

Course Withdrawal Dates, Tuition Refunds, and Student Persistence in University Programs

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Abstract

University policies, such as the last date for withdrawal from courses without academic penalty and tuition refund schedules, vary across universities and over time. Data on those policies at 38 Canadian universities, 1997-2005, are used to estimate their relation to whether students: (i) continued in their first university program, (ii) switched to another program or institution, or (iii) exited post secondary education. The Youth in Transition Survey, Cohort B, provides data on students' characteristics and education outcomes. Controls for students' characteristics and backgrounds, cohort year effects, and university characteristics are included. Students enrolled in schools with more generous tuition refund schedules are less likely to exit post secondary education between second and third year, but the result is not robust to the inclusion of individual university fixed effects. Students facing later withdrawal deadlines are more likely to switch (transfer) to other programs or institutions between their first and second year, in both the university characteristics and university fixed effects specifications.

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1. Introduction

Students start their post secondary education without knowing what the outcome will be. For example, Finnie and Qiu (2008) report that only 54% of the Canadian university students surveyed in the Youth in Transition Survey (Cohort-B) completed their first post secondary program within five years. But only 15% dropped out of post secondary education entirely. The rest were continuing in their first programs (9%) or they had switched to another institution or program (23%). Given the large investments of time and money involved (both private and public), and the substantial psychic costs that can be incurred, a large literature has developed to examine students' pathways and progress (or lack of progress) through their post secondary education. Surveys of the literature include Grayson and Grayson (2003), Mueller (2007), and Parkin and Baldwin (2009). Other surveys that concentrate on the American literature are Kuh, Kinzie and Buckley (2006) and Pascarella and Terenzini (1991 and 2005).

The literature considers a wide range of factors that may affect students' progress through their post secondary education. These include students' personal characteristics, family

background characteristics, region, high school and post secondary education experiences, and the characteristics of the college or university. See the brief survey of the literature in the next section for more details.

The institution's academic regulations may also affect students' persistence, but they have been neglected in the literature. The regulations set out the rules governing students' education so it is reasonable that they affect students' progress through their programs and their decisions to transfer to other programs or exit post secondary education. The regulations govern issues such as the last date (within a term) that a student can withdraw from a course without academic penalty, whether and how many times failed or passed courses can be repeated, whether the old grades for repeated courses are still included in students' cumulative averages, and the rules for academic probation, suspension, and debarment. Each university sets its own academic regulations so they vary across schools. Each university also reviews its regulations regularly so they also vary over time.

I concentrate on one academic regulation; namely, the last date within a term that a student can withdraw from a course without academic penalty. There is support in the literature for the importance of course withdrawals to students' persistence. Adelman (2006, executive summary p. 8) writes: "one of the most degree-crippling features of undergraduate histories is an excessive volume of courses from which the student withdrew without penalty... Excessively lax withdrawal ... policies do students no favours". To my knowledge no other work has estimated how course withdrawal policies are related to students' progress, or lack of progress, through their programs.

Another part of the persistence literature considers the financial aspects of students' post secondary education, especially the effects of tuition levels and financial aid. One financial

policy that has been ignored is the timing and generosity of the tuition refunds that students can receive if they withdraw from a course. Refunds affect the incentives that students face when deciding whether to withdraw from a course or remain in the course until completion, so students' progress may be affected by differences in refund policies. As with academic regulations, each university sets its own refund policies and reviews them periodically so they vary across universities and over time.

To address these gaps in the literature, data on course withdrawal dates and tuition refund policies (1997 to 2005) are collected for a sample of 38 Canadian universities. The data are merged into the Youth in Transition Survey, Cohort B (YITS-B) data set which tracks the academic progress of individual students enrolled in Canadian post secondary institutions over those years. As noted, withdrawal dates and tuition refund policies vary across universities and over time so regression analysis is used to estimate whether they are related to students' education outcomes between their first and second year. The specific outcomes considered are whether students: (i) continued in their first university program, (ii) switched to another program or institution, or (iii) left post secondary education. The estimation is repeated for students' transitions between year two and year three for those students who continued to year two in their first program. Controls for students' personal and background characteristics, high school achievement, and major field of study are included along with controls for university characteristics (size, research intensity, and selectivity) and year specific cohort effects. The results from another specification, which includes individual university fixed effects, are also summarized below.

The goal is to provide empirical evidence that may inform institutions' decisions about their withdrawal dates and tuition refund policies. Given the lack of empirical research on their

impacts, it seems clear that these decisions have been made with little evidence on, or consideration of, their effects on students' academic progress.

2. Brief survey of the persistence and pathways literature studying Canadian students

This section provides a brief survey of the literature studying the persistence and pathways of Canadian students. It (mostly) concentrates on studies that apply multivariate analysis to Canadian university students.

The literature considers a wide range of factors that may affect students' progress through their post secondary education. These include students' background characteristics (family structure and parents' education, income and occupation) and personal characteristics. Virtually all studies find that Canadian male students and older students are less likely to persist in their university education. See, for example, Dooley, Payne and Robb (2012), Finnie and Qiu (2008), Montmarquette, Mahseredjian and Houle (2001), and Shaienks, Gluszynski and Bayard (2008). As for students' other characteristics, Finnie and Qiu (2008) show that visible minorities are more likely to persist in their university education. Dooley et al. (2012) estimate that Canadian citizens are more likely to persist, while Butlin (2000), Finnie and Qiu (2008), and Shaienks et al. (2008) all report that there are only statistically insignificant differences in persistence between immigrants and those born in Canada. Students' persistence in university varies significantly across Canadian provinces or regions according to most studies, but differences between rural and urban students are estimated to be statistically insignificant (Shaienks et al. 2008 and Looker 2010 for all post secondary education). Butlin (2000), Finnie and Qiu (2008), and Shaienks et al. (2008) all show significant differences in persistence between students from two parent versus single parent families.

The literature clearly shows that students are much more likely to enrol in post secondary education the higher is their parents' education and income. But once enrolled, parents' education/income are generally not estimated to have a significant direct effects on students' persistence. Dooley et al. (2012), however, report that students from neighborhoods with higher income levels and higher proportions with university degrees are more likely to persist. Martinello (2008) also shows that, conditional on not completing their first university program, students with more educated parents are more likely to switch to a second post secondary program rather than leave post secondary education.

Another area of the literature concentrates on students' high school and post secondary education experiences; including academic performance, engagement, and major field of study. Virtually all studies show that higher high school grades are strongly related to more persistence in university. Finnie and Qiu (2008) also report a strong relation between university grades and persistence but they note the problems with simultaneity. To help deal with the simultaneity problem, Montmarquette et al. (2001) estimate an explicit two year model and find that higher grades in the first semester are positively related to a higher probability of persistence into the second year. As for other experiences in university, Montmarquette et al.(2001) estimate an inverse U shaped relation between class size and persistence and higher persistence for full time students. Dooley et al. (2012) and Martinello (2008) show that persistence varies strongly across students' major field of study.

There is also an American literature that investigates the effects of university or college characteristics on persistence. The characteristics include size, diversity, public or private, affiliated with a religion, selectivity, research orientation, percentage of students living on campus (versus commuting), and the school's emphasis on student orientation and advising.

See, for example, Astin and Oseguera (2005), Bowen, Chingos and McPherson (2009), and the surveys cited in the first paragraph of the introduction.

Another part of the persistence literature considers the financial aspects of students' post secondary education, especially the effects of tuition levels and financial aid. The consensus in the literature is that tuition and financial aid are generally not strongly related to students' persistence. For example, Johnson (2008) uses variation in university tuition over time and across provinces to estimate its relation to persistence, but finds statistically insignificant and sometimes counter-intuitive results. For financial aid, Day (2008) estimates that the total amount of financial aid is positively related to university students' persistence in a multivariate analysis, but the relation reverses direction and becomes statistically insignificant when instrumental variables are used to adjust for the endogenous nature of the aid. Other studies of Canadian students such as Dooley et al. (2013), Finnie and Qiu (2008), McElroy (2005), and Shaienks et al. (2008) all report statistically insignificant or mixed results for the relation between university students' persistence and any scholarships, bursaries, loans, or grants that they receive. Studies of American students such as Bettinger (2004); DesJardins, Ahlburg and McCall (1999 and 2002) and Dynarski (2003) have found stronger links between student aid and persistence but the results are still somewhat inconsistent and mixed.

3. Course withdrawal dates and tuition refund policies

Data on course withdrawal dates and tuition refund policies were collected for 38 of the larger, four year, English language universities in Canada. The course withdrawal date (**withdrawal_date**) is the latest date within the term that students can withdraw from a course without receiving a grade or academic penalty, and it is expressed as a proportion of the length of

the term. Data on withdrawal dates and term lengths are taken from university calendars.

Figure 1 shows `withdrawal_date` for each school and year. The average across schools and years is 0.668; about two thirds of the way through the term. Most terms are 12 to 13 weeks long so the average withdrawal deadline falls at the end of the eighth week or the start of the ninth.

Figure 1 shows that there is considerable variation in withdrawal dates across universities, with some as early as five weeks into the term and many as late as the last day of classes, corresponding to `withdrawal_date` values of 0.385 and 1.0 respectively. The observations where `withdrawal_date` equals one are jittered in Figure 1 (i.e. a random variable with range [-0.01, 0.01] is added to the marker in Figure 1) so that the observations will not all appear as just one value. Figure 1 also shows that universities changed their withdrawal dates and/or term lengths over time so there is year to year variation within universities which aids in the identification of possible effects. Only four schools maintained the same `withdrawal_date` over the years in the sample. Some schools made only small changes, but twenty three schools changed their withdrawal dates by a week or more. Of those, three made changes of two to three weeks and four changed their withdrawal dates by more than four weeks. Many schools made changes (in either direction) only to reverse them in later years. Overall, the average withdrawal date across schools increased slightly (roughly two percentage points) from 1997 to 2000, indicating later withdrawal dates. After 2000, it decreased by slightly more than two percentage points to a new minimum and earlier withdrawal dates in 2004.

The bottom of Table 1 shows the means and standard deviations of `withdrawal_date` in the year one to year two (Y_{12}) and the year two to year three (Y_{23}) samples of students where each observation is weighted by the population weights provided in the YITS-B data. The student population weighted means of `withdrawal_date` (0.678 for Y_{12} and 0.673 for Y_{23}) are

quite close to the simple average over years and schools (0.668).

Tuition refund policies are harder to quantify. A typical refund policy allows 100 percent refunds for withdrawals (drops) during the initial two week add/drop registration period and then the proportion refunded decreases the later is the withdrawal. Define **refund_gen** as an index of the generosity of the tuition refund schedules. It is bounded by zero and one and it equals the sum of the refund proportions times the proportion of the term where they are available. For example, a school with a 12 week term which provides a 100 percent refund over the first two weeks of the term and zero refund thereafter has $\text{refund_gen} = 1.0 \times (2/12) = 0.166$. A refund policy which gives a 100 percent refund over the first two weeks, 50 percent refunds over the next 4 weeks, and zero refunds thereafter has $\text{refund_gen} = 1.0 \times (2/12) + 0.5 \times (4/12) = 0.333$, given a 12 week term. The simple average value of refund_gen across schools and years is 0.324 so the latter example is close to the average refund generosity.

Figure 2 plots refund_gen for each school and year and it shows that there is wide variation in the generosity of refund schedules across schools. The least generous school provides less than a 100 percent tuition refund during the initial add/drop period and zero refund thereafter, yielding a value for refund_gen around 0.1. The most generous schedules decrease the percentage refunded by five percentage points for each week over the first ten weeks of the term, yielding a value for refund_gen just below 0.6. Figure 2 shows some variation in refund generosity from year to year. Only three schools have zero variation in refund_gen over the years in the sample, but there is much less within school variation than in Figure 1. Schools were generally less likely to make big changes in their refund policies from year to year compared to course withdrawal dates. The average refund generosity ranged from a high of 0.337 in 1997 to a low of 0.310 in 2005 so refunds became less generous over the years in the sample.

Table 1 shows the population weighted mean values of `refund_gen` in the two estimation samples. The year one to year two and year two to year three averages are 0.311 and 0.308 respectively, so both are close to the simple average over schools and years.

A majority of the universities in the sample provide tuition refunds (summarized by `refund_gen`) on a per course basis. This means that students are always eligible to receive a tuition refund as long as they withdraw early enough in the term. But some schools, over some years, provide tuition refunds only if the student drops below a threshold number of courses. In this case, students pay a fixed tuition (a flat fee) equal to the full course load tuition amount regardless of the number of courses taken above that threshold. Thus tuition becomes a sunk cost and the marginal cost of a course equals zero over that range of courses. Let **#flat_fee_courses** equal the number of courses that a student can withdraw from, starting from the typical full load of five courses per semester, and receive no tuition refund.

`#flat_fee_courses` equals zero if refunds are given on a per course basis and this is the case for 71% of the sample. `#flat_fee_courses` equals one for 18% of the sample. In these cases, students who withdraw from one course (i.e. go from five to four courses in a term) are not eligible for any tuition refund. They pay the same (flat fee) tuition whether they are enrolled in four or five courses, but receive refunds (according to `refund_gen`) if they fall to three or fewer courses. Similarly for `#flat_fee_courses` equal to two or more. For the university/years with a flat fee policy, the mean value of `#flat_fee_courses` is roughly 1.4. Only one university changed the number of flat fee courses over the years of the sample.¹

Data on tuition refund policies were taken from university calendars and student

¹ It is notable that Ontario is imposing limits on the number of flat fee courses (Morrow and Bradshaw 2013). Starting in the fall of 2015, flat fee tuition can only be charged for up to 30% of a typical full course load. This implies a maximum value of 1.5 for `#flat_fee_courses`, given a full course load equal to five courses. In September 2016 the percentage falls to 20% so maximum value of `#flat_fee_courses` will be reduced to 1.0 for Ontario universities.

registration and finance guides. Unfortunately there are some missing tuition refund data for three of the 38 universities so observations for some years are omitted for those schools. Note that the refund variables consider only course tuition. Students pay several other fees, usually for student governance or facilities fees, and their refund schedules often do not match those for tuition. Further, universities usually charge administrative fees before issuing refunds or financial credits. Thus, the refund measures do not provide exact measures of the refunds students receive, but modeling all of the charges and schedules would be far too difficult. Tuition is by far the largest portion of the per course cost to students, however, so tuition refunds should provide a good measure of the variation in refund generosity.

4. Data on outcomes, students, and other institution characteristics

Data on individual students' education, personal characteristics, and family background are taken from cycles one to four of Statistics Canada's Youth in Transition Survey, Cohort B (YITS-B) (Statistics Canada 2000). In the first cycle, youth who were 18 to 20 years of age in 1999 were interviewed about their personal characteristics, family background, employment, and education experiences back to 1995. The respondents were then re-interviewed three more times, at two year intervals, to produce the next three cycles of the YITS-B. Thus the first four cycles of the YITS-B sample cover the years 1995 to 2005. Very few respondents started a university program before 1997, so the sample period is restricted to 1997 to 2005. See Motte, Qiu, Zhang and Bussière (2008) for more details on the YITS.

To be included in the sample: (i) students had to have started their first university program between 1997 and 2003, (ii) their program had to be at the bachelors level at one of the 38 universities considered here and (iii) students had to be interviewed in all four YITS-B cycles.

Two dependent variables are examined. The first (Y_{12}) indicates whether students enrolled in the first year of their first program are continuers (C), switchers (S), or leavers (L) from year one to year two. Continuers (C) are enrolled in the same bachelors level program in the next year, meaning that they continued or persisted in their program from that year to the next. This is the base or omitted case in the multinomial logit regression analysis that follows. Switchers (S) are enrolled in a different post secondary program in the following year. Given the YITS-B definitions, these students switched or transferred: (i) to another type of post secondary institution, for example a community college or vocational school, (ii) to another university, (iii) to a program at a different level (e.g. a diploma or certificate program) within the original university or (iv) to a bachelors level program with a different degree name (e.g. from a Bachelor of Commerce program to a Bachelor of Arts) within the original university. Leavers (L) are not enrolled in any post secondary education program, at any post secondary institution, in the next year. The second dependent variable (Y_{23}) shows the same outcomes for students (continuing (C), switching (S), or leaving (L)) from year two to three, but only for those students who continued in their first program into their second year. Table 2 shows the proportions of continuers, switchers and leavers for the year one to two (Y_{12}) and the year two to three (Y_{23}) samples of students, where all observations are weighted by the YITS-B population weights.

Variables showing students' personal and background characteristics are constructed from the YITS-B data. Table 1 shows their means and standard deviations weighted by the YITS-B population weights. The age dummy variables (under 19, equal to 19, over 19) show students' ages at the start of their first program. `low_HS_grades` is a dummy variable that equals one if students' average grade in their last year of high school was under 80%. `HS_engagement_index` is a scale variable constructed by Statistics Canada that provides a

measure of students' academic engagement in their last year of high school. `two_parents` is a dummy variable that equals one if the student lived with two parents or guardians in their last year of high school. The next set of dummy variables in Table 1 shows parents' highest level of education. `student_loan` equals one if the student received a government sponsored student loan in his or her first academic program. The following set of dummy variables indicate students' major field of study in their first post secondary program and `part_time` equals one if the student studied part time.

Data on university characteristics; namely, size, research intensity, and selectivity were collected from publicly available sources. The characteristics change very little over time, relative to one another, so each university is kept in the same dummy variable categories over all of the sample years. Four size category dummy variables are constructed from the 1999/00 full time equivalent student enrolments (CAUT 2003) of each university and used to control for university size. Four dummy variables showing levels of research intensity or the orientation of the university are defined from the research funding per faculty member, averaged over the 2000 to 2003 period (CAUT 2004-2006). Lastly, the 1999/00 average high school grade of entering students (Macleans 2003) is used to reflect the selectivity of the university. There is less variation in average entering grades so only three category dummy variables are used to control for selectively differences across the universities. The size, research intensity, and selectivity dummy variables provide far more information on and discrimination across the schools than would be provided by the Carnegie classification (used by Macleans) of the universities.

Lastly, year dummy variables are created to indicate the calendar year of the first year of a student's first program. They are included to control for any fixed, year specific, cohort effects.

5. Expected impacts

A later withdrawal date gives students more opportunity to withdraw from their courses without academic penalty. The alternative to withdrawal is remaining enrolled in the course and receiving a passing or failing grade. Since later withdrawal dates give students more options, it seems reasonable that they would facilitate more course withdrawals and fewer low or failing grades. The higher grade average and fewer credits completed should, in turn, facilitate program changes and lead to a higher probability of transfers (switches) between programs and institutions. The increased ability to make adjustments by withdrawing and switching programs, without incurring any academic penalties, should also decrease exits (leavers) from the post secondary system. But another possibility is that later withdrawal dates make it easier for students to withdraw altogether (bail out) rather than persevering and finishing courses. Or more withdrawals may slow down students' progress so much (due to the time inconsistency problem: short term relief from course withdrawals at the expense of worse long term outcomes) that they cannot afford to continue for the extended time in school. Or students may become discouraged with their slow progress and not return the next year. So, all things considered, the expected ultimate effect of later withdrawal dates on exits is ambiguous.

More generous tuition refunds decrease the cost of withdrawing from courses, so it is expected to also facilitate withdrawals and have the same predicted effects as later withdrawal dates. Increasing the number of courses covered by the flat fee tuition means that tuition becomes a sunk cost for more courses. This decreases the financial incentive to withdraw from a course since the student cannot receive the potential tuition refund. Thus it is expected to have the opposite effects as increased tuition refund generosity.

6. Estimation Method

Multinomial logit regression analysis is used to estimate whether course withdrawal dates and tuition refund generosity are related to students' decisions to continue in their first program (C), switch to another program or institution (S), or leave post secondary education (L), after controlling for the other right hand side variables. The probability of each outcome, between the first and second years, is specified as follows:

$$\text{Prob}(Y_{12} = j) = \frac{e^{X\beta^j}}{e^{X\beta^C} + e^{X\beta^S} + e^{X\beta^L}}, \quad j = C, S, L$$

where $\mathbf{X}$ is the matrix of right hand side variables consisting of the variables shown in Table 1 (excluding the omitted categories) and dummy variables for the cohort year and institution size, research orientation, and selectivity categories. β^j is the vector of regression coefficients, estimated by maximum likelihood methods. The model is unidentified as specified, so β^C is set equal to zero and only equations for the probability of switching programs (S) and leaving post secondary education (L) are estimated. This means that continuing in the first program is the baseline case and the probabilities of switching and leaving are estimated relative to that base case. The same model is re-estimated for the probability of each outcome between the second and third years (Y_{23}). The marginal effect of each right hand side variable is calculated from the estimated coefficients and reported in Table 3 along with estimated asymptotic t-statistics.

Estimating the standard errors or t-statistics of the estimates is problematic because the data have a grouped or clustered structure. Specifically, each withdrawal date and tuition refund policy covers a group of observations. If students' outcomes are correlated within the groups (conditional on the right hand side variables), which is to be expected, then the usual t-statistic estimates are biased upwards. To correct for clustering, the t-statistics in Table 3 are calculated using an estimate of the covariance matrix that is robust to correlations within each group as well

as heteroscedasticity. Angrist and Pischke (2009 p.312) set out the formula for robust covariance estimates and argue that it provides a good correction as long as there are a sufficient number of groups or clusters. 42 clusters is mentioned as a potential benchmark. The year one to year two (Y_{12}) regression has 140 groups or clusters and the year two to year three (Y_{23}) regression has 123 clusters, so the asymptotic t-statistics reported in Table 3 should not be biased upwards.

7. Estimation Results

Table 3 reports the estimated marginal relations, evaluated at the sample means, with controls for university size, research intensity, and selectivity, and fixed year effects. The top row of Table 3 shows that students attending universities with later withdrawal dates are more likely to switch to another program between their first and second year. If students can withdraw from a course without academic penalty one week later in the term (roughly a 0.08 increase in `withdrawal_date`) then the probability of transferring to another institution, level, or program is predicted to be about one percentage point higher. Withdrawal dates are also positively related to transfers between years two and three, but the estimate is far from statistically significant. Later withdrawal dates are correlated with less exit from post secondary education in all years, which is consistent with the expectation that more students are adjusting by switching programs or institutions rather than exiting, but the estimates are not statistically significant.

More generous tuition refunds are also associated with more program switches across both years, but the estimates are far from statistically significant. Refund generosity is not significantly related to students leaving post secondary education between their first and second year. But students at schools with more generous tuition refund schedules are estimated to be less likely to leave post secondary education between year two and year three. A one standard

deviation increase in refund generosity is predicted to decrease the probability of leaving post secondary education by roughly 0.9 percentage points.

Surprisingly, the number of courses not eligible for tuition refunds (`#flat_fee_courses`) is estimated to be positively related to students' switches between the first and second years. The predicted probability of switching to another program or institution from first to second year is 2.45 percentage points higher if schools switch from refunds on a per course basis (`#flat_fee_courses=0`) to charging the same flat fee tuition regardless of whether students are enrolled in four or five courses (`#flat_fee_courses=1`). This is contrary to the expectation that fewer opportunities for course refunds would reduce flexibility and decrease the probability of switches. Number of flat fee courses is similar to `withdrawal_date` in that it is not estimated to have a statistically significant association with switches between years two and three, or the probability of leaving post secondary education in any of the years.

Most of the estimated relations with the other right hand side variables are consistent with those found in the literature. Women are much less likely (than men) to leave post secondary education before the start of their second year but, conditional on continuing to second year, women are slightly more likely to leave between their second and third years. The former effect is much larger than the latter so, overall, women are less likely to exit from post secondary education. Women are also more likely to switch programs between their second and third years, but the estimate is only significant at the 7.4% significance level. Students with lower high school grades are more likely to leave post secondary education after year one and after year two, but only the exit after year two estimate is statistically significant. Lower high school grades are also associated with more program switching between years two and three. Students with higher measures of high school academic engagement are less likely to switch programs or

leave post secondary education between years one and two. The significance of high school engagement does not persist past the first year, however, since all the year two to year three outcomes are statistically insignificant. Students with parents who graduated from college or university are estimated to have lower probabilities of switching programs between their first and second years, but the estimates are not statistically significant at conventional levels. Contrary to the literature, older students and those who lived with two parents in high school are not estimated to be more likely to leave university, but those from two parent families are more likely to switch programs between years one and two.

Students' major field of study is not significantly associated with student's switches or exits, with the exception of undecided or undeclared students who (not surprisingly) are much more likely to switch programs or leave post secondary education. Part time students are estimated to be much more likely to switch programs or leave post secondary education between years one and two, but are less likely to switch programs after the start of their second year of schooling. Receipt of a government sponsored student loan is not estimated to have statistically significant relation to any of the switching or leaving outcomes.

One potential concern is that institution specific effects are not captured adequately by the controls for institution size, research intensity, and selectivity. If so, the estimates may result from other university effects (on students' outcomes) that are correlated with withdrawal dates and tuition refunds. To control for this, the models were re-estimated with dummy variables for each institution replacing the institution size, research intensity, and selectivity category variables. This allows each university to have its own separate fixed effect on the dependent variables. All of the other right hand side variables (gender, major, HS grades, year ...) are still included in the estimation. The results with individual university fixed effects are not reported

here for brevity, but differences from those reported in Table 3 are as follows. The biggest difference is that the negative relation between `refund_gen` and exits after second year is not estimated to be statistically significant. This is not surprising since universities changed their refund policies less than they changed withdrawal dates over the years of the sample, so there is less variation in refund policy over time within each university. This means that the significant coefficient between exits and `refund_gen` shown in Table 3 is identified largely by the variation in refund generosity across schools and the estimated differences in exits may be due to other unspecified differences in universities (fixed university effects). The estimated coefficient on `#flat_fee_courses` remains positive and statistically significant when individual university dummy variables are included, but there is very little variation in `#flat_fee_courses` over time so the coefficient is poorly identified and it cannot be considered reliable.

Students facing later withdrawal dates are estimated to be much more likely to switch programs between years one and two when the individual university fixed effects are included. The estimated coefficient is roughly three times as large and statistically significant at much lower probability thresholds than the one shown in Table 3. The estimate on `withdrawal_date` remains virtually unchanged if the tuition refund variables are not included in the fixed effects regression, so the result is robust and not due to an interaction with the tuition refund variables.

8. Conclusions and Discussion

This paper estimates whether an academic regulation (course withdrawal deadlines) and a university finance policy (tuition refund generosity) are related to the following education outcomes: whether students continue in their first university program, transfer to another institution or program, or exit postsecondary education, from their first year to their third year in

university. All of the results control for students' personal characteristics, academic and family background, university major, part time status and cohort year effects. The baseline specification (Table 3) also controls for university size, research orientation, and selectivity. An alternative specification replaces the university characteristics with fixed effects for each individual university and the resulting differences in estimates are reported.

The estimates show that university regulations and finance policies are related to the students' outcomes considered here. Later course withdrawal dates are correlated with more program switching between students' first and second years, although the estimated increase in switching is not large in the baseline case (Table 3). This supports the expectation that later withdrawal dates (with no academic penalty) provide more flexibility for students to transfer (switch) to other programs or institutions that are more appropriate for them. It seems likely that the additional adjustments would result in less exit from post secondary education but, as noted above, the effect could work in the opposite direction. In this case, the relevant coefficients are estimated to be negative, indicating less exit when there are later withdrawal dates, but they are not statistically significant. The results for course withdrawal dates are robust to the inclusion of dummy variables for each individual university to capture fixed university effects. In fact the impact of withdrawal dates on switching programs is estimated to be much larger when individual university fixed effects are included.

More generous tuition refunds are associated with a lower probability of leaving post secondary education between students' second and third years when controls for university characteristics are included (Table 3). This is consistent with the expectation that more generous tuition refunds provide students with a greater ability and willingness to make adjustments to their courses and programs, resulting in less exit. The estimated coefficients on switching are

positive for all years but they are far from statistically significant. The results for refund generosity, however, are not as robust as those for withdrawal dates. They become statistically insignificant when individual university fixed effects are included.

There is a positive estimated relation between the number of courses covered by flat fee tuition and transfers between students' first and second years in the baseline case (Table 3) but the estimate is poorly identified when fixed university effects are included. The estimated sign contradicts the expectation that fewer refund opportunities reduce the incentives to withdraw from courses and switch programs. It is possible that the nonlinear pricing scheme yields more complex incentives and student responses than the expectations considered here. This possibility highlights the important caveat that a rigorous theoretical model of students' decisions regarding enrolments in courses, withdrawals and completions, and program transfers and exits has not been constructed. Instead, simple expectations about likely effects have been set out and the effects on exits and switches tested. A further caveat is that the mechanisms through which the university policies are expected to affect switches and exits (i.e. more course withdrawals, fewer courses completed (pass or fail)) cannot be tested directly. The YITS data sets do not provide data on students' courses, credits, and withdrawals so the expected impacts on numbers of withdrawals, courses completed, and credits earned cannot be verified.

It is clear that the estimates above provide only a first step in the analysis of university policies. Future work also requires an examination of how the academic regulations and financial policies affect the probability of completing a degree or other post secondary credential and especially the amount of time required. The higher number of transfers associated with later withdrawal dates may ultimately increase graduation rates and the amount of post secondary education completed since transfers to other programs provide an important means for students

to complete more post secondary education and obtain post secondary credentials. See, for example, Bowen et al. (2009), Choy (2002), and Horn and Carroll (2001) for evidence on this for American post secondary students. Martinello (2008) and Finnie and Qiu (2008) provide evidence for Canadian students. On the other hand, the additional flexibility and attendant program switches may result in more “milling around”, with negative effects on the amounts of post secondary education completed, graduation rates, and time to a degree or other post secondary credential (Adelman 2006). The outcomes of students’ second programs (which are the targets of the switches) and any other subsequent programs must be examined to determine the policies’ ultimate effects.

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Table 1. Right Hand Side Variables,
weighted by the YITS-B student samples' population weights

Variable	Year 1 to Year 2		Year 2 to Year 3		Comments
	<u>Mean</u>	<u>Std. Dev.</u>	<u>Mean</u>	<u>Std. Dev.</u>	
female	0.578	0.494	0.597	0.491	dv
visible_minority	0.185	0.389	0.194	0.396	dv
age_under_19	0.362	0.481	0.368	0.482	dv
age_equals_19	0.511	0.500	0.526	0.499	dv, omitted category
age_over_19	0.127	0.333	0.106	0.308	dv
low_HS_grades	0.322	0.467	0.292	0.455	dv
HS_engagement_index	0.375	0.857	0.427	0.850	
two_parents	0.861	0.346	0.856	0.351	dv
parents_less_than_HS	0.039	0.194	0.043	0.202	dv
parents_HS_graduate	0.167	0.373	0.157	0.363	dv, omitted category
parents_college_graduate	0.252	0.434	0.258	0.438	dv
parents_university_graduate	0.509	0.500	0.515	0.500	dv
parents_education_unknown	0.034	0.181	0.028	0.165	dv
student_loan	0.291	0.454	0.289	0.453	dv
humanities_education	0.201	0.401	0.211	0.408	dv
social_sciences	0.242	0.429	0.261	0.439	dv
business_management	0.113	0.317	0.122	0.327	dv
science_engineering	0.282	0.450	0.274	0.446	dv
recreation_health_agriculture	0.089	0.285	0.098	0.298	dv, omitted category
undecided_undeclared	0.054	0.226	0.026	0.160	dv
part_time	0.018	0.133	0.008	0.087	dv
withdrawal_date	0.678	0.146	0.673	0.150	
refund_gen	0.311	0.092	0.308	0.094	
#flat_fee_courses	0.420	0.647	0.392	0.632	

HS is an abbreviation for High School. dv signifies a dummy variable. Std. Dev. is standard deviation.

Table 2. Proportions of Continuers, Switchers and Leavers

	<u>Year 1 to Year 2 (Y₁₂)</u>	<u>Year 2 to Year 3 (Y₂₃)</u>
Continuers (C) who persist in the same program	0.8034	0.8626
Switchers (S) who transfer to another post secondary institution or program	0.1139	0.0980
Leavers (L) who exit post secondary education	0.0827	0.0395
Number of observations	3,483	2,541

Table 3. Estimated marginal effects on switching programs or institutions, and leaving post secondary education

Variable	Year One to Year Two (Y ₁₂)		Year Two to Year Three (Y ₂₃)	
	<u>Switch</u>	<u>Leave</u>	<u>Switch</u>	<u>Leave</u>
withdrawal_date	0.127* (1.98)	-0.060 (-1.12)	0.052 (0.82)	-0.009 (-0.44)
refund_gen	0.033 (0.33)	-0.002 (-0.02)	0.080 (0.90)	-0.101* (-2.55)
#flat_fee_courses	0.025* (2.36)	0.001 (1.12)	0.001 (0.07)	0.005 (0.87)
female	-0.007 (-0.52)	-0.042* (-2.49)	0.026 (1.78)	0.013** (2.66)
visible_minority	-0.039** (-2.70)	-0.019 (-0.89)	-0.004 (-0.14)	-0.008 (-0.88)
age_under_19	0.018 (1.13)	0.011 (0.63)	0.035 (1.81)	0.003 (0.37)
age_over_19	0.031 (0.82)	0.020 (0.71)	0.001 (0.02)	0.001 (0.09)
low_HS_grades	0.011 (0.74)	0.019 (1.50)	0.048* (2.30)	0.040** (3.47)
HS_engagement_index	-0.017** (-2.98)	-0.014* (-2.12)	-0.010 (-1.00)	0.001 (0.32)
two_parents	0.049** (3.35)	-0.021 (-1.25)	-0.004 (-0.17)	-0.005 (-0.50)
parents_less_than_HS	-0.033 (-1.38)	-0.011 (-0.49)	-0.002 (-0.05)	0.027 (0.93)
parents_college_graduate	-0.028 (-1.70)	-0.000 (-0.03)	-0.005 (-0.22)	0.009 (0.85)
parents_university_graduate	-0.020 (-1.45)	-0.004 (-0.28)	0.008 (0.31)	-0.003 (-0.28)
parents_education_unknown	-0.046* (-2.54)	-0.052** (-4.55)	-0.016 (-0.30)	-0.019** (-2.93)
student_loan	0.019 (1.30)	-0.008 (-0.73)	-0.006 (-0.28)	0.009 (0.98)
humanities_education	0.018 (0.89)	-0.015 (-0.82)	0.002 (0.05)	0.011 (0.77)
social_sciences	0.019 (0.82)	-0.015 (-0.79)	0.002 (0.06)	-0.008 (-0.87)

business_management	-0.019 (-1.01)	0.008 (0.24)	-0.040 (-1.56)	0.004 (0.32)
science_engineering	0.017 (0.85)	0.018 (0.69)	0.003 (0.11)	0.004 (0.32)
undecided_undeclared	0.291** (5.25)	0.086* (2.16)	0.360** (3.90)	0.095 (1.42)
part_time	0.274** (2.60)	0.182** (2.61)	-0.063* (-2.33)	0.021 (0.76)
university size category variables	included	included	included	included
university research intensity category variables	included	included	included	included
students' entering grade category variables	included	included	included	included
year dummy variables	included	included	included	included
number of observations	3,483	3,483	2,541	2,541

*, ** denote significant at the 5% and 1% levels, respectively
Asymptotic t-statistics are in parentheses

Figure 1. Last date for course withdrawals, as a proportion of the term

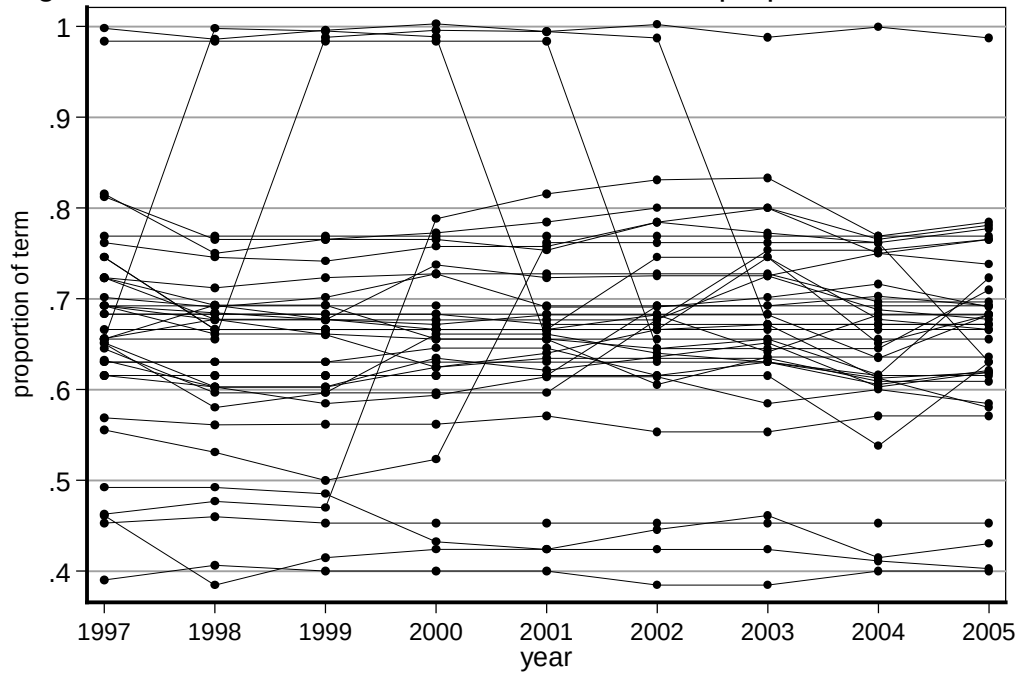


Figure 2. Tuition refund generosity index

