rather than having the leeway to do what they like, with the essentially blank cheques they are currently given. "Give us the money and we'll do the job" is their popular refrain. But surely it's sensible to make those transfers dependent on the quality of the education provided so as to get the best results possible from the money. Moreover, this proposal would in no way limit an institution's freedom to improve quality in the way it thought most appropriate, and indeed could encourage a great deal of

12 Another possible difficulty with such a system is that institutions might be tempted to increase financial awards to individual students in order to attract those who brought transfers with them, which could result in a significant amount of the transfers being competed away, leaving the institutions with a diminished net transfer while students benefited. For example, if a student brought a transfer of, say \$10,000, an institution would be tempted to essentially use some of that \$10,000 to attract the student. This money would then go towards the student rather than the institution itself, as intended. Certain rules and agreements could, however, perhaps be struck in order to circumvent this problem.

experimentation in this regard. This is “accountability” as it can and should be operationalized: prescriptive as to ends but not to means.

Ranking Programs, Targeting the Money

Another option that is somewhat similar to giving the money to students is to transfer money to departments — or faculties, schools, or even institutions as a whole — according to the adjudged quality of their graduate programs. Better programs would receive more money, which would give them the means to grow and otherwise finance their programs. Such a system could, theoretically, again result in a set of incentives where quality was rewarded and better-quality programs could grow.

Such a “ranking-based” approach would avoid the problem mentioned above of schools competing for students with financial awards that essentially diminished the net value of the transfers since the money would not be attached to students. It would also be superior to the student-targeted system if the ranking scheme used was better at identifying quality graduate programs than students were when making their enrolment decisions. In particular, such a ranking scheme could take future plans for change and improvement into account in a way that students’ current choices might not, thus opening up the transfer system to emerging and innovative programs more than a system based on past performance might do.

The greatest challenge to such a system, however, would be to devise an effective and efficient ranking scheme that accurately gauged the quality of graduate programs. Where such schemes have been tried, they have been neither popular nor particularly successful — Great Britain being the leading case in point. The ranking has been laborious, time-consuming, and controversial, and it has ultimately not done resulted in much differentiation of programs. For these reasons, the student-based transfer system is likely the better option.

Increasing Research Money

Given that research and graduate training can be complementary, especially at the doctoral level, another means of increasing the capacity and improving the quality of graduate education would be to put more money into research. This could also help address demand-side problems by helping students fund their studies and otherwise making graduate school more attractive if some of this funding found its way into students’ pockets in the form of research assistantships or other forms of remuneration.

Such benefits could, furthermore, be strengthened if more emphasis were put on funding the training of graduate students in the awarding of research monies. And one undeniable advantage of the enhanced-research-money approach is that it would be fairly easy to implement since various systems for awarding research grants are already in place, and individual research grants could lead to the financing of a number of graduate students and otherwise help the system grow more than awarding funds one student at a time.

Research considerations generally represent an important component to any overall graduate education strategy. One limitation of this approach, however, is that increased research funding would, by definition, do less to expand an institution's course offerings, the number of professors, and other non-research components of the educational experience since research grants are awarded first and foremost according to the proposed research plan rather than the benefits it might have for graduate student education per se. Similarly, whereas in many cases, research and graduate education are integrally related, there are many good graduate programs in places where relatively little research goes on (especially at the master's level, where research is less important), and these would not benefit from such a system.

In other words, if the goals of government are to improve the quality of graduate school education or to expand programs, money spent directly on these goals will likely yield greater results per dollar than will the spin-off benefits of putting more money into research, significant as those might be.

Coping with the Influx

Expanding graduate education is easier said than done. And as noted at the beginning of this paper, there will be some significant cost and resource implications, even if the basic problems with incentives can be solved.

In the present model of instruction, graduate students are accorded intensive amounts of faculty time, and thus are a major draw on resources. It is in large part this intensity that will lead to billions of dollars in increased instructional costs for universities. It therefore seems likely that at least one part of the solution to coping with the coming influx of graduate students will be to reduce the per-student cost of providing graduate education. Indeed, many such changes have already been making their way into the system since the pressure on costs generated by the reductions in government support for postsecondary education in general in the 1990s; with the additional pressures that will be generated by the planned or desired expansions, we are likely to see more. This is simply a descriptive statement, not a prescriptive one.

There are some obvious ways to reduce the cost of educating graduate students. Classes can become larger, thus reducing unit costs. More intensive programs of study — such as full thesis options (especially at the master's level) — can be reduced in favour of cheaper course-based options. Professors involved in teaching graduate students could have their undergraduate teaching loads decreased or eliminated, and their undergraduate duties taken over by lower-paid, non-research faculty — or even by graduate students themselves.

None of these ideas are new, of course; indeed, all of them were used to decrease unit costs at the undergraduate level with the massification of first-degree programs during the 1960s, 1970s, and 1980s. But that process is widely judged to have been a traumatic one that led to widespread falls in the quality of education. It is unclear, however, whether or not such declines in quality truly occurred, since quality has not, in general, been well enough defined and the measurement of quality — or any changes in it — has not been done rigorously enough to show how the quality of the educational experience actually changed.

Looking forward, what is most important is that any such declines in quality be minimized during the transition to a perhaps necessarily somewhat more “massified” system of graduate education. Extensive research and careful analysis will need to be brought to bear on the question of how to maintain or — preferably — enhance educational quality while unit costs are being reduced because of the pressures we have referred to. At a minimum, this will require the measurement and monitoring of learning conditions, environments, and outcomes through instruments similar to the National Survey of Student Engagement (NSSE) and the College Learning Assessment (CLA), adapted to graduate schools.

Such changes at the graduate level are of course likely to have knock-on effects on undergraduate education. Because of the cost pressures from the expansion of the graduate system, undergraduates will, for example, probably find themselves in larger classes and will come into contact with tenured faculty less often and receive more instruction from graduate students or teaching-only faculty. It is possible, of course, that such changes may be blessings in disguise: it may, for instance, be found that teaching-only faculty are better instructors at the undergraduate level than their more research-intensive colleagues. But again, this will be determined only by constant and vigilant monitoring of changes in learning environments and outputs.

Perhaps a more serious effect at the undergraduate level is the potential erosion — or perceived erosion — of the value of the undergraduate degree as higher degrees become more common and as increasing numbers of employers begin demanding the higher credential. As we noted at the beginning of this paper, pressures are at the same time likely to mount for increases in tuition fees to help defray the massive increase in the expenditures that will be necessary to enlarge the graduate-level education system along the lines contemplated — these tuition increases coming alongside any increases in government funding and any reductions in unit costs that may be achieved. Yet the changes in the nature of undergraduate education along the lines just discussed pose a serious challenge for such “enhanced revenue generation.”

At present, in most disciplines, undergraduates partially subsidize graduate students. Though neither comes close to paying the full costs of their education through their tuition fees, undergraduates certainly pay a far larger proportion of their costs than graduate students. If one consequence of increased graduate enrolment is a real or apparent decline in educational quality or relative declines in long-term earnings because of the credential inflation just outlined, then undergraduates may object even more vociferously to paying higher tuition fees — effectively in order to subsidize graduate education. As a result, a substantial share of the cost burden for graduate education may in fact necessarily revert to graduate students themselves.

None of these factors are reasons, in themselves, to dissuade us of the need to raise enrolment — or improve the quality of instruction — at the graduate level. The purpose of this discussion is merely to make the point that the expansion of graduate education is unlikely to be painless. It will entail significant cost increases, and to the extent that these increases cannot be borne through public funding, it may cause potentially wrenching shifts in universities. It is imperative that the system — from the top down — be prepared to cope with these pressures

in the best manner possible and to minimize any potential diminution of educational quality at the undergraduate level. As much as the financial challenge of finding spaces for graduate students, we face the challenge of managing the full set of pressures and changes likely to be set into motion by these developments.

Conclusion

In this paper we have noted the following:

- The demands of the new “knowledge economy” require an increasing number of highly skilled workers; this in turn is driving policymakers to look at ways of increasing the number of people acquiring graduate degrees.
 - Graduate education is expensive; considerably more so than undergraduate education. Rough calculations suggest that a doubling of graduate school enrolment in Canada might create an increase in costs on the order of \$5 billion annually.
 - An effective strategy for increasing enrolment at the graduate level will require that both demand- and supply-side issues be addressed.
 - On the demand side, the student loan system should be changed to accommodate the special needs of graduate students. Changes should include a widening of eligibility and a rise in loan limits. Grants, scholarships, bursaries, and other forms of non-repayable support should also be modified — and in many cases increased — in order to make graduate education an affordable and a worthwhile investment, particularly in a context where many potential students can earn decent money without going further in their studies. Such awards will almost surely need to vary by discipline, reflecting differences in schooling costs, alternative employment opportunities, and the social and economic value of the schooling.
 - An expansion of graduate education — or improvements in its quality — are unlikely to be achieved unless the supply-side is also addressed, particularly in terms of finding the most effective means of getting money into the hands of institutions in a manner that best achieves the twin goals relating to expansion and quality. The most obvious and traditional means of doing that is to increase transfers from the federal government to the provincial governments or from governments to institutions. But while such initiatives will undoubtedly have positive effects, they offer few guarantees that the money will be spent in the best way to achieve the desired ends: improved quality and an expanded system.
 - An alternative option is to attach funding directly to students. One possible broad model for doing this is that of the Russian GIFO system, which grants variable subsidies according to merit, the largest subsidies being granted to the best students. This would create incentives for institutions to improve the quality of their programs as they compete for the better students while also providing them with the means to expand.
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- Such an expansion — or indeed “massification” — of graduate-level education is likely to generate significant financial pressures on the system and consequently lead to changes in the delivery — and price — of university education at both the graduate and undergraduate levels. Great care will need to be taken to ensure that these changes are made in as informed a manner as possible; there will be a need for more measurement and monitoring of quality, and there should be a commitment to maintaining quality at the highest level that is possible — given these pressures. After all, it will be of dubious benefit to expand the number of graduate students out of concern that we need a larger supply of very highly qualified workers if the quality of those graduates declines as a result.

The expansion of graduate education in Canada promises to be an important, large, and complex undertaking. With wisely chosen policy initiatives, the desired expansion can be achieved, access to all qualified applicants can be ensured, quality can be preserved or even enhanced, and universities can be provided with the incentives and means to generally put students’ interests at the heart of their enterprise. While challenging in many ways, the general solution is at least conceptually a simple matter of paying attention to both the supply and demand sides of the problem; establishing effective incentives, including the structure of financing at the individual, governmental, and institutional levels; and monitoring quality so as to inform decisions and the evaluation of outcomes as effectively as possible.

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