



Postsecondary Borrowing Patterns and Graduation among Transfer Students in Ontario: The Role of High School Academic Performance

Evidenced Based on TDSB-PSIS-CSLP Data Linkages

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Executive Summary

Until very recently, most research on postsecondary education (PSE) pathways and outcomes of transfer students in Canada has relied on labour market and postsecondary graduate surveys, yet these surveys are subject to several limitations. Population-based survey data related to school-to-work transitions are typically limited to college and university graduates (e.g., Statistics Canada's National Graduates Survey), while labour market surveys do not contain sufficient data to allow researchers to answer questions related to student mobility. Furthermore, large-scale surveys have been plagued by low response rates in recent years, making them prone to response bias. This is particularly problematic for sensitive questions, such as those related to earnings, parental income, and student debt. These data limitations have prevented researchers from investigating graduation, student debt, and labour market outcomes of postsecondary students who pursue atypical pathways (i.e., those who transfer from university to university, university to college, college to college, and college to university). By drawing on administrative records of postsecondary students, this research overcomes many of the limitations of previous research that examines the outcomes of transfer students in Ontario.

The present study follows from previous research that focuses on non-traditional PSE pathways (Walters et al., 2020) to investigate the ways in which high school performance and PSE mobility affects student debt and graduation rates in Ontario. This research involves a system-wide analysis of student borrowing patterns among high school graduates of the Toronto District School Board (TDSB), who later entered and transferred through community colleges and universities in Ontario. The TDSB is the largest public education system in Canada, serving close to one quarter of a million kindergarten to Grade 12 (K-12) students, and accounting for roughly 12% of Ontario's K-12 population (Brown, Parekh, and Marmureanu, 2016). We linked data from the TDSB with Statistics Canada's Educational Labour Market Longitudinal Platform (ELMLP) to address the following research questions

- 1)** How do transfer students and direct-entry (i.e., non-transfer) students compare in terms of:
 - a. High school academic achievement?
 - b. Postsecondary completion?
 - c. Student debt?
- 2)** Is student borrowing related to academic performance in high school, and does this relationship vary by postsecondary pathway?
- 3)** Do socio-demographic characteristics—namely gender, income, and immigration status—predict the likelihood of transfer, PSE completion, and amount of student debt?

This research contributes to the existing body of literature on transfer students by examining the high school to PSE transitions of lateral (university to university and college to college), vertical (college to university), and reverse (university to college) transfer students.

Results of this work revealed that about two thirds of TDSB students belonging to the 2009 TDSB cohort took on a loan to fund their postsecondary education. Transfer students were more likely to borrow to fund their postsecondary education than students who remained at the same institution for the duration of their studies; however, they were less likely to graduate from their programs. When distinguishing among the various transfer pathways, analyses further revealed considerable heterogeneity in the likelihood of borrowing, loan amounts, and the probability of graduating among vertical, lateral, and reverse transfers. Gaps in borrowing and graduation could be attributed, in part, to differences in socio-demographic characteristics, field of study, duration of study, and high school performance; yet gaps in student borrowing and the odds of completing PSE programs among transfer groups remained. These findings offer strong evidence that lateral, vertical, and reverse transfer students have very different postsecondary experiences, and that research into PSE outcomes among transfer students should distinguish among these different postsecondary trajectories whenever possible.

In terms of policy implications, this work suggests that transferring institutions is, in and of itself, an obstacle to graduation from PSE. It also highlights the increased financial burden that students often experience because they transferred institutions in pursuit of their postsecondary goals. While many young people graduate with debt, and the obligation to repay student loans can be an enormous source of emotional and financial strain, this strain may be disproportionately felt by transfer students who are more likely to borrow and less likely to obtain a postsecondary credential compared to those who choose to remain at the same institution for their PSE studies. Lack of PSE credentials often means poorer access to stable, well-paying jobs and less protection from unemployment and underemployment. As a result, transfers may be at greater risk of defaulting on their student loans and experiencing delayed life transitions, such as entry into the housing market and starting a family. Young Canadians would be well-served by policies aimed at improving student assistance programs and enhancing supports for borrowers as they repay their student debt.

Introduction

High school graduates are increasingly departing from traditional postsecondary education (PSE) pathways. During their undergraduate studies, postsecondary students are transferring from college to university and vice versa, and they are doing so in larger numbers than in the past. This movement often stems from work and life obligations that require young people to adjust to changing circumstances by transferring institutions. This is particularly true for students from lower socio-economic situations, who are more likely to encounter financial or other barriers that require (or inspire) a change in education or career goals. PSE in Ontario is continuously evolving, in part to provide opportunities and support for students who alter their education plans in the midst of their PSE programs, particularly when decisions to do so are the result of challenging and changing life circumstances.

Freedom to transfer across institutions midstream and without penalty helps accommodate changing interests, career goals, financial circumstances, and family responsibilities (see Speers, Stockdale, and Martin, 2012). On the other hand, transferring programs creates barriers, particularly among students who lack the resources to successfully navigate the transfer process (see Allen, Smith, and Muehleck, 2014; Kerr, McCloy, and Liu, 2011; Gawley and McGowan, 2006; Percival et al., 2016; Tobolowsky and Cox, 2012; Townsend and Wilson, 2006). For example, when comparing transfer students with their “direct-entry” counterparts (i.e., those who started and completed their postsecondary studies at the same institution), transfers are more likely to struggle with academic performance, social adjustment, degree completion, and completion time (see Kerr, McCloy, and Liu, 2011; Tobolowsky and Cox, 2012; Percival et al., 2016).

Inadequate funding during the transfer process may also be an obstacle to program completion. The Canada Student Loans Program (CSLP) is a student support mechanism offered by the federal government to facilitate equitable access to and completion of postsecondary education—particularly for members of marginalized groups. Student loans alleviate immediate financial strain for lower- and middle-income families and provide opportunities for students to complete their schooling without the strain of working long hours in part-time jobs to make ends meet. Reducing the immediate financial burden of PSE improves the chances that students will complete their programs and do so in a timely fashion. Likewise, government student loans may be particularly valuable for lower income transfer students who must grapple with the bureaucratic responsibilities associated with the transfer process.

Still, government loan holders generally experience more financial strain than non-loan holders. This is likely to be a source of worry among those who transfer programs, as recent research reveals that Ontario students who transfer institutions are both less likely to graduate

and more likely incur debt during their studies (see Walters et al., 2020). Transfer students also tend to hold higher loan balances relative to direct-entry students, which may be due to the longer completion time associated with transferring (Walters et al., 2020). For these reasons, student mobility and student debt are salient policy concerns, particularly among those who are in critical need of financial support during their postsecondary studies.

Academic Achievement



High school grades are important indicators of how well students are able to navigate the public education system. In fact, past research has shown that high school academic performance is a key predictor of postsecondary attendance, university enrolment, and postsecondary graduation (Parekh, Brown, and James, 2020; Robson et al., 2019b). Research using data from the Toronto District School Board (TDSB), for example, revealed that average grades in Grade 9 English and Mathematics are significant predictors of entrance into postsecondary education programs (Brown and Tam, 2017; Brown, Parekh, and Gallagher-Mackay, 2019), and academic performance in high school is closely related to PSE completion among students who attended university (Parekh, Brown, and James 2020; Brown, Davies, and Chakraborty, 2019).

When studying academic performance, it is important to acknowledge that a number of attitudinal and structural factors affect the achievement of specific groups (Parekh, Brown, and Zheng, 2018; Parekh and Brown, 2019). For instance, research has shown that academic achievement is affected by sex identity, family income, and students' and parents' place of birth (Brown and Sinay, 2008). Furthermore, an investigation into the relationships between transfer status and graduation revealed significant differences across a variety of socio-demographic and structural variables. Students who arrived at York University after transferring from another postsecondary institution, for example, were considerably less likely to graduate than those who entered York directly from high school, and this gap varied depending on students' sex, sexual orientation, racial identity, region of birth, and family structure. Secondary program of study (i.e., academic and applied), absenteeism, and Grade 9 achievement were also associated with likelihood of graduation (Parekh, Brown, and James, 2020).

Relationships between student achievement, borrowing patterns, and PSE outcomes across multiple institutions—particularly among transfer students—are not well understood in Canada. Few, if any, Canadian studies are based on system-wide, population-based data that include transfer status and student achievement. The limited body of research on the high school performance of transfer students is largely based on data from individual institutions, or articulation agreements across a small number institutions (see Acai and Newton, 2015; Brown, Davies, and Chakraborty, 2019; Decock, 2004; Gerhardt and Masakure, 2016; Parekh, Brown, and James, 2020; Smith et al., 2016; Stewart and Martinello, 2012). Studies based on data from a single or a small number of institutions typically focus on outcomes of incoming transfer students; however, they are unable to capture outgoing transfer students (i.e., students who transfer to institutions outside of an articulation agreement). Hence, the picture of transfer students' experiences and their PSE outcomes is limited.

Using data from a large cohort of Toronto students who entered PSE in 2009, this study links data from the TDSB with data from Statistics Canada’s Educational Labour Market Longitudinal Platform (ELMLP) to provide the first investigation into the relationships between high school achievement, borrowing patterns, and graduation rates among transfer students in Ontario. The TDSB is the largest public education system in Canada, serving close to one quarter of a million kindergarten to Grade 12 (K-12) students, and accounting for roughly 12% of Ontario’s K-12 population (Brown, Parekh, and Marmureanu, 2016). This study follows from previous research that focuses on non-traditional PSE pathways (Walters et al., 2020) to address the following research questions:

- 1) How do transfer students and direct-entry (i.e., non-transfer) students compare in terms of:**
 - a. High school academic achievement?**
 - b. Postsecondary completion?**
 - c. Student debt?**
- 2) Is student borrowing related to academic performance in high school, and does this relationship vary by postsecondary pathway?**
- 3) Do socio-demographic characteristics—namely gender, income, and immigration status—predict the likelihood of transfer, PSE completion, and amount of student debt?**

Data and Methods

This research combines data from three administrative datasets: the TDSB’s Grade 9 Cohort dataset, Statistics Canada’s Postsecondary Student Information System (PSIS), and the Canada Student Loans Program (CSLP). Data from the TDSB include 13 years of student records for 231,563 students who entered Grade 9 between September 2000 and September 2012. Data for each cohort are collected for up to five years. Both PSIS and CSLP are in Statistics Canada’s ELMLP. PSIS is an administrative dataset with annual, nation-wide information about college and university enrolments and graduates, including program information, fields of study, and credentials. Data for PSIS were collected beginning in the 2005–2006 academic year, with full reporting for Ontario beginning in the 2009–2010 year. The CSLP dataset provides information about individual borrowing from the Canada Student Loans program between 2003–2004 and 2016–2017.

The PSIS-CSLP data linkage allows for a comparative analysis of student debt between those who transfer and those who do not. With the addition of TDSB data, secondary school performance can also be examined to determine whether academic achievement in high school is associated with likelihood of transfer and borrowing patterns at the postsecondary level. There is an overlap of PSIS and CSLP data for Ontario from 2009–2010 to 2016–2017, and approximately 12% of those records were students who appeared in the TDSB dataset.

Subsample

The combined dataset contains information from the TDSB cohort who started postsecondary education in September 2009, excluding those who began or completed postsecondary education outside of Ontario. Data from the PSIS and CSLP are merged using the linkage variable “Register_group_ID,” which is shared across datasets in the ELMLP. Relevant variables from the TDSB dataset were transferred into the PSIS-CSLP dataset for all but 0.6% of the TDSB cohort.

Only students who were between the ages of 17 and 19 when they started their PSE in September 2009 were included in the analyses. Mature students and those who began their PSE programs at atypical times during the school year represent unique groups. For instance, preliminary analyses indicate that these groups of students are more likely to attend college than university. Additionally, a small proportion of students who had multiple records of enrolment in the fall of 2009 were excluded from the analyses. The final sample included 9,850 students aged 17 to 19 who attended a TDSB secondary school and who began an Ontario postsecondary program in 2009. These same selection criteria were used in a previous report by Walters et al., 2020, which will allow for a direct comparison of results across these two studies.

Variables

Together, data from the TDSB, PSIS, and CSLP include a variety of student-level variables that measure secondary school academic performance, postsecondary attainment, and student debt.

Secondary school academic achievement was measured using three variables: Grade nine Mathematics and English marks, both of which were included as categorical variables (<70%; 70-79%; >80%), and the average of the six highest final marks obtained in Grade 12. These measures of high school performance were selected because they are known to be strong predictors of PSE enrolment and graduation (see Brown, Davies, and Chakraborty, 2019; Parekh, Brown, and Robson, 2018; Robson et al., 2014; Brown, Presley, and Parekh, 2013).

To measure **postsecondary attainment**, five variables were included in the analysis. These were field of study, length of study (derived from program start and end dates), graduation (i.e., graduates vs non-graduates), and PSE pathway (derived from type of institution at entry and exit). A dichotomous transfer variable was also derived from the PSIS data to identify students who did and did not transfer between institutions during their postsecondary studies. Similar to our earlier report, this variable does not include those who changed fields within the same institution, and it does not differentiate students who transfer once from those who transfer multiple times.

Student debt was measured using variables that identify CSLP loan holders and outstanding loan amounts at the last student record. Using the consumer price index, the amount owing is adjusted based on the dollar equivalence in 2017.

Several socio-demographic variables were also included in the analyses. These include age, sex, country of birth, and a proxy for family income that was derived using census data, where each student record was assigned the average economic family income associated with their postal code. The parental income of students who borrowed from the CSLP was also included in analyses involving only student borrowers. This variable was derived from the parental income variable reported in CSLP.

Pathways to Graduation

Close to nine out of ten students in the sample (88.5%) were enrolled in a university program in September 2009 (compared to 11.5% in college programs). Preliminary analyses were carried out to determine the typical number of years to graduation. Consistent with past research (see Frenette, 2019), most university students in the 2009 cohort graduated within five years (77.5%). The graduation time for college students was more variable, with three-quarters graduating within two to four years. Regardless of whether they were enrolled in college or university, the majority of students completed their PSE at the institution at which they first enrolled in the fall of 2009.

Descriptive Results: Direct-Entry and Transfer Students

Table 1 presents the descriptive statistics for non-transfer (i.e., direct-entry) and transfer students who started their postsecondary program of study in the province of Ontario in 2009. The results in **Table 1** are discussed below.

Socio-demographics

The data in **Table 1** reveal that direct-entry students are more likely to be female (55%) than are transfer students (51%). Transfer students are more likely to be older than non-transfer students: 36% of transfer students were 19 years of age at the start of their programs, compared to 31% of direct-entry students. Sixty nine percent of non-transfer students and 64% of transfer students included in our analyses were born in Canada. The average income decile for both transfer and non-transfer students was 6.

High School Achievement

The descriptive statistics for Grade 9 English illustrate that direct-entry students attained higher grades than transfer students. About four in ten non-transfer students achieved a grade of 80% or above (41%), and about a third received a grade of 70–79% (31%). On the other hand, about a quarter of transfer students achieved a grade of 80% or more (27%), and a third received a grade of 70–79% (33%). Similarly, direct-entry students typically achieved higher grades in Grade 9 Math: 41% attained a grade of 80% or above (41%), compared to 26% of transfers. Direct-entry students achieved a somewhat higher overall Grade 12 average than transfer students (78% versus 72%, respectively).

Postsecondary Outcomes and Field of Study

As displayed in **Table 1**, direct-entry students were nearly 40% more likely to have completed their program by the end of the study period compared to transfer students. Furthermore, direct-entry students tended to complete their programs more quickly: approximately 53% of direct-entry students finished within four years compared to 23% of transfer students. In both groups, about two-thirds had a loan balance at the end of their studies.

There was little difference between transfer and non-transfer students in terms of field of study.¹ About 40% of students pursued STEM, health, or “other” fields of study, and another 40% studied fine arts, humanities, or social sciences. The remaining 16–20% entered a business program.

Student Loan Holders

Table 2 summarizes the descriptive results for family income and family size among Canada Student Loan holders in Ontario. The average parental income (in 2017 dollars) among direct-entry students was \$51,400, which was nearly \$4,000 per year higher than among transfer students. The average family size of both groups was 3.6 and 3.5, respectively.

1. Due to the vetting requirements at Statistics Canada, the field of study variable is limited to three categories for the descriptive statistics. For the regression models, we distinguish among a broader number of fields.

Descriptive Results: All Educational Pathways

The second series of descriptive statistics disaggregate the direct-entry and transfer groupings. The purpose of these analyses is to demonstrate the heterogeneity of the transfer groups in terms of their socio-demographic composition, academic performance, and postsecondary outcomes. A key element of these analyses is to distinguish among various transfer groupings, of which there are three types: lateral transfers, who move from one community college to another, or one university to another; vertical transfers, who begin their PSE at a community college and transfer to a bachelor's program; and reverse transfers, who transfer from university to a community college. This research made use the longitudinal structure of the dataset to examine PSE outcomes and borrowing patterns of students who followed six postsecondary trajectories:

- 1) Direct Entry to University,
- 2) Transfer from University to University (lateral transfer),
- 3) Transfer from University to College (reverse transfer),
- 4) Direct Entry to College,
- 5) Transfer from College to College (lateral transfer), and
- 6) Transfer from College to University (vertical transfer).

Descriptive statistics for the variables used in this research are presented in **Tables 3** and **4** for each of the direct-entry and transfer pathways. The results are discussed below.

Sex

Postsecondary students entering university from the TDSB in 2009 were more likely to be female. Those who entered college, on the other hand, were more likely to be male. Among transfer students, females made up a slightly larger proportion of university to university (52%) and university to college transfers (52%), while males made up a larger percentage of those who transferred from college to college (62%) and college to university (62%). For ease of comparison, these results are also presented in **Figure 1**.

Age

The data in **Table 3** indicate that those who began PSE in a university and stayed in a university (i.e., the direct-entry university and the university to university pathways), as well as those

who transferred from university to college, tended to be younger (i.e., 17 and 18 years of age) than those who began PSE at college.

Country of Birth

Approximately 40% of students who attended university at some point in their postsecondary studies—either as direct-entry or transfer students—were born outside of Canada. Those who entered college after high school and remained in college until they completed their programs were somewhat less likely than those who attended university to have been born outside of Canada.

Field of Study

Regarding field of study, the STEM, health and related fields, and other fields contained the greatest proportion of students in the university to university (48%), college to college (54%), and direct-entry college (43%) pathways, followed by those in the fine arts, humanities, and social sciences (37% in the university to university pathway, 31% in the college to college pathway, and one third in the direct-entry college pathway). The university to college pathway showed the opposite pattern, with half of those students started their programs in the fine arts, humanities, and social sciences, and 35% enrolled in the STEM, health and related fields, and other fields. In the direct-entry university pathway, 40% of students were enrolled in both the fine arts, humanities, and social sciences, and STEM, health and related fields, and other fields groupings. The business field of study contained the fewest students across all pathways (ranging from 15–25% of students), except for the college to university pathway which contained 40% of those students.

Income Decile

TDSB graduates involved in any PSE pathway that included university tended to reside in higher income neighbourhoods relative to those who attended only college. The average neighbourhood income decile of university attendees was 6; the average decile for direct-entry community college students and students who transferred between colleges was 5.5 and 5, respectively.

Grade 9 English and Math

The descriptive statistics in **Table 3** indicate that student performance in Grade 9 English varied by postsecondary pathway. Roughly three quarters of students who remained in university for the duration of their studies, and about 60% of those who transferred from university to college or vice versa, achieved a grade of 70% or higher in Grade 9 English.

Approximately 40% of students who attended college and remained in college achieved a B (70-79%) or higher in Grade 9 English.

While overall performance in Grade 9 Math tended to be poorer than Grade 9 English, the pattern was similar. Students who entered university and remained in university tended to achieve the highest grades, followed by those who transferred between college and university. Students who attended college for the duration of the PSE studies tended to have lowest marks in Grade 9 Math. This pattern is displayed in **Figures 2** and **3**.

Grade 12 Average

The final variable tapping into high school achievement was the overall average in Grade 12.² As illustrated in Table 3, those in the direct-entry university, university to university, and university to college pathways achieved Grade 12 averages in the 70s (79%, 76%, and 71%, respectively), whereas those in the direct-entry college, college to college, and college to university pathways achieved averages in the 60s (67%, 64%, and 65%, respectively). These results are expected, given that the required average for admission to a university programs is typically higher than for college programs; however, it is noteworthy that the average of students who entered university and transferred to college was noticeably lower than for those who entered university and stay at university. The opposite does not appear to be the case at the college level—that is, those who entered college and transferred to university did not have a higher Grade 12 average than those who remained at college.

Grade 12 Average

As expected, results revealed that direct-entry university students completed their programs at a much higher rate than all other pathways, with 86% of those students graduating from their program by the end of the study period. University students who transferred to another university or to college during their PSE studies were considerably less likely to graduate by the end of the study period than those who remained at their institution, at 61% and 50%, respectively.

Among direct-entry college students, two-thirds of students graduated by the end of the study period. Again, this was substantially higher than students who transferred during their PSE studies. Just 40% of college-to-university transfers, and 38% of college-to-college transfers, had graduated. These comparisons are depicted in the Figure 4.

2. The averages are calculated based on the six top-scoring Grade 12 courses.

Loan Balance at End of Study

At least half of students in the 2009 cohort had a loan balance at the end of their studies, and there was considerable variability by PSE pathway. Those who began their studies at college were least likely to have taken a student loan: just over half of direct-entry college students, 60% of college to university, and 62% of college to college transfer students held a loan balance at the end of the reporting cycle. In contrast, between two thirds and three quarters of students who began their PSE programs at university took on a student loan. Those who followed the university to university transfer pathway were most likely to have had a loan, likely because the cost of university tuition tends to be higher than college, and those who transfer during their studies tend to spend more time in PSE.

Length of Study

Postsecondary program length typically ranges from one to three years for college programs and 3 to 4 years for university programs. It is therefore expected that most direct-entry students would take four years or fewer to complete their program of study. Data from **Table 3** support this expectation, as nearly half of direct-entry university students, and almost 85% of direct-entry college students completed their program of study within four years. As many as one-third of students in the direct-entry university pathway spent a fifth year in their programs, and another 18% were enrolled for six or more years.

As described in the previous section, transfer students were enrolled in their programs for much longer than students who did not transfer during their PSE studies. In fact, more than half of the students (52–60%) in each transfer pathway were enrolled for at least six years, and more than a third remained in their program for seven years or more. **Figure 5** displays the differences in length of study across the six PSE pathways.

Student Loan Holders

Table 4 displays the descriptive statistics for Canada Student Loan holders in Ontario by all educational pathways. The highest average parental incomes were associated with the direct-entry university (\$52,500) and university to university transfer pathway (\$51,700) groups. Direct-entry college students (\$39,700) and college to college transfers (\$40,900) reported the lowest average family incomes. Those who transferred between from university to college, and college to university, had comparable incomes (\$45,200 and \$45,700, respectively).

With respect to family size, student loan borrowers who start their PSE pathways in university typically have family sizes averaging between three-and-a-half and four family members, whereas student loan borrowers who start their PSE pathways in college typically had three to three-and-a-half family members.

Regression Results

Borrowing from Canada Student Loan Program

A series of logistic regression models were estimated where the dependent variable, which captures whether students borrowed from the CSLP, was regressed on student mobility and transfer pathway, both with and without controls. Control variables included sex, age, country of birth, family income, field of study, length of study, Grade 9 English, Grade 9 Math, and Grade 12 average. The regression models were estimated in three stages, described below. Dummy coding was used for categorical variables and the reference categories are identified in the corresponding tables.

Table 5 presents the results of the regression analyses that assessed whether Ontario college and university students borrowed from CSLP to subsidize the cost of schooling. The purpose of these models was to assess the impact of student mobility, in general, on student borrowing. The key explanatory variable, labelled mobility, compared transfer students with their direct-entry counterparts. **Model 1** examined the effect of student mobility on borrowing without controls. **Model 2** includes PSE program and socio-demographic variables, and **Model 3** adds controls for secondary school performance.

Model 1 revealed that students who transfer programs were significantly more likely to borrow from the CSLP than non-transfer students ($p \leq 0.001$). However, when controls for PSE and socio-demographics were included in **Model 2**, transfer students were no more or less likely to borrow from the CSLP than non-transfer students, suggesting that differences in the likelihood of borrowing between the two groups can be explained by other factors, described below.

When controlling for other variables in the model,³ regression results revealed that females were significantly more likely to borrow from the CSLP than males ($p \leq 0.001$) and students born in Canada were less likely to borrow than students born outside of Canada ($p \leq 0.001$). As expected, the likelihood of borrowing decreased as neighbourhood income increased ($p \leq 0.001$). There was no significant difference in borrowing by age at entry to PSE.

In terms of length of study, students who were in their program for five or more years were, as one might expect, more likely to take out a Canada Student Loan than those who were in their

3. When not otherwise stated, the estimates for non-zero order models are to be interpreted as controlling for the other variables in the model.

program for four years or less ($p \leq 0.001$). Students in the business, STEM, and health and related fields were also more likely to borrow from CSLP compared to those in the fine arts ($p \leq 0.001$). Those in the humanities, social sciences, and “other” fields were no more or less likely to borrow than those in the fine arts.

Model 3 controls for variables related to secondary school performance. Again, findings revealed that transfer students were not significantly different from non-transfer students in terms of their likelihood of borrowing. Measures of high school performance, however, had a significant impact on whether students borrowed from CSLP. Students who achieved a 70-79% ($p \leq 0.05$) or 80% or more ($p \leq 0.001$) in Grade 9 English were less likely to borrow than those who achieved less than 70%. Conversely, in Grade 9 Math, students earning 80% or more were more likely to borrow from the CSLP than those achieving less than 70% ($p \leq 0.05$), and a higher Grade 12 average was associated with a small but significant increase in the likelihood of borrowing ($p \leq 0.05$). The introduction of the high school performance variables in **Model 3** did not affect the significance and magnitude of the relationships between the control variables introduced in **Model 2**.

The estimates (logits) in **Table 5** for the mobility variable were converted into predicted probabilities of borrowing from the CSLP to provide more meaningful estimates of effect size and statistical significance (via 95% confidence intervals). These estimates are provided in **Table 6**, (below) where **Model 1** displays the predicted probability of borrowing for transfer and non-transfer students without controls; **Model 2** includes the predicted probabilities when controlling for program and socio-demographic variables; and **Model 3** includes the estimates when controls for secondary school performance were added. The predicted probabilities derived from **Models 2** and **3** were calculated by holding other variables at their means (for quantitative variables) or proportions (for categorical variables). These estimates suggest that the probability of borrowing from the CSLP is about the same for direct-entry students and transfer students (0.64 and 0.65, respectively) when holding all other variables constant (**Model 3**).

Table 7 presents the results of the logistic regression analyses predicting student borrowing across the two direct-entry and four transfer groups. The purpose of this analysis was to demonstrate whether there were differences in borrowing patterns across vertical, lateral, and reverse transfer groupings in relation to their direct-entry counterparts, and assess the extent to which these differences can be attributed to variability in the socio-demographic composition of students, high school academic performance, field of study, and length of study. As with the previous analysis, **Model 1** displays the bivariate association between transfer pathways and borrowing, **Model 2** controls for socio-demographic and PSE variables, and **Model 3** includes measures of secondary school academic performance.

The estimates in **Model 1** revealed that the effect of the transfer group variable was statistically significant ($p \leq 0.001$). Specifically, students who transferred from university to university were significantly more likely to take a Canada Student Loan compared to the reference category, direct-entry university students ($p \leq 0.001$). Direct-entry college students, on the other hand, were less likely to borrow from the CSLP compared to direct-entry

university students ($p \leq 0.001$). The estimates for the remaining transfer pathways (university to college, college to college, and college to university) were not statistically different from the reference group.

After controlling for socio-demographic characteristics, as well as field and length of study, the effect of transfer group remained statistically significant. The estimates in **Model 2** revealed that direct-entry college students ($p \leq 0.001$), as well as students who transferred from college to university ($p \leq 0.01$), were less likely to borrow from the CSLP than direct-entry university students. The difference between direct-entry university students and students who transferred from one university to another was no longer significant.

Similar to the results presented in **Table 5**, above, estimates from **Model 2** indicate that female students were significantly more likely to borrow from the CSLP than males ($p \leq 0.001$), and those born in Canada were less likely to borrow than those born outside of Canada ($p \leq 0.001$). Students residing in higher income neighbourhoods were much less likely to take on student loans ($p \leq 0.001$) when controlling for other variables in the model. Students who entered their program at age 19 were no more or less likely to borrow than those who entered their program at age 17 or 18.

Turning to length and field of study, estimates in **Model 2** are also consistent with those presented in **Table 5**: students who were in their programs for five years or more were significantly more likely to borrow from the CSLP than those who completed their studies in four years or less ($p \leq 0.001$), and students in business ($p \leq 0.05$), STEM ($p \leq 0.01$), and health and related fields ($p \leq 0.05$) were significantly more likely to borrow than those in the fine arts. There were no significant differences in borrowing among those who were in the humanities, social sciences, and other fields compared to those in the arts.

When controlling for secondary school performance in **Model 3**, direct-entry college students ($p \leq 0.001$), students who transferred from college to college ($p \leq 0.05$), and from college to university ($p \leq 0.01$), were found to be significantly less likely to borrow from the CSLP than direct-entry university students. Students who transferred from university to university or university to college were no more or less likely to borrow than direct-entry university students.

In terms of secondary school performance, results were, for the most part, comparable to those reported in **Table 5**. Students who earned 70–79% ($p \leq 0.01$) or 80% or more ($p \leq 0.001$) in Grade 9 English were significantly less likely to borrow federal student loans than those who received less than 70% in this course. Conversely, students who earned 80% or more in Grade 9 Math were significantly more likely to borrow than those achieving less than 70% ($p \leq 0.05$), and there was no difference in the likelihood of borrowing among students achieving a 70–79% and those who earned less than 70%. Unlike the previous analysis, the average of students' top six Grade 12 grades was not a significant predictor of borrowing when controlling other variables in the model.

To improve interpretability of the estimates for the transfer variable, the predicted probabilities of borrowing from the CSLP across the transfer groupings are provided in **Table 8**. The estimates indicate that, across all three models, the predicted probability of taking a government student loan was highest among university to university transfer students, suggesting that transferring from one university to another increases the financial burden of PSE compared to students who remain at the same university for the duration of their studies and those who attend college programs. Students who transferred from university to college also had a comparatively high predicted probability of borrowing, ranging from 0.67 to 0.63 across the models, though the estimates are comparable to those for direct-entry university students. Overall, students who started their PSE program in college were the least likely to borrow. The predicted probabilities of borrowing for direct-entry college students, and college to college transfers, were among the lowest, likely because of the lower cost of tuition at Ontario colleges and shorter duration of programs compared to universities. Interestingly, the predicted probability of borrowing changed little for direct-entry students when control variables were added in **Models 2** and **3**; however, the control variables tended to decrease the likelihood of borrowing among transfer students, suggesting that there are factors associated with student borrowing that disproportionately affect transfer students.

The estimates in **Table 8** highlight the importance of distinguishing among PSE pathways when comparing student borrowing among transfer and non-transfer students. There is considerable variation in borrowing patterns among the four transfer groups, which was not observed in the previous analysis that aggregates transfer students into a single category.

Amount of Debt at End of Study Period (Direct Entry versus Transfer)

Table 9 presents the results of the ordinary least squares (OLS) regressions predicting the amount of debt accrued by those who borrowed from the CSLP.⁴ The purpose of these models is to compare the borrowing patterns of direct-entry and transfer students. **Model 1** displays the estimates when student loan amount is regressed onto the mobility variable, without controls. **Model 2** presents the results comparing transfer and non-transfer students while controlling for PSE and socio-demographic variables. Finally, **Model 3** includes the variables that capture secondary school achievement.

Estimates in **Model 1** suggest that direct-entry students who borrowed from the federal student loan program accrued significantly more debt than transfer students ($p \leq 0.001$). This finding persisted when controlling for PSE and socio-demographic variables in **Model 2** ($p \leq 0.001$), and the effects of many of the control variables in this model were also statistically significant. Females, on average, had more debt than males ($p \leq 0.01$) and those

4. The distribution of the student debt variable for first credential holders was approximately normal, and our preliminary analyses did not identify any statistically significant influential observations across each of the six categories of the transfer variable.

who entered their program at a younger age tended to accrue more debt than those who entered at age 19 ($p \leq 0.01$). Students born in Canada typically borrowed less than those born outside of Canada ($p \leq 0.001$). The effect of family income was also statistically significant, whereby higher incomes were associated with less student debt ($p \leq 0.001$).⁵

With respect to the PSE measures, significant differences in loan amount were observed by field and length of study. As expected, students who were enrolled in PSE longer took on more debt than those who completed their programs in four years or less. Students in business ($p \leq 0.05$), STEM ($p \leq 0.001$), and health and related fields ($p \leq 0.05$) accrued higher debt than those in the fine arts, the reference category. The remaining fields of study were not significantly different from the fine arts.

Results of **Model 3** indicate that transfer students borrowed less from the CSLP than non-transfer students after controls for secondary school academic performance were added ($p \leq 0.001$). Grade 9 English marks did not significantly predict the amount borrowed, but achieving a 70–79% ($p \leq 0.01$) or 80% or more ($p \leq 0.001$) in Grade 9 Math was associated with increases in the amount borrowed from the CSLP compared to the reference category. Students with higher averages in Grade 12 also tended to borrow more from CSLP ($p \leq 0.001$). The statistically significant effects of sex and age disappeared when high school achievement was added to the model, suggesting that the higher levels of borrowing observed among younger students and females in **Model 2** can be attributed to differences in high school academic performance.

Based on the regression estimates in **Table 9**, the predicted levels of student debt were derived for direct-entry and transfer students and are displayed in **Table 10** to provide meaningful comparisons across models. The estimates for **Model 1** in **Table 10** reveal the predicted amount of student debt for transfer and non-transfer students, without controls. **Model 2** displays these estimates while holding the PSE and socio-demographic controls constant at typical values, and **Model 3** controls for these variables as well as secondary school performance. The estimates are also accompanied by their respective 95% confidence intervals. The data in both **Table 9** and **Table 10** show that these estimates are relatively stable across the models.

Table 11 presents the results of the OLS regression analyses predicting the amount of Canada Student Loan debt at the end of the study period across all direct-entry and transfer (vertical, lateral, and reverse) pathways. The estimates in **Model 1**, without controls, reveal that those who attended college during their PSE studies accrued less debt than direct-entry university students: direct-entry college students averaged nearly \$10,000 less in student loans than direct-entry university students ($p \leq 0.001$), as did college to college transfers ($p \leq 0.001$).

5. Family income was measured using the family income equivalence scale, which is equal to total family income divided by the square root of the family size. The family income and family size variables were only available in the CSLP dataset; hence they do not apply to non-borrowers.

Those who transferred from university to college ($p \leq 0.001$) had about \$6,000 less student debt, and college to university ($p \leq 0.05$) transfers averaged roughly \$3,500 less debt. University to university transfer students did not accrue significantly more or less debt than direct-entry university students.

These findings highlight the variability in borrowing among transfer groups in relation to non-transfer university students and, in conjunction with the findings reported in the previous section, suggest that students who stay in college, or move between college and university, are less likely to borrow to fund their education and when they do borrow, they tend to take on less debt than those who attend university. These results are also particularly enlightening because when we did not distinguish among direct-entry and transfer groups (**Table 10** above), we found that direct-entry students who borrowed from the federal student loan program accrued significantly less debt than transfer students.

After controlling for demographic and program information in **Model 2**, results revealed that students who transferred from one university to another accrued significantly more debt than direct-entry university students ($p \leq 0.05$). In contrast, students who transferred from university to college ($p \leq 0.001$), college to college ($p \leq 0.001$), and college to university ($p \leq 0.05$) borrowed less than direct-entry university students, as did those who attended college and did not transfer ($p \leq 0.001$). Estimates in **Model 2** further revealed that, as with the previous analyses, females accrued greater amounts of debt than males ($p \leq 0.05$), those born in Canada had less debt than those born outside of the country ($p \leq 0.001$), and a higher family income was associated with lower student debt ($p \leq 0.001$). Age was not a significant predictor of student loan amount.

Turning to the PSE indicators, estimates from **Model 2** show that students who were in their programs for five or six years borrowed significantly more than students who were in their programs for four years or fewer ($p \leq 0.001$), although the estimate for those who were in their programs for seven years or more was not statistically significant. Students of the social sciences tended to amass less debt than those in the fine arts ($p \leq 0.05$), and there was no significant difference between the remaining fields of study and the reference category, when controlling for other variables in the model.

Model 3 displays the regression estimates predicting the CSLP borrowing amount when controlling for secondary school performance. Again, students who transferred from university to university accrued significantly higher debt than direct-entry university students ($p \leq 0.05$), while direct-entry college students ($p \leq 0.001$) and those who transferred from university to college ($p \leq 0.001$) or college to college ($p \leq 0.001$) borrowed less. In this model, the amount of debt that college to university transfers took on was not significantly different than the amount for direct-entry university students.

With respect to the secondary school performance variables, marks in Grade 9 English were not significant predictors of student debt when controlling for other variables in the model. In contrast, students who achieved 70-79% ($p \leq 0.05$) or 80% and above ($p \leq 0.001$) in Grade

9 Math borrowed greater amounts than those students who achieved less than 70%. A higher average across the top six Grade 12 courses was also associated with higher amounts of debt at the time of PSE graduation ($p \leq 0.05$). The estimates for the other control variables in this model did not change markedly from **Model 2**.

Table 12 displays the predicted values of student debt derived from the regression estimates in **Table 11** for each of the direct-entry and transfer pathways, along with their corresponding 95% confidence intervals. As anticipated, the estimates revealed a great deal of heterogeneity across the groupings, where higher levels of student debt were associated with pathways that involve university. Interestingly, with some small discrepancies, the estimates are stable across models. Hence, the effect of PSE pathways on student debt was not largely affected by the characteristics of students in the respective pathways.

Graduation

Table 13 presents the results of the logistic regression analysis predicting graduation for transfer students and their direct-entry counterparts. **Model 1** includes the student mobility variable, without controls. **Model 2** includes the socio-demographic and PSE control variables, and **Model 3** adds measures for secondary school academic achievement. In this analysis, a fourth model was added that includes a variable that captures whether students borrowed from the CSLP.

Results from **Model 1** show that transfer students were significantly less likely to graduate than their peers who did not transfer ($p \leq 0.001$). The estimates in **Model 2** revealed that even when controlling for socio-demographic characteristics, field of study, and length of study, transfer students were less likely to complete their programs than non-transfer students ($p \leq 0.001$). As one might expect, females were more likely to complete their programs than males ($p \leq 0.001$), students who started their program at a younger age were more likely to graduate than those who began their programs at age 19 ($p \leq 0.001$), and a higher family income was associated with a higher likelihood of graduating by the end of the study period ($p \leq 0.001$). Students born in Canada were no more or less likely to graduate within the study period than those born outside of Canada.

Turning to field and length of study, regression results indicate that students who were in their program for five or six years were more likely to have completed their programs than those who were enrolled for up to four years ($p \leq 0.001$). On the other hand, students who were enrolled in their program for seven years or more were less likely to have completed their programs relative to the reference group ($p \leq 0.001$). Students of the social sciences ($p \leq 0.01$), business ($p \leq 0.001$), STEM ($p \leq 0.001$), health and related fields ($p \leq 0.01$), and other fields ($p \leq 0.05$) were all significantly more likely to graduate than students of the fine arts.

Model 3 adds controls for high school academic performance. When these variables were included, transfer students remained significantly less likely to graduate during the study

period than non-transfer students ($p \leq 0.001$). This model suggests that Grade 9 English marks were not a significant predictor of graduation when controlling for other variables in the model; however, those who attained 80% or more in Grade 9 Math were significantly more likely to complete their programs than those who achieved less than 70% ($p \leq 0.001$). Higher averages across the top six Grade 12 marks were associated with an increased likelihood of graduation from a PSE program ($p \leq 0.001$).

Lastly, **Model 4** controls for student borrowing from the CSLP. As with the previous models, transfer students were less likely to complete their programs than their direct-entry counterparts ($p \leq 0.001$). In addition, borrowing from the CSLP was associated with an increased likelihood of program completion ($p \leq 0.05$). The effects of the socio-demographic, PSE, and academic performance control variables changed little from **Model 3** to **Model 4** and are presented in **Table 13**.

Table 14 presents the predicted probabilities of graduation for transfer and non-transfer students for each of the four models presented above. These probabilities were calculated by holding all of the other independent variables constant at their means or proportions. These results show that direct-entry students were 55% more likely to graduate than transfers students; however, the magnitude of the “graduation gap” narrowed when differences between the two groups in terms of their socio-demographic characteristics, average length of study, field of study, and high school achievement were taken into account. Specifically, controls for sex, age, country of birth, income, field of study, and length of study reduced the graduation gap by half – from 56% to 28%. When academic achievement was added to **Model 3**, the difference between the transfer and non-transfer students in their predicted probability of graduation was further reduced to 19%. While borrowing from the CSLP had a modest impact on the likelihood of graduating from PSE, it does not appear to account for differences in the probability of graduation between direct-entry and transfer students.

The final regression models, presented in **Table 15**, provide the estimates for the regression of the program completion variable on the transfer grouping variable that distinguishes among reverse, lateral, and reverse transfer students, in comparison with their direct-entry counterparts. The results in **Model 1** indicated that direct-entry university students were more likely to complete their programs during the study period than students who followed all other pathways ($p \leq 0.001$). After adding socio-demographic and PSE control variables in **Model 2**, differences in the likelihood of graduation by the end of the study period among direct-entry university students and all other transfer groups persisted ($p \leq 0.001$), though the magnitude of the gaps decreased. Consistent with the results reported in the previous analysis, females were more likely to complete their programs than males ($p \leq 0.001$), students who began their program at age 17 or 18 were more likely to graduate than those who started at age 19 ($p \leq 0.001$), and students born in Canada were more likely to graduate than those born outside of Canada ($p \leq 0.05$). PSE students in higher family income neighbourhoods were also more likely to complete their programs by the end of the study period ($p \leq 0.01$).

Turning to the PSE variables, students who were enrolled in their programs for five or six years were more likely to have completed their programs than those who were registered in their

program for four or fewer years ($p \leq 0.001$), while those enrolled for seven or more years were significantly less likely to complete their programs by the end of the study period ($p \leq 0.001$). Additionally, students registered in the STEM fields, and fields classified as “other,” were more likely to complete their programs during the study period than those in the fine arts ($p \leq 0.01$).

Model 3 once again revealed statistically significant effects of transfer pathway on graduation when controlling for secondary school performance. As with the previous models, students who entered and remained at college, and those who transferred institutions, were less likely to complete their programs than direct-entry university students ($p \leq 0.001$). Grade 9 English marks were not associated with graduation, while those who achieved 80% or more in Grade 9 Math had a significantly higher likelihood of graduating from their programs relative to those who scored less than 70% ($p \leq 0.001$). A higher Grade 12 average was also associated with an increased likelihood of PSE completion ($p \leq 0.001$). Estimates for the remaining control variables can be found in **Table 15**.

Lastly, **Model 4** produced similar effects of transfer pathways on graduation when also controlling for borrowing from the CSLP. Students who entered college directly and those who transferred institutions were all significantly less likely to graduate than direct-entry university students ($p \leq 0.001$). Whether students borrowed from the CSLP was not a significant predictor of graduation when controlling for other variables in the model. The estimates for the control variables in Model 4 did not change markedly when adding the CSLP variable to the model.

Predicted probabilities were calculated from the estimates (logits) from the models in **Table 15**. The predicted probabilities in **Model 1** were obtained from the zero-order estimates in **Model 1**; the probabilities in **Model 2** were adjusted after controlling for the socio-demographic and PSE variables, and were adjusted again in **Model 3** after controlling for the variables that tap into secondary school performance. Finally, the predicted probabilities in **Model 4** account for the inclusion of the CSLP variable in the model. The probabilities and corresponding confidence intervals in **Models 2** through **4** were calculated while holding all control variables constant at their means or proportions. The results are presented in **Table 16**.

Most notably, differences in the predicted probability of graduation by transfer pathway narrowed considerably after taking into account sex, age, country of birth, income, field of study, and length of study. The gaps further converged when high school academic achievement was held constant. These findings suggest that much of the graduation gap observed across PSE pathways can be attributed to differences in the socio-demographic composition of students across transfer groups, their field and length of study, and their academic performance in high school. The implications of these findings are discussed in the next section.

Discussion and Concluding Remarks

This study is a follow-up to our previous report examining the student loan outcomes of transfer students drawing on data linkages between PSIS and CSLP. Prior to this research, little, if any, population-based research has examined the extent to which postsecondary graduation and student borrowing among transfer students can be attributed to individual characteristics related to high school academic performance. To address this gap in the literature, we linked data from the TDSB, Statistics Canada's PSIS, and the CSLP to investigate the relationships between high school achievement, PSE outcomes, and student borrowing patterns. To our knowledge, this is the first population-based study to use administrative data linkages to track student debt and graduation outcomes of transfer students. This research provides important findings relevant to policy makers, institutional officials, researchers, and future students in Ontario and across Canada.

The primary focus of this research was to examine the PSE pathways and borrowing behaviour of students who entered their college or university programs in Ontario immediately after or within one to two years of completing high school. Our goal was to examine the extent to which differences in student borrowing and program completion between direct-entry and transfer students is associated with academic preparation at the high school level, and offer a more detailed analysis of these differences—particularly among those who follow less conventional PSE pathways—than has been presented in the literature to date.

Results of this analysis revealed that students from the TDSB borrow from the CSLP in astonishing numbers: roughly two thirds of students in the 2009 cohort took on a loan to fund their postsecondary education. By drawing on system-wide administrative records, we have provided evidence suggesting transfer students are more likely to borrow to fund their postsecondary education, but are less likely to graduate from their programs than students who remain at same institution for the duration of their studies. This finding persisted even after adjusting for differences in socio-demographic characteristics, field of study, length of enrollment, and measures of high school performance. We investigated this finding in more detail by estimating a second series of models to distinguish among vertical, lateral, and reverse transfer students. These analyses revealed a great deal of heterogeneity in the likelihood of borrowing, loan amounts, and the probability of graduating among transfer groups. This finding provides strong evidence that lateral, vertical, and reverse transfers have very different postsecondary experiences, and that research into PSE outcomes among transfer students should distinguish among these different postsecondary trajectories, whenever possible.

The results presented here also indicate that gaps in student borrowing and the odds of completing PSE programs across transfer groups can be attributed, in part, to differences

in socio-demographic characteristics, field of study, duration of study and, to some degree, high school performance. These findings also highlighted the increased financial burden that students often experience as a result of transferring institutions; however, borrowing does not appear to help close the graduation gap between transfer and non-transfer students. Taken together, these findings provide a clearer picture of the postsecondary outcomes and financial burden facing students who transfer between PSE institutions in Ontario.

Limitations

As indicated in our preliminary report, this analysis may underestimate college graduation, as the initial PSIS cohorts had an underreporting of Ontario college graduation information. To the degree that we were able, we addressed this limitation by comparing graduation rates across colleges and removing students who attended colleges for which the graduation data were obviously incomplete. Furthermore, the graduation data are truncated at eight years. A recent analysis of TDSB postsecondary graduation revealed that it can take up to a decade to get a complete assessment of postsecondary graduation patterns (see Parekh, Brown and James, 2020). We anticipate that we will be in a better situation to accurately assess graduation levels of transfer students when additional cohorts of student records are made available in the PSIS.

Secondly, government student loan programs in Canada are typically coordinated through the CSLP, whereby participating provinces and territories (excluding Quebec) work collaboratively with the federal government to provide government sponsored student loans. As mentioned in our preliminary report, 60% of the total student loan amount is provided by the CSLP, while the remaining 40% is provided by the respective provinces and territories. In Ontario, this is the Ontario Student Assistance Program (OSAP). Unfortunately, information on provincial support is not yet available in the ELMLP. We are aware that there are currently initiatives to facilitate data sharing agreements related to student loan disbursements across provincial and federal agencies. Should these initiatives succeed, researchers and organizations will be able to use the data to better understand student debt across the province. Despite this, we are confident that these analyses provide robust estimates of the comparative debt levels of transfer and non-transfer students in Ontario.

Lastly, as discussed above, students who transfer institutions are less likely to complete their programs within the study period than their direct-entry counterparts. Failure to graduate tends to hinder one's labour market potential; as a result, transfers may be at a greater risk of defaulting on their student loans. Unfortunately, we are not able to adequately examine the default rates of transfer students for this cohort until additional reporting cycles of PSIS and CSLP become available.

Future Directions

To ensure consistent comparisons with our previous report to ONCAT, we used the PSIS program start date to define the cohort for this analysis. We recommend, however, that future research on transfer students involving TDSB-PSIS linkages use TDSB cohort start dates rather than postsecondary start dates. This would allow for more precise estimates of postsecondary entry (i.e., on-time versus delayed entry) and the inclusion of students who choose to postpone their entry into PSE programs. Researchers could use these data to assess the effects of high school performance on postsecondary outcomes for a growing number of non-traditional PSE populations, such as delayed starters and mature students. Our preliminary research (not shown) suggests that transfer students, particularly those who start their programs at community colleges, are over-represented among these non-traditional PSE populations. Moreover, previous research has found that delayed postsecondary access is strongly connected to university graduation (Brown, Davies, and Chakraborty, 2019; Parekh, Brown, and James, 2020). Using secondary school as a starting point and including multiple cohorts would therefore provide more robust sample sizes for transfer pathways that tend to be followed by smaller, non-traditional PSE populations.

This report also removed students who were not in the official PSIS “snapshot,” which generally captures only those who entered postsecondary entry in the fall. As a result, this research excludes a vulnerable segment of the postsecondary population: students who enter postsecondary after September, or through indirect entry points that may not be captured by the PSIS snapshot (e.g., students who enroll in just one or two courses). Future research on transfer students may benefit from making this distinction, as our preliminary analyses (not shown) revealed that students who did not start their programs in September were more inclined to transfer institutions during their PSE studies.

By including measures of high school performance in our analyses, we were able to include variables that have been omitted from much of the previous research on PSE transitions in Canada. Still, there are other, more creative methods for estimating the effects of high school performance on PSE outcomes while reducing the bias attributable to confounding variables. For example, propensity score matching and related techniques account for the probability of assignment to a particular group, conditional on observed covariates (see Rosenbaum and Rubin, 1983; Rosenbaum, 2002). A key challenge when using such methods is identifying variables for a propensity score model that are unrelated to the exposure (treatment versus control groups) but related to the outcome. Unfortunately, the performance variables in the TDSB data that were selected for these models were more closely related to our exposure variable (transfer) than our outcome variable (student loans), which has the potential to decrease the precision of the estimated exposure effect without decreasing bias (see Brookhart et al., 2006). That said, we anticipate that the rich array of variables in updated TDSB-PSIS-CSLP-T1FF linkages will provide fruitful opportunities for other avenues of research involving the outcomes of transfer students.

There are additional research questions we plan to investigate that were beyond the scope of this report or could not be investigated due to small sample sizes. In the future, we plan to examine the outcomes of transfer students with special education needs or disabilities, as well as students who transferred out of the province. Research involving multiple TDSB cohorts will provide opportunities to investigate these questions in the future.

Finally, by comparing transfer students with their direct-entry counterparts, we have highlighted some of the challenges experienced by students who transfer programs. However, transfer students who graduate may be better positioned for the labour market than direct-entry students who withdraw from their programs prior to receiving a credential. Comparing the outcomes of transfer students with those who choose to withdraw rather than transfer may bring to light the benefits of moving to a different institution. Such comparisons would also be well-suited to the counterfactual analyses involving quasi experimental methods for observational data discussed above.

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Figures

Table 1: Sample Characteristics of Non-transfer and Transfer Students in Ontario, 2009 Cohort (n=9,850)⁶

Variables	Non-transfer students (n=8,550)		Transfer students (n=1,300)	
	%	n	%	n
Sex⁷				
Male	45	3,850	49	640
Female	55	4,700	51	660
Age				
17-18 years	69	5,890	64	830
19 years	31	2,660	36	470
Country of Birth				
Canada	62	5,280	64	830
Outside Canada	38	3,280	36	470
Income Decile	6	8,550	6	1,300
Grade 9 English Grade				
69 or less	28	2,370	40	520
70-79	31	2,670	33	430
80+	41	3,520	27	350
Grade 9 Math Grade				
69 or less	35	2,950	48	630
70-79	25	2,110	25	320
80+	41	3,490	26	340
Grade 12 Average	78	8,550	72	1,300
Graduation				
No	17	1,420	48	630
Yes	83	7,130	52	670
Loan balance at end of study period				
No	36	3,080	32	410
Yes	64	5,480	68	890
Field of Study				
Fine arts, humanities, social sciences	39	3,350	42	550
Business	21	1,790	16	210
STEM, health and related fields, other	40	3,410	42	540
Length of Study				
2012/13 (4 years or less)	53	4,520	23	300
2013/14 (5 years)	31	2,620	23	300
2014/15 (6 years)	9	760	17	220
2015/16-2016/17 (7+ years)	8	660	37	480

6. Minor discrepancies in totals are attributable to rounding as part of Statistics Canada's disclosure requirements for data vetted through their research data centres.

7. Statistics Canada uses the term sex. Due to the availability of data, we are only able to provide estimates for males and females.

Table 2: Parental Income and Family Size of Canada Student Loan Holders in Ontario by Non-transfer and all Transfer students, 2009 Cohort (n=5,550)

	Non-transfer students	Transfer students
<i>Variables</i>	<i>Mean</i>	<i>Mean</i>
Family Income (Mean Dollars)	51,400	47,400
Family Size	3.6	3.5

Figure 1: Sex of Post-secondary Students by Non-transfer and Transfer Groupings, 2009 Cohort (n=9,850)

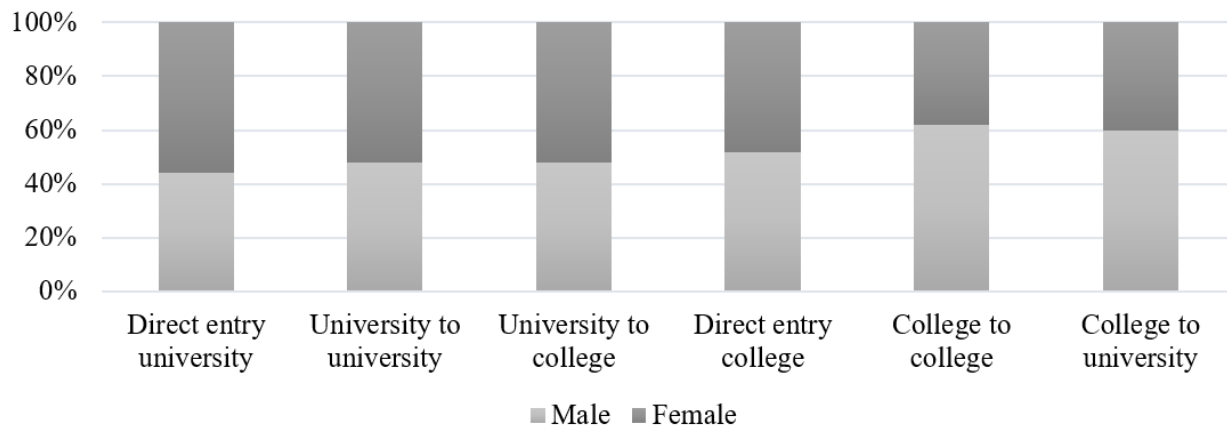


Figure 2: Grade Nine English Grades by Non-transfer and Transfer Groupings, 2009 Cohort (n=9,850)

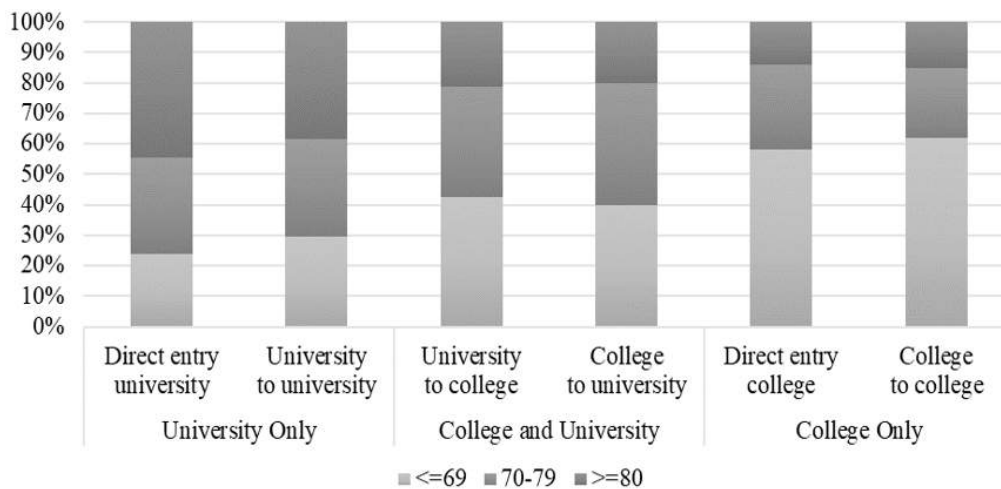


Figure 3: Grade Nine Math Grades by Non-transfer and Transfer Groupings, 2009 Cohort (n=9,850)

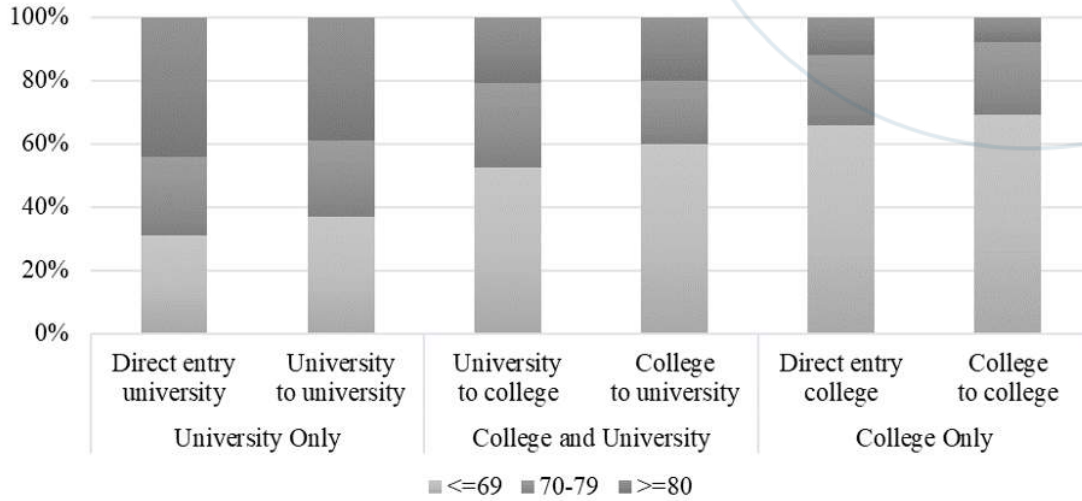


Table 3: Sample Characteristics of Students Entering Post-Secondary Education in Ontario in 2009 by All Educational Pathways (n=9,850)

Variables	Direct Entry University (n=7,600)		University to University (n=460)		University to College (n=660)		Direct Entry College (n=950)		College to College (n=130)		College to University (n=50)	
	%	n	%	n	%	n	%	n	%	n	%	n
Sex												
Male	44	3,360	48	220	48	320	52	490	62	80	60	30
Female	56	4,240	52	240	52	340	48	460	38	50	40	20
Age												
17-18 years	72	5,470	74	340	64	420	45	430	46	60	40	20
19 years	28	2,140	26	120	36	240	55	520	54	70	60	30
Country of Birth												
Canada	61	4,630	61	280	64	420	68	650	69	90	60	30
Outside Canada	39	2,980	39	180	36	240	32	300	23	30	40	20
Field of Study												
Fine Arts/ Humanities/ Social Sciences	40	3030	37	170	50	330	33	310	31	40	20	10
Business	20	1550	15	70	15	100	25	240	15	20	40	20
STEM/ Health and related fields/ Other	40	3020	48	220	35	230	43	410	54	70	40	20
Income Decile	6	7,600	6	460	6	660	5.5	950	5	130	6	50
Grade Nine English Grade												
69 or less	24	1,810	30	140	42	280	58	550	62	80	40	20
70-79	32	2,400	33	150	36	240	28	270	23	30	40	20
80+	45	3,390	39	180	21	140	14	130	15	20	20	10
Grade Nine Math Grade												
69 or less	31	2,330	37	170	53	350	66	630	69	90	60	30
70-79	25	1,900	24	110	27	180	22	210	23	30	20	10
80+	44	3,380	39	180	21	140	12	110	8	10	20	10
Grade 12 Average	79	7,600	76	460	71	660	67	950	64	130	65	50
Graduation												
No	14	1,070	39	180	50	330	37	350	62	80	60	30
Yes	86	6,540	61	280	50	330	63	600	38	50	40	20
Loan balance at end of study												
No	34	2,610	26	120	33	220	49	470	38	50	40	20
Yes	66	5,000	74	340	68	450	51	480	62	80	60	30
Length of Study												
2012/13 (4 years or less)	49	3,720	20	90	24	160	84	800	31	40	20	10
2013/14 (5 years)	33	2,520	24	110	24	160	11	100	15	20	20	10
2014/15 (6 years)	10	750	22	100	14	90	2	20	15	20	20	10
2015/16-2016/17 (7+ years)	8	620	35	160	38	250	4	40	38	50	40	20

Figure 4: Graduation Rate of Post-secondary Students by Non-transfer and Transfer Groupings, 2009 Cohort (n=9,850)

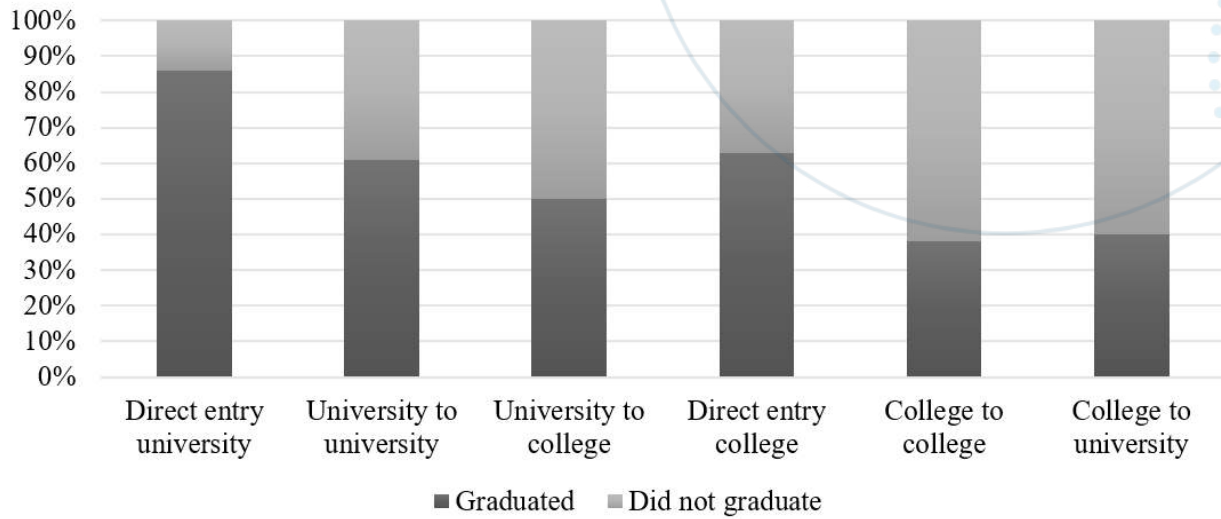


Figure 5: Length of Study of Post-secondary Students by Non-transfer and Transfer Groupings, 2009 Cohort (n=9,850)

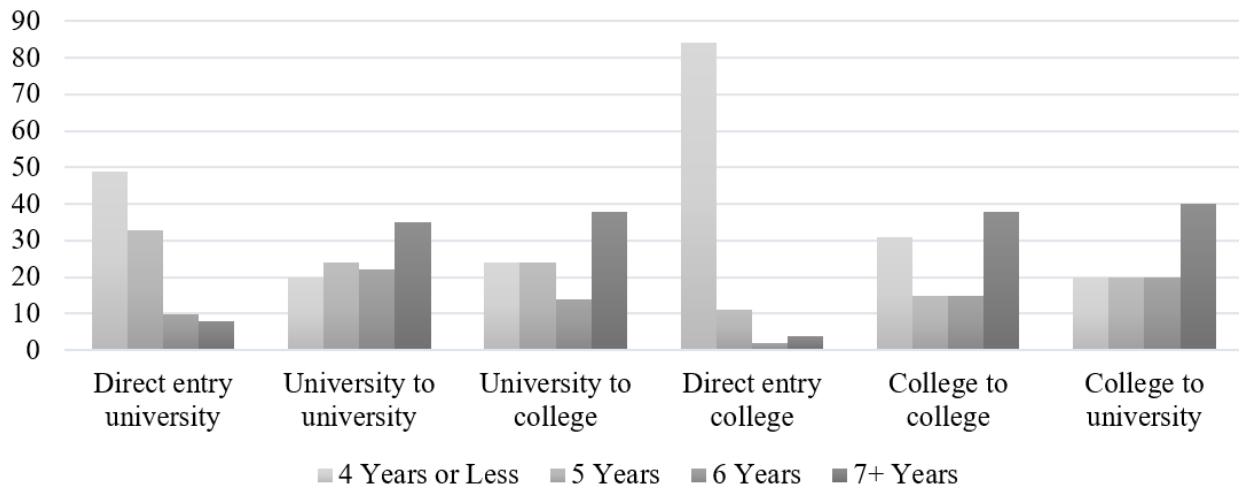


Table 4: Parental Income and Family Size of Canada Student Loan Holders in Ontario by All Educational Pathways, 2009 Cohort (n=5,550)

	Direct Entry University	University to University	University to College	Direct Entry College	College to College	College to University
<i>Variables</i>						
Family Income (Mean Dollars)	52,500	51,700	45,200	39,700	40,900	45,700
Family Size	4	3.5	3.5	3.5	3	3

Table 5: Logistic Regression Predicting Student Borrowing from Canada Student Loan Program - 2009 Cohort (n=8,940)

Variables	Model 1			Model 2			Model 3		
	b	SE(b)	p	b	SE(b)	p	b	SE(b)	p
Mobility									
Direct entry (ref)									
Transfer	0.213	0.064	***	0.004	0.079		0.010	0.080	
Sex									
Male (ref)									
Female				0.279	0.050	***	0.317	0.052	***
Age									
17-18 years (ref)									
19 years				-0.025	0.053		-0.019	0.056	
Country of Birth									
Outside of Canada (ref)									
Canada				-1.025	0.056	***	-0.990	0.056	***
Neighbourhood Income Decile									
				-0.181	0.009	***	-0.181	0.009	***
Field of Study									
Fine arts (ref)						***			***
Humanities				0.056	0.109		0.085	0.110	
Social sciences				0.072	0.113		0.101	0.114	
Business				0.370	0.111	***	0.374	0.111	***
STEM				0.454	0.109	***	0.449	0.111	***
Health and related fields				0.419	0.130	***	0.442	0.131	***
Other				0.028	0.146		0.054	0.146	
Length of Study									
2012/13 (4 years) (ref)						***			***
2013/14 (5 years)				0.462	0.057	***	0.462	0.057	***
2014/15 (6 years)				0.654	0.089	***	0.654	0.089	***
2015/16 & 2016/17 (7+ years)				0.745	0.090	***	0.757	0.091	***
Grade 9 English Grade									
<70% (ref)									***
70-79%							-0.135	0.067	*
>80%							-0.372	0.073	***
Grade 9 Math Grade									
<70% (ref)									*
70-79%							0.064	0.064	
>80%							0.173	0.068	*
Grade 12 Average									
Constant	0.576	0.023		1.746	0.127		1.256	0.259	
Log Likelihood	-6395.93			-5118.51			-5103.04		
LR χ^2	11.27			1400.34			1431.29		
Prob > χ^2	***			***			***		

Estimates in the model are logits

*p ≤ .05 **p ≤ .01 ***p ≤ .001

Table 6: Predicted Probabilities of Students Borrowing from the Canada Student Loan Program (n=8,940)

Mobility	Model 1			Model 2			Model 3		
	Margins	95% CI		Margins	95% CI		Margins	95% CI	
Direct Entry	0.64	0.63	0.65	0.64	0.63	0.65	0.64	0.63	0.65
Transfer	0.69	0.66	0.71	0.64	0.62	0.67	0.65	0.62	0.67

Table 7: Logistic Regression Predicting Student Borrowing from Canada Student Loan Program by Transfer Group - 2009 Cohort (n=8,940)

Variables	Model 1			Model 2			Model 3		
	b	SE(b)	p	B	SE(b)	p	b	SE(b)	p
Transfer Group			***			***			***
Direct Entry University (ref)									
University to University	0.355	0.108	***	0.194	0.129		0.192	0.129	
University to College	0.073	0.086		-0.097	0.104		-0.142	0.105	
Direct Entry College	-0.628	0.069	***	-0.599	0.084	***	-0.685	0.092	***
College to College	-0.105	0.185		-0.346	0.208		-0.422	0.212	*
College to University	-0.211	0.288		-0.971	0.363	**	-0.977	0.363	**
Sex									
Male (ref)									
Female				0.264	0.051	***	0.322	0.052	***
Age									
17-18 years (ref)									
19 years				0.039	0.053		-0.007	0.056	
Country of Birth									
Outside of Canada (ref)									
Canada				-1.014	0.056	***	-0.980	0.056	***
Neighbourhood Income Decile				-0.187	0.009	***	-0.185	0.009	***
Field of Study						***			***
Fine arts (ref)									
Humanities				-0.096	0.112		-0.076	0.113	
Social sciences				-0.036	0.115		-0.034	0.116	
Business				0.287	0.113	*	0.286	0.113	*
STEM				0.343	0.111	**	0.361	0.113	***
Health and related fields				0.323	0.132	*	0.338	0.132	*
Other				0.058	0.147		0.058	0.147	
Length of Study						***			***
2012/13 (4 years) (ref)									
2013/14 (5 years)				0.400	0.058	***	0.389	0.058	***
2014/15 (6 years)				0.578	0.090	***	0.546	0.091	***
2015/16 & 2016/17 (7+ years)				0.706	0.091	***	0.677	0.092	***
Grade 9 English Grade									***
<70% (ref)									
70-79%							-0.183	0.067	**
>80%							-0.410	0.074	***
Grade 9 Math Grade									
<70% (ref)									
70-79%							0.031	0.065	
>80%							0.136	0.069	*
Grade 12 Average							-0.001	0.003	
Constant	0.649	0.024		1.963	0.131		2.139	0.285	
Log Likelihood	-6351.15			-5087.62			-5069.86		
LR χ^2	100.82			1462.14			1497.65		
Prob > χ^2	***			***			***		

*p ≤ .05 **p ≤ .01 ***p ≤ .001

Table 8: Predicted Probabilities of Students Borrowing from the Canada Student Loan Program by Transfer Group (n=8,940)

Transfer Group	Model 1			Model 2			Model 3		
	Margins	95% CI		Margins	95% CI		Margins	95% CI	
Direct entry university	0.66	0.65	0.67	0.66	0.65	0.67	0.66	0.65	0.67
University to university	0.73	0.69	0.77	0.69	0.65	0.74	0.70	0.65	0.74
University to college	0.67	0.64	0.71	0.64	0.60	0.68	0.63	0.59	0.67
Direct entry college	0.51	0.47	0.54	0.54	0.50	0.57	0.52	0.49	0.56
College to college	0.63	0.55	0.72	0.59	0.51	0.67	0.58	0.49	0.66
College to university	0.61	0.47	0.74	0.46	0.31	0.61	0.46	0.31	0.61

Table 9: Ordinary Least Square Regression Predicting Amount of Canada Student Loan Debt at End of Study Period - 2009 Cohort (n=5,550)

Variables	Model 1			Model 2			Model 3		
	b	SE(b)	p	b	SE(b)	p	b	SE(b)	p
Mobility									
Direct entry (ref)									
Transfer	-2832.89	329.84	***	-2714.59	384.00	***	-2220.45	381.21	***
Sex									
Male (ref)									
Female				744.82	250.03	**	414.09	252.04	
Age									
17-18 years (ref)									
19 years				-825.21	267.23	**	237.83	279.50	
Country of Birth									
Outside of Canada (ref)									
Canada				-1228.49	243.30	***	-1054.41	243.07	***
Family Income									
				-0.04	0.01	***	-0.05	0.01	***
Field of Study									
Fine arts (ref)									*
Humanities				883.07	631.89		801.62	624.24	
Social sciences				176.92	646.79		418.69	638.76	
Business				1510.01	618.29	*	1207.98	610.88	*
STEM				2475.55	608.25	***	1542.97	607.71	*
Health and related fields				1730.40	703.20	*	1494.89	695.78	*
Other				-334.26	837.42		132.14	827.64	
Length of Study									
2012/13 (4 years) (ref)									***
2013/14 (5 years)				2425.42	279.94	***	2462.66	276.41	***
2014/15 (6 years)				3708.82	410.62	***	4069.03	406.63	***
2015/16 & 2016/17 (7+ years)				1289.54	408.02	**	1994.22	406.79	***
Grade 9 English Grade									
<70% (ref)									
70-79%							449.69	312.57	
>80%							363.90	340.53	
Grade 9 Math Grade									
<70% (ref)									***
70-79%							908.32	323.50	**
>80%							1631.71	337.60	***
Grade 12 Average									
							121.36	15.43	***
Constant	14946.71	123.52		14101.24	647.23		3802.57	1306.72	
Adjusted R-square	0.011			0.060			0.086		

*p ≤ .05 **p ≤ .01 ***p ≤ .001

Table 10: Predicted Amount of Canada Student Loan Debt at End of Study Period (n=5,550)

Mobility	Model 1			Model 2			Model 3		
	Margins	95% CI		Margins	95% CI		Margins	95% CI	
Direct entry	14900	14700	15200	15300.0	15049.8	15550.3	15238.7	14991.6	15485.7
Transfer	12100	11500	12700	12585.4	11886.5	13284.4	13018.2	12324.8	13711.6

Table 11: Ordinary Least Square Regression Predicting Amount of Canada Student Loan Debt at End of Study Period by Transfer Group - 2009 Cohort (n=5,550)

Variables	Model 1			Model 2			Model 3		
	b	SE(b)	p	b	SE(b)	p	b	SE(b)	p
Transfer Group			***			***			***
Direct Entry University (ref)									
University to University	801.56	488.61		1310.84	547.00	*	1326.75	545.86	*
University to College	-6035.72	428.89	***	-5955.49	487.31	***	-5608.93	490.61	***
Direct Entry College	-9753.71	414.28	***	-9719.28	462.30	***	-8971.90	488.39	***
College to College	-9463.75	971.05	***	-9814.18	1092.15	***	-9150.23	1100.19	***
College to University	-3556.71	1561.90	*	-4389.45	2056.43	*	-3886.67	2056.00	
Sex									
Male (ref)									
Female				587.10	238.11	*	481.73	242.60	*
Age									
17-18 years (ref)									
19 years				113.33	257.72		444.41	269.26	
Country of Birth									
Outside of Canada (ref)									
Canada				-967.72	231.94	***	-865.63	234.17	***
Family Income				-0.05	0.01	***	-0.06	0.01	***
Field of Study						***			***
Fine arts (ref)									
Humanities				-1106.43	609.36		-964.56	609.00	
Social sciences				-1388.04	620.11	*	-1138.01	620.31	
Business				80.06	592.10		6.36	591.23	
STEM				745.88	584.21		332.78	588.42	
Health and related fields				360.90	672.73		291.33	673.05	
Other				-53.86	798.46		124.46	797.64	
Length of Study						***			***
2012/13 (4 years) (ref)									
2013/14 (5 years)				1575.58	269.77	***	1644.54	269.93	***
2014/15 (6 years)				2610.11	393.53	***	2837.04	395.66	***
2015/16 & 2016/17 (7+ years)				729.56	390.08		1062.90	395.23	**
Grade 9 English Grade									
<70% (ref)									
70-79%							-1.58	301.74	
>80%							-22.44	328.36	
Grade 9 Math Grade									***
<70% (ref)									
70-79%							641.11	311.58	*
>80%							1370.22	325.14	***
Grade 12 Average							36.00	15.46	*
Constant	15801.83	122.67		16910.77	628.64		13351.6	1345.86	
R-square	0.111			0.151			0.157		
Adjusted R-square	0.110			0.148			0.153		

*p ≤ .05 **p ≤ .01 ***p ≤ .001

Table 12: Predicted Amount of Canada Student Loan Debt at End of Study Period by Transfer Group (n=5,550)

Transfer Group	Model 1			Model 2			Model 3		
	Margins	95% CI	95% CI	Margins	95% CI	95% CI	Margins	95% CI	95% CI
Direct entry university	15800	15600	1600	16102.4	15852.8	16351.9	16016.7	15765.2	16268.2
University to university	16600	15700	17500	17413.2	16374.7	18451.7	17343.4	16307.4	18379.5
University to college	9800	9000	10600	10146.9	9231.9	11061.8	10407.8	9490.3	11325.2
Direct entry college	6100	5300	6800	6383.1	5517.7	7248.5	7044.8	6137.7	7951.9
College to college	6300	4400	8200	6288.2	4167.6	8408.7	6866.5	4734.8	8998.1
College to university	12200	9200	15300	11712.9	7693.1	15732.7	12130.0	8113.2	16146.9

Table 13: Logistic Regression Predicting Student Graduation - 2009 Cohort (n=8,940)

Variables	Model 1			Model 2			Model 3			Model 4		
	b	SE(b)	p	b	SE(b)	p	b	SE(b)	p	b	SE(b)	p
Mobility												
Direct entry (ref)												
Transfer	-1.524	0.068	***	-1.117	0.079	***	-0.945	0.083	***	-0.948	0.083	***
Sex												
Male (ref)												
Female				0.545	0.062	***	0.400	0.066	***	0.390	0.066	***
Age												
17-18 years (ref)												
19 years				-0.627	0.061	***	-0.114	0.068		-0.115	0.069	
Country of Birth												
Outside of Canada (ref)												
Canada				0.099	0.064		0.135	0.067	*	0.167	0.069	*
Neighbourhood Income Decile												
				0.042	0.011	***	0.021	0.011		0.028	0.012	*
Field of Study												
Fine arts (ref)												
Humanities				0.230	0.131		0.163	0.136		0.159	0.136	
Social sciences				0.408	0.137	**	0.536	0.142	***	0.534	0.142	***
Business				0.439	0.133	***	0.461	0.138	***	0.451	0.138	***
STEM				0.679	0.132	***	0.432	0.138	**	0.420	0.138	**
Health and related fields				0.450	0.159	**	0.438	0.165	**	0.424	0.165	**
Other				0.409	0.178	*	0.740	0.186	***	0.741	0.186	***
Length of Study												
2012/13 (4 years) (ref)												
2013/14 (5 years)				0.762	0.081	***	0.819	0.084	***	0.803	0.084	***
2014/15 (6 years)				0.350	0.106	***	0.536	0.111	***	0.516	0.111	***
2015/16-2016/17 (7+ years)				-1.600	0.084	***	-1.447	0.087	***	-1.473	0.088	***
Grade 9 English Grade												
<70% (ref)												
70-79%							0.048	0.076		0.051	0.077	
>80%							0.132	0.090		0.143	0.090	
Grade 9 Math Grade												
<70% (ref)												
70-79%							0.068	0.078		0.067	0.078	
>80%							0.327	0.088	***	0.321	0.088	***
Grade 12 Average												
							0.068	0.004	***	0.068	0.004	***
Borrowed from CSLP												
No (ref)												
Yes										0.173	0.069	*
Constant	1.669	0.031		0.866	0.148		-4.465	0.321		-4.594	0.326	
Log Likelihood	-4186.53			-3694.49			-3423.02			-3419.90		
LR χ^2	476.86			1460.95			2003.89			2010.13		
Prob > χ^2	***			***			***			***		

*p ≤ .05 **p ≤ .01 ***p ≤ .001

Table 14: Predicted Probabilities of Student Graduation (n=8,940)

Mobility	Model 1			Model 2			Model 3			Model 4		
	Margins	95% CI		Margins	95% CI		Margins	95% CI		Margins	95% CI	
Direct entry	0.84	0.83	0.85	0.83	0.82	0.84	0.82	0.82	0.83	0.82	0.82	0.83
Transfer	0.54	0.51	0.57	0.65	0.62	0.68	0.69	0.67	0.71	0.69	0.67	0.71

Table 15: Logistic Regression Predicting Student Graduation by Transfer Group - 2009 Cohort (n=8,940)

Variables	Model 1			Model 2			Model 3			Model 4		
	b	SE(b)	p	b	SE(b)	p	b	SE(b)	p	b	SE(b)	p
Transfer Group			***			***			***			***
Direct Entry University (ref)												
University to University	-1.326	0.111	***	-0.882	0.128	***	-0.875	0.133	***	-0.882	0.133	***
University to College	-1.798	0.091	***	-1.322	0.105	***	-1.041	0.107	***	-1.038	0.107	***
Direct Entry College	-1.271	0.080	***	-1.256	0.091	***	-0.536	0.101	***	-0.516	0.101	***
College to College	-2.332	0.193	***	-1.979	0.217	***	-1.254	0.225	***	-1.246	0.225	***
College to University	-2.596	0.353	***	-2.078	0.397	***	-1.533	0.417	***	-1.505	0.417	***
Sex												
Male (ref)												
Female				0.532	0.063	***	0.413	0.066	***	0.404	0.066	***
Age												
17-18 years (ref)												
19 years				-0.495	0.063	***	-0.107	0.069		-0.109	0.069	
Country of Birth												
Outside of Canada (ref)												
Canada				0.149	0.065	*	0.156	0.068	*	0.180	0.069	**
Neighbourhood Income Decile				0.032	0.011	**	0.019	0.011		0.024	0.012	*
Field of Study						***			***			***
Fine arts (ref)												
Humanities				-0.150	0.137		0.013	0.139		0.015	0.139	
Social sciences				0.144	0.141		0.418	0.144	**	0.420	0.144	**
Business				0.238	0.137		0.388	0.139	**	0.383	0.139	**
STEM				0.427	0.136	**	0.361	0.139	**	0.355	0.139	*
Health and related fields				0.223	0.163		0.352	0.166	*	0.344	0.166	*
Other				0.525	0.183	**	0.765	0.187	***	0.765	0.187	***
Length of Study						***			***			***
2012/13 (4 years) (ref)												
2013/14 (5 years)				0.604	0.083	***	0.743	0.086	***	0.733	0.086	***
2014/15 (6 years)				0.155	0.109		0.426	0.113	***	0.414	0.113	***
2015/16 & 2016/17 (7+ years)				-1.770	0.086	***	-1.533	0.089	***	-1.550	0.089	***
Grade 9 English Grade												
<70% (ref)												
70-79%							0.017	0.077		0.020	0.077	
>80%							0.107	0.090		0.116	0.090	
Grade 9 Math Grade									**			**
<70% (ref)												
70-79%							0.043	0.078		0.042	0.078	
>80%							0.294	0.088	***	0.290	0.088	***
Grade 12 Top 6 Average							0.061	0.004	***	0.061	0.004	***
Borrowed from CSLP												
No (ref)												
Yes										0.135	0.070	
Constant	1.862	0.035		1.361	0.156		-3.722	0.347		-3.850	0.354	
Log Likelihood	-4055.82			-3593.77			-3407.92			-3406.05		
LR χ^2	738.30			1662.39			2034.09			2037.83		
Prob > χ^2	***			***			***			***		

Table 16: Predicted Probabilities of Student Graduation by Transfer Group (n=8,940)

Transfer Group	Model 1			Model 2			Model 3			Model 4		
	Margins	95% CI		Margins	95% CI		Margins	95% CI		Margins	95% CI	
Direct entry university	0.87	0.86	0.87	0.85	0.84	0.86	0.83	0.83	0.84	0.83	0.83	0.84
University to university	0.63	0.58	0.68	0.73	0.69	0.77	0.72	0.67	0.76	0.71	0.67	0.75
University to college	0.52	0.47	0.56	0.65	0.61	0.69	0.69	0.65	0.72	0.69	0.65	0.72
Direct entry college	0.64	0.61	0.68	0.66	0.63	0.69	0.77	0.74	0.79	0.77	0.74	0.79
College to college	0.38	0.30	0.47	0.51	0.42	0.60	0.65	0.57	0.73	0.65	0.57	0.73
College to university	0.32	0.17	0.48	0.49	0.32	0.66	0.60	0.44	0.75	0.60	0.45	0.76