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Is Debt Relief as Good as Liquidity? The Impact of Prospective Student Debt on Post-Secondary Attendance among Low-Income Youth

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Abstract

In this study, I estimate the impact of offering two large non-refundable grants to low-income Canadian youth on postsecondary attendance. The grants had two interesting features. First, they were clawed back from loans, thus reducing costs but providing no additional liquidity. Second, the grants were only available to students if parental income was below a fixed threshold. This sharp discontinuity in the offer of the grants provides for near ideal conditions to study their causal impact, closely mimicking random assignment. Despite the large size of the grants (up to $6,000 or $7,000), the fact that students were automatically assessed for the grants with their regular student loans application, and evidence that most Canadian youth are at least aware of non-refundable study grant opportunities, I find that the grants had no impact on postsecondary or university attendance. Some policy implications are discussed.

JEL: I22, I23

Keywords: Access to postsecondary, student debt

Executive Summary

Previous research suggests that student financial aid generally reduces liquidity constraints, and consequently, helps improve access to postsecondary studies. However, rising student debt load is also a concern. Student debt may have an impact on post-graduate outcomes (e.g. job quality, life outcomes), while prospective student debt may impact the decision to enroll in postsecondary education (PSE) in the first place since it affects costs. This study is devoted to analyzing the latter of these two hypotheses by studying the introduction of two large non-refundable grants made available to low-income youth in Canada (The Canada Access Grants for Low-Income youth and the Millennium Access Bursaries). An interesting aspect of these grants is that they help reduce debt, but they have no impact on liquidity constraints since they are simply clawed back from loans. Furthermore, there is a sharp discontinuity in the eligibility criteria, based on parental income. These two features provide near ideal conditions for studying the causal impact of prospective debt on PSE attendance, while holding liquidity constant. To date, no study in the world has looked at prospective debt load and PSE attendance under these circumstances.

Using a large longitudinal administrative data set of Canadian youth that is linked to their parents, I find no evidence that the reduction in prospective debt offered through the grants impacted PSE or university attendance. This is despite the fact that the grants were large (up to $6,000 or $7,000), students were automatically assessed for the grants with their regular student loans application, and most youth were at least aware of non-refundable grant opportunities. However, it is possible that students may not have been well informed about the mechanics of the grants. Although they had to apply and qualify for a Canada Student Loan (CSL) to obtain a grant, they did not need to take up the loan. Unfortunately, no evidence exists to support this hypothesis.

Important policy considerations are worth noting from these findings. First, the primary purpose of student aid is to raise access to PSE. Based on the results of this study and others, liquidity may be a more important factor in this decision than prospective debt. The windfall economic rents collected by students who would have attended in the absence of the grants could perhaps have been better directed towards reducing liquidity constraints for those facing them. Although Canadian students generally have all of their financial needs met with regards to attending PSE through government aid, this is not necessarily the case for all groups. In particular, students who are raised in remote areas must pay additional costs to attend university, and the ability of student loans to cover those costs is constrained by loan limits, which are no higher for these students.

Another policy consideration is the level of debt accumulated by PSE students. To this end, the grants no doubt succeeded as they represent an automatic reduction in debt. However, very little evidence exists to support the notion that debt matters in terms of post-graduate outcomes. More work is needed in this area, particularly with respect to identifiying exogenous variation in student debt. The grants studied here may serve this purpose quite well in the future.

Introduction

Previous research suggests that student financial aid generally helps reduce liquidity constraints, and consequently, helps improve access to postsecondary studies. However, rising student debt load is also a concern. Student debt may have an impact on post-graduate outcomes (e.g. job quality, life outcomes), while prospective student debt may impact the decision to enroll in postsecondary education (PSE) in the first place since it affects costs. This study is devoted to analyzing the latter of these two hypotheses by studying the introduction of two large non-refundable grants made available to low-income youth in Canada (The Canada Access Grants for Low-Income youth and the Millennium Access Bursaries). An interesting aspect of these grants is that they help reduce debt, but they have no impact on liquidity constraints since they are simply clawed back from loans. Furthermore, there is a sharp discontinuity in the eligibility criteria, based on parental income. These two features provide near ideal conditions for studying the causal impact of prospective debt on PSE attendance, while holding liquidity constraints constant. To date, no study in the world has looked at prospective debt load and PSE attendance under these circumstances.

Using a large longitudinal administrative data set of Canadian youth that is linked to their parents, I find no evidence that the reduction in prospective debt offered through the grants impacted PSE or university attendance. This is despite the fact that the grants were large (up to $6,000 or $7,000), students were automatically assessed for the grants with their regular student loans application, and most appeared to have been at least aware of non-refundable grant opportunities in general. However, it is possible that students may not have been well informed about the mechanics of the grants. Although they had to apply and qualify for a

Canada Student Loan (CSL) to obtain a grant, they did not need to take up the loan. Unfortunately, no evidence exists to support this hypothesis.

These findings, coupled with previous research on the impact of relaxing liquidity constraints, are consistent with the notion that PSE attendance is more responsive to short term liquidity constraints than to the long-term costs of attending PSE. The results are also consistent with the grants providing sizeable economic rents in the form of debt relief among students who would have attended PSE without the grants. The policy implication is that the grants could have been better spent on providing more aid for liquidity-constrained youth.

In the next section, I review the relevant literature on the impact of liquidity constraints and prospective debt on PSE attendance. Next, I summarize the Canadian postsecondary education system, with special attention paid to its fee structure and financial aid system. The remainder of the study is devoted to the empirical analysis. To this end, I begin by discussing the identification strategy and data in the methods section. The empirical results are presented in the next section. Finally, the study is summarized and the findings put into perspective in the conclusion.

Literature review

The main purpose of student financial aid is to reduce liquidity constraints for students contemplating attending postsecondary schooling. The Canadian and US student financial aid systems generally covers all or most of the cost of attending PSE in the form of grants and

loans.[1] Furthermore, most studies have found that reducing liquidity constraints have been effective in raising attendance. The early studies were reviewed by Leslie and Brinkman (1988). The consensus finding from these studies is that a $1,000 decrease in the net price of college (fees less non-refundable aid) is associated with an increase in postsecondary enrolment of 3 to 5 percentage points in the US.

The limitation of many of these early cross-sectional studies is that they are largely based on observed correlations. Students with similar characteristics are more likely to attend postsecondary if they receive aid. However, as Dynarski (2002) points out, many characteristics are unobserved, and this may have severely limited the credibility of the early evidence presented in Leslie and Brinkman (1988). To better understand the relationship between aid and attendance, Dynarski suggests that researchers should focus on identifying random variation in the price of postsecondary.

This has been the general direction of the literature over the past couple of decades. For example, many of the studies focus on temporal variation in student aid derived from natural experiments. Changes in student aid policies provide such variation, and the US is not short

[1] Frenette (2009a) provides direct empirical evidence that supports this claim. The study shows that only 10% of high school graduates from Canada claimed to not have attended university (despite wanting to do so) due to their financial situation (including a lack of credit). Studies in the US also come to the same general conclusion using different methods. For example, Carneiro and Heckman (2002) found that, at most, 8% of youth are credit constrained in terms of PSE access. They identified credit constraints by using a residual approach: they suggest that the unexplained portion of the gap in attendance rates between high- and low-income youth is due to credit constraints, under the assumption that high-income youth (those in the top quartile) are not credit constrained. Belley and Lochner (2007) update this work and find that the proportion doubled in recent years (to about 17%).

on this front. The majority of aid provided to American students comes from the Pell Grants and the Stafford Loans. The Pell Grants were initially offered in 1974, when they were named the Basic Educational Opportunity Grants. Pell Grants are needs-based, and form the majority of federal grants for students in the US. Aside from grants, US students could also secure federally-sponsored loans. In 1965, the Guaranteed Student Loan Program was created, which was later renamed the Stafford Loan Program in 1987.

Kane (1995) noted that Pell Grants had no impact on attendance when they were introduced in the 1970s, a period when real tuition was relatively stable. The resulting supply constraints may have prevented enrolment from rising despite the increased aid. This view was supported by McPherson and Shapiro (1991), who looked at estimated the impact of the grants in the 1980s—a period when tuition fees rose—and found that a $1,000 increase in the Pell Grant was associated with a 6.8 percentage point increase in the enrolment of low-income students.

An alternative view was presented by Dynarski and Scott-Clayton (2008), who argued that the complexity in the system may have discouraged students to apply. They contrast the Pell Grant system with the relatively simpler Georgia Hope Scholarship and similar programs, noting that research has consistently pointed to significant effects in the latter, but not the former.

Arguably, the studies related to the Pell Grant system were not able to implement a compelling identification strategy. This is because the system was introduced in 1974 and was targeted at low-income youth. National level changes in enrolment rates pre- and post-treatment by income class is hardly a desirable research design.

In contrast, the Georgia Hope Scholarship (GHS) and similar programs did offer more promising avenues of research. Dynarski (2000) examined the GHS, which was a merit-based aid package offered to college students in the US state of Georgia beginning in 1993. Students who obtained a B average in high school were eligible for the grant. Specifically, eligible students who resided in Georgia could attend any of Georgia's state colleges for free.

Dynarski (2000) finds that a $1,000 increase in student aid is associated with a 3.7 to 4.2 percentage point increase in enrolment compared to nearby 'control' states. However, since merit is based on grades, and grades tend to rise with parental affluence, the gap in enrolment between high- and low-income students rose following the GHS.

In Dynarski (2003), the same author adopts a very different identification strategy. Social Security is a monthly benefit available to elderly Americans. Prior to 1965, benefits were also allocated to children of deceased, disabled, or retired Social Security beneficiaries as long as they were in school full-time and less than 18 years old. Between 1965 and 1982, the benefits to children were extended to college or university age children. Specifically, 18 to 22 year-old children of deceased, disabled, or retired Social Security beneficiaries received monthly payments if they were enrolled in school full-time (most students were enrolled in postsecondary schooling at that age). The average annual payment in 1980 was $6,700 (in 2000 US dollars). In 1982, the extension beyond age 18 was terminated. Using a differences-in-differences approach with the National Longitudinal Survey of Youth (NLSY), and a proxy for Social Security beneficiaries (a deceased father), Dynarski (2003) finds that the elimination of the extended benefits led to a decline in postsecondary attendance. Specifically, a $1,000 decrease in benefits (a form of aid since it is tied to education) led to a 3.6 percentage point decline in enrolment.

Around the same time, van der Klaauw (2002) exploited discontinuities in financial aid rules at one US East Coast college. Using administrative data on students who applied to the college, he finds that aid increases enrolment. While the identification approach in this study—a regression discontinuity design—is very strong, it does not address the relationship between aid and enrolment in general; rather, it looks at aid in the form of helping a specific college compete for students.

Some recent reforms in Europe provide the groundwork for compelling research in the area. Baumgartner and Steiner (2006) use the German Socio-Economic Panel (GSOEP) to examine a German reform in student aid in 2001. Using a differences-in-differences approach (pre-/post-reform for low-/high- income students), the authors find no statistically significant relationship between aid and enrolment. However, unlike the US system, the German postsecondary system was well-funded to begin with: loans and non-refundable grants covering all costs were already available to students in need.

A similar reform in Denmark in 1988 was studied by Nielsen, Sørensen, and Taber (2010). Using a longitudinal register of high school graduates from the classes of 1985 to 1990, they find that a $1,000 increase in aid is associated with a 1.35 percentage point increase in college enrolment. Although the effect is significant (in a statistical sense), it is somewhat smaller than the US findings. Once again, this could be due to the funding in place in Denmark prior to the 1988 reform. In fact, tuition was already free in that country.

In Canada, I could only locate two studies that assess the impact of additional aid on attendance. The first is by Neill (2008), who adopts an empirical strategy that largely exploits the increase in the loan and grant limits in the Canada Student Loans Program in the mid-

1990s to study their impact on university attendance among 18 to 23 year olds with the Labour Force Survey (LFS). She uses students in Québec as a comparison group since they apply for aid through a separate program (Aide financière aux etude - AFE), which gradually adjusts its aid limits over time.

Although the study differentiates between variation in loan and grant limit, it notes that increases in loan limits were usually associated with an increase in the amount of the grant received during the period of study since most grants have generally been clawed-back from loans in recent years; however, grants awarded were not available in the data. What this means in practical terms is that the variation in loan limits exploited in the study actually referred in large part to increases in non-repayable aid. More liquidity was offered, but it is largely non-repayable liquidity. The study found that increasing the loan limit (non-repayable grants awarded, effectively) had no impact on university attendance. However, a $1,000 increase in the grant limit was associated with a one percentage point increase in overall enrolment.

These estimates are lower than what has typically been found in the US. One possible reason is that changing the loan limit is only expected to affect those with unmet needs since the amount of loans will not change for those whose needs are fully met. Second, the study could not identify students from low-income families, the group that may be most affected by increased aid. Finally, the results may be also be lower than expected because of the inclusion of older students in the analysis, a group who may be less sensitive to enrolment decisions. Although Neill found similar results when the analysis was limited to 18 to 20 year olds, a 20 year old may have already decided to pursue college or work, as opposed to attend university.

Furthermore, for the time period covered by the study, both Ontario and Québec students generally did not begin university until the year they became 19.

A second Canadian study (Neill and Kapsalis, 2010) takes advantage of longitudinal administrative data to address some of the challenges faced in Neill's earlier study. Specifically, the authors use the Longitudinal Administrative Databank (LAD) and the Needs Assessment Records (NARS) to identify parental income and the amount of loans that youth are eligible to receive. They find that a $1,000 increase in loans that students are estimated to be eligible to receive is associated with a 0.85 of a percentage increase in enrolment among 18 to 21 year-old women from low-income families. For men, no associated is found.

Given the superior data, these results are more convincing than those in Neill (2008). However, they still stand in stark contrast from US findings. Furthermore, they may not be entirely credible for at least three reasons. First, as in Neill (2008), the focus on older students may dilute whatever impact may exist. Second, the parental income threshold for defining low-income families is somewhat higher than in most studies ($60,000). In fact, about 40% of youth in the sample are classified as low-income. Finally, the aid that youth are eligible to receive had to be estimated from the NARS data, and then brought over to the LAD, using predictors that are common to both data sets. This is expected to generate random measurement error. Since the aid variable is used as an independent variable in the university attendance model, we expect this random measurement error to generate attenuation bias (i.e. bias towards zero). Given all of these reasons, it is thus not entirely surprising that the study only finds small (and inconsistent) effects.

A second concern of the student financial aid system is the debt load that students carry with them upon graduation. This is especially so in Canada given that tuition fees have been increasing substantially over the last two decades. Between 1990 and 2006, real tuition fees have increased by 147%, while real debt load upon graduation has increased by 107%.[2]

Does prospective debt influence attendance, given that students generally have enough money to attend university or college? Human capital theory would suggest so, as a reduction in prospective debt represents a decline the costs of attending postsecondary. Surprisingly, there are only three relevant empirical studies. The studies have all surfaced in recent years. The first is from Germany (Baumgartner and Steiner, 2004), where a substantial reform to the loan repayment schedule was implemented in 1990. Prior to that year, student aid was in the form of loans, which had to be repaid in full. Following the reform, only half of the aid had to be repaid. This represented a significant reduction in debt for eligible students. The authors report that a fully supported student saw their debt load reduced by 23,500 EUR. Using the German Socio-Economic Panel (GSOEP), the authors estimate a differences-in-differences model, the results of which suggest that the aid reform was ineffective in raising enrolment rates.

Linsenmeier et al. (2006) examine a significant program change at a major northeastern US university (ANON U). Prior to 1998, the university's financial aid package available to freshmen from low-income families consisted of grants, loans, and jobs. Beginning with the 1998 freshmen class, the loan component of the aid package was converted to non-refundable grants. Using admissions and financial aid data from the university, the authors used a

[2] Sources: Tuition and Living Accomodation Costs (TLAC) survey, National Graduates Survey (NGS), and Canadian University Survey Consortium (CUSC).

differences-in-differences approach and found that the loan reduction program had no statistically significant impact on the probability of enrolment at ANON U. However, for low-income minority students, loan reduction was associated with an increase in the probability of enrolment (significant at 10% only).

One additional study in this area is worth noting, this time based on a social experiment. Field (2009) examines enrolment rates of New York University (NYU) law students in various areas of law. The experiment was set up to test the hypothesis that debt matters to students. In total, 140 students were randomly assigned to one of two groups. The treatment group received a non-refundable grant if they pursued a public interest law career. The control group received a loan that would be forgiven for up to 10 years following graduation if they pursued a career in 'public interest law' (i.e. legal fields with a public good aspect to it, which often is lower-paying than other forms of law). In both cases, the amount of aid covered two-thirds of tuition fees. The results suggest that the treatment group was twice as likely to enroll in a public interest field of law, and substantially more likely to hold a first job in public interest law.

The results of the NYU study stands in contrast to those of Baumgartner and Steiner (2004) and Linsenmeier et al. (2006). However, the study by Field is very different in scope. It focuses on students who are already enriolled in a specific program, and thus, does not examine the decision to enroll (only the decision to specialize in a certain field of law). Moreover, the level of debt reduction is quite substantial. Law students at NYU can expect to pay about $40,000 in tuition fees. Waiving two-thirds of their debt is likely to have an impact, especially since the decision to enroll at NYU Law School was already made, and only the specialization had to be changed.

In summary, the literature on liquidity constraints and postsecondary access is well developed. It points to liquidity as playing a major role in the decision to pursue higher education, except in some Europeen countries where tuition fees are generally lower and/or financial aid is usually more generous. In contrast, the evidence on the impact of prospective debt is scarcer and the evidence that does exist is mixed. The one study that looks at the impact of prospective debt on postsecondary attendance finds no impact.

The current study contributes to the literature by estimating the impact of two broad-based, large non-refundable grants offered to low-income Canadian students. The identification strategy is based on a sharp discontinuity of the offer of the grants, which is a first in this particular branch of the literature.

An overview of the Canadian postsecondary education system[3]

Postsecondary schooling generally includes three types of institutions in Canada: university, college, and trade school. However, trade school doesn't necessarily require a high school diploma for entry. University and college generally require a high school diploma, although some students may be eligible to begin postsecondary studies without a high school diploma if they are deemed to be 'mature students' (i.e. usually 21 years old or above). A typical university undergraduate degree takes four years to complete, which may be followed by a graduate degree (a Master's or a PhD) or a professional degree (Medicine, Dentistry, Law,

[3] This overview generally describes the situation in most Canadian provinces. Québec stands out on many fronts, but as we shall see, this province is not included in the current study.

etc.) A college diploma can normally be obtained after two or three years of study, while a trade school diploma is even shorter in duration.

With the exception of the small number of private career colleges and some elite professional university programs, postsecondary institutions are heavily regulated by government. Provincial governments usually set a price ceiling on tuition fees, although they often allow for some variability in tuition fees to reflect differences in costs. To ensure that the price ceiling does not reduce enrolment too much, governments provide supply side subsidies to universities for every student enrolled. Fees are not always regulated, although *de facto* price ceilings still exist since subsidies are reduced when tuition increases. Since tuition is in effect frozen in Canada, increased aid is not likely to have an impact on total enrolment. However, aid may raise enrolment among the group to which it is targeted (at the expense of others).

Average undergraduate tuition fees are generally about $4,000 at Canadian universities, with some variability by province and program. Although Statistics Canada no longer maintains data on college tuition fees, they are generally about half that of university fees. College tuition fees are generally similar across programs and provinces.

The federal and provincial governments provide direct funding for postsecondary education through non-merit based aid in the form of loans and grants (including loan remissions). All provinces (except Québec) and the Yukon Territory co-ordinate their provincial student aid systems with the federal Canada Student Loans Programs (CSLP), with the costs shared between the federal and provincial levels. The bulk of this aid is in the form of student loans. When students apply for loans, they may also qualify for special grants that are generally targeted at low income youth. This process is automatic with the loan application. Applying

applying for a Canada Student Loan (CSL) is required to be assessed for a grant, the loan need not be accepted in order to obtain the grant. The amount of student aid that students are eligible to receive is governed by the needs assessment: *Assessed Needs = Total costs – Total resources*, where *Total costs* correspond to the costs associated with attending the program (tuition, other fees, books, living costs, return travel, etc.), and *Total resources* correspond to parental and student income and assets (with considerations for other parental obligations), as well as other resources. If costs exceed resources, applicants will generally be offered loans to cover the gap. However, there is a limit on the amount of loans they can receive, which may be binding for certain students facing high direct costs of attending, or perhaps very low resources. In these situations, students have 'unmet needs' (needs that the CSL will not cover due to loan limits).

Since aid is already available to most students in need, policy has recently shifted towards easing debtloads. I begin the next section by discussing two grants designed with this purpose in mind, which will form the basis for the identification strategy in this paper.

Methods

To identify the impact of prospective student debt load on PSE attendance, an important ingredient would be an exogenous increase in expected debt, but with no change in total student financial aid (liquidity) provided. The implementation of the Canada Access Grant for Low-Income youth (CAG-LI) and the Millenium Access Bursaries (MAB) provides such a setting.

The CAG-LI consists of a non-refundable grant whereby loans are clawed back by the amount of the grant. In other words, CAG-LI does not provide more aid to students. Rather, it changes the amount of aid that must be repaid. Another convenient aspect of the grant is that students are eligible for the full grant if their parental income is below a certain threshold. If parental income is above the threshold (even by $0.01), students are not eligible for the grant. Thus, there is a sharp discontinuity in the amount of the non-refundable grant available (and therefore, debt) around the threshold. The threshold mimics random assignment of debt near the threshold since students with parents who have very similar incomes are likely to be quite similar in their PSE choices in absence of the CAG-LI.

The CAG-LI first became available to students in the 2005-06 academic year. The grant applies to first-year, full-time PSE students only. The amount of the CAG-LI is one half of first year tuition, up to a limit of $3,000. Eligibility is based on the net income of the parent(s), as per line 236 of their income tax return in the previous year. Net income consists of the sum of employment income, other market income (e.g. investment income, rental income, etc.), transfer income (including Social Assistance, Employment Insurance, Old Age Security, etc., but excluding the Child Tax Benefit and the National Child Benefit Supplement, and the Goods and Services and Harmonized Sales Tax Credit), minus certain deductions such as Registered Pension Plan contributions, union dues, etc. [4] The threshold for CAG-LI eligibility is the same threshold used for the National Child Benefit Supplement (NCBS), which is around $35,000, depending on family size and year.[5]

[4] Of these income components, perhaps the easiest to manipulate (in order to qualify for the grants) is the contributions to a Registered Pension Plan. I will investigate later whether or not net income was manipulated.

[5] The NCBS income does not create a discontinuity of its own since it does not jump suddenly at the threshold. Rather, it goes from zero when net income is above the threshold, to a small (near zero) amount just below the

The CAG-LI coincided with the introduction of a similar grant: the Millenium Access Bursary (MAB). In four provinces, the MAB worked in a very similar way as CAG-LI in that eligibility for both programs were based on the NCBS threshold. In Prince-Edward-Island (beginning in 2006), Ontario (beginning in 2005) and Manitoba (beginning in 2006), the MAB was also similar to CAG-LI in terms of the amount of the grant (i.e. one half of tuition, up to a limit of $3,000). In New Brunswick (beginning in 2006), the grant was larger (up to $4,000), but was spread out over three years. In other provinces, different versions of the MAB were available, but in all of those cases, no clear discontinuities could be identified based on program parameters. In the four provinces listed above, the combination of CAG-LI and MAB provided up to $6,000 ($7,000 in New Brunswick) in debt reduction for qualified students, although the actual amount of the grants depended on tuition fees.

For both grants, students need only apply and qualify for a CSL to receive the grants. No additional application is necessary and the loans can be rejected without comprosing the offer of the grant. The CAG-LI and MAB take-up rate for eligible PSE students is 100%.[6]

To identify the effect of the grants, I adopt two econometric approaches. The first is a simple differences-in-differences approach, whereby I compare enrolment rates of youth who were eligible for the NCBS before and after their introduction to youth who were not eligible. This

threshold. The NCBS amount gradually increases as net income falls further below the threshold. Details are available at http://www.nationalchildbenefit.ca/eng/o4/chap2.shtml.

[6] This is among students who were enrolled in the first-year of full-time studies at a post-secondary institution. This is not entirely surprising, as the grants represent free money to students. Thanks to Malgorzata Winizewska from the Canada Student Loans Program at Human Resources and Skills Development Canada and to Anne Motte from the Canadian Millenium Scholarship Foundation for confirming this point.

effect is estimated with the following regression model, which is estimated by ordinary least squares[7]:

$$(1) ENROL_i = \beta_0 + \beta_1 NCBS_i + \beta_2 YEAR_i + \beta_3 NCBS_i * YEAR_i + \beta_2 X_i + \varepsilon_i$$

, where *ENROL* is a dummy variable for PSE or university enrolment, *NCBS* is a dummy variable indicating eligibility for the program (treatment stauts), *YEAR* is a vector of year dummies, *X* is a vector of contol variables (described later), and *i* denotes the individual .

The second approach takes advantage of the sharp discontinuity in grant eligibility. In a sharp regression discontinuity design, assignment to the treatment has a deterministic impact on treatment status (i.e. the take-up rate is 100%). In this case, all youth assigned to receive the treatment (grant *eligibility*) will receive that treatment by design (i.e. all are eligible). Very close to the cutoff (denoted by the NCBS threshold), the treatment status should be orthogonal to all observed and unobserved characteristics that determine the outcome. In other words, individuals just above and just below the threshold should be identical except for the treatment they receive.

More formally, let *PARINC* denote the assignment variable (parental income), $PARINC_0$ denote the income cutoff, the vector *Z* denote all observed and unobserved characteristics determining enrolment status, and and all else as before. We then have:

$$(2) NCBS_i = \begin{cases} 1 \, if \;\; PARINC_i \leq PARINC_0 \\ 0 \, if \;\; PARINC_i \succ PARINC_0 \end{cases}, \text{ and}$$

[7] Logit and probit models yield similar results.

$$(3) \quad \underset{PARINC - PARINC_0 \to 0}{p\lim} \quad (Z \perp NCBS) = 1$$

If these assumptions hold, the design will closely mimic random assignment. For an evaluation of regression discontinuity that uses random assignment as a benchmark, see Buddelmeyer and Skoufias (2003).

For estimation purposes, I adopt a local polynomial regression discontinuity method (Nichols, 2007). This approach identifies the impact of the discontinuity by estimating separate local polynomial (or kernel) regressions of a given bandwidth size on both sides of the discontinuity.[8] Once again, the outcome variable is postsecondary enrolment. I estimate the relationship between enrolment and the treatment with a linear probability model.[9]

The data required to conduct this study should contain information on PSE attendance of youth, their parental income, the province of residence, and a sufficiently large sample to allow one to look very closely around the point of discontinuity. The Canadian Longitudinal Administrative Databank (LAD), developed by Statistics Canada, satisfies all of these

[8] I specifiy a bandwidth size of 100 and use estimate a triangle kernel function (the preferred method in the literature). The robustness of the results will be tested by altering the size of the bandwidth. Standard errors are calculated by bootstrapping.

[9] Although far from common in the literature, applying a regression discontinuity estimator to a binary dependent variable is not unique. For example, see Buddelmeyer and Skoufias (2003), who model child labor market participation and school enrolment with a linear probability model in a regression discontinuity framework. Lemieux and Milligan (2008) apply regression discontinuity to study employment. Given the large sample size they had to work with (men across Canada in the Census micro-data), they were able to create large cells by single year age groups. A similar approach was not possible in the current study since cell sizes were not large enough around the point of discontinuity.

requirements. The LAD is built from personal income tax records (the T1s). The T1 data are combined into families to form the T1 Family File (T1FF). The T1FF contains records of all tax filers, as well as their non-filing dependents.[10] The LAD is a 20% simple random sample of T1FF, with the records linked longitudinally (until they leave the sample through death, out-migration, or if everyone in their family stops filing taxes).[11] Currently, data are available from 1982 to 2006.

Since CAG-LI and MAB apply to first year students, it is necessary to identify the year in which youth become eligible for first year enrolment in PSE. In six of the 10 Canadian provinces (Newfoundland and Labrador, New Brunswick, Ontario, Manitoba, Saskatchewan, and British Columbia), this is simply the year in which the youth turned 18.[12] This is because age of entry in those provinces is determined based on one's age as of December 31. In the LAD, we know the year of birth for all children[13], allowing one to identify the year when

[10] Dependents are imputed through information provided by tax filers on their returns. This includes spouses and children. The population coverage in T1FF is about 97% compared to census data.

[11] Since 1993, virtually all families with children (even ones with low incomes) have had an incentive to file taxes in Canada. This is largely because of the introduction of the Child Tax Benefit, which is available to about 90% of families with children below the age of 18.

[12] It is of course possible that students take a 'gap-year' (i.e. they begin postsecondary studies after taking a year-long break following high school). This can pose a problem if we only focus on 18 year olds and there is a systematic bias in the propensity to take a gap-year by parental income level. According to Finnie and Johnson (2011), 32% of post-secondary students from Ontario took a gap-year following high school. However, their econometric evidence suggests that there is no statistical relationship between taking a gap-year and parental income, both for college and university students.

[13] Unless they are tax filers themselves, in which case we know the exact date of birth. However, many children do not file taxes, so a certain degree of bias might be introduced by selecting children with detailed birth date information.

youth first become eligible for PSE attendance. Of the six provinces, CAG-LI and MAB were quite similar in New Brunswick, Ontario and Manitoba.[14] For these reasons, analysis is limited to those three provinces. Finally, note that prior to 2003 in Ontario, students could normally only begin university at age 19 (they could begin college at age 18). Since 2003, both college and university normally begin at age 18. For consistency, analysis is limited to the 2003-2006 period.

The specific variables used in the analysis are as follows:

Dependent variable

- Full-time PSE attendance in year t (age 18)
    - This is derived from full-time tuition credits and full-time education deductions. If either of these is greater than zero, then the indicator is set to 1.
    - These credits/deductions can be transferred to a higher income family member (specifically, a parent); since the late 1990s, we can identify which family member actually attended PSE.

Independent variables[15]

[14] CAG-LI and MAB were also quite similar in Prince-Edward-Island, but their school entry laws are based on age as of January 31.

[15] Many of these variables are captured in year (t-1), at age 17, since in year t, many youth may move from the parental home in order to attend PSE. As such, their 'family' on the tax files may simply consist of themselves. All variables derived from this family will thus omit information on their parents, their parental home, their siblings, etc. Note also that even if youth tried to strategically move out of their home at age 17

- Net parental income in year (t-1)
    - This variable will be used to identify eligibility for CAG-LI and MAB by mapping the relevant NCBS threshold to each family.
- Province in year (t-1)
- Lone-parent family dummy in year (t-1)
- Number of children in family in year (t-1)
- Sex of the youth

The means of the variables used in the analysis and sample sizes appear below in Table 1.[16] Slightly fewer than half of 18 year olds have attended PSE. There is some provincial variability in this figure, which is not surprising given that each province has its own postsecondary education system. Parental income also varies by province (highest in Ontario, lowest in New Brunswick, among the three affected provinces). Note that parental income among this sample is relatively high since only families with at least one child of age 17 are included here (i.e. they are relatively older families). About one in five youth live in families with income that is sufficiently low to qualify them for the NCBS (and thus, the CAG-LI and MAB grants in certain years). The other variables—lone-parent status, the number of children in the family, and sex—are included as control variables. Of interest is the fact that slightly

(to lower their income in hopes of qualifying for the grants), this would have no bearing on grant eligibility since *parental* income is used in determining eligibility.

[16] For confidentiality reasons, all reported dollar estimates from LAD must be rounded to the nearest 100, while all sample sizes must be rounded to the nearest 5. Note that only the published results are rounded. The actual micro-data I use in the calculations are not rounded.

less than 50% of the sample consists of females. This is because 17 year-old males are more likely to remain in their parental home than 17 year-old females.

Table 1: Sample means of variables used in analysis

	New Brunswick	Ontario	Manitoba
Full-time PSE attendance	0.482	0.426	0.376
Net parental income	65,600	99,600	77,900
Below NCBS threshold	0.259	0.178	0.210
Lone-parent family	0.139	0.134	0.133
Number of children in family	2.5	2.8	2.8
Female	0.464	0.490	0.476
N	3,705	56,735	5,530

Notes: The sample consists of 18 year-old youth. All variables are captured at age 17, except full-time PSE attendance (captured at age 18).
Source: Longitudinal Administrative Databank (LAD).

Addressing manipulation effects and program awareness

Although CAG-LI and MAB provide a convenient framework to study the causal impact of prospective debt on PSE access, there are still reasons to believe that this is not necessarily so. First, as with any discontinuity, there is always the possibility of manipulation effects. Parents would have a very high incentive to hide their income on aid applications in order to help their children qualify for the grant. However, parental income has to match line 236 of their income tax returns. In some provinces, tax documents have to be included with the student loan application. In other provinces, random checks are applied. Alternatively, parents could manipulate the income reported on their tax files through legitimate or illegitimate means. In this case, random checks could not detect manipulation.

To test for manipulation effects, I used the LAD data to generate the distribution of net parental income around the CAG-LI/MAB threshold among parents in the sample for each of the three affected provinces for the years 2003 to 2006. If manipulation effects are present, we would expect to see an increase in the proportion of cases just below the threshold (among all cases near the threshold) in the three affected provinces. However, there is no such evidence in Table 2, which tests for changes within a $1,000 band above and below the threshold.

Table 2: Proportion with net family income below NCBS threshold (within a $1,000 band above and below the threshold)

	New Brunswick		Ontario		Manitoba	
Year	Proportion	s.e.	Proportion	s.e.	Proportion	s.e.
2003	0.478 ***	0.035	0.458 ***	0.011	0.429 ***	0.032
2004	0.498 ***	0.035	0.481 ***	0.011	0.466 ***	0.033
2005	0.440 ***	0.035	0.475 ***	0.012	0.498 ***	0.034
2006	0.480 ***	0.036	0.471 ***	0.012	0.473 ***	0.032
2005-2004	-0.058	0.049	-0.005	0.016	0.032	0.047
2006-2004	-0.018	0.050	-0.010	0.016	0.006	0.046
2005-2003	-0.038	0.049	0.017	0.016	0.069	0.047
2006-2003	0.002	0.050	0.013	0.016	0.044	0.046

Notes: Statistical significance is denoted by "***" (1%), "**" (5%), and "*" (10%). The sample consists of 18 year-old youth. All variables are captured at age 17.
Source: Longitudinal Administrative Databank (LAD).

Program awareness is also a potential issue. If students do not know that a program exists, there is no reason to believe that they will modify their behaviour because of it. However, all students were assessed for CAG-LI and MAB eligibility once they applied for student aid, and take up was 100%. Of course, students may not have applied for student aid if they were not aware of the new grants since they may not have planned on attending PSE. To help make students aware of financial aid opportunities (including loans and grants), the Canadian

government provides a convenient on-line loan calculator.[17] Still, this measure is no guarantee that students were made aware of the programs. The closest direct form of evidence on this issue comes from the Canadian Survey of Youth in 2009 (EKOS, 2009). Among 17 to 30 year olds, 70% were aware of government study grant opportunities (that do not require repayment) when asked if they had heard of them. Of course, it is not clear why individuals in their late 20s (past the typical age of PSE) or youth who have no interest in attending PSE would be aware of current study grant opportunities. As a result, the rate of awareness among youth who are pondering higher education is almost certainly higher than 70%.

Although most youth seemed to be aware of non-refundable grant opportunities, it does not mean that they are well-informed about them. For example, some may not realize that although they need to apply and qualify for a CSL to be eligible for a grant, they need not take the loan. Unfortunately, no evidence exists on this point.

Differences-in-differences results

The first portion of the empirical analysis applies differences-in-differences (DD) regressions. The sample sizes and means of the control variables used in the regression are broken down by province, year, and NCBS eligibility in Tables A1 to A3 in the Appendix. As can be seen from these tables, there are considerable differences in the socio-characteristics of youth in families whose income qualifies them (or not) for the NCBS. For example, those who qualify for the NCBS are far less likely to attend PSE. The gap is about 15 to 20 percentage points. This is likely because of the substantial difference in net parental income. Those who qualify

[17] The calculator is available at http://tools.canlearn.ca/cslgs-scpse/cln-cln/40/sfae-eafe/sfae-eafe-0-eng.do.

for the NCBS generally have net parental incomes in the $20,000 to $25,000 range. In contrast, net parental income is generally above $80,000 among youth who do not qualify for the NCBS. Not surprisingly, this latter group is also less likely to be raised in a lone-parent family (only about 5% to 8% of them are in lone-parent families, compared to about 40% for youth in families who qualify for the NCBS).

In Table 3, results for models estimated on the three provinces are shown. The models consist of regressing a dummy variable indicating PSE attendance on interactions between the grant eligibility indicator and the year dummy variables, as well as the control variables described above. At the bottom of the table, p-values from various F-tests are shown. In all cases, the p-values are well above all significance thresholds, indicating the absence of any solid evidence that the introduction of the grants raised PSE attendance among low-income youth.

Table 3: Results from differences-in-differences estimation of full-time PSE attendance

	New Brunswick		Ontario		Manitoba	
	b	s.e.	b	s.e.	b	s.e.
Above NCBS threshold*2004	0.065 **	0.027	0.023 ***	0.006	0.012	0.021
Above NCBS threshold*2005	0.052 **	0.026	0.032 ***	0.006	0.011	0.021
Above NCBS threshold*2006	0.054 **	0.027	0.058 ***	0.006	0.029	0.021
Below NCBS threshold*2003	-0.165 ***	0.035	-0.119 ***	0.010	-0.131 ***	0.029
Below NCBS threshold*2004	-0.132 ***	0.036	-0.095 ***	0.010	-0.123 ***	0.030
Below NCBS threshold*2005	-0.142 ***	0.037	-0.087 ***	0.010	-0.113 ***	0.031
Below NCBS threshold*2006	-0.114 ***	0.037	-0.050 ***	0.011	-0.121 ***	0.031
Lone-parent family	-0.053 **	0.025	-0.085 ***	0.006	-0.082 ***	0.020
Number of children in family	0.099 ***	0.028	0.063 ***	0.007	0.021	0.022
(Number of children in family)^2	-0.013 ***	0.005	-0.009 ***	0.001	-0.003	0.004
Female	0.171 ***	0.016	0.182 ***	0.004	0.162 ***	0.013
Intercept	0.264 ***	0.042	0.251 ***	0.011	0.296 ***	0.035
Adjusted R^2	0.068		0.054		0.048	
N	3,710		56,790		5,530	
			p-values			
Impact of threshold (2005 - 2003)	0.5571		0.9771		0.8567	
Impact of threshold (2005 - 2004)	0.9503		0.9853		0.7958	
Impact of threshold (2006 - 2003)	0.9464		0.4724		0.6552	
Impact of threshold (2006 - 2004)	0.5641		0.4688		0.7180	
Impact of threshold (2006 - 2005)	0.6114		0.4597		0.5428	

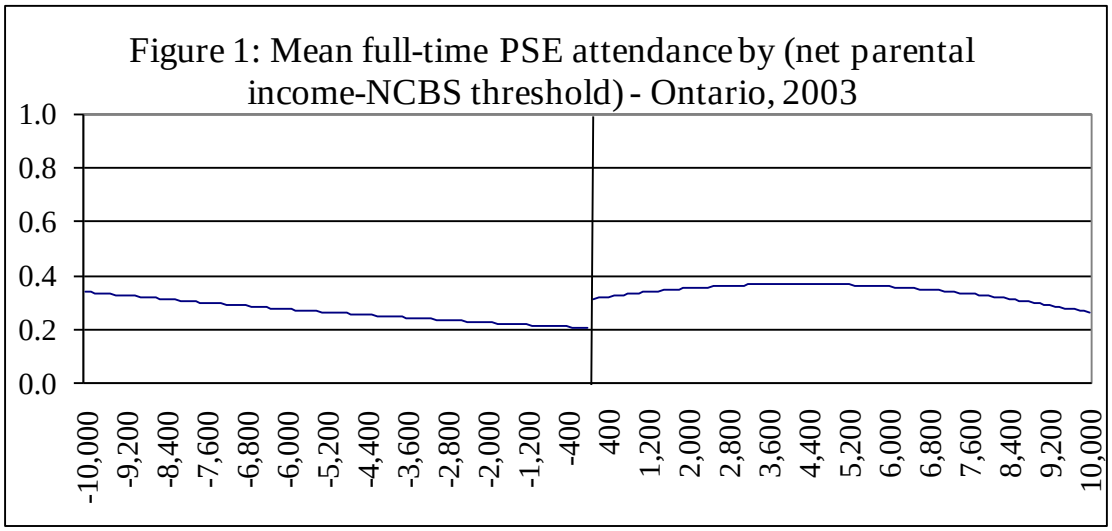
Notes: Statistical significance is denoted by "***" (1%), "**" (5%), and "*" (10%). The sample consists of 18 year-old youth. All variables are captured at age 17, except full-time PSE attendance (captured at age 18).
Source: Longitudinal Administrative Databank (LAD).

Regression discontinuity results

The differences-in-differences approach used in the previous section may suffer from omitted factors that may bias the results. Since no significant effects were found, it may still be the case that confounding factors worked in the opposite direction, thus 'masking' a true effect. Rather than attempt to identify all possible confounding factors, an alternative strategy is to adopt an approach that is not susceptible to this problem. This is the spirit of this section, as I turn to a regression discontinuity (RD) approach.

I begin the RD analysis with pictures. In Figures 1 to 4, I show quadratic trends in full-time PSE attendance rates by the gap between net parental income and the NCBS threshold in Ontario for each year from 2003 to 2006. [18,19] Separate trend functions are estimated above and below the NCBS cut-off (denoted by the vertical bars).

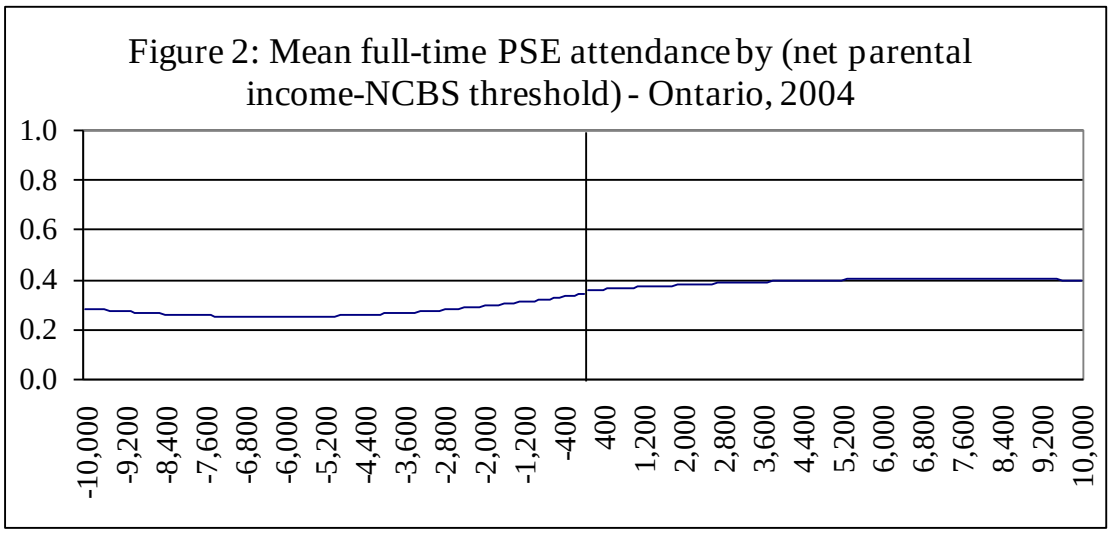
If the prospective debt reduction programs worked, we should expect to see a higher PSE rate when the gap is slightly negative compared to when it is slightly positive in 2005 and 2006 (the years when the grants were offered), relative to earlier years when the grant was not offered. However, there is no evidence of this in the figures. In all years, the trends are essentially flat, or they display a slight dip as we move from the positive to the negative.



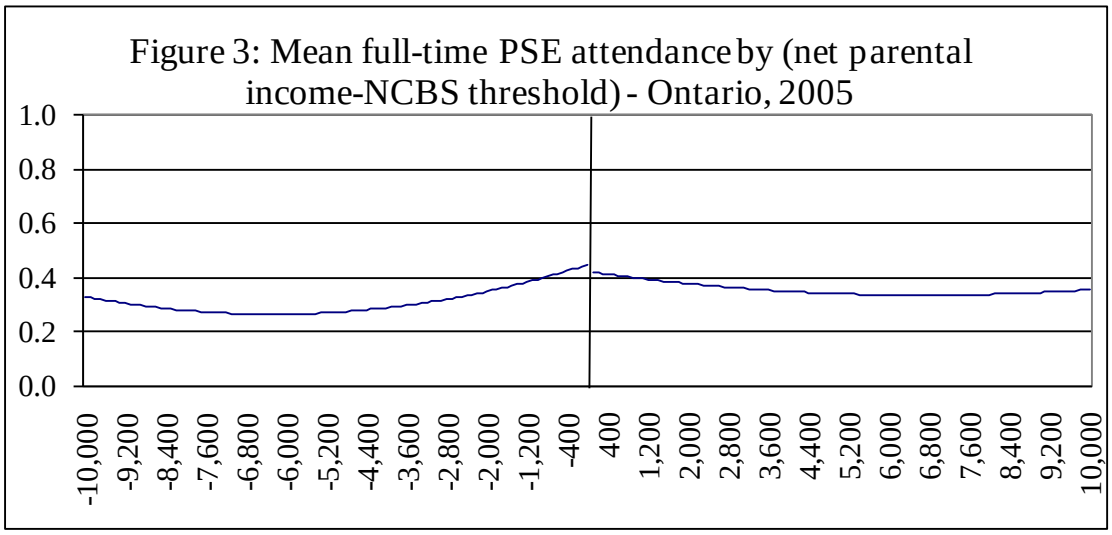
Notes: The sample consists of 18 year-old youth. All variables are captured at age 17, except full-time PSE attendance (captured at age 18).
Source: Longitudinal Administrative Databank (LAD).

[18] The raw data from the income tax files could not be shown due to confidentiality concerns. Moreover, since the data are binary (attended or not), they would not be informative unless they are smoothed in some way.

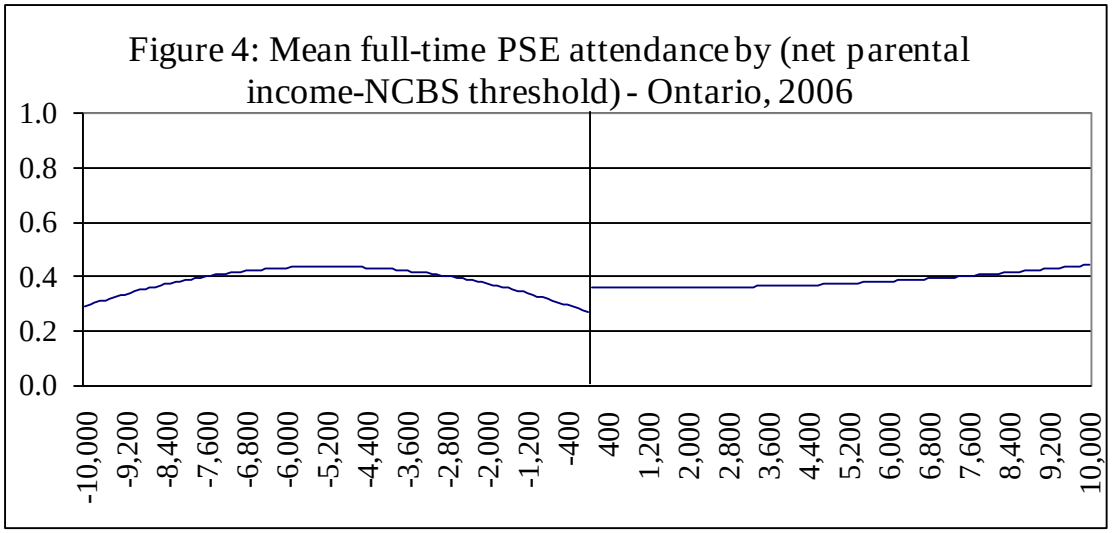
[19] Results for New Brunswick and Manitoba were similar.



Notes: The sample consists of 18 year-old youth. All variables are captured at age 17, except full-time PSE attendance (captured at age 18).
Source: Longitudinal Administrative Databank (LAD).



Notes: The sample consists of 18 year-old youth. All variables are captured at age 17, except full-time PSE attendance (captured at age 18).
Source: Longitudinal Administrative Databank (LAD).



Notes: The sample consists of 18 year-old youth. All variables are captured at age 17, except full-time PSE attendance (captured at age 18).
Source: Longitudinal Administrative Databank (LAD).

In Table 4, I estimate local polynomial regression discontinuity models separately for the three provinces in the years when the grants were offered (from 2005 in Ontario and from 2006 in New Brunswick and Manitoba). These main results appear at the top of the table. The coefficients are never close to being statistically significant in the years when the grants were in effect.[20]

[20] The graphs corresponding to the regressions to follow are not shown in order to conserve space. However, they are available upon request.

Table 4: Results from regression discontinuity estimation of full-time postsecondary attendance

	New Brunswick		Ontario		Manitoba	
	b	s.e.	b	s.e.	b	s.e.
Main results						
Bandwidth size = 100; year = 2005			0.032	0.025		
Bandwidth size = 100; year = 2006	-0.016	0.125	-0.010	0.024	0.053	0.066
Robustness test #1: Bandwidth size						
Bandwidth size = 50; year = 2005			0.043	0.035		
Bandwidth size = 50; year = 2006	-0.087	0.192	-0.010	0.030	0.034	0.108
Bandwidth size = 200; year = 2005			0.020	0.024		
Bandwidth size = 200; year = 2006	-0.019	0.085	-0.016	0.024	0.052	0.066
Robustness test #2: Falsification						
Bandwidth size = 100; year = 2003	0.088	0.095	-0.009	0.023	-0.070	0.076
Bandwidth size = 100; year = 2004	0.104	0.094	0.043 *	0.022	0.017	0.076
Bandwidth size = 100; year = 2005	-0.109	0.100			-0.084	0.070

Notes: Statistical significance is denoted by "***" (1%), "**" (5%), and "*" (10%). The sample consists of 18 year-old youth. CAG-LI and MAB programs in effect in 2006 in the three provinces, as well as in 2005 in Ontario.
Source: Longitudinal Administrative Databank (LAD).

The results of two robustness tests appear below the main results. First, different bandwidth sizes of the polynomial regressions are applied. This had no impact on the results. Second, the models are estimated in the pre-grant period (in an attempt to falsify the results). It is possible conceivable that the NCBS threshold had a negative impact on PSE attendance prior to the introduction of the grants. Perhaps the receipt of the (very small) NCBS payout had psychosocial effects on children. In that case, the introduction of the grant may have counterbalanced that negative effect, resulting in no overall impact. However, I find no such evidence. In fact, the Ontario result is positive and significant at 10% in 2004.

So far, we have considered any form of PSE attendance. However, university academic entrance requirements are generally higher than college requirements. As a result, university students may be particularly skilled at calculating net returns to attending, and consequently, they may be quite sensitive to the debt relief provided by the two grants.

In Table 5, the regression discontinuity models are estimated for university attendance.[21] Once again, I find no evidence that the grants were associated with an increase in attendance for any of the provinces. The bandwidth robustness test shows similar results, while the falsification tests do reveal some statistically significant results prior to the grants. A positive result is evident for Ontario in 2004 (as with overall PSE attendance). Interestingly, there is a negative and significant result in Manitoba in 2005. However, this effect is not significantly different than the estimated effect in 2006 (when the grant was introduced).

[21] In the tax files, we only know PSE attendance with certainty since there is no distinction between college and university tuition credits and education deductions. However, based on the amount of the tuition credits claimed, as well as known tuition fees in Canadian provinces (which are somewhat constant across institutions), a series of proxies for university attendance can be created. In the first, I set university attendance equal to 1 if tuition credits are at least 80% of mean tuition fees in the province and year in question (for one semester only since students normally begin school in September, and the tax year ends in December—coinciding with the end of the first semester). I thank Alex Usher, Ross Finnie, and Theresa Qiu for providing me with university and college tuition fees, as well as for sharing their imputation approach (which I adapted for my own purposes).

Table 5: Results from regression discontinuity estimation of full-time university attendance

	New Brunswick		Ontario		Manitoba	
	b	s.e.	b	s.e.	b	s.e.
Main results						
Bandwidth size = 100; year = 2005			0.008	0.022		
Bandwidth size = 100; year = 2006	-0.089	0.090	0.001	0.018	0.073	0.057
Robustness test #1: Bandwidth size						
Bandwidth size = 50; year = 2005			0.011	0.031		
Bandwidth size = 50; year = 2006	-0.137	0.114	0.002	0.029	0.054	0.073
Bandwidth size = 200; year = 2005			-0.002	0.019		
Bandwidth size = 200; year = 2006	-0.059	0.062	-0.002	0.014	0.064	0.044
Robustness test #2: Falsification						
Bandwidth size = 100; year = 2003	0.086	0.078	0.012	0.018	-0.072	0.063
Bandwidth size = 100; year = 2004	0.086	0.092	0.051 ***	0.018	-0.026	0.069
Bandwidth size = 100; year = 2005	-0.038	0.101			-0.144 **	0.070

Notes: Statistical significance is denoted by "***" (1%), "**" (5%), and "*" (10%). The sample consists of 18 year-old youth. CAG-LI and MAB programs in effect in 2006 in the three provinces, as well as in 2005 in Ontario.
Source: Longitudinal Administrative Databank (LAD).

Finally, another way of falsifying the results is to find an impact in the rest of Canada, where no grants were associated with crossing the NCBS threshold. However, this analysis yielded no shift in PSE or university attendance around the threshold from the years 2003 to 2006.

Conclusion

In this study, I estimate the impact of prospective debt load on the probability of PSE attendance among youth. To identify this effect, I exploit a setting whereby two non-refundable grants (the Canada Access Grant for Low-income youth and the Millenium Access Bursaries) were offered to students, but were clawed back from their calculated loan amount. This feature ensured that liquidity constraints remained constant since students were offered the same amount of total aid (loans and grants). The only variable factor was the amount of aid that had to be repaid. For identification purposes, the interesting (and unique)

feature of the program related to eligibility: students with parental income below a critical threshold were eligible to receive the full grant, while those above the threshold could not receive the grant. This created a sharp discontinuity in eligibility.

Using a large longitudinal administrative data set that is linked at the family level, I find no evidence that the grants helped raise enrolment in PSE or university. This is despite the large size of the grants (up to $6,000 or $7,000), the fact that students were automatically assessed for the grants with their regular student loans application, and evidence that most Canadian youth are at least aware of study grant opportunities (although perhaps not well informed).

Some important policy considerations are worth noting. First, the primary purpose of student aid is to raise access to PSE. Based on the results of this study and others, liquidity may be a more important factor in this decision than prospective debt. This seems at odds with basic basic human capital theory. For example, Linseimeier et al. (2006) showed in a simple two-period institutional choice model that debt reduction leads to increased net returns, and presumably, increased demand for attending the institution in question. Their conclusion is easily generalizeable to a model of postsecondary attendance (e.g. Frenette, 2010). However, increased demand in either model will only follow if the debt reduction is large enough to allow youth to cross the ‘breakeven point’. In actual fact, the net returns to attending postsecondary are quite large since the benefits (the increased annual earnings) accrue over a lifetime, whereas the costs are only incurred for a few short years. For this reason, only students who view postsecondary as a bad investment may change their decision when offered a non-refundable grant. Moreover, it may take a sizeable non-refundable grant to make a difference unless there are enough students who are very close to the margin. As a

result, the windfall economic rents resulting from the two grants may have been better directed towards reducing liquidity constraints for youth who faced them.

But who are these student facing liquidy constraints? One possible group is students who are raised in remote areas. They must pay additional costs to attend university, which according to Barr-Telford et al. (2003), surpass $5,000 per year. Although student loans are designed to cover additional costs (even paying for two return trips home), there are maximum allowable loan amounts that substantially limit the aid available to students in need of additional funds to cover the cost of moving away to attend.[22] Perhaps as a result of this, several studies in Canada have found that distance to school is negatively associated with university attendance, especially among low-income youth (e.g. Andres and Looker, 2001; Frenette, 2004, 2006, and 2009b).

Another policy consideration is the level of debt accumulated by PSE students. To this end, CAG-LI and MAB no doubt succeeded as they represent an automatic reduction in debt. However, very little evidence exists to support the notion that debt matters. In the US, Rothstein and Rouse (2011) examine the impact of the introduction of a "no-loans" policy at a highly selective university. Under this new arrangement, the loan component of financial aid was replaced with grants. They student debt is associated with poorer post-graduation job quality from a 'public interest' point of view since these typically pay less. In Canada, the

[22] According to http://tools.canlearn.ca/cslgs-scpse/cln-cln/40/sfae-eafe/sfae-eafe-0-eng.do (accessed February 4, 2011), a single dependent student living at home in a family of four, whose parents earn $80,000, and attending university at a cost of $5,000 in tuition, $1,000 in books/supplies, and $500 in computer costs can expect to have all of their assessed needs met. An identical student who attends university away from home can expect to face $1,307.36 in unmet needs. A similar figure was generated for students in many different situations.

evidence does not benefit from causal identification strategy. Luong (2010) uses the Survey of Labour and Income Dynamics (SLID) and descriptive regression analysis to show that among postsecondary graduates between the ages of 20 and 45, those who borrowed to attend school were ten percentage points less likely to have investment income and seven percentage points less likely to own a home, and had about $39,000 less net worth. The study does not look at student debt load, only the incidence of borrowing, so it is difficult to conclude that higher debt loads matter. More work is needed in this area, particularly with respect to identifiying exogenous variation in student debt. The CAG-LI and MAB grants may serve this purpose quite well in the future.

Acknowledgements

I would like to thank my PhD thesis supervisors Peter Wright and Richard Disney at the University of Nottingham for excellent guidance. Excellent comments were provided by participants at the 2009 Canadian Economics Association Meetings in Toronto and at the 2009 Conference on Using Social Statistics to Illuminate the Issues, Processes, and Outcomes in Higher Education: International Viewpoints in Montréal. Austin Nichols provided useful technical advice on implementing local polynomial regressions in Stata. Finally, the majority of this work was completed while I was employed at Statistics Canada in the context of completing my PhD thesis. I would like to thank Statistics Canada for facilitating the completion of this paper (specifically Theresa Qiu, for skilled assistance with the data). However, the views expressed in this paper are my own, and in particular, should not be attributed to Statistics Canada.

Appendix

Table A1: Sample means of variables used in analysis by NCBS eligibility - New Brunswick

	2003		2004		2005		2006	
	Not eligible for NCBS	Eligible for NCBS	Not eligible for NCBS	Eligible for NCBS	Not eligible for NCBS	Eligible for NCBS	Not eligible for NCBS	Eligible for NCBS
Full-time PSE attendance	0.500	0.300	0.556	0.346	0.542	0.333	0.546	0.333
Net parental income	81,800	23,800	79,300	23,700	78,700	23,800	81,600	22,600
Lone-parent family	0.049	0.340	0.059	0.385	0.056	0.422	0.054	0.400
Number of children in family	2.7	2.5	2.6	2.5	2.6	2.5	2.5	2.2
Female	0.458	0.480	0.467	0.481	0.465	0.489	0.454	0.444
Sample size	710	250	675	260	710	225	650	225

Notes: The sample consists of 18 year-old youth. All variables are captured at age 17, except full-time PSE attendance (captured at age 18).
Source: Longitudinal Administrative Databank (LAD).

Table A2: Sample means of variables used in analysis by NCBS eligibility - Ontario

	2003		2004		2005		2006	
	Not eligible for NCBS	Eligible for NCBS	Not eligible for NCBS	Eligible for NCBS	Not eligible for NCBS	Eligible for NCBS	Not eligible for NCBS	Eligible for NCBS
Full-time PSE attendance	0.425	0.270	0.447	0.294	0.457	0.304	0.482	0.343
Net parental income	112,000	22,700	114,800	22,700	117,500	22,200	120,800	22,500
Lone-parent family	0.071	0.401	0.079	0.407	0.075	0.398	0.082	0.398
Number of children in family	2.8	2.8	2.8	2.9	2.8	2.8	2.8	2.8
Female	0.492	0.474	0.488	0.478	0.492	0.490	0.490	0.496
Sample size	12,030	2,480	11,690	2,520	11,595	2,550	11,335	2,540

Notes: The sample consists of 18 year-old youth. All variables are captured at age 17, except full-time PSE attendance (captured at age 18).
Source: Longitudinal Administrative Databank (LAD).

Table A3: Sample means of variables used in analysis by NCBS eligibility - Manitoba

	2003		2004		2005		2006	
	Not eligible for NCBS	Eligible for NCBS	Not eligible for NCBS	Eligible for NCBS	Not eligible for NCBS	Eligible for NCBS	Not eligible for NCBS	Eligible for NCBS
Full-time PSE attendance	0.402	0.237	0.409	0.242	0.407	0.246	0.427	0.241
Net parental income	89,000	24,100	90,000	23,000	93,800	23,800	97,000	24,400
Lone-parent family	0.058	0.390	0.068	0.339	0.067	0.421	0.068	0.370
Number of children in family	2.8	3.1	2.8	3	2.7	2.9	2.7	2.9
Female	0.482	0.475	0.473	0.468	0.478	0.456	0.491	0.463
Sample size	1,120	295	1,100	310	1,045	285	1,100	270

Notes: The sample consists of 18 year-old youth. All variables are captured at age 17, except full-time PSE attendance (captured at age 18).
Source: Longitudinal Administrative Databank (LAD).

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