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Structural Incentives to Attract Foreign Students to Canada's Post-Secondary Educational System: A Comparative Analysis

John McHale (Queen's University)

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Abstract

Recruitment of foreign students has risen dramatically across the OECD since the early 1990s. Somewhat surprisingly for a country that has pioneered the use of skill-based immigration policies, Canada has been a relatively reluctant recruiter of foreign students. This paper provides a comparative and policy-focused examination of Canada's participation in the "market" for foreign students. It first documents how Canada's recruitment of foreign students compares with other countries and also how it has evolved over time. With a focus on the costs and benefits for Canadians, it then examines various rationales for recruitment, including revenue generation, improved knowledge production at Canadian post-secondary institutions, and complementarities with the system of skill-based immigrant selection. The broad conclusion of the paper is that foreign student recruitment can provide net benefits to Canada if pursued within an appropriate incentive structure.

Résumé

Depuis le début des années 1990, le recrutement d'étudiants étrangers est monté en flèche dans les pays de l'OCDE. Il est quelque peu surprenant de voir que, pour un pays qui a été l'un des premiers à appliquer des politiques d'immigration fondées sur les compétences, le Canada n'a recruté que relativement timidement des étudiants étrangers. Cette étude comprend un examen comparatif et axé sur les politiques de la participation du Canada sur le « marché » des étudiants étrangers. Données à l'appui, l'auteur compare le recrutement d'étudiants étrangers au Canada avec celui d'autres pays, et il en montre l'évolution au fil du temps. Dans une optique de coûts et d'avantages pour les Canadiens, l'auteur étudie ensuite les raisons qui motivent ce recrutement, notamment la production de revenus, la plus grande création de savoir au sein des établissements d'enseignement postsecondaire au Canada ainsi que les complémentarités avec le système de sélection des immigrants basé sur les compétences. L'auteur en arrive à la conclusion que le recrutement d'étudiants étrangers peut apporter des avantages nets au Canada s'il est jumelé à une structure de stimulants appropriés.

1. Introduction

The idea that countries are competing for the world's top student talent has become a focus—and the source of some hype—in the globalization debate. As the number of foreign students enrolled in higher education fell for the first time in 2003/04, leading figures in the scientific community in the United States worried that the country would lose its lead in cutting edge industries (National Science Board, 2004a&b). Observers look to the rapid growth of graduates in China and India—and the increasing competition for students from other countries—and worry that the United States is losing its status as the "world's greatest talent magnet" (Florida, 2005).[1] In the United Kingdom, universities now depend on foreign students for roughly one-tenth of their revenues, and leading institutions such as the London School of Economics stay competitive for top research faculty by recruiting full-fee paying students from outside the EU. In Australia, the number of foreign students increased by almost 300 percent since the early 1990s.

A comparison of foreign student enrolment numbers across countries reveals that Canada lags key comparator countries in the market for foreign students. Canada ranks fourteenth in the OECD in terms of the percentage of foreign students in its post-secondary student body, and far behind Australia and the United Kingdom in terms of its

[1] A recent *New York Times* editorial raised alarm about the competition for students:

> The fact is that the competition for students has become far more intense. While American campuses are still by far the favorite destination, they have been steadily losing share for years, especially to Canada, Australia and Europe. Now the European Union is considering offering citizenship to foreign students who complete their doctorates at European universities. . . . Indeed, the competition for brains and ideas is where the battle for global influence should be waged. After so many years of near-hegemony in this field, it is good for the United States to be reminded that those people banging at the door have ever more other addresses to try if they are rebuffed. ("Imported Brains," The New York Times, December 3, 2005.)

stock of foreign students. Hopefully succeeding in putting the hype aside, this is paper looks at Canada's participation in the market for foreign students, and explores the costs and benefits of foreign student recruitment.

In considering the merits of foreign student recruitment, my metric will the costs and benefits to Canadians, especially would-be Canadian students. Of course, other considerations matter as well; for example, fostering mutual understanding between Canada and other countries or helping to build the institutional capacities of poorer countries, though these concerns are outside the scope of the current paper.[2] The most worrisome potential cost for *Canadians* is that domestic students are "crowded out" of higher education. The potential benefits are more subtle. I consider three main rationales for recruiting foreign students: revenue generation, knowledge production in higher education, and a more productive immigrant pool. My general conclusion is that there are significant benefits based on each of these rationales, and that it should be possible to devise an incentive structure that expands the scope for foreign student recruitment in a way that helps rather than harms Canadian students and strengthens Canada's national innovation system.

The rest of the paper is organized as follows. In the next section, I describe both longer term and also more recent trends in the recruitment of foreign students in Canada and its leading "competitors" in this market. Section 3 looks at the revenue-raising

[2] Devesh Kapur and I discuss the broader effects of skill recruitment on developing countries in a recent monograph published by the Center for Global Development (Kapur and McHale, 2005).

potential of foreign student recruitment, notably by examining fees charged to foreign and domestic students at Canadian universities. Section 4 examines how foreign students affect knowledge production at Canadian institutions of higher education. One aspect is the way that foreign students alter the human capital acquisition of Canadian students, impacts that include the value of diversity and competition-induced changes in teaching practice. A second aspect is how foreign graduate students affect research productivity, and thus the level of knowledge spillovers from Canadian institutions. In Section 5, I turn to important connections between foreign student recruitment and the ability to attract and select a pool of immigrants that will be successful in the Canadian labor market. The background here is that recent cohorts of immigrants are performing less well relative to the Canadian-born than earlier immigrant cohorts. Part of the reason is that there is a low return to foreign education and experience. This suggests the value of recruiting from a relatively large pool of foreign students with Canada-specific human capital. Section 6 offers some concluding thoughts.

2. Canada and the Competition for Foreign Students

Canada has been a relatively reluctant recruiter of foreign students. **Figure 1** shows that Canada ranks seventh in terms of the number of foreign students in post-secondary education, far behind the United States, and also behind the United Kingdom, Germany, France, Australia and Japan. Even more revealingly, Canada's ranking is even lower when we look at the share of foreign students in the total post-secondary educated student body (see **Figure 2**). In 2001, 4.6 percent of Canada's post-secondary-level student body was foreign, which compares with 10.9 percent in the United Kingdom and

13.9 percent in Australia. These two English-speaking countries are especially interesting because they are close competitors in the market for students seeking instruction in English.[3] Canada's relative lack of presence in this market is curious given its pioneering polices in recruiting permanent immigrants through its points system, and the overall high share of immigrants in the population (18 percent).

Figure 3 shows that a number of countries—Australia and the United Kingdom included—significantly scaled up the size of their foreign student populations during the 1990s. The percentage increase in Canada was next to last on this list of OECD countries, with only France having a lower rate of increase.

Although it is somewhat simplistic to think of Canada with English-speaking countries for foreign students, **Table 1** shows that Canada's "market share" is low across all the regions considered. For example, in 2001 46 percent of all Asian students that were studying in an OECD country were in the United States, with a further 12 percent going to each of Australia and the United Kingdom. Canada had just 2 percent. Even for North Americans studying outside their home country—a group primarily comprised of students from the United States—Canada hosted just 7 percent compared with 19 percent in the United Kingdom.[4]

[3] Of course, Canada has the additional competitive advantage that it is also attractive to students seeking instruction in French.
[4] This comparison is not entirely fair, since the 19 percent studying in the United Kingdom includes some Canadians.

Figures 4a and 4b provide a rather different perspective on the changing importance of foreign students in Canada. The source here is Citizenship and Immigration Canada data on student stocks and flows. **Figure 4a** shows the evolving stocks and flows of foreign students at all education levels. **Figure 4b** shows the stocks and flows for just university students. Concentrating on university students, we see that the stock has grown rapidly since the mid 1990s. Interestingly, the stock has continued to rise after 2001, even as the annual inflow declined for three straight years from 2002 to 2004. The graph also shows the implied outflows given the inflows and the change in the stock. Assuming the inflows and the stock are being measured correctly, the numbers imply that the outflow rate is lagging the inflow rate, which in turn suggests lengthening average durations. Eventually, however, the average duration must stabilize and stock will move in the same direction as annual inflows.

Tables 2 and 3 provide additional information of the distribution of foreign students across levels of education and across regions in Canada based the CIC data. **Table 2** shows that university students now account for just under half of all foreign students, a share that has been relatively stable since in the late 1980s. There has been a marked decline in the share of students at the secondary or less level over this period, with the share falling from a peak of 39 percent in 1989 and 1990 to just 20 percent in 2003. There has also been a notable increase in the "other post-secondary"—presumably colleges—since the mid 1990s, rising from 5 percent in 1993 and 1994 to 14 percent in 2003. **Table 3** shows shares of foreign students by region. The most marked change over time is in the share residing in British Columbia, which has roughly doubled to 30

percent since the mid-1980s. The number destined for Ontario has tended to drift downwards over time from more than one-half in 1980 to roughly one-third by 2001.

There is little doubt that the United States is Canada's closest competitor in the market for foreign students. The events of September 2001 and after have raised questions about the United States' interest in and attractiveness to foreign students. Reports abound of the difficulties involved in getting a U.S. student visa. Florida (2005) reports that the number of student visas dropped by 20 percent in 2002 and a further 8 percent in 2003. **Figure 5** shows that after a marginal increase in foreign-student enrolments in higher education in for academic year 2002/03 (0.6 percent), enrolments actually fell in 2003/04 for the first time since records began in the 1950s (-2.4 percent). **Table 4** shows that the decline was not uniform across countries, with enrolments from India actually increasing by 7 percent, while those for most other Asian countries fell. A recent survey by the Council of Graduate Schools found a 6 percent decline in first-time foreign graduate student enrolment from 2003 to 2004. The reported declines were 8 percent for China and 4 percent for India. Where surveyed institutions indicated the enrolments had declined, 40 percent noted visa troubles (both delays and denials) as the top factor contributing to the decline, while 20 percent noted a drop in applications.

From Canada's perspective, the interesting question is how these changes affecting the United States should alter Canada's recruitment efforts in the market for international students. On the one hand, with the country's chief competitor becoming less welcoming, it could be argued that Canada can afford to be less aggressively in its

efforts to attract top student prospects. On the other hand, if the United States has become a less attractive destination, or is turning away highly qualified students without good reason, then Canada may have the opportunity to recruit top students that would previously have gone to the United States. Assuming that the optimal recruitment effort is positively related to the quality of the potential applicant pool, this suggests that Canada should be competing more aggressively for students rather than less.

3. Foreign Students and Revenue Generation

Perhaps the most obvious rationale for foreign student recruitment in the Canadian context is that it generates revenues for cash-strapped universities and colleges. Tuition at Canada's public institutions is typically set well below the total cost per student (though closer to the marginal cost per student); and government subsidies to cover the short fall are only loosely linked to the number of students. It follows that schools have a strong revenue-raising rationale for expanding the number of foreign students paying full (or greater than full) tuition. Of course, since non-professional school foreign graduate students typically receive subsidized tuition, this rationale mainly applies to the recruitment of foreign undergraduates.

An important part of the background to the issue of revenue generation for Canadian post-secondary institutions is the concern that the rising cost of publicly funded health care will increasingly starve the education sector of funds. One implication of under-funding is that the marginal social value of revenues from foreign students is likely to be high. This effect is likely to be heightened if the immediacy of needs in the health

sector trumps the longer-term benefits of investing in higher education. In other words, higher education gets starved for funds despite the relatively high marginal social value of such spending due to its relative lack of political salience.

Table 5 shows the foreign-student tuition levels at a number of Canadian universities for the 2004/05 academic year. The recorded tuitions are for arts and science programs. These tuitions compare with typical subsidized tuitions charged to domestic students of $4,000 to $6,000,[5] so that foreign students typically pay two- to three-times what domestic students pay. The table also shows the shares of international students at each institution at both the graduate and undergraduate levels. At present, the shares of foreign students in the undergraduate body are quite low at most institutions. The highest share of foreign undergraduates is recorded at McGill at almost 18 percent, while the median share is just 4.7 percent.[6] The table suggests, however, that most institutions have a strong monetary incentive to increase the foreign share.

The implications of such revenue-driven foreign student recruitment for Canadian students depend on how this recruitment affects the quantity of slots and the quality of education provided. Take first the case where there are a fixed number of undergraduate slots. The recruitment of a foreign student will then "crowd out" a domestic student. Domestic students may still gain overall to the extent that the increased revenues are used increase the quality of education provided. It is clear that cash-strapped institutions

[5] Quebec students typically pay between $2,000 and $3,000 (inclusive of ancillary fees) at Quebec universities.
[6] The median foreign graduate student share for the universities listed with significant graduate programs is 20.9 percent.

receiving fixed government allocations have a strong monetary incentive to shift their student mix towards full-tuition paying foreign students.[7]

Figure 6 graphically shows how the option of recruiting foreign students can lead to strong incentives to reduce places for domestic students. The length of the horizontal axis is equal to the total number of places available. The domestic price is assumed to be fixed at a low level, leading to an excess demand for places. The foreign is assumed to be set at a level that clears the available places available. The difference between the two prices is the revenue gain that is available if a place is shifted from the domestic to the foreign student "bucket."

Take next the case where the number of slots is expanded to accommodate the newly recruited foreign students. The impact on domestic students depends now on how the larger student body affects the quality of their education. Putting aside for the moment any advantages of a more diverse student body or competition-induced effects on the quality of instruction (these will be taken up in the next section), the expanded

[7] A similar crowding out argument is often heard in relation to the recruitment of foreign workers. The fear is that foreign workers will take jobs from domestic workers. Many economists are dismissive of this argument, however, as they see this as an example of the "lump of labour fallacy," whereby the total number of jobs is mistakenly view as fixed. Expansions in the labour force are typically associated with broadly matching expansions in the number of jobs available. In effect, supply creates its own demand. But fear of crowding may have greater warrant in the case of foreign student recruitment; for example, if administrators place a cap on the total number of places available.

student body may drive quality down, as more students are spread over fixed resources, or drive quality up, as extra resources are funded out of the additional revenues.[8]

This brief discussion makes clear the impact on domestic students of revenue-driven foreign recruitment depends on the incentives and opportunities that institutions have to alter the number of student slots, the student mix, and the quality of education provided. In primarily public-funded system, the government may not want to take a completely hands-off attitude to foreign recruitment. Instead, it must make sure that the incentives of the public institutions are well aligned with using foreign recruitment to maximize the benefit to domestic students.

A crude incentive structure with the right properties is to set a floor on domestic recruitment and allow unconstrained recruitment of fee-paying foreign students, with all the revenues going the university or college. This provides the institution with a strong incentive to compete aggressively for foreign students while limiting their ability to crowd out domestic students. Drawbacks of this incentive structure include the loss of autonomy for institutions in regard to the size of their domestic student bodies, and the

[8] I thank the referee for pointing out that the affect of additional resources depends on how the money is spent. One obvious fear is that money is just used to increase faculty and administrator salaries and perks, and not for increased resources. While this fear is real, it is important to recognize that "quality" in part depends on the ability to recruit and retain world class faculty. The internationalization of education also extends to the integration of markets for top teaching and research talent, with the U.S. clearly being the main competitor for Canada. Thus the funding of higher salaries need not be at odds with stronger institutions from the point of view of domestic students.

possible diminution of quality due to overcrowding or the lowering of standards to attract revenue-rich foreign students.[9]

The United Kingdom's experience with revenue-driven recruitment is instructive. Higher education is widely viewed to have been under-funded by successive governments, while institutions have (until recently) been prevented from raising tuition above nominal levels. The result has been lagging performance relative to top private and public universities in the United States. Revenue-strapped universities—particularly those with international reputations—have eagerly embraced fee paying students from outside the EU, who now account for roughly 10 percent of total revenues. The London School of Economics has been a leader in the competition for foreign students. For the academic year 2003/04, LSE had 5,203 foreign students, comprised of 2,036 undergraduate students and 3,167 graduate students. The largest source country is the United States with 890 students, followed by China with 395 students. The total number of students at the LSE in 2003/04 was 8,381. Of the 5,203 foreign students, the LSE reports 1,184 were not paying the higher rate for overseas students, presumably because they came from within the EU. For the academic year 2004/05, the fees for

[9] In regard to the latter concern, it is clear the schools have can have a very strong financial incentive to recruit additional foreign students, which can create strong pressures to admit marginally qualified students. This danger is even greater if the price is set in advance, so that the financial gain from admitting an additional student is equal to the potentially substantial gap between marginal cost and price, which can put pressure on recruiters to hit ambitious recruitment targets. This concern—that quality standards are stretched too far for financial gain—is often heard in relation to deregulated MBA programs.

undergraduates originating in the United Kingdom or another EU country was £1,150,[10] which compares with a fee of £10,509 for non-EU students. The LSE example shows both the significant revenue implications of foreign student recruitment at an institution with a strong international reputation. It also shows the risk that domestic students will get crowded out when institutions have a strong monetary incentive to recruit overseas.

4. Foreign Students and Knowledge Production

The second often-mentioned rationale for recruiting foreign students is that it improves broadly defined knowledge production at Canadian universities and colleges. I find it useful to distinguish between the impact of foreign students on the human (and possibly social) capital acquisition of domestic students, and the impact of foreign (primarily graduate) students on research output.

4.1 Human capital of domestic students

There are two major channels through which the recruitment of foreign students is likely to affect the learning experience of domestic students. The first is the diversity effect—the costs and benefits of learning in a more diverse environment; the second is the competition effect—the way the learning experience of domestic students is affected by the need to compete for foreign students.

Diversity can be both good and bad for domestic students. On the one hand, a diverse student body allows for a greater frequency of interactions that lead to the sharing

[10] New government regulations allow the fee for UK students to give to £3,000 for the academic year 2005/06.

of non-redundant information. In contrast, when you interact with people that are very like you, and tend to know the same things as you, much of the information exchange is likely to be redundant (see, for example, Burt 1992). On the other hand, highly variable capabilities and communication difficulties among a diverse student body may impede knowledge acquisition, forcing teaching to the lowest common denominator and slowing down the pace of instruction. This cost will be most apparent when the recruited students are not fluent in the language of instruction.

The conventional wisdom at elite universities in the United States is that diversity is a positive force in education. Terenzini et al. (2001, p.510) quote former Harvard University president Neil Rudenstein as saying that the "fundamental rationale for student diversity in higher education [is] its educational value," and Lee Bollinger, president at the University of Michigan as asserting that "A classroom that does not have a significant representation from members of different races produces an impoverished discussion." Terenzini et al. note that these are not isolated examples. A statement published by the Association of American Universities and endorsed by the presidents of 62 research universities read: "We speak first and foremost as educators. We believe that our students benefit significantly from education that takes place in a diverse setting." These authors go on to report that the literature is broadly supportive of the hypothesis that diversity improve student outcomes, and report on their own finding of a small but significant positive effect of diversity on student learning. These findings relate mainly to the representation of minority citizens in the student body, and much of the broader benefit for society of diverse learning environments is seen to come though the learned

ability to thrive in such multi-ethnic environments. It is not obvious how applicable such findings are to international student diversity, especially where a large majority of the international students return home. On the one hand, the differences in the cultural backgrounds of an international diverse student body are likely to be large, increasing both the potential for non-redundant knowledge sharing and also the costs of poor communication. On the other hand, interactions with international students do not necessarily make for a more cohesive multi-ethnic society, though it is likely to make students more comfortable working and living in an ever more integrated world.

Studies of the effects of diversity on economic performance in knowledge-intensive sectors outside of education are also revealing. In recent joint work with Ajay Agrawal and Devesh Kapur on Indian inventors in the United States and Canada, we have found that both that both co-ethnicity and co-location are each significant facilitators of knowledge flows between inventors (as proxied by patent citations). However, co-ethnicity has little additional effect where inventors are co-located. This suggests that co-ethnicity and co-location are substitutes in overcoming barriers to knowledge flows. It also suggests that a location gains from having a more diverse inventor population. In effect, co-location is effective in facilitating knowledge flows between diverse inventors—in part because it provides opportunities for diverse individuals to form social relationships—and co-ethnicity related links between non-co-located inventors helps the location access knowledge from other locations. In a recent NBER working paper, Gianmarco Ottaviano and Giovanni Peri (2004) find that "cultural diversity" (based on country-of-birth) at the city level increases the productivity and

earnings of the domestic population. In the Canadian context, Daniel Trefler and Michael Baker (in work for the Ontario Institute for Competitiveness and Prosperity) find that urbanization—which is probably in part proxying for diversity—increases the return to a university education, with the largest effect (10.4 percent) observed for advanced university degrees.

Turning now to the competition effect, the idea is that colleges and universities that must compete for foreign talent will be induced to improve their performance, and that improvement will also benefit domestic students. A useful way to think about this competition effect is in terms of Hirschman's distinction between "exit" and "voice" as mechanisms for improving performance in organizations. Poorly performing schools may be induced to improve performance if they fail to attract and retain high-fee paying foreign students who effectively vote with their feet. This channel will be most important where competitive pressures are week in the market for domestic students. Where fees are capped for domestic students, leading to an excess demand for places, the incentive to compete for students with better teaching and other services may well be attenuated. Of course, leading schools will still want to attract the best possible students to sustain and improve their reputations. Nevertheless, budgetary strains can be a very immediate motivator, and the absence of short-term financial gain from providing superior quality to domestic students might impair performance. In contrast, allowing cash-strapped schools to compete for fee paying foreign students—or even highly talented non-fee paying that have a vast array of options in the international marketplace—can provide very immediate motivation for improved performance.

Although evidence of a competition effect in higher education is lacking, there is credible evidence of a significant competition effect at the pre-tertiary level. Hoxby (2002) shows that the greater the range of school choices available to parents the better schools perform. In particular, she looks at what she calls "Tiebout choice" among districts. Parents effectively choose their schools by choosing where to live. She takes advantage of the fact that natural geographic features (e.g., streams) affect the number of school districts and thus provides plausibly exogenous variation in the availability of choice.[11] Hoxby (2002, p. 1237) also concludes that choice needs to have "financial consequences if it is to produce the productivity effects described."

Securing net benefits for domestic students from competition for foreign students again requires that institutions face an appropriate incentive structure. Important features are that institutions do not face a binding ceiling on foreign recruitment and that institutions have a strong financial incentive for such recruitment. Moreover, it is important that a two-tiered price structure for foreign and domestic students is not matched by a two-tiered quality structure. This ensures that competition-induced quality improvements to attract foreign students work to the benefit of domestic students.

4.2 Research output form universities

I next turn to the role of foreign graduate students in the research output of universities. Such output is typically viewed as a key component of a country's "national

[11] However, see Rothstein (2004) for a critical analysis of Hoxby's construction and use of instrumental variables for competition based on geographic features of the locality.

innovation system." It is well known that knowledge tends to be "locally sticky" (see, e.g., Jaffe et al. 1993), so that local knowledge-based enterprises can gain competitive advantage from locally produced research.

One of the outstanding facts about the national innovation system in the United States is its ability to draw top talent to its universities from around the world. The National Science Foundation reports that of the 430,000 graduate students in science and engineering in 2001, 133,000 were foreign citizens on temporary visas (National Science Board, 2004a). Moreover, the 2000 census revealed that the foreign-born comprised 22.4 percent of all tertiary-educated individuals working in science and engineering. The share of the foreign born amongst those with doctorates is 37.6 percent overall, and 51.3 percent of those with doctorates in engineering.[12]

There is concern in the United States scientific community over the recent drop in graduate enrolments, and the risk of loss of leadership in knowledge intensive sectors. A recent paper released along with the National Science Board's Science and Engineering Indicators for 2004 expressed the concern as follows:

> If the trends identified in *Indicators* 2004 continue undeterred, three things will happen. The number of jobs in the U.S. economy that require science and engineering training will grow; the number of U.S. citizens prepared for those jobs will, at best, be level; and the availability of people from other countries who have science and engineering training will decline, either because of limits to entry imposed by U.S. national security restrictions or because of intense global competition for people with these skills. The United States has always depended on the inventiveness of its people in order to compete in the world marketplace.

[12] I consider the issue of retaining foreign graduates from Canadian institutions in the domestic skilled workforce in the next section.

> Now, preparation of the S&E workforce is a vital arena for national competitiveness. (National Science Board, 2004b)

Table 5 reveals that leading Canadian research institutions are also heavy recruiters of foreign graduate students, with the median foreign share just below 21 percent. Thus foreign graduate students also play an important role in Canada's national innovation system. In this context, the fact that the inflow of foreign students has fallen over the last three years should be of some concern. As noted in Section 2, the recruitment difficulties faced by institutions in the United States should have provided an opportunity for Canadian institutions capture a larger share of the market. Of course, both countries have been hit by similar shocks, including the need for greater security vigilance in processing applications and the strengthening position of domestic institutions in key markets such as China. Canada has also been put at somewhat of a competitive disadvantage of its own by the significant strengthening of the Canadian dollar vis-à-vis the United States dollar. On the other hand, although there are anecdotal stories of Canadian institutions taking advantage of the increased difficulty of getting and renewing visas in the United States, there has not been a concerted effort to capture a larger share of the internationally mobile graduate student market.

How should we think about the role of foreign graduate students in the national innovation system? At the most basic level, access to these students will increase the supply of researchers and help to lower the cost and increase the output of research. One unwelcome implication of the lower cost would be that earnings are held down for domestic graduates, leading to a partly offsetting contraction of domestic quantity

supplied. In a recent paper, Borjas (2005) provides evidence that the earnings of domestic researchers are adversely affected in the short run. A less pessimistic view is that foreign researchers complement domestic researchers, making them more productive and raising their earning potential.

Figure 7 captures some of the key considerations in the context of a competitive market for graduate students. The government is likely to have multiple motives: (i) increasing overall research output; (ii) lowering the total cost of research; and (iii) a high proportion of domestic students in the graduate student mix. The figure helps show why it is difficult to achieve all the goals simultaneously. The case depicted is one where the demand for graduate students is quite price inelastic (which is appropriate for the short run where research and supervision facilities are likely to be limited). There is also assumed to be a large available quantity of foreign graduate students even at relatively low stipends, explained by the absence of good opportunities in many poorer countries for even the very talented. The available number of domestic graduate students falls off sharply as the value of stipends falls, however, as the research sector is not able to compete with the other opportunities available to potential graduate students. Free competition in this market will lead to a relatively low cost of graduate students, a relatively large overall graduate student body, but relatively few domestic students in that body. One solution that is already widely used is to have a two-tiered system of stipends, with greater support offered to domestic students. This effectively creates a segmented market, with a price-controlled domestic market and a competitive foreign market. The

extra instrument of differentiated prices should allow policy makers to achieve a better mix of quantity, cost and student-mix goals.

The effects of graduate research output should not be considered in isolation from other elements of the national innovation system. One element of Canada's system that has received substantial upgrading in recent years is the research funding provided by the main granting agencies. Following Romer (2000), we can think of such funding as increasing the demand for research output, of which graduate research output is an important direct and indirect (e.g. research assistance) element. Romer uses simple supply and demand analysis to make the point that the increased demand will not lead to much additional research output if the supply curve for researchers is highly inelastic. Instead, the price of research is pushed up (higher graduate student stipends in our case given a relatively inelastic supply). This is shown in **Figure 8**. Having access to foreign students not only shifts the total supply curve to the right, it also makes the curve more elastic (which is simply a reflection of the fact that a higher stipend will draw on students from two supply sources—domestic and foreign.). The result is that the increase in demand due to greater funding availability will go further in stimulating research output. Thus increased access to foreign students should be seen as a complement to increased research funding.

5. Foreign Students and Immigrant Selection

The previous two sections examined channels through which foreign students impact the education system and the broader economy *while they are students*. In

considering the long-term impact of recruiting foreign students, we need to recognize that some fraction of foreign students will want to remain in Canada. In contrast to its position as a reluctant recruiter of foreign students, Canada has one of the world's most developed systems for recruiting immigrant students based on their skills. It is important, then, to take account of the links—or the absence of links—between foreign student recruitment and Canada's broader immigration regime.

Under the reformed points system that came into effect in 2002 under the Immigration and Refugee Protection Act, a substantial number of points (25) are available for educational attainment. A further category of points is based on indicators of adaptability to Canada.[13] The maximum number of points available under this category is 10, and can be attained by some combination of spousal education (3-5), a years worth of authorized work in Canada (5), 2 years of post-secondary education in Canada (5) points for arranged employment (5), and a family relationship in Canada (5). Thus, while there is some advantage to having obtained Canadian education, little differentiation is made between a Canadian and a foreign education.

Recent international evidence suggests that the value of education can vary greatly depending on where it was acquired. In an influential study of immigration to Israel, Friedberg (2000) found that education (and experience) acquired abroad are significantly less valuable than human capital acquired in Israel. She also found that the

[13] The current pass mark is 67. In addition to educational attainment and adaptability, 24 points are available for language skills (English and French), 21 points for experience, 10 for age, and 10 for arranged employment.

value of foreign education differs greatly depending on its quality and its comparability with what is provided domestically. An additional important finding is that education acquired in Israel has the additional benefit of increasing the value of education acquired abroad. It appears that getting additional education in the host country helps them apply their previously acquired knowledge.

In recent work using Canadian data, Alboim, Finnie, and Meng (2005) have also found evidence of heavy discounting of foreign university degrees compared with Canadian degrees. Their study uses a rich data set that allows them to distinguish where education is acquired. For "non-white" immigrants, they find that a foreign degree yields a proportionate increase in income that is less than one-third of what a Canadian degree yields to the native born. For "white" immigrants, however, foreign degrees have roughly the same yield as Canadian degrees. Interestingly, the value of Canadian degrees for both "white" and "non-white" immigrants is roughly equivalent to their value to the native born. This evidence suggests that immigrants from countries with education systems that are poorly adapted to the Canadian economy do much better if their degrees are obtained in Canada.[14] Ferrer, Green, and Riddell (2005) point to an important reason for why foreign-acquired education is less beneficial in the Canadian labour market—literacy. Indeed, they find that once literacy in controlled for a foreign-acquired

[14] In recent work, Ferrer and Riddell (2004) allow separately for the effects of years of completed education and the actual attainment of credentials—what they term the "sheepskin effect." They find that this effect is quite important for Canadian immigrants, and that not allowing for it can lead to downward biased inferences about how foreign education is rewarded in the Canadian labour market. Interestingly, they find the "sheepskin effect" is especially pronounced for immigrants from outside the United Kingdom and the United States.

university degree is similarly rewarded to a Canadian-acquired degree in the Canadian labour market.

Empirical studies have also found that age at arrival is a strong predictor of success in the Canadian labour market (see, in particular, Schaafsma and Sweetman, 2001). Immigrants arriving at younger ages tend to outperform those that arrive at older ages for given levels of measured education and experience. One explanation is that immigrants that arrive at younger ages tend to obtain more of their education and experience in Canada, and that these domestically acquired skills have greater value in the Canadian labour market (see also Sweetman 2004). Another factor is that younger immigrants are likely to "acculturate" better to Canadian society. Whether the greater success of younger immigrants stems from their greater domestically acquired human capital or their easier adaptation to their new home, these results suggest the value of recruiting immigrants prior to their completion of formal education.

A central motivation for looking for better ways to link foreign student recruitment and immigrant selection is the evidence that recent immigrant cohorts are doing poorly in the Canadian labor market (see, for example, Baker and Benjamin, 1994, and Green and Worswick, 2004). One factor in this deteriorating performance is that the origin mix has been changing over time, with a greater proportion of immigrants coming from countries with educational and industrial structures that match less well with those in Canada. In addition, Reitz (2005) has argued that the under-utilization of immigrant skills has worsened with the shift to a more knowledge-based economy and the attendant

problems of credential recognition that tend to be associated with knowledge-based jobs. Reitz suggests a range of valuable policies to hasten the immigrant-integration process, including bridge-training programs to make foreign skills transferable to the Canadian labor market. Another part of the solution is better immigrant selection. McHale and Rogers (2005) explore methods for devising a more rational points system based on the best available evidence from earnings regressions on how immigrants with different bundles of human capital characteristics are performing in the Canadian labour market. The emerging econometric evidence on the differential value of Canadian and foreign degrees in terms of their impact on earnings suggest the need to differentiate between credentials in the points allocation process. At present, even graduates with PhDs from Canadian universities often do not qualify for permanent residency until they have acquired a number of years of experience.

The foregoing analysis considers how a better immigrant pool can be selected by taking better advantage of a given pool of foreign students. Probably just as important is the opportunity to recruit a higher quality student pool by offering a package to perspective student recruits that offers a predictable path to permanent residency. In the United States, employment-based permanent residency is quite difficult to obtain. A Canadian system that offers student visas plus a clear path to permanent residency could help Canada secure a greater share of the world's best mobile student talent. Finally, once foreign students are seen as a rich recruitment ground for skilled immigrants, there is an additional reason beyond revenue generation and knowledge production for expanding the size of the foreign student pool.

6. Concluding Comments

I opened the paper by noting that the topic of foreign student recruitment is often discussed in over-hyped language concerning the need to "compete for talent." In considering policy design in this area, there needs to be a careful debate about what Canada hopes to accomplish by the recruitment of foreign students, with particular emphasis on its effects on Canadian students and the broader economy. My review of the various sources of costs and benefits suggests that well-designed systems of foreign student recruitment can provide net benefits. But for these net benefits to result—and in particular for foreign student recruitment to increase the available quantity and quality of educational opportunities for younger Canadians—it is important that an appropriate incentive structure is put in place. I close the paper, then, by recapping elements of an incentive structure that should increase the odds that such recruitment will prove an overall plus (see also **Table 6**).

- Revenue generation. Universities should be allowed to enhance their revenues without crowding out domestic students. This could be accomplished by placing floors on the number of domestic students, leaving institutions free to expand their student bodies by recruiting foreign students. The institutions should be allowed to keep the resulting revenues, and the government should not reduce future appropriations based on success in raising these revenues. Institutions need to pay close attention to ensure that strong financial incentives do not lead to reduced standards and diminished reputations.

- Diversity. An internationally diverse student body can enhance the learning experience relevant to a more global society, provided that all students are meet rigorous standards, including standards for language competence.
- Competition. The government should avoid placing a cap on foreign students so that institutions have an incentive at the margin to attract foreign students by improving quality. However, to ensure that domestic students benefit from the improved quality, it is essential to avoid a two-tiered system.
- Knowledge production. Foreign graduate students can significantly boost the research capabilities of Canadian universities, and also increase the return to government support for research and development. But it is important to minimize the extent that foreign graduate students drive domestic students out of research careers due to their willingness to work of lower stipends. It is thus important to keep stipends for domestic students at a competitive level with other opportunities in the economy. A two-tiered stipend system—with more generous stipends for domestic students—could help balance the goals of increasing research output, reducing research cost, and ensuring that Canadian students are attracted to research.
- Links to the immigration system. The immigration points system should recognize that the value of a Canadian education tends to be more valuable than a foreign education in the Canadian economy. Foreign students should not be impeded from gaining valuable work experience during their time as students, and the process of obtaining temporary work permits after graduation should be streamlined.

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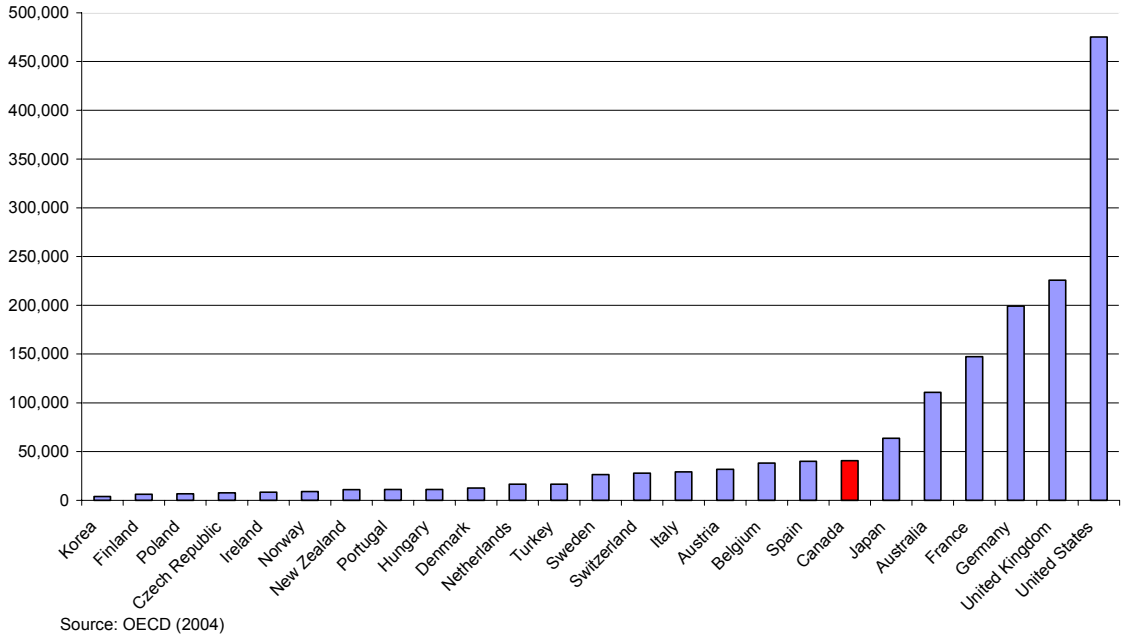
Figure 1. Number of Foreign Students in Tertiary Education in 2001



Source: OECD (2004)

Figure 2. Number of Foreign Students as a Percentage of All Students, Tertiary Level, 2001

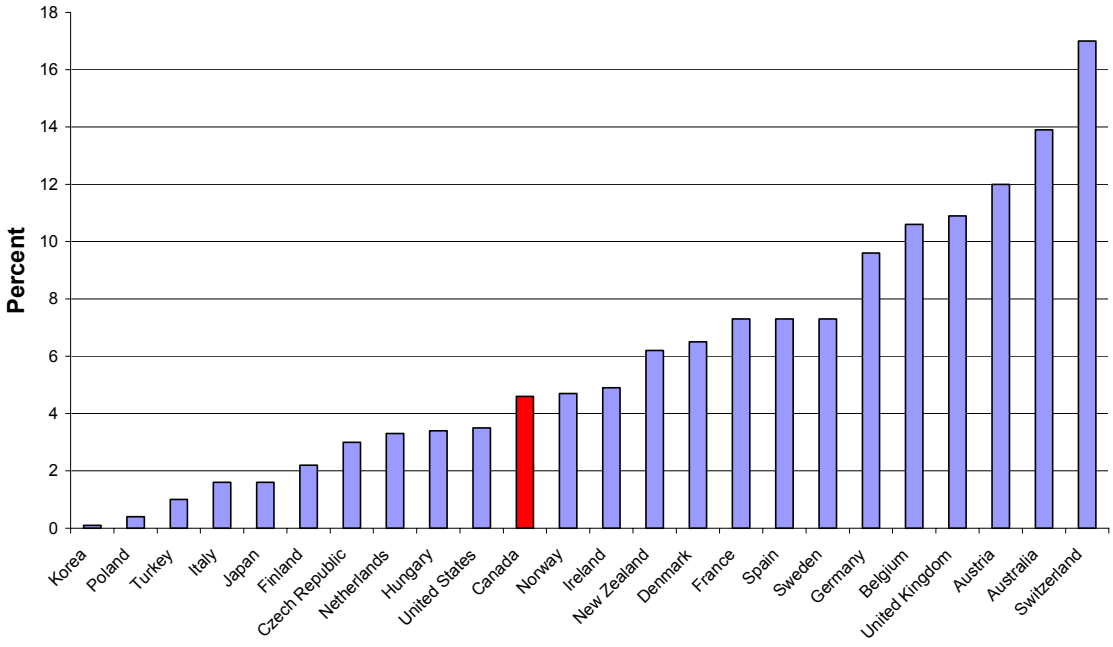
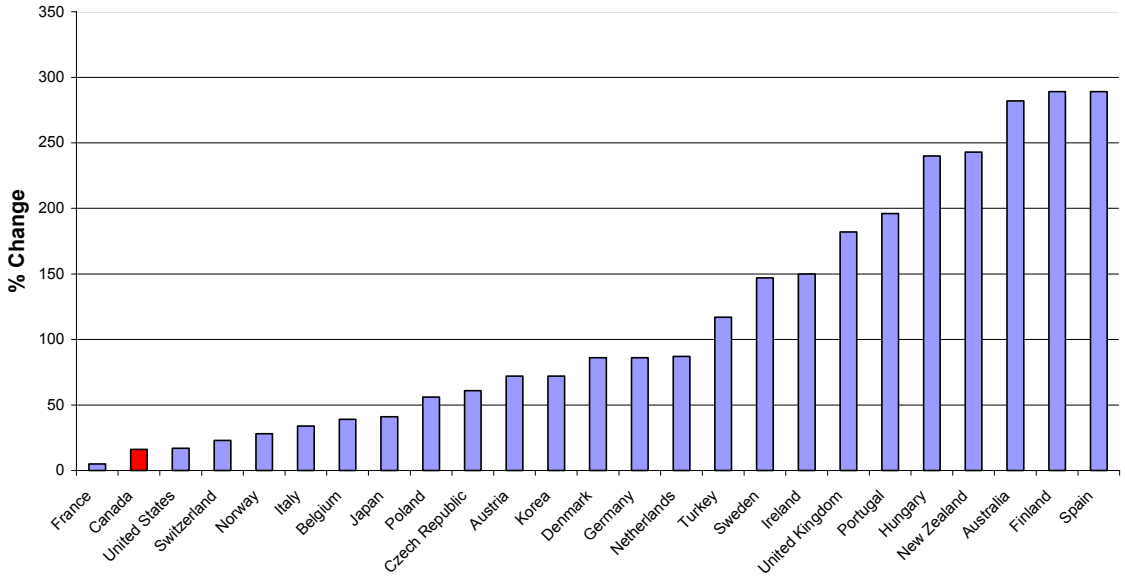


Figure 3. Percentage Change in Foreign Students in Tertiary Education, 1990 to 2001



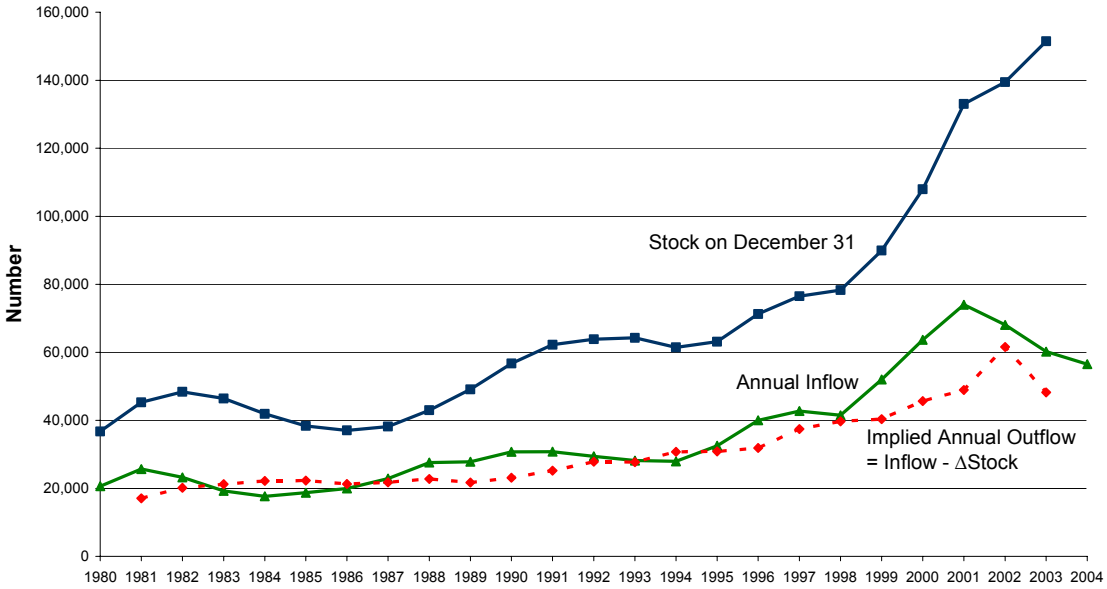
Source: OECD (2004)

Table 1. Shares of Foreign Tertiary Students in Selected English-Speaking Countries, 2001

Origin of Students	United States	United Kingdom	Australia	Canada	Total of Four
Asia	46	12	12	2	72
Oceania	26	12	43	3	84
South America	52	5	2	2	61
North America	50	19	6	7	82
Europe	13	21	2	2	38
All OECD Countries	30	14	7	3	54

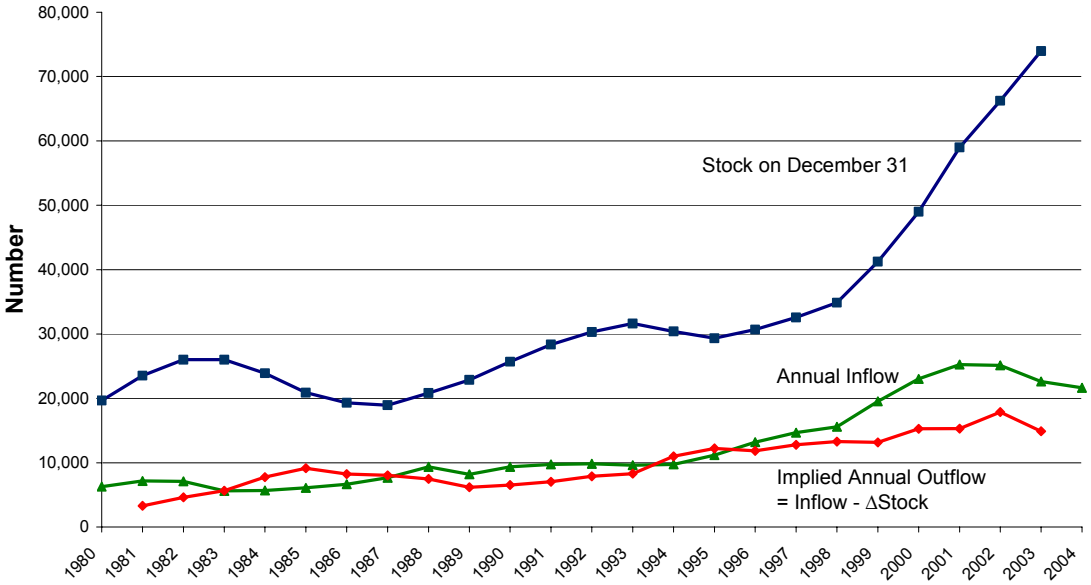
Source: OECD (2004)

Figure 4a. Stocks and Flows of Foreign Students in Canada, 1980 to 2004



Sources: CIC (2003) *Foreign Students in Canada,1980-2001* ; CIC (2004), *Facts and Figures 2003;* CIC (2005), *The Monitor, Spring* .

Figure 4b. Stocks and Flows of University Students in Canada, 1980 to 2004



Sources: CIC (2003) Foreign Students in Canada,1980-2001; CIC (2004), Facts and Figures 2003; CIC (2005), The Monitor, Spring.

Table 2. Stock of Foreign Students in Canada by Level of Study, 1980 to 2003

	Secondary or Less	Trade	University	Other Post-Secondary	Other	Total
1980	31	12	54	0	3	100
1981	34	11	52	0	3	100
1982	33	11	54	0	3	100
1983	31	10	56	0	3	100
1984	31	11	57	0	2	100
1985	33	11	54	1	2	100
1986	35	10	52	1	2	100
1987	37	9	50	2	3	100
1988	38	9	48	2	3	100
1989	39	9	47	3	3	100
1990	39	9	45	4	2	100
1991	38	9	46	5	2	100
1992	35	9	48	6	2	100
1993	33	10	49	5	3	100
1994	32	10	49	5	3	100
1995	31	13	46	6	3	100
1996	31	15	43	6	5	100
1997	30	15	43	7	6	100
1998	30	12	45	7	7	100
1999	27	13	46	8	7	100
2000	26	14	45	9	6	100
2001	24	13	44	13	6	100
2002	23	14	47	11	5	100
2003	20	13	49	14	4	100

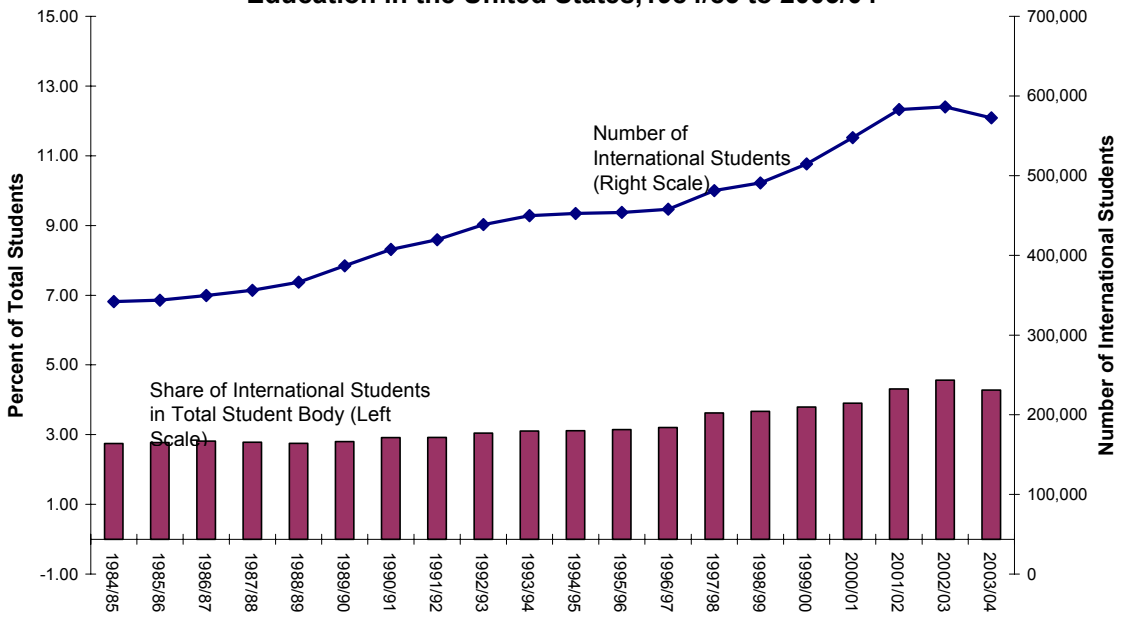
Source: CIC (2003), Foreign Students in Canada,1980-2001.

Table 3. Foreign Student Stocks by Province/Region, 1980 to 2001

	Atlantic Region	Quebec	Ontario	Prairies	British Columbia	Other	Total
1980	6	20	51	13	11	0	100
1981	5	17	56	12	10	0	100
1982	5	16	56	12	10	0	100
1983	6	15	54	14	11	0	100
1984	6	15	51	17	12	0	100
1985	6	16	48	18	12	0	100
1986	6	16	45	19	14	0	100
1987	6	16	43	19	16	0	100
1988	7	16	42	18	17	0	100
1989	6	15	41	18	19	1	100
1990	6	16	42	17	20	0	100
1991	6	15	41	17	21	0	100
1992	6	16	40	16	22	0	100
1993	6	18	38	16	21	0	100
1994	6	19	36	16	24	0	100
1995	5	19	33	15	27	0	100
1996	5	18	32	14	30	0	100
1997	5	18	32	14	31	1	100
1998	5	20	32	14	29	1	100
1999	5	19	33	13	28	1	100
2000	5	19	35	13	28	0	100
2001	5	18	36	12	30	0	100

Source: CIC (2003), Foreign Students in Canada,1980-2001.

Figure 5. Number and Share of International Students in Higher Education in the United States,1984/85 to 2003/04



Source: Institute of International Education (2004), Open Doors 2004: Report on International Educational Exchange

Table 4. Number of International Students in the United States by Country of Origin, 2003/04

		Number in 2003/04	% Change from 2002/03
1	India	79,736	6.9
2	China	61,765	-4.6
3	Korea	52,484	1.9
4	Japan	40,835	-11.2
5	Canada	27,017	1.9
6	Taiwan	26,178	-6.6
7	Mexico	13,329	4.1
8	Turkey	11,398	-1.7
9	Thailand	8,937	-10.5
10	Indonesia	8,880	-14.9
11	Germany	8,745	-6
12	United Kingdom	8,439	1.4
13	Brazil	7,799	-7
14	Columbia	7,533	-3.1
15	Kenya	7,381	-6.1
	World Total	572,509	-2.4

Source: Institute of International Education (2004), Open Doors 2004:
Report on International Educational Exchange

Table 5. Foreign Student Shares and Tuition Costs at Canadian Universities

	% First-Year Undergraduate Students From Outside Canada	% Graduate Students From Outside Canada	Tuition Fess 2004-2005 Undergraduate Arts & Science Programs
Undergraduate and Graduate			
Alberta	3.4	17.5	$12,161
Calgary	1.9	17.0	$12,032
Carleton	8.5	30.0	$11,438
Concordia	11.7	58.7	$10,592 to $14,941
Dalhousie	6.1	20.9	$10,440 to $11,190
Guelph	1.7	15.4	$10,221
Laval	11.5	24.9	$11,311
Manitoba	5.1	20.8	$6,847
McGill	17.9	29.3	$12,289 to $13,461
McMaster	6.8	22.8	$11,632 to $16,854
Memorial	4.6	20.6	$8,950
Montreal	12.8	26.4	$9,824
New Brunswick	6.1	21.3	$9,713
Ottawa	5.8	20.9	$12,176
Queen's	2.2	17.4	$15,136
Regina	4.6	20.3	$8,653
Saskatchewan	0.8	14.5	$11,811
Sherbrooke	1.4	16.6	$10,199 to $11,309
Simon Fraser	8.5	25.8	$14,759
Toronto	6.2	21.0	$12,405
UBC	8.6	23.6	$16,844 to $16,853
Victoria	7.1	25.4	$13,102
Waterloo	5.0	20.9	$15,763
Western	4.8	20.3	$13,346
Windsor	11.4	33.8	$10,612
York	3.0	16.8	$11,881
Primarily Undergraduate			
Acadia	17.0	. . .	$13,963
Bishop's	10.1	. . .	$10,642 to $11,752
Brandon	3.6	. . .	$5,249 to $5,779
Brock	6.8	. . .	$10,486
Cape Breton (UCCB)	8.4	. . .	$9,422
Lakehead	2.1	. . .	$9,908
Laurentian	4.7	. . .	$10,424

Continued . . .

Lethbridge	9.4	. . .	$8,991
Moncton	4.0	. . .	$8,285
Mount Allison	7.3	. . .	$11,811
Mount Saint Vincent	5.5	. . .	$10,863
Nipissing	0.7	. . .	$9,293
Ryerson	3.9	. . .	$13,421
Saint Mary's	16.1	. . .	$10,706 to $10,806
St. Francis Xavier	2.8	. . .	$10,718
St. Thomas	4.8	. . .	$7,955
Trent	3.6	. . .	$11,851
UNBC	1.7	. . .	$12,962 to $13,149
UPEI	5.1	. . .	$8,357
Wilfred Laurier	1.0	. . .	$9,913 to $12,371
Winnipeg	4.6	. . .	$5,407.00

Source: Maclean's Guide to Canadian Universities '05.

Figure 6. Allocation of Places Between Domestic and Foreign Students

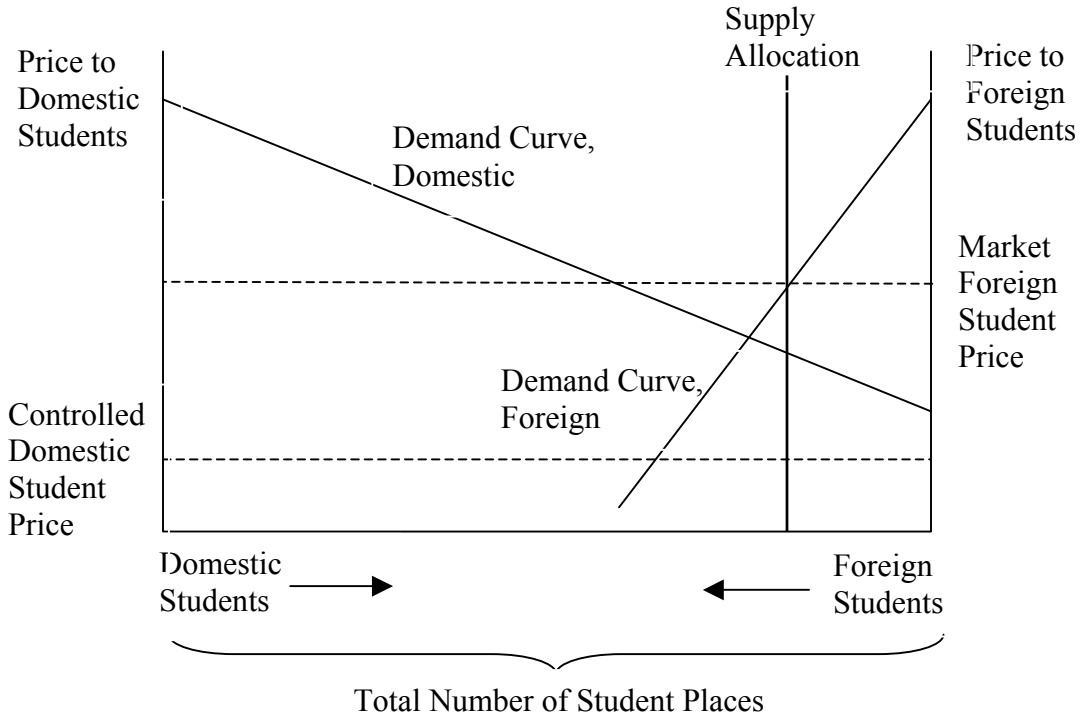


Figure 7. Impact of Foreign Supply on the Market for Graduate Students

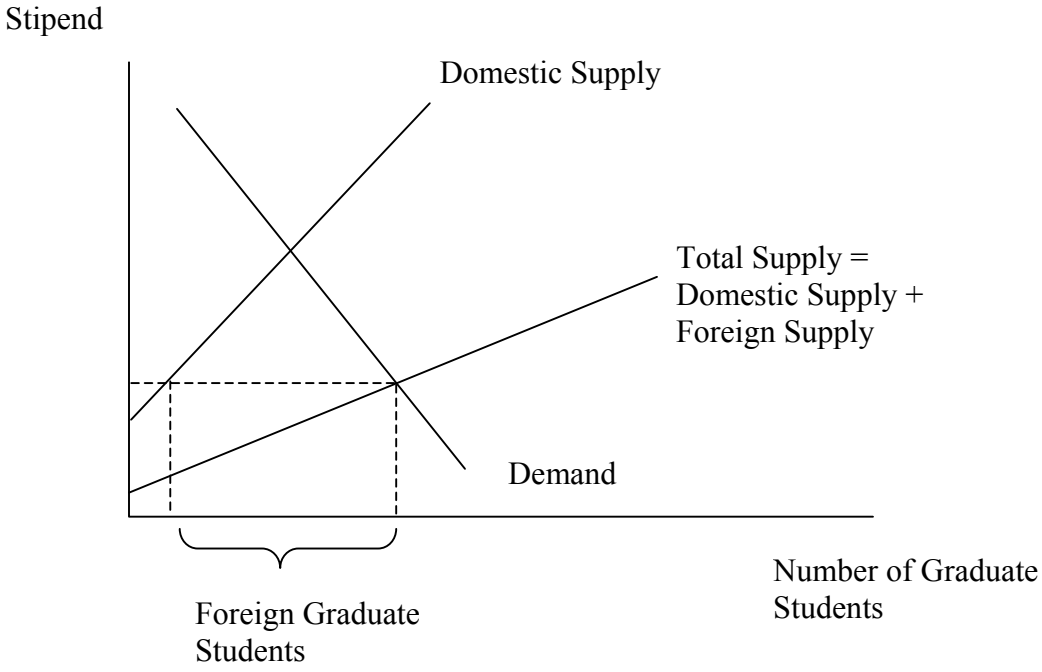


Figure 8. Effect of an Increase in Research Funding on Research Output

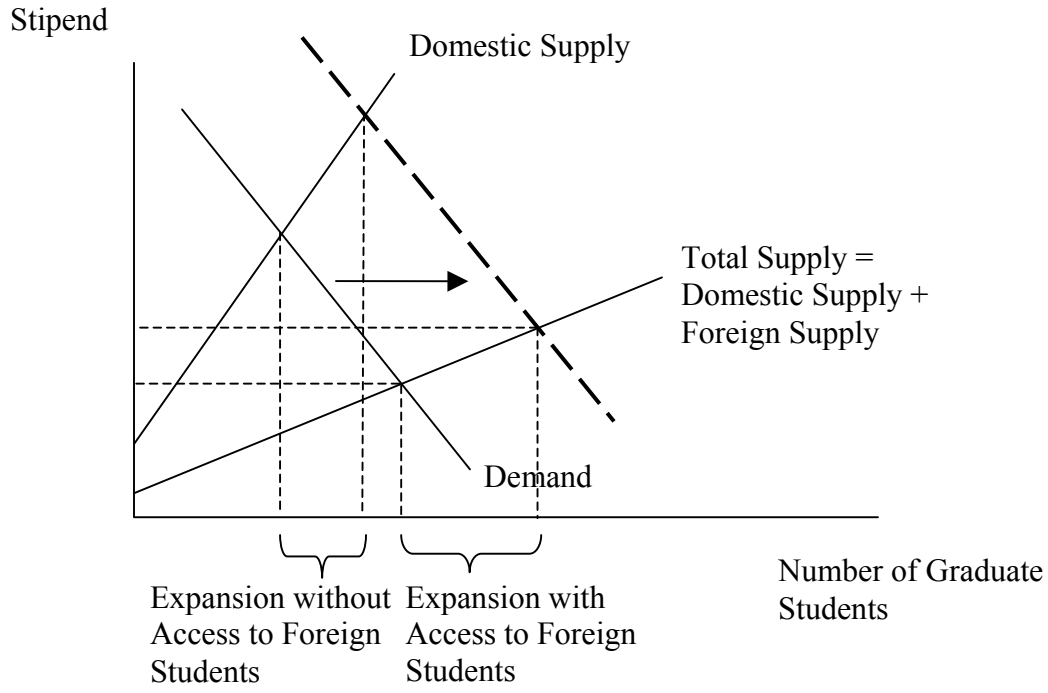


Table 6. Structural Incentives to Improve the Benefit-Cost Balance

Channel of Influence	Potential Benefit	Potential Cost	Structural Incentive
Revenue Generation	Increased places/quality for domestic students	Crowding out of domestic students	Floor on number of domestic places
Competition	Competition-induced improvements in performance	Competition-induced lowering of selection standards	Quality control in foreign student body
Diversity	Enriched learning environment	Impediments created by communication difficulties	Strict language competency requirements
Research Output	Lower costs and higher research output	Fewer domestic graduate students	Two-tier system of stipends
Immigrant Selection	Greater Canada-specific human capital	Greater share of education costs falls on Canada	Differentially recognize Canadian education in points allocation