

BUS 336

Data Analytics and Visualization

D100

Hackathon Report

Instructor: Gohram Baloch

TA: Shayan Zarifian

Anjana Sanatkar

Ryan Katongole 301447623

Aryaman Bahuguna 301563474

Mayank Mayank 301563549

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## Objective

Our analysis provides the major insight for students seeking an education with the highest return on investment characterized by acquiring a well-compensated job upon graduation. The key variables assessed within the analysis were tuition fees of undergraduate and graduate students in Canada, average student debt and income data of people in the workforce five years after graduation. The following are the questions we used to direct our analysis:

1. Has the increase in salaries kept pace with the increase in tuition fees over time?
2. How has the percentage of students with debt over \$25,000 changed between 2000 and 2020?
3. Which province gives students the highest chance of employment in Canada after education??

## Data Collection, Cleaning & Preparation

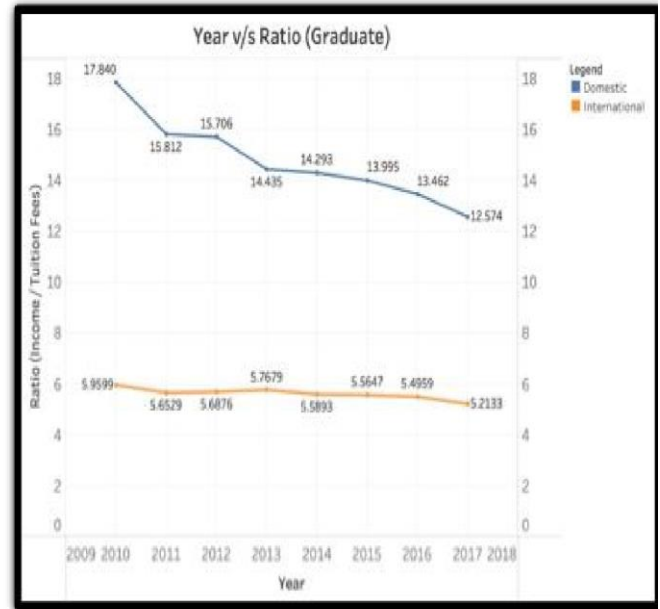
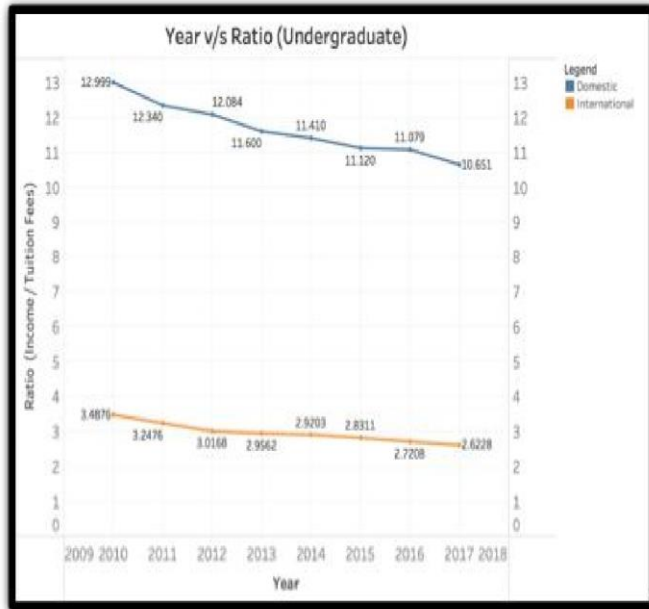
Our raw data for this study was collected from the Statistics Canada website. It was cleaned and tidied in R with our variables set up ready to be analyzed and visualized.

## Assumptions & Limitations

The income data used in this analysis was collected five years after graduation, which is assumed to be stable enough to provide meaningful insights. Statistics Canada did not provide sufficient data on the income for graduates after 2017 and therefore we could not make any forecasts and analysis beyond this timeline.

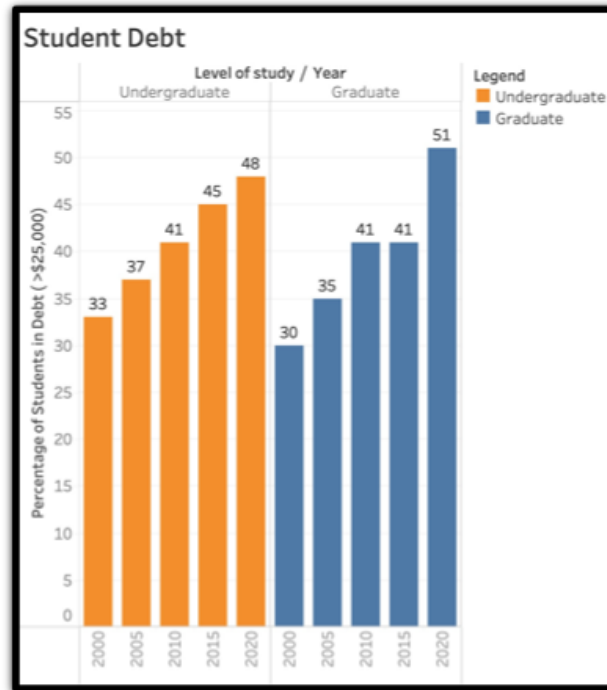
We also found that the data set provided by Statistics Canada did not disclose incomes for some provinces in Canada such as Prince Edwards Island, North West Territories, Nunavut and the Yukon so we could not make any inferences on the return of investment for students in these regions.

## Analysis Graphs providing comparison and contrast of salaries and Tuition fees in Canada



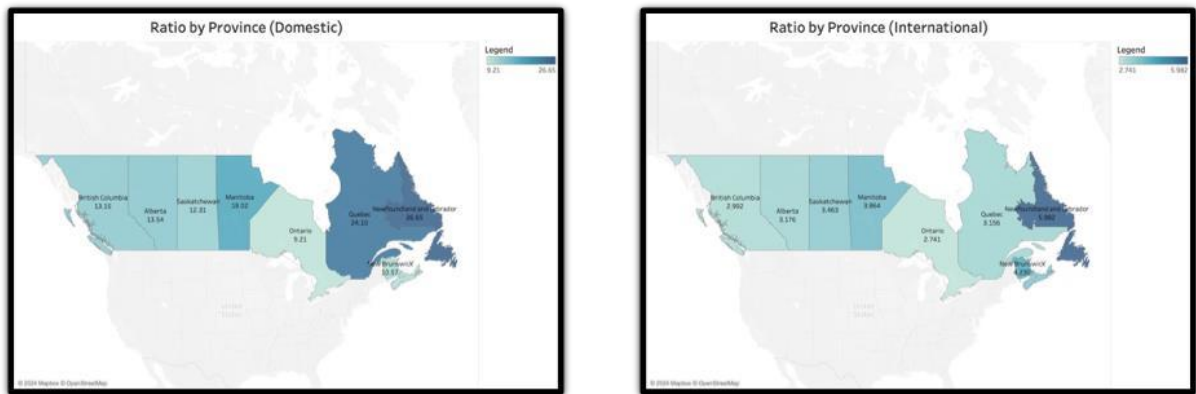
The graphs above show that the increase in salaries is at a far slower rate than the increase in tuition fees. This is seen specifically with the ratio of employment income to tuition cost for domestic students which declines at a steeper rate compared to ratio for international students. This gap is attributed to the difference in fee structures for both categories and raises concerns for investment in education for international students to be seen as not worth it.

## Percentage of students with Debt



The percentage of undergraduate and graduate students who incurred debt over \$25,000 has consistently risen between 2000 and 2020. The trend positively correlates with income-to-tuition fee ratios thereby inferring the increasing financial burdens that students are experiencing align with the decreasing income-to-tuition fee ratios, highlighting the growing financial challenges students face. We also see the cost of education continues to rise and negatively correlate with the increase in income from employment resulting in higher student debt. Given this analysis, policymakers should act swiftly on subsidizing education for students, for example providing tax benefits to companies that offer scholarships to students to increase the amount of financial aid available to students. This is our opinion on the matter.

## Provincial ROI Analysis



Given our map plot, Newfoundland and Labrador has shown the highest return on employment for both domestic and international students with graduates from the province well compensated in their job positions relative to the incurred cost of education. Contrasting this observation in our analysis is the province of Ontario which has provided the lowest return on investment for graduates both domestic and international consistently has the lowest ROI for graduates in both categories.

## Conclusion

The analysis provides insights into the challenges faced by both domestic and international students that are seeking well compensated jobs given the significantly high financial burdens students face in their academic journeys. Firstly, we are seeing an increasing percentage of debt accumulated by domestic students in Canada which raises the need to provide adequate and feasible policies to help them meet tuition costs. In addition to domestic students, international students should be granted more scholarship opportunities and work study bursary opportunities to meet the rising tuition costs. However, in the time before such changes are made, our analysis concludes with the recommendation for first year students to seek higher education in the province Newfoundland and Labrador as these offer the highest return on investment because they have adequate costs to tuition and high probability of acquiring a well compensating job after graduation. .

## References

Statistics Canada. (2024, April 17). Characteristics and median employment income of postsecondary graduates five years after graduation, by educational qualification and field of study (primary groupings)1, 2. doi:<https://doi.org/10.25318/3710011401-eng>

Statistics Canada. (2023, September 6). Canadian and international tuition fees by level of study. Retrieved from Statistics Canada: <https://doi.org/10.25318/3710004501eng>

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