

The Effect of Student Loan Limits on University Enrolments

Christine Neill¹
Wilfrid Laurier University
February 2008

Abstract

Student loan programs are an important feature of post-secondary education systems around the world. However, there is little direct evidence on whether these programs are effective in increasing enrolments of credit constrained students. Unlike most other countries, Canada has a system of student loans and grants that is based on combined provincial/federal jurisdiction, leading to policy differences over time between provinces. I exploit these differences to evaluate the effects of changes in maximum student loan limits on enrolments of young people. Although there is evidence that increasing nonrepayable assistance leads to increases in enrolments, loans appear to increase only the probability of youth living away from their parents' house while studying.

Key words: post-secondary education; student loans; credit constraints

¹ Thankyou to Michael Baker, Dwayne Benjamin, Rob McMillan, Thomas Lemieux, Azim Essaji and Yvan Guillemette for helpful comments. Research for this paper was funded by the Canadian Labour Market and Skills Researcher Network. This paper makes use of confidential data available under the Statistics Canada RDC program. The views do not represent those of Statistics Canada. Correspondence to: cneill@wlu.ca

1. Introduction

The notion that optimal choices of education may be thwarted by credit constraints is an old one in the human capital literature, and lies behind the establishment of government run student loans and grants programs in many countries, including the Pell Grants and Stafford loans in the US, Australia's Higher Education Contribution Scheme, and Canada's Student Loan Program. However, the bulk of the evidence of the impact of credit constraints on enrolment rates is at best indirect. There are two key types of evidence that suggest credit constraints may have important effects on post-secondary enrolment decisions. The first is that tuition fee increases may reduce enrolments of youth from low income families to a greater extent than for youth from high income families (eg Kane, 1994). The second is that estimates of the returns to education are typically higher in instrumental variables models than in OLS models (eg Card 1994).

As Cameron and Taber (2004) point out, the focus on indirect approaches has been a matter of necessity rather than choice, arising because "the data to answer this question directly is not available" (p. 132). The reasons for this are threefold. First, individual use of student loan programs is highly correlated with individual and family characteristics that are also correlated with enrolments. Low income students typically receive larger loans, but they are also less likely to go to university for other reasons. Estimates of the impact of loans on enrolment decisions therefore must rely on some exogenous variation in loan availability. Secondly, most student loan programs are run at the national level, so that it is difficult to identify variation in such programs that affect some group of students but not others. Third, student loan programs are typically subsidized, making it difficult

to attribute the effects of changes in loan availability to reduced credit constraints rather than the price subsidy effect.

Only one study directly explores how variation in student loan policy parameters affect enrolments. Dynarski (2002b) examines the 1997 removal of the value of a family home from the calculation of assets available to finance a student's education. This led to an increase in eligibility for student loans among individuals whose parents owned their own home. She estimates that enrolments increased as a result, but because the loans are subsidized, Dynarski was unable to attribute this to a pure credit effect.

This paper makes use of policy variation due to changes in the maximum loan limits available to students in different provinces to directly identify the impact on education decisions. In Canada, both the federal and provincial governments are involved in providing student loans and grants. The Canada Student Loan Program (CSLP) operates in all provinces of Canada but Quebec, which runs a similar but separate system, the Aide Financière Aux Études (AFE). The provinces also often adopt somewhat different parameters in their student loan programs. In all provinces, governments provide loans in an amount equal to assessed need less available resources, up to a maximum dollar borrowing limit. There have been quite substantial differences in these maximum borrowing limits across provinces over time.

In Section 2, I discuss in more detail previous studies on financial aid. Section 3 turns to a brief discussion of the theoretical predictions of the effect of a subsidized student loan

program on students' decisions. In Section 4, I outline the main policy changes which provide the identification for the empirical results, and Section 5 provides details on the data and empirical strategy. The empirical results given in Section 6 show that increases in the amount students are able to borrow under government run student loan programs does not appear to have affected enrolments, but that increases in nonrepayable assistance has had an effect. The magnitude of this effect seems to have been larger for youth whose parents have relatively less education. Section 7 concludes.

2. Financial aid, student loan programs and educational outcomes

To my knowledge, there is only one paper that uses variation in student loan program parameters to estimate the enrolment effects of increasing credit availability. Dynarski (2002b) relies on the variation induced by the removal of home equity from the assets included in the financial aid formula for the subsidized Stafford loan program in the US. This increased loan eligibility among children whose parents owned their home, but did not affect children of parents who were not homeowners. Dynarski finds a large positive effect on enrolment rates for children from homeownership families, but is 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. Thus, it is possible that the increase in enrolments was entirely attributable to the effect of the subsidy on those loans, rather than to a relaxation in credit constraints.

While there is little direct evidence on the effects of student loan programs on educational outcomes, there is a substantial literature on the effects of financial aid more generally. On the whole, studies of financial aid programs show that price reductions increase enrolments.² Several studies suggest that the effect is larger for students of relatively low income (Kane, 1994; van der Klaauw, 2002; Linsenmeier, *et al.*, 2002). Along with the consistent finding of a strong correlation between family income and university enrolments, and the often higher IV than OLS estimates of the high rate of return on education, this has been used as suggestive evidence of the importance of credit constraints.

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.* (2006) however, find that although enrolments in Georgia increased substantially, the increase came about due to a reduction in students studying outside the state. They found little evidence of a large increase in overall enrolments, as opposed to in-state enrolments, among recently graduated Georgia resident freshmen.

² Discussions can be found in Dynarski (2002a), Heller (1998), among others. The Canadian evidence, discussed in Neill (2006) and Coelli (2005) is less definitive.

On the whole, then, although the literature on financial aid almost universally finds important increases in enrolments in response to increased aid, it is not able to conclusively attribute this effect to credit constraints.

3. Clarifying the relationship between subsidized loans and student outcomes

This section aims to clarify the effects of student loan programs. For the purposes of this paper, I abstract from concerns regarding the riskiness of investments in post-secondary education, and focus on the stated goals and design of the Canadian student loan programs. In particular, I ask what effects an increase in student loan limits would be expected to have on students' borrowing, consumption, hours of work, and enrolment rates.³

Suppose that students are able to borrow either from a government operated student loans program, or from the private sector. Any student borrowing would be from the source with the lowest interest rates. If the government student loan program offered loans at a subsidy compared to the private sector, then all student borrowing would be under the government program. Borrowing and consumption would be higher during the period of study the greater the subsidy on the student loan program. By facilitating higher consumption in the first period, and therefore reducing the marginal utility of consumption in period one, such a system would also result in a reduction in hours worked by students. These two factors combined would make studying more attractive for all individuals. Thus the introduction of a universally available and subsidized student

³ Other margins of adjustment, including switching between types of post-secondary education, are possible but not considered here.

loan program would be expected to increase overall enrolments and reduce students' hours of work even in the absence of credit constraints. This effect arises because the subsidies relax the lifetime budget constraint for students, but not for non-students.

The Canadian student loan system, however, limits individual students' borrowing, placing a cap on the total amount that can be borrowed per week. Then, students will borrow as much as they can from the student loan program, with any additional borrowing from the private sector. An increase in limits on the student loan program will then lead to a shift in borrowing away from the private sector towards the public program. Borrowing under the student loan program will increase, but in the absence of credit constraints, this increase will be largely offset by a reduction in borrowing from the private sector. There will be no net increase in student borrowings, merely a change in their composition. This is because, so long as students are unable to undertake all their borrowing from the student loan program, the increase in student loan limits has no effect on the marginal cost of borrowing. The increase in student loan limits does, however, reduce the total cost of a university education (since the overall repayment costs will be lower), so that enrolments may increase as a result. Hours worked during school and consumption during school years are unlikely to be substantially affected. This effect will be larger the larger is the gap between the interest rate on private loans compared with the interest rate on government loans, so, an increase in student loan limits will have a larger effect on the net present value calculation for any group students facing a relatively high interest rate on private sector borrowings.

Finally, suppose that there are also constraints upon borrowing in the private sector – students are unable to borrow as much money as they would like to at the prevailing private sector interest rate during their studies. Then, an increase in student loan limits will reduce overall credit constraints. Borrowing will increase under the student loan program to the maximum available, and overall borrowing will also increase. This easing of the overall credit constraint, on top of the increase in the subsidy component of the student loan program, leads to an increase in the calculation of the net present value of a university education that is greater than would be the case in the absence of private sector credit constraints.

A first indicator of the success of a policy to raise limits on student loans, then, must be whether the increase in limits has an effect on actual borrowing under the student loan program itself. If an increase in student loan limits does not raise the average value of student loans, then there can be no other economic effects. It is also necessary that total borrowing from both public and private sources increase – otherwise, the evidence would show that there was simply substitution from private to public sources.

Even this is not sufficient to demonstrate that there are important economic benefits from these programs, however. The main justification for student loan programs is that they help youth to continue their education until it is economically optimal to do so. Thus, if there is no effect of changes in these loan programs on enrolment decisions, or on other elements of educational activities, there would be little reason to spend large amounts of

public funds maintaining, let alone expanding, the programs. The most important question, then is whether increasing borrowing limits in fact increases enrolments.

Finding that higher student loan limits are associated with higher enrolments need not indicate the presence of credit constraints, however. Both the CSLP and AFE are heavily subsidized. Junor and Usher (2004) estimate that the in-school interest subsidy means that between 15 and 30 per cent of the face value of a loan is a grant equivalent. Even if students were not credit constrained, an increase in the amount students can borrow under a subsidized loan scheme should therefore act in a similar manner to a price reduction. It is only if there is evidence that there is an enrolment effect over and above that which would be expected based on the effective price reduction, then, that one could argue that there is evidence that the student loans program was effective in overcoming credit constraints.

Finally, the full benefits of student loan programs may be understated if one looks simply at the enrolment effects. Keane (2002) discusses how credit constraints may be binding for a large proportion of the population without having much impact on overall enrolments. Students who are unable to borrow as much as they would like to can either reduce current consumption below the optimal level to save money, or increase working hours to earn more income. He notes, however, that credit constraints begin to be much

more important if there are also important constraints on the number of hours students are able to spend working for pay.⁴

4. Canada's student loan systems

In this section, I describe Canada's two student loan programs – the Canada Student Loan Program (CSLP) and Quebec's Aide Financière aux Études (AFE), and the key changes to these programs over the past decade. A more detailed explanation of the programs is available in Junor and Usher (2004).

The CSLP, which offered its first loans to students in 1964, is the most important source of financial aid provided by Canadian governments direct to students. Its main aim is to “help low-income students obtain a post-secondary education” (HRDC, 1997). The CSLP covers all provinces except Quebec, with the federal government providing individual students with 60% of their assessed need, up to a maximum limit. The provinces cover the remaining 40%, again up to a maximum amount. Quebec's AFE program is a similar but separate system, funded in part by grants from the federal government, but the details of the system are decided by the provincial government.

A student's assessed need is determined by adding all their expenses and subtracting available financial resources. Assessed need depends on factors such as tuition fees, study expenses, travel expenses, and the student's living arrangements. The needs assessment is designed so that the out of pocket expenses a student must pay are the same regardless of

⁴ This is exactly what the CSL does, in imposing 100 per cent taxback rates for all in-semester employment income over \$50 per week.

the program or institution attended. Available financial resources include work income and scholarship income. Assets valued over a certain amount are also included, as is some percentage of parental income, unless a student is considered to be independent. A student is considered independent if he or she is married, has dependent children, has been working for two years or more, or has been out of high school for five years or more.⁵

Debt on student loans accumulates interest free so long as the student is still enrolled in school. Repayments become due six months after graduation. There are some forms of debt and interest relief that are available to debtors upon request. The programs are therefore subsidized loan schemes.

As mentioned previously, annual borrowing under the CSLP is limited. For most provinces where the CSLP operates, this maximum amount is currently \$350 per week, with 60% of that amount provided by the federal government and 40% by the provincial government. Thus, a student with assessed need of \$400 per week will only receive loans of \$350 per week. Any increase in assessed need for students below the loan limits is met by an increase in financial aid, while for those above the limits, increases in assessed need do not increase financial aid.⁶

Federal borrowing limits under the CSLP are raised in nominal terms only irregularly.

Figure 1 shows the nominal and real value of the maximum Canada Student Loan and the

⁵ In Quebec, this last criterion is instead when the student has attained enough credits for an undergraduate degree

⁶ Some universities do provide guarantees that they will meet any unmet need through bursary programs

average value of a loan since the beginning of the program in 1964/65. Increases in the limits have been followed closely by increases in the average value of loans distributed under the CSLP, and have often come at times when the average value of a loan is surprisingly close to the loan limit.

In Quebec, by contrast, tuition fees have remained stable while the AFE limits have increased to keep pace with overall inflation plus tuition fee increases. As Junor and Usher (2004) point out, this has led to an important divergence in the resources available to students in the CSLP zone compared with Quebec: “in the nine provinces where the CSLP operates, tuition has risen steadily in recent years while the maximum student loan level has remained constant since 1994. In Quebec, the converse is true: tuition has remained stable but maximum assistance levels have risen with inflation” (p. 105).

This difference across provinces that provides the key identification for this paper. However, there are also important differences in the programs of the provinces that work within the framework of the CSLP. First, prior to 1994, there was considerably less consistency between the CSLP and the provincial loan programs. Prior to that time, provinces were much more likely to set borrowing limits without reference to the federal program. The most important provincial differences were in Ontario, where provincial regulations had specified a maximum to borrowing from the CSLP and OSAP combined so that the 1994 increase in federal loan limits did not increase overall loan limits for students at all, and Alberta, where loan limits have increased in recent years when the CSLP has not increased loan limits.

The maximum limits on the CSL program are an important feature from the recipients' perspective. In 1994, just before the limits were raised, around half of all student loan recipients were at the limit, with the figure falling to around 18 per cent afterwards (HRDC, 1997: 36). A similar proportion were again at the limits in 2003, just before the limits were raised again (HRDC, 2004: 11).⁷ The proportion of CSL recipients attending universities who received the maximum possible grant was likely higher than these figures, since this group typically has higher assessed need than college students. Increases in maximum loan limits have little or no effect on students who were previously receiving less than the maximum possible loan. For these students, changes in the maximum loan limit have no effect – their limits remain determined by the calculation of needs less available resources

Nor does an increase in limits increase eligibility for student loans. Furthermore, Finnie (2001) notes that almost all students borrow the full amount for which they are eligible. Thus, there is little need to consider the possibility that increases in loans may have effects on those not previously constrained by the limits.

There is one other important qualification. In most provinces, student loans are provided as part of a more general package of student financial assistance, which also includes some non-repayable assistance. In the 1980s, such assistance was typically provided through an up-front grant program, in which students who had very high assessed need

⁷ Similar figures are unavailable for Quebec, but the large size of the possible value of loans plus bursaries, both in dollar terms and relative to the average amount borrowed, suggests that few students were at the limits of the program.

(and therefore loans) were given a grant to cover part of their assessed need. Since the early 1990s, it has become more common to provide this non-repayable assistance in the form of debt relief – that is, a student will be provided with funds described as a loan, but at the end of successful completion of an academic year or in some cases after graduation, any debt over a specified dollar amount is forgiven. In such a system, then, increases in loan limits may in fact not increase repayable debt at all – while more funds are provided in what is called a ‘loan’, in fact there is no increase in the amount a student is required to repay. This has been particularly important in Ontario, which has a limit of \$7000 on repayable assistance which has not increased in more than a decade. For students in Ontario, then, an increase in CSL loan limits increases not loans but rather grants.

Figure 2 shows how these provincial differences affect overall repayable (loan) and non-repayable (grant) funds available to students in four different provinces in nominal terms. New Brunswick has a profile that is most similar to that for other provinces not shown here, following relatively closely changes in the CSLP. The clear differences between New Brunswick and Ontario and Alberta show the extent to which provincial loan programs can affect total funds available to students. This paper relies on these differences in funds available to students from different provinces to estimate the effect of increases in loans and grants on student enrolments.

5. Empirical Strategy and Data

My empirical strategy takes advantage of the policy variation described in Section 4 to

estimate the effect of increasing credit availability on students' borrowing, enrolments, and work while in school. There is no single dataset in Canada stretching to before 1994 that includes information on individuals' borrowings separated into student loan program and other borrowing, university enrolments of youth, hours worked by youth, and parental background information. For this study, therefore, I rely on two main data sources to answer separate questions. First, to examine changes in student borrowings around the times of the changes in the CSLP limits, I use administrative data from the CSLP as well as data from the National Graduates Surveys (NGS). To examine whether the changes in the CSLP loan limits affected enrolments and students' work, on the other hand, I use individual level data from the master files of the Labour Force Survey (LFS).

The Labour Force Survey (LFS), has been conducted consistently since 1976, covering around 50,000 households, and 150,000 individuals aged over 15 years each month. Its main use is constructing estimates of labour force statistics, but it also includes questions on current student status, in which individuals are asked to self-identify whether they are currently studying full time, part time or not at all, as well as what type of institution they are attending (school, university, community college/CEGEP, or another institution). The master files of the LFS have the advantage of enabling matching between children and parents, so that I can incorporate some information on the educational background and labour force status of an individual's family members. Regrettably, it has included information on incomes only since 1997.

In this paper, I use data on 18-23 year olds from the December round of the LFS from 1990 to 2005. It is common in studies of post-secondary enrolments to include individuals aged between 18 and 24 years old. I have excluded 24 year olds from the analysis, because in all provinces 24 year olds are considered independent students, so parental income is not considered to be a part of students' available financial resources. It is therefore more difficult to draw links between family background and loan eligibility for these individuals. Independent students have also been subject to more important changes in eligibility criteria over the 1990s than have other groups, and these changes may confound the estimates in this paper.

Given that changes in student loan limits are likely to disproportionately affect individuals from relatively disadvantaged backgrounds, it is important that some information on family background be available in the dataset. The LFS does not have family background information for youth who are not living with their parents. I include all 18-23 year olds regardless of whether or not I have parental education information, because excluding those without it could lead to biased estimates (Cameron and Heckman, 2001), and create a set of dummy variables that divide students into four parental education groups: those whose parents' education is unknown; those who have no parent with more than a high school education; those who have at least one parent with some post-secondary education (but not a university degree); and those who have at least one parent who has a bachelors' degree.

An important feature of the LFS is that the definition of usual place of residence means

that any students who are temporarily away from the family home, including those who are living away from their parents' home during the semester to attend university, are considered to be living with their parents. This means that the LFS data show not the enrolment rate of students in Quebec universities, but the enrolment rate of students who are usually resident in Quebec, regardless of where the university in which they are enrolled is located. This may cause difficulties, as noted by Fortin (2005) and Kane (1999), in assessing the effects of tuition fees on enrolments, since it means that the tuition fee assigned to a particular student may not be the tuition fee actually paid.⁸ However, it is actually helpful in assessing the effect of student loans programs, since students are typically eligible for a loan from the government of the province where they completed their high school education. Thus, a student from Quebec studying in Ontario would be eligible for a loan under AFE rather than the CSLP/OSAP.

Data on loan limits are from federal and provincial legislation and annual reports, and tuition fee data from Statistics Canada's Tuition Fees and Living Accommodations (TLAC) Survey. Both are deflated by provincial consumer price indices. I also include information on other variables that may affect enrolment rates, including the real value of provincial minimum wages and unemployment rates. The sources of all data are in the Appendix.

Estimating framework

The main estimating equation used in assessing the effect of loan limits on enrolments and students work takes the form:

⁸ This is likely to be less of a concern in Canadian than US data, however, since less than 10 per cent of students are studying out of province, compared with 15-20 per cent of Americans studying out of state. Note also that only Quebec charges different fees for out-of-province students than in-province students. Fee differentials for students not studying in their home province are therefore not as large as in the US.

$$Y_{ipt} = \alpha + \beta (loan_{pt}) + \beta (grant_{pt}) + X_{pt}\gamma + D_{ipt}\delta + T_t\rho + P_p\lambda + \varepsilon_{ipt} \quad (1)$$

where Y_{ipt} is a dummy variable equal to one if a given student is enrolled in university full time,⁹ $loan_{pt}$ is the real value of the limit on repayable assistance in province p in year t , $grant_{pt}$ is the real value of the limit on repayable assistance in province p in year t , X_{pt} is a set of province-year varying economic variables, including tuition fees, minimum wages and unemployment rates, D is a set of dummy variables for characteristics of the individual including age, sex, parental education, and whether there is some person in the individual's family (other than themselves) who is unemployed, T is a full set of year effects, P is a full set of province effects.

A first concern is that there may be overall trends in enrolment rates which bias the results. If there is some trend in a relevant unobserved characteristic which affects the economic environment in one Quebec differently to that in the CSL zone, then the influence of the unobserved trend on the enrolment rate will be incorrectly attributed to the increase in loan limits. To counter this possibility, I check my results by including province-specific quadratic time trends in the estimating equation. The results are robust to this inclusion.

A second concern is that in the late 1990s, there were also some changes to the definition of independent students, which made it more difficult to claim independent status. A student can claim independent status if they have been in the workforce for two or more

⁹ I also estimate the effects of the loan cap on the percentage of students working full-time, restricting the sample to full-time university students, and replacing Y with a dummy variable equal to one if a student is working fulltime.

years, have been out of school for five or more years, or are married. In Quebec, students can claim independent status if they have completed their undergraduate studies.

Independent students are not expected to receive a contribution from their parents, so parental income is not considered as an available resources for the purposes of the needs calculation. This makes it easier for independent students to qualify for student loans, and also breaks the link between student loan eligibility and parental income. Independent students are a large proportion of CSL borrowers (around 55%) and receive on average larger loans than dependent students (Junor and Usher, 2004). Importantly for the purposes of this study, the changes to the definition of independent students may have affected eligibility and enrolment rates of this group in different ways between the CSL provinces and Quebec. For that reason, I restrict my sample to those who have been out of school for five years or less on average. That is, I focus on those who are 18-23 years of age.¹⁰

Besley and Case (2000) note policy changes themselves may not be exogenous to changes in the overall economic and social environment, which potentially biases the estimated effects of policy changes. In this case, policy changes occur at both the national and provincial level, and changes in national policy have automatic effects on provincial programs. The national policy changes – increases in loan limits in 1984 and 1994 – appear to have been principally a response to the declining real value of the loan, and unrelated to any particular changes in enrolments around the time of the policy change. The majority of the changes to Quebec's AFE appear to be automatic increases to

¹⁰ Restricting the sample to only 18-19 year olds led to similar results to those reported here.

account for inflation, with some more recent changes in response to changes in the federal policy environment.¹¹

Provincial policy changes may be more related to development in the post-secondary education system. Changes in other provincial loan programs may be in part driven by changes in the local economic environment. Alberta in particular is somewhat suspicious, having had relatively slow growth in enrolments coupled with larger increases in student loans than other provinces. The policy itself may have responded to the slower growth in enrolments in that province, or perhaps a third factor may have led to both lower enrolments and increased spending on student loan programs in that province.¹²

6. Results

Before turning to the main question of how increases in student loan limits affect individual youths' education and employment decisions, I first examine the available evidence on two prior questions. First, do increases in CSL limits increase borrowings under the student loans program? And second, is there any evidence that such an increase in borrowing represents a substitution away from higher cost private borrowing? The evidence available is perhaps rather casual and is in some cases contradictory, however, a result of the relative paucity of reliable data on student loan debt.

Do higher loan limits increase debt?

It certainly would appear that in real terms the relaxation of the CSLP loan limits led to a large increase in CSL borrowing in the early 1990s. The annual average amount borrowed in the CSLP increased by an average of more than 5 per cent per annum from

¹¹ In particular, the introduction of the CMSF bursaries.

¹² An obvious possible candidate here is changes in oil prices, which both increase employment opportunities for young people and increase the funds available to the provincial government.

1993-94 to 1996-97 (Figure 3). While some of this probably reflected increasing tuition fees over this period, fees were rising rapidly in many provinces as of 1992, and were still rising by 2000.

Table 1 reports results from time series regressions of average dollar value of student loans on CSLP limits and average tuition fees in the CSL provinces. A \$1000 increase in CSL limits increased average CSL borrowing by around \$250 to \$300, after accounting for the effects of tuition fees and time trends. However, this need not mean that total borrowing from student loan programs increased. As noted earlier, in Ontario the 1994 increase in CSL limits led only to an increase in the federal government's share of the total loan provided to students, and not to an increase in overall borrowing under the combined CSLP/OSAP. Unfortunately, administrative data on borrowing from provincial student loan programs is not readily available. Instead, I use student reports of their debt on graduation taken from the National Graduates' Surveys (of 1982, 1984, 1990, 1995 and 2000).

Regression results shown in Table 2, demonstrate that the two periods during which the CSL loan limits were increased were associated with an increase in borrowing from student loan programs, particularly for students whose parents had relatively less education. There was, however, no offsetting decrease in borrowing from other sources.

Breaking the total financial resources available to students down into repayable and non-repayable categories, however, there is little evidence that increased loan limits increased

borrowing, but evidence that increased grant limits did (Table 3).¹³ This is somewhat disconcerting. It may perhaps reflect that the grants in the later years typically come in the form of increased debt relief. Perhaps students do not correctly report their debt on graduation net of this debt relief. Nonetheless, it does lead to some concern that the results on enrolments reported in the next section may not be correctly attributable to grants rather than loans.

Importantly, though, there is no evidence that increases in student loan limits reduce borrowing from other sources under any specification (Table 2 and Table 3). Point estimates are almost precisely equal to zero in magnitude.

Tuition fee increases lead to large increases in debt from graduates who borrow from student loan programs, as well as increases in debt owing to other sources. Estimates are that a \$1000 increase in tuition fees increases borrowing by around \$850, for those who have ever borrowed from a government-run student loan program, with some \$200 of that increase coming from non-student loan program sources.

Overall, the results in this section – that higher student loan limits lead to increased student loan borrowing, and to no reduction in non-student loan borrowing – are consistent with findings of other studies (eg Finnie, 2001). If rising student loan limits had no effect on average loans, it would be unlikely that there could be any effect on overall enrolments. However, it is not itself sufficient to show that the increases were

¹³ In this case, I sum the loan and grant limits over the three years prior to graduation to arrive at a total borrowing limit for students undertaking a 3 year program.

effective policy. The loans may be taken out by inframarginal students, attracted by the relatively low cost of borrowing through the student loan program. It is therefore necessary to consider whether overall borrowing was increased.

Do higher loan limits increase enrolments?

Table 4 shows estimates of the effect of changes in student financial aid parameters on full-time university enrolments.¹⁴ In no specification do student loan limits have a positive effect on enrolments.

The estimates of the effect of a \$1000 increase in grants provided under student loan programs are all in a tight band around 0.9 to 1 percentage point. The inclusion of province-specific quadratic time trends does not substantially affect the estimates.

Tuition fees, on the other hand, are estimated to have either a slightly positive or an overall neutral effect on enrolments. This is almost the opposite of the results in Kane (1994), where financial aid was estimated to have little effect on enrolments, while fees were estimated to have large effects.

The estimated effect by parental education closely resembles the distribution of the value of student loans by family background, and the likely distribution of individuals receiving the maximum possible financial aid. Table 5 shows the results interacted by parental education. The largest estimated effects are for those students who are outside their

¹⁴ In these models, the key policy variables are the values that held in the year in which a student was reported enrolled. Results are similar when the variables are lagged to the year in which the student turned 18 or 19, corresponding to the approximate year of university entrance.

parents' home (the omitted category). For these students, a \$1000 increase in grants increases enrolment rates by 1.1 to 1.4 percentage points. These students are more likely to be at the maximum loan amount than students living with their parents, because of the higher calculated cost of living expenses for those living away from home, and are also therefore more likely to be receiving non-repayable assistance in most provinces. It is possible that this result may be due to an increase in the number of students choosing to live away from home following increases in student loans rather than an increase in the number of individuals already living away from home who decide to study. This is because any increased living costs associated with living away from home are largely covered by the needs assessment in the student loans program, until the increased costs move students over the loan limit. Increases in grants would therefore mean potentially larger subsidies to living away from home, and may encourage students to live independently.

If such a substitution were the main reason for the increase in enrolment rates of this group, however, we might expect to see declines in the overall enrolment rates of students living at home.¹⁵ This does not appear to be the case. For each other family background grouping, the estimated effect of the increases in grants is either positive (for those whose parents have high school or less) or not significantly different from zero (for the other two family background groups). The enrolment rates of students whose parents have high school or less are estimated to increase by 0.5 to 0.7 percentage points per

¹⁵ It is this selection effect that Cameron and Heckman (2001) discuss, and which makes it preferable to include all 18-23 year olds in the analysis, not simply those for whom parental background information can be obtained.

\$1000 increase in the grants, while the point estimate of the effect on those whose parents have a university degree is estimated to be 0.1 to 0.4 percentage points, and not significantly different from zero. The family incomes of students who have at least one parent with a university degree are on average considerably higher than the average families, making it less likely that students from these families would have been receiving the maximum available student loan in the first place. Further, evidence presented in Neill (forthcoming) shows that this group is unaffected by changes in the cost of a university degree. Thus, changes in student loan limits should not be expected to have a large impact on this group.¹⁶

Enrolments may also have been affected by other changes in post-secondary policies on the part of provincial governments. An additional \$1000 in spending per 18-24 year old (a 28 per cent increase compared with average spending) is estimated to increase enrolments, but the largest effect appears to be on individuals who are not living with their parents. The inclusion of other policy variables does not much alter the estimates of the effect of changes in student financial aid on enrolments.

Serial correlation does not appear to be a major concern in these models. Clustering either at the province level or at the Quebec vs rest-of-Canada level does not generate

¹⁶ Coelli (2005) finds that increases in tuition fees are generally not associated with a decline in the percentage of students living away from home, though there is some weak evidence that students from higher income families may move back home to economise on tuition fees. If true, this would suggest that the estimated effect of loans programs on students whose parents have a university degree is the most likely to be understated.

substantially larger standard errors. Regressions which restrict the sample to 18-20 year olds give almost identical results.¹⁷

The estimates of the effect of a \$1000 increase in grant aid are quite large relative to reliable estimates of the impact of tuition fees in Canada.¹⁸ Just under half of all students receive financial aid from student loan programs, and just under half of these are constrained by loan and grant limits. Thus, the 1 percentage point increase in enrolments likely represents a 2 to 4 percentage point increase in enrolments among the targeted population. This may reflect the fact that this grant funding is going to individuals who are more likely to be on the margin of the post-secondary education decision. The fact that overall increases in loan limits have almost no effect on enrolments, however, suggests that this may be more in response to the change in the effective price of university attendance, rather than to the relaxation of credit constraints.

7. Conclusion

This paper shows evidence that changes in financial aid programs can have important effects on university enrolments in Canada. A \$1000 increase in non-repayable assistance (grants) provided under the student loan program is estimated to increase enrolment rates by just over 1 percentage point. However, increases in the maximum amount of student loans on offer does not appear to have any effect, suggesting this is more related to a change in effective price rather than a relaxation of credit constraints.

¹⁷ Results available on request.

¹⁸ Coelli (2005) estimates that a \$1000 increase in university tuition fees reduces university enrolments of low income students by nearly 25 percentage points. This seems unreasonable, given the average enrolment rate of this group is under 20 per cent for much of the 1990s. His point estimates of the effect on the overall enrolment rate are of a decline of enrolments by around 5 percentage points per \$1000 increase, similar to the largest estimates in Neill (2006), and close to the estimates of tuition fee effects on enrolments in the US.

The estimated effects of the increase in grants by family background also accord well with the distribution of student loan recipients in the population. The largest effect is on the enrolments of youth living independently of their parents. This group is more likely than most to be receiving the maximum student loan, given they have higher assessed living expenses. Students whose parents have relatively low education levels are also affected to a significant extent, while those whose parents have relatively high education levels (and are unlikely because of income tests to be receiving loans at all) are not affected at all.

There is a possibility that the increases in grants may have enabled some individuals who would have attended university in any case to move out of the parental home. This could explain the large estimated effect on the enrolment rate of students living away from home. However, to the extent that this is an important effect, it would mean that the estimated effects on enrolment rates of students living at home are understated. The estimated effects on enrolment rates of youths by parental education levels can therefore be considered the minimum effect for each of those categories.

Some of the results described here do seem odd, however – in particular, the result that increases in grant aid appear to be associated with an increase student loan debt. Further exploration of the reasons for this, using alternative data sets, is warranted.

References

- Besley, T., and A. Case (2000), "Unnatural Experiments? Estimating the Incidence of Endogenous Policies," **Economic Journal**, 110(467): F672-94
- Cameron, S. and J. Heckman (2001), "The dynamics of educational attainment for blacks, Hispanics and whites," **Journal of Political Economy**, 109(3): 455-99
- Cameron, S. and C. Taber (2004), "Estimation of educational borrowing constraints using returns to schooling," **Journal of Political Economy**, 112(1): 132-82
- Card, D. (1994), "The Causal Effect of Education on Earnings", in O.Ashenfelter and D.Card (eds) **Handbook of Labor Economics**, Volume 3A, Elsevier Science, pp.1802-1860
- Carneiro, P. and J. Heckman (2002), "The evidence on credit constraints in post-secondary schooling," **The Economic Journal**, 112(October): 705-734
- Coelli, M. (2005), "Tuition, Rationing and Equality of Access to Post-Secondary Education," manuscript, University of Melbourne: Australia
- Cornwell, C.M., D.B. Mustard, and D. Sridhar (2006), "The Enrollment Effects of Merit-based Financial Aid: Evidence from Georgia's HOPE Scholarship," **Journal of Labor Economics**, 24(4): 761-786
- Dynarski, S. (2002a), "The Behavioural and Distributional Implications of Aid for College," **American Economic Review**, 92(2): 279-85
- Dynarski, S. (2002b), "Loans, Liquidity and Schooling Decisions". Manuscript, Harvard University
- Dynarski, S. (2000), "Hope for Whom? Financial aid for the middle class and its impact on college attendance," **National Tax Journal**, 53(3): 629-661
- Finnie, Ross (2002), "Measuring the Load, Easing the Burden. Canada's Student Loan Programs and the Revitalization of Canadian Postsecondary Education", **C.D. Howe Institute Commentary** No. 155. C.D.Howe Institute: Toronto
- Finnie, Ross and Saul Schwartz (1996), **Student Loans in Canada: Past, Present and Future**. Observation 42. C.D. Howe Institute: Toronto.
- Heller, D. (1997), "Student Price Response in Higher Education: An Update to Leslie and Brinkman," **Journal of Higher Education**, 68(6): 624-659
- HRDC (various years), **Canada Student Loans Program Annual Report**. HRDC, Government of Canada: Ottawa.

HRDC (1997), **Evaluation of the Canada Student Loans Program, Final Report.** Evaluation and Data Development, Strategic Policy, HRDC: Ottawa.

Junor, S. and A. Usher (2004), **The Price of Knowledge: Access and Student Finance in Canada.** Canadian Millennium Scholarship Foundation: Toronto

Kane, T. (2003), "A Quasi-experimental estimate of the impact of financial aid on college-going," **NBER Working Paper**, No. 9703

Kane, T. (1999), **The Price of Admission: Rethinking how Americans Pay for College.** Brookings Institution: Washington D.C.

Kane, T. (1994), "College Entry by Blacks since 1970: The Role of College Costs, Family Background, and the Returns to Education," **Journal of Political Economy**, 102(5): 878-911

Keane, M. (2002), "Financial Aid, Borrowing Constraints and College Attendance: Evidence from Structural Estimates," **American Economic Review**, 92(2): 293-297

Ministère de l'Éducation, Québec (various years), **Statistique sur l'Aide Financière Aux Études.** Gouvernement du Québec: Québec

Usher, A. (2005), **Much ado about a very small idea: Straight talk on income-contingent loans.** Educational Policy Institute: Toronto, ON

Appendix. Data Sources and Description

LFS - aggregate

| | |
|--------------------|--|
| Enrolment rate | The percentage of 17-24 year olds enrolled in university (or college) full time (or part time), in percentage terms |
| Unemployment rates | Unemployment rate of 25-29 year old high school graduates (or those with 11-13 years of high school prior to 1990) and 25-54 year old university graduates respectively, by province and gender, from LFS public use files |

LFS - individual

| | |
|--------------------------------|---|
| Female | Dummy variable, equal to one for female respondent |
| Age | Age of respondent in years |
| Full time university | Dummy variables equal to one if student is enrolled in university full time (in the public use files, schooln=4) |
| Number of unemployed in family | Number of unemployed people in the respondent's family, not including the respondent (efamunem-I(respondent unemployed)) |
| Working | Dummy variable equal to one if an individual is currently employed |
| Hours per week | Usual hours worked per week, reported in reference week |
| Parental education | Highest level of education achieved by either parent, grouped into: high school or less, some post-secondary, university, or unknown. |

CANSIM II

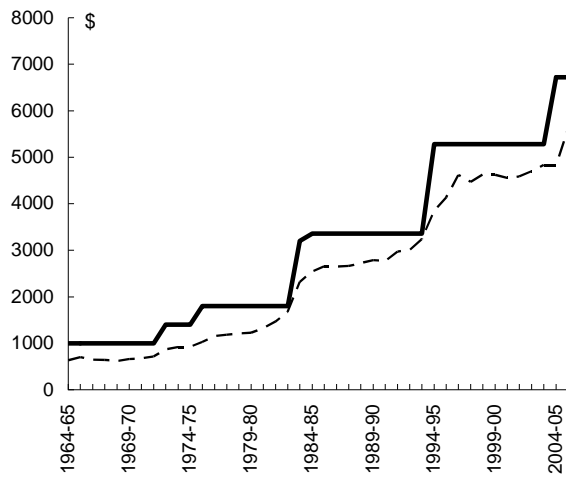
| | |
|--------------------------------------|--|
| Provincial GDP per capita, 1981-2002 | V15855454, V15855508, V15855562, V15855616, V15855670, V15855724, V15855778, V15855832, V15855886, V15855940 |
| Population | Population estimates are by individual age and sex from CANSIM II. Series labels for Newfoundland are: V467044, V467047, V467050, V467056, V467059, V46706, V467065, V467071, V467045, V467048, V467051, V467057, V467060, V467063, V467066, V467072 |
| Provincial CPI | V737638, V737773, V737907, V738042, V738177, V738313, V738449, V738585, V738721, V738856 |

OTHER

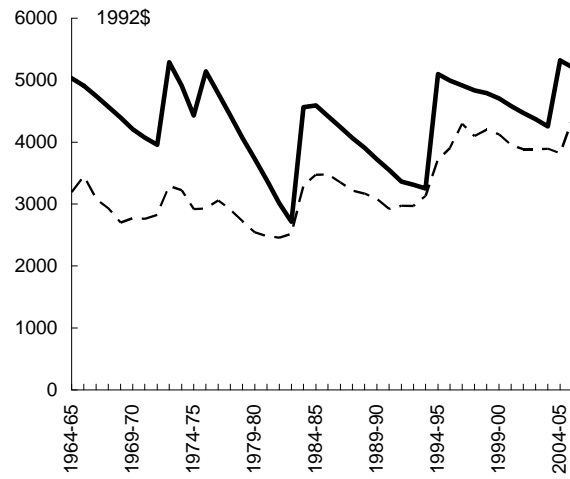
| | |
|---------------------------------------|--|
| University tuition fees, | Undergraduate arts and sciences tuition fee plus ancillary fees by university from Statistics Canada, <i>Tuition Fees and Living Accommodations (TLAC)</i> , various years, weighted by individual institutions' undergraduate enrolment levels, from University Student Information System |
| Minimum wage | The minimum wage applying in July, from the Human Resources Development Canada website, deflated using provincial CPI: http://www110.hrdc-drhc.gc.ca/psait_spila/lmnec_eslc/eslc/salaire_minwage/index.cfm/doc/English . |
| Maximum student loan and grant limits | CSL Annual Reports and provincial student loan annual reports and regulations, various years |
| Average student loan | CSL Annual Reports and AFE Statistics, various years |

Figure 1 CSL federal loan limits and average amount borrowed, 1964/65 – 2004/05

a) Nominal



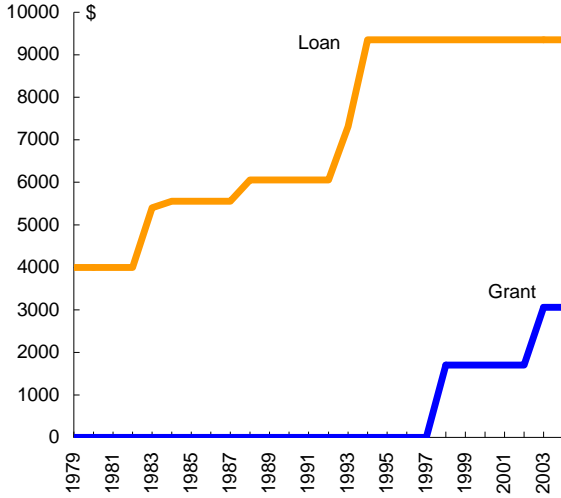
b) Real (1992\$)



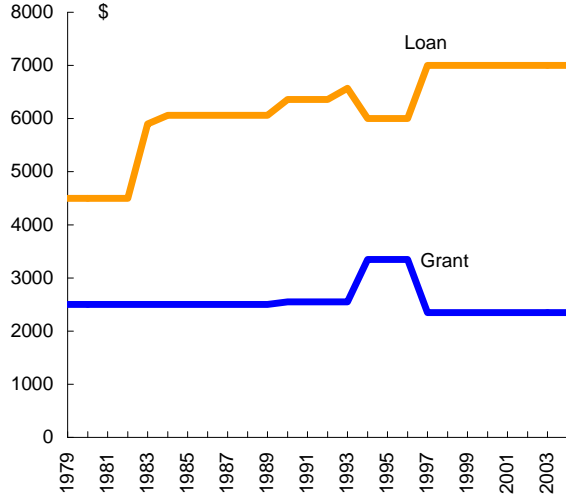
Source: CSL Annual Reports, various years.

Figure 2. Maximum amount of repayable vs non-repayable assistance from combined provincial and federal student loan programs in Canada

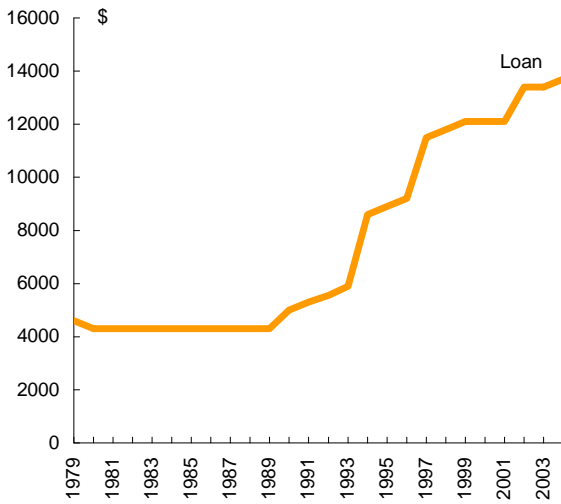
a. New Brunswick



b. Ontario



c. Alberta



d. Quebec

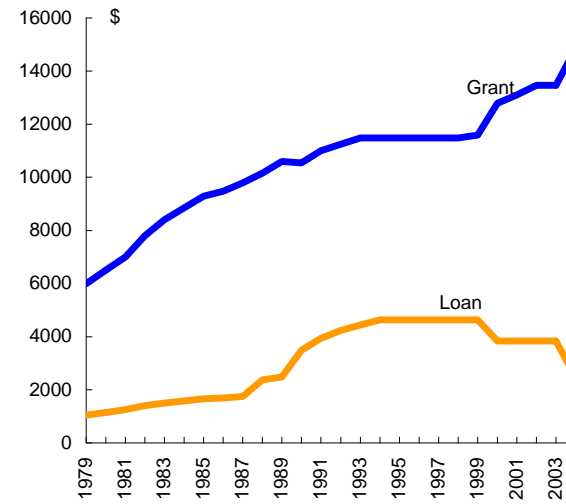
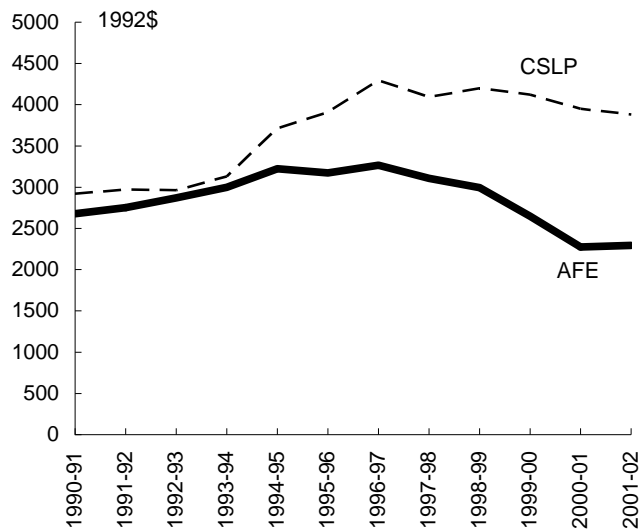


Figure 3 Average loans under AFE vs CSLP, constant dollars, 1990/91 – 2001/02



Source: CSLP and AFE annual reports, various years

Table 1. Effect of increases in CSL limits on average dollar value of Canada Student Loans, 1979-2002

| | a | b | c | d | e | f |
|--------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Maximum CSL amount | 0.396 (0.0369)** | 0.286 (0.0302)** | 0.289 (0.0306)** | 0.281 (0.0356)** | 0.285 (0.0328)** | 0.245 (0.0321)** |
| Tuition fee | | | | 0.318 (0.0675)** | 0.013 (0.1558) | 0.892 (0.3538)* |
| Year | | y | y | | y | y |
| Year^2 | | | y | | | y |
| N | 23 | 23 | 23 | 23 | 23 | 23 |
| R2 | 0.8456 | 0.9411 | 0.9432 | 0.927 | 0.9412 | 0.958 |

Robust standard errors in parentheses

* significant at 5%; ** significant at 1%

Table 2. Effect of increases in CSL limits on student debt at graduation

| | Govt borrowing | Other borrowing | Total borrowing |
|---------------------------|-----------------------|---------------------|-----------------------|
| First increase in CSL | 751.76 (272.4)** | -138.63 (136.3) | 732.55 (311.6)* |
| * Father has some PSE | -13.67 (304.8) | -34.37 (154.5) | -120.83 (352.9) |
| * Father has a uni degree | 1319.42 (273.9)** | -72.34 (138.1) | 1307.98 (317.5)** |
| Second increase in CSL | 1711.61 (392.6)** | 105.54 (202.8) | 1933.24 (463.8)** |
| * Father has some PSE | -1902.14 (548.4)** | 518.2 (287.6) | -1148.19 (655.1) |
| * Father has a uni degree | -494.82 (520.3) | 214.26 (273.4) | -173.37 (624.7) |
| Fees | 609.58 (63.6)** | 236.2 (33.2)** | 805.35 (75.3)** |
| * Father has some PSE | 146.38 (61.4)* | 7.87 (31.8) | 163.18 (72.3)* |
| * Father has a uni degree | -156.46 (58.1)** | -57.53 (30.1) | -229.53 (68.5)** |
| Father has some PSE | -1190.77 (327.7)** | -136.88 (167.2) | -1317.31 (380.6)** |
| Father has a uni degree | -871.61 (315.9)** | 711.01 (161.3)** | -109.36 (367.4) |
| Mother has some PSE | -211.26 (117.3) | 118.61 (59.5)* | -140.62 (136.0) |
| Mother has a uni degree | -863.03 (136.0)** | 126.11 (68.7) | -734.89 (157.5)** |
| Female | 871.54 (88.6)** | -130.78 (44.8)** | 737.65 (102.4)** |
| Graduate at age 21 | 1527.66 (164.5)** | 177.05 (83.1)* | 1651.11 (189.9)** |
| Graduate at age 22 | 2571.45 (154.9)** | 343.29 (78.3)** | 2816.5 (178.8)** |
| Graduate at age 23 | 3413.26 (156.2)** | 518.66 (78.9)** | 3844.23 (180.2)** |
| Graduate at age 24 | 4579.76 (165.7)** | 720.04 (83.7)** | 5172.27 (191.0)** |
| Province FE? | Y | Y | Y |
| Year FE? | Y | Y | Y |
| Observations | 24530 | 24528 | 23547 |
| R-squared | 0.1877 | 0.0238 | 0.165 |

Robust standard errors in parentheses, clustered at the province of residence level. Note: tuition fees are the sum of total fees in the province of institution in the three years prior to graduation. The first increase in student loan limits was in 1984, and the second in 1994. Sample includes all college and university students graduating between the ages of 20 and 24 who had at some point borrowed through a government student loan program.

* significant at 5%; ** significant at 1%

Table 3. Effect of increases in CSL limits on student debt at graduation

| Govt | Loans and grants | | | Total funds only | | |
|--------------------------------|------------------|-----------------|-----------------|------------------|-----------------|-----------------|
| | Govt borrowing | Other borrowing | Total borrowing | Govt borrowing | Other borrowing | Total borrowing |
| Total funds | | | | -104.65 | 2.05 | -98.13 |
| | | | | (12.83)** | (6.5) | (15.0)** |
| Funds*Parent/s have PSE | | | | 11.23 | -2.82 | 12.05 |
| | | | | (13.2) | (6.7) | (15.3) |
| Funds*Parent/s have uni degree | | | | -28.64 | 6.55 | -21.35 |
| | | | | (12.19)* | (6.2) | (14.1) |
| Loan limit | -205.34 | -6.99 | -204.12 | | | |
| | (17.19)** | (8.7) | (19.87)** | | | |
| Loan*Parent/s have PSE | 54.04 | -0.34 | 63.13 | | | |
| | (33.3) | (16.6) | (38.4) | | | |
| Loan*Parent/s have uni degree | 75.17 | -6.74 | 60.86 | | | |
| | (29.74)* | (14.7) | (34.3) | | | |
| Grant limit | 196.06 | 47.02 | 246.33 | | | |
| | (35.4)** | (17.7)** | (41.26)** | | | |
| Grant*Parent/s have PSE | 32.49 | -0.55 | 36.27 | | | |
| | (14.73)* | (7.4) | (17.02)* | | | |
| Grant*Parent/s have uni degree | 2.71 | 5.28 | 6.1 | | | |
| | (13.4) | (6.8) | (15.5) | | | |
| Fees | 677.25 | 210.78 | 860.66 | 663.91 | 212.68 | 840.65 |
| | (59.7)** | (31.1)** | (70.7)** | (59.6)** | (31.0)** | (70.6)** |
| Fees*Parent/s have PSE | 68.4 | 27.04 | 116.61 | 76.75 | 25.21 | 129.09 |
| | (55.5) | (28.6) | (65.4) | (51.4) | (26.6) | (60.6)* |
| Fees*Parent/s have uni degree | -193.53 | -34.22 | -224.82 | -141.04 | -43.6 | -183.32 |
| | (52.12)** | (26.9) | (61.5)** | (49.5)** | (25.6) | (58.4)** |
| Father has some PSE' | -2313.87 | -213.32 | -2832.94 | -1291.15 | -128.96 | -1644.21 |
| | (825.8)** | (416.9) | (953.4)** | (645.5)* | (327.2) | (747.7)* |
| Father has a uni degree | -1357.84 | 608.4 | -599.03 | 632.79 | 393.04 | 1004.98 |
| | (759.6) | (381.6) | (875.9) | (590.4) | (299.5) | (685.4) |
| Mother has some PSE | -193.93 | 117.23 | -129.82 | -220.14 | 114.43 | -158.8 |
| | (117.1) | (59.6)* | (135.7) | (117.2) | (59.5) | (135.9) |
| Mother has a uni degree | -867.1 | 132.42 | -735.75 | -864.19 | 128.64 | -737.02 |
| | (135.7)** | (68.8) | (157.2)** | (135.9)** | (68.7) | (157.4)** |
| Female | 880.25 | -128.44 | 750.03 | 868.49 | -130.29 | 738.07 |
| | (88.4)** | (44.8)** | (102.2)** | (88.5)** | (44.8)** | (102.4)** |
| Graduate at age 21 | 1565.61 | 178.61 | 1686.13 | 1552.82 | 180.06 | 1673.47 |
| | (164.1)** | (83.2)* | (189.5)** | (164.4)** | (83.2)* | (189.8)** |
| Graduate at age 22 | 2590.21 | 342.19 | 2833.27 | 2566.73 | 342.02 | 2807.83 |
| | (154.6)** | (78.4)** | (178.5)** | (154.9)** | (78.4)** | (178.8)** |
| Graduate at age 23 | 3402.64 | 518.55 | 3835.63 | 3403.76 | 521.66 | 3841.02 |
| | (155.8)** | (79.0)** | (179.8)** | (156.1)** | (79.0)** | (180.1)** |
| Graduate at age 24 | 4610.72 | 721.2 | 5203.39 | 4599.51 | 719.75 | 5189.78 |
| | (165.3)** | (83.8)** | (190.7)** | (165.6)** | (83.8)** | (191.0)** |
| Province FE? | Y | Y | Y | Y | Y | Y |
| Year FE? | Y | Y | Y | Y | Y | Y |
| Observations | 24530 | 24528 | 23547 | 24530 | 24528 | 23547 |
| R-squared | 0.1917 | 0.0233 | 0.1684 | 0.1884 | 0.023 | 0.1653 |

Robust standard errors in parentheses, clustered at the province of residence level. Note: tuition fees are the sum of total fees in the province of institution in the three years prior to graduation. The first increase in student loan limits was in 1984, and the second in 1994. Sample includes all college and university students graduating between the ages of 20 and 24 who had at some point borrowed through a government student loan program.

* significant at 5%; ** significant at 1%

Table 4. Estimates of the effect of student loan parameters on university enrolment rates of 18-23 year olds (1979-2005)

| | Basic | Incl. spending | Incl. trends |
|------------------------------|-------------------------|------------------------|-------------------------|
| Loan limit | 0 (0.0011) | -0.002 (0.0012) | 0.001 (0.0019) |
| Grant limit | 0.011 (0.0021)** | 0.009 (0.0022)** | 0.011 (0.0032)** |
| Tuition fee | 0.008 (0.00372)* | 0.002 (0.0041) | -0.002 (0.0049) |
| Spending on PSE | | 0.023 (0.00529)** | |
| Age 19 | 0.12424 (0.01033)** | 0.12971 (0.01089)** | 0.12428 (0.01035)** |
| Age 20 | 0.15896 (0.01231)** | 0.16705 (0.01268)** | 0.15899 (0.01234)** |
| Age 21 | 0.16473 (0.01303)** | 0.17143 (0.01371)** | 0.1647 (0.01306)** |
| Age 22 | 0.13457 (0.01284)** | 0.13872 (0.01333)** | 0.13462 (0.01287)** |
| Age 23 | 0.07921 (0.01162)** | 0.08677 (0.01207)** | 0.0792 (0.01164)** |
| Someone in family unemployed | -0.05317 (0.00276)** | -0.0534 (0.00273)** | -0.05307 (0.00274)** |
| Parent/s have HS or less | 0.03984 (0.00464)** | 0.04427 (0.00461)** | 0.03985 (0.00466)** |
| Parent/s have some PSE | 0.12543 (0.00704)** | 0.13527 (0.00720)** | 0.12537 (0.00705)** |
| Parent/s have a BA | 0.36277 (0.00810)** | 0.37294 (0.00774)** | 0.36255 (0.00812)** |
| Min wage | 0.00479 (0.0034) | 0.00042 (0.0032) | 0.00366 (0.0041) |
| UR, HS grads | 0.10879 (0.04400)* | 0.05665 (0.0447) | 0.00822 (0.0401) |
| Ur, uni grads | 0.22873 (0.1209) | 0.119 (0.1193) | 0.10477 (0.1275) |
| Observations | 329157 | 302534 | 329157 |

All specifications include a full set of male and female-specific year and province fixed effects not reported here for brevity. Robust standard errors, adjusted for clustering at the province-year level, in parentheses.

* significant at 5%; ** significant at 1%

Table 5. Estimates of the effect of student loan and grant maxima on university enrolment rates of 18-23 year olds, by parental education level

| | Basic | | Including spending | |
|-----------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | No trends | Including trends | No trends | Including trends |
| Loan limit | -0.001 (0.0020) | 0 (0.0019) | -0.001 (0.0028) | 0.001 (0.0027) |
| Loan*Parent/s have HS or less | -0.001 (0.0030) | -0.003 (0.0027) | -0.001 (0.0030) | -0.003 (0.0027) |
| Loan*Parent/s have some PSE | 0.001 (0.0035) | -0.002 (0.0033) | 0.001 (0.0035) | -0.002 (0.0033) |
| Loan*Parent/s have uni degree | -0.004 (0.0027) | -0.007 (0.00244)** | -0.004 (0.0027) | -0.007 (0.00244)** |
| Grant limit | 0.012 (0.00243)** | 0.011 (0.00251)** | 0.014 (0.00446)** | 0.013 (0.00456)** |
| Grant*Parent/s have HS or less | -0.007 (0.00124)** | -0.006 (0.00119)** | -0.008 (0.00124)** | -0.006 (0.00119)** |
| Grant*Parent/s have some PSE | -0.009 (0.00157)** | -0.008 (0.00151)** | -0.009 (0.00159)** | -0.007 (0.00152)** |
| Grant*Parent/s have uni degree | -0.011 (0.00124)** | -0.009 (0.00118)** | -0.011 (0.00125)** | -0.009 (0.00119)** |
| Tuition fee | 0.023 (0.00486)** | 0.007 (0.0056) | 0.029 (0.00774)** | 0.012 (0.0084) |
| Fee*Parent/s have HS or less | -0.023 (0.00365)** | -0.002 (0.0056) | -0.023 (0.00365)** | -0.003 (0.0056) |
| Fee*Parent/s have some PSE | -0.043 (0.00468)** | -0.018 (0.00779)* | -0.044 (0.00476)** | -0.017 (0.00781)* |
| Fee*Parent/s have uni degree | -0.03 (0.00408)** | -0.002 (0.0066) | -0.03 (0.00411)** | -0.001 (0.0067) |
| Spending on PSE | 0.024 (0.00530)** | 0.044 (0.00676)** | 0.007 (0.0091) | 0.027 (0.01006)** |
| Spending*Parent/s have HS or less | | | -0.026 (0.00626)** | -0.026 (0.00628)** |
| Spending*Parent/s have some PSE | | | -0.033 (0.00881)** | -0.034 (0.00885)** |
| Spending*Parent/s have uni degree | | | -0.038 (0.00802)** | -0.039 (0.00802)** |
| Observations | 302534 | 302534 | 302534 | 302534 |

All specifications include a full set of male and female-specific year and province fixed effects.

Robust standard errors, adjusted for clustering at the province-year level, in parentheses.

* significant at 5%; ** significant at 1%