The Patterns of Persistence in Post-Secondary Education Among College Students in Ontario: New Evidence from Longitudinal Data

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This paper reports the results of an analysis of persistence in post-secondary education (PSE) for college students in Ontario based on the extremely rich YITS-B dataset that has been used for other recent studies at the national level. We calculate hazard or transition rates (and cumulative transition rates) with respect to those who i) graduate, ii) switch programs, and iii) leave PSE (perhaps to return later). We also look at the reasons for switching and leaving, subsequent re-entry rates among leavers, and graduation and persistence rates once switchers and re-entrants are taken into account. These patterns are then probed in more detail using hazard (regression) models where switching and leaving are related to a variety of individual characteristics, family background, high school outcomes, and early pse experiences. Student pathways are seen to be varied. Perhaps the single most important finding is that the proportion of students who either obtain a degree or continue to be enrolled somewhere in the PSE system in the years after entering a first program remains close to the 80 percent mark for the five years following entry. Seventy-one percent of students graduate within five years of starting, while another 6 percent are still in the PSE system.

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I. Introduction

Entering a (first) post-secondary education (PSE) program is just a beginning, and can be followed by many possible outcomes. Some students continue in their programs until graduation – with some proceeding at faster or slower rates than others. Other students switch to another program, either at the same institution or at another institution of the same kind (college, university) or at a different level of study. Still others abandon their studies – some of these to return at a later date.

The general objective of this paper is to provide new and unique empirical evidence on these different pathways of persistence in PSE for college students in Ontario. We present evidence on the frequency of various different trajectories, and use statistical modelling techniques to show how they vary by students' individual characteristics and family background, as well as educational outcomes at the high school level, PSE program characteristics, and other early PSE experiences.[1]

The study employs Statistics Canada's Youth in Transition, Cohort B ("YITS-B") dataset, which possesses a number of unique strengths for this analysis. The YITS-B is a national level sample of Canadian Youth first interviewed at age 18-20 in 2000 and then followed with additional interviews in 2002, 2004 and 2006.[2] It thus captures young people when they tend to be entering the PSE system and tracks them through their PSE dynamics of interest: i) graduation; ii) continuing on in the initial program; iii) switching programs within a given institution, moving to a new institution but staying at the same level of study (i.e., college versus university), or changing levels of study; and iv) leaving PSE, possibly to return to school at the original institution or another one at a later date. No other Canadian dataset allows this kind of analysis.

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[1] This paper is heavily based on Finnie and Qiu, 2008, 2009, which uses the YITS-B to look at PSE dynamics at the national level for both college and university students.

[2] A fifth cycle has subsequently been collected, but those data are not used in this analysis.

The YITS-B also includes a range of variables that permit a more detailed analysis of the transitions in question. These include the prevailing unemployment rate, basic individual demographic characteristics such as sex, and immigrant and visible minority status; family background measures, including parental education and family type (two-parent or otherwise); high school experiences as represented by the person's overall grade average and academic and social engagement; PSE program characteristics such as the age at which it was started, the number of years since starting, and whether it is a trades program; and early PSE experiences, including the receipt of student financial aid, grades, and the student's perception of the quality of teaching and the presence of a social support network.

In contrast, previous studies of persistence in PSE (and graduation rates) have – in Canada as also in most cases elsewhere – been almost entirely restricted to following students at a given institution, which implies a number of important limitations. First, mobility across institutions is not captured, and this not only precludes the analysis of various dynamics that are interesting on their own, but also leads to a general underestimation of persistence (and graduation) rates at the more general level. Second, although the results of institution-specific analyses can be important for campus planning and management and otherwise have specific relevance for the particular institution in question, they do not reflect student experiences at the broader (national or provincial) level. Finally, such studies tend not to have the richness of variables available in the YITS-B which allow us to probe these transitions in detail.

This paper thus fills an important void in the existing literature which allows the following sorts of questions to be answered:

- How many students continue in their programs after entering PSE, how many change programs, and how many leave PSE on a year by year basis from their time of entry?
- How many students who leave their initial programs subsequently return to their studies?

- Where do switchers and those who return after leaving continue their studies – at the first institution, at another institution at the same level, or at a different level of study?
- What are graduation rates from the initial program, and how do these rates change once program switchers and leavers who subsequently return are taken into account? How do persistence rates change further when those still in PSE are factored in?
- What are the reasons students cite for switching or leaving?
- How are these different transition rates related to individual, family, high school, and early PSE factors?

These and related issues are not only of academic interest, but also of significant policy relevance. If, for example, leaving rates are high, this essentially raises issues regarding PSE attainment beyond what we see in terms of who starts (or "accesses") PSE, especially if the reasons for leaving are significantly related to finances or other identifiable barriers, or are associated with being the member of a disadvantaged group (e.g., coming from a family with no history of PSE). If, on the other hand, leaving rates are significantly related to a student's educational experiences, an entirely different set of policy issues would be raised. Finally, if persistence rates are found to be significantly higher once the full set of PSE pathways is taken into account, the concern currently attached to the issue might be at least partly attenuated.

The paper is organised as follows. In Section II, we discuss the previous research on persistence. Section III describes the model specification and data. Section IV presents the empirical results. Finally, Section V summarises the main empirical findings, places them in context, and discusses possible directions for further research.

II. The Literature[3]

The persistence literature can be classified into two parts, that which focuses on overall rates of graduation, switching, and leaving, and that which analyses these patterns by various characteristics of the student, his or her situation, and other relevant factors. We discuss each of these literatures in turn.

II.1 The General Patterns of Persistence

Much of the interest in participation in PSE is grounded in empirical estimates which suggest that the returns to higher education are substantial (e.g., Ferrer and Riddell (2001)). Turner (2004) has, however, pointed out that it is to not enough to look at "access" (typically defined as entering the PSE system at some level at some point in time) when the critical element is schooling *attainment* as defined by the successful *completion* of a PSE diploma or degree. In her words (p. 14): "…many education analysts (including economists) focus on *enrolment* measures, which is an indicator of *potential* investment, rather than on degree or credits, which measures *[actual]* additions to human capital stock." (emphasis added)

This critique is, furthermore, offered in a context where persistence in PSE is much less studied than access. The main reason for this is that persistence is essentially a dynamic process, and studying it is much more demanding in terms of the data requirements, which essentially include the longitudinal tracking of sufficient numbers of students and their (detailed) PSE outcomes (Long, 2005), along with the measures of family background, high school and PSE experiences, and other factors to which it would be interesting and useful to link persistence.

Because of this data limitation, most existing studies, at least until the last couple of years, have focused on persistence at a single institution, and have thus ignored switching across institutions and other related dynamics, and are in any event not representative of any population more than the particular institutions studied. This is why the recent work

[3] See Finnie and Qiu (2008, 2009) for a more extensive literature review.

carried out by the MESA (Measuring the Effectiveness of Student Aid) Project[4] has been so significant: for the first time, a large, representative sample of students has been followed from their entry into PSE through their PSE pathways, including switching, leaving, returning, and other ways of moving through the system towards graduation – or not. Finnie and Qiu (2008, 2009) are probably the most notable pieces for the national level analysis they carry out, which also provides the foundation upon which other MESA studies were built (e.g., work by Martinello, Johnson, and Day found at the MESA web site as well as in Finnie et al (2009).

II.2 Who Leaves and Why: Factors that Influence Persistence Decisions

There exist two well known and broadly used theoretical models in the persistence literature. The first is Tinto's (1975, 1993) model of "student integration", according to which students enter PSE with various pre-entry characteristics, such as age, race, gender, family structure, parental education attainment, high school preparation, and their own skills and abilities. These factors contribute to the formation of their initial goals and their level of commitment to their studies. Once enrolled, students then begin to have their specific institution-related PSE experiences, which include their level of academic and social engagement and academic performance. Students' initial goals and commitments are then influenced and modified by these post-entry experiences. These various factors are then taken to determine persistence.

The second well known model in the literature is Bean and Metzer's (1985) "student attrition model". It's main difference from the Tinto model is that it introduces factors external to institutions, such as finances and peer effects. The student integration model also regards academic performance as an indicator (or determinant) of academic integration, while the student attrition model treats PSE experiences as an outcome on the grounds that, for example, lower grades can be a symptom of an individual's detachment from school as they begin the process which leads to their leaving.

[4] See http://mesa-project.org/.

In summary, these two models both posit that persistence decisions are affected by both pre-entry characteristics and post-entry experiences, but differ in what they include in the latter and their interpretation of some of the related effects.

In the empirical literature, however, there is no consensus on who drops out and why. In their review, Grayson and Grayson (2003) say that "…it is difficult to tell if different results of various studies reflect real differences in explanations for attrition or are simply artefacts of different methodologies…it [therefore] makes more sense to examine findings of individual studies in their own right rather than attempting to fabricate generalizations about attrition." This statement of course points to the need for more empirical work, especially if it employs a dataset that is well suited to the relevant estimation issues, is broadly representative, and uses an appropriate methodology.

A national level Canadian study based on the Post-Secondary Education Participation Survey (PEPS) found that among students who left PSE prior to completion, half of them cited "lack of interest in their programs or PSE in general" as the reason for dropping out, whereas 29 percent cited "financial considerations" (Barr-Telford, Cartwright, Prasil and Shimmons, 2003), implying that motivation plays a more important role than financial factors with respect to PSE persistence. This is, however, only a descriptive study, and does not control for other factors or probe into the determinants of these different reasons for leaving, including the various factors (e.g., family background) associated with the two models that have driven the American empirical literature.

Taking one step in this direction, Gilbert and Auger (1988) check the first-year persistence rates for students who entered the University of Guelph in the fall of 1986 to find that financial factors appear to play an important role among students with lower socio-economic status (SES), but not others. They also find that students from relatively higher SES backgrounds tend to switch to other institutions, while low SES students are more likely to stop-out.

Grayson and Grayson (2003), in their review of the literature, concluded that the few studies that consider financial constraints as a reason for leaving a PSE program show only a weak relationship between leaving PSE and finances.

Finally, Finnie and Qiu (2008, 2009) find in their econometric analysis based on the YITS-B that different sets of factors matter, depending on the precise specification of the model. For example, high school grades and experiences are important when included on their own or along with other family background factors (e.g., parental education), but then become insignificant when PSE grades and experiences are included. They also emphasize the potential endogeneity of some of these measures (e.g., PSE grades).

III. The Methodological Approach, the YITS-B Data, the Samples[5]

In the first part of this section the methodological approach used in the analysis is developed. This is followed by a description of the YITS-B data and construction of the samples employed. The final part presents the descriptive statistics associated with these samples.

III.1 The Methodological Approach

This paper essentially uses a survival analysis set-up which focuses on two different kinds of spells and the possible transitions that may occur for the individuals who start one of these. First, we look at those who start a first spell of PSE in terms of their possible (first) transitions, namely graduation, a switch to another program, or leaving PSE (at least temporarily) before graduation. The second spell/process which is analysed is the return to PSE among those who leave their first PSE program before graduation (as just defined).

The time frame for the analysis is spell time, not calendar time. Individuals enter PSE (and leave) in different calendar years, but we define the beginning time for anybody

[5] See Finnie and Qiu (2008, 2009) for further details on the material discussed in this section.

starting a spell (for each of the two processes considered) as t_0.[6,7] We then observe individuals after one year, after two years, etc. (t_1 through a maximum of t_5). The analysis is organized around these event-based one-year intervals.

For the first process (i.e., for those who start a first spell of PSE), after one year they are classified according to four possible outcomes: "continuer", "graduate", "switcher", and "leaver". For those who make one of these transitions, the first program spell ends at that point and we do not follow them any longer in this regard. For those who have not yet made one of these transitions, however, and are thus continuing in their programs, the process is repeated in subsequent years. A similar set-up characterises the re-entry process among leavers from the point they leave (defined in the first part of the analysis as just described), except the outcomes are simpler: individuals either re-enter PSE or they don't.[8]

For the descriptive analysis, we simply calculate the rates of the different transitions and otherwise work with those outcomes. For the regression analysis, a multinomial logit model is used to capture the effects of the various explanatory variables included in the analysis on the different possible transitions.

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[6] t_0 is thus mapped to different calendar year for different cohorts. For example, t_0 is mapped to the year 1997 for those who started their first program in 1997 ("cohort-1997"), to the year 1998 for cohort-1998, and so on.

[7] Since entry into PSE is highly concentrated in August and September, and because restricting the analysis to those who entered at this time made for a much cleaner and more tractable identification of the dynamics in question, individuals' spells were included only if they started PSE in these months. We then assess their status one year later, and classify them into one of the indicated categories: graduate, switcher or leaver. Note that someone who leaves early, spends some time out of school, but returns to school by the next September is classified as a switcher, while someone who goes most of the year but then fails to return to school by the second September will be classified as a leaver, even if he or she returns to school soon thereafter.

[8] Censoring of spells is also taken into account. See Finnie and Qiu (2008).

III.2 The YITS-B, the Samples Employed, and Data Issues

The Youth in Transition Survey, Cohort B (YITS-B) dataset used in this analysis is a Canadian longitudinal survey designed to facilitate the study of the patterns and determinants of major transitions in young people's lives, particularly with respect to education.[9] For the data used in this analysis, the YITS-B had gone through 4 cycles. The first interview was conducted in April 2000 when information was collected for the year 1999 and retrospectively for earlier years. A second interview was conducted in April 2002 and captured activity during 2000 and 2001, the third interview was held in 2004 and picked up activity during 2002 and 2003, and the last interview in 2006 collected information on students' activities during 2004 and 2005.

The YITS-B includes 22,378 respondents who were 18 to 20 years old on December 31, 1999, who were then followed through the subsequent interview cycles. The sample frame is thus clearly well suited to tracking young people as they move through their first PSE experiences, and its focus on PSE-related information (among other early transitions) allows the construction of the detailed PSE profiles required for this analysis with relatively little recall bias. Finally, the dataset includes a selection of interesting variables to include as explanatory factors in the analysis.

For the work reported in this paper, individuals who did not have any Canadian PSE experience over the observed period (prior to December 31, 2005) were excluded. Individuals who started PSE before 1996 were also screened out, since there were few such persons and they tended to be sufficiently young to be considered as outliers (with recall bias also being an issue).

When we link the four cycles of the YITS together to track students' PSE trajectories over time, information could be lost for two reasons. First, there is attrition from the YITS-B over the period studied. Among the 22,378 respondents who were interviewed the first time, 18,779 were included again the second interview, 14,817 respondents

[9] See Youth in Transition Survey (2003), Motte et al (2009).

participated in the third interview, and 12,435 remained in the last interview. Rather than restrict the analysis to individuals who were present all four cycles and risk introducing the associated sample bias and otherwise limiting the analysis, we kept such individuals until they actually attrited from the sample, at which point they were treated as right-censored.[10]

The second issue with respect to information being lost over time relates to what the YITS-B refers to as "ineligible programs", which basically has to do with inconsistencies in an individual's record in terms of the reporting on PSE programs across YITS interview cycles. After a detailed analysis of the relevant issues, we treat these data in three different ways (see Finnie and Qiu (2008) for a detailed description), which we present below for the initial transition or hazard rates, but regarding which we identify our preferred treatment which is used as the basis of the analysis.

The final sample includes 1,848 individuals whose first PSE program was in an Ontario college, and another sample of 2,223 individuals who started in college in another other province ("ROC" for rest of Canada) for comparison. (We exclude Quebec, because it is less comparable due to its CEGEP system.) In each case, these samples consist of nine cohorts defined with respect to the year of entering PSE: cohort-1996 through to cohort-2004.

III.3 Sample Characteristics

Table 1 shows the characteristics of the individuals selected into our samples of those entering their first PSE programs (college level) used in this analysis. These are shown for the Ontario group being focused upon, as well as the comparison rest of Canada sample ("ROC" – excluding Quebec for the reasons mentioned above).[11] All results

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[10] Various tests carried out for the MESA project indicate that the sample weights constructed for the YITS by Statistics Canada do a good job of adjusting for attrition, at least with respect to observables. Left-hand censoring is not an issue with this sample since we capture all individuals from the beginning of their PSE programs if this occurred at any point over the period covered by the sample.

[11] Students' level of study is determined using the relevant YITS variable that includes the following categories: 02 Attestation of Vocational Specializations (AVS or ASP); 03 Private Business School or

shown here and below were generated using the weights constructed by Statistics Canada for the YITS, which are designed so that the samples, and any analysis based on them, should reflect the underlying population, after allowing for the relevant sample selection procedures employed – in our case those aged 18-20 in 1999 who subsequently started a college level program.

The Ontario sample has slightly more females than males (52 versus 48 percent), whereas it is almost perfectly balanced for ROC. Immigrants make up 11.7 percent of the Ontario sample, which exceeds the rate for ROC (8.4 percent). Fourteen point six percent are identified as visible minorities (12.8 elsewhere). The age distribution reflects the system that prevailed before OAC was abolished in Ontario, with just 20.5 starting at age 18 or younger and 45.9 percent at age 19, which is quite different from ROC (39.5 and 26.0 percent respectively). About a third of all students start at age 20 or older in each jurisdiction. Region is naturally given only for ROC.

The distributions for family type and parental education make sense and are consistent with other studies: Ontario has somewhat more single parent families, and parental education is a bit skewed towards having fewer with just high school, more having college, and fewer holding university diplomas.

Ontario college students tend to have had fewer As, more Bs, and fewer Cs and below in high school, and roughly similar patterns hold for them once they are in college. They also have fewer forms of all kinds of aid, especially scholarships and grants. Students

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Training Institute Diploma or Certificate; 04 Registered Apprenticeship Program; 05 College or CEGEP program; 06 University transfer program at a college or CEGEP; 07 College post-diploma or graduate level program; 08 University diploma or certificate BELOW Bachelor's; 09 Bachelor's degree; 10 First Professional degree; 11 Graduate-level diploma or certificate above Bachelor's, below Master's; 12 Master's degree; 13 Ph.D. degree; 20 Diploma, certificate or license from a professional association as in accounting, banking, or insurance. Our college sample includes categories 02 through 07. Note that private business schools are included, partly because they are still college students, and partly due to concerns that this differentiation may not be reliable in the YITS-B data. Institutional identifiers are missing for about 43 percent of the Ontario college sample. Of those which were identified, 95 percent were one of the 24 public colleges in the province. It is thus assumed that private colleges represent only a small portion of the total sample.

both in and out of Ontario seem to have similar assessments of their teachers' ability, with almost 60 percent saying "most" are strong. About 40 percent report some level of trouble with keeping up with their work load, about three quarters say there are people at school to talk to, and 80 percent say their first year helped them obtain useful skills.

IV. EMPIRICAL FINDINGS

We turn now to the results of our empirical analysis of persistence based on the YITS data. We first present a descriptive analysis of the various transitions and other rates which describe the different pathways students take after entering PSE. We then use a modelling approach to see how switching and leaving PSE are related to the various explanatory variables previously mentioned.

IV.1 Descriptive Analysis

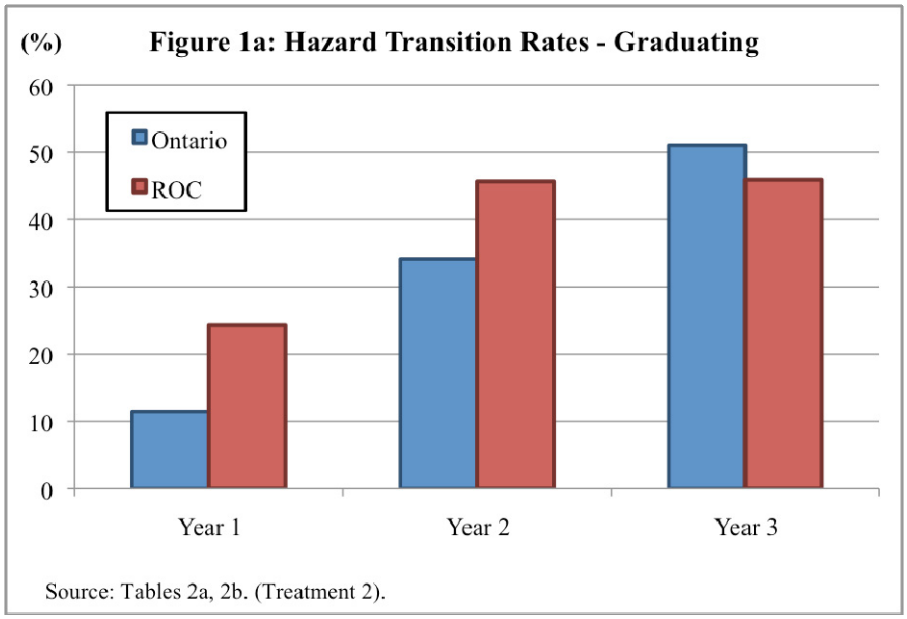
Hazard and Cumulative Transition Rates: Persistence in PSE

Tables 2a and 2b (all tables are included at the back of the paper) show the hazard (transition) rates for college students in Ontario and ROC, respectively. The calculations show the proportion of students who, during each year of their (first) program – one through five – made each of the relevant transitions, namely that they graduated from the program, they switched to a new program, or they left PSE. Switchers are further differentiated by where they switched to: the same level or (very rarely) a different level in the same institution, or to a different institution, either at the same level or a different one. For each year, these rates are calculated for those students who had not previously made one of these transitions or were censored in the current year or in a previous one, thus representing the rates for those who were observed in the relevant year and had continued their studies up to that point in time. Once a transition is made, individuals are dropped from this part of the analysis (since they have made one of the relevant transitions – as explained earlier). We thus capture "first transitions" of the relevant population in each year.

Three sets of results are presented in the tables, corresponding to the different treatments of ineligible programs previously discussed, which is consistent with earlier work by the

authors (Finnie and Qiu, 2008, 2009) and allows for detailed comparisons with that earlier work for those interested in doing so. We focus on the second treatment, however, which we think is best. The rest of our discussions are confined to this treatment.

We present the key results in Figures 1a, 1b, and 1c, which show the transition rates graphically: graduating, switching (to any other program), and leaving. One general finding is that switching and leaving rates are considerably higher in the first year than in the following years, which suggests that "drop-out" rates (from the first PSE program) decline substantially over the course of a program.[12]



Graduation rates are quite low in the first year (11.5 percent), then of course rise in subsequent years, such that higher proportions of those still in school graduate in each year (34.2 and 51.0 percent in years two and three). Rates in year one and two are higher elsewhere in Canada, but are a little lower in the last year.[13]

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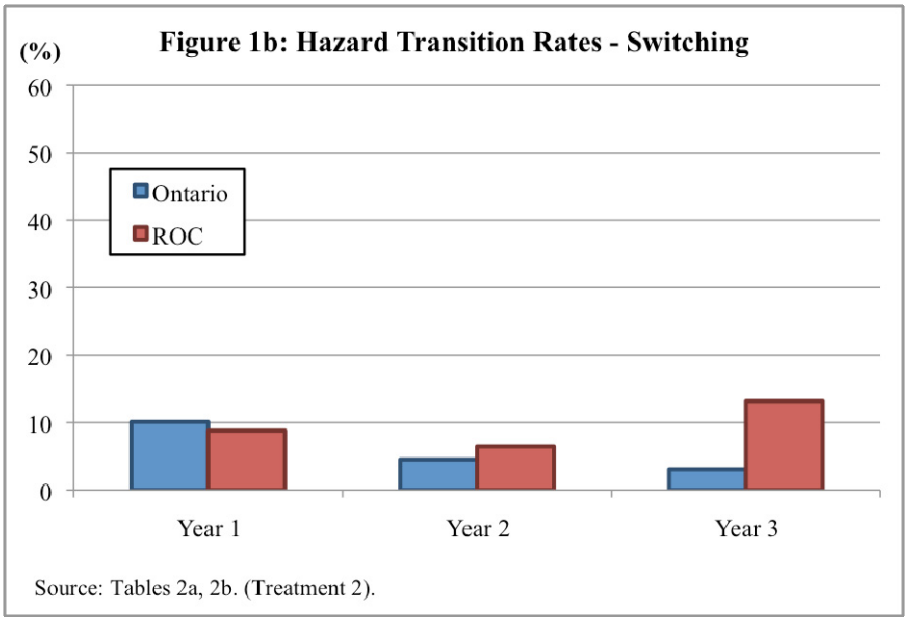
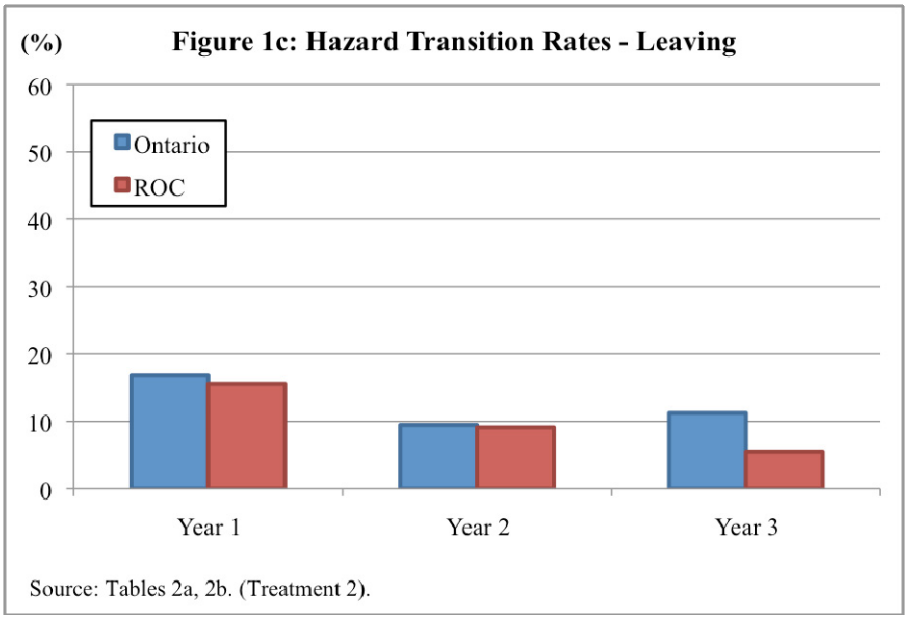
[12] One exception here is the relatively high switching rates in year 3 for ROC. This likely represents university-transfer programs, which are especially popular in Alberta and British Columbia.

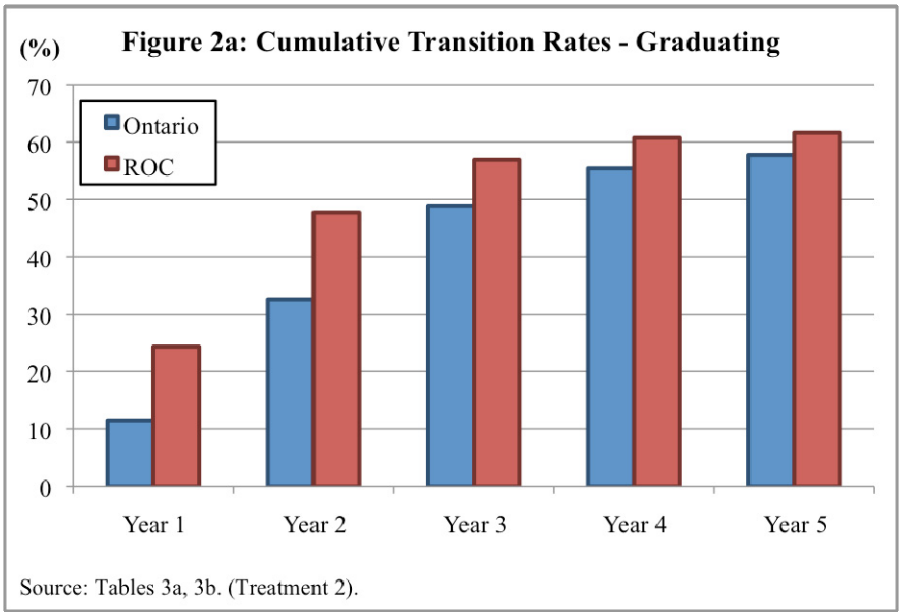
[13] Comparisons with the rest of Canada are presented only for descriptive purposes and should be read with caution, since differences could be related to a range of factors, including the purposes and structures of the college systems across the country and the characteristics of students. A more analytical comparison could be carried out, but such an exercise is beyond the scope of this paper.





Switching rates are lower – 10.1 percent in year one, then under 5 percent after that. A good part of that is to a different program at the same institution, especially in the first two years. The one- and two-year rates are very similar for ROC, and the divergence in year three has been referred to (likely university transfer programs in the West).

The first-year "dropout rate" is 16.8 percent in Ontario, then hovers around the 10 percent mark in the second and third years for those who make it that far. These rates are very slightly higher than the rates for ROC, except in year 3, when university transfer programs may skew things a bit (i.e., a number of those still in school at that point switch to university).

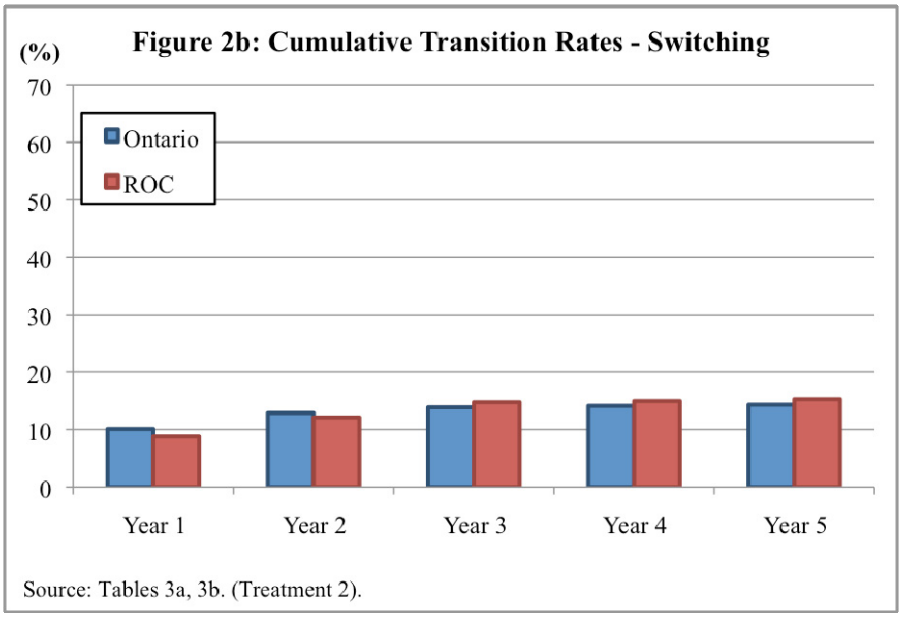


Tables 3a and 3b show the *cumulative* transition rates by year which are calculated from the hazard rates shown in Tables 2a and 2b, and show how many of the total starting population are still continuing in their studies and how many have made each of the relevant transitions by the point in time indicated (after one year, after two years, after three years).[14] These are shown graphically in Figures 2a through 2c.

The first year rates are by definition the same as those already seen above, while the second year cumulative transition rates are obviously higher as the transition rates from the two years are added together, and so on for later years. Turning first to leavers (Figure 2c), we see from this perspective just how many who leave do so in the first year –

[14] These are calculated by adding the first year rates plus the second year rates applied to the proportion of students who had not made a transition in the first year and thus continued forward, plus the third year rates applied to the proportion of the initial population that had still not made a transition, and so on.

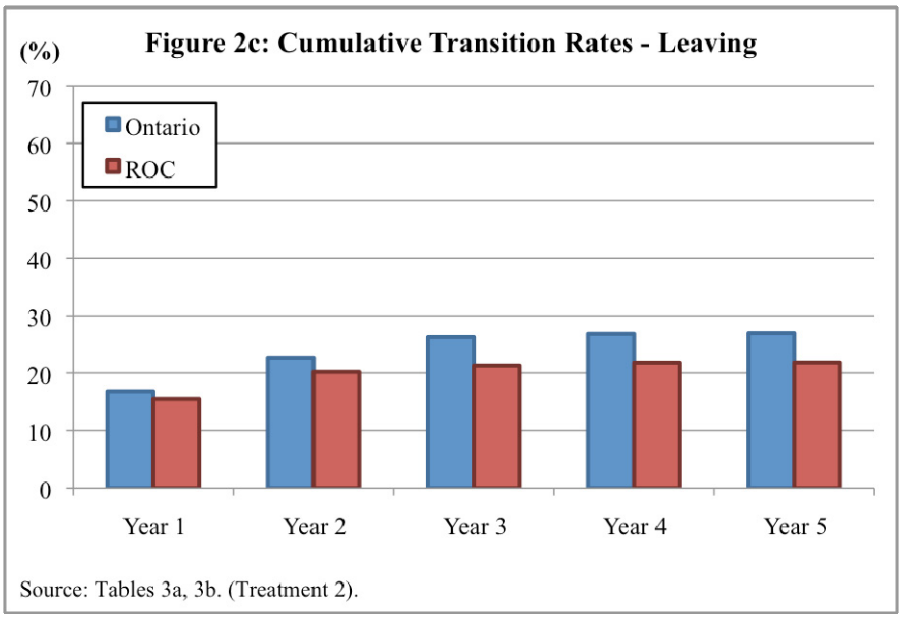
measured here as students who either drop out during term in the relevant academic year or who do not return for their studies the next year. That said, the rates do rise over time, from 16.8 percent to 22.7 percent to 26.3 percent in years one through three. By that time, virtually all the leaving that is going to happen has indeed occurred. In short, just over a quarter of all those who start a college program in Ontario leave that program without graduating or switching to another program. Leaving rates for Ontario are consistently somewhat greater than in ROC, where the three-year rate is 21.3 percent.



Switching rates are even "flatter" over time, rising from 10.1 through 12.9 to 13.9 percent, respectively, in the first three years. The greatest part of this (8.0 percent by year three) is to a new program within the same institution, another 2.9 percent is to a different college, and just 1.5 percent of all college starters switch (directly) to university by three years after starting. These rates are overall very similar to those in ROC.

Finally, what of the all-important graduation rates? These total 11.5 percent of all starters in first year (seen above), shoot up to 32.5 percent in the second year, and continue rising to 48.8 percent in year three. Looking even further down the line gives a rate of 57.8 percent by the end of the fifth year. Interestingly, these rates are lower than elsewhere in

Canada in the earlier years, but then become closer over time, so that the five year rate is just 4 percentage points lower (61.6 percent in ROC).



We shall see below how these graduation rates change even further once we take into account those who leave PSE but then graduate from other programs, and those who are still in school in other programs.

Reasons for Switching and Leaving

Table 4 shows the reasons individuals who leave their program or switch to another program cite for doing so. These results are reported for the populations of leavers and switchers identified in the preceding part of the analysis.

"Didn't like it/not for me" is by far the single most common reason for both switchers (45.3 percent) and leavers (41.1 percent). "To change schools or programs" is the second most common reason for switchers (25.0 percent), for whom it verges on being a meaningless answer but at least does rule out some of the other more specific reasons such as not having enough money. "Not enough money" is, interestingly, cited by just 6.8 percent of switchers, and 9.7 percent of leavers. The latter result implies that only 2.6

percent of all those who start a college program in Ontario leave it because of money problems within their first five years (26.9 percent leave, and of these 9.7 percent cite money reasons.) Other specific reasons cited by college leavers include "wanted to work" (10.3 percent), and "marks too low" (9.0 percent). Other reasons are less common.

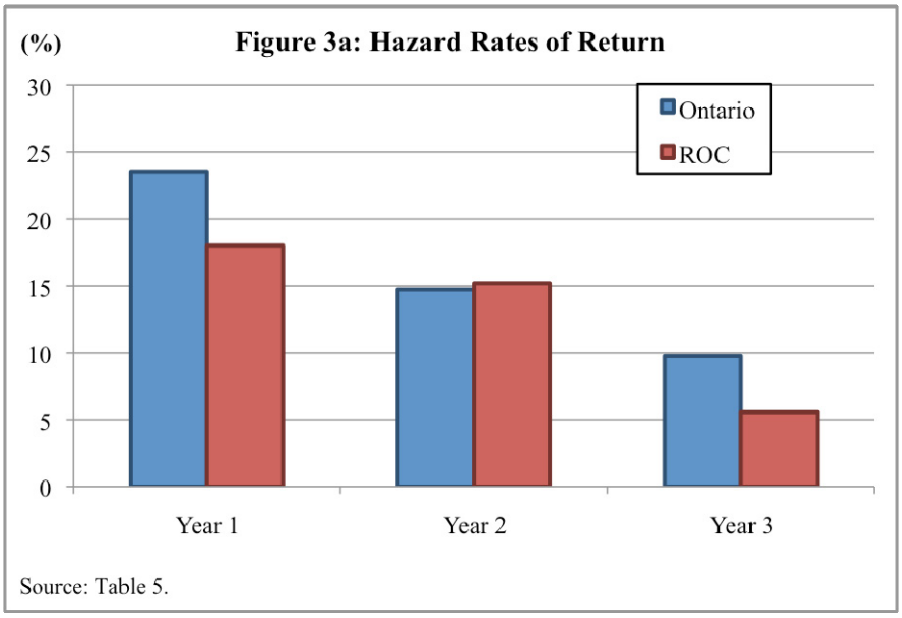
A relatively lower percentage of students in ROC cite the "didn't like it/not for me" reasons (33.7 percent) for leaving, while other categories are either similar, or too small to report/compare.

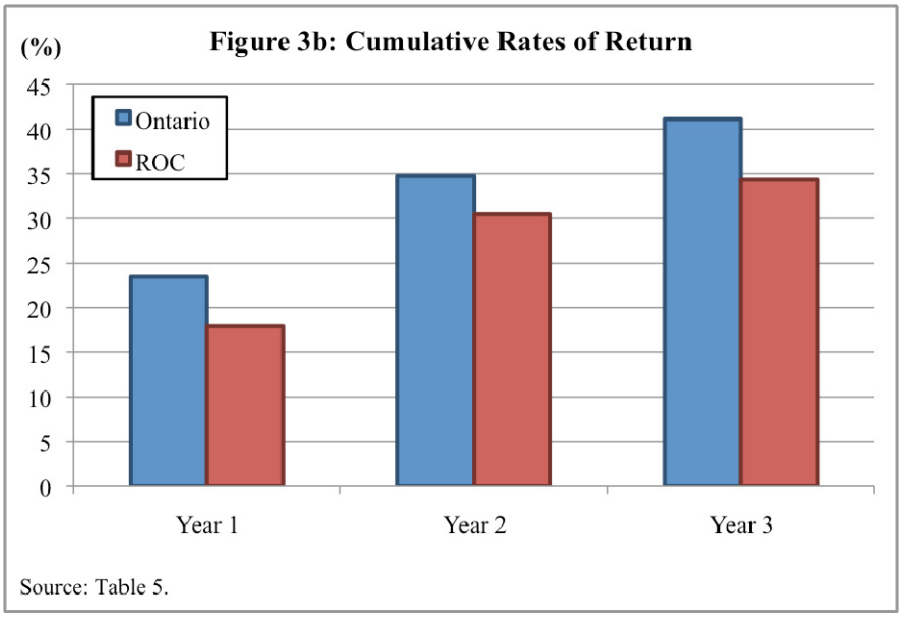
Of course these reasons must be seen in the perspective of the self-report nature of this variable. The true "objective" reasons for leaving and switching may differ from what students say.

How Many Return to PSE after Leaving

Table 5 shows the rates of returning to PSE among students who left their first program and who did not immediately switch to another program. To analyse this dynamic, we take those identified as "leavers" in the first part of the analysis and follow them to see how many are found in another PSE program in subsequent years. The first panel in the top part of the table shows the hazard or transition returning rates for Ontario, and the second panel shows the cumulative returning rates, calculated from the hazard rates shown in the first panel. This is repeated for ROC in bottom part of the table. The key overall hazard/transition rates and cumulative rates are shown in Figures 3a and b.

We find that by one year after having left school, 23.5 percent of the college leavers have returned to PSE. Rates fall off significantly after this. The cumulative rates show the totals at each point in time and reveal that by three years after leaving (the furthest we can measure with sufficient precision in these data), the returns stand at 41.1 percent. These are substantial numbers, and are in fact a bit higher than for ROC, where the three year rate is 36.8 percent.



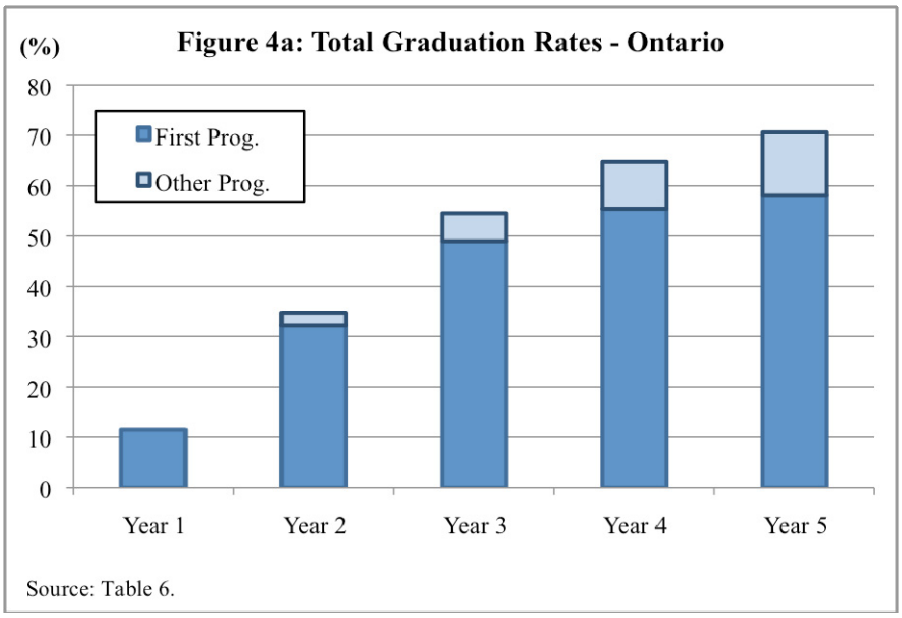


Again we see (like the switchers above) that the greatest number return to another college program (25.1 percent – or 61 percent of those who return in relative terms). Twelve

point five percent are identified as returning to a university program, but these numbers are affected by the 26.4 percent "don't know" category.

Total Graduation and Overall Persistence Rates

The overall PSE graduation rates shown in Table 6 extend the graduates category to include those who graduate not just from the first program as seen previously, but also those switchers and leavers who go on to graduate from another program they start either immediately or after first being out of PSE (i.e., leavers who then return). The key findings are graphed in Figures 4a (Ontario), 4b (ROC), and 4c (both shown together).



Taking these other graduates into account raises five-year graduation rates from 58.1 percent to 70.6 percent.[15] The "persistence" problem as defined with respect to graduation rates is thus seen to be significantly diminished when we track individuals across programs and institutions rather than looking only at the records of students within a given institution, or even just a given program in a given institution. Seen differently,

[15] The graduation rates from the first program shown here are very close to, but not exactly the same as those shown earlier. This is due to a slight shift in the means of making the relevant calculations when estimating the two different sets of persistence rates.

82.2 percent of all Ontario college graduates receive their diploma from their first program at their first institution, while the rest graduate from a different program or institution. Ontario's overall graduation rates are similar to those in ROC from this perspective.

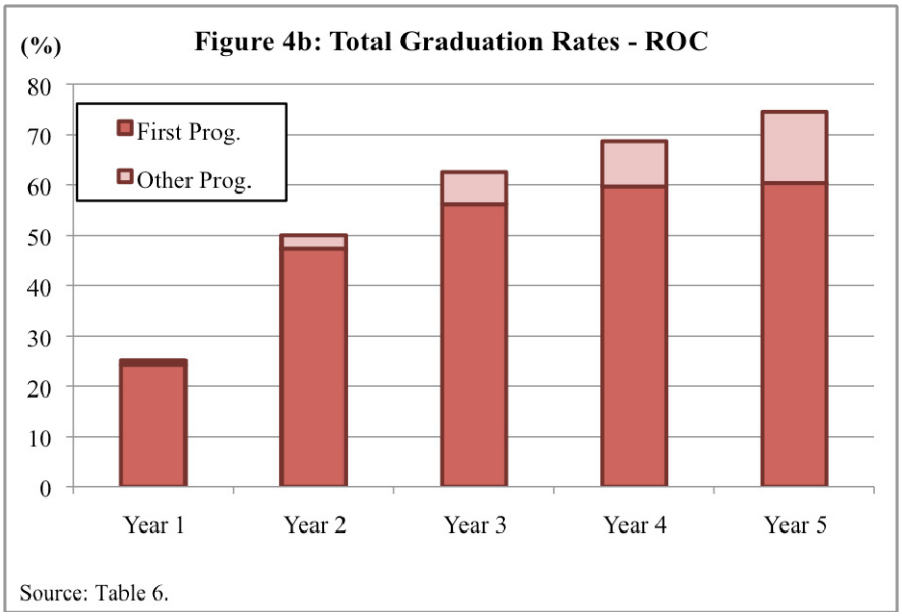
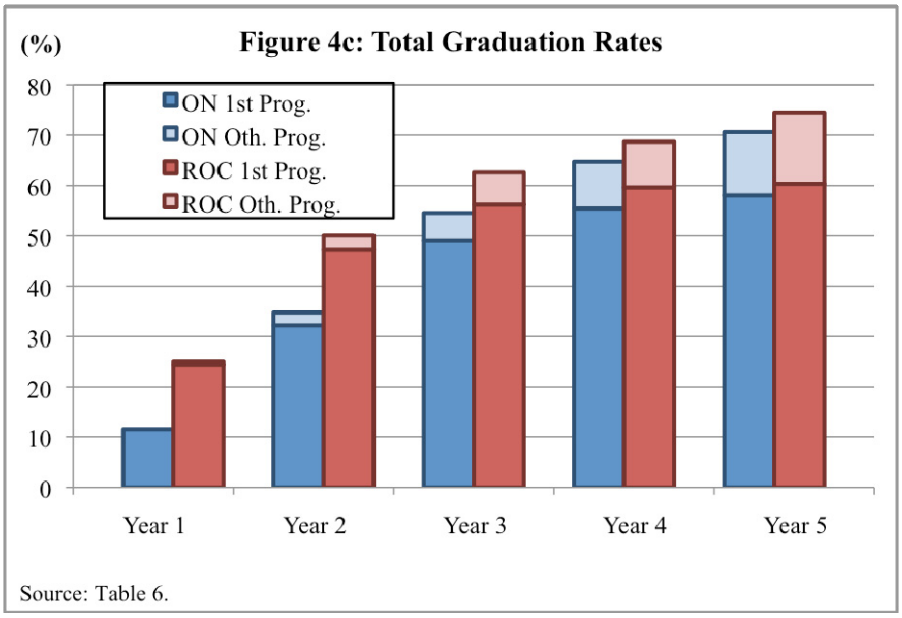
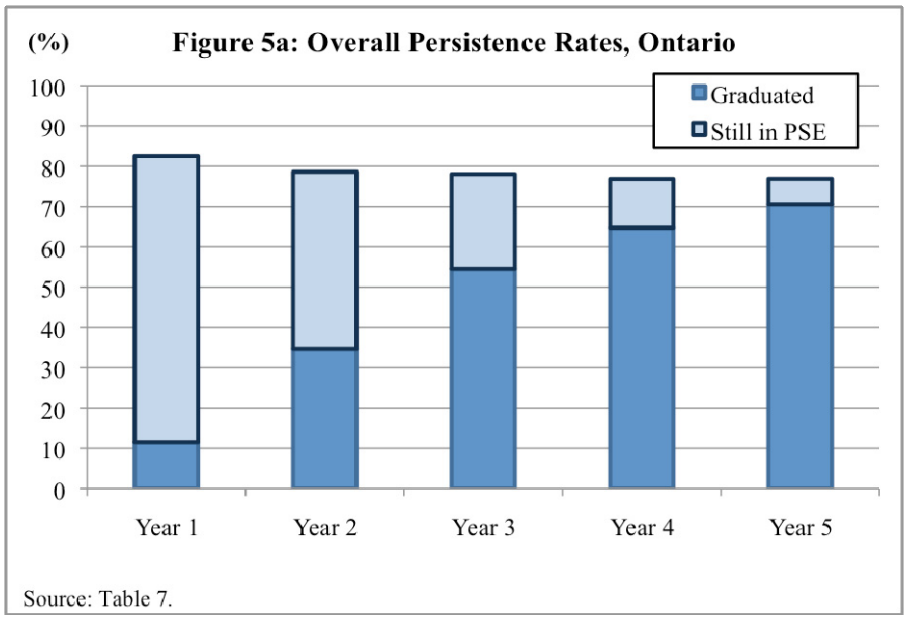


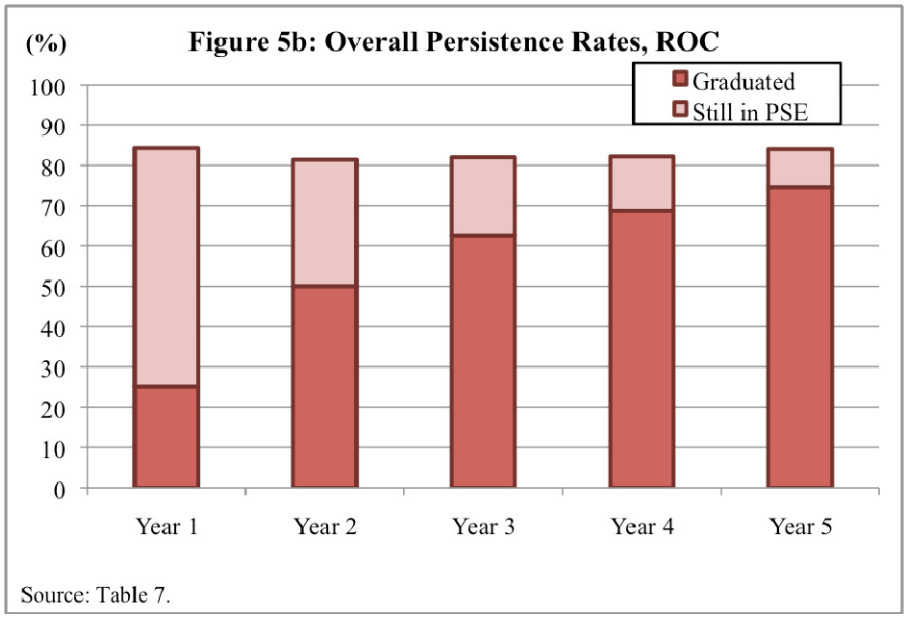
Table 7 extends the "persistence" analysis still further by looking at the status of students at the end of each year after they first enter PSE. In each year, students are categorized into three mutually exclusive groups: having earned a degree, from the first program or another one; not having graduated but being currently enrolled in PSE, regardless of where they are enrolled or the movements they had previously made in and out of the system; and not having graduated and not being in PSE. This table essentially adds those still in PSE to the graduates reported in Table 6, including showing where exactly the on-going students are enrolled. Figures 5a through c show the main results graphically.

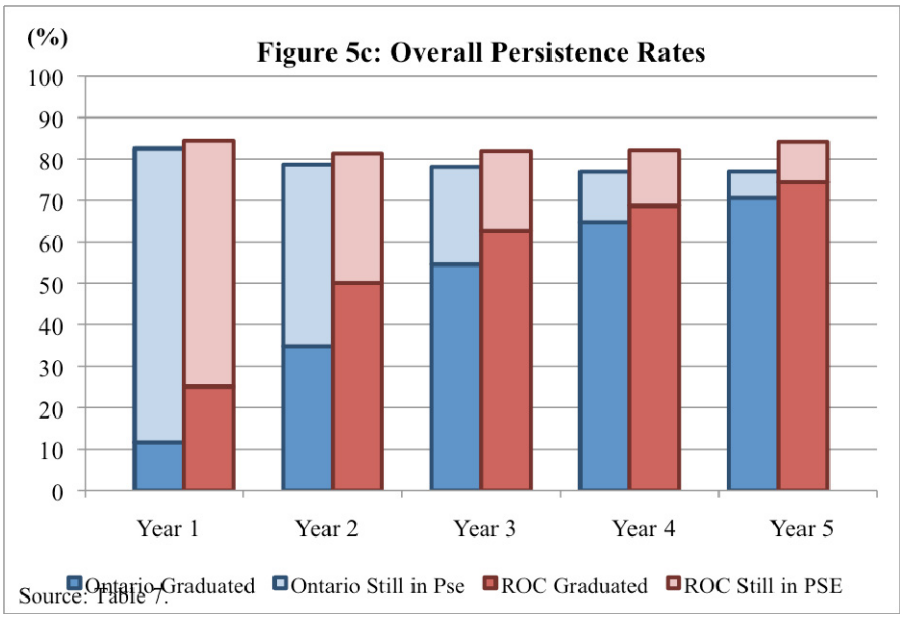




After five years, to the 70.6 percent graduated seen just above we now add another 6.3 percent that are currently in PSE, for a total of 76.9 percent, versus 23.1 percent who are neither graduated nor currently in PSE (without having earned a degree). This is perhaps the single most meaningful number in terms of measuring "persistence" in PSE. This

broader perspective obviously shows substantially more students who have either *received a diploma somewhere at some time* or *are still in the system* than the narrower measures presented above.





Also of significant interest is how this total changes relatively little from year one through year five, moving from just over 80 percent to just under 80 percent over this period. So, yes, there is initially, in the first year, a significant loss in students from the PSE system (i.e., almost 20 percent), but then – due to the various pathways students follow once entering PSE, including switching and dropping out and then re-starting – numbers are pretty stable at that level. There is not, in particular, much of an increase in the number of students (totally) "detaching" from the PSE system after that first year, as leaving rates fall, while a substantial percentage of those who previously left recycle back into the system. These overall persistence rates are slightly lower in Ontario than ROC (see Figure 5c in particular).

IV.2 Regression Analysis

The descriptive statistics presented thus far provide an overall view of PSE transitions. We now turn to a regression analysis in order to isolate the effects of a variety of factors, holding other influences constant, on two of the key underlying dynamic processes – switching and leaving PSE.

The model is estimated with different sets of explanatory variables included. It first includes a restricted set of variables that can be relatively safely assumed to be "exogenous" to PSE persistence (i.e., they are not themselves the result of a decision to leave or switch), mainly pertaining to basic demographic characteristics, including family background. Results are then presented for other models that add regressors (variables) which capture more of the student's experiences but which may, in turn, be endogenous (e.g., PSE grades) or be related to other factors (e.g., the receipt of student financial aid or attitudes to school).

More specifically, five models are estimated: the first model includes the most basic (and most clearly exogenous) background factors: the local unemployment rate, sex, immigrant and visible minority status, age at enrolment, the number of years they have been in the program so far ("transition year"), an indicator of being in trade school, family type, and parental education. The second model adds indicators of student

financial aid (i.e., the receipt of a scholarship, grant, or student loan). The third specification turns to schooling outcomes, starting with the individual's high school grade average and high school engagement variables. The last two models add PSE grades and then four descriptors representing individuals' PSE experiences.

To estimate this model, we collect the data across all spell years, meaning that each year we observe an individual "at risk" of leaving PSE enters as a separate observation. We estimate the models using a multinomial regression approach which allows for the different outcomes (switching and leaving).[16]

The results are presented in Tables 8a for Ontario and 8b for ROC. The tables report the "average marginal effects" and the standard errors and statistical significance associated with these estimates. The average marginal effects essentially represent the estimated associations of the variables in question with the probability of switching or leaving, respectively, in any given year, and the magnitudes of the estimated effects can be interpreted in the context of the average hazard or transition rates seen above: switching rates on the order of 5 percent, and leaving rates between 10 and 16 percent in any given year (see Tables 2a and b or Figures 1b and 1c above).

The results indicate that the unemployment rate (defined with respect to those with no PSE – presumably the relevant job market if they were to drop out) and gender have no statistically significant impact on the probability of switching or leaving in any given year. Being a visible minority is associated with, on average, a 5-6 percentage point lower probability of leaving in any given year (e.g., the -.049 average marginal effect in model 1 suggests an effect of minus 4.9 percent), although the estimates vary in statistical significance across the different models. Being an immigrant has a negative effect on switching, but only after the PSE experience variables are included (models 4 and 5), and the results are only marginally significant even there.

[16] See Finnie and Qiu (2008) for further discussion.

The few very young college entrants (17 and under) represented in the data are much less likely to leave their first programs. Judging from the general patterns of the estimates, starting the program at age 21 or older appears to be associated with higher leaving rates (relative to the baseline/omitted age 19 category), but the results are nowhere individually significant.

The decline in switching rates with the number of years spent in the program seen in the descriptive analysis show up here in the associated sets of negative average marginal effects (i.e., lower rates at higher years). Conversely, no year of program effects are statistically significant for leaving. This may seem surprising, but we must keep in mind that sample sizes are limited, so statistically insignificant results should not necessarily be surprising, since we are asking a lot of the data. In contrast, the negative relationship between year of program and leaving does show up in the ROC model, and the general shape of the effects (i.e., the actual point estimates of the average marginal effects) do make sense even if they are not significant – they simply need to be interpreted in this cautionary manner. The trade school program indicator is generally not significant.

Family background is found to matter significantly. Coming from a single parent family appears to increase the probability of leaving by between 3 and 8 percentage points, depending on which other variables are included in the model, the effect diminishing as other factors to which it might be related (e.g., grades) are added. Being from a family with a history of PSE (speaking of the parents here) appears to have a negative effect on leaving relative to those with no such history of PSE, the strength of this effect being in the 4-5 percent range. Interestingly, no such effect is found for ROC. Given the recent attention – and policy attention – focused on such students, this set of results bears further investigation.

In the second model, the financial aid variables are added. Most of the findings reported above change very little as these variables are included in the model, which is also the case as the other extra variables are added below, so our focus in the remaining part of this section is mostly on the new variables, as they are added in groups.

Those students in receipt of grants are considerably less likely to leave PSE, although it is difficult to interpret this finding since those who apply for and receive grants are likely to be different, on average, than other students in a variety of ways not controlled for in these models that may have their own effects on persistence (Day, 2009, Finnie, Sweetman and Usher, 2009). Furthermore, these results do not hold for ROC, and is not clear why this would be so. Still the result is interesting if only as a starting point for thinking about these effects: perhaps grants do indeed help college students stick with their studies, perhaps they are only associated with other factors that matter. This is an important policy variable that should be investigated further, although the empirical challenges associated with estimating these effects are daunting.[17]

The scholarship variable is nowhere significant, but the loan variable is in some cases marginally significant, and shows a consistently positive effect on leaving rates in the range of 3-4 percentage points higher in any given year. The caveats raised with the grant variable apply again here (as do the same references mentioned above), but once more the effect is interesting, and the variable important, especially from a policy perspective. More study is warranted.

The third model includes high school grades and high school "engagement" (including, most importantly, work effort). Having a higher high school average is associated with substantially lower leaving rates for Ontario college students, but this effect disappears when PSE grades are included (the fourth model). One way to think of these results is that high school grades might be a good marker for who is at risk of leaving, but PSE grades are – not surprisingly – even better. Such variables could be important for targeting students at risk of leaving, especially since grades are easily observable, especially for institutions, where programs aimed to help students are usually located.

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[17] See Day (2009), for an in-depth treatment of student financial aid measures and their effect on persistence in the face of concerns such as these (i.e., endogeneity and unobserved heterogeneity). Her findings are generally unstable and inconsistent across estimation methods that attempt to correct for these influences, and point to the need for other better data, including perhaps data generated by experimental or quasi-experimental mechanisms, in order to better identify the related effects..

Also, these sets of results may point to at least some of the pathways through which high school grades operate to the degree they are in fact causal and not just correlated with such factors as unobserved individual attributes. That is, it may be that those with higher grades in high school also tend to get higher grades in PSE, and it is the latter which has the greatest (direct) "effect" on persistence.

High school academic engagement – work habits and so on – is negatively related to leaving, whereas high school *social* engagement has no significant influence. At face value, it appears that it is not having someone to talk to while you are in high school that is going to keep you in college, but rather your seriousness about your studies.

The last two columns show the regression results for the models which include PSE grades and PSE experiences. In the literature, the well known theoretical model of Tinto (1975, 1993) suggests that PSE experiences, including grade performance, academic engagement, social engagement, and other outcomes are important determinants of persistence, although other researchers have criticised this approach on the grounds that these variables may be endogenous to persistence (Bean and Metzer, 1985).

In the present case, PSE grades are available in the data, but PSE "engagement" (comparable to the high school engagement variables seen above) is not. Instead, we have a pair of variables which provide information on the individual's PSE experiences with regard to the quality of instruction and the presence of individuals to whom the student can talk (an element of "social engagement").

There is a strong relationship between PSE grades and PSE persistence: better performing students are considerably less likely to switch programs or leave. While the interpretation of these results may be debated on theoretical grounds for the reasons previously mentioned (i.e., are the effects actually causal or simply reflect correlations with other influences which have their own effects on persistence?) it is clear that grades are a very good *predictor* of who is likely to change programs and who is likely to leave PSE entirely, and this alone could be useful to help us better identify, and ultimately better understand, students at risk.

The PSE experience variables are interesting. The measures of teaching ability appear to be unrelated to persistence, while "there are people at school that I can talk to about personal things" is associated with a lower probability of leaving of just over 5 percentage points.

V. Conclusion

This paper has provided new and unique evidence on PSE pathways for college students in Ontario based on the Youth in Transition Survey, Cohort B ("YITS-B") database, which has allowed us to track a representative sample of students on a longitudinal basis (i.e., over time) from their point of entry into PSE.

Our analysis thus stands in clear contrast to earlier Canadian studies, which have mostly been based on institution-level data which, by construction, lose students when they leave the particular college in question and thus miss switchers and those who return to their studies elsewhere after leaving their first program. The present research also goes well beyond the small number of other studies where slightly broader tracking has been attempted but only for very limited populations. In these respects, the analysis stands out not only in Canada, but at the international level as well.

We have also provided an analysis of the reasons students give for switching and leaving, of where exactly they go when they change programs or where they re-enter the system after leaving PSE entirely, and of various factors related to switching and leaving PSE, including personal characteristics, family background, and high school and early PSE experiences, using a multivariate regression approach.

Our analysis has found that a substantial proportion of individuals follow what could be considered "non-traditional" pathways, which includes switching programs, taking breaks, and otherwise moving in and out of PSE as they work their way through their studies, and that persistence rates are found to be much higher when viewed from this broader perspective. We find, for example, that while 26.9 percent of Ontario college

students leave their first PSE program by the end of the first year, over a third of these (10.1 percent of that total) switch immediately to another PSE program, mostly again at the college level, many of these in fact at the same institution, and that many of those who do leave PSE return to the system in the few years following, with 23.5 percent doing so within a year of leaving.

And thus, while the five year graduation rate is only 58.1 percent when measured with respect to the initial program started, this rate rises to 70.6 percent when those who graduate from another program are included. When those who have not graduated but are still in PSE are also added in, persistence rates rise to 76.9 percent. Put differently, the "drop out rate" declines from 41.9 percent, to 29.4 percent, to 23.1 percent as the persistence measure is expanded, or drops 44.9 percent in relative terms. This analysis – and these numbers – thus provide a substantially new and different view of persistence in PSE among college students in Ontario, and therefore put related discussions on a new empirical footing.

This is emphatically not to say, however, that there is no need to be concerned about persistence – or pathways more generally – in Ontario colleges, or in PSE in Canada more generally. Leaving rates are still substantial, and could perhaps be reduced if students could be better directed into programs more to their liking or helped through tough patches they encounter, which we know is common for these young people. Similarly, some individuals may "persist" (by our definitions), but struggle through programs to which they are not well suited or do not much like and could be helped to make better choices initially or make the changes they may want to make when that is the right thing to do. Furthermore, these dynamics appear to be at least somewhat related to family background – and the advantages or disadvantages these imply – and policy in this area should presumably also be focused on equalising PSE opportunities in this regard.

Our analysis also points to where certain specific policy-related variables appear to be significant, including not only those that may have direct effects on leaving or switching, but also others that could potentially help us better identify those students at risk of

switching or leaving and thus towards whom related programs could be directed. That said, sorting out correlation and causation is a challenge on many of these counts, including those related to such basic policy measures such as student financial aid.

In conclusion, this paper has provided a new empirical basis for discussions regarding persistence in PSE among college students in Ontario, and thus constitutes a new platform for further investigations of these issues and related policy questions.

Appendix A: The Explanatory Variables Used in The Analysis

The explanatory variables used in the analysis are as following:

Gender: Student's gender.

Age at enrolment: A series of categorical variables representing the student's age at the beginning of their program.

Immigrant: In indicator that the student was not born in Canada but became a citizen after coming to the country.

Visible minority: An indicator that the student is identified as being non-Caucasian in race or non-white in colour according to the Employment Equity Act.

Parental education: A series of categorical variables representing the highest level of education obtained by the student's natural or adoptive parents. The categories are "less than high school", "high school completed", "college completed", "university completed", and "don't know/no parent".

Family type: A series of categorical variables representing the family structure in which the student was living most of the time during high school. The categories are "single parent", "two parents", "other", and "don't know/no parent".

Program year: A series of categorical variables indicating the current year of the student's program as it is tracked over time: first year, second year, etc.

Average grade in high school: A series of categorical variables representing the student's overall grade average in the last year of high school. The categories are 80% or above, 70-79%, 60-69%, and below 60%.

High school academic engagement: A series of categorical variables representing the student's academic engagement in high school, defined as their identification with, and involvement (participation) in, the academic aspects of school.[18]

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[18] The high school academic engagement and social engagement measures are "scale variables" generated by YITS. These scales are scores obtained by combining answers to a group of questions, based on established methodologies. For detailed information, see *YITS, Cohort B, Cycle 1, User Guide, section 4.3*.

High school social engagement: A series of categorical variables representing the student's social engagement at high school, defined as their identification with, and involvement in, the social aspects of school.

PSE region: A series of categorical variables representing the geographic location of the PSE institution of the student's program.

Unemployment rate: The provincial unemployment rate for individuals with no PSE (source: CANSIM Table 282-0004).

Trade School: A categorical variable indicating the student was in a trade school program (within the college system).

Scholarship: An indicator that the student received a scholarship when the program was started. A scholarship is defined as a financial award based on outstanding academic achievement rather than financial need.

Grant: An indicator that the student received a grant or bursary when the program was started. A grant is defined as a financial award provided by a government, corporation, or educational or charitable foundation on the condition that certain terms are accepted or certain engagements fulfilled, or based on financial need and satisfactory achievement.

Student Loan: An indicator that the student received a student loan when the program was started. A student loan is defined as money received from a government to assist a student in the pursuit of his or her studies that has to be paid back.

Average grade in PSE: A series of categorical variables representing the student's overall grade average in the first year of PSE. The categories include above 80% or above 70-79%, 60- 69%, and below 60%.

PSE engagement: The student's self-reported answers to the following questions:[19]

- How many instructors had strong teaching ability?
- There were people at school that I could talk to about personal things.

[19] Although YITS generates scale variables for high school engagement (see above), it does not do so for PSE engagement. We therefore use students' answers to the questions indicated to measure their PSE experiences directly.

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Table 1 - Sample Characteristics, Ontario & ROC

	Ontario (%)	ROC (%)
# of Obs.	1848	2223
Gender		
Male	48.1	49.9
Female	51.9	50.1
Immigrant Status		
Immigrant	11.7	8.4
Non-Immigrant	87.8	90.7
D.K.	0.5	0.9
Visible Minority Status		
Visible Minority	14.6	12.8
Others	84.6	86.1
D.K.	0.8	1.1
Age at Enrolment		
17 and Younger	1.0	0.7
18	19.5	38.8
19	45.9	26.0
20	20.1	14.1
21 and Older	13.5	20.4
PSE Region		
Atlantic		24.5
Prairies		42.1
BC		33.4
Family Type		
Two Parents	81.2	83.0
Single Parent	16.9	13.6
Others	1.4	2.8
D.K.	0.6	0.5
Parental Education		
Below HS	9.7	9.4
HS Completed	26.8	29.8
Coll. Completed	37.3	30.7
Univ. Completed	21.7	24.5
D.K.	4.5	5.5
Average Grade in HS		
Below 60%	1.7	3.2
60%-69%	17.7	22.1
70%-79%	54.9	45.0
80% or Above	24.5	26.7
D.K.	1.1	3.0

cont…

Table 1 - Sample Characteristics, Ontario & ROC - cont.

	Ontario (%)	ROC (%)
Average Grade in PSE		
Below 60%	6.8	3.5
60%-69%	16.9	13.1
70%-79%	38.4	32.4
80% or Above	34.3	44.1
D.K.	3.6	6.9
Scholarship		
Yes	13.0	25.0
No	85.5	73.5
D.K.	1.5	1.4
Grant		
Yes	14.6	19.2
No	83.9	79.2
D.K.	1.5	1.6
Student Loan		
Yes	31.3	32.5
No	67.0	65.9
D.K.	1.7	1.6
Instructors Have Strong Teaching Ability		
None	13.1	9.0
Some	19.1	17.4
Most	58.0	58.3
D.K.	9.8	15.2
Student Has Trouble Keeping Up With the Workload		
Never	51.1	47.5
Sometime	28.6	29.3
Most of the Time	10.6	9.1
D.K.	9.6	14.1
There Are People at School to Talk to		
Disagree	21.6	23.0
Agree	75.9	74.0
D.K.	2.5	2.9
The First Year Helped Student Obtain Skills		
Disagree	17.7	17.5
Agree	80.0	79.7
D.K.	2.3	2.8

Table 2a - Hazard Transition Rates by Year - Ontario

	# of Obs.	Continuers	Graduates	Switchers						Leavers
				Total	Same Inst.		Diff. Inst.		D.K.	
					Same level	Diff. Level	Same level	Diff. Level		
		(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Treatment 1: All Ineligible programs are right-hand censored										
Year 1	1,706	67.2	10.1	9.3	5.4	0.5	1.7	0.7	1.0	13.4
Year 2	887	56.6	32.9	3.9	3.3	---	---	---	---	6.6
Year 3	348	42.2	48.9	1.4	---	---	---	---	---	7.5
Year 4	94	39.9	54.1	---	---	---	---	---	---	---
Year 5	18	38.0	50.0	---	---	---	---	---	---	---
Treatment 2: Some Ineligible programs are kept, others are right-hand censored										
Year 1	1,848	61.6	11.5	10.1	5.7	0.4	2.1	0.8	1.1	16.8
Year 2	971	51.8	34.2	4.5	3.4	---	---	0.3	0.4	9.5
Year 3	399	34.6	51.0	3.1	0.5	---	---	---	---	11.2
Year 4	113	33.0	59.6	---	---	---	---	---	---	---
Year 5	24	26.8	64.7	---	---	---	---	---	---	---
Treatment 3: All Ineligible programs are kept										
Year 1	1,944	58.0	10.8	12.4	7.6	0.4	2.2	0.8	1.3	18.9
Year 2	1,023	49.7	32.8	5.4	3.9	---	---	0.3	0.9	12.0
Year 3	418	33.2	49.0	3.5	0.6	---	---	---	---	14.2
Year 4	114	32.9	59.5	---	---	---	---	---	---	---
Year 5	24	26.8	64.7	---	---	---	---	---	---	---

Note:

1. --- Indicates that results are suppressed to meet the confidentiality requirements of the *Statistics Act*.

Table 2b - Hazard Transition Rates by Year - ROC

	# of Obs.	Continuers	Graduates	Switchers						Leavers
				Total	Same Inst.		Diff. Inst.		D.K.	
					Same level	Diff. Level	Same level	Diff. Level		
		(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Treatment 1: All Ineligible programs are right-hand censored										
Year 1	2,043	57.0	21.8	7.4	2.1	0.6	1.1	0.9	2.7	13.8
Year 2	831	43.8	43.9	6.0	0.9	---	---	1.9	1.7	6.3
Year 3	211	38.3	43.1	13.6	---	---	---	---	---	4.9
Year 4	67	42.1	51.7	---	---	---	---	---	---	---
Year 5	16	67.2	17.7	---	---	---	---	---	---	---
Treatment 2: Some Ineligible programs are kept, others are right-hand censored										
Year 1	2,223	51.3	24.3	8.8	2.3	0.6	1.3	2.2	2.5	15.5
Year 2	919	38.8	45.7	6.5	1.2	---	---	2.2	1.5	9.1
Year 3	239	35.4	45.9	13.2	1.0	---	---	---	---	5.5
Year 4	79	35.7	54.2	---	---	---	---	---	---	---
Year 5	22	51.1	35.1	---	---	---	---	---	---	---
Treatment 3: All Ineligible programs are kept										
Year 1	2,354	48.3	22.9	11.1	3.3	1.1	1.4	2.5	2.9	17.6
Year 2	974	36.6	43.1	7.6	1.8	---	---	2.2	1.7	12.7
Year 3	257	32.3	41.8	16.2	1.0	---	---	6.3	1.7	9.7
Year 4	76	35.1	53.3	---	---	---	---	---	---	---
Year 5	22	51.1	35.1	---	---	---	---	---	---	---

Note:

1. --- Indicates that results are suppressed to meet the confidentiality requirements of the *Statistics Act*.

Table 3a - Cumulative Transition Rates by Year - Ontario

	# of Obs.	Continuers	Graduates	Switchers						Leavers
				Total	Same Inst.		Diff. Inst.		D.K.	
					Same level	Diff. Level	Same level	Diff. Level		
		(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Treatment 1: All Ineligible programs are right-hand censored										
Year 1	1,706	67.2	10.1	9.3	5.4	0.5	1.7	0.7	1.0	13.4
Year 2	1,706	38.0	32.2	11.9	7.6	0.5	1.9	0.9	1.1	17.9
Year 3	1,706	16.0	50.8	12.5	7.8	0.5	2.0	1.0	1.2	20.7
Year 4	1,706	6.4	59.5	12.7	7.8	0.7	2.0	1.0	1.2	21.4
Year 5	1,706	2.4	62.7	13.2	8.3	0.7	2.0	1.0	1.2	21.7
Treatment 2: Some Ineligible programs are kept, others are right-hand censored										
Year 1	1,848	61.6	11.5	10.1	5.7	0.4	2.1	0.8	1.1	16.8
Year 2	1,848	31.9	32.5	12.9	7.8	0.4	2.3	1.0	1.4	22.7
Year 3	1,848	11.1	48.8	13.9	8.0	0.4	2.9	1.1	1.5	26.3
Year 4	1,848	3.6	55.4	14.1	8.0	0.6	2.9	1.1	1.5	26.8
Year 5	1,848	1.0	57.8	14.3	8.2	0.6	2.9	1.1	1.5	26.9
Treatment 3: All Ineligible programs are kept										
Year 1	1,944	58.0	10.8	12.4	7.6	0.4	2.2	0.8	1.3	18.9
Year 2	1,944	28.8	29.8	15.5	9.9	0.4	2.5	1.0	1.8	25.8
Year 3	1,944	9.6	43.9	16.5	10.0	0.4	3.0	1.1	2.0	30.0
Year 4	1,944	3.2	49.6	16.7	10.1	0.6	3.0	1.1	2.0	30.5
Year 5	1,944	0.8	51.7	16.9	10.2	0.6	3.0	1.1	2.0	30.6

Note:

1. Calculated from the annual (hazard) transition rates shown in Table 2a.

Table 3b - Cumulative Transition Rates by Year - ROC

	# of Obs.	Continuers	Graduates	Switchers						Leavers
				Total	Same Inst.		Diff. Inst.		D.K.	
					Same level	Diff. Level	Same level	Diff. Level		
		(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Treatment 1: All Ineligible programs are right-hand censored										
Year 1	2,043	57.0	21.8	7.4	2.1	0.6	1.1	0.9	2.7	13.8
Year 2	2,043	25.0	46.8	10.8	2.6	1.3	1.2	2.0	3.6	17.4
Year 3	2,043	9.6	57.6	14.2	2.7	1.5	2.4	3.6	4.0	18.6
Year 4	2,043	4.0	62.6	14.5	3.0	1.5	2.4	3.6	4.0	19.0
Year 5	2,043	2.7	63.3	15.0	3.1	1.5	2.4	3.6	4.5	19.0
Treatment 2: Some Ineligible programs are kept, others are right-hand censored										
Year 1	2,223	51.3	24.3	8.8	2.3	0.6	1.3	2.2	2.5	15.5
Year 2	2,223	19.9	47.8	12.1	2.9	1.3	1.3	3.3	3.3	20.2
Year 3	2,223	7.1	56.9	14.7	3.1	1.4	2.2	4.5	3.6	21.3
Year 4	2,223	2.5	60.7	14.9	3.2	1.5	2.2	4.5	3.6	21.8
Year 5	2,223	1.3	61.6	15.3	3.3	1.5	2.2	4.5	3.8	21.8
Treatment 3: All Ineligible programs are kept										
Year 1	2,354	48.3	22.9	11.1	3.3	1.1	1.4	2.5	2.9	17.6
Year 2	2,354	17.7	43.7	14.8	4.2	1.9	1.5	3.6	3.7	23.8
Year 3	2,354	5.7	51.1	17.7	4.3	2.4	2.2	4.7	4.0	25.5
Year 4	2,354	2.0	54.2	17.9	4.5	2.5	2.2	4.7	4.0	25.9
Year 5	2,354	1.0	54.9	18.2	4.5	2.6	2.2	4.7	4.2	25.9

Note:

1. Calculated from the annual (hazard) transition rates shown in Table 2b.

Table 4 - Main Reason for Leaving - All Years Results - Ontario and ROC

	Ontario			ROC		
	All (%)	**Switcher (%)**	**Leaver (%)**	**All (%)**	**Switcher (%)**	**Leaver (%)**
# of Obs.	513	192	321	528	181	347
Not enough money	8.6	6.8	9.7	7.8	---	---
Wanted to work	7.4	2.6	10.3	8.5	3.9	11.0
Marks too low	7.8	5.7	9.0	8.1	5.0	9.8
Didn't like it/Not for me	42.7	45.3	41.1	34.7	36.5	33.7
To change schools or programs	12.1	25.0	4.4	14.6	32.6	5.2
Only missing a few credits, not worth continuing	1.9	---	---	3.0	---	---
Wanted a break	1.6	---	---	2.3	2.8	2.0
To Travel	---	---	---	---	---	---
Pregnant/Caring for own child	---	---	---	---	---	---
Own Health	3.3	4.7	2.5	2.1	---	---
Other	13.3	8.3	16.2	16.7	13.3	18.4

Note:

1. --- Indicates that results are suppressed to meet the confidentiality requirements of the *Statistics Act*.

Table 5 - Hazard and Cumulative Rates of Return to PSE Among Leavers - Ontario and ROC

	# of Obs.		Total	Same Inst.		Diff. Inst.		D.K
				Same Level	Diff. Level	Same Level	Diff. Level	
			(%)	(%)	(%)	(%)	(%)	(%)
1) Ontario								
Hazard Rates								
Year 1	384	Percentage	23.5	8.3	1.3	6.2	3.0	4.8
		Distribution	100.0	35.3	5.4	26.4	12.6	20.3
Year 2	237	Percentage	14.7	1.7	---	5.3	---	6.6
		Distribution	100.0	11.2	---	36.0	---	44.6
Year 3	166	Percentage	9.8	5.6	---	2.6	---	---
		Distribution	100.0	57.0	---	26.7	---	---
Cumulative Rates								
Year 1	384	Percentage	23.5	8.3	1.3	6.2	3.0	4.8
		Distribution	100.0	35.3	5.4	26.4	12.6	20.3
Year 2	384	Percentage	34.8	9.6	1.3	10.3	3.9	9.8
		Distribution	100.0	27.5	3.6	29.5	11.2	28.2
Year 3	384	Percentage	41.1	13.2	1.3	11.9	3.9	10.8
		Distribution	100.0	32.1	3.1	29.1	9.4	26.4
2) ROC								
Hazard Rates								
Year 1	432	Percentage	18.0	4.4	2.1	3.3	3.1	5.0
		Distribution	100.0	24.6	11.6	18.6	17.5	27.7
Year 2	255	Percentage	15.2	8.7	---	---	2.8	2.1
		Distribution	100.0	57.5	---	---	18.3	14.1
Year 3	175	Percentage	5.6	---	---	---	---	1.4
		Distribution	100.0	---	---	---	---	24.4
Cumulative Rates								
Year 1	432	Percentage	18.0	4.4	2.1	3.3	3.1	5.0
		Distribution	100.0	24.6	11.6	18.6	17.5	27.7
Year 2	432	Percentage	30.5	11.6	2.4	4.3	5.4	6.7
		Distribution	100.0	38.1	8.0	14.0	17.8	22.2
Year 3	432	Percentage	34.3	12.6	3.2	4.8	6.1	7.7
		Distribution	100.0	36.8	9.2	14.0	17.7	22.4

Notes:

1. Cumulative transition rates shown in the second panel are calculated from the annual (hazard) transition rates shown in the first panel.
2 --- Indicates results are suppressed to meet the confidentiality requirements of the *Statistics Act*.
3. Results for Year 4 and Year 5 are omitted due to small sample sizes.

Table 6 - Cumulative Total Graduation Rates - Ontario and ROC

	# of Obs.		Grad.	Same Prog.	Same Inst.		Diff. Inst.		D.K.
					Same Level	Diff. Level	Same Level	Diff. Level	
			(%)	(%)	(%)	(%)	(%)	(%)	(%)
1) Ontario									
Year 1	1,848	Percentage	11.5	11.5	---	---	---	---	---
		Distribution	100.0	99.6	---	---	---	---	---
Year 2	1,848	Percentage	34.8	32.2	1.0	---	0.3	---	0.9
		Distribution	100.0	92.7	2.9	---	1.0	---	2.5
Year 3	1,848	Percentage	54.5	49.0	2.1	---	0.8	---	2.2
		Distribution	100.0	89.8	3.8	---	1.4	---	4.0
Year 4	1,848	Percentage	64.7	55.4	3.6	0.4	2.0	0.4	2.9
		Distribution	100.0	85.7	5.6	0.6	3.1	0.6	4.4
Year 5	1,848	Percentage	70.6	58.1	4.9	0.4	2.7	1.3	3.2
		Distribution	100.0	82.2	7.0	0.6	3.9	1.8	4.5
2) ROC									
Year 1	2,223	Percentage	25.1	24.3	---	---	---	---	0.6
		Distribution	100.0	97.1	---	---	---	---	2.3
Year 2	2,223	Percentage	50.1	47.3	0.8	---	---	---	1.4
		Distribution	100.0	94.6	1.7	---	---	---	2.8
Year 3	2,223	Percentage	62.6	56.2	2.0	---	1.8	---	2.4
		Distribution	100.0	89.8	3.3	---	2.8	---	3.8
Year 4	2,223	Percentage	68.7	59.6	2.2	---	2.0	---	3.7
		Distribution	100.0	86.8	3.2	---	2.9	---	5.4
Year 5	2,223	Percentage	74.5	60.3	2.7	0.5	2.4	4.1	4.5
		Distribution	100.0	81.0	3.6	0.7	3.2	5.5	6.1

Note:

1 – Indicates results are suppressed to meet the confidentiality requirements of the *Statistics Act*.

Table 7 - Overall Persistence Rates - Ontario and ROC

	# of Obs.		Grad.	Still In PSE							Not In PSE
				Total	Same Prog.	Same Inst.		Diff. Inst.		D.K.	
						Same Level	Diff. Level	Same Level	Diff. Level		
			(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
1) Ontario											
Year 1	1848	Percentage	11.5	71.0	61.6	5.3	0.2	1.9	0.9	1.0	17.5
		Distribution	100.0	100.0	86.7	7.5	0.3	2.7	1.3	1.4	100.0
Year 2	1848	Percentage	34.8	43.9	31.2	6.1	0.3	3.3	1.3	1.6	21.4
		Distribution	100.0	100.0	71.1	13.9	0.8	7.6	2.9	3.8	100.0
Year 3	1848	Percentage	54.5	23.5	11.2	4.7	0.2	4.3	1.8	1.4	22.0
		Distribution	100.0	100.0	47.7	19.9	0.7	18.2	7.6	5.9	100.0
Year 4	1848	Percentage	64.7	12.1	3.5	2.4	0.1	3.3	1.3	1.5	23.1
		Distribution	100.0	100.0	28.9	20.0	1.1	26.9	11.0	12.1	100.0
Year 5	1848	Percentage	70.6	6.3	1.1	1.8	0.1	1.6	1.0	0.7	23.1
		Distribution	100.0	100.0	17.3	28.8	1.3	25.1	15.6	11.9	100.0
2) ROC											
Year 1	2223	Percentage	25.1	59.3	51.2	2.1	0.6	1.3	2.2	1.9	15.7
		Distribution	100.0	100.0	86.4	3.5	0.9	2.1	3.8	3.2	100.0
Year 2	2223	Percentage	50.1	31.3	19.3	2.8	1.5	1.6	3.9	2.3	18.6
		Distribution	100.0	100.0	61.5	8.9	4.7	5.1	12.5	7.3	100.0
Year 3	2223	Percentage	62.6	19.4	6.3	2.9	1.1	0.9	6.2	2.1	18.0
		Distribution	100.0	100.0	32.4	14.9	5.8	4.5	31.8	10.7	100.0
Year 4	2223	Percentage	68.7	13.5	2.1	1.8	0.9	0.7	6.2	1.9	17.8
		Distribution	100.0	100.0	15.3	13.6	6.3	5.1	45.8	14.0	100.0
Year 5	2223	Percentage	74.5	9.5	1.0	2.2	0.3	0.3	3.8	2.0	15.9
		Distribution	100.0	100.0	10.7	23.1	2.9	3.0	39.5	20.7	100.0

Note:

1. At the end of each year, students are categorized in a sequential manner into three groups: Graduate from a PSE program, Still in PSE, and Not in PSE. Students who are still in PSE are further categorized into the six groups shown.

Table 8a - MNL Regression on the Probability of Switching/Leaving - Ontario

	MNL (1)		MNL (2)		MNL (3)		MNL (4)		MNL (5)	
	Switcher	**Leave**	**Switcher**	**Leave**	**Switcher**	**Leave**	**Switcher**	**Leave**	**Switcher**	**Leave**
Unemployment Rate	0.017	0.002	0.017	0.006	0.019	0.001	0.023	0.014	0.022	0.017
	[0.016]	[0.019]	[0.016]	[0.019]	[0.016]	[0.018]	[0.015]	[0.017]	[0.015]	[0.018]
Female	0.017	-0.026	0.017	-0.025	0.025	0.0003	0.030	0.013	0.030	0.010
	[0.018]	[0.020]	[0.018]	[0.020]	[0.020]	[0.021]	[0.019]	[0.021]	[0.019]	[0.021]
Immigrant	-0.030	-0.002	-0.033	-0.012	-0.030	0.000	-0.050*	-0.034	-0.053*	-0.042
	[0.031]	[0.041]	[0.031]	[0.038]	[0.032]	[0.044]	[0.026]	[0.036]	[0.027]	[0.033]
Visible Min.	0.006	-0.049*	0.003	-0.053*	-0.004	-0.066**	0.014	-0.048	0.014	-0.054**
	[0.034]	[0.029]	[0.033]	[0.029]	[0.032]	[0.029]	[0.035]	[0.029]	[0.037]	[0.027]
Age at Enrolment (Age 19)										
17 and Younger	0.057	-.133***	0.058	-.141***	0.066	-0.147***	0.035	-0.148***	0.045	-0.144***
	[0.080]	[0.028]	[0.079]	[0.028]	[0.082]	[0.030]	[0.057]	[0.028]	[0.062]	[0.029]
18	0.031	-0.001	0.287	-0.972	0.033	-0.008	0.018	-0.027	0.019	-0.024
	[0.034]	[0.026]	[0.034]	[0.026]	[0.034]	[0.026]	[0.025]	[0.024]	[0.026]	[0.024]
20	-0.004	0.024	-0.008	0.017	-0.014	-0.013	-0.016	-0.008	-0.015	-0.002
	[0.022]	[0.030]	[0.022]	[0.029]	[0.021]	[0.026]	[0.020]	[0.026]	[0.021]	[0.026]
21 and Older	0.003	0.048	-0.002	0.047	-0.005	0.022	-0.003	0.045	-0.022	0.048
	[0.030]	[0.045]	[0.028]	[0.048]	[0.027]	[0.045]	[0.028]	[0.045]	[0.034]	[0.068]
Transition Year (Year 1)										
Year 2	-0.045**	-0.039*	-0.044**	-0.035	-0.043**	-0.031	-0.034*	-0.012	-0.033*	-0.010
	[0.018]	[0.023]	[0.018]	[0.023]	[0.018]	[0.023]	[0.018]	[0.023]	[0.018]	[0.023]
Year 3	-0.056*	0.055	-0.056*	0.070	-0.057*	0.074	-0.054*	0.083	-0.053*	0.087
	[0.030]	[0.056]	[0.030]	[0.060]	[0.030]	[0.060]	[0.028]	[0.059]	[0.028]	[0.057]
Year 4	-0.061**	-0.054	-0.060**	-0.046	-0.060**	-0.035	-0.053*	-0.034	-0.053*	-0.034
	[0.029]	[0.050]	[0.029]	[0.052]	[0.029]	[0.056]	[0.031]	[0.053]	[0.031]	[0.050]
Year 5	0.066	-0.091	0.062	-0.097	0.066	-0.105	0.058	-0.104	0.065	-0.097
	[0.18]	[0.077]	[0.17]	[0.071]	[0.18]	[0.067]	[0.16]	[0.064]	[0.17]	[0.072]
Trade School	0.013	0.162	0.008	0.139	0.004	0.087	0.022	0.160*	0.019	0.119
	[0.056]	[0.15]	[0.052]	[0.14]	[0.049]	[0.093]	[0.055]	[0.092]	[0.055]	[0.076]
Family Type (Two Parents)										
Single Parent	0.046	0.078**	0.043	0.064**	0.044	0.066**	0.015	0.033	0.018	0.035
	[0.040]	[0.035]	[0.041]	[0.033]	[0.041]	[0.033]	[0.027]	[0.027]	[0.028]	[0.028]
Other	0.014	0.193**	0.009	0.197**	0.004	0.174**	-0.024	0.161**	-0.030	0.143*
	[0.066]	[0.096]	[0.062]	[0.086]	[0.061]	[0.075]	[0.060]	[0.076]	[0.059]	[0.076]
Parental Education (High School Completed)										
Below HS	-0.021	0.009	-0.020	0.003	-0.017	-0.003	-0.021	-0.019	-0.018	-0.012
	[0.028]	[0.047]	[0.028]	[0.047]	[0.029]	[0.048]	[0.029]	[0.043]	[0.030]	[0.043]
Coll. Completed	0.004	-0.041*	0.002	-0.045*	0.004	-0.053**	0.010	-0.044*	0.012	-0.039*
	[0.024]	[0.023]	[0.024]	[0.023]	[0.024]	[0.024]	[0.020]	[0.022]	[0.021]	[0.023]
Uni. Completed	0.020	-0.040	0.021	-0.042	0.021	-0.056**	0.032	-0.055**	0.033	-0.055**
	[0.028]	[0.028]	[0.029]	[0.029]	[0.027]	[0.027]	[0.026]	[0.026]	[0.027]	[0.025]
Scholarship			-0.039*	-0.040	-0.034	-0.029	-0.030	-0.015	-0.031	-0.012
			[0.022]	[0.027]	[0.024]	[0.031]	[0.024]	[0.033]	[0.024]	[0.034]
Grant			0.007	-.106***	0.011	-0.102***	0.026	-0.095***	0.028	-0.098***
			[0.028]	[0.021]	[0.029]	[0.021]	[0.027]	[0.023]	[0.028]	[0.023]

cont…

Table 8a - MNL Regression - Ontario - cont.

	MNL (1)		MNL (2)		MNL (3)		MNL (4)		MNL (5)	
	Switcher	**Leave**	**Switcher**	**Leave**	**Switcher**	**Leave**	**Switcher**	**Leave**	**Switcher**	**Leave**
Student Loan			0.014	0.033	0.013	0.041*	0.015	0.041*	0.014	0.041*
			[0.023]	[0.025]	[0.022]	[0.024]	[0.020]	[0.022]	[0.020]	[0.022]
Average Grade in HS (60%-69%)										
Below 60%					0.015	-0.045	0.0273	-0.021	0.023	-0.013
					[0.075]	[0.076]	[0.067]	[0.063]	[0.066]	[0.066]
70%-79%					-0.006	-0.047*	0.023	-0.000	0.022	0.002
					[0.024]	[0.027]	[0.024]	[0.025]	[0.024]	[0.025]
80% or Above					-0.0395	-0.078**	-0.001	0.005	-0.004	0.002
					[0.024]	[0.030]	[0.026]	[0.034]	[0.026]	[0.035]
High School Engagement										
Academic Engage					-0.011	-0.061***	-0.003	-0.052***	-0.002	-0.050***
					[0.013]	[0.016]	[0.010]	[0.014]	[0.011]	[0.014]
Social Engage					-0.000	0.002	-0.000	-0.001	0.001	0.006
					[0.0093]	[0.012]	[0.0093]	[0.011]	[0.0092]	[0.011]
Average Grade in PSE (60%-69%)										
Below 60%							0.166**	0.032	0.162**	0.031
							[0.076]	[0.057]	[0.077]	[0.057]
70%-79%							-0.038*	-0.079***	-0.036	-0.074***
							[0.022]	[0.027]	[0.023]	[0.027]
80% or Above							-0.088***	-0.211***	-0.085***	-0.204***
							[0.026]	[0.026]	[0.026]	[0.025]
Instructors Have Strong Teaching Abilities (Some)										
None									0.019	0.056
									[0.030]	[0.034]
Most									0.001	0.004
									[0.022]	[0.024]
There Are People at School to Talk to									-0.012	-0.053**
									[0.023]	[0.023]
# of Observations	2457	2457	2457	2457	2455	2455	2455	2455	2455	2455

Notes:

1. Average marginal effects are shown (see text and Appendix C for explanations).
2. Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.
3. --- indicates results are suppressed to meet the confidentiality requirements of the *Statistics Act*.

Table 8b - MNL Regression on the Probability of Switching/Leaving - ROC

	MNL (1)		MNL (2)		MNL (3)		MNL (4)		MNL (5)	
	Switcher	**Leave**	**Switcher**	**Leave**	**Switcher**	**Leave**	**Switcher**	**Leave**	**Switcher**	**Leave**
Unemployment Rate	-0.009	0.002	-0.008	0.000	-0.006	-0.001	-0.006	-0.00299	-0.006	-0.002
	[0.0077]	[0.0065]	[0.0076]	[0.0064]	[0.0074]	[0.0052]	[0.0075]	[0.0052]	[0.0074]	[0.0051]
Female	-0.052**	0.023	-0.054**	0.025	-0.048**	0.027	-0.041*	0.0365*	-0.040*	0.037*
	[0.022]	[0.023]	[0.022]	[0.022]	[0.022]	[0.022]	[0.023]	[0.022]	[0.023]	[0.021]
Immigrant	-0.002	-0.069*	0.002	-0.077**	-0.005	-0.077**	-0.020	-0.0885***	-0.015	-.088***
	[0.051]	[0.036]	[0.051]	[0.033]	[0.054]	[0.034]	[0.054]	[0.031]	[0.058]	[0.032]
Visible Minority	0.058	-0.033	0.059	-0.036	0.049	-0.031	0.058	-0.0201	0.049	-0.026
	[0.064]	[0.033]	[0.063]	[0.033]	[0.064]	[0.033]	[0.069]	[0.036]	[0.070]	[0.035]
Age at Enrolment (Age 19)										
17 and Younger	-0.103***	0.038	-0.103***	0.064	-0.108***	0.059	-0.120***	0.0551	-0.122***	0.064
	[0.020]	[0.13]	[0.020]	[0.13]	[0.021]	[0.13]	[0.026]	[0.14]	[0.026]	[0.15]
18	0.087**	-0.035	0.081**	-0.022	0.086**	-0.027	0.073**	-0.027	0.064*	-0.026
	[0.036]	[0.025]	[0.036]	[0.027]	[0.037]	[0.023]	[0.037]	[0.021]	[0.037]	[0.021]
20	0.0151	0.0204	0.020	0.013	0.017	0.010	0.025	0.016	0.0214	0.020
	[0.036]	[0.036]	[0.037]	[0.034]	[0.036]	[0.033]	[0.040]	[0.032]	[0.039]	[0.032]
21 and Older	-0.035	-0.000	-0.033	-0.005	-0.047	-0.017	-0.041	0.026	-0.044	-0.004
	[0.027]	[0.035]	[0.028]	[0.033]	[0.030]	[0.031]	[0.036]	[0.036]	[0.043]	[0.041]
PSE Region (Prairies)										
Atlantic	0.038	0.012	0.055	0.009	0.047	0.011	0.045	0.032	0.051	0.030
	[0.060]	[0.047]	[0.064]	[0.043]	[0.061]	[0.042]	[0.062]	[0.044]	[0.063]	[0.044]
BC	0.058	-0.030	0.050	-0.020	0.040	-0.012	0.039	-0.009	0.043	-0.015
	[0.036]	[0.030]	[0.034]	[0.030]	[0.033]	[0.028]	[0.034]	[0.029]	[0.035]	[0.027]
Transition Year (Yr 1)										
Year 2	-0.000	-0.013	-0.001	-0.016	-0.001	-0.015	0.000	-0.007	0.001	-0.002
	[0.025]	[0.033]	[0.025]	[0.033]	[0.026]	[0.031]	[0.026]	[0.030]	[0.026]	[0.030]
Year 3	0.111	-0.076**	0.111	-0.076**	0.068	-0.077**	0.070	-0.062*	0.071	-0.056
	[0.074]	[0.037]	[0.073]	[0.037]	[0.061]	[0.035]	[0.060]	[0.036]	[0.060]	[0.036]
Year 4	-0.051	-0.008	-0.050	-0.017	-0.044	-0.0315	-0.033	-0.022	-0.032	-0.014
	[0.043]	[0.079]	[0.044]	[0.075]	[0.051]	[0.069]	[0.058]	[0.066]	[0.058]	[0.064]
Year 5	0.047	-.177***	0.048	-0.178***	0.100	-.184***	0.140	-0.162***	0.127	-.152***
	[0.10]	[0.020]	[0.10]	[0.020]	[0.12]	[0.018]	[0.14]	[0.019]	[0.14]	[0.023]
Trade School	0.040	0.009	0.042	0.006	0.042	-0.010	0.049	0.026	0.050	0.027
	[0.053]	[0.046]	[0.052]	[0.045]	[0.048]	[0.029]	[0.046]	[0.033]	[0.047]	[0.034]
Family Type (Two Parents)										
Single Parent	-0.004	0.064*	0.010	0.057	0.009	0.066*	0.022	0.080**	0.026	0.076**
	[0.036]	[0.036]	[0.037]	[0.035]	[0.037]	[0.035]	[0.039]	[0.035]	[0.041]	[0.035]
Other	-0.003	0.376**	-0.012	0.387**	-0.006	0.385**	-0.046	0.294**	-0.063	0.276**
	[0.11]	[0.17]	[0.090]	[0.16]	[0.10]	[0.15]	[0.091]	[0.14]	[0.088]	[0.12]
Parental Education (High School Completed)										
Below HS	0.010	0.003	0.007	0.000	0.021	-0.001	0.022	-0.001	0.0224	0.003
	[0.059]	[0.037]	[0.055]	[0.035]	[0.054]	[0.034]	[0.056]	[0.034]	[0.056]	[0.033]
Coll. Completed	-0.021	-0.021	-0.024	-0.023	-0.007	-0.032	-0.007	-0.022	-0.004	-0.015
	[0.030]	[0.027]	[0.029]	[0.026]	[0.031]	[0.023]	[0.033]	[0.023]	[0.032]	[0.023]
Univ. Completed	-0.008	-0.034	-0.010	-0.032	0.003	-0.035	0.005	-0.029	0.003	-0.026
	[0.032]	[0.025]	[0.031]	[0.025]	[0.033]	[0.024]	[0.035]	[0.025]	[0.034]	[0.024]

Cont…

Table 8b - MNL Regression - ROC - cont.

	MNL (1)		MNL (2)		MNL (3)		MNL (4)		MNL (5)	
	Switcher	**Leave**	**Switcher**	**Leave**	**Switcher**	**Leave**	**Switcher**	**Leave**	**Switcher**	**Leave**
Scholarship			0.009	-0.049**	-0.008	-0.037*	-0.002	-0.037*	0.003	-0.035*
			[0.029]	[0.022]	[0.030]	[0.021]	[0.031]	[0.020]	[0.032]	[0.020]
Grant			0.038	-0.043*	0.044	-0.036*	0.060	-0.032	0.058	-0.029
			[0.036]	[0.023]	[0.036]	[0.022]	[0.039]	[0.023]	[0.039]	[0.023]
Student Loan			-0.072***	0.021	-0.078***	0.026	-0.081***	0.020	-0.078***	0.021
			[0.022]	[0.026]	[0.021]	[0.023]	[0.023]	[0.023]	[0.023]	[0.023]
Average Grade in HS (60%-69%)										
Below 60%					0.156	0.006	0.163	-0.002	0.158	-0.016
					[0.12]	[0.056]	[0.12]	[0.048]	[0.11]	[0.047]
70%-79%					0.053	-0.007	0.066*	0.014	0.060*	0.009
					[0.034]	[0.025]	[0.037]	[0.027]	[0.036]	[0.026]
80% or Above					0.080*	-0.022	0.105*	0.018	0.098*	0.012
					[0.048]	[0.027]	[0.057]	[0.032]	[0.057]	[0.031]
High School Engagement										
Academic Engagement					-0.018	-0.018	-0.022	-0.014	-0.021	-0.007
					[0.014]	[0.013]	[0.014]	[0.012]	[0.015]	[0.012]
Social Engagement					0.004	0.003	0.007	-0.001	0.005	0.001
					[0.014]	[0.010]	[0.014]	[0.010]	[0.015]	[0.0097]
Average Grade in PSE (60%-69%)										
Below 60%							-0.081	0.229***	-0.089*	0.228***
							[0.054]	[0.073]	[0.053]	[0.071]
70%-79%							-0.098***	-0.063**	-0.010***	-0.055*
							[0.033]	[0.031]	[0.033]	[0.029]
80% or Above							-0.103***	-.140***	-0.105***	-0.134***
							[0.035]	[0.022]	[0.035]	[0.021]
Instructors Have Strong Teaching Abilities (Some)										
None									-0.022	0.036
									[0.038]	[0.041]
Most									-0.025	-0.039*
									[0.031]	[0.020]
There Are People at School to Talk to									0.026	-0.035*
									[0.028]	[0.020]
# of Observations	2176	2176	2176	2176	2167	2167	2167	2167	2167	2167

Notes:
1. Average marginal effects are shown (see text and Appendix C for explanations).
2. Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.
3. --- indicates results are suppressed to meet the confidentiality requirements of the *Statistics Act*.