Can we say whether the Canada Millennium Scholarship bursaries have affected post-secondary enrolments?

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Summary

The Canada Millennium Scholarship Program was established with a $2.5 billion endowment in 1999, with the goal of distributing all its capital for the purposes of student financial aid between 2000 and 2010. The goals of the program were to increase access to post-secondary education, especially among students facing economic and social barriers, and to reduce student debt. This paper examines whether there is any evidence that the first of these goals was met, drawing on statistics on post-secondary enrolments and persistence, and examining the likely distributional effects of the bursaries. There is reason to think on theoretical grounds that the bursaries – which were primarily paid in the form of a reduction in student debt, and therefore primarily increased resources to students only once they were in repayment of their student loans (after leaving PSE) – that the effects of the CMSF bursary program would not have been very large. On the other hand, data on post-secondary participation shows there was a substantial increase in university enrolments and perhaps in some increase in university persistence after 2000. Unfortunately, it is impossible to attribute this to the CMSF bursary program because of the unusual way the program was implemented. It is unlikely that there is any reliable way to evaluate the effects on enrolments of the CMSF bursary program, even if more informative data were available.

Acknowledgement

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Introduction

In January of 2000, the Canada Millennium Scholarship Foundation (CMSF) – a foundation established to provide financial assistance to high-need post-secondary students from a $2.5bn endowment fund – disbursed the first of their funds to students. By 2009, the CMSF's funds are scheduled to be exhausted.

The majority of the CMSF's funds have been dedicated to its bursaries and scholarships programs. With around $350 million distributed each year to 100,000 students, these programs have provided significant assistance to students on top of the existing student loans programs and university-based aid programs.

Government statements on the aims of the CMSF bursaries mention two key goals:
1. To increase access to post-secondary education, particularly among youth facing 'economic or social barriers'; and
2. To allow students to graduate with lower debt.

This paper will focus on the first of these goals, measuring access to PSE though enrolment and participation statistics over the past several decades, and attempting to discern any recent changes that may be attributable to the CMSF. Unfortunately, because of peculiarities in the way the CMSF bursary program was implemented, a formal evaluation yielding reliable results is not feasible. The paper relies on a relatively informal discussion of recent trends in several key indicators, therefore.

To be specific, I examine three key indicators in this paper:
1. overall enrolments, particularly among those facing 'economic or social barriers';
2. post-secondary students' persistence in post-secondary education; and
3. the likely distribution of resources going to financially disadvantaged post-secondary students.

Since the biggest effects of the CMSF were likely to be on universities rather than colleges – university students accounted for 70% of all bursaries received, while college students accounted for 25% - much of the paper also focuses on university enrolments.[1]

It should be noted that the CMSF does run other programs than the bursaries – in particular the Excellence scholarships. It has also been active in recent years in trying to better identify and target funds towards students who face particular barriers to participation in post-secondary education, in line with its mandate. However, these pilot programs are in their early stages, are of a scale that would not be expected to have significant effects on aggregate enrolments, and have quite well-defined research plans associated with them. As a consequence, this paper can not make any statements on the effects of those programs.

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[1] These figures do vary by province – see Figure A1.

Brief history and description of CMSF

The CMSF was created by an Act of Parliament in 1998, with an endowment of $2.5 billion dollars. The legislation stated that the bursaries should complement existing student provincial assistance programs and avoid duplication with them. As a result, the Millennium Bursary program was integrated with existing provincial student financial aid programs. As well, the program was consistently described as being intended to alleviate debt of students who had demonstrated academic merit (Institute for Intergovernmental Relations (IIGR),(Institute for Intergovernmental Relations, 2003) 2003). Thus, in most provinces the bursaries were specifically designed to reduce the debt owed by students who received financial aid in the second to fourth years of an undergraduate program.

The creation of an independent body to oversee distribution of the loans in consultation with the provinces was another innovation. These features together meant that the mandate of the CMSF was largely to work with provincial governments to design a program to substitute grants for some part of existing loans (of an amount of around $3000 per year for recipients), with the aim of increasing access to university.

This meant two things, which are important in evaluating the program, and which have led to a considerable criticism of the CMSF:

1. In most provinces, the bursaries did not increase funds available to students while they were studying, but reduced the amount that would have to be repaid upon graduation; and
2. The Millennium Bursaries in many cases displaced provincial programs that were already in place to forgive debt, or to reduce repayments on graduation.

Table 1 shows the main parameters of the CMSF bursary program by province, as they stand at present. The major changes since inception in 2000 have been that Alberta and Ontario have changed their delivery method from debt remission to a cash grant.

Table 1. Payment of CMSF bursaries: provincial detail

Province	Maximum	Current method of payment	Existing debt relief program?	Net increase in current funds?
BC	$5625	Reduce student loan debt	Yes: Replaces BC Grants for 2nd year students. Abolished in x.	No
AB	$3000	Cash grant through the Alberta Student Assistance Program	Yes: Replaces Alberta Opportunity Grants for 2nd year students	Yes
SK	$4000	Reduce student loan debt.	Yes: Saskatchewan Study Grants	No
MB	$4500	Reduce student loan debt	No	No
ON	$3000	Cash grant through the Ontario Student Assistance Program	Yes: OSOG	Yes
PQ	$2500 or $3500	Forms a part of the total aid package provided by the province's Loans and Bursaries Program	Yes: Program redesigned after introduction so no net increase in funding for students.	No?
NB	$4000	Reduce student loan debt	No	No
NS	$3000	Reduce student loan debt	No? (Yes?)	No
PEI	$4000	Reduce student loan debt. Must be among the first 300+ finalized high-need applicants	No.	No
NF	$3500	Up to 50 per cent paid as cash grant; the balance is paid to reduce student loan debt.	No – in addition to existing programs	Yes – by half the amount of the bursary

Source: CMSF website

It is apparent that if there had been no changes to provincial aid programs when the Millennium Bursaries came into existence then the Millennium bursaries would to a large extent replace provincial financial aid, leading to savings for the provincial aid programs. To ensure that the program provided benefits to post-secondary students, therefore, the CMSF negotiated side agreements with each province on how the savings would be 'reinvested' in "the same or a related policy area", where this appears to have been broadly interpreted to mean in the area of post-secondary education.[2]

The reinvestment agreements differed substantially by province (IIGR, 2003: 91). Some provinces used the freed-up funds to improve provincial student aid programs. In BC, for instance, the BC Grant was initially extended, so that students in their 3rd and 4th years of an undergraduate program were now eligible, where before they had not been.[3] In Ontario, on the other hand, around $33 million of estimated provincial savings of $69.2 million was reinvested in student financial aid.

For Ontario, the CMSF funds came at an opportune time. The Ontario government had already decided to make changes to the high school curriculum which would allow most students to graduate from high school in 12 rather than 13 years of formal schooling. This would cause an increase in the numbers of students seeking entry into post-secondary institutions in the early part of the 21st Century. Overall demographic trends meant this would be followed by a bulge in the population of post-secondary aged youth. In order to maintain post-secondary enrolment rates, large increases in infrastructure and likely the numbers of faculty at universities and colleges would be necessary. It is perhaps not surprising then that Ontario appears to have used the funds to increase general transfers to universities more than most other provinces.

This has been heavily criticized by student organizations.[4] But there may have been an important way in which Ontario has managed the double cohort bulge relatively well. It does not appear that there was a very large disadvantage to students entering in the double cohort, in terms of their ability to enroll in university or college. Although it does appear that grades required to enter university increased – and this could have had a disproportionately large effect on enrolments of students from disadvantaged backgrounds – such effects could have been substantially worse if the funds had been simply devoted to student financial aid and universities themselves had not been given additional resources to devote to increasing faculty numbers and facilities.

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[2] Note: it is beyond the scope of this paper to specifically and independently evaluate the extent to which reinvestments occurred. This is to be the subject of a separate paper commissioned by HRSD. Brief comments on the issue of reinvestments here are intended mostly to highlight the fact that the total effects of the CMSF bursary program may be quite different from the direct effects on the students who actually received the bursaries.

[3] This program was later abolished.

[4] It is not clear why this should be so. The Canadian Federation of Students, for instance, has consistently criticized the federal government for not having a substantial cash-transfer program targeted to post-secondary education. In effect, the CMSF bursaries reduce the need to spend provincial funds on financial aid programs, with the reinvestment agreements requiring them to increase spending elsewhere in the area of post-secondary education. It is unclear how this is inferior to a regular conditional transfer payment.

The fact that the CMSF program did allow some flexibility in implementation by provinces, then, may have actually helped provinces to ensure that the provincial funds released were spent effectively on post-secondary education.

Thus, the direct effects of the CMSF program may have been quite limited – because, say, the program mostly replaced previous provincial programs – but overall may have had substantial benefits to students if the savings were reinvested in a way that benefited students. This has important implications for attempts at evaluation. In particular, the total effect of the CMSF program could potentially be larger than the effect on the group that was directly targeted.

Examining the effects only on those who were the direct targets of the policy, therefore, may understate the benefits of the program. Thus, using what has become a typical approach in the evaluation literature – comparing the effects of a policy intervention on the targeted or treatment group and comparing them to the effects on a non-targeted or control group – may not provide all the information needed for an evaluation. It will, in the terminology of the IIGR, give an estimate of the direct effects, but not of the indirect effects. That leaves us with an approach that is much less attractive, namely examining statistics from before the policy change and after the policy change. The key disadvantage of this approach is that there may be other policy or other socio-economic changes that occurred around the same time that could explain the changes in enrolments, and fully accounting for those changes in a formal regression analysis is likely impossible.

With this overall picture in mind, I turn now to the question of whether there is any theoretical or empirical evidence to suggest that the introduction of the CMSF has been effective in achieving three main goals:
1. increasing enrolments;
2. increasing student persistence through university; and
3. a more equitable distribution of the costs of attending post-secondary education

Financial Aid and Post-Secondary Enrolments

Previous studies

The most extensive review of the CMSF was undertaken by a group of distinguished analysts of Canada's post-secondary education system, under the auspices of the Institute for Intergovernmental Relations (IIGR) at Queen's University, in 2003. The work covered several different areas, including the CMSF's financial situation, relationships with the provinces, and access to post-secondary education.

The report did not examine any enrolment data – there being none available at the time – but rather undertook an extensive review of the nature of the CMSF bursaries and the available empirical evidence on the effects of changes in the direct costs of education in order to draw conclusions on their likely effects. They concluded that:

> The direct impact of the CMSF on access therefore likely ranges from limited and indirect (where the CMSF money leads to a substitution of grants for loans) to non-existent (where it simply displaces provincial money). … The direct impact of the CMSF awards on the nature of student financial aid in the provinces does not, however, reflect the full effect of the CMSF program, because the CMSF awards saved each province a considerable amount of money through the reduced spending on provincial grant, loan, and debt remission programs that resulted. In the agreements between the CMSF and the provinces, each province agreed to re-invest any such savings that were created by the CMSF awards …. Any full understanding of the effects of the CMSF on access thus depends on those agreements and how they have been observed." (IIGR, 2003: 47)

The IIGR noted that the agreed upon reinvestments were greater than the savings – casting doubt on whether these reinvestments were in fact new spending promises, and suggesting that many of the 'reinvestments' would have occurred anyway. This is clearly an important issue in analyzing the effects of the CMSF. However, it is an extremely difficult task, requiring judgements about whether particular changes to provincial programs would have occurred in the absence of the CMSF. This task is beyond the scope of this paper.

Focusing on the issue of the direct benefits of the CMSF bursaries, the IIGR employed a very useful strategy, identifying three key reasons why access to post-secondary education may be impeded, and which could potentially be overcome by a student financial aid program:
1. A high cost of post-secondary education relative to perceived benefits (rate of return limitation);
2. A lack of readily available funds (credit constraints); and
3. Debt aversion

As noted, these barriers are those which could plausibly be overcome by financial aid programs, and are pertinent to the issue of the direct effects of the CMSF bursaries.[5] There is another possible barrier that the IIGR did not consider, but which may also have been important – all the financial aid in the world cannot help if there are too few positions available at universities.

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[5] There are many other potential barriers to post-secondary attendance, including informational (Usher, 2006) and low grades which may be the result of long-term family or schooling factors (Frenette, 2007). These are not considered here, since the CMSF bursaries are very unlikely to reduce such barriers.

While the CMSF bursaries in themselves would have been unable to affect this type of barrier, they may have had an indirect effect, by freeing up provincial funds for reinvestment in direct grants to universities.

Nonetheless, supposing that the aim is to increase enrolments through direct financial aid to students, there are three types of aid program that could be considered[6]:

1. Grants
   a. A cash grant that would allow a student to spend more while he or she is in school, with no need to repay this amount after graduation.
   b. This type of aid helps overcome all three types of access barrier identified above. It is likely the most costly kind of aid, however, and needs to be targeted wisely to achieve the greatest increase in access for the smallest amount of spending. Providing a direct cash grant to an individual who would have attended university in any case merely redistributes tax dollars, with no access effects.
2. Subsidized student loans
   a. A cash grant that would allow a student to spend more while he or she is in school, but that would need to be repaid on graduation, albeit on concessional terms relative to private borrowing.
   b. This type of aid helps alleviate the first and second kinds of access barrier identified above (though the first only to the extent that the loan is subsidized). It may not assist students who are averse to borrowing regardless of the likely financial payoff in the long run. If the main access barrier is credit constraints, it is likely to be relatively cost effective compared with grants, although the administrative costs involved in recovering the debt are potentially quite large.
3. Debt remission
   a. A grant that is applied to reduce existing student loan debt – it does not directly increase the amount that a student has available to spend while in school, but reduces the amount that has to be repaid on graduation. It is equivalent to an up front payment only to the extent that students know they will be eligible for it.
   b. Because it does not increase the resources available to students while they are studying, it cannot alleviate the second kind of access restriction. Because it is a deferred grant, it has a smaller effect on the rate of return barrier than does an in-course grant. It may, however, alleviate the debt aversion barrier. Nonetheless, it is likely to be the weakest form of financial aid in terms of its effects on access and enrolments.

The CMSF bursaries take the last form. Note that theoretically it is the least likely of the three forms of financial aid to reduce disincentives against enrolment for students facing financial barriers to postsecondary education. It is important to note that there has been no empirical study which finds that this type of financial aid is effective in increasing enrolments or access to

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[6] Another possible type of aid would be to reduce any debt accumulated after graduation on the basis of a lack of income earned after graduation. Because individuals cannot be certain that they will receive such payments at the time they are making the decision to enroll, they would only affect enrolments if individuals were choosing not to enroll in post-secondary education due to risk aversion. While this is a possibility, and alleviating such risk aversion is one of the potential benefits of a fully income-contingent loan scheme, I do not explore it further here. Such characteristics play only a minor role in the Canadian student financial aid system.

post-secondary education. By contrast, there is strong empirical support that direct grants to students increase the probability of students enrolling, and some evidence that subsidized student loans increase enrolments (see Appendix 1 for an elaboration of this evidence). This is the basic reasoning underlying the IIGR's conclusion that the CMSF bursaries would have had little, if any, direct effect on enrolment rates.

Summary

The IIGR report on the effectiveness of the CMSF program in 2003 concluded that the likely effects of the CMSF program on enrolments were negligible. The evidence reviewed here points to the same conclusion regarding the direct effects – since the direct nature of the program was purely debt remission, and since it largely replaced existing loan remission programs. However, the indirect effects in those provinces where debt remission programs were already in place may have been larger.

Because there is no way to separate out the direct from the indirect effects of the CMSF bursaries, I take an agnostic approach to this question in the subsequent analysis. However, this means that in an important sense the evaluation here will be restricted to answering the question of whether enrolments – and particularly enrolments of relatively disadvantaged students – increased after the introduction of the CMSF bursary program. For reasons that have been extensively discussed in the literature on program evaluation, this is a rather tenuous approach to take. In particular, it requires the assumption that there was no other change that occurred at around the same time that might have affected enrolments. This is extremely unlikely to be true in the case of the CMSF, as I point out in the next section.

Enrolments – trends and analysis

There is substantial work surveying the socio-economic determinants of post-secondary enrolments in Canada, most of which is very recent – most notably Corak Lipps and Zhao (2003), Junor and Usher (2004), Drolet (2005), Rahman, Situ and Jimmo (2005) and Lin and Situ (2006). There is also a growing body of research discussing the role of policy in determining post-secondary enrolments – see for instance Christofides, Cirello and Hoy (2001), Fortin (2004), Coelli (2005) and Neill (2006). Finally, informational determinants of post-secondary enrolments are discussed by Usher (2005a).

A difficulty of undertaking an integrated survey of this research is that typically each paper uses a single data set and a single definition of critical variables such as 'enrolment' or 'socio-economic status', making it difficult to compare the research effectively. For instance, Corak, Lipps and Zhao (2003) analyse enrolments by parental income group, where the groups are broken down into ranges of $25,000, while Coelli (2005) breaks the sample down into the top, middle and bottom third of families by income, and Lin and Situ (2006) use family income quartiles. Given that each also uses a different data set, and typically youth in different age groups, this makes it difficult to draw conclusions on trends at any but the roughest level.

Figure 1 shows that different data sources can give quite different pictures of trends in overall enrolments. Overall enrolments as measured by the Survey of Labour and Income Dynamics (SLID), Labour Force Survey (LFS) and administrative data from universities, provided under the University Student Information System and Enhanced Student Information System (ESIS)

also differ quite substantially. For instance, estimates from the ESIS imply that 42% of 18-24 year olds were enrolled in post-secondary educational institutions in 2003, while the LFS puts this figure at 40% and the SLID at 47%.[7]

Nonetheless, each of these data sets has slightly different advantages in helping to identify trends in enrolments, especially when broken down by province and socio-economic status. The LAD has by far the largest sample (20 per cent of taxfilers), but the least detail on student status and family background. It does, however, along with the SLID, have excellent data on income of individuals and their parents (where a match is possible). The LFS has considerable information on labour market characteristics, including education levels and occupation and industry of an individual's jobs, very useful for identifying socio-economic status, but has no parental income data. The SLID has the advantage of a longitudinal component, but has small sample sizes which makes a breakdown of results even to the province-year level unreliable.

The first CMSF bursaries were allocated in January of 2000, benefiting students in the second to fourth year of their post-secondary education. In terms of the likely timing of the effects of the CMSF on students, therefore, it would be most prudent to take 1998-99 academic year as the base year – the year in which the program would seem unlikely to have any effects. Effects on enrolments could perhaps have been seen as early as the 1999-2000 academic year, if students were able to anticipate payments that were made in early 2000, but they were more likely to start to be visible by the 2000-01 academic year and later on.

It should also be noted that the CMSF bursaries distribute funds to around 100,000 students annually, or around 10 per cent of all post-secondary students. For the recipients, the annual cost of education was reduced by about $3000 on average. According to the Canadian studies, the effect of this price reduction should have been to increase university enrolment rates by two to three percentage points.[8] Assuming that this affected 20 per cent of 18-24 year old university students (because they were more likely to receive a CMSF bursary than college students, or older students), then the introduction of the CMSF bursary program would have been expected to increase overall university enrolment rates by one or two percentage points at most. Again, though, there may potentially be larger effects if the reinvestments were more effective in raising enrolments than was debt remission. Indeed, actual enrolment rates increased by considerably more than one or two percentage points between 2000 and 2004 in most provinces. Clearly, it would be unwise to attribute all of the trend increase in enrolments in recent years to the CMSF alone. Other factors most likely played an important role.

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[7] The identification of student status is quite different between the LAD and the SLID/LFS, but those two have a very similar approach to identifying who is enrolled and who is not.
[8] The estimates from Neill (2006) and Johnson and Rahman (2005) are used here.

Figure 1 Comparison of estimates all full-time university students (% of the 18-24 year old population), various data sources
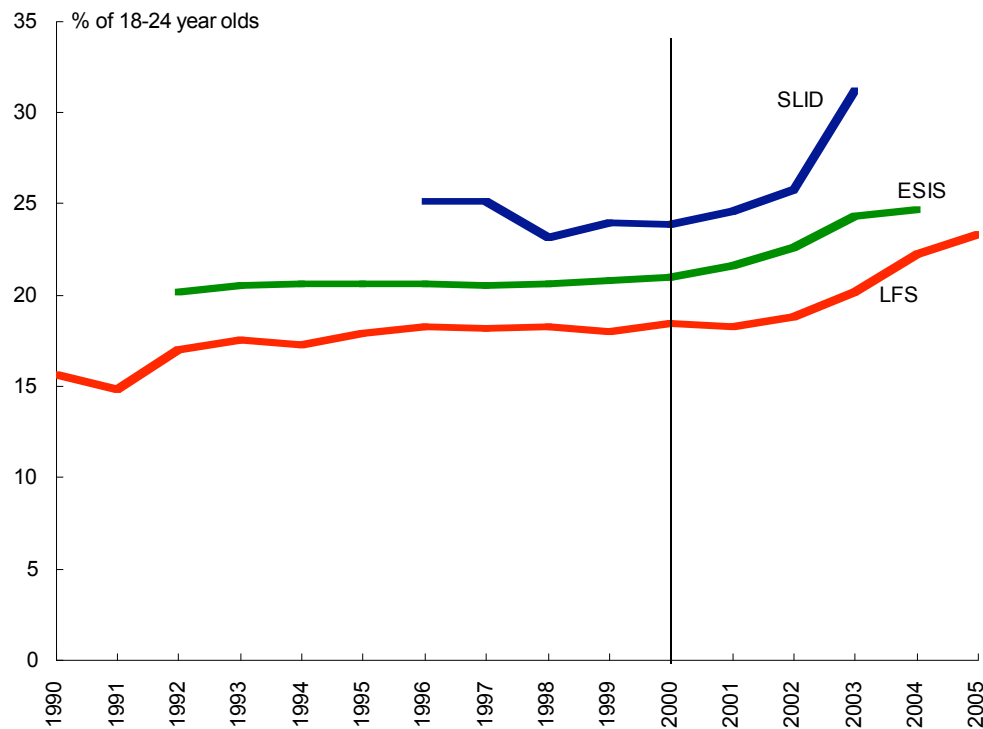

Source: calculations from LFS (December), SLID and Statistics Canada *Education in Canada*, various years. Note that the time periods for each data source are somewhat different. The ESIS data shows enrolments of individuals of all ages as a percentage of 18-24 year olds in November/December. The LFS is enrolments of 18-24 year olds in the month of December. The SLID is enrolments of 18-24 year olds at some time in the calendar year (thus is straddles two academic years, unlike the other data sets).

The base population examined in this paper is all 18-24 year olds. This is standard in the literature on post-secondary enrolments, because this group makes up the bulk of all post-secondary students. However, the CMSF would not be expected to affect all students in this group equally. Students over the age of 22 are less likely to be eligible to receive the CMSF bursary because they are more likely to have completed four years of undergraduate education. Unfortunately, in the data sets used in this paper, it is not possible to clearly identify the year in which a student is registered. Furthermore, if reduced debt on graduation is associated with a higher propensity to enroll in post-graduate work, then any such effect would be picked up only among older students. In some cases, results are reported for more disaggregated age groupings, but typically the results are not different from those for all 18-24 year olds.

As Figure 1 shows, the three key sources of data used here are fairly consistent in their description of the broad trends in enrolment rates over the past decade. The full-time university enrolment rate was roughly flat during most of the 1990s, and began gradually picking up in around 2000. Regardless of which measure is used, the enrolment rate is considerably higher in 2003 and after than in 1999, up between 4 and 7 percentage points. This is a large increase, particularly in comparison to the stagnation in enrolments over the 1990s.

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Figure 2. Full-time university and college enrolments, % of 18-24 year olds attending university, SLID vs LFS
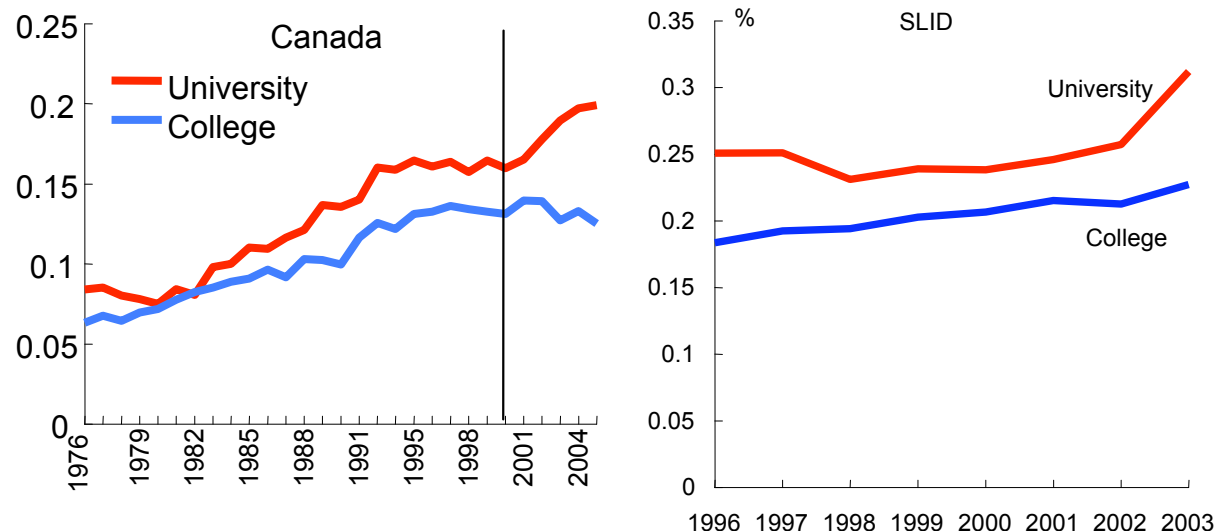
Source: LFS; SLID

Enrolments in universities (and colleges) had grown rapidly in the 1980s, and were then relatively stagnant from the mid 1990s on.   From 1992 to 2001, there was virtually no increase in the university enrolment rate across Canada. This was a period of fiscal restraint on the part of many provinces and the federal government, and considerable tuition fee hikes in many provinces (Figure 3). Since 1999-2000, there has been a slight slowdown in growth in tuition fees. The net effect of a slower rate of fee increase on enrolment rates is not clear, however. It may increase demand from individuals for a university education, but it could also limit the number of spaces that universities are able to make available. The overall effect would depend on whether demand or supply acted as the biggest inhibitor of increases in spaces in any particular situation. Empirical studies tend to show a relatively small net effect on overall enrolment rates.

Figure 3. Real undergraduate tuition fee, Canada average, 2004/05 dollars
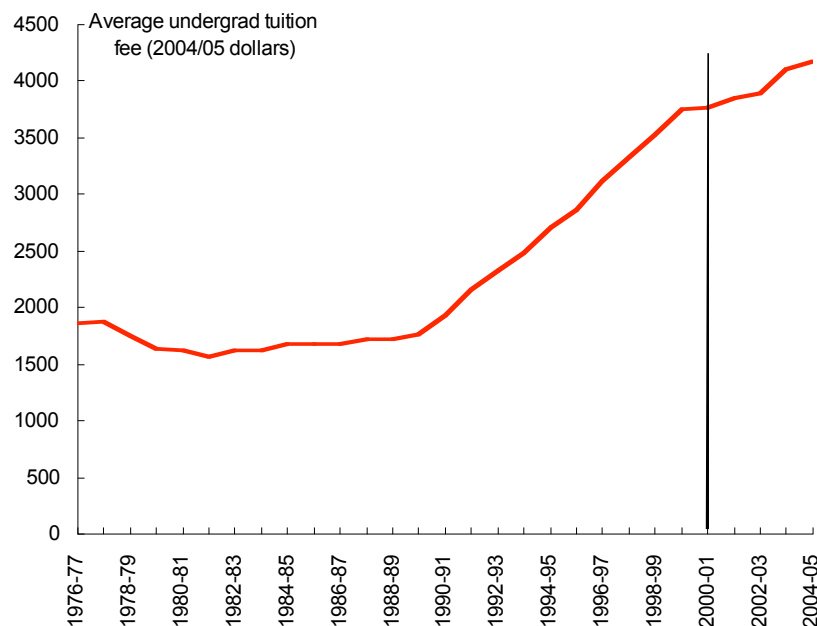
Source: Statistics Canada, Tuition fees and living accommodations survey

After the relative stagnation of enrolment rates in the 1990s, the full-time university enrolment rate began increasing quite substantially beginning in around the 2001-02 academic year. Using the ESIS measures, the full -time enrolment rate increased by 18.6 per cent, from 20.8 per cent to 24.7 per cent in the 5 years to 2004-05. In the five years to 1999-2000, by contrast, it increased only marginally, from 20.6 per cent to 20.8 per cent. The turning point in enrolment rates appears to have come some time between 1999 and 2001, roughly the same time as the CMSF bursaries were introduced. Changes in tuition fees do not appear, at first glance, to have been substantial enough to trigger the change in enrolment rates. Further, the enrolment rate has increased in all provinces since 1999-00. That was not the case in the prior five year period, when enrolments dropped in several provinces.

A similar increase does not seem to have occurred among the college student population (Figure 2).[9] The CMSF bursaries predominantly benefited university students, who were both more likely to receive a bursary, and more likely to receive a bursary in multiple years, than were college students. Given that there appears to be a shift away from college towards university enrolments around the time the CMSF was introduced, this provides some additional support for the notion that the increase in university enrolments is attributable to policy changes, rather than general shifts in the returns to education, say. It may also be the case that the job market affected potential college students to a greater extent than university students. This may explain the relatively weak growth in overall university enrolments in Alberta also (see Figure 5) – the economy there has been booming for the past several years, and unemployment rates have been extremely low.

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[9] There is no good administrative data on college enrolments currently available. For most inference on college enrolments, the LFS is the only reliable source of information at present.

Note, however, that the data from the SLID tell a somewhat different story – it shows little increase in the university enrolment rate until calendar year 2003, when Ontario's double cohort would have affected the figures, and a relatively steady, though small, increase in college enrolment rates for most years since 1996. The LFS measures seem preferable here for two reasons. First, the sample size is considerably larger, making the estimates more precise, and the data are available for an additional two years, making trends since 2000 clearer. Second, the SLID follows a set cohort over time, so that changes in enrolment rates are within the group initially surveyed. Estimates of enrolment rates are therefore not independent across years in the SLID as they are in the LFS.

Provincial level data

A few provinces experienced some growth in university enrolment rates over the mid to late 1990s, including Nova Scotia, Newfoundland and Prince Edward Island. In all other provinces, however, enrolment rates either stagnated or declined over that time period. Since around 2000, however, every province has seen some increase in enrolment rates. In the five years to 2003, enrolments increased by more than 10% in eight provinces, and decreased in none. In the five years to 1998, on the other hand, enrolments increased by more than 10% in only two provinces, and decreased in four. Enrolment rates at provincial universities increased by more than 20 per cent in Newfoundland, PEI, Ontario and Manitoba between 1998 and 2003. The smallest increase was in Alberta, which only increased 5% (from 18.3% to 19.3%). Quebec, BC and Ontario saw very large increases beginning in around 2001. Figure 5, which shows estimates of enrolment rates of 17-24 year olds taken from the Labour Force Survey public use files show similar patterns, although the figures show more variability since they are based on a sample survey rather than administrative data.

This break in enrolment trends coincides with the introduction of the CMSF bursary program. Again, it would be naïve to attribute all of the increase to the CMSF bursary program, but the coincidence is interesting.

Figure 4. Enrolments in provincial universities, % of 18-24 year old population
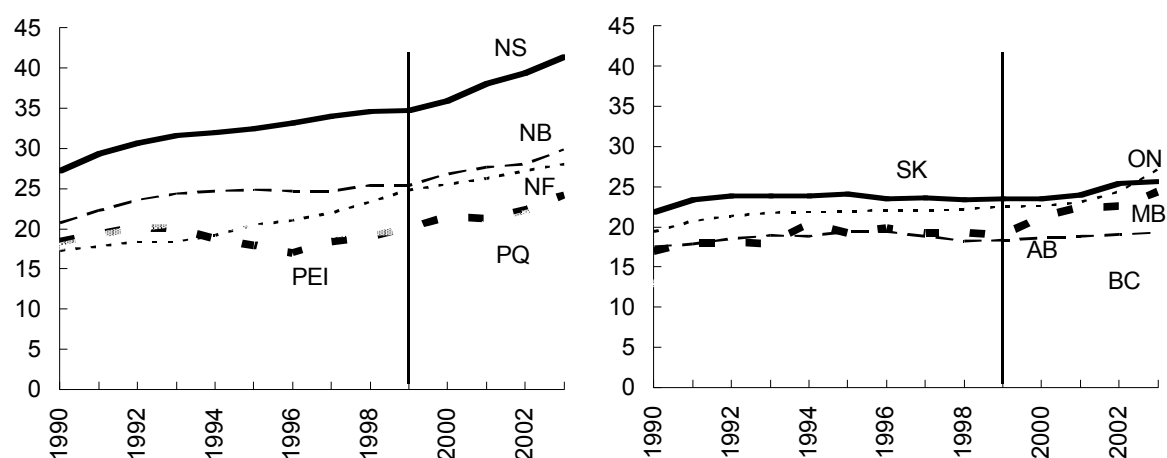
Source: ESIS/USIS data, from CANSIM Matrix 4770013

Figure 5. Percentage of 17-24 year olds enrolled in university full time, by province
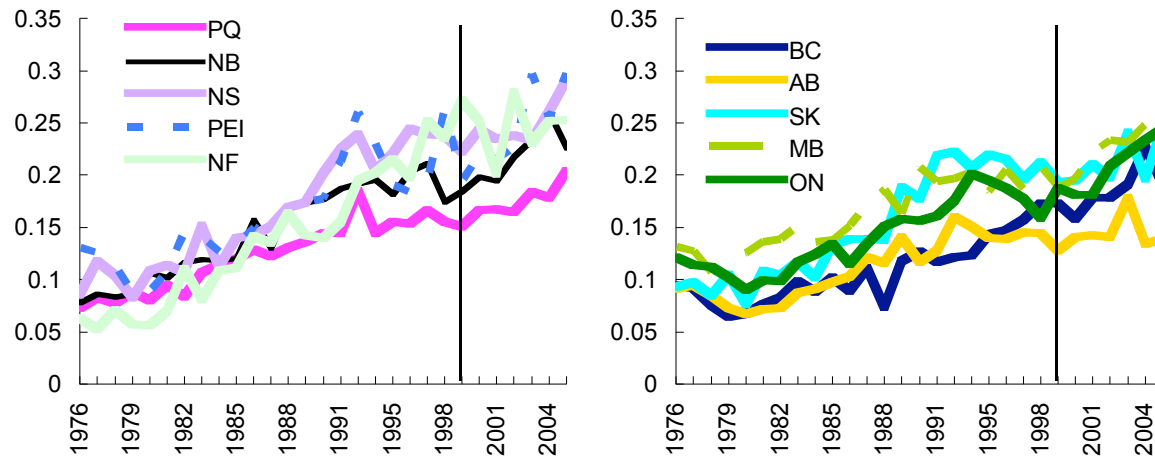
Source: LFS public use files, various years.

The figures below show more clearly the full-time university and college enrolment rates of 17-24 year olds in each province in Canada. The LFS is the most reliable of the surveys available to estimate college enrolments, since administrative data have not been available for some years. Of all the provinces, only Alberta and Manitoba have seen any increases in college enrolments since 2000.

Figure 6. Enrolment rates of full-time college and university students, by province
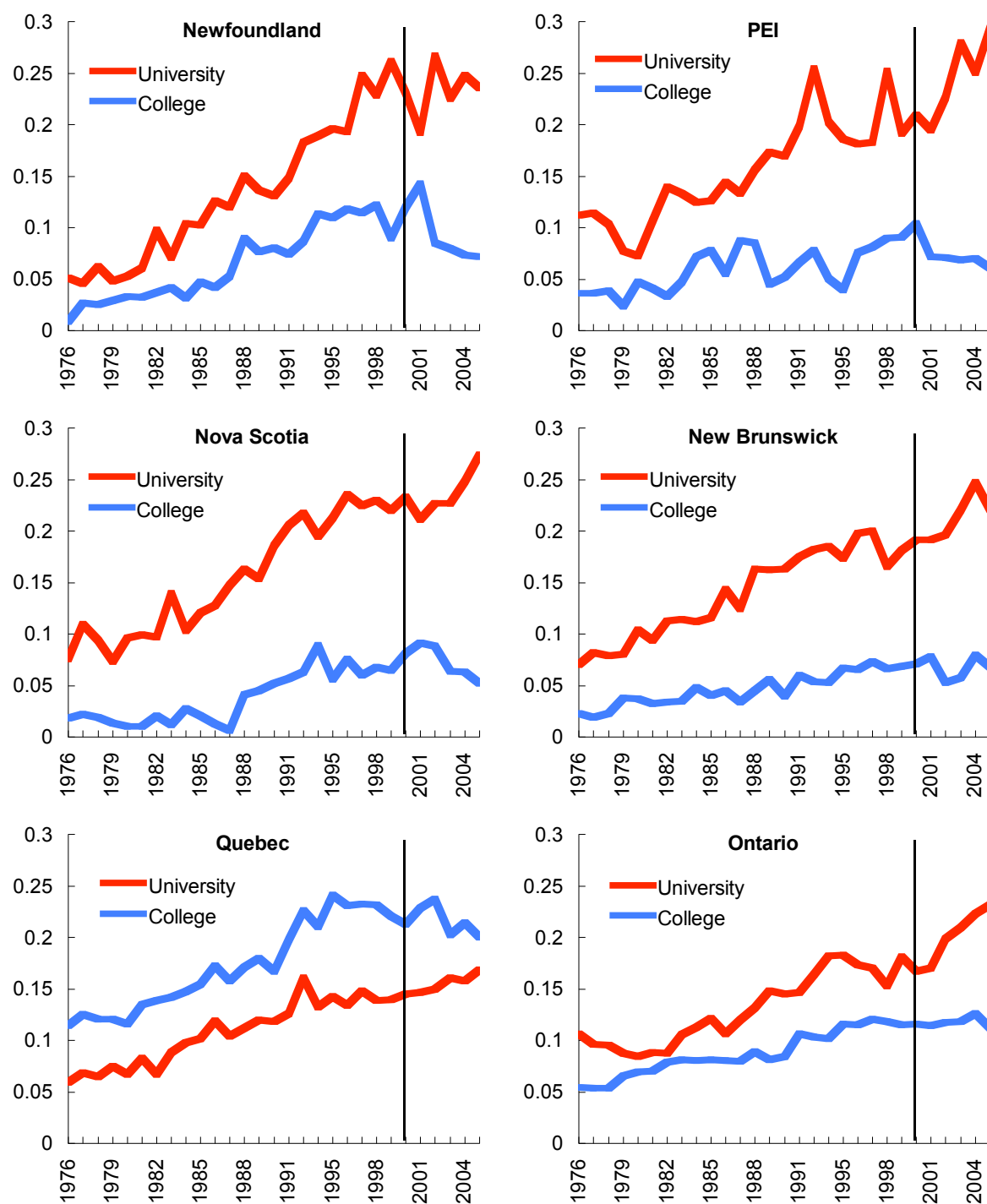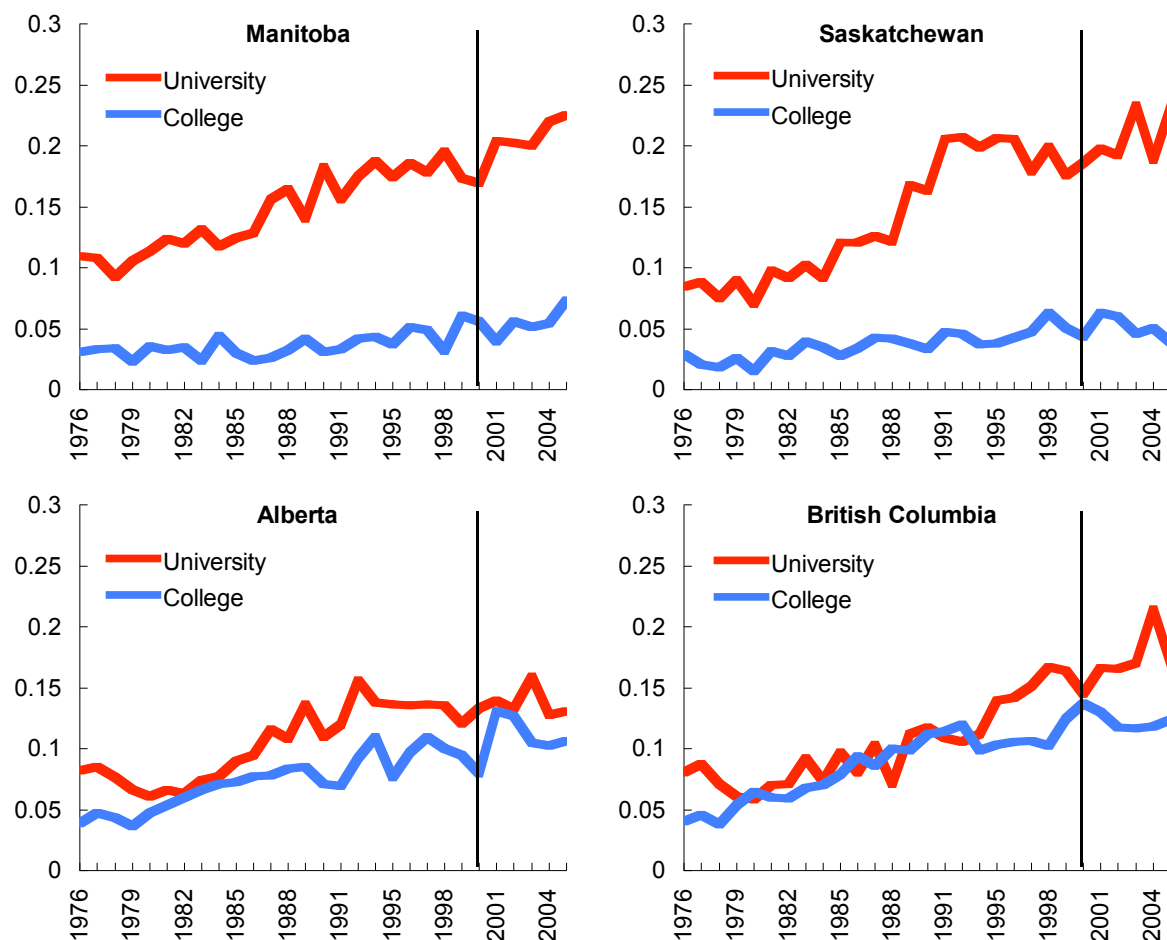
Source: LFS public use files

British Columbia has an interesting pattern in college relative to university enrolments. Recently, periods of rapid growth in university enrolments appear to have been accompanied by slow growth in college enrolments. Part of this may be due to the conversion of colleges to university status, which has been more pronounced in BC than it has been in other provinces.

As mentioned earlier, there are several differences in provincial implementation of the CMSF bursaries. Unfortunately, it is not possible to use those differences in a formal econometric evaluation. However, it is instructive to examine particular cases, of which two stand out. Newfoundland was the only province that originally allowed any of the bursaries to go towards current funds available to students, rather than solely to reduce student debt. If there were concerns that the bursaries may have had only a small impact on enrolments because they did not alleviate current credit constraints, then, one might have expected to see a relatively large increase in enrolments in Newfoundland. This was not the case. On the other hand, there was a disagreement between the CMSF and Nova Scotia on its reinvestment strategy, which was resolved only around 2004. Nova Scotia only saw an increase in enrolments beginning around that time.

Ontario's double cohort

In 2003, two classes of students were eligible to graduate from Ontario high schools. This meant not only an increase in applications to universities and colleges for the 2003-04 academic year, but perhaps also in the 2002-03 and 2004-05 academic years. This coincided almost precisely with the period of increasing enrolments in Ontario – although there does appear to have been a small increase in enrolments in the 2001-02 academic year as well. It is extremely likely that this also affected enrolments in other provinces. Many universities appeared to be marketing themselves strongly to double cohort students.

It is clear that there were substantial effects of the Ontario double cohort that could explain the dramatic increase in the enrolment rate of 17-19 year olds in the early part of the decade (Figure 7). This is a difficult confounding factor: clearly we do not wish to attribute any increase in enrolments to the double cohort to the effects of the CMSF.

Figure 7. 17-19 year old full time university and college enrolment rate
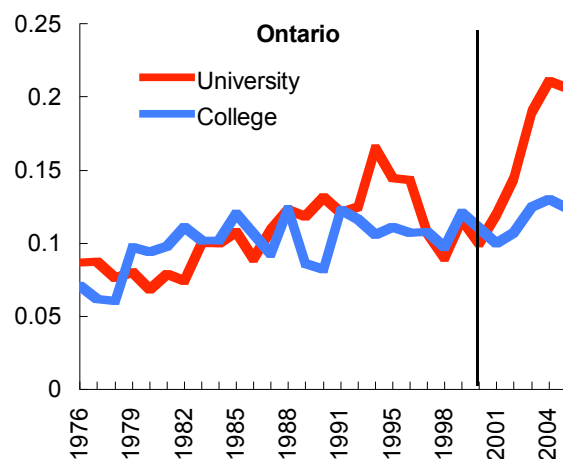
Source: LFS public use files.

That said, there was almost no double cohort uptake visible in the college enrolments data, even among 17-9 year olds who would be the most likely to be affected. There was also a substantial increase in university enrolments of 20-21 year olds and 22-24 year olds in the early 2000s, which could not have been attributed to the double cohort effect (Figure 8).

Figure 8 Canada: FT university enrolment rates by age group
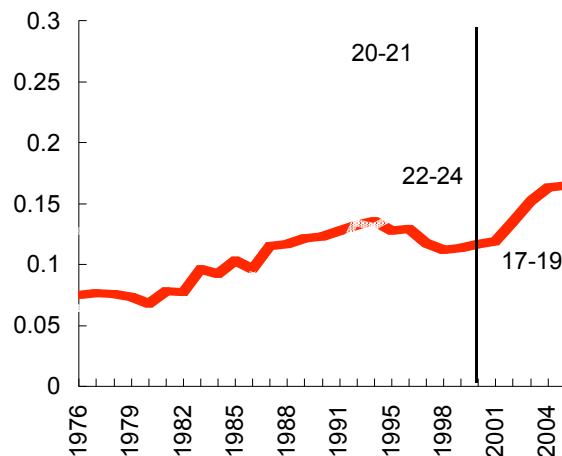
Source: LFS public use files.

Figure 9 Ontario: comparison of actual enrolment rates by age group (LFS) and predicted enrolment rates by age group
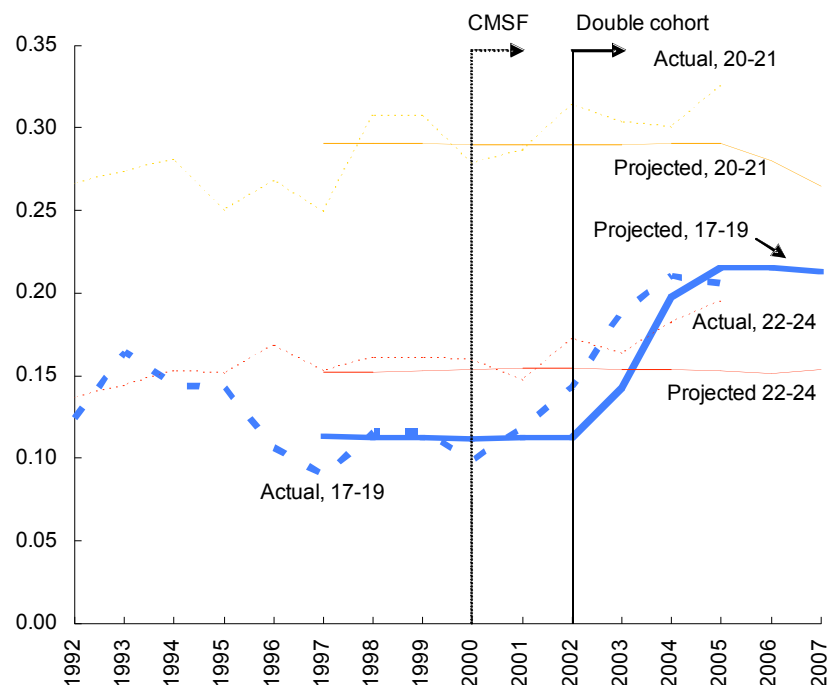
Note: Predicted enrolment rates by age group based on population structure (by individual age) and approximate enrolment rates by age group. The projections assume: 1. enrolments would be at approxmiately their average levels of the period December 1997-2001 in absence of double cohort effect; 2. double cohort caused enrolment rate of cohort which turned 17 in 2002 to be the same as that of the cohort which turned 18 in 2002 in the same year – that is, the effect of the double cohort occurred only for 2003-04 university class.

Figure 9 compares Ontario's university enrolment rates by age group (from the LFS) with the enrolment rate that age group would have seen if, beginning in the academic year 2003/04 (here identified using data from December 2003), approximate enrolment rates had shifted down by

one year.[10]   The diagram shows that although the double cohort could not be expected to have increased enrolments among groups over 20 years old (and indeed should cause a decline in enrolments of these groups beginning in around 2006), there has been a steady increase in the enrolment rate in these age groups since 2001.   Again, this roughly coincides with the introduction of the CMSF bursaries.

Overall, the provincial trends emphasize the degree to which university enrolments increased after 2000 in Canada. The increase was country-wide, rather than concentrated in one province. It was clearly not attributable to a single cause, such as the Ontario double cohort, and it represented a clear break from the trends in the previous half decade.

Family background

Data on the relationship between family income or socio-economic background and enrolments is more difficult to come by, due to the lack of datasets that match post-secondary school age children with information about their parents, mostly because they often no longer live with their parents. This would not be a great concern for analysis if not for the possibility that the choice to move out of home is likely to be correlated with family income or the decision to attend a post-secondary institution.

The Survey of Consumer Finances (SCF) had information on family income and post-secondary enrolment status of any co-resident children, but that survey was cancelled after 1997. Corak, Lipps and Zhao (2003) use the SCF, the LFS and the General Social Survey to show that income and overall socio-economic status are highly correlated with university (but not college) attendance, and that this correlation remained fairly constant over the late 1990s, but their work does not extend to cover years after 2001. Drolet (2005) performs a similar analysis using data from the SLID, again continuing only until 2001. These studies find that there has been little change in the relative participation of students from different socio-economic backgrounds over the 1990s, and that differences in policy also have made relatively little difference on this front.[11]

Figure 10 shows movements in enrolment rates by parental education, using data taken from the Master Files of the Labour Force Survey. It illustrates a key difficulty of evaluating recent changes in the socio-economic status of university students. The only group that has seen a substantial increase in enrolment rates in the past decade and a half has been the group whose parental income and education are not typically collected in standard statistical surveys, since

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[10] Data available on request. Enrolment rates are calculated as approximate averages for the 5 years to 2001, by age in each year. The assumption here is that the full effect of the double cohort was felt in 2003/04 academic year – that is, roughly, that in that year 18 year olds and 19 year olds had approximately the same university enrolment rate, whereas the year before 18 year olds would have had a much lower enrolment rate. This is not quite how the transition occurred, however. Some students reportedly sped up their OAC to graduate early in 2001/02, making them eligible for university entrance in 2002/03 before the double cohort hit in 2003/04. Others apparently delayed exit from high school, making them eligible for university entrance in 2004/05. This may partly explain the large increase in 17-19 year old enrolments in Figure 6 between 2001 and 2002.

[11] Christofides, Cirello and Hoy (2001) find little effect of tuition fee increases on youth from low income families, using the SCF. Coelli (2005) finds tuition fee freezes advantage students from low income backgrounds. Neill (2006) and Frenette (2005) find that tuition fee increases appear to have affected students from middle educational backgrounds, while increases in student loan borrowing limits support higher enrolments among youth from relatively disadvantaged families. The magnitude of these effects relative to the size of the policy changes is typically not very large, however.

they are not co-resident with their parents (the 'unknown' group in the figure). It is difficult to say whether these youth should be considered disadvantaged or not, but they are more likely to be assessed as in high financial need according to the student loan parameters, and are therefore more likely to have been recipients of a CMSF bursary. It also appears that since 2000 there has been a slight improvement in the enrolment rate of students who have one or more parents with high school or less, and more recently in the group whose parents have some post-secondary education, relative to the group whose parents have some university education. However, if the increase in the enrolment rate of the 'unknown' group reflects an increased propensity for students from relatively advantaged families to live on their own relative to those from disadvantaged families, this need not be the case.

Figure 10. Full-time university enrolment rate, by parental education level
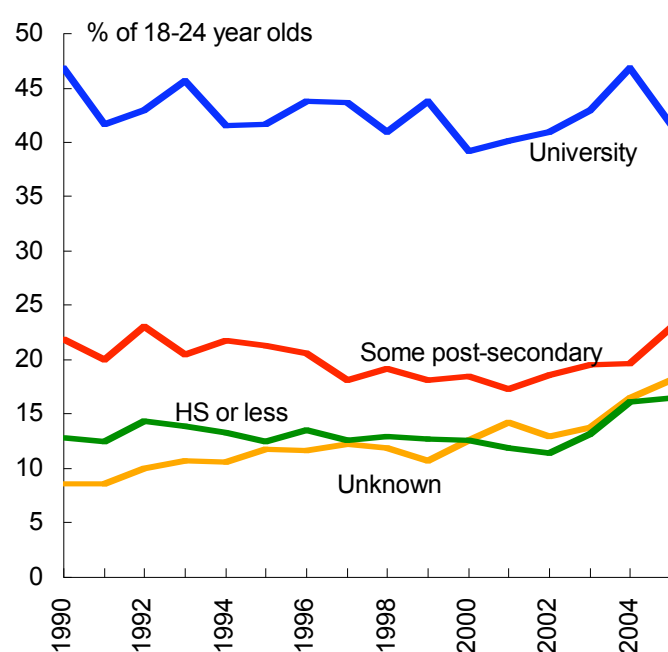
Source: LFS, various years

Figure 11 shows the average full-time university enrolment rate of students by parental education background and province in 1995-99 and 2001-05.[12] Overall, enrolments were up in every province in the latter period. In most cases, as in the national data, this was due to a large increase in the enrolment rate of youth not living at home. Only for Nova Scotian resident students did the enrolment rate of youth living away from the parental home fall, and this was more than offset by a large rise in the enrolment rate of youth from families where no parent had education beyond the high school level. The enrolment rate for youth from families with no parent with more than a high school education increased in seven provinces and decreased in three (Newfoundland, Quebec and Saskatchewan). The enrolment rate of students who had at least one parent with at least some postsecondary or a university education stayed relatively constant overall, with mixed results at the provincial level.

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[12] These years were chosen because it is not clear whether the CMSF would have been expected to affect enrolments in 2000.

Thus, the increases in the enrolment rate in recent years have been concentrated among groups that are more likely to be eligible for financial aid, including CMSF bursaries. However, it should be noted that this is not sufficient evidence of the effectiveness of the CMSF bursaries. There has been a long-term trend increase in the enrolment rate of youth living independently of their parents (the 'unknown' category in Figure 8), mostly a result of a reduction in the numbers of youth living with their families even though they are working. This depresses the numbers of young non-students living independently and causes an 'artificial' increase in the enrolment rate of independent students. This is not true, however, of children of parents with a high school education or less. Their enrolment rate overall was quite stagnant throughout the 1990s, and has only begun to increase in the last three years.

The results from Newfoundland do not seem to support the notion that the CMSF bursary being made available up front had a particular effect on overall enrolments, or on enrolments of disadvantaged students, relative to other provinces.

As a result of these changes, the enrolment rate of youth from families where no parent has more than a high school education relative to the enrolment rate of youth from families where at least one parent has a university education increased slightly after 2000 (Table 1). Note that there were substantial falls in this ratio in only two provinces: Newfoundland and Saskatchewan. Both of these provinces, however, also saw substantial increases in enrolments among children living out of their parents' home. Again, caution needs to be taken in interpreting these results, since we have no information on the parental background of these children, and mobility into and out of the family home could contaminate the results. The disparity in enrolment rates between students from families with no parent going past high school and those with at least one parent with some post-secondary education has fallen (Figure 10).

Figure 11. Full-time university enrolment rates by parental education level and province

Overall
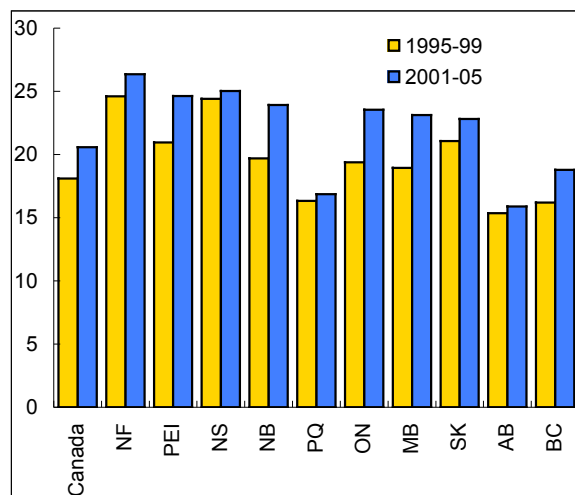
Unknown/not at home

High school or less

Some post-secondary

University degree

Source: LFS master files

Table 1. Enrolment rate ratios

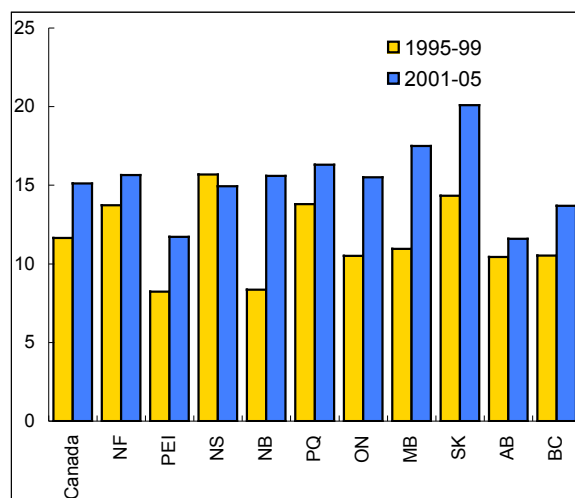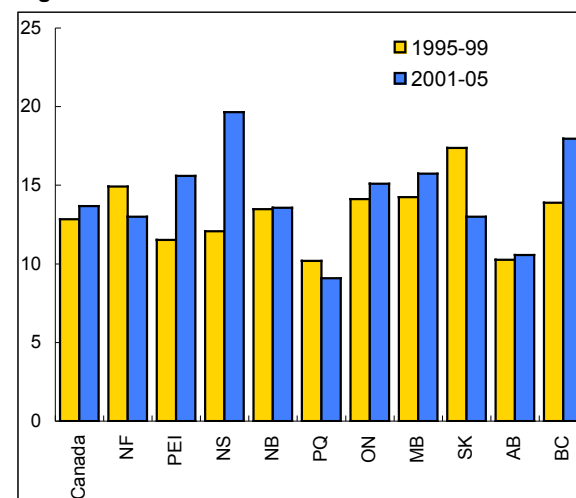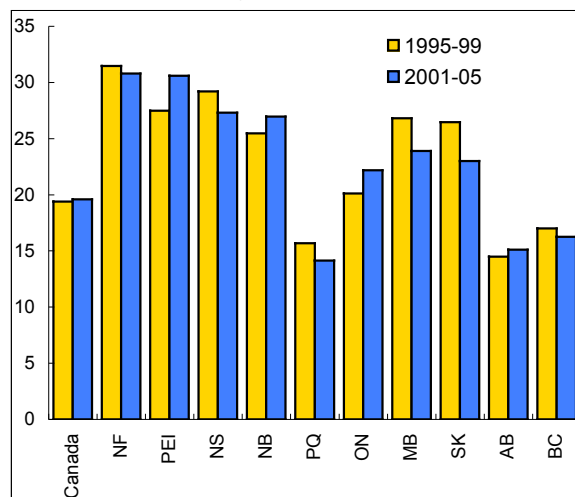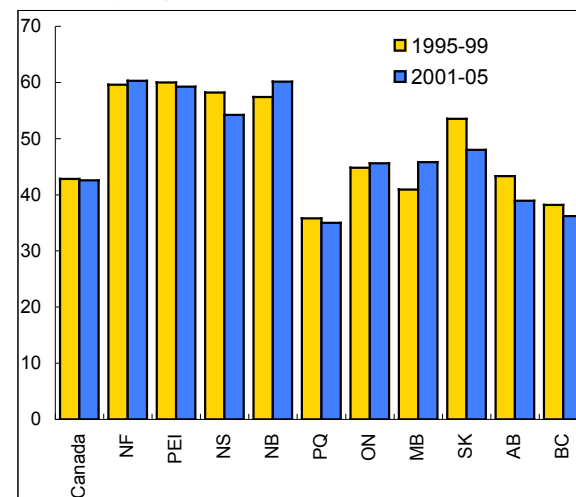|	1995-1999	2001-05
Canada	30.0%	32.1%
NF	25.0%	21.6%
PEI	19.2%	26.3%
NS	20.8%	36.2%
NB	23.5%	22.6%
PQ	28.5%	26.0%
ON	31.5%	33.1%
MB	34.8%	34.4%
SK	32.5%	27.1%
AB	23.7%	27.1%
BC	36.4%	49.6%

Source: LFS master files

Dealing with this problem of unobserved family background is exceedingly difficult. Coelli (2005) is the only paper in Canada to do this: he uses the longitudinal aspects of the Survey of Labour and Income Dynamics (SLID) to identify household income of 16 year olds (close to all of whom are co-resident with their parents) and then to track their university and college enrolment rates once they reach 18 or 19 years old. He finds a slight reduction in the gap between the university attendance rates of children from high income and low income families over the late 1990s. His data shows a decline in overall university enrolment rates in the late 1990s, mostly among children from families in the top third of the income distribution. This does not seem to be particularly supported by other data sources. Unfortunately, this analysis does not extend to the cohorts who were most likely to be affected by the CMSF, as it includes data only up to 2001 for individuals who were living at home at the start of the wave – if any of these individuals remained at university in 2001, they were likely to have started university before the CMSF was announced, and to have been affected to only a slight extent by the program.

Figure 12 shows calculations of the enrolment rates of 18-24 year olds broken down by family income quartile, using data from the SLID from 1996 to 2004. As in the case of Drolet (2005) and Corak, Lipps and Zhao (2003), there is little evidence of any substantial narrowing of the enrolment rate gap by parental income. This is perhaps not surprising, since the results from the LFS show relatively little narrowing in the enrolment gap by parental education, and most studies which compare the magnitude of the effects of parental income and parental education on childrens' university enrolment rates show that education appears to exert a stronger influence. Since parental education and income are highly correlated, one would expect short-run movements in enrolment rates by parental income would be quite similar to the movements in enrolment rates by parental education.

Figure 12. University enrolment rates by family income quartile: SLID
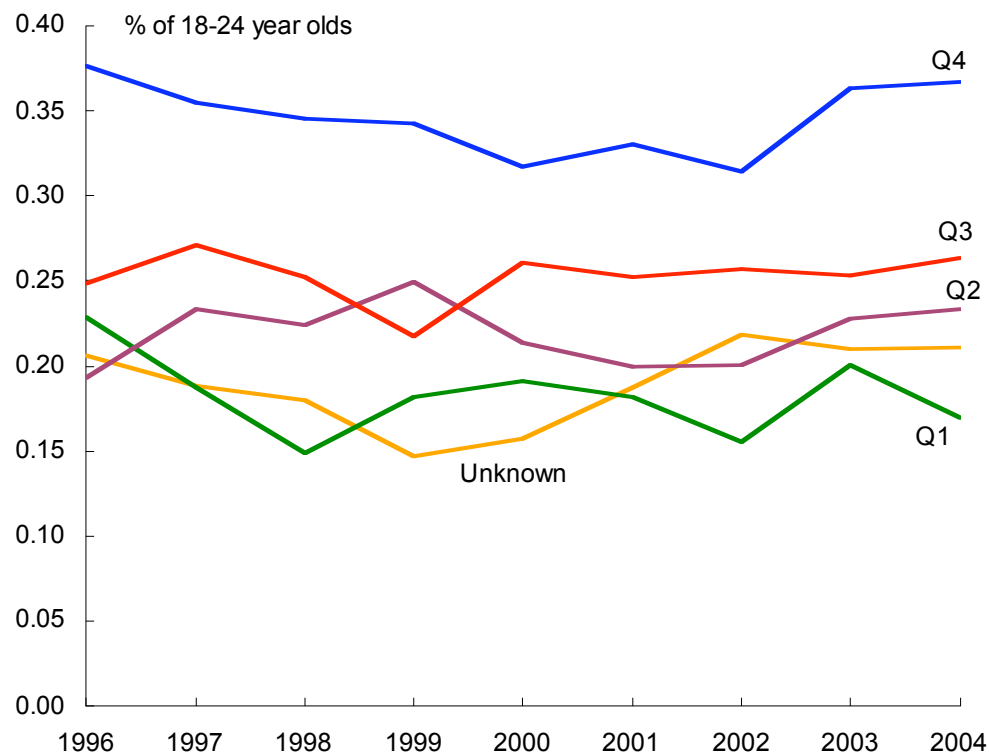
Note: Family income quartiles are defined for all 18-24 year olds living at home in a particular year. Around three quarters of 18-24 year olds are usually resident with their parents. No use is made of the longitudinal elements of the SLID in calculating these figures.

Figure 13 shows how enrolment rates by parental income quartile have changed in four key regions: the Maritimes, Quebec, Ontario and the West. The relatively small sample sizes in the SLID and consequent high variability in the province-year level data makes it necessary to aggregate up to the regional level, and to calculate averages over several years. The figures show that there may have been a narrowing of the enrolment gap between the top and bottom quartiles' enrolment rates in the Maritimes and Ontario, while the gap has widened slightly in Quebec.

Figure 13. University enrolment rates by family income quartile and region of residence: SLID

a. Ontario
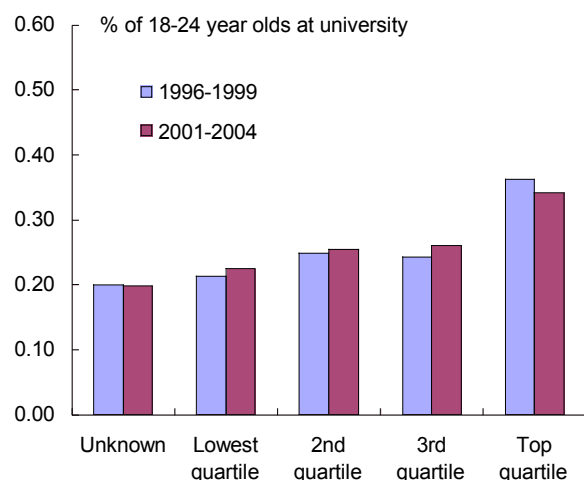
b. Quebec
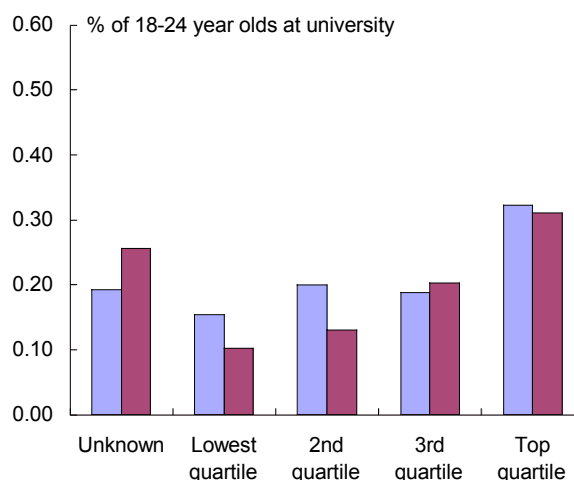
c. Maritimes
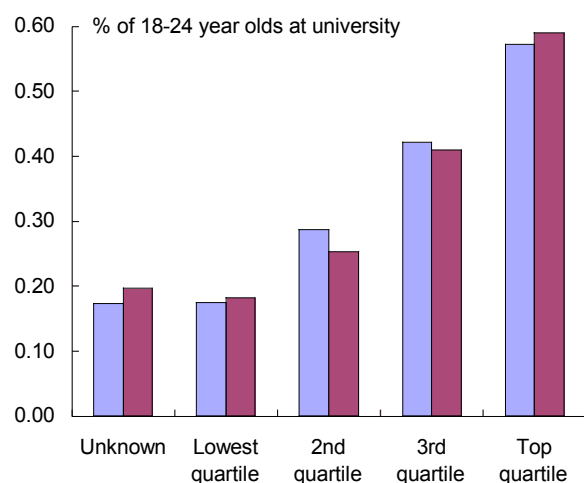
d. West
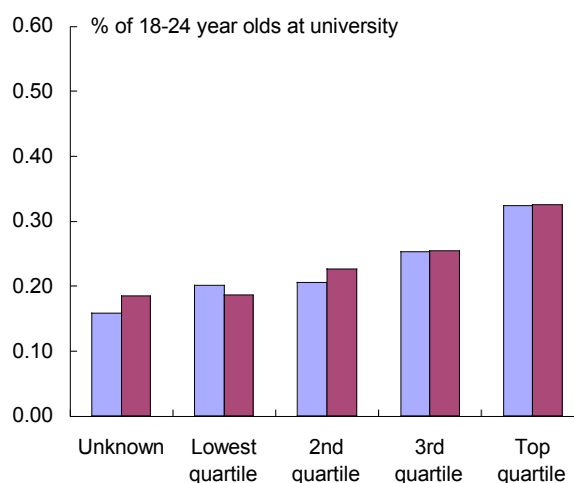
Note: Family income quartiles are defined for all 18-24 year olds living at home in a particular year. Individuals not living with their parents in a particular year are allocated to the 'unknown' parental income category. Around three quarters of 18-24 year olds are usually resident with their parents. No use is made of the longitudinal elements of the SLID in calculating these figures.

All summary statistics describing university enrolment rates using the SLID should, however, be treated with some caution. The number of individuals surveyed who are attending university in any given year is quite low, making the series extremely volatile. Also, trends in overall enrolment rates derived from the enrolment rate estimates from the master files of the SLID appear somewhat different from those in the public use files – they show a decline in enrolments in the late 1990s, which is not evident in data from any other source.

Another option to examine enrolment rates by parental income quartile is to use the Longitudinal Administrative Databank (LAD). Lin and Situ (2006) show that the implied enrolment rate of dependent students and of independent 18-21 year old students (who are more likely to be eligible for the CMSF bursaries since the bursaries are limited to undergraduate students) declined slightly between 1995 and 2000, with the decline being slightly larger among students

from relatively high income families. For single 18-21 year olds without at least 2 years of work experience, the enrolment rate of students in the highest income quartiles fell by around 5 percentage points between 1995 and 2000, while in the lowest income quartile the enrolment rate did not change. Even the LAD, however, is unlikely to be able to identify family income for much more than 85% of youth. This is an improvement on the 60% whose family income can be identified in the same year in the LAD, which is about the same as the percentage whose family characteristics can be identified in the LFS.[13]

Further, because it is principally data from tax files, identification of students is somewhat problematic, based on the assumption that all students claim tuition and education tax credits. If there are changes in the incentives to claim education and tuition tax credits, then this may lead to changes in the percentage of students claiming those credits which would lead to an artificial inflation of the estimated increase in enrolment rates. This may well have occurred during the time period under study here. Prior to 1997, individuals who could not use the tax credits in the same year they were earned had no incentive to claim them. After 1997, any unused amount could be carried forward to a future year. This led to a large jump in claims of education tax credits after 1997, as shown in Figure 14. It is also clear that in part because of this. The trends in estimated enrolment rates taken from the LAD that are shown in this paper do not track trends in enrolments estimated from other data sets. Caution needs to be used in interpreting any results on post-secondary education that use longitudinal aspects of the LAD.[14]

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[13] In the 2004 LAD, parental income could be identified in the current year for 75% of full-time students, 59% of part-time students and 51% of non-students. Parental income could be identified in a recent year for 89% of full-time students, 87% of part-time students and 77% of non-students (Neill, 2007). In the LFS, parental education can be identified for around 75% of full-time students and 50% of non-students aged 18-24.

[14] The figures here do not align with those in Lavallée and Backus (2007). This may be because of the use of longitudinal elements in this data extract.

Figure 14. Estimates of enrolment rates in LAD compared with other sources
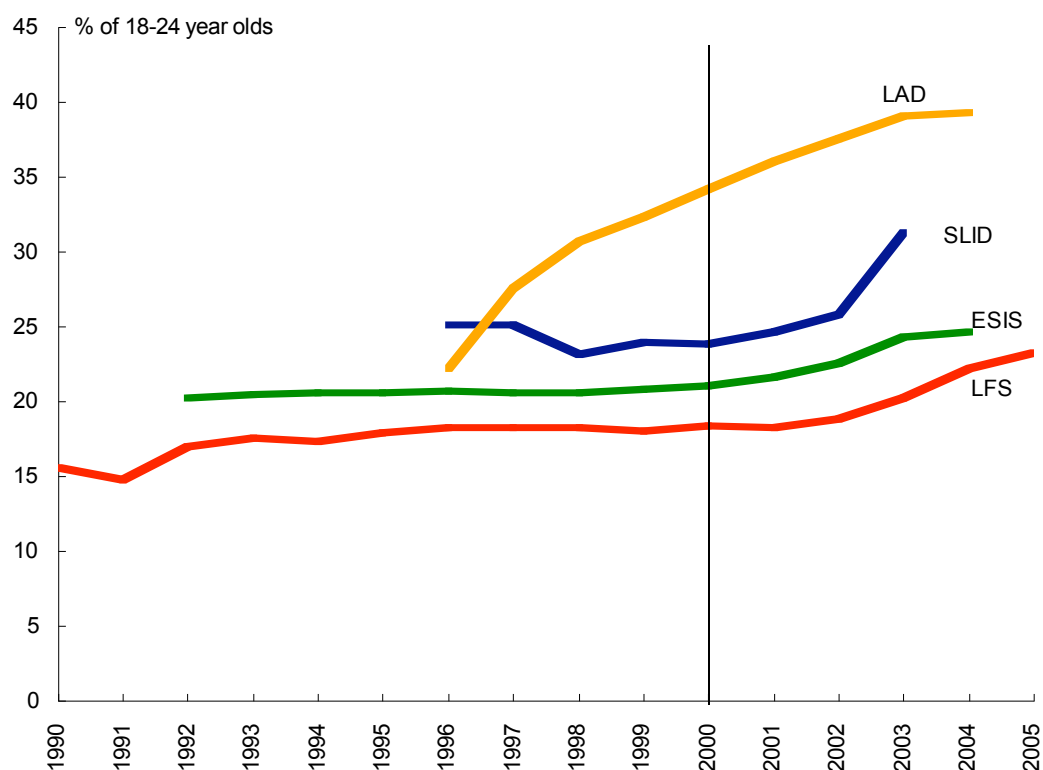
Note: LAD estimates are for all post-secondary enrolments, while others are for university only.

Figure 14 shows the estimated post-secondary enrolment rates of students by parental income quartile from the LAD. These are probably somewhat higher than actual enrolment rates, because it is easier to identify parental income for students than non-students (because they are more likely to live at home). And again, the secular upward trend in the implied enrolment rates should probably be largely ignored. However, Figure 15 shows that there has been a fairly consistent increase in enrolments across all parental income quartiles, and relatively little change in the relative enrolment rates of financially disadvantaged relative to advantaged youth. This is fairly consistent with the findings of other data sources. As well, the LAD and SLID show a similar enrolment rate gap: there is a very substantial gap between the enrolment rate of youth from the highest income quartile and those from all other quartiles, and the enrolment rate of youth from the lowest parental income quartile is around half that of youth from the highest parental income quartile. Neither data set shows any substantial narrowing of that gap in recent years. There is thus at least some consistency between the results from these different datasets. Provincial breakdowns using the LAD provide no additional insight, and given the concerns over this data are not shown here.

Figure 15. Implied enrolment rates by parental income quartile, LAD
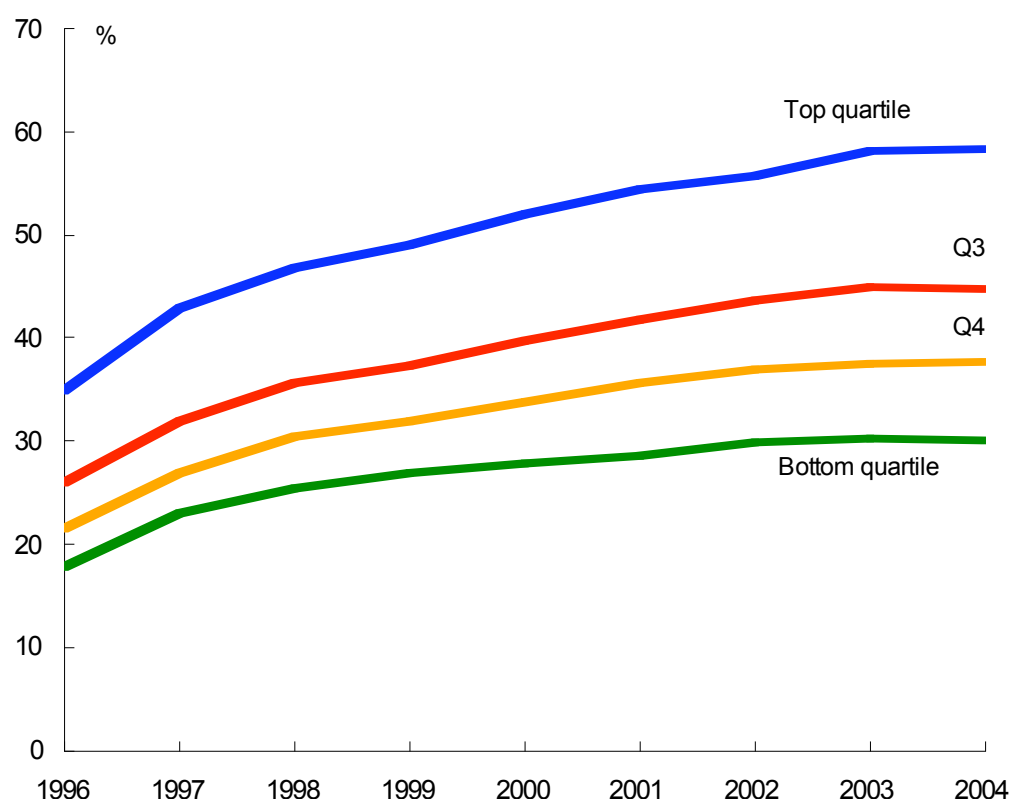
Source: Longitudinal Administrative Databank.
Note: the figure shows full-time enrolments in any post-secondary institution of 18-24 year olds, by parental income quartile. Full-time enrolment is indicated by claims of an education tax credit. Changes to the education tax credit introduced in 1997 may have encouraged a greater proportion of students to claim the tax credit. Incentives to claim the tax credit may also be affected by parental income.

Summary of overall effect on enrolments

These initial descriptions of trends need to be taken as exactly that – descriptions of trends, rather than a comprehensive evaluation of the CMSF. Many other factors could potentially have contributed to these trends – an increase in spaces in BC, and the double cohort in Ontario are just two possible examples. A serious evaluation of the program would really require actual knowledge of who receives the grants, and more detailed information on the structural parameters of the grants program. Much of this work cannot be undertaken without access to more detailed micro data, and preferably a longer time series of data following the introduction of the CMSF. Unfortunately, it would also require data on receipt and no-receipt of CMSF bursaries. There is no dataset with such information available at the national level. In any case, such an analysis would only be able to identify direct effects, which as the IIGR noted are likely to be small.

Whether there has been any greater effect on enrolments of youth from relatively disadvantaged backgrounds is even more difficult to say. We do not have good data on the socio-economic

status in most data sets that also contain information on post-secondary enrolments over time.[15] Data from the LFS suggests that recent years may have seen an increase in enrolments of disadvantaged groups relative to advantaged groups. However, there is no way to be certain of the reasons for this. Data from the LAD and the SLID, which can be used to calculate enrolment rates by parental income, shows relatively little change in the enrolment gap during the past decade. This is consistent with studies that show little change on these measures over the late 1990s, including Drolet (2005) and Corak, Lipps and Zhao (2003).

Changes in enrolment rates by province do not help to identify the effect of the distribution method of the CMSF. For the years for which data is available, Newfoundland is the only province that provided some portion of the CMSF as a cash grant rather than as debt remission. Because Newfoundland is such a small province, it is not a particularly reliable comparison for the effects of this policy change. The data that are available on Newfoundland, however, suggest that there was a trend increase in overall enrolments pre-existing the introduction of the CMSF and that there was no particular increase in enrolments among disadvantaged youth in that province relative to advantaged youth.

In conclusion, there has been a substantial increase in enrolment rates across almost all Canadian provinces since around 2001, and this was coincident with the introduction of the CMSF. However, this increase cannot be attributed to the CMSF itself. Other factors that changed at the national level at the same time – including overall changes in the level of economic activity or in the returns to education – or even large changes at the provincial level – including the Ontario double cohort and increases in university finances independent of the CMSF – could as easily have been responsible for this increase. There is no obvious way to disentangle these effects using available data sources.

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[15] There are some data sets with much better background information on students, but these are typically cross-sectional, so that changes over time cannot be tracked.

Effects on Persistence

While overall enrolment rates are typically the key indicator used to measure 'access' to university and the degree of investment by individuals and society in education, individuals' persistence in their course of studies may be important independently. Persistence in a course of study is said to increase if either the probability of remaining in post-secondary education from one year to the next increases, or if the probability of completing a course of post-secondary study increases. Note that persistence can be defined either in terms of continuing enrolment in any form of post-secondary education, or in terms of continuing enrolment in a particular course of study. Because of the nature of the data used here, this paper focuses on the former definition.

Persistence and enrolment are closely related. If entry rates from high school to university remain constant and persistence increases, then enrolment rates must increase. Enrolment rates could increase substantially, however, with no increase in persistence. The economic theory explaining persistence in post-secondary education is very similar to that explaining the individual enrolment decision – indeed, the basic theory of human capital investments makes no clear distinction between the two concepts. However, if there are separate returns to completion of a post-secondary certificate, diploma or degree, then increases in persistence have a value over and above any enrolment rate effect they might have, and governments may wish to consider how their policies affect persistence separately from enrolment. Furthermore, since the CMSF bursaries were specifically targeted to students in their second year and beyond, there may have been different effects on persistence than on overall enrolments that may help identify the CMSF's effects. This paper therefore considers the evidence on the effects of the CMSF persistence as distinct from the overall enrolment effects.

Previous studies

While there has been substantial study of high school persistence and graduation (Parent, 2002; Bushnik, 2003), as well as the decision to enroll in a post-secondary institution (Kane, 1994; Cameron and Heckman, 2001; and in Canada, Coelli, 2005; Fortin, 2004), there has been less attention paid to what factors are important in explaining continuation of a students' post-secondary studies and eventual completion in Canada.[16] Persistence matters because it has been shown that there are important financial returns to completion for the individual concerned (Ferrer and Riddell, 2002). Desjardins, Ahlburg and McCall (1999) highlight several other social costs of dropout, including possible intergenerational effects, particularly if dropouts come disproportionately from already disadvantaged groups.

The economic theory behind persistence is largely the same as that underlying the enrolment decision more generally. Students are assumed to remain enrolled in post-secondary institutions

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[16] Barr-Telford *et al.* (2003) discuss some overall statistics on post-secondary persistence using the Post-Secondary Education Participation Survey, but their data do not contain information on persistence beyond 18 months. Lambert *et al.* (2004) describe the relationship between dropping out of post-secondary education and individual characteristics using the Youth in Transition Survey (YITS) Cohort B, but do not attempt to examine the effects of the overall economic or policy environment. McElroy (2005) looks at institutional persistence in 3 Canadian provinces, but has limited information on students' family background.

so long as the net benefits at the margin outweigh the net costs. This theory needs to be modified somewhat if there are important 'sheepskin effects', as per Ferrer and Riddell (2002).[17] With such effects, decisions on continuing to another year need to take into account not only the benefits of completing that year, but also the benefits of completing the entire degree. Financial aid would nonetheless be expected to play largely the same role regardless of the presence of these effects, except that increases in aid would have a smaller effect on the decision to persist for students close to completing their course if students were deterred from continuing their education either due to the rate of return limitation or to the debt aversion limitation.[18] If the main limitation on continuing enrolments were credit constraints, however, it may be possible that the effect on upper year students of an increase in financial aid would be greater than the effect on lower year students.[19]

There is also a large literature discussing the determinants of persistence from a non-economic point of view, focusing on issues including the quality of the match between an institution and the student's interests, as well as the student's motivation and institutional characteristics (see Desjardins, Ahlburg and McCall (1999) for a more extended discussion). Student employment may also be an important factor in explaining persistence. Ehrenberg and Sherman (1987) find that increasing hours of paid work during college increases the probability of dropping out. A review of the Canada Student Loan Program explicitly suggests that its loans help to increase persistence because they reduce the need for students to spend time on paid employment (HRDC, 1997). On the other hand, the CMSF bursary program does not provide up-front funding. Unless students work in college to pay back the debts they will owe on graduation – which would be rather odd – then the bursaries would have little effect on students' work.

It is difficult, however, to identify the effect of governments' student financial aid policies on persistence. Again, because eligibility for financial aid is correlated with factors that are known to be important in making decisions on enrolment and persistence, particularly parental education and income, it is not reasonable to simply compare persistence rates of students who receive aid with those who do not. This difficulty is evident in McElroy (2004,2005). In two papers commissioned by the CMSF, she finds that total student financial assistance is negatively associated with persistence. This illustrates Dynarski's (2002) point that financial aid is likely to be correlated with other characteristics that affect persistence – it is not likely that persistence declines because of higher financial aid, but that the types of people who receive financial aid are also the types who are less likely to persist in post-secondary education. McElroy does, however, find that those students who receive a larger amount of aid in the form of grants are more likely to persist than those who receive only loans. In her studies of Manitoba and BC, McElroy compares persistence rates of post-secondary students who would likely have been

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[17] 'Sheepskin effects' are financial returns to completion of a course of study, in excess of the sum of the returns to completing each additional year of study.
[18] This is because the returns to completing one year and graduating are much greater than the returns to completing one year and not graduating, so that changes in the costs of an additional year of study have a smaller effect on the net cost-benefit calculation of students near to completion.
[19] This would, however, require an assumption that students did not have good foresight about the costs of education, and about future income and costs, when they first enrolled in a course. Effectively, the idea would be that by third year students may have exhausted the savings they have available to continue study, so that changes in financial aid available at that time may have larger effects on their decisions. There is no evidence to support this notion, however.

eligible for a CMSF bursary except that they were enrolled before those bursaries were available with persistence rates of a similar group of students who were enrolled after the bursaries became available. She finds that in Manitoba a student in the 'Millennium' cohort was ten percentage points less likely to have dropped out than a comparable student in the 'Pre-Millennium' cohort. In a similar study of BC students, however, she finds there was an increase in persistence for students in two year programs but not in four year programs, which she suggested could be due to higher levels of unmet need for students in the latter group.

McElroy concludes that the first priority for student financial aid programs is first to ensure that students have access to adequate funds to support themselves during their studies, and once that has been achieved to focus on debt relief. Implicitly, the suggestion is that the funds used for CMSF bursaries would have been best directed at reducing any unmet need – or increasing loan limits under existing student loan programs – in the first instance. It is important to keep in mind, however, that this study only provides a measure of the direct effects of the bursaries, which directly affected only 3rd and 4th year students. If there were indirect effects on other students as a result of re-investments, these would not have been picked up by McElroy's studies.[20] Further, her data set identified institutional persistence, rather than persistence in any post-secondary education more generally. The latter might be more important from a policy perspective.

McElroy's work does, however, cast some doubt on the IIGR's suggestion that debt remission does not increase overall enrolment rates. Still, the mechanism suggested by McElroy – that students may work less as they are not accumulating so much debt – requires some further evidence, particularly since the CMSF bursaries did not increase resources available to students while they were studying. It is unclear why a student would work while a student to reduce debt that incurs no interest until after graduation, when they are more likely to be able to work at a higher income. An analysis along these lines is however outside the scope of this review.

Bettinger (2004) is able to pay more attention to these issues of endogeneity, and finds recipients of Pell Grants in the US were less likely to drop out than non-recipients who otherwise had similar characteristics. The Pell Grants provide an increase in the total financial resources available to students during their period of study, unlike the CMSF bursaries. The Pell Grant's main aim, however, is not to increase persistence but to increase enrolments. In Canada, on the other hand, the Canada Millennium Scholarship Foundation's bursary program was specifically targeted at upper year students, and was in part intended to ensure students are able to complete their course of study. The effects of these programs may well be dissimilar, therefore.

Persistence – trends and analysis

Measuring persistence in post-secondary studies is quite difficult in Canada. There are three data sets that could plausibly help to identify changes in the persistence of university students over the period when the CMSF bursaries were introduced.

The first is the SLID, which is a panel dataset with individuals followed for up to six years – enough time to evaluate their persistence in university. The SLID does, however, have some

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[20] This was a part of the design of the study: it asked not whether the CMSF bursary program had overall positive effects on persistence, but whether the specific form the program took, namely debt relief, had that effect.

important disadvantages for undertaking this type of analysis. Foremost among these is the relatively small sample size. As discussed in the last section, even estimating university enrolment rates using the SLID is somewhat problematic. Using the SLID to estimate the persistence rate – which necessarily means restricting attention to a sample consisting only of university students, which is around 25% of the size of the sample of all 18-24 year olds – is likely to result in very variable estimates. Changes in these estimates between one year and the next are very likely to reflect random error rather than fundamental changes in persistence rates. With that warning aside, Table 14 shows the most reliable estimates of the persistence rate. Here, this is defined as the percentage of individuals who are between 18 and 24 years old, have less than 4 years of university education, and who are enrolled in the year indicated and who continue on to university the following year. Table 2 shows persistence rates by year for each of the three completed cohorts of the SLID. It shows, there has been a slight increase in the persistence rate of individuals since the late 1990s, but it would be difficult to attribute this to the effects of the CMSF (there is little evidence of a strong increase in persistence after 2000).

Table 2. Percentage of individuals enrolled in university and without a completed degree who continue on to an additional year of university in the next year, SLID

	Method 1			Method 2		
	Cohort 1	Cohort 2	Cohort 3	Cohort 1	Cohort 2	Cohort 3
1993	91.9%			72.3%		
1994	90.7%			76.7%		
1995	91.8%			76.6%		
1996	90.1%	91.1%		83.4%	81.0%	
1997	88.0%	90.8%		71.5%	75.9%	
1998		86.3%			66.7%	
1999		90.3%	93.9%		66.8%	77.6%
2000		89.6%	90.8%		72.0%	75.6%
2001			91.4%			75.9%
2002			91.4%			80.8%
2003			90.4%			75.5%
Cohort average:	90.5%	89.6%	91.6%	76.1%	72.5%	77.1%

Source: Master Files of the SLID. Figures are weighted using longitudinal weights. The figure for 2000, for instance, shows the number of 18-24 year olds who had not completed a four year university degree, and who were enrolled in university in both 2000 and 2001, divided by the total number enrolled in 2000. It therefore shows the percentage of those enrolled in 2000 who continue on with their studies in 2001. Method 2 counts individuals whose enrolment status is unknown in the second year as not enrolled in university. Figures separately identified for each of the SLID's three complete cohorts.

A second data source is the Longitudinal Administrative Databank (LAD). It is helpful in that it is longitudinal and tracks a large number of individuals. However, as mentioned previously, estimates of enrolment rates derived from the LAD do not appear to be in line with those from other data sources (Figure 14).

Perhaps unsurprisingly given the strong upward trend in overall enrolment rates in the LAD, there is also a strong upward trend in persistence, as measured in the LAD (Figure 16). Again, it is important to be aware of the limitations of the LAD in this measurement. First, the year in program can be identified only indirectly. In the dataset here, all individuals who fell between

the ages of 17 and 24 in 1993 or later were identified. Enrolment status of each individual in each year was identified by the presence of a claim for a full-time education tax credit at some point in that calendar year. An individual was classified as being in the first year of a program in 1994 if they claimed an education tax credit in 1994 and had not claimed one in 1993. An individual was considered to be in the second year of a program if he or she had already claimed an education tax credit in one previous year, and was currently enrolled. Clearly this definition is an approximation at best. While data is available for each province separately, these results are not shown here. It is not likely to add any useful information from which to draw conclusions. Roughly speaking, however, the LAD shows no obvious increase in persistence following the introduction of the CMSF. Nor is there an obvious divergence in the trends across years, except perhaps a slightly smaller increase in persistence from year 3 to year 4 than for the other years. This is, however, not statistically significant.

Figure 16. Persistence in University enrolments: LAD
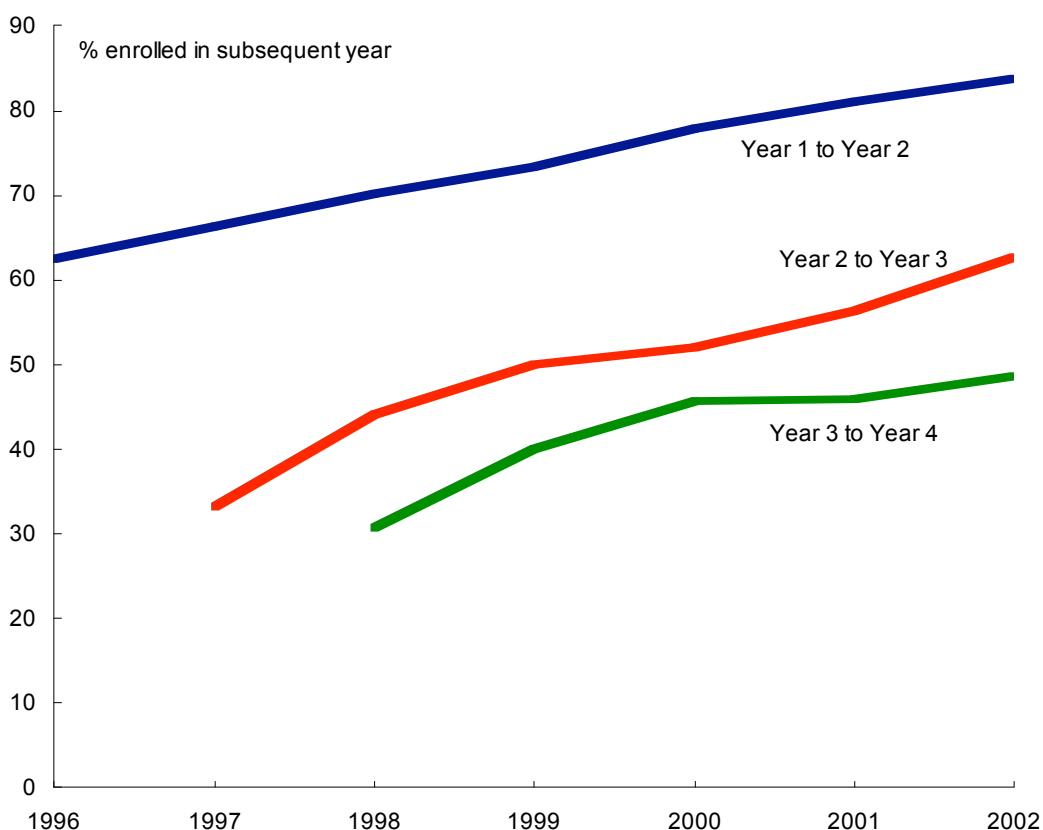
Source: LAD

Note: this data should be treated with caution. Identification of university students in the LAD is by the presence of a claim for a tuition tax credit that is larger than would be expected given the college tuition fees applying in the province in which the student is registered as paying taxes. Identification of subsequent enrolment further requires that the individual is observed in the data set in a subsequent year. Individuals are allocated a 'year in program' that corresponds to the number of years in which that individual has claimed a full-time tax credit for at least one month. Again, this relies on an individual being present in the sample for multiple periods. Furthermore, the individuals' educational status was tracked only from 1993, or from age 17. This may be a reason for the underlying upward trend in persistence across all year in program groups.

Another advantage of the LAD is that it can be linked to data from the Canada Student Loan Program to examine whether there was any difference in response to the introduction of the CMSF among students who were eligible for student loans and those who were not. Since receipt of a student loan is a necessary condition for receipt of a CMSF bursary, if the CMSF had any effect, we would expect it to be larger effects on persistence among students who receive student loans than those who do not. Tables 2 and 3 use a simple linear regression to estimate whether in the LAD data there is any evidence of an increase in persistence after 2000. In no case is there an estimate that suggests that persistence was higher than would be expected after 2000 for any group (Table 3). Nor is there evidence that persistence increased for those who were eligible for student loans as compared with those who were not (Table 4, column d) – indeed the evidence appears to be to the contrary, although the results are not statistically significant. Student loan recipients appear to have higher persistence rates than those who did not receive student loans, which does not sit particularly well with the results in McElroy (2005). Again it must be noted that these regression results are only as reliable as the underlying data, which are questionable.

Table 3. Regression results: post-CMSF persistence rates by loan status and year in program

	CMSF	Year
No loan		
1 to 2	0.1798	3.5082
	(3.4480)	(0.9517) **
2 to 3	2.7535	2.1266
	(2.9812)	(0.8229) **
3 to 4	1.6497	2.7331
	(3.2485)	(0.8967) **
Loan		
1 to 2	-1.4453	3.9618
	(4.3159)	(1.1913) **
2 to 3	-3.8434	2.6193
	(2.8796)	(0.7949) **
3 to 4	-0.9315	1.8742
	(2.5351)	(0.6998) **

Note: uses data from 1997 and on only. Underlying data are mean persistence rates calculated by province, year and year in program. CMSF is a dummy variable equal to one for years after 2000.

Table 4. Regression results: post-CMSF persistence rates, pooled

	a	b	c	d
CMSF	-0.0134	-0.0134	-0.0134	1.1793
	(1.6055)	(1.3454)	(1.3202)	(1.5323)
Year	2.9077	2.9077	2.9077	2.9077
	(0.4453) **	(0.3731) **	(0.3662) **	(0.3654) **
Student loan			2.5098	3.2114
			(0.7149) **	(0.8490) **
Student loan* CMSF				-2.3853
				(1.5655)
Prov FE	n	y	y	y
R2	0.2846	0.5109	0.5306	0.5343

Note: uses data from 1997 and on only. Underlying data are mean persistence rates calculated by province, year and year in program.

Summary of overall effect on persistence

Overall, there is no strong evidence of an increase in aggregate persistence of university students after the introduction of the CMSF beyond what is suggested by pre-existing trends. However, it is perhaps unlikely that a program of the size of the CMSF would be expected to have substantial effects on aggregate persistence rates, and provinces made relatively few reinvestments in areas that were directly targeted at improving persistence rates, so that there would be few if any indirect effects expected in this case.

Given this, it makes more sense to rely on McElroy's finding that persistence rates increased among some groups that were most likely to receive CMSF bursaries – in Manitoba and among college students in BC. That evidence suggests that there may well be an effect on the persistence of individuals who receive the bursaries, but that this effect would be on too small a population to be able to pick it up in aggregate level data such as that used in this review.

Distributional Consequences

Of late, there has been an increase in interest in the question of how financial aid payments are distributed. Of particular note here is Usher (2004a,b) who attempts to provide a complete description of the distributional impacts of policies on post-secondary education. He argues that the current system is poorly targeted at students who are likely to be in high financial need, or at high risk of dropping out of their studies. There are three reasons for this. First, most post-secondary students come from relatively high income families, so that any program that benefits post-secondary students generally will mostly benefit already well-off students. Second, there are a large number of programs that provide assistance to all post-secondary students. The most important of these are the general subsidies to universities, which help to keep tuition fees lower than they would otherwise be, and the education tax credit program. And third, even among programs that provide assistance that is intended to target those students with high financial need, a large percentage of recipients are often from a fairly high income background. For example, the Canada Student Loan Program (CLSP) gives more than half of its loans to independent students, but these students are not considered to receive any support from their parents. Thus, their parents' income is not taken into account as part of the financial resources available to these students. Independent students with relatively wealthy parents are as likely to receive aid as independent students with relatively low income parents.

Distribution by family income

It is clear that the CMSF bursaries were intended to go to students from low income backgrounds. In this sense, the program is clearly intended to be progressive. However, whether this is in fact their effect is unclear. This is for two reasons. First, although the CMSF bursaries are available only to those with high assessed need under provincial student loan programs, it may be the case that high assessed financial need is not well correlated with family income. Second, to the extent that these bursaries replaced existing debt relief programs, the distributional effects are largely neutral, unless provincial policy changes in response in a non-neutral way. In effect, then, a complete analysis of the distributional consequences needs to consider both the direct and indirect effects of the program. Such an effort would, however, require a detailed analysis of all changes in provincial government higher education policies over the past 6 years, as well as a judgement as to whether these changes were a result of the introduction of the CMSF or some other factor. This is well beyond the scope of this paper.

McElroy (2004) examines this issue using program data from the BC student loans program. She finds that of those students who were eligible for an increase in grants after the introduction of the CMSF bursaries in BC, those with dependents benefited substantially more than students without dependents: their accumulated debt would have been $9000 higher than in the absence of the CMSF, compared with a figure of $3200 for those without dependents. This reflects the higher need and therefore higher average amount received by students with dependents, but also that single parents were eligible for assistance for up to five years, compared with four for other students. She also finds that CMSF bursary recipients are more likely to be dependent than are other financial aid recipients: of CMSF recipients, 38% were assessed as dependent compared with 28% of all BCSL recipients.

BC seems to be something of an outlier in terms of the percentage of student loan recipients who are classified as independent. Usher's estimate that under the CSLP around 60% of loans go to independent students is considerably smaller than McElroy's estimate of 72% in BC. Nonetheless, it is clear that the CMSF bursaries tend to go more to dependent students than do student loans more generally. This matters because the link between parental income and student loan receipt is much stronger for dependent recipients than independent recipients.

Unlike Usher (2004a,b), Lin and Situ (2006) examine data on receipt of student loans that is linked to tax file data of individuals and their parents from 1995 and 2000. They compare the income levels of the families of students who receive student loans with those of students who do not receive such loans. They find that for dependent students in 2000, the average family income of CSLP students was $48,600, while the average family income of students not in receipt of a CSLP loan was $109,900. For independent students, the figures were $65,700 and $100,500 respectively. This represents a large difference for both independent and dependent students. Among dependent students, the average student loan received by recipients with parents in the lowest income quartile was also larger than the average loan received by those in the highest income quartile ($4200 vs $3200 in 2000). For independent students, however, the amount received did not vary much across parental income quartiles.

Any program that targets students receiving student loans is likely to be moderately progressive among the population of post-secondary students. This is less true of the population as a whole, however, given that university students are considerably more likely to come from high income families. Figure 17 shows the average amount of the Canada student loan received by parental education. The blue column shows the dollars received by income quartile per student, while the orange column shows dollars received per 18-29 year old. On average, dependent students from the lowest quartile receive $2,600 in loans each. Dependent students from the highest quartile receive under $288 each. However, the average student loan amount received by all 18-29 year olds, including non-students, in the bottom quartile is only $755, while that for those in the top quartile is $130. The differences in the amount received per person are much smaller than the amounts received per student. This is because of the lower post-secondary participation rate of youth from families in lower income quartiles.

This is more stark for independent students. For this group, students from the lowest parental income quartile receive on average $2200, just under twice what those in the highest quartile receive. But when different enrolment rates are accounted for, 18-29 year olds from the highest income quartile receive a larger loan on average than those from the lowest quartile - $300, compared with $220.

This effect is responsible for Usher's (2004a,b) finding that the CSLP is only mildly progressive, with 40 per cent of student loan expenditures going to youth from the top two quartiles. However, they are more likely to be progressive than the CSLP loans, since the CMSF bursaries are more likely to go to dependent students, and to students with higher assessed need.

That said, this still does not take into account the fact that in many provinces the savings from the CMSF were reinvested not in targeted financial aid but in general investments in post-secondary education. BC in fact had one of the highest rates of reinvestment in financial aid

programs. In Ontario and Saskatchewan, on the other hand, almost all savings were of the form of general subsidies. Usher (2004a), among many others, argues that such spending is in fact mildly regressive. In those provinces, the overall effect of the CMSF, once provincial policy changes were taken into account, may have been mildly regressive. It is, however, impossible to say whether this is in fact the case, let alone to put some magnitude on the effect. This again raises the issue of the importance of designing programs in a way that accounts for their interaction with existing programs.

Figure 17. Average CSL amount, by parental income quartile, 2000
a. Dependent students
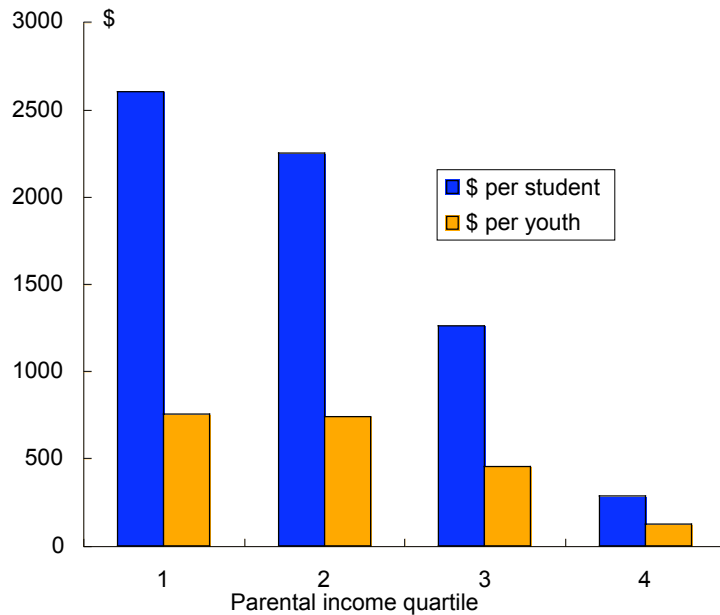
b. Independent students
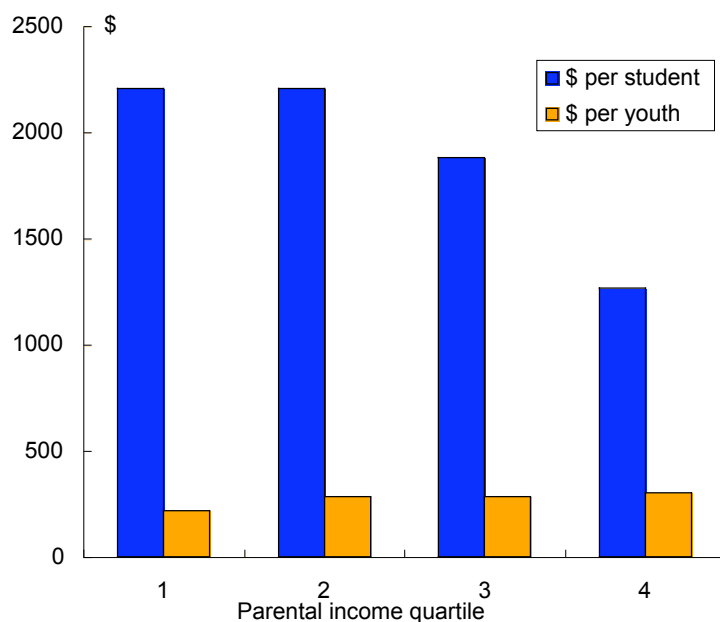
Source: own calculations based on data from Lin and Situ (2006).

Distribution of Lifetime Income

It is also important to consider how these bursaries affect the distribution of income over the course of a university graduate's life time. Because in most provinces the bursaries replace an equivalent loan, they do nothing to increase the financial resources currently available to students. They do, however, reduce the amount of future repayments the students need to make upon graduation, and so increase disposable incomes of students after graduation. In other words, the bursaries do almost nothing to increase funds at the time of life when income is lowest – the student years – but increases income when the funds are less needed. The program thus faces a similar problem to the educational tax credits, described in Finnie *et al.* (2005), and Usher (2005): the funds are not available at the optimal time from the students' perspective. This is not a sensible approach to providing assistance to students.

Other Distributional Issues

There are other potential quirks in the approach of providing a grant that goes directly to loan reduction rather than to increase current income. For instance, although a loan is not considered to be taxable income, a grant that is paid to reduce a loan is. Thus, it is entirely possible that a student in receipt of a CMSF bursary could have a lower income in the current year than he or she would have in the absence of that bursary. This is because the bursary does not add to current income but is taxable, and taxes on that income would need to be repaid in the current year. This was recognized by the CMSF early on, however, and was a part of the reason for the increase in the scholarship income exemption from $500 to $3000 – an amount large enough to cover the average CMSF bursary payment – in 2002. The recent decision to exempt all scholarship income from taxation has removed this concern. It has, however, meant that students who receive large amounts of up-front scholarship income pay less tax than students who earn the same amount of income from part time work. One inequity has therefore been replaced by another.

Summary of distributional consequences

While it is clear that the intention was that the CMSF bursaries would go to help students who had high financial need and therefore high borrowing, it is not entirely clear that it has actually helped students with low financial resources. The bursaries themselves likely went disproportionately to students from low income backgrounds, with a consequent slight improvement in the progressivity of the financial aid system. However, to some extent they merely replaced existing aid that would have gone to these students. To the extent that reinvestments were made in a way that was regressive – which is likely to have been the case in several provinces – this would have offset the direct distributional effects. Further, the increased income made available to these students was distributed awkwardly over their life cycle – total financial resources were not increased during their low income student years, but were effectively increased later on after graduation, in the form of lower interest and principal payments on the smaller stock of student loan debt.

Comments and Conclusion

This paper has shown that enrolments increased around the same time as the CMSF bursaries were introduced, and that there may have been some increase in persistence at university as well. However, despite the efforts of McElroy (2005, 2004) Lavallée and Backus (2007) and this paper, it is not possible to truly isolate the total effects of the CMSF bursary program – whether in terms of overall enrolments, persistence, or distribution – in a reliable way. This is because:

1. receipt of a bursary is strongly correlated with other determinants of enrolment and persistence;
2. the CMSF bursary program was introduced across Canada at the same time, so that there is no provincial variation in the timing of the program that could allow a control group to be identified; and
3. the CMSF bursary program was accompanied by negotiated (and likely non-negotiated) policy changes at the provincial level. Given this, it is not reasonable to assume that there were no co-incident changes in policy that may have affected enrolments or persistence is clearly invalid – and without that assumption, a simple comparison of pre- and post- bursary enrolments or persistence rates cannot hope to identify the true effect of the bursary program.

It is also very important to keep in mind that evaluations of such programs – even much simpler ones such as the Georgia HOPE program – typically require several years of subsequent data in order to be able to conduct a meaningful analysis, and they typically use microdata that are much more detailed than those available for this evaluation. It is critical that the reader of this analysis understand that any conclusions being drawn from this study are tentative at best. Further work, being undertaken under the MESA program, and being directed by several of Canada's pre-eminent education researchers, will help to shed further light on the program, and student financial aid in general.

It is also important to note that even if the CMSF bursary program were definitively shown to have had positive effects on enrolments or persistence, this would not necessarily mean that the program should be continued. It would be necessary to show that this was the best possible use of the funds to achieve the desired objectives. The IIGR's criticism of the approach taken by the CMSF is not so much that it is ineffective, but that it is likely to be among the least effective approaches available because it does not in itself increase financial resources available to students during their studies. Unfortunately, research on the relative effects of grants vs loans vs debt remission in Canada remains at a very early stage, and even in the US literature there is very little evidence on the effects of loans, much less debt remission. This is why the IIGR report focused on the theoretical effects of each of these three types of financial aid, and explains their conclusion that the likely direct effects of the CMSF bursaries were limited, as well as their policy conclusion that the funds would have been better directed to increasing resources to students while studying. It is hard to argue with this as a logical proposition.

Finally, the overall effect of the CMSF bursaries is likely to have been to increase the progressivity of the distribution of financial aid. However, this effect is smaller than it would have otherwise been if not for interactions with provincial programs.

In evaluating the CMSF bursary program, a major difficulty has been that it has had effects on provincial governments' policies. Although the approach taken by the CMSF was required by legislation, and had some administrative advantages, such as reducing duplication of payment infrastructures and perhaps increasing the speed of implementation of the program, it made it impossible – regardless of the available data – to separate out the effect of the CMSF bursary program from the effect of these other policies. Perhaps more importantly for future policy making, it means that the effects of eliminating or even substantially revising the CMSF bursary program may be quite unlike the direct effects of introducing the program. Junor and Usher (2006) note the political difficulties that are likely to arise for most provincial governments after the CMSF distributes its last bursaries and grants in 2009. They suggest that the sheer size of CMSF spending means that it is unlikely that most provincial governments would be able to simply replace the federal programs with equivalent provincial ones.

This paper has also highlighted some of the difficulties associated with analysis of the effects of post-secondary education policies in Canada. In particular, there is a lack of detailed data that is available to researchers and contains all of the information one would want in order to evaluate such policies. As a result, governments cannot rely on data being available to evaluate programs and policies – if an evaluation is expected to be required for a new program, then an evaluation plan needs to be considered prior to implementation.

Appendix A. Detailed review of literature on financial aid and enrolments

Tuition Fees and Grants

Models of the demand for a university education predict that, much as with increases in the price of any other good, higher tuition fees decrease the demand for university places. On the flip side, an increase in grants to students would be expected to increase the demand for university places. So long as there is some flexibility on the part of the university system to increase the number of places on offer in university programs, then, as such an increase in grants would be expected to increase the percentage of young people attending universities. How large this effect is likely to be is, however, an empirical question.

Canadian commentators have typically suggested that higher tuition fees (and by extension higher grants) are likely to have little effect on students' enrolment decisions. Stager (1996), for instance, argues that even a very large increase in fees would be insufficient to reduce demand significantly.   He suggests that doubling tuition fees from 1992 levels would have reduced the rate of return on university education by two to three percentage points, compared to an average rate of return of 6 to 12 per cent for an undergraduate arts degree in Canada at the time, and that this change in returns would not have been large enough to have a big effect on enrolments. Laidler (2002) and Rathje and Emery (2002) make a similar point. This argument is not based on empirical evidence on the sensitivity of enrolments to changes in the average rate of return, however, nor does it consider what the change in return is to the marginal student, nor how many students could be considered 'marginal'.   Only direct empirical evidence can speak to this question.

There are a vast number of empirical studies of how the direct costs of post-secondary education affect students' decisions on continuing with their education in the US. Leslie and Brinkman (1987) had already identified more than a dozen research papers on this question, and Heller (1997) added another dozen or so. In the decade since 1997, the literature has branched out from examining the relationship between tuition fees and enrolments to examining the effects of financial aid targeted to particular groups (eg Dynarski, 2002; Kane, 2003; Abraham and Clark 2006).   Almost universally, these studies find that reducing the direct costs of education increases enrolments, and that this effect is quite large. A summary of the results of key US and Canadian studies on the topic is in Table A1. The US literature suggests that a C$3000 reduction in tuition fees, or an equivalent increase in grants to individuals, would increase enrolments at colleges by around 9 percentage points.   This is clearly a huge effect, perhaps unrealistically so for the Canadian case. Unfortunately, there are relatively few reliable Canadian studies of this issue. Those that do exist suggest a more moderate effect, though nonetheless of the order of 6 percentage points. That is, a reduction of tuition fees of C$3000 from current levels would increase enrolments from around 20% of 18-24 year olds to around 26%.

There is also a suggestion from the US literature, and to a lesser extent the Canadian, that the effect of tuition fees (or grants) on enrolments is larger for students of relatively low income (Kane, 1994; van der Klaauw, 2002; Linsenmeier, *et al.*, (forthcoming); Carneiro and Heckman,

2002). Canadian studies that suggest a similar effect include Coelli (2005) and Neill (2006). The only other study that examined whether tuition fee increases disproportionately discourage Canadian students from low income backgrounds from pursuing post-secondary studies is Christofides, Cirello and Hoy (2001), which found little effect of family background. Other Canadian studies have either been unable to identify family background (Johnson and Rahman, 2005), or have not explicitly estimated tuition fee responses (Corak, Lipps and Zhao, 2003).

There are, however, studies that suggest that even relatively high income individuals may be quite price sensitive. Among these are Dynarski's (2000) study of the Georgia HOPE scheme. She finds that the introduction of this grant which provided free tuition at public universities in Georgia for students from Georgia who achieved a B average on high school graduation substantially increased enrolments in universities in Georgia, and that the effect was largest among middle and higher income Georgians. Cornwell *et al.* (2005) however, find that although enrolments in Georgia increased substantially, the increase came mostly through a reduction in students studying outside the state. They found little evidence of a large increase in enrolments among recently graduated Georgia resident freshmen.

On the whole, then, the literature on financial aid almost universally finds important increases in enrolments in response to increased aid. It is not, however, able to satisfactorily determine whether this is due to pure price sensitivity or to credit constraints. Carneiro and Heckman (2002), and Cameron and Taber (2002) find that price sensitivity is higher among students from relatively disadvantaged backgrounds, but they also argue that fewer than 8% of students can be said to be credit constrained. Keane and Wolpin (2001) find a similar excess response to tuition fee increases by students from disadvantaged backgrounds. In their work, the majority of university students face binding credit constraints, but directly relaxing those credit constraints would not increase enrolments by much. They argue this is because students who are credit constrained tend to be able to finance their education through increases in part time work. Thus, these writers argue that the sole explanation for the increase in enrolments with lower tuition fees is that it helps to overcome the rate of return barrier. On the other hand, in Canada, Coelli (2005b) provides suggestive evidence that short run income fluctuations of parents affect the decision to enroll in a post-secondary institution, which is also suggestive of credit constraints despite the existing financial aid system.

The conclusion from the studies in this area is that reducing the up-front price of a post-secondary education – either by reducing tuition fees or by increasing grants to students – has a substantial effect on enrolments, with what appears to be a bigger effect on students from disadvantaged backgrounds. However, there is no agreement on the precise reasons for this. It could be because the price reduction alleviates the rate of return barrier, the credit constraint barrier, or even perhaps the debt aversion barrier, or some combination of the three.

Subsidised student loans

A short-term lack of available funds and an inability to use human capital as collateral in a loan has long been recognized as a potential deterrent to individual's decisions to undertake higher education. The idea is that private markets may be unwilling to lend money to individuals to undertake higher education, so that those who do not have funds on hand could be discouraged from undertaking an otherwise profitable investment. Friedman (1955) was among the first to

propose a system of student loans with income contingent repayment to deal with this problem. Universally available income contingent student loan programs have been implemented in relatively few countries (Australia and New Zealand are notable exceptions). However, both the US and Canada have had government student loan programs, available to students who are considered the most likely to be credit constrained, in place since the 1960s.

Despite the importance attributed to these programs as part of the post-secondary education finance system, there is very little empirical evidence on their effects on enrolment decisions.[21] Only two papers empirically study the effects of an increase in the availability of loans: one in the US and one in Canada.[22] Susan Dynarski (2002) studies how the removal of home equity from the assets included in financial aid formula for the subsidized Stafford loan program in the US affected enrolments among children from homeowning families. She found a large increase in enrolments among children from such families, but was unable to attribute this to the effects of increased credit availability. The affected group should have easy access to credit through home equity, so that an increase in the loan limits would be unlikely to increase overall credit available to these students. As well, the magnitude of the effect was not larger than would be expected given the implicit price subsidy on the loans, and given previous estimates of the response of enrolments to the costs of college. Dynarski could not with confidence attribute the effects of the policy change to a relaxation in credit constraints rather than an effective reduction in the price of a college education.

Neill (2006) studies the increase in loan limits under the Canada Student Loan Program in 1994. Unlike Dynarski, she finds an effect of the increase in available credit that is greater than would be expected if the full effect were attributable to the effective price reduction.[23] This is suggestive of important credit constraints facing students from disadvantaged families, who are primarily likely to have been affected by the increase in loan limits. However, that study may have been compromised because it contains only one episode of policy change, and does not incorporate information on changes in the details of provincial loan schemes that were occurring at the same time.

These studies are hardly conclusive, but together suggest that targeted loan programs are likely to be at least as effective in increasing enrolments in post-secondary education as are grants or lower tuition fees. If credit constraints are empirically important, loans could potentially be a more cost effective way of increasing enrolments than grants, at least if they could be targeted to individuals who in fact presently face credit constraints. It is for this reason that many commentators, including the IIGR, tend to favour expanding student loan programs rather than increasing grants or reducing tuition fees as an approach to stimulate university enrolments. The latter also has the disadvantage of being untargeted, so that the major beneficiaries are likely to be students who would have been willing to attend university despite substantially higher costs, but receive a windfall gain from lower costs. That said, the administrative costs of student loan

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[21] Both in Canada and the US, the programs were in existence prior to the existence of surveys that could help to identify the effects of the programs.

[22] Bruce Chapman, of the Australian National University, has undertaken extensive studies of the effects of an income contingent loan program on students post-secondary education decisions in Australia. However, these studies are not particularly relevant to the existing Canadian system.

[23] Junor and Usher (2004) estimate that every dollar borrowed under the CSLP is equivalent to a grant of around 25-30 cents, taking into account the in-school interest subsidy and loan remission and interest relief programs.

programs may be quite high relative to a general policy of untargeted grants or tuition subsidies, or even relative to targeted grants, because of the need to put in place an administration for collecting loan repayments.[24]

On the other hand, it is unclear whether increasing the funding to student loan programs compared with current levels would greatly increase enrolments. Finnie and Laporte (forthcoming) report that 70% of Canada Student Loan recipients say that they would not have enrolled in post-secondary education had they not received a student loan. On the other hand, they find relatively few individuals who did not enroll because of they did not receive a student loan. This suggests a remarkable degree of effectiveness of the student loan program in Canada. If the results could be believed, very few individuals in Canada would presently be deterred from investing in post-secondary education due to a credit constraint.

Debt remission

Canada's student loan programs typically allow students to borrow a sum of money equal to assessed financial need, up to a particular dollar amount. However, in many provinces there are also loan or debt remission programs in place. The first typically reduces the amount of an annual loan that must be repaid on graduation to a particular dollar amount. For instance, in BC in 2004/05 a student can be issued with a loan of up to $10,880 in a 34 week academic year, but of this amount, only around $8300 was repayable.[25] Debt remission, on the other hand, is typically available after graduation, or in some cases when the debt becomes repayable, if the debt is sufficiently large or unmanageable.

So long as this remission is not subject to any conditions (including graduation or province of residence), it acts in practice in a similar way to an up-front grant, in terms of reducing the price of a university education. However, it does little to alleviate credit constraints beyond that available under the initial loan program – it does not increase up-front funds available to students compared with the loan program.

The CMSF bursaries are applied in most provinces in this fashion – they go to reduce existing debt and therefore future repayments rather than to increase funds available to students while they are still studying. Ideally, one would therefore use results of studies of loan remission to draw conclusions about the likely effects of the CMSF program. Unfortunately, no such studies exist. This is in part because of the relative absence of such back-end loaded aid programs in the US, and partly because of their complexity and reliance on an existing system.

That said, there have been studies of the effect of back-ended tax subsidies to higher education in the US. Long (2004) finds that they have had a smaller effect on enrolments than an equivalent up-front grant. Combined with the fact that debt remission does little to overcome credit constraints, this might suggest that debt remission is likely to be the least effective approach to

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[24] One of the attractive features of Australia's income contingent loan repayment program is that it saves on administrative costs by using the tax agency to collect repayments.

[25] In 2004/05 any BC student loan in excess of $34.37 per week was forgiven on successful completion of 60% of the academic year, for students in their first four years of an undergraduate program, as part of the BC Loan Reduction Program offered in partnership with the CMSF. The federal Canada Student Loan portion of total borrowing, accounting for around $7100, was not subject to this loan reduction.

increasing enrolments. As well, there appears to be little evidence that students are deterred from pursuing post-secondary studies because of a fear of taking on too much debt (Finnie and Laporte, forthcoming). This is the basis of the IIGR's conclusion that the direct effects of the CMSF program are likely to be minimal. That said, this is largely speculation, and based on an assessment that the main concern of higher education finance policy should be to overcome credit constraints.

Some studies commissioned by the CMSF (McElroy, 2004,2005) suggest that in fact the CMSF bursary program may have had an effect on the persistence of students, which would also have influenced measured enrolments. These studies are reviewed in the section on persistence.

Table A1 Summary of Selected Previous Studies of the Effect of Fees on Enrolments

Author/s	Impact of 1992 C$1000 increase in tuition fees	Elasticity	Data Source	Comments
US – surveys				
Leslie & Brinkman (1987)	-3.5	-	Survey	18-24 year old population
Heller (1997)	-3 to -6	-	Survey	Did not standardize for units/population used.
US – cross-state/time fee variation				
Kane (1994)	White: -2.5 Black: -6.4	-0.09 -0.24	CPS	18-19 year old white and black male high school graduates. Estimates shown are for model without state fixed effects.
Cameron & Heckman (1999)	White: -3.6 Black: -2.2 Hispanic: -6.0	-0.12 -0.08 -0.20	NLSY	High school graduates, controlling for family income av wage in local labour mkt, local tuition, Pell eligibility. Results here from Table 13.C.
Kane (1999)	-3.5	-0.2	NELS	
Card & Lemieux (2001)	18yos: -1.6 19-21yo M: -0.02 19-21yo F: -1.6	-0.06 -0.02 -0.1	CPS	Same tuition fee data as Kane, state and year fixed effects. Significant effect for women and for 18 year olds only.
US – financial aid				
Dynarski (2003)	-3	-0.65	NLSY	Impact of removal of social security benefits. Elasticity calculation here is based on total direct costs, and would be smaller if only tuition were included.
Dynarski (2000)	-3	-0.21	Admin	Impact of Georgia HOPE on enrolments in Georgian colleges.
Kane (2003)	-7	-1	Admin	Cal Grant on enrolments in public 4 year colleges in California, regression discontinuity
US – other				
Keane & Wolpin (2001)	-6.8	-0.62	NLSY	Simulations from structural model of enrolment decisions of 18-24 year old white males.
Canada				
Christofides, Cirello & Hoy (2001)	-	-	SCF	Identification of fees is across provinces & time. Estimates are for impact of university fees on all post-secondary enrolments.
Raymond & Rivard (2004)	-	-	YITS	Finished high school between 1996-1998. Does not include Ontario or Quebec.
Coelli (2005)	-4.3	-0.41	SLID	16 year olds living at home in first year of each wave. Largest effect among low income group.
Johnson & Rahman (2005)	-2	-0.26	LFS	1979-2001, public use files. Estimates shown here are largest response. Overall no effect.
Fortin (2004)	-1.5	-0.14	Admin	Elasticity between -0.09 and -0.14
Ontario				
Foot & Pervin (1983)	U/G: -1 P/G: -2		Admin	Aggregate. All 20-24 year olds, aggregate enrolment rate, 1960s and 1970s. Does not include fees directly .
Michael (1999)	FT: +0.2 PT: -0.4	0.05 -0.21	Admin	By university/year. All 18-24 year olds, by university.

| Mueller & Rockerbie (2002) | - | -0.27 | Council of Ontario Universities | By university/year. Estimates price elasticity of applications (not enrolments). 10% decrease in fees increases applications by 1.5-5.9% |

Acronyms: Admin = source is enrolment data from university administrative databases; NELS = National Education Longitudinal Survey (US); CPS = Current Population Survey (US); NLSY = National Longitudinal Survey of Youth (US); SCF = Survey of Consumer Finances (Canada); YITS = Youth in Transition Survey (Canada); SLID = Survey of Labour and Income Dynamics (Canada); LFS = Labour Force Survey (Canada); COU = Council of Ontario Universities.
Source: Neill (2006)

Table A2. Description of key data sets for calculating enrolment statistics

Data set	Variables identifying enrolment status	Variables identifying socio-economic status
Enhanced Student Information System (ESIS)	Numbers of university students by university and full-time/part-time status. No recent information on college enrolments. From university administrative data.	None – data not available at individual level
Labour Force Survey (LFS) Public Use Files	Currently enrolled in educational institution; Type of educational institution; Full-time/part-time 17-24 year olds	None – data available at individual level, but no information on family available

Labour Force Survey (LFS) Master Files	Currently enrolled in educational institution; Type of educational institution; Full-time/part-time 18-24 year olds	For children usually resident with their parents:
		  Parent's education
		  Parent's labour force status
		  Family type
		  Parent's occupation
		  Parent's industry of employment
		  Region of residence

Survey of Labour and Income Dynamics (SLID) Master Files	Enrolled in educational institution in last year; Type of educational institution; Full-time/part-time	For children able to be tracked back to their parents:
		  Parent's education
		  Parent's labour force status
		  Family type
		  Parent's occupation
		  Parent's industry of employment
		  Region of residence
		  Parent's income

Longitudinal Administrative Databank (linked to Canada Student Loan Program data)	Claimed education tax credit in past year; Value of education tax credit claimed used to identify full-time/part-time status Can also identify student loan recipients and value of loans received.	For children who can be linked to parents' tax file data: Parent's income Financial need can also be assessed using the value of loan received. Does not include Quebec.

Figure A1. Percentage of CMSF bursary recipients, by type of institution, 2005
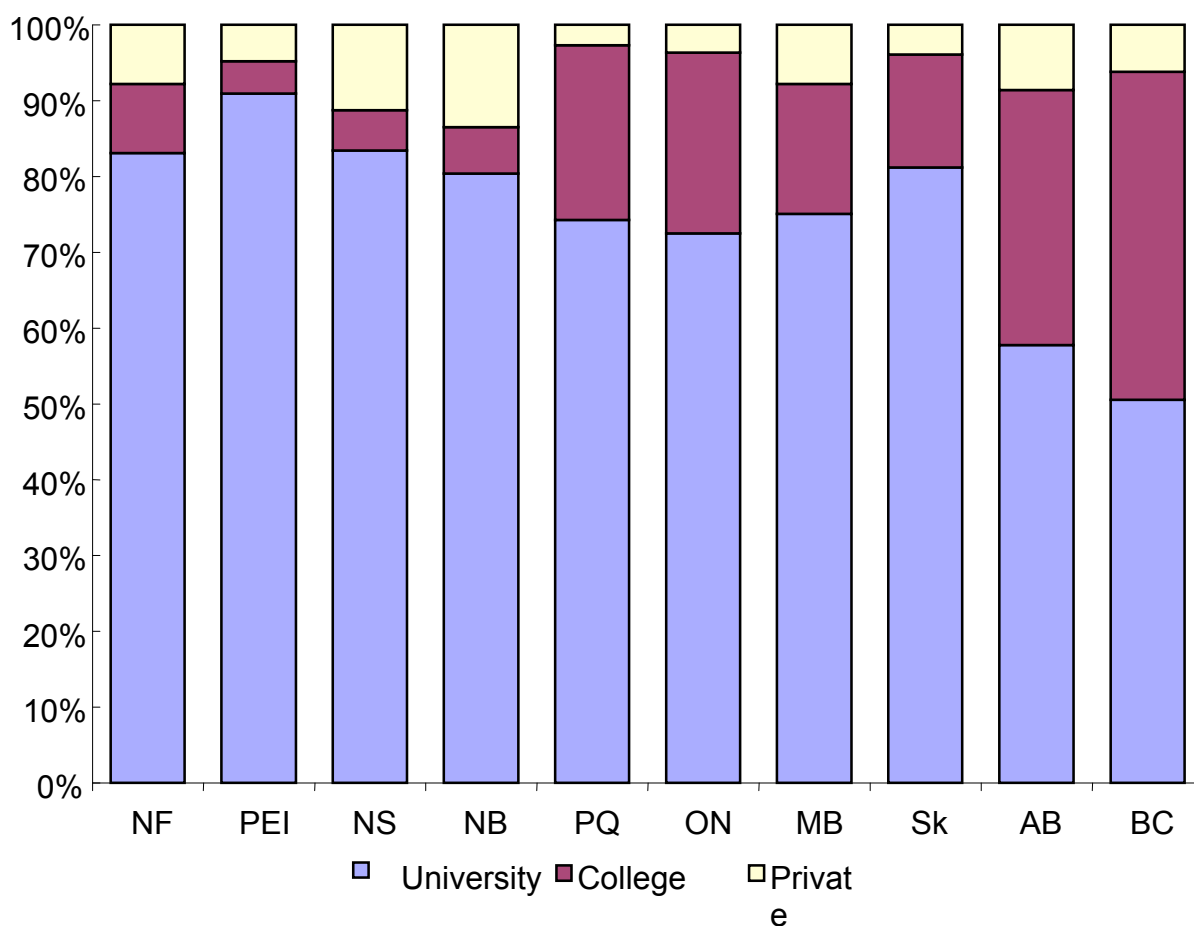
Source: CMSF Annual Report, 2005

Appendix B. Why evaluate when an ideal evaluation is not possible?

The main conclusion of this paper is that it is largely impossible to evaluate the CMSF bursary program using available data sets. This could perhaps be seen as an unsatisfactory outcome, in that it would appear concerning to spend large amounts of funds on a program of the scale of the CMSF without having some chance to be able to review its effects. It is unfortunately not merely a result of not having the ideal data set for the purpose at hand, but rather is a result of the implementation of the program itself, as argued above.

Of course, many government policies cannot be seriously evaluated in an ideal fashion – the same is true, for instance, of the Canada Student Loan Program. It is nonetheless useful to review the economic arguments on what the effect of the bursaries would be expected to be, drawing on economic theory and on previous studies of related schemes. This may provide insights into the effectiveness of the scheme even when a formal econometric evaluation is not possible. In the case of the CMSF, there are sound reasons to believe that the overall direct effects on enrolments are likely to be small, as argued by the IIGR (2003). On the other hand, it remains useful to allow for the possibility that there is some effect. Thus, this paper does examine whether there is any reason to think there was an increase in enrolment rates and persistence around the time of the introduction of the CMSF.

It should also be noted that governments may need to try to evaluate programs even when this may seem impossible and indeed rather pointless by the standards of academic economists or policy analysts. The Request for Proposal (RFP) on this work made it clear that the difficulties of undertaking a formal evaluation in this case were well known, and focused on a request for a description of recent trends. The sections of the RFP dealing with the purpose of the work and the scope of the work are reproduced below:

Purpose of the Work

The final anticipated deliverable will be a report measuring access to PSE though enrolment and participation statistics over the academic years of 1996-97 or earlier to the latest year possible. These statistics and trends should be produced at the provincial level, Canada total and by various socio-economic indicators as determined through data availability and consultation with CSLP analyst. All statistics should, where possible, be examined using, at minimum, the Survey of Labour Income Dynamics (SLID), the Labour Force Survey (LFS), and the linkage of the Longitudinal Administrative Data (LAD) to the Canada Student Loans Program data. A summary of existing literature on these statistics and trends should also be done.

Scope of the Work
The supplier, in consultation with the project authority will:

1. Develop a summary of current research on access to Post Secondary Education (PSE);
2. Research using use existing survey and administrative data (including but not limited to the Survey of Labour Income Dynamics, the Labour Force Survey, and the linkage of LAD to CSLP administrative data) which can fill in research gaps in access to PSE;
3. Develop methodology to measure trends in access to PSE, by various socio-economic factors, using at least SLID, LFS and LAD;
4. Develop methodology to examine/quantify whether there is a measurable shift in these trends after January 2000 (i.e., the first disbursement of CMSF's bursaries), and to examine/quantify whether

this shift in trend can be related to the CMSF and/or other events, using at least SLID, LFS and LAD;

5. Develop methodology to examine/quantify the questions as to the CMSF's bursaries has impacted on the equity and fairness of access or other indicators by various socio-economic factors, using at least SLID, LFS and LAD;
6. Execute the analysis using the methodology developed; and,
7. Write a report describing the trends and measurable shift in trends in access to PSE at the aggregate level and by various socio-economic factors, including low-income, age group.

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Comments on Christine Neill's paper

The author argues that, given the data available to her, "a formal evaluation [of the millennium bursary program] yielding reliable results is not feasible" and that the conclusions of her study are "tentative at best." She notes that, on the question of persistence, it is preferable to rely on evaluations such as those conducted by Lori McElroy or the "MESA" study of the impact of access grants – in other words, it is preferable to rely on the results of the Foundation's own research program. The paper also argues that post-secondary enrolment rates have increased since 2000, the year in which the millennium bursary program was introduced.

In discussing the effectiveness of bursaries, the author echoes the 2003 IIGR report's theoretical argument that bursaries that reduce student debt likely have a negligible impact on students. This argument calls into question, among other things, the CSLP's 2004 decision to introduce Canada Access Grants, and is contrary to the positions of the federal and provincial governments as well as student groups. The discussion of the comparative effectiveness of financial aid is weakened, however, by the author's confusion regarding different types of grants. The author initially distinguishes between grants covering unmet need and debt remission. These, however, are not the only two types of grant available: there are also bursaries issued *in lieu* of loan. The author alludes to this type of grant subsequently in the paper through the use of terms such as "direct grants," "upfront grants," "cash grants" and "in-course grants," but fails to develop and base her analysis upon a consistent typology. This is important: the literature she reviews supporting the effectiveness of grants refers as much to grants that replace loans as it does to grants that cover unmet need, a fact that the author does not fully take into account. Given the importance of loan reduction bursaries within the federal and provincial programs, it would have been preferable for CSLP to have asked for the paper to be revised to remove this confusion. At times, the author also confuses the savings to provinces that resulted from the reduction of student loans by millennium bursaries with "displacement," and therefore overestimates the scale and consequences of the latter phenomenon.