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A Statistical Analysis of Transfer and Student Mobility in Ontario: What the University/College Applicant Survey™ Tells Us

Brief 1: Regional Disparities in Transfer Intent Among Ontario College Applicants: Insights from Academica's University/College Applicant Survey™

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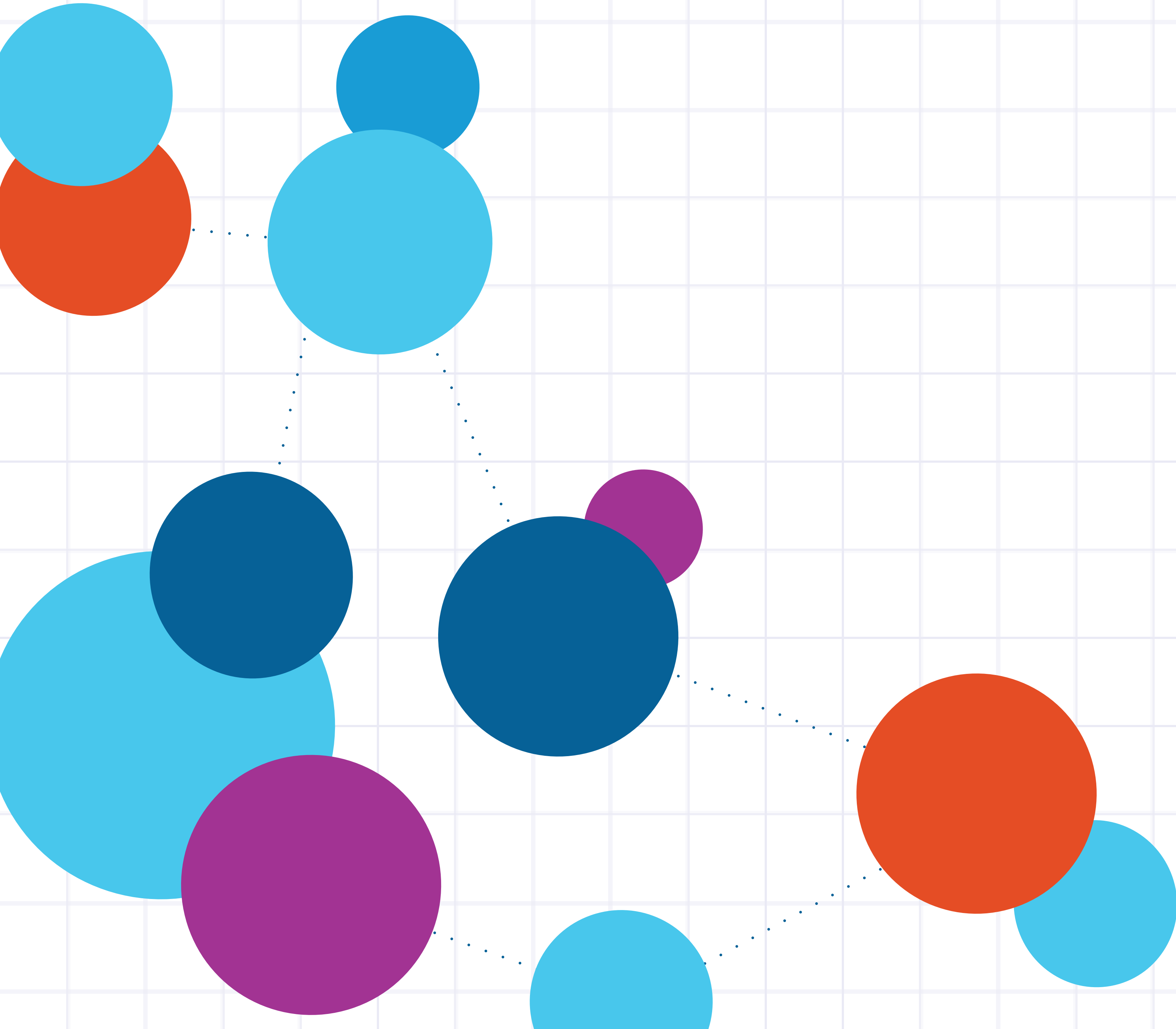**Rod Missaghian**, ONCAT

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Foreword

Rod Missaghian, ONCAT

Postsecondary transfer research in Ontario – despite making significant strides in recent decades – continues to suffer from a lack of data sources that systematically capture patterns in student mobility. For this reason, ONCAT has been diligently working to find innovative data sources, potential new data-linkages, and other opportunities that allow us to extend our understanding of transfer and student mobility in Ontario.

In the spring of 2020, Academica Group graciously provided ONCAT with access to one of the richest and largest educational datasets in Canadian postsecondary education (PSE): The University/College Applicant Survey™ (UCAS). This proprietary data source provides impressive coverage of hundreds of data fields capturing postsecondary applicants' demographic characteristics, educational background and aspirations, usage of various information sources, decision-making, and other relevant topics. The UCAS™ has been conducted annually by Academica since the mid-2000s and has been fine-tuned over the years in consultation with PSE stakeholders to capture emerging topics of interest. During this period, the UCAS™ has been completed by hundreds of thousands of applicants to 100+ Canadian colleges, polytechnics, and universities. To date, the UCAS™ remains one of the most trusted data sources for institutional decision-makers across Canada.

ONCAT is now releasing a series of briefs and papers that outline the initial statistical analysis of transfer and student mobility in Ontario based on this UCAS™ dataset. The analysis presented in this series was developed by the ONCAT research team in partnership with researchers from across the sector and a cross-sector panel of external reviewers. This work builds on previous ONCAT-funded research (Henderson & McCloy, 2017) that also used UCAS™ data. This series contains an introductory paper followed by three briefs:

- **Situating the UCAS™ Dataset within the Ontario PSE Data Landscape**

- **Brief 1: Regional Disparities in Transfer Intent Among Ontario College Applicants: Insights from Academica's University/College Applicant Survey™**

- **Brief 2: Does Socio-Economic Background Matter? A Look at Pathways into Ontario Colleges**

- **Brief 3: Applicant Pathways into University: Do High School Grades Matter?**

It is our hope that this statistical research will advance transfer research and instigate useful discussions at multiple levels within policy and administrative circles.

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Introduction[1]

Each year, thousands of individuals apply and are accepted into colleges across Ontario, gaining access to world-class training opportunities primarily at the sub-baccalaureate level.[2] The OECD (2012; 2014) has highlighted the instrumental role that colleges in Canada play in promoting an inclusive skills development ecosystem. With the growth of articulation agreements between Ontario colleges and universities, colleges now also represent a viable pathway to an abundance of university degree programs. In the United States, 2-year community college (CC) student aspirations for 4-year degree programs have been well documented (see Chan & Wang, 2020; Wang & Lee, 2019). In Canada, however, there's less research on this subject – a fact attributable to the absence of survey data on this topic. The lack of work on this subject in Ontario is unfortunate, as research has found that student aspirations are an important predictor of transfer out behavior (McCloy, Steffler & Decock, 2017, p. 10).

Studying degree aspirations among college applicants is particularly useful intelligence for policy development. At a provincial level, examining regional disparities in degree aspirations could inform the design of targeted strategies, such as regional articulation hubs, to promote seamless transfer. Of course, an understanding of demand for degrees among college applicants can also inform the further development of applied degree programs within the college sector itself, a market which is in its early stages of development within the province.

In this brief, we examine degree aspirations among a sample of 31,000 first-time Ontario college applicants within Academica's University/College Applicant Survey™ dataset (2013-2019). We focus on disparities that exist across the various geographical regions in Ontario, while accounting for the unique characteristics of these sub-populations. A regional focus is warranted given that research finds that both PSE attainment, skills development, and student mobility rates differ significantly across regions, with the provincial north being particularly disadvantaged (Zarifa, Seward, & Pizarro Milian, 2019; Zarifa, Hango & Pizarro Milian, 2018; Zarifa, Sano & Hillier 2020a; 2020b). We explore this topic using a combination of descriptive statistics and logistic regression modelling.

[2]Though Ontario colleges are now able to grant degrees, reports suggest that college degree-granting programs account for only a small fraction (2%) of the provinces' degree-level enrollments (Hicks et al., 2013). More recent Ministry of Colleges and University (2020) data for the 2019-20 academic year show that only 6% of degree-level enrollments in Ontario are in the college sector. Moreover, Statistics Canada reports note that college degrees are "generally concentrated in more specific, applied areas than university bachelor's degree programs" (Frenette, 2019, p. 7). Thus, we operate under the assumption that for most students, completing a degree at an Ontario college is not an option due to limited availability.

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The Relevance of Regional Disparities in Aspirations

American research finds that anywhere from 60-80% of community college students aspire to obtain a 4-year degree (Bailey & Morest, 2006; Hoachlander, Sikora, Horn, & Carroll, 2003; Wang & Lee, 2019). It has also found disparities in aspirations across various demographic categories (e.g., Buchmann & Dalton, 2002; Howley, 2006; Kao & Tienda, 1998; Pascarella, 1984; Raabe & Wölfer, 2019; Sewell & Shah, 1968; Zimmermann, 2020). As well, a substantial body of research has found a link between aspirations and early life-course trajectories (Irvin, Byun, Meece, Reed & Farmer, 2016, p. 178). For ONCAT, degree aspirations serve as a useful proxy for transfer intent during or after the completion of a college certificate or diploma.

Canadian studies have repeatedly shown that individuals in remote regions possess lower levels of educational attainment (Zarifa et al., 2018; Alasia, 2003, p. 1). An early study, focusing on rural-urban gaps in education from 1981-1996, concluded that a "major divide" existed in Canada, with southern and western regions eclipsing northern and eastern regions when it comes to educational attainment. Research has also found that northern and rural Canadians have lower rates of access to university STEM programs (Hango, Zarifa, Pizarro Milian & Seward, 2021). These regional disparities are far from a Canadian problem, with similar disparities also being documented across other countries (e.g., Dickerson & McIntosh, 2013; Gibbons & Vignoles, 2012; Spiess & Wrohlich, 2010; White & Lee, 2019). The argument has been made that education and skill development policies suitable for urban centres are often disconnected from the challenges faced by communities in peripheral geographical regions (Pizarro Milian, Seward & Zarifa, 2020). Such facts necessitate that policymaking and analysis carefully consider regions as a primary dimension along which inequities in education and training exist.

Focus of this Analysis

Through this brief, we address the following two questions:

1. Do the degree aspirations[3] of first-time college applicants differ regionally in Ontario?
2. To what extent are regional disparities in aspirations attributable to student socio-demographic and other applicant characteristics?

We focus specifically on Ontario college applicants designated in the UCAS™ dataset as being "first-entry" or "delayed-entry" from high school, excluding those with any reported postsecondary-level studies.[4]

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[3]We code those aspiring to a 4-year degree or graduate-level credentials (e.g., M.A, Ph.D.) as "aspirants" (=1), and others (e.g., college diplomas/certificates) as "non-aspirants" (=0). We experimented with including those aspiring to a post-graduate certificate in either group and it did not bias observed regional effects. Results presented here include them in the aspirant category.

[4]We purposely restrict our analysis to this relatively more homogenous group. Doing so hopefully limits some of the unobserved variance that comes along with more mature applicants.

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We also exclude those respondents more than 30 years old at the time of application. We acknowledge the importance of these excluded groups, particularly mature and non-direct applicants, and leave it to future research to explore the nuances of their aspirations. These restrictions leave us with an analytic sample of approximately 31,000 individuals.[5] We begin our analyses with descriptive statistics, and then move to logistic regression models. The latter is a common modelling strategy when trying to predict binary categorical dependent variables. In our case, whether a student aspires towards a 4-year degree (or more) versus those who do not (Long, 2014). Moreover, to further highlight our findings, we produce graphical displays of the predicted probabilities and 95% confidence intervals of aspiring to a degree (or more) across each of our regions.
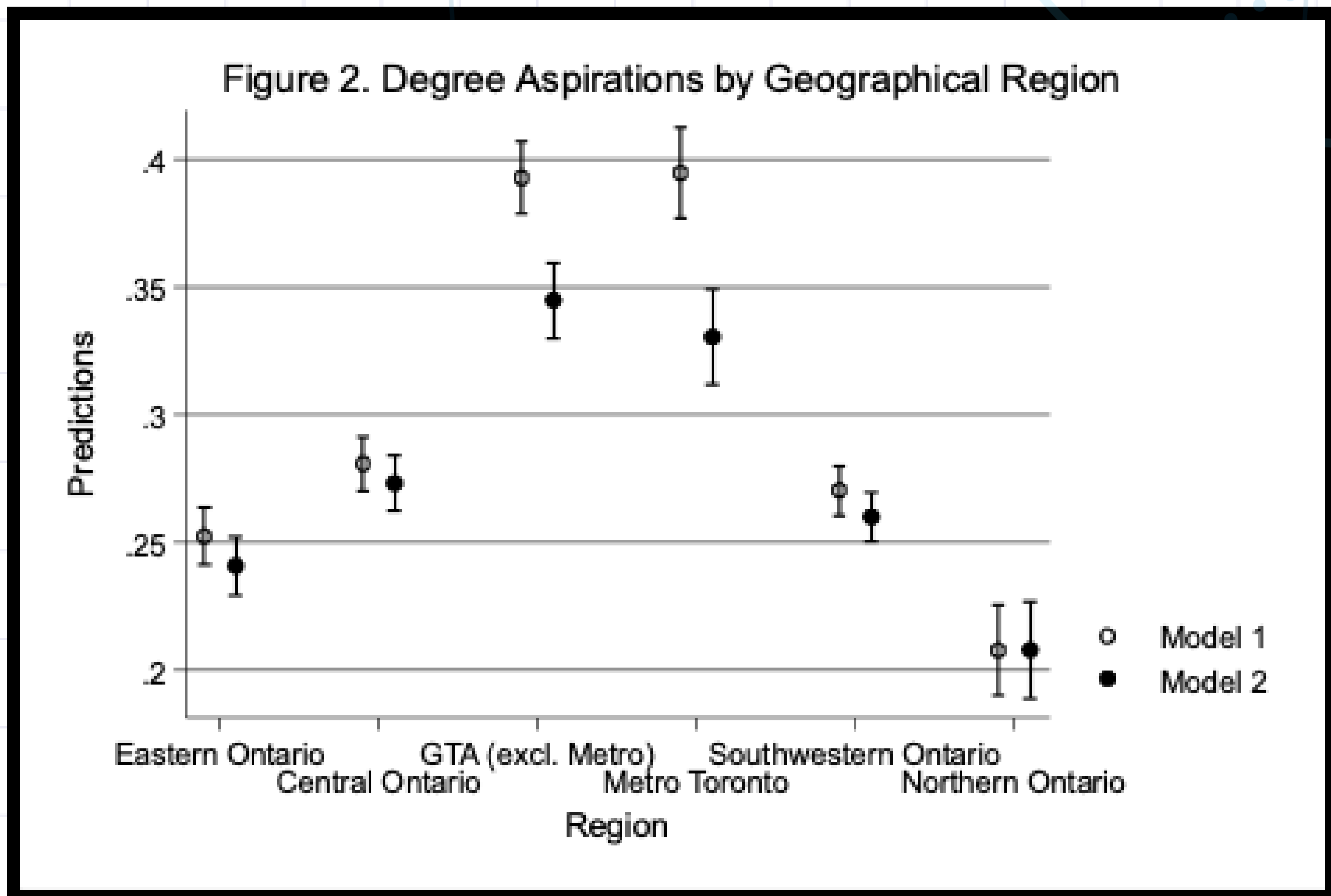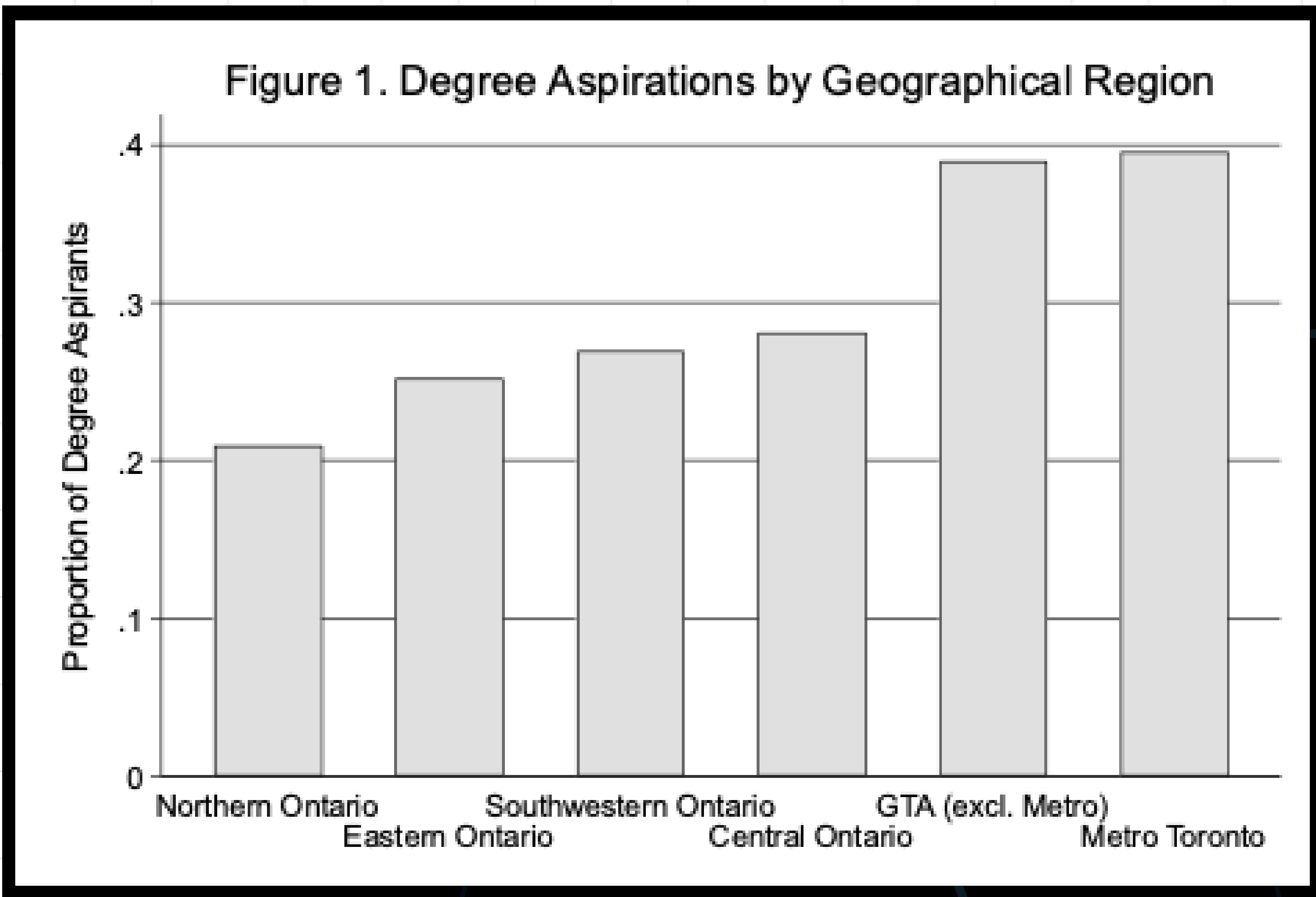
Findings

Basic descriptive statistics (see Figure 1) demonstrate great variability in the degree aspirations of first-time college applicants across regions of Ontario.[6] We observe a gradual decline in aspirations by region, with over 15% separating the highest (Metro and Greater Toronto Area (GTA) and lowest (Northern Ontario). However, given that demographics differ markedly across regions, it is important to account for variations in ethno-racial groupings, immigrant status and other metrics when comparing regions. To do so, we fit an initial logistic regression model (Model 1) which incorporates only the regional variable and the year an individual applied, followed by a second model (Model 2) that accounts for a wide range of socio-demographic and academic predictors of degree aspirations.[7]

This analytical strategy allows us to compare how the estimated relationship between region and degree aspirations changes once we account for applicant characteristics (which differ across regions). In Model 1 (see Figure 2), like the descriptive data, we see those individuals in the Metro and GTA have significantly higher aspirations (.39), with others lagging significantly behind (.20-28). Controlling for various demographic and academic factors in Model 2 shrinks the gap between these two groups, as the predicted probabilities for the Metro (.33) and Greater Toronto (.34) areas are reduced by roughly .05-.06 points. Nevertheless, these gaps remain statistically significant in the underlying regression models.

[5]The size of our analytic sample also reflects our use of listwise deletion to handle those observations with missing data and "don't know" responses across several predictors in our models. In some cases, we do retain these categories when they represent a sizable share (>3-5%) of responses.

[6]The region categories were created using individual's forward sortation area at the time of application. The distribution of our respondents across regions is: 6.5% North, 18.5% Eastern, 26.8% Southwest, 23.4% Central, 9.7% Metro, and 15.2% GTA (excluding Metro).

[7]This includes age, sex, place of birth, ethno-racial grouping, disability status, first language, marital status, whether they had dependents, parental education, parental income, approximate high school average in Grade 12, type of high school attended (e.g., public/private), and primary field of study applied to.

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Figure 1. Degree Aspirations by Geographical Region

Figure 2. Degree Aspirations by Geographical Region

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Discussion

Our analyses show that degree aspirations differ markedly among college applicants residing in different regions of Ontario and that these differences persist even after we control for their academic and demographic traits. Such findings prove remarkably robust,[8] and raise several important questions, from both a research and policy standpoint. Researchers may question: what triggers these regional disparities in applicant ambitions? Let us assume that these disparities are not entirely a function of some unobservable demographic or attitudinal factors. One potential explanation may be that applicants are rationally adjusting their aspirations in accordance with available jobs in their region (Zarifa et al., 2020b). This would explain why those in the highly urbanized Metro and Greater Toronto Areas desire degrees at a higher rate – in line with local industries – than those in more remote and rural regions in the province. Economic theory tells us that individuals should stop consuming education once the returns to an additional unit of learning no longer exceeds its cost. This could be the dynamic we are observing here. Of course, further research is needed to better understand the causal mechanisms at play. We imagine that this work will necessitate a more in-depth qualitative, as opposed to quantitative, approach.

From a policy standpoint, there are several ways to interpret these findings. One potential takeaway is that, though regional disparities exist, even in the lowest aspiring regions we see that roughly 1 in 5 college applicants aspires to a degree. As such, the province should augment college-to-university pathways in an indiscriminate fashion, to pave the way for all aspirants. A second takeaway may be that regional variations in aspirations should guide the differential allocation of resources towards college-to-university pathway development. The argument could be made that, based on objective interest levels alone, far more attention should be given to this task within the Greater Toronto Area, as opposed to the provincial north. A more detailed analysis of aspirations, cross-referenced with employer demand for degrees across program areas, could provide a useful blueprint for where priority investments could be made to create more efficient transfer pathways between college and university programming. This latter approach may prove most strategic for the province. Funding university pathways in regions where there is limited demand, though it would not harm anyone, is arguably inefficient public policy.

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[8] In robustness checks not presented, we refit our saturated models on sub-samples of applicants that had higher high marks (e.g., >80%), high parental income or education, and various other sub-groups. The reported regional differences remained statistically significant even in these far more homogenous groups.
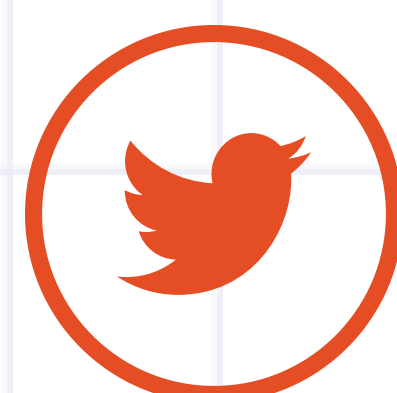
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Established in 2011, the Ontario Council on Articulation and Transfer (ONCAT) was created to enhance academic pathways and reduce barriers for students looking to transfer among Ontario's public colleges, universities, and Indigenous Institutes.