



Multi-Credentialed Graduates in Canada: Employment, Earnings and Student Loan Holding

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Executive Summary

Postsecondary graduates are taking increasingly diverse educational pathways. Yet there is little recent evidence on the labour market outcomes for these various paths—especially for graduates with multiple credentials. This report addresses some of these research gaps to understand outcomes (such as earnings, underemployment, and loan obligations) for multi-credentialed graduates in the province of Ontario using representative survey data. This study relies on 2013 and 2018 responses to the National Graduate Survey. This data provides comprehensive coverage of graduate demographics, fields of study, and postgraduate outcomes across a diverse set of educational pathways.

We use this survey to accomplish the following objectives:

1. To identify the profiles and demographic trends of multiple credential holders;
2. To estimate differences in annual earnings between graduates with multiple credentials and graduates who acquire a single postsecondary credential;
3. To estimate differences in likelihood and magnitude of loans borrowed among multiple credential holders from those who acquire a single postsecondary credential; and
4. To understand the education-to-work match of graduates with multiple non-analogous credentials, including the predicted probability of underemployment and overqualification.

Highlights

From the report's demographic analysis, females, minorities, and immigrants are well represented across all pathways to postsecondary education and are especially likely to be university or postgraduate degree holders with second credentials. Persons with a disability appear underrepresented in the population of multi-credentialed graduates (MCGs), suggesting that disability status—whether via accommodation requirements or financial obligations—may be a barrier to obtaining subsequent credentials. MCGs are also more likely to be married and have children, which likely derives from correlations between time-to-completion and age but may indicate how the presence of an income-earning partner may help lessen the financial burdens associated with obtaining a second credential.

Other key findings from this study include:

- Most MCGs who pursue a second credential at a “lower” tier than their first postsecondary degree program tend to enroll in health, education, or business programs instead of other programs.
- Those same MCGs—graduates that complete additional credentials at lower tiers than their first postsecondary degree program—show a higher likelihood of underemployment but are not more likely to feel overqualified.

- Completing an additional, lower-level credential does not result in increased earnings. However, obtaining an additional credential at an equivalent degree level or higher does increase earnings.
- Most MCGs do not have significantly worse loan burdens at graduation than single-credentialed graduates. They are also not any more likely than single-credentialed graduates to hold any loan amount, or to hold a loan exceeding \$10,000.
- MCGs appear largely satisfied with employment after receiving secondary credentials, which suggests their pursuit of additional credentials were undertaken for reasons of interest or life satisfaction.

Table of Contents

EXECUTIVE SUMMARY	1
HIGHLIGHTS.....	1
LIST OF TABLES	4
LIST OF FIGURES.....	4
INTRODUCTION.....	5
BACKGROUND.....	6
DATA	7
OUTCOME VARIABLES	8
EXPLANATORY VARIABLES.....	8
METHODS	9
DESCRIPTIVE RESULTS.....	10
DEMOGRAPHICS	10
FIELD SPECIALTY	14
OUTCOMES OF INTEREST.....	14
REGRESSION RESULTS.....	17
UNDEREMPLOYMENT AND OVERQUALIFICATION	17
INCOME OUTCOMES.....	23
STUDENT LOAN HOLDING	26
DISCUSSION.....	31
LIMITATIONS	32
FUTURE DIRECTIONS.....	32
REFERENCES.....	34
APPENDIX.....	37

List of Tables

Table 1 Mean Value of Key Demographic Variables

Table 2 Underemployment by Educational Credentials (Logistic Regression)

Table 3 Subjective Overqualification among Credential Holders (Logistic Regression)

Table 4: Annual Earnings among Credential Holders (OLS Regression)

Table 5: Likelihood of Student Loans among Credential Holders (Logistic Regression Approach)

Table 6: Graduated with Large Student Loan (Logistic Regression Approach)

Appendix Table 1: Underemployment by Educational Credential (OLS)

Appendix Table 2: High Underemployment by Educational Credential (Logistic Regression)

List of Figures

Figure 1 Age and Time-to-Completion Across Credential Types

Figure 2 Field of Study Across Credential Type

Figure 3 Average Outcomes of Interest by Credential Type

Figure 4 Average Earnings across Credential Type, by Sample

Figure 5 Key Covariates in Predicting Underemployment

Figure 6 Predicted Probability of Underemployment or Overqualification

Figure 7 Change in Annual Earnings by Credential Type

Figure 8 Predicted Likelihood of Loan Holding at Graduation

Appendix Figure 1 Predicted High Underemployment

Introduction

The educational landscape has evolved considerably in recent years, with increasingly diverse learning pathways available to students. These pathways include many postsecondary graduates returning to higher education at both the college and university levels after they have completed their original postsecondary program (Barnes and Robinson 1999). However, even though many graduates are returning to institutions of higher education, they are not always doing so to receive higher-level credentialing in their initial field of study. Rather, research suggests that students' postsecondary experiences are dynamic and responsive to labour market demands (Leigh, 2009; Reusch, 2000; Townsend & Dever, 1999). While these returns to higher education may include linear continuations of a given educational pathway, many also obtain new lateral- or lower-level credentialing that are not a continuation of their previous postsecondary schooling (Allen 1996; Walters 2003)—a group that we refer to in this report as multi-credentialed graduates (MCGs). For instance, data from the 2013 National Graduate Survey (NGS) and the Ontario Council on Articulation and Transfer (ONCAT) show that 13% of Ontario students pursue a college degree after a university qualification (Wheelahan et al., 2015).¹

Nevertheless, there are significant knowledge gaps about who becomes MCGs and about the labour market outcomes that are associated with these pathways. Policymakers also lack access to research that investigates the potential downsides of multi-credentialing, including the time and monetary costs of added credentials and the potential for more considerable debt burdens. The primary objective of this report is therefore to assess the outcomes of postsecondary MCGs along three dimensions that typify labour market outcomes in the wider body of literature: earnings, student loan encumbrance, and employment fit.

This study will contribute to MCG research to understand both the underemployment patterns faced by MCGs, as well as providing an analysis of the self-assessed feelings of respondents who have become overqualified by the multi-credential education pathways they have completed. It also elucidates the impact of multi-credentials on annual earnings and assesses loan holding in terms of both loan-holding likelihood, and the magnitude of those loan burdens at graduation. This study employs a nationally representative survey on Canadian postsecondary graduates, and focuses on Ontario graduates. We differentiate MCG “types” according to the following compositions of credentials: college to college; college to university; university to college; university to university; postgraduate to either college or university; and postgraduate to postgraduate. These graduates are compared alongside their counterparts that have only a single college, university, or postgraduate credential.² This report will aid government and policymakers in understanding the particular needs of MCGs to inform future postsecondary policy.

¹ In Canada, pursuing a second postsecondary education credential that is not designed to be a continuation of prior postsecondary attainment is often referred to as “recycling” (see Walters, 2003, also Allen, 1996). This report uses the broader term “multi-credentialed graduate” (MCG).

² Although postgraduates technically possess multiple credentials (i.e., they must have completed an undergraduate degree before proceeding to a master's and/or PhD), this report does not treat them as MCGs as their credentialing tends to be linear and cumulative.

Background

Despite the changing landscape of Canadian postsecondary educational pathways, there is limited research available to define and understand the mechanisms and outcomes of these academic decisions. Prior literature often uses multiple—sometimes inconsistent—definitions of MCGs. For instance, previous research has referred to multi-credential holding as reverse-transferring, reverse-flow (Clark, 1960, cited by Moodie, 2004), reverse articulation (Golding, 1995, cited by Moodie, 2004), and completer reverse transfer (Reusch, 2000). Another common term is “postbaccalaureate reverse transfers” (PRTSs), which describes students who attend college after obtaining a university degree (Townsend & Dever, 1999, p. 16). Finally, the term “recycling” has been used to refer to students seeking to upgrade their skills in non-university institutions such as community colleges, technical institutes, and trade schools (Adamuti-Trache, 2011). Some researchers take a stricter definition of recycling to include only those students who specifically seek a second credential that is a non-continuation of their first credential (Walters, 2003). Thus, university graduates who obtain a college diploma via a postgraduate program would not be considered recyclers.

Several studies do provide some insights into the reasons why students may pursue additional, non-continuous credentials. Research on university-to-college MCGs suggests that students often seek college credentials following an undergraduate degree to learn new skills, change job fields, or improve occupational status (Resusch, 2000; Townsend & Lambert, 1999). In fact, all MCGs, not just university-to-college transfers, tend to deviate from their first field of study, with just over 20% of Canadian postsecondary graduates who pursued a second credential doing so as a continuation of their first credential (Wheelahan et al., 2015). The students that do choose more linear education pathways tend to be under the age of 35 (Wall, 2021). For students who pursue college diplomas after completing an undergraduate degree, previous work shows that the undergraduate degree in question is most likely in the social sciences (Reusch, 2000). The motivation for social science majors to complete a college diploma after their undergrad may be because their undergraduate degree program was chosen based on personal interest and development rather than on future employability. Another reason social science majors may be more likely to pursue a college diploma after completing their undergrad is because their original degree has not provided as direct a pathway into the labour market upon graduation as other fields of study. Both scenarios may result in higher underemployment or educational mismatch for graduates with social science degrees (Walters 2004; Dezelan et al. 2014). In response, students may be motivated to pursue more specialized forms of schooling with a higher likelihood of employment (Dezelan et al., 2014).

Conversely, the current body of research points to MCGs enrolling in more technical fields of study, with the most common second credentials completed in information technology (Friedel & Friesleben, 2017; Reusch, 2000), health, and business studies (Taylor, 2016; Wheelahan et al., 2016). Regulated fields, like health in particular, may have stronger labour-market ties and better employment opportunities, which may explain recent findings by Statistics Canada showing that older MCGs and women tend to migrate towards health-related second credentials (Wheelahan et al., 2015; Wall, 2021).

A small body of literature shows that, for certain fields, university-to-college pathways may be worth the investment. For those university graduates with a social science degree who later obtained a college diploma, doing so in the fields of commerce, engineering, health, or math earned them more than students with a social science undergraduate degree alone (Walters, 2003). Additionally, research has shown that, in general, university graduates who obtained a second undergraduate degree also saw improved earnings across all study fields (Walters, 2003).

Despite the existing body of work on university-to-college MCGs, there are no recent studies on labour market outcomes for those who complete the variety of separate pathways to inconsonant postsecondary credentials. Furthermore, there is limited research to understand the potential costs of obtaining multi-credentials. These costs may include administrative burdens, pecuniary and social costs of moving, and the time and financial costs associated with additional time in school (Walters 2003; Boothby and Drewes 2006; Kerr, McCloy, and Liu 2011; Tobolowsky and Cox 2012; Percival et al. 2016; Finnie et al. 2020; Zarifa et al. 2020). Although Walters (2003) suggests that a second college credential may be an attractive pathway for MCGs because of the lower cost and quicker time to completion typically needed for a college diploma, there remains a dearth of research on whether obtaining multiple unrelated diplomas provide tangible benefits to their employment outcomes. The practice of multi-credential holding, therefore, presents intriguing unanswered questions for social scientists and policymakers.

Data

This analysis draws data from the 2013 and 2018 cross-sectional National Graduate Survey (NGS), accessed via the Statistics Canada's Research Data Centre Network (CRDCN). The NGS documents school-to-work transitions and labour market outcomes of Canadian postsecondary graduates, and it represents the most extensive survey available in Canada to assess these transitions. The NGS was conducted by computer-assisted telephone interviewing (CATI) and is representative of all postsecondary graduates at publicly funded institutions within Canada. The 2018 NGS introduced an option for graduates to self-complete the survey online, while still providing the option for over-the-phone assistance. The survey includes multiple questions related to demographic characteristics, educational attainment, and labour market outcomes since the respondent's graduation. In the 2013 NGS sample, there is a total of 28,715 respondents. These respondents graduated from postsecondary schooling in the 2009-2010 academic year and were surveyed three years following graduation. The 2018 NGS includes 35,759 respondents from the 2014-2015 academic year, again surveyed three years following graduation. The response rate is approximately 50% and 63% of the targeted sample, respectively, across survey years.

Both waves of the NGS are pooled to maximize the sample size and incorporate the most up-to-date information available. The analysis sample is restricted to graduates from Ontario who reported valid answers for all variables of interest. All graduates with degrees in professional fields, including medicine, dentistry, and optometry, are excluded from the analysis due to the specificity of skills and training received in these programs and the substantial earnings differential from other fields. The analysis is further restricted to full-time workers, resulting in a sample size of 8,000 respondents.

Outcome Variables

To understand the early labour market outcomes and conditions of recent postsecondary graduates, we use NGS measures of earnings, underemployment, and student loan debt. Earnings are measured as the natural logarithm of self-reported annual job income for full-time working survey respondents.³ All earnings values are adjusted to 2018 dollars to reflect the annual earnings reported by the more recent cohort. The response variable for the second series of regression models is a binary measure of underemployment. Respondents were asked to compare their education credentials upon graduation to the qualifications needed for the job they held in the week before being interviewed. Respondents who indicated they have higher credentials than required were treated as being underemployed. We also use a measure of whether an individual reported feeling overqualified or not for their current position. The 2018 measure of this variable also allows respondents to indicate if they felt appropriately qualified or underqualified. This variable was coded dichotomously to correspond to the 2013 measure. Any respondents reporting that they felt overqualified were given a value of zero, and those who felt appropriately or underqualified were given a value of one. The final response variable is a binary measure of whether respondents had any government student loans at the time of the survey. A secondary measure was created to indicate whether a student held a large loan at the time of graduation, derived from a variable reporting the outstanding dollar amount of a loan at the time of graduation. This outcome variable is a binary response of whether or not the respondent held a student loan at graduation exceeding \$10,000.

Explanatory Variables

The focal explanatory variable in this study identifies the educational pathways and instances of multiple credentials, or multi-credentialism, for our sample of recent graduates. The multi-credentialism variable includes a total of nine educational attainment categories: 1) college only; 2) college to college; 3) college to university; 4) university only; 5) university to college; 6) university to university; 7) postgraduate only; 8) postgraduate to university or college, and 9) postgraduate to postgraduate. “University only” is treated at the baseline variable against which all other educational attainment categories are compared. We also include several predictors of employment, including: the field of study for the graduate’s most recent program; time to degree; participation in a co-op program; disability status; parental education; gender; age; marital status; presence of children; language; immigrant status; and minority status.

Field of study consists of six categories: 1) social sciences (treated as the reference category); 2) STEM: math, computer science, engineering, and the life sciences; 3) arts and humanities; 4) business; 5) health; and education; and 6) other fields of study.⁴ The time-to-degree variable

³ The income measure approximates what a respondent earns on an annual basis if the job were to last the full year and accounts for irregularities in working patterns. We take the natural log of income to normalize the typically skewed distribution of the variable. This approach is consistent with past research drawing upon NGS data (see Zarifa, Walters, and Seward 2015; Zarifa 2012; Walters 2004; Finnie 2001).

⁴ Fields of study were collapsed into conceptually similar categories to satisfy Statistics Canada’s data disclosure requirements. More detailed categories were possible for the student loans analyses in this report. For these analyses we used the following eight categories: 1) social sciences (treated as the reference category); 2) math, computer

assesses duration in postsecondary education based on a respondent's enrolment and graduating year, treated as continuous. Participation in a co-op program has two categories: co-op participation or not, with no co-op participation treated as a reference. Similarly, the presence of a disability is compared to a baseline of no disability. The parental education variable identifies whether respondents have at least one university educated parent, measured across two categories: neither parent has an undergraduate degree, and at least one parent has an undergraduate degree.

To measure gender, the NGS contains two categories: male (the reference category) and female. Age is assessed as a continuous variable. Marital status covers two categories: married (reference) or not. A variable for the presence of children also has two categories: no children present (reference) and children present. The language variable consists of two categories: not bilingual and bilingual in Canada's official languages. Finally, both minority status and immigrant status assess whether or not respondents identify as such. These measures are included as control variables in each model because they have been identified as significant predictors of labour market outcomes in prior research examining the school-to-work transitions of postsecondary graduates in Canada (Finnie 2000; Jehn, Walters, and Howells 2019; Walters and Zarifa 2008). A further description of these variables is provided in Table 1.

Methods

The analysis consists of descriptive summary statistics analysis and regression analysis. Descriptive statistics encompass the means and standard deviation of each outcome and explanatory variable overall and by multi-credential status. All analyses are weighted using bootstrap weights to adjust for the complex sampling design of the NGS. Descriptive statistics are estimated using listwise deletion to provide weighted study sample characteristics for all the variables included in our analyses.

Regression models are employed to assess the returns to multi-credentials across different credential compositions while controlling for other known predictors. OLS regressions are used to evaluate the effect of credentials on income, where the focal dependent variable is quantitatively coded. Logistic regressions are used where appropriate to analyze categorically coded binary response variables (i.e., this can be used to predict the probabilities of underemployment and loan-holding likelihood).

We build three distinct income models estimated via ordinary least squares (OLS) regression modelling. Model 1 includes our main explanatory variable of interest: credentials classifications, as well as baseline variables to control for respondents' age and a year of survey indicator. Model 2 includes gender, marital status, presence of children, language, immigrant and minority status, disability status, and parental education to assess the influence these differences in demographic

science, and engineering; 3) arts and humanities; 4) business; 5) health; 6) education; 7) life sciences (biology, chemistry, and physics); and 8) other fields of study.

characteristics have on annual earnings estimates. Lastly, Model 3 includes our additional educational attainment measures: namely, field of study, time to degree, and co-op program participation. The results from Model 3 are then used to determine predicted average earnings. These predicted average earnings estimates are presented graphically.

All other models are assessed via logistic regression. The structure of the models follows the same pattern, with Model 3 again being used to determine predicted probabilities of underemployment. We also estimate the same set of logistic regression models to predict the likelihood of having government student loans and the size of these loans for our focal explanatory variables. Using the fully adjusted model, we again determine the predicted probabilities of having government loans and the likelihood of having large student loans.

Descriptive Results

Demographics

Table 1 presents the mean values of the main demographic variables under study. Firstly, females make up the majority of graduates overall (59.6%) as well as across all credential types. The highest representation of females is found in three categories of MCGs: university to college (69.0%); university to university (i.e., two undergraduate degrees) (69.3%), and postgraduate to university or college (71.0%). Graduates with only college degrees have near parity of males (48.1%) to females (51.9%), and males are slightly less represented in college-to-college MCGs (42.3%). Men also make up slightly less of the population of respondents with one (44.0%) or more (42.5%) postgraduate degrees.

Overall, 32.4% of graduates identify as a minority, 20.2% are immigrants, and 16.5% are bilingual in Canada's official languages. Graduates identifying as minorities are also more likely to have either one postgraduate degree (45.2%) or a college-only credential (36.0%). The most common MCG type for minority graduates, however, is the university-to-college pathway (48.3%). Similarly, immigrant populations are highly likely to obtain one (37%) or more (32.1%) postgraduate degree(s), as well as to complete a university-to-college MCG pathway (35.1%). Notably, persons with disabilities (15.3% of graduates overall) are more represented as single credential holders, including at the college (26.4%), university (24.9%), and postgraduate levels (21.7%). Persons with a disability appear less likely to move from college to college (9.7%) or college to university (7.1%), which potentially reflects barriers for students with disabilities to obtain multiple credentials.⁵

⁵ Persons with disabilities are also more represented among MCGs if they were able to acquire university education and go on to earn a second university degree (23%), or college diploma (17.7%). However, they are even less represented at the postgraduate level when going on to pursue a second university- or college-level credential (6.16%) or postgraduate education (7.23%). Unfortunately, it is unknown whether these differences are due to better accessibility and accommodation programming at the university level, or if there are ability-based selection effects among these graduates that determine their chosen pathways.

Table 1 Mean Value of Key Demographic Variables

Credential Type	Female (%)	Minority (%)	Immigrant (%)	Bilingual (%)	Disability (%)	Married (%)	Has Children (%)	Parent with PSE (%)	Co-Op Experience (%)
Overall	59.57 (0.95)	32.38 (0.91)	20.22 (0.74)	16.46 (0.67)	15.25 (0.62)	35.35 (0.91)	15.14 (0.71)	44.65 (0.96)	19.62 (0.82)
College Only	51.86 (2.46)	36.02 (2.43)	19.81 (1.97)	12.17 (1.49)	26.36 (2.12)	23.15 (2.04)	12.61 (1.52)	30.57 (2.25)	25.95 (2.18)
College to College	57.74 (2.66)	22.84 (2.40)	12.56 (1.68)	9.59 (1.44)	9.70 (1.29)	36.55 (2.55)	23.87 (2.50)	22.81 (2.29)	31.89 (2.60)
College to University	60.22 (2.25)	27.75 (2.03)	17.21 (1.65)	16.44 (1.65)	7.07 (1.04)	33.32 (2.16)	8.55 (1.18)	49.83 (2.33)	14.77 (1.65)
University Only	59.91 (1.92)	39.47 (1.98)	20.00 (1.67)	20.29 (1.51)	24.85 (1.67)	21.52 (1.60)	3.93 (0.69)	54.94 (1.95)	15.44 (1.34)
University to College	68.99 (4.49)	48.31 (5.00)	35.06 (4.72)	9.89 (2.63)	17.70 (3.45)	41.32 (4.84)	17.79 (3.53)	58.99 (4.81)	21.42 (4.18)
University to University	69.33 (4.20)	29.68 (4.14)	21.01 (3.70)	22.45 (3.72)	23.00 (3.80)	42.61 (4.45)	10.61 (2.61)	48.31 (4.52)	5.45 (2.01)
Postgraduate	55.97 (1.83)	45.16 (1.91)	36.99 (1.94)	20.20 (1.35)	21.69 (1.43)	49.08 (1.86)	20.43 (1.32)	63.84 (1.90)	10.98 (1.18)
Postgraduate to Univ/College	70.99 (3.63)	27.61 (3.59)	18.69 (3.03)	21.99 (3.68)	6.16 (1.90)	53.14 (4.46)	26.69 (3.87)	43.98 (4.25)	23.09 (3.96)
Postgraduate to Postgraduate	57.53 (1.97)	33.55 (1.95)	32.10 (1.94)	23.25 (1.49)	7.23 (0.79)	65.53 (1.93)	35.18 (1.86)	58.17 (1.98)	12.41 (1.75)
N	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000

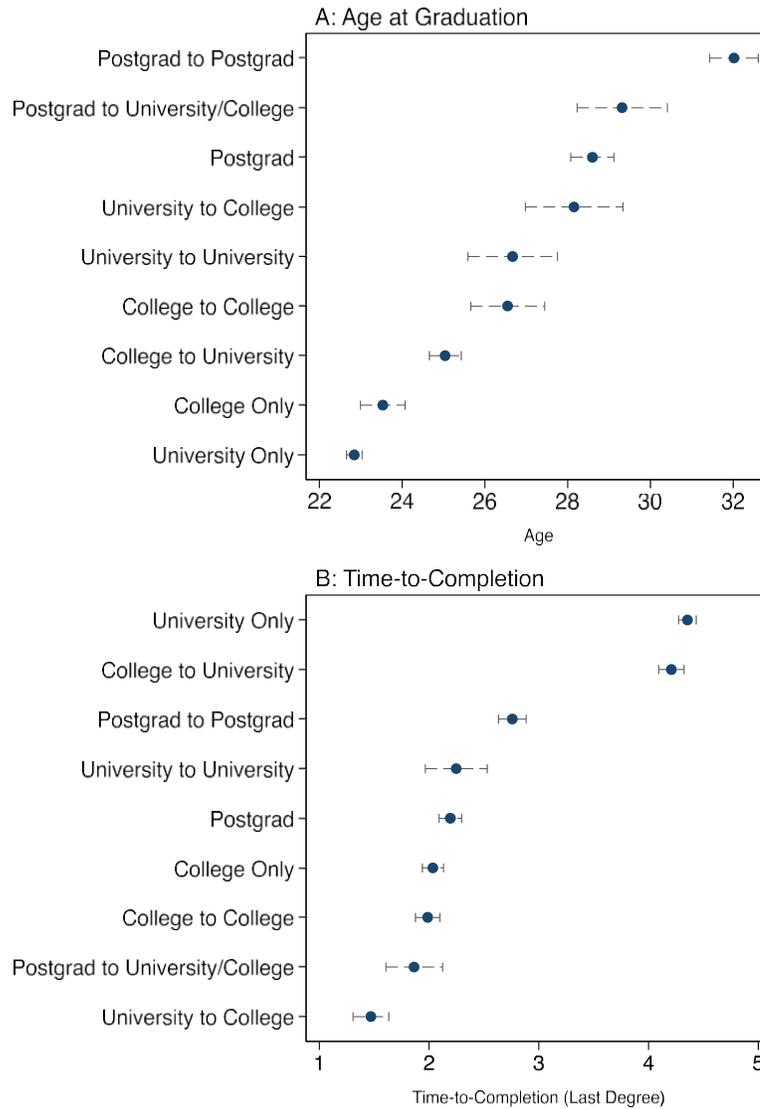
Table presents proportions and standard errors for given covariates across all graduates and by graduate types. Proportions are calculated on the sample used to estimate the effects of MCG type on underemployment, feeling overqualified, and loan holding, with a total sample size of 8,000. The sample used for measuring annual earnings relies on full-time workers and is therefore smaller (N= 7,000). Proportions of key covariates are largely similar in this sample, which are presented in Appendix Table 1. Sample sizes are rounded to the nearest 1000 due to Statistics Canada Research Data Centre vetting rules.

Finally, we note that married graduates (35.4%) are more represented in the university-to-college MCG pathway (41.3%), the university-to-university MCG pathway (42.6%), as well as across all categories of postgraduate studies, though most notably for double postgraduate degrees (65.5%). Graduates with children (15.1% overall) are also more represented across *all* postgraduate degree credential types—particularly postgraduate to postgraduate MCGs (35.2%). These demographics likely reflect the underlying correlation between age and degree-holding, as well as with marriage and childbearing. Indeed, the average age of completion across different types of postgraduate degree holders ranges from age 29 for those with only one postgraduate degree to 32 for those with two or more postgraduate degrees.

Figure 1 provides a visual representation of age and the time it takes to complete the last credential acquired. Interestingly, earning a prior credential does appear to make subsequent completion of university study more efficient, with university-only graduates taking the longest to complete, while those who earn a second undergraduate complete that second degree in less time. We suspect that some of this efficiency might be administrative: graduates with prior postsecondary experience may be more likely to have already completed university-level program requirements (i.e., elective courses) and prerequisites.

Overall, these summaries suggest that women, minorities, and immigrants are highly represented in postsecondary education and are especially likely to be university or postgraduate degree holders with second credentials. Married individuals are also more represented as MCGs, likely reflecting an underlying association with time-to-completion and age. This representation of married individuals may also suggest the potential for increased financial flexibility to seek a second credential if another income-earning partner is present. In fact, our modelling indicates that across all degree levels, MCGs are more likely to be married. Given the underrepresentation of persons with a disability in various MCG types, disability status—whether via accommodation requirements or financial obligations—may be a barrier to obtaining second credentials.

Figure 1 Age and Time-to-Completion Across Credential Types

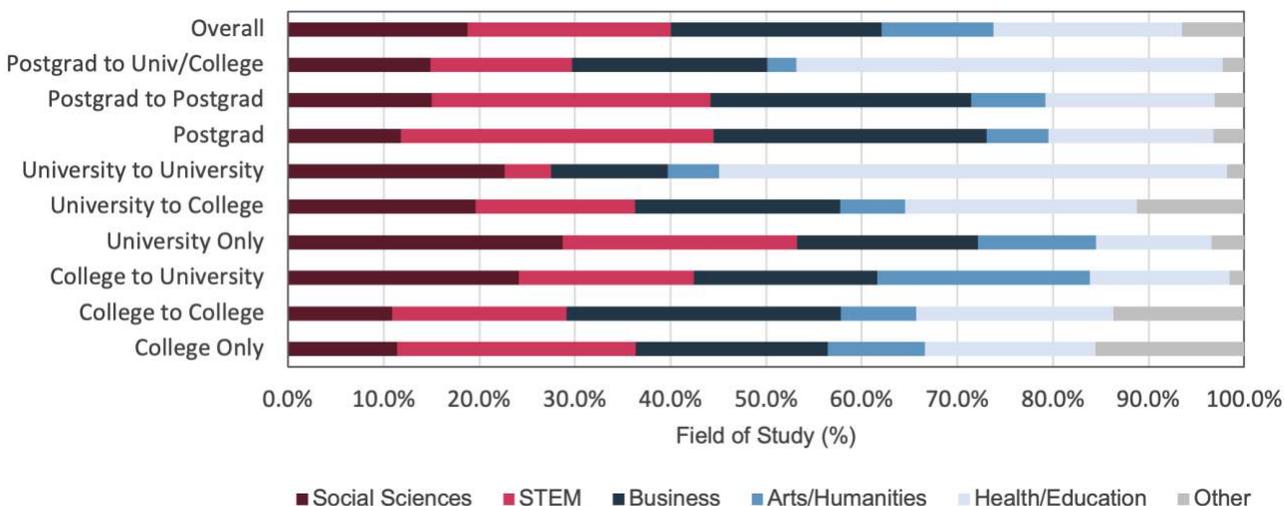


Note: Panel A presents age at the time of graduation across graduate types. The NGS provides age at the time of survey, which occurs 3 years post-graduation. Approximate age at graduation is calculated as the NGS age less 3 years. Panel B presents time-to-completion for last degree obtained across graduate types.

Field Specialty

Figure 2 presents a breakdown of the various fields of study by credential type. Overall, business (22.1%), as well as STEM (science, technology, engineering, and math) fields (22.2%) were the most common areas of study. A similar field distribution is found in college-only degree holders and postgraduate degree holders with one or more degrees. University degree holders are most likely to study social sciences (28.7%) or STEM (24.53%). College-to-university MCGs were also more likely to obtain their university degree in the social sciences (24.1%) or the arts and humanities (22.2%). MCGs that transferred downwards to obtain a college credential after a higher degree were highly likely to pursue their last credentials in health/education or business. This group includes college-to-college MCGs (20.7%), university-to-college MCGs (24.2%), and postgraduate-to-university or -college MCGs (44.6%). University-to-university MCGs were even more likely to pursue a second credential in health/education, at 53.1%. Business and STEM were other common second credentials when MCGs sought additional credentialing at lower levels than previously attained. These results suggest that MCGs that completed their subsequent credentialing at a lower level than their first degree did so to obtain specific career training, particularly in health, education, or business. Conversely, graduates who sought a first or second undergraduate degree, with or without a college degree first, were most likely to pursue social sciences or arts and humanities, which may be driven by specific interests.

Figure 2 Field of Study Across Credential Type



Note: Figure 2 presents breakdown of fields of study, overall, and by credential type as reported from the NGS 2013 and 2018.

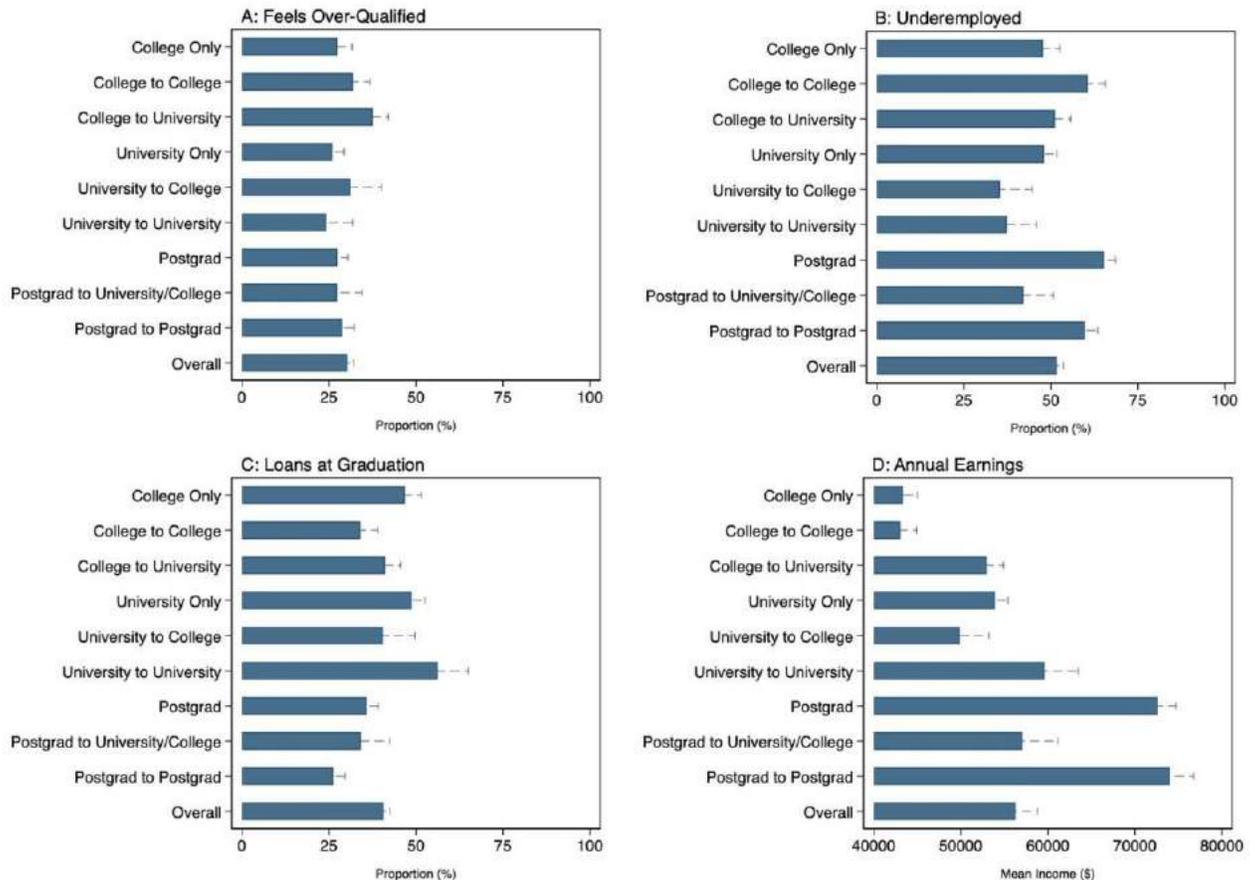
Outcomes of Interest

Figure 3 presents the mean values of the primary outcomes for this study. Panel A reports the proportion of graduates who express that they feel overqualified for their current job. Overall, 30.3% of graduates feel overqualified for their current position. College-to-university (37.5%), college-to-college (31.8%), and university-to-college (31.2%) MCGs appear to feel the most overqualified. University-to-university MCGs are the least likely to report feeling overqualified

(24.2%), followed by postgraduate-to-university or –college (27.3%) and postgraduate-to-postgraduate MCGs (28.8%).

Panel B reports the proportion of graduates who are underemployed for their given position. Overall, around half of all graduates (51.7%) are underemployed to some degree. The most underemployed of these respondents are postgraduate degree holders (65.3%), postgraduate-to-postgraduate MCGs (59.8%), and college-to-college MCGs (60.5%). The least underemployed MCGs are university-to-college (35.3%), university-to-university (37.3%), and postgraduate-to-university/college (42.0%). These results suggest that MCGs are, for the most part, less likely to be underemployed. In other words, greater MCG employability may be less a result of the *type* of extra credentialling the graduates accumulate and more the result of the fields they are enrolling in. As noted in further detail below, MCGs of all types are more likely to pursue additional credentialling in health or education—fields that are highly regulated and in high demand on the labour market.

Figure 3 Average Outcomes of Interest by Credential Type

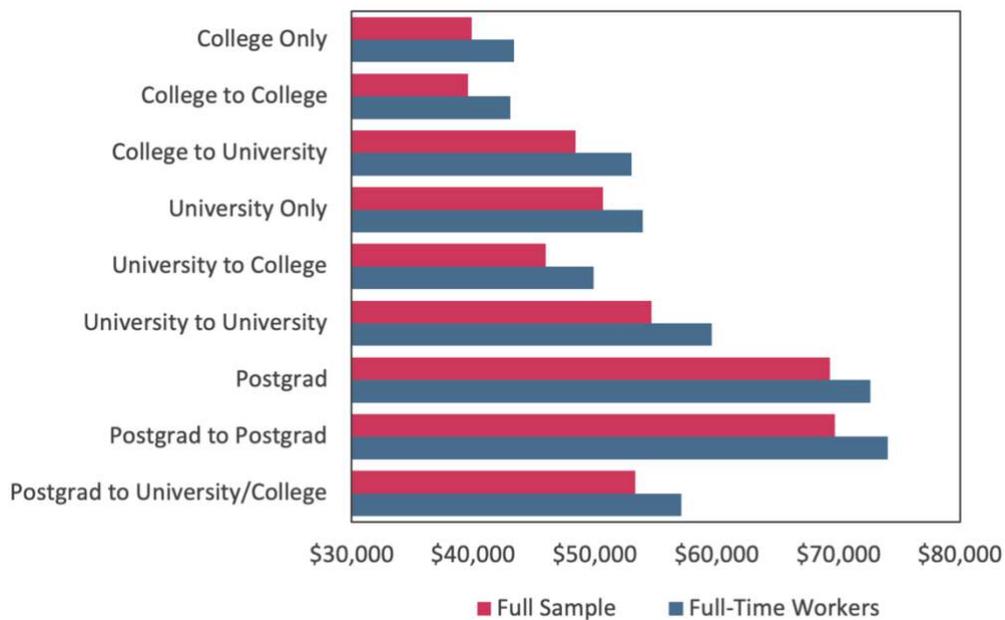


Note: Figure presents mean values by graduate pathways for whether a graduate feels overqualified (Panel A); is underemployed for their current job (Panel B); held any loans at graduation (Panel C); and average annual earnings (Panel D). All panels outside of Panel D use the full sample (N = 8,000). Panel D uses a sub-sample of full-time workers (N = 7,000). Comparisons between this sample and the full sample for income are presented in Figure 4. All annual earnings are rounded to the nearest \$1,000.

Panel C assesses the proportion of individuals holding loans at the time of graduation, with 40.7% of graduates overall holding loans. The most likely graduates to have loans at graduation are university-to-university MCGs (56.2%) and those who have completed a single undergraduate degree (48.7%). This higher degree of loan holding for university graduates likely reflects both the higher cost of university and longer time-to-completion (Figure 1B). Double-postgraduate MCGs are the least likely to hold loans at graduation (26.2%), potentially because many postgraduate programs have some form of funding for students.

Finally, Panel D provides the average annual earnings of graduates by credential type. In a sample of full-time workers, the highest average earners are those holding one (\$72,000) or more postgraduate degrees (\$74,000). However, postgraduates who subsequently obtain a university or college degree *do* experience lower earnings, with average annual earnings for full-time workers being \$57,000. Expectedly, this penalty worsens when we include in our sample those postgraduates that are not working full-time (see Figure 4).

Figure 4 Average Earnings across Credential Type, by Sample



Note: Figure 4 provides average annual earnings of survey respondents by credential status for the full sample (red) and the sample of full-time workers used in the earnings analysis (blue).

Regression Results

With regards to Tables 2-6 (below), regression modelling was used to first assess the effect of being an MCG on outcomes related to underemployment and feeling over-qualified.⁶ For any binary outcome variable (e.g., respondent is underemployed or not), a logistic regression was used. In the first column of each table, the outcome is regressed on a student's multi-credential or transfer status only. In Model 2, control variables, including income, survey year, respondent age, gender, parents' education, and marital status are included to account for additional factors that may impact both the likelihood of multi-credentialism and the outcome of interest regardless of credential status. The final model further incorporates field of study in the last held credential. University-only graduates (i.e., respondents whose only credentialing is an undergraduate degree) are used as the reference credential category across all regression models and given a coefficient value of one. All other credential categories can then be compared to a baseline value of one. Values greater than one suggest a higher likelihood for a specific outcome of interest. Values less than one suggest a lower likelihood of a given outcome of interest.

Underemployment and Overqualification

Results estimating the effect of multi-credential holding on underemployment using logistic regression are presented in Table 2. Similar results for subjective overqualification are found in Table 3.⁷ Looking first at the baseline model results for underemployment in Table 2, compared to university-only graduates, college-only graduates ($p < 0.05$) college-to-college MCGs ($p < 0.01$) appear more likely to be underemployed. College-to-university MCGs appear to have similar likelihood of underemployment to that of university-only students and university-to-university MCGs ($p > 0.10$). At the postgraduate tier of education, the likelihood of underemployment increases substantially for respondents with either one ($p < 0.001$) or more ($p < 0.001$) postgraduate degrees. Postgraduates that subsequently completed a lower-level degree (i.e., postgraduate-to-university/college MCGs) do not differ from bachelor only graduates in their likelihood of underemployment ($p > 0.10$), which contrasts with university-to-college MCGs, who appear to experience a substantial increase in the likelihood of underemployment in comparison to the reference group ($p < 0.001$).⁸

To capture confounding factors, several covariate controls are included in the logistic regressions in Model 2. Underemployment appears to decrease at higher levels of income. As well, being female or having at least one parent with an undergraduate degree appear to decrease likelihood of underemployment. Model 2 coefficients, estimating the impact of different credential pathways of underemployment, remain largely consistent with those estimated in Model 1, though college-only graduates and college-to-college MCGs no longer indicate an increased likelihood of underemployment ($p > 0.10$). When controlling for these factors, postgraduate-to-

⁶ Regression models are run on a sample of full-time workers only.

⁷ Comparable results estimated via OLS can be found in Appendix Tables 1 and 3.

⁸ For the postgraduate-to-postgraduate group, the data does not allow for differentiation between those that acquire a PhD and return for a master's degree or those that return for an incongruous masters or PhD program from those that follow a traditional master's degree to PhD route.

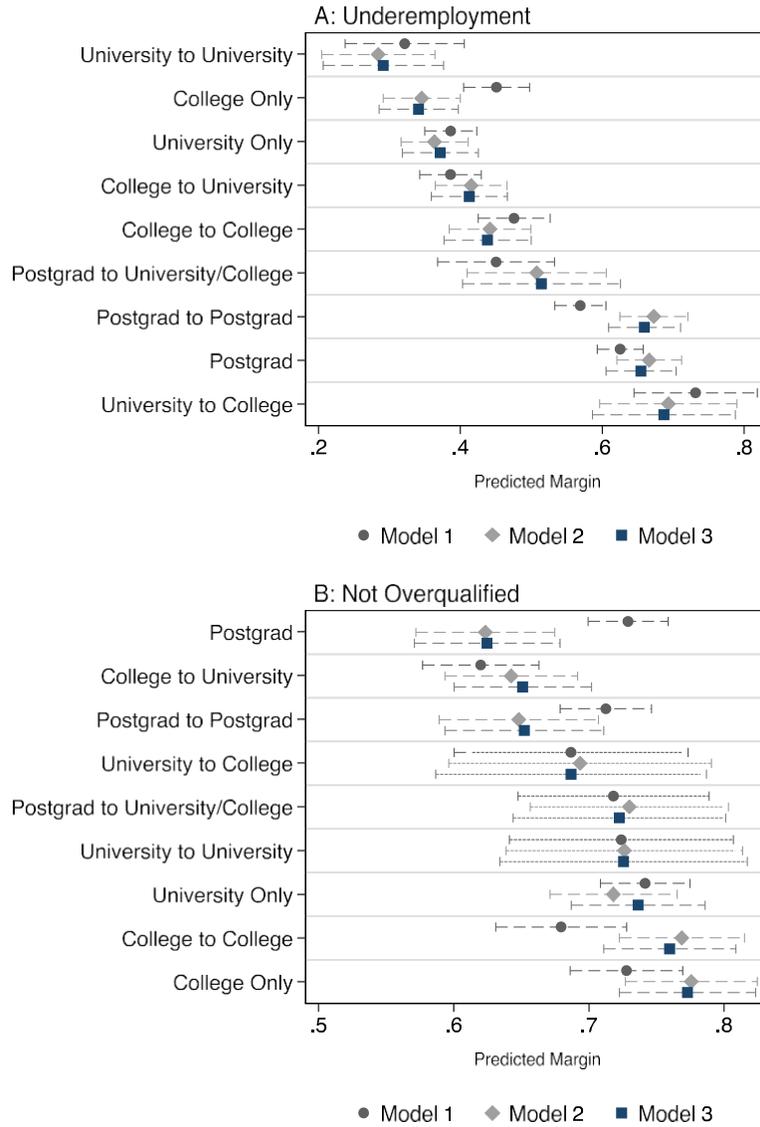
university/college MCGs do appear to have higher rates of underemployment when compared to university-only graduates ($p < 0.05$). In the final column, Model 3, field of study is incorporated, and indicates that the likelihood of underemployment is roughly the same across fields. That said, those with health or education credentials are much less likely to be underemployed ($p < 0.001$). When incorporating field, as well as time-to-completion and co-op participation, the estimated effects of credential types remain largely consistent with the covariate-controlled model. Respondents with the highest rates of underemployment are university-to-college MCGs, postgraduates, and postgraduate-to-postgraduate MCGs (Figure 5, Panel A).

Table 2 Underemployment by Educational Credentials (Logistic Regression)

Variables	Model 1 Coef (s.e.)		Model 2 Coef (s.e.)		Model 3 Coef (s.e.)	
Transfer(Ref: University Only)						
College Only	1.289*	(0.164)	0.915	(0.121)	0.868	(0.136)
College to College	1.434**	(0.193)	1.387	(0.238)	1.323	(0.256)
College to University	0.950	(0.120)	1.237	(0.204)	1.177	(0.195)
University to College	4.243***	(1.028)	3.952***	(0.963)	3.709***	(0.984)
University to University	0.715	(0.148)	0.695	(0.146)	0.714	(0.161)
Postgraduate to Uni/College	1.302	(0.252)	1.805*	(0.429)	1.832*	(0.496)
Postgraduate	2.673***	(0.291)	3.476***	(0.420)	3.205***	(0.474)
Postgraduate to Postgraduate	2.171***	(0.246)	3.603***	(0.630)	3.281***	(0.617)
Log Income	-		0.376***	(0.036)	0.413***	(0.040)
Year 2018 (Ref: 2013)	-		1.593***	(0.213)	1.535**	(0.206)
Respondent Age	-		1.022**	(0.008)	1.023**	(0.009)
Female (Ref: Male)	-		0.680***	(0.058)	0.708***	(0.064)
Has Disability (Ref: None)	-		1.091	(0.115)	1.100	(0.117)
Parental ED (Ref: None)	-		0.780**	(0.068)	0.764**	(0.068)
Field (Ref: Social Sciences)						
STEM	-		-		0.837	(0.107)
Arts/Humanities	-		-		1.109	(0.167)
Business	-		-		0.788	(0.111)
Health/Education	-		-		0.575***	(0.077)
Other	-		-		1.186	(0.232)
Co-op Participation (Ref: None)	-		-		0.708**	(0.082)
Observations	8,000		8,000		8,000	

Note: Table 2 presents results from three logistic regression estimations of credential holding on risk of underemployment. All coefficients are odds ratios and standard errors in parentheses: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. For parsimony, coefficients for married, has children, bilingual, immigrant and minority are not reported. Other field specialty and time-to-completion are also not reported. Covariate coefficients for underemployment are presented in Figure 6.

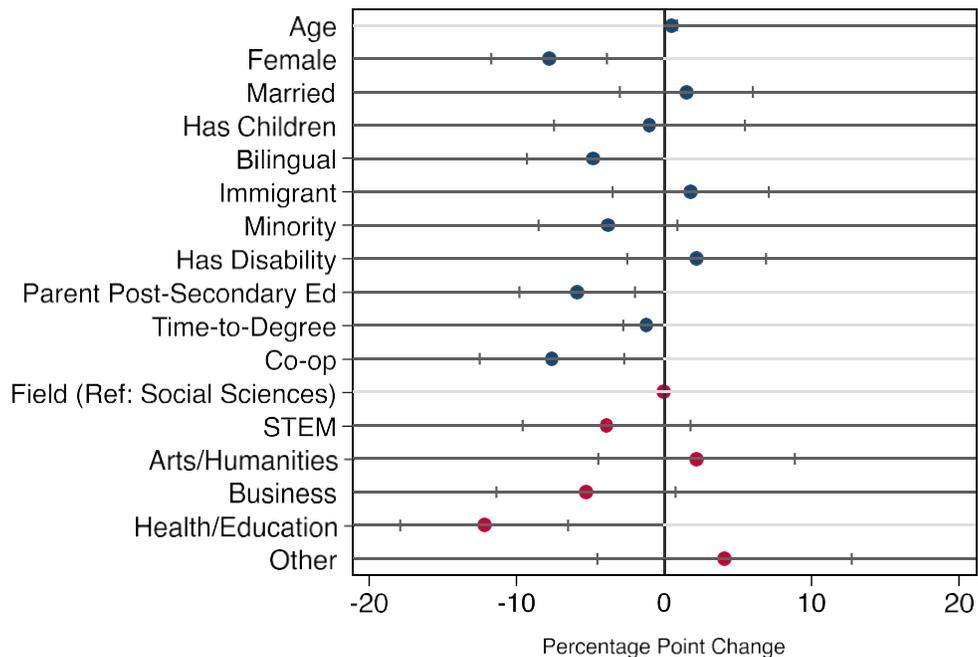
Figure 5: Predicted Probability of Underemployment or Overqualification



Note: Figures plot the predicted likelihood of being underemployed (Panel A) and if a graduate does not feel overqualified (Panel B). All predicted margins are measured at covariate means. Each figure is sorted based on predicted margins from Model 3.

Results from Model 3 suggest that age increases the likelihood of underemployment ($p < 0.05$), while being female ($p < 0.001$) and having at least one parent with an undergraduate education ($p < 0.01$) decreases the likelihood of underemployment (see Figure 6). Similar results in terms of important covariates and MCGs' underemployment are found when measuring coefficients via OLS (Appendix Table 2). If underemployment is instead measured based on a graduates' first credential, respondents with one ($p < 0.001$) or more ($p < 0.01$) graduate degrees sustain a higher rate of underemployment when compared to university-only respondents. Using just their first credential, MCGs who obtained a lower second degree do not appear to have an underemployment penalty. University-to-college MCGs are less likely to be underemployed ($p < 0.01$), while postgraduate-to-postgraduate MCGs' underemployment does not differ from that of respondents with a single undergraduate degree (i.e., "university only").

Figure 6 Key Covariates in Predicting Underemployment



Note: Figure 6 presents estimated impact of key covariates on likelihood of underemployment, measured via OLS (Appendix Table 1). Demographic and school related covariates (blue) and field of study (red) are both presented.

Table 3 presents the effect of credential type on whether graduates feel overqualified for their level of employment. It should be noted that underemployment may not necessarily be a problem if graduates do not *feel* overqualified; particularly in situations when underemployment is a choice, where MCGs earned a second credential to begin a new type of career.⁹

Compared to university-only graduates, most other respondents do not feel overqualified. The two exceptions to this from Model 3 are college-to-university MCGs ($p < 0.05$) and postgraduate degree holders ($p < 0.01$). For college-to-university MCGs, feelings of overqualification and underemployment may be due to the considerable time investment in education, coupled with the looser labour market connection to university degrees (when compared to college-level degrees, which are designed to have more immediate application in the labour market). Postgraduates may also feel overqualified versus university-only respondents for the same reason: the looser connection of postgraduate degrees to the labour market. Especially for PhD holders, obtaining an academic position is exceedingly difficult and may result in feelings of overqualification. Given limited data availability on this group of graduates, however, further granularity on this sentiment is not feasible within this analysis or within the scope of this report. Nevertheless, as shown in Figure 6 (Panel B), the predicted probabilities of not feeling overqualified, as assessed at the means of all covariates, have a high degree of overlap regardless of degree type.

Table 3: Subjective Overqualification among Credential Holders (Logistic Regression)

Outcome: Graduate Does Not Feel Overqualified	Model 1 Coef (s.e.)		Model 2 Coef (s.e.)		Model 3 Coef (s.e.)	
Transfer (Ref: University Only)						
College Only	0.93	(0.133)	1.352	(0.211)	1.264	(0.221)
College to College	0.749	(0.112)	1.300	(0.247)	1.193	(0.250)
College to University	0.582***	(0.077)	0.712	(0.129)	0.686*	(0.124)
University to College	0.769	(0.175)	0.893	(0.223)	0.821	(0.221)
University to University	1.094	(0.250)	1.047	(0.249)	0.86	(0.219)
Postgrad to Uni/College	0.933	(0.194)	1.077	(0.260)	0.887	(0.230)
Postgraduate Only	0.928	(0.112)	0.651**	(0.089)	0.597**	(0.095)
Postgraduate to Postgraduate	0.866	(0.109)	0.751	(0.150)	0.695	(0.144)
Log Income	-		3.572***	(0.339)	3.531***	(0.346)
Year 2018 (Ref: 2013)	-		1.254	(0.184)	1.238	(0.181)
Respondent Age	-		0.99	(0.008)	0.99	(0.008)
Female (Ref: Male)	-		1.371***	(0.128)	1.329**	(0.130)
Has Disability (Ref: None)	-		0.732**	(0.087)	0.721**	(0.086)
Parental ED (Ref: None)	-		1.098	(0.109)	1.097	(0.107)
Field (Ref: Social Sciences)						
STEM	-		-		1.190	(0.163)
Arts/Humanities	-		-		1.173	(0.191)
Business	-		-		1.085	(0.158)
Health/Education	-		-		1.642***	(0.240)
Other	-		-		0.808	(0.171)
Time-to-Completion	-		-		0.976	(0.031)
Co-op Participation (Ref: No Co-op)	-		-		1.045	(0.131)
Observations	8,000		8,000		8,000	

Note: Table 3 presents results from three logistic regression estimations of credential holding on risk of feeling overqualified. All coefficients are exponentiated and standard errors in parentheses: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. For parsimony, coefficients for married, dependent children, bilingual, immigrant, and minority are not reported. No excluded coefficients are measured with precision.

We note that the presence of a disability appears to increase subjective feelings of overqualification ($p < 0.01$). Males, in addition to being more at risk of underemployment ($p < 0.001$), also report greater subjective feelings of overqualification when compared to females ($p < 0.01$). Health and Education are again the only fields where individuals are significantly less likely to report feeling overqualified ($p < 0.001$). Again, at least part of this result may derive from the close connection between these types of certifications and the types of jobs they lead to.

Overall, these results indicate that while some MCGs (notably those that receive a second credential at a lower level than their first) do experience increased underemployment, these same MCGs largely feel that their education matches the jobs they go on to acquire. On the other hand, college-to-university MCGs were not more likely to be underemployed than university-only graduates, but they *were* more likely to feel overqualified. It may be the case that MCGs that move to a lower credential level do so for alternative reasons from career attainments. They may be more likely to seek out new career paths out of personal interest or for reasons related to life satisfaction—which cannot be measured through traditional metrics of labour market outcomes. The difficulty of measuring these less tangible career motivations should be kept in mind when reading the next section on loan and income analyses, where the monetary outcomes for MCGs that return to lower credential tiers is not as positive.

Income Outcomes

Results estimating the effect of differing credential types on annual earnings are presented in Table 4. University-only remains the reference group to which all other credentials are compared. For traditional graduates with single credentials, earnings follow a relatively linear relationship, with college-diploma holders earning 22% ($p < 0.001$) less than university graduates, and postgraduates earning 30% more ($p < 0.001$). As well, college-to-college MCGs do not have higher earnings than respondents with single college diplomas. In Figure 7 there is an almost identical overlap in the estimated additional earnings for college-only graduates and college-to-college MCGs.

University-to-university MCGs do experience improved earnings, by around 10% ($p < 0.01$), depending on the exact model employed. When accounting for field of study (Model 3), a second university program is associated with 9.9% higher earnings over respondents with a single undergraduate degree ($p < 0.01$). It is more difficult to discern the earnings outcome for university-to-college MCGs: when controlling for all covariates outside of field of study (Model 2), MCGs appear to earn roughly 12% ($p < 0.01$) less than university-only graduates. Nevertheless, when controlling for field of study (Model 3), this apparent earnings reduction falls to 6.0% but is not precisely estimated. In either case, the earnings return for university-to-college multi-credentialling do not appear to be greater than a university credential on its own.

Table 4 Annual Earnings Among Credential Holders (OLS Regression)

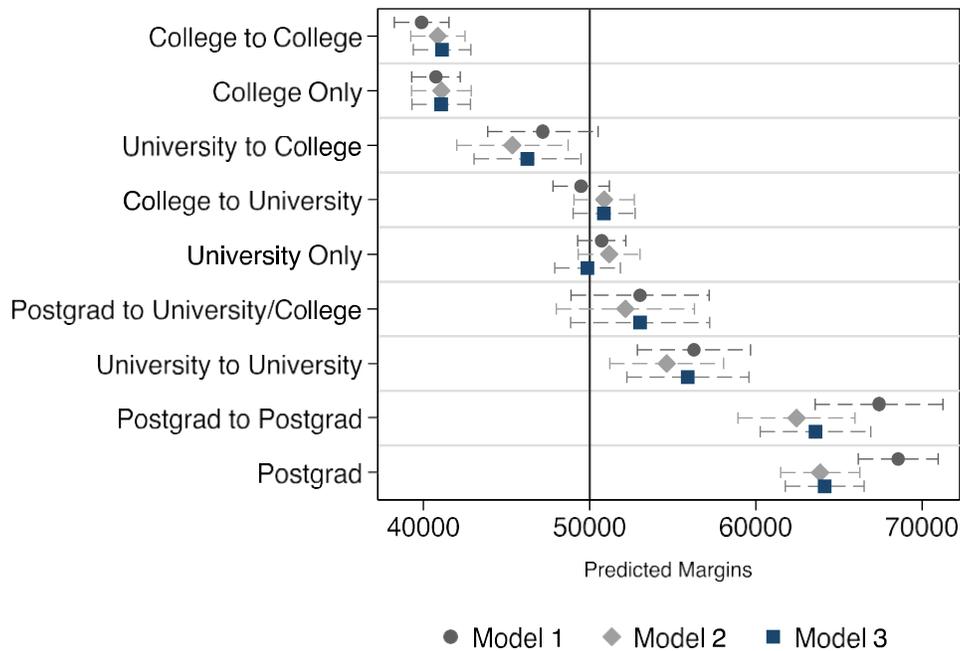
Variables	Model 1 Coef (s.e.)		Model 2 Coef (s.e.)		Model 3 Coef (s.e.)	
Transfer (Ref: University Only)						
College Only	-0.218***	(0.023)	-0.219***	(0.024)	-0.179***	(0.027)
College to College	-0.243***	(0.026)	-0.232***	(0.030)	-0.182***	(0.034)
College to University	-0.022	(0.023)	-0.007	(0.029)	0.022	(0.028)
University to College	-0.073	(0.039)	-0.122**	(0.039)	-0.06	(0.040)
University to Univ	0.103**	(0.035)	0.064	(0.035)	0.099**	(0.038)
Postgraduate to Uni/College	0.05	(0.043)	0.023	(0.047)	0.059	(0.050)
Postgraduate Only	0.300***	(0.023)	0.220***	(0.022)	0.248***	(0.026)
Postgraduate to Postgraduate	0.293***	(0.033)	0.202***	(0.037)	0.239***	(0.034)
Year 2018 (Ref: 2013)	-		0.066**	(0.024)	0.082***	(0.023)
Respondent Age	-		0.011***	(0.001)	0.011***	(0.001)
Female (Ref: Male)	-		-0.116***	(0.015)	-0.098***	(0.016)
Married (Ref: Not Married)	-		0.046**	(0.018)	0.041*	(0.017)
Bilingual (Ref: Not Bilingual)	-		0.023	(0.017)	0.038*	(0.017)
Has Disability (Ref: None)	-		-0.066***	(0.018)	-0.063***	(0.018)
Parental ED (Ref: None)	-		0.068***	(0.016)	0.070***	(0.016)
Field (Ref: Social Sciences)						
STEM	-		-		0.148***	(0.021)
Arts/Humanities	-		-		-0.039	(0.026)
Business	-		-		0.115***	(0.023)
Health/Education	-		-		0.155***	(0.024)
Other	-		-		0.006	(0.030)
Time-to-Completion	-		-		0.024***	(0.006)
Co-op Participation (Ref: No Co-op)	-		-		0.062**	(0.019)
Observations	7,000		7,000		7,000	
R ²	0.17		0.24		0.28	

Table 4 presents results from three ordinary least squares regression estimations of credential holding on annual earnings. For parsimony, coefficients for dependent children, immigrant and minority are not reported. All coefficients for earnings are presented in Figure 5. No excluded coefficients are measured with precision. Standard errors in parentheses: * p<0.05, ** p<0.01, *** p<0.001.

Overall, postgraduate degrees bolster earnings more than an undergraduate degree on its own does (p < 0.001)—and that earnings advantage over undergraduates is maintained even when more than one postgraduate degree is completed (p < 0.001). The earnings effect for either of

these categories is high, at around 24%.¹⁰ However, earnings for postgraduate-to-postgraduate MCGs do not differ from respondents with a single postgraduate degree (Figure 7). However, postgraduate-to-college/university MCGs appear have substantially lower earnings than their single degree-holding postgraduate counterparts (Figure 7). There also appears to be no earnings differential between postgraduate-to-college/university MCGs and respondents with only an undergraduate degree ($p > 0.10$).

Figure 7 Change in Annual Earnings by Credential Type



Note: Figure 7 compares predicted earnings for each credential type, measured at the mean value for each covariate. Three models are presented for each credential type: a zero-order model (dark grey circle), a demographic covariate-controlled model (light grey diamond), and a model controlling for demographic characteristics and field specialty (blue square).

Taken together, this data shows that obtaining a secondary credential at an equivalent or lower tier than one’s original credential does not appear to improve earnings—and may sometimes lead to lower earnings. While there is some evidence of incremental earnings with a second undergraduate degree, this effect is small and appears to be field-dependent (Figure 7). Conversely, obtaining an undergraduate degree after completing a college diploma does appear to confer increases to earnings. Whether this improvement to earnings for some MCG types outweighs the additional costs of obtaining secondary credentials is explored in the next section regarding student borrowing.

¹⁰ Note that for postgraduate-to-postgraduate transfers, the NGS does not differentiate between those that receive a master’s followed by a Ph.D.; two master’s; a master’s after a Ph.D.; or two Ph.D.s; and the analysis in this report is unable to determine if a specific pathway drives the large returns for this MCG path.

Student Loan Holding

Table 5 presents results estimating the likelihood of retained student debt at the time of graduation. The outcome of interest is a binary measure of whether the graduate had government-sponsored student loans at the time of graduation for their last credential. Any individual who received student loans but repaid them prior to graduation are not included in this variable. Thus, this variable captures the presence of loans that may impact employment choices upon graduation and early career stresses related to loan repayment. From Model 1, most MCGs types appear less likely to hold student loans at the time of graduation when compared to university-only graduates. Only university-to-university MCGs appear more likely to hold debt. However, this higher likelihood of loans is only precisely estimated for university-to-university MCGs after controlling for demographic covariates and field specialty ($p < 0.01$).¹¹

MCGs who first obtained credentials at the college and postgraduate level (i.e., college-to-college MCGs or postgraduate-to-university/college MCGs) have a lower likelihood of student loan burdens at the time of graduation in Model 1 (see also Figure 8, Panel A for predicted likelihood of loan holding). However, once controlling for demographic and field differences between graduates, these MCGs do not appear to have significantly worse loan burdens than single-credentialed graduates ($p > 0.10$).¹² Parental education in particular appears to mitigate the likelihood of a loan balance at graduation ($p < 0.001$). If parental education is correlated with family income, this suggests that those that seek a second credential may be less likely to take loans because they or their families have the means to afford a second degree without support. Nevertheless, both females ($p < 0.05$) and graduates with a disability ($p < 0.001$) have a higher likelihood of retaining loans at graduation.

¹¹ One possible explanation should acknowledge the lower cost and time-to-completion associated with college tuition, as well as the grant and scholarship opportunities available within postgraduate study. Therefore, university-only graduates, as well as university-to-university MCGs, may be more likely to have a loan simply because of the differences in cost structure and funding availability between credential types.

¹² Postgraduates are as likely to carry loans as undergraduates with no other credentialing, which makes sense given that many postgraduate programs offer funding support to students. For college-to-college MCGs as well, given the extra years of schooling required to obtain a second college credential, it makes sense that their loan holding is comparable to that of undergraduates with no other credentialing.

Table 5 Student Loans among Credential Holders (Logistic Regression Approach)

Variables	Model 1		Model 2		Model 3	
	Coef (s.e.)		Coef (s.e.)		Coef (s.e.)	
Transfer (Ref: University Only)						
College Only	0.925	(0.116)	0.857	(0.112)	0.938	(0.14)
College to College	0.542***	(0.076)	0.669*	(0.115)	0.764	(0.14)
College to University	0.735*	(0.090)	0.984	(0.165)	1.013	(0.17)
University to College	0.718	(0.151)	0.886	(0.200)	1.005	(0.25)
University to University	1.353	(0.268)	1.603*	(0.324)	1.834**	(0.39)
Postgraduate to Uni/College	0.545**	(0.112)	0.830	(0.201)	0.989	(0.26)
Postgraduate Only	0.590***	(0.064)	0.762*	(0.094)	0.889	(0.12)
Postgraduate to Postgraduate	0.374***	(0.045)	0.658*	(0.116)	0.759	(0.14)
Respondent Age			0.959***	(0.008)	0.957***	(0.009)
Year 2018 (Ref: 2013)	-		1.156	(0.159)	1.187	(0.166)
Female (Ref: Male)	-		1.184*	(0.100)	1.164	(0.107)
Married (Ref: Not Married)	-		0.950	(0.101)	0.941	(0.100)
Has Children (Ref: No Children)	-		1.049	(0.164)	1.058	(0.167)
Bilingual (Ref: Not Bilingual)	-		0.928	(0.097)	0.928	(0.097)
Immigrant (Ref: Non-Immigrant)	-		1.131	(0.149)	1.166	(0.154)
Minority (Ref: Non-Minority)	-		1.239	(0.138)	1.264*	(0.140)
Has Disability (Ref: No Disability)	-		1.520***	(0.157)	1.509***	(0.157)
Parental ED (Ref: No Parental ED)	-		0.647***	(0.061)	0.642***	(0.061)
Field (Ref: Social Sciences)						
Math/Computer	-		-		0.941	(0.133)
Sci/Engineering	-		-		1.019	(0.154)
Arts/Humanities	-		-		0.727*	(0.100)
Business	-		-		1.127	(0.166)
Health	-		-		0.867	(0.161)
Education	-		-		0.981	(0.164)
Sciences	-		-		0.989	(0.225)
Other	-		-			
Time-to-Completion	-		-		1.050	(0.032)
Co-op Participation (Ref: No Co-op)	-		-		1.166	(0.131)
Observations	8,000		8,000		8,000	

Table 5 presents results from three logistic regression estimations of credential holding on likelihood of student loans at graduation. The outcome variable measures debt at the time of graduation. Individuals that received government-sponsored student loans and repaid these loans prior to graduation are not included in this variable. Standard errors in parentheses: * p<0.05, ** p<0.01, *** p<0.001.

In a secondary analysis, Table 6 presents results on whether a student held a large loan at the time of graduation. The outcome variable of interest indicates whether the respondent held a student loan at graduation exceeding \$10,000. Results from Model 1 indicate that, compared to respondents with a single undergraduate degree, respondents with college credentialing are less likely to hold large loans at graduation. This result holds for those with only one college diploma ($p < 0.001$), those with more than one college diploma ($p < 0.001$), and even those that obtain a college diploma following university ($p < 0.01$).

Upon controlling for demographics and field of study, the difference in loan burdens at graduation is less apparent for college-degree holders (Figure 8, Panel B). For university-to-college MCGs, their likelihood of a large loan burden is not statistically different from university graduates with no other credentialing ($p > 0.10$). At the same time, regardless of the model specification, respondents with one or two college-level credentials have a lower large-loan likelihood than respondents with a single university degree. Nevertheless, much of these results may be derived from the lower costs of education for college versus university.

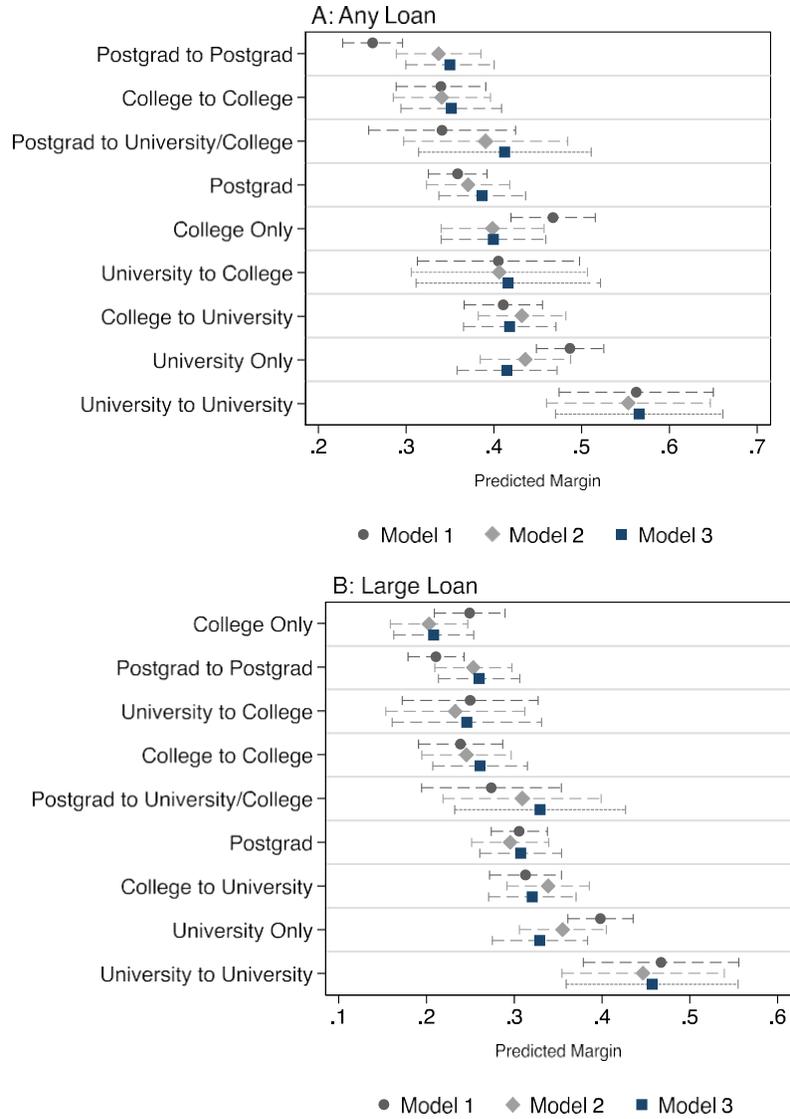
For higher degrees, once accounting for field of study and demographics, MCGs with two undergraduate degrees are more likely to hold a balance greater than \$10,000 at graduation when compared to respondents with only one undergraduate degree ($p < 0.05$). Postgraduate MCGs do not appear more or less likely than undergraduate degree holders to have large loans at graduation ($p > 0.10$). Large loans at the postgraduate level are likely field specific. We also note that minority status, disability status, and parental education are all strong predictors of loan holding, with higher likelihood of holding a large loan for minority graduates or graduates with a disability, as well as those without a parent with a university education

Table 6 Graduated with Large Student Loan (Logistic Regression Approach)

Variables	Model 1		Model 2		Model 3	
	Coef (s.e.)		Coef (s.e.)		Coef (s.e.)	
Transfer (Ref: University Only)						
College Only	0.501***	(0.068)	0.462***	(0.065)	0.536***	(0.088)
College to College	0.474***	(0.074)	0.591**	(0.108)	0.720	(0.146)
College to University	0.688**	(0.086)	0.929	(0.162)	0.961	(0.171)
University to College	0.503**	(0.113)	0.551*	(0.131)	0.665	(0.176)
University to University	1.326	(0.262)	1.466	(0.294)	1.715*	(0.381)
Postgraduate to Uni/College	0.570*	(0.125)	0.811	(0.209)	1.001	(0.287)
Postgraduate Only	0.665***	(0.073)	0.761*	(0.095)	0.904	(0.136)
Postgraduate to Postgraduate	0.404***	(0.051)	0.616**	(0.115)	0.716	(0.144)
Respondent Age	-		0.977*	(0.009)	0.975**	(0.010)
Year 2018 (Ref: 2013)	-		1.249	(0.182)	1.277	(0.191)
Female (Ref: Male)	-		1.136	(0.100)	1.130	(0.109)
Minority (Ref: Non-Minority)	-		1.329*	(0.155)	1.359**	(0.158)
Has Disability (Ref: No Disability)	-		1.275*	(0.137)	1.266*	(0.137)
Parental ED (Ref: No Parental ED)	-		0.659***	(0.067)	0.651***	(0.067)
Field (Ref: Social Sciences)						
Math/Computer	-		-		0.982	(0.145)
Sci/Engineering	-		-		0.965	(0.149)
Arts/Humanities	-		-		0.736*	(0.107)
Business	-		-		1.121	(0.174)
Health	-		-		0.882	(0.171)
Education	-		-		1.138	(0.190)
Sciences	-		-		1.058	(0.126)
Co-op Participation (Ref: None)	-		-			
Observations	8,000		8,000		8,000	

Table 6 presents results from three logistic regression estimations of credential holding on likelihood of student loans at graduation. The outcome variable measures debt greater than \$10,000 at the time of graduation. Individuals that received government-sponsored student loans and repaid those loans prior to graduation are not counted as loan holders in this variable. For parsimony, coefficients for married, dependent children, bilingual, and immigrant are not reported. The category for "other" field specialty is also not reported. Standard errors in parentheses: * p<0.05, ** p<0.01, *** p<0.001.

Figure 8 Predicted Likelihood of Loan Holding at Graduation



Note: Figure 8 plots the likelihood of holding any loan at the time of graduation (Panel A) and holding a loan of \$10,000 or greater (Panel B). Margin plots are calculated at the mean value of all covariates and are sorted based on Model 3 results.

Discussion

These findings overall point towards several new understandings about MCGs. In terms of feeling overqualified or underemployed, most MCGs do not appear worse off than respondents with a single undergraduate degree. It is also encouraging from a cost standpoint that common MCG types, like college-to-college, do not have a higher likelihood of holding debt at the time of graduation when compared to college-only graduates or university-only graduates, who would have been in school for a similar length of time. It is only university-to-university MCGs who appear to have a higher likelihood of both loans overall and large loans when compared to college- or university-only graduates.

There is also some evidence to suggest bumps in earnings when comparing college-to-university MCGs to respondents with a single college diploma, as well as when comparing university-to-university MCGs to university-only graduates. It is difficult, however, to discern if these modest income gains outweigh the larger loan burdens associated with being one of these MCG types. Furthermore, unmeasured opportunity costs of time away from the labour market and earning both income and experience may impact labour market returns in the longer term. In this analysis, we additionally cannot investigate pension contributions, or major life transitions (e.g., purchasing a home) that may be delayed by the additional investment in postsecondary education of MCGs. These factors together provide limited economic justification for pursuing college-to-college credentials from a cost-benefit standpoint.

Nevertheless, there may be non-pecuniary (or non-cost-related) reasons for students to pursue additional credentials. For instance, MCGs may be pursuing an educational passion after obtaining postsecondary experience. If this is the case, then the unmeasured/non-pecuniary returns to finding employment in a desired career may justify the investment, even at the cost of financial returns. These reasons for transfer may be more likely in “recycling”-type MCGs (i.e., those who complete lower-tier additional credentialing), who do see income penalties. For instance, postgraduates returning to university or college see lower earnings than single or double postgraduates, as do university-to-college MCGs compared to university-only graduates.

From a policy standpoint, there may be better ways to support educational interests without the greater risk of more time in school, forgone income in the labour market, or taking on large loans. This may be in the form of improved career counselling directed at high school students or recent secondary school graduates. One pertinent area for investment would be to focus on students without prior family history in postsecondary education or postsecondary completion. If programs were put in place to better prepare graduates for postsecondary education and avoid the time and monetary costs of switching majors, transferring schools, or pursuing additional degrees, there is the potential for significant individual savings.

For those that have already earned credentials, the analyses in this report present a case for alternative opportunities for upskilling and retooling that do not carry the same time and financial costs of a second pass through traditional postsecondary programs. Advancements in the “short-credential” market are continuing to grow, offering novel opportunities to develop

skills and competencies via micro-credentials, stackable credits, and badges. As the labour market continues to diversify and specialize in response to rapid advancements in innovation and technology, these types of non-traditional skilling pathways could alleviate some of the individual costs associated with lengthy and costly additional postsecondary pursuits.

Furthermore, given the impact of the COVID-19 on career transitions, and with more people moving into health fields, this report can help to understand that these moves may result in some income loss, but also a closer attachment to the labour force. Again, the non-pecuniary benefits of pursuing a more personally favourable career cannot be measured in the present analysis.

Limitations

There are several limitations to report in this study. Many of these limitations revolve around the data set employed. First, use of survey data to understand underemployment, earnings, and loan holding may be prone to some measure of self-reporting error. Second, the 2018 NGS dropped variables reporting if a graduate was employed for the full year and full time. It is thus difficult to discern if a survey respondent reporting to be full-time employed ever experienced unemployment over the course of the year. Thus, to estimate income, the sample was limited to only those who are full-time employed to ensure a comparable sample. Third, for postgraduate-to-postgraduate MCGs, the NGS does not differentiate between those that receive a master's followed by a PhD; two master's; a master's after a PhD; or two PhDs; and the analysis is unable to determine if one of these pathways drives the large returns for this MCG group.

Future Directions

The research presented in this report is an important step to understanding multi-credentialism, yet there is still much to be known about this demographic of postsecondary graduates. While the analyses presented here cover the pecuniary returns to MCGs pathways, more information is sorely needed. One crucial area of research is to better understand the indirect costs to multi-credentialing. Whether or not the choice to multi-credential delays pension contributions or the purchase of a home, for example, can have costly ramifications down-road in an economic climate characterized by inflation.

There is also more work needed to understand the subtleties in the characteristics of multi-credentialism and how these details play out over the long term. The many variations and combinations of level of education and field of study are likely to present different outcomes later on in graduates' careers, when work experience and acquired skills can be leveraged into more senior and more desirable positions. If MCGs add an additional layer to what is known about labour market outcomes across fields of study, for example, then graduates would greatly benefit from this information.

Finally, given the rise of unconventional credential markets (micro-credentials, badges, etc.), it would be worthwhile to audit whether the investments made in multiple postsecondary credentials can be truncated in meaningful and measurable ways to secure positive labour market outcomes. If postsecondary education is as much a signal of ability as it is a means of acquiring skills, for example, then there may be diminishing returns to a second incongruous degree or diploma. If this is the case, then micro-credentialing, with its streamlined systems and lower cost, may better serve graduates looking for additional skilling. As we enter a period of unprecedented postsecondary innovation, the practice of multi-credentialism will likely continue to present intriguing and unanswered questions for social scientists and policymakers.

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Appendix

Appendix Table 1 Underemployment by Educational Credential (OLS)

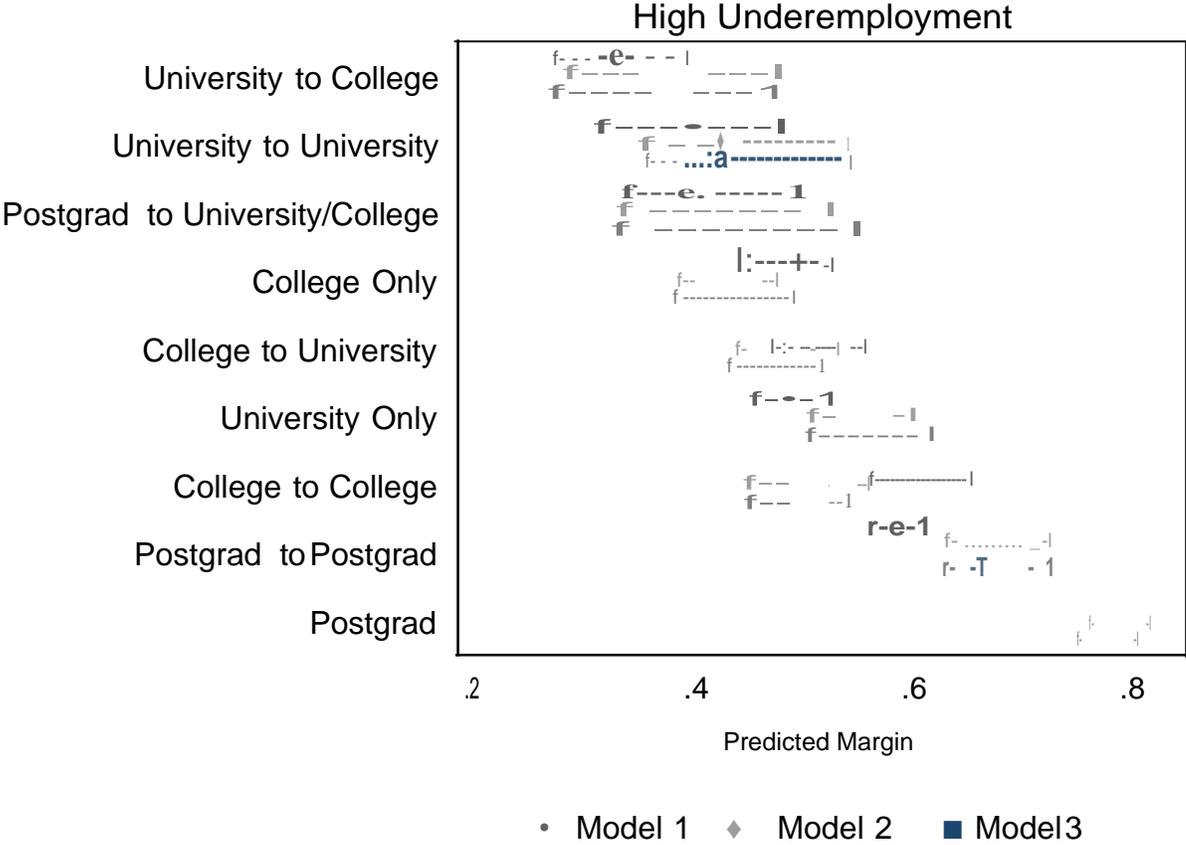
Variables	Model 1 Coef (s.e.)		Model 2 Coef (s.e.)		Model 3 Coef (s.e.)	
Transfer (Ref: University Only)						
College Only	0.062*	-0.031	-0.018	-0.03	-0.031	-0.035
College to College	0.088**	-0.033	0.079*	-0.04	0.067	-0.044
College to University	-0.012	-0.03	0.051	-0.037	0.04	-0.037
University to College	0.342***	-0.049	0.307***	-0.048	0.286***	-0.053
University to University	-0.076	-0.045	-0.075	-0.043	-0.072	-0.046
Postgrad to Uni/College	0.064	-0.048	0.135*	-0.054	0.136*	-0.06
Postgraduate Only	0.241***	-0.026	0.287***	-0.027	0.264***	-0.032
Postgraduate to Postgraduate	0.191***	-0.027	0.293***	-0.039	0.268***	-0.042
Log of Income			-0.218***	-0.019	-0.195***	-0.02
Respondent Age			0.005**	-0.002	0.005**	-0.002
Year 2018 (Ref: 2013)	-		0.106***	-0.031	0.097**	-0.03
Female (Ref: Male)	-		-		-	
			0.086***	-0.019	0.076***	-0.02
Married (Ref: Not Married)	-		0.014	-0.022	0.015	-0.023
Has Children (Ref: No Children)	-		-0.019	-0.033	-0.01	-0.033
Bilingual (Ref: Not Bilingual)	-		-0.038	-0.023	-0.048*	-0.023
Immigrant (Ref: Non-Immigrant)	-		0.021	-0.027	0.018	-0.027
Minority (Ref: Non-Minority)	-		-0.039	-0.023	-0.038	-0.024
Has Disability (Ref: No Disability)	-		0.021	-0.024	0.022	-0.024
Parental ED (Ref: None)	-		-0.055**	-0.019	-0.059**	-0.02
Field (Ref: Social Sciences]						
Math/Computer	-		-		-	
Sci/Engineering	-		-		-0.039	-0.029
Arts/Humanities	-		-		0.022	-0.034
Business	-		-		-0.053	-0.031
Health/Education	-		-		-0.122***	-0.029
Other	-		-		0.041	-0.044
Time-to-Completion	-		-		-0.012	-0.008
Co-op Participation (Ref: No Co-op)	-		-		-0.076**	-0.025
Observations	8000		8000		8000	
R-squared	0.034		0.093		0.108	
Note: Linear coefficients; Standard errors in parentheses: * p<0.05, ** p<0.01, *** p<0.001						

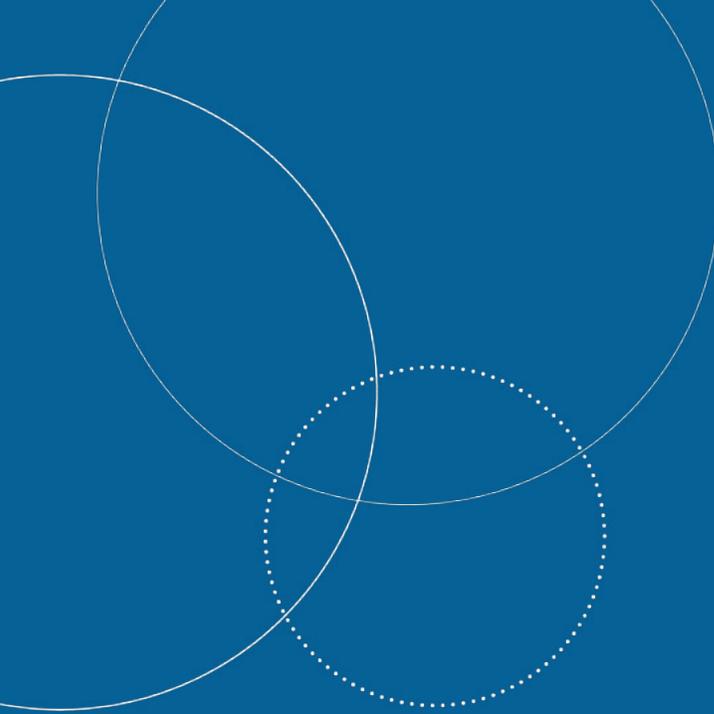
Appendix Table 2 High Underemployment by Educational Credential (Logistic Regression)

Variables	Model 1		Model 2		Model 3	
	Coef (s.e.)		Coef (s.e.)		Coef (s.e.)	
Transfer (Ref: University Only)						
College Only	0.99	(0.125)	0.640***	(0.086)	0.610**	(0.096)
College to College	1.662***	(0.225)	0.812	(0.140)	0.789	(0.153)
College to University	1.137	(0.138)	0.77	(0.130)	0.735	(0.125)
University to College	0.593*	(0.132)	0.489**	(0.112)	0.453**	(0.118)
University to University	0.646*	(0.129)	0.644*	(0.135)	0.695	(0.155)
Postgrad to Uni/College	0.787	(0.156)	0.598*	(0.146)	0.629	(0.173)
Postgraduate Only	2.038***	(0.219)	3.093***	(0.378)	2.892***	(0.430)
Postgraduate to Postgraduate	1.614***	(0.180)	1.802***	(0.318)	1.667**	(0.317)
Log of Income			0.275***	(0.028)	0.297***	(0.031)
Year 2018 (Ref: 2013)			0.713*	(0.097)	0.691**	(0.095)
Respondent Age	-		1.016	(0.009)	1.017	(0.009)
Female (Ref: Male)	-		0.591***	(0.050)	0.631***	(0.057)
Married (Ref: Not Married)	-		0.918	(0.091)	0.92	(0.095)
Has Children (Ref: No Children)	-		0.94	(0.137)	0.971	(0.145)
Bilingual (Ref: Not Bilingual)	-		0.888	(0.091)	0.853	(0.089)
Immigrant (Ref: Non-Immigrant)	-		1.071	(0.136)	1.047	(0.139)
Minority (Ref: Non-Minority)	-		0.812	(0.089)	0.812	(0.092)
Has Disability (Ref: No Disability)	-		1.209	(0.130)	1.225	(0.134)
Parental ED (Ref: None)	-		0.797**	(0.070)	0.778**	(0.071)
Field (Ref: Social Sciences)						
Math/Computer	-		-		0.985	-0.127
Sci/Engineering	-		-		1.272	-0.197
Arts/Humanities	-		-		0.915	-0.126
Business	-		-		0.616***	-0.084
Health/Education	-		-		1.341	-0.292
Other	-		-			
Time-to-Completion	-		-		0.961	-0.032
Co-op Participation (Ref: No Co-op)	-		-		0.731**	-0.082
Observations	8000		8000		8000	

Note: All coefficients are odds ratios and standard errors in parentheses: * p<0.05, ** p<0.01, *** p<0.001.

Appendix Figure 1 Predicted High Underemployment





oncat
Ontario Council on
Articulation and Transfer



caton
Conseil pour l'articulation
et le transfert – Ontario

oncat.ca/en/projects/multi-credentialed-graduates-canada-employment-earnings-and-student-loan-holding



Established in 2011, the Ontario Council on Articulation and Transfer (ONCAT) was created to enhance academic pathways and reduce barriers for students looking to transfer among Ontario's public colleges, universities, and Indigenous Institutes.

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