Doctoral Study in Canada

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- In Canada, only about 50% of doctoral students who enrolled between 2011 and 2015 graduated within six years (Statistics Canada, 2023).

- Within nine years, completion rates ranged from 78.3% in health sciences to 55.8% in the humanities (University Affairs, 2013).

- Doctoral students remain an under-researched group in academic literature, mainly due to lack of data.
  - Most previous studies rely on data from specific institutions or disciplines

Introduction

- How long should you expect the PhD study to take?

- Are female doctoral students more or less likely to dropout/graduate than male doctoral students?

- Is there any difference between international students, permanent residents, citizens?

- Which major takes longer/shorter to graduate?

- Which school has higher dropout/graduation rate?

Introduction

- This paper provides a purely positive analysis of doctoral study in Canada, considering dropout, graduate, and duration of study.

- We use administrative data from Education and Labor Market Longitudinal Platform (ELMLP)

- Postsecondary Student Information System (PSIS)
    - information on students attending Canadian public colleges & universities from 2009/2010 to 2021/2022
    - including all doctoral students: degree year, major, institution, background characteristics.

- Income (tax) records from T1 Family File (T1FF)
    - additional information about marital status, family structure, number of children from 1992-2020

We estimate a discrete-time competing risk duration model.

Dropout and graduate are considered as competing risks (of exit). For each risk $j \in \{1, 2\}$, cause-specific hazard in $[t - 1, t)$, i.e., the conditional probability that individual will experience the event j in time period $[t - 1, t)$ given that no failure from any cause has yet occurred in any earlier time period, is

$$h_j(t|\mathbf{X}) = 1 - \exp(-\exp(\mathbf{X}\beta_j + \gamma_{jt}))$$

where $\mathbf{X}$ is a vector of individual characteristics.
β_j and γ_{jt} are parameters to be estimated.

# Model

Covariates **X** includes

- Time invariant: Gender; age (dummies), major, and school in first year of doctoral study; cohort (when start first year)
- Time variant (i.e., in each year of enrolment):
    - immigration status (international students, permanent residents, citizens)
    - whether immigrations status changed from previous year
    - full-time or part-time study
    - Covid shock (year 2019-2021)
    - From T1FF: whether married, whether live with parents, number of children

Sample

Main sample restrictions:

- start doctoral study between 2009 to 2016

- for 2009 cohort, observe up to 13 years

- for 2016 cohort, observe up to 6 years

- ages 21–55 when first enrolled

Estimates on Gender

- Compared to male, female less likely to drop out, less likely to graduate, i.e, enrol longer

Estimates on Immigration Status
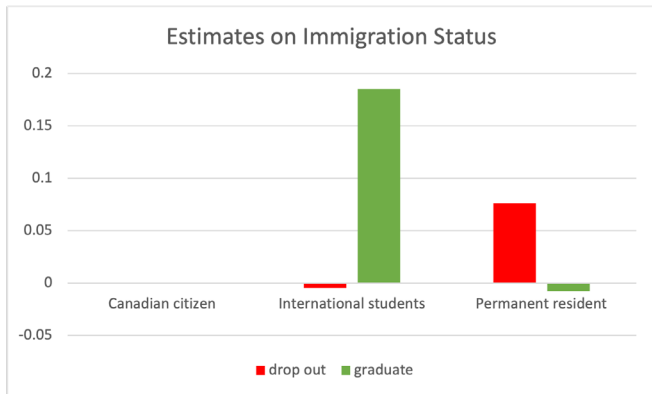
- Compared to Canadian citizens, international students more likely to graduate, permanent residents more likely to drop out.
- Also, if the immigration status changes, less likely to drop out and less likely to graduate (i.e., longer duration)
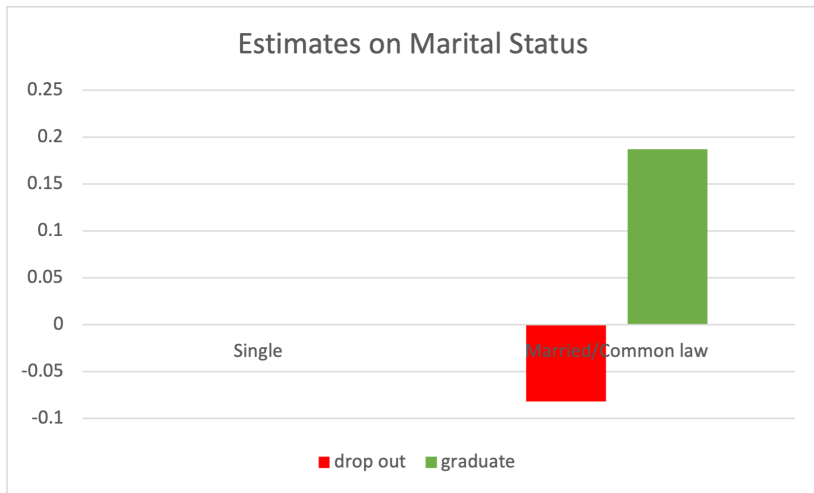
Results

Estimates on Major
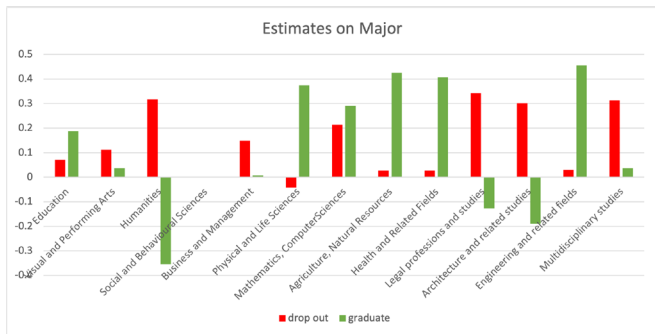
- Humanities students more likely to drop out and less likely to graduate
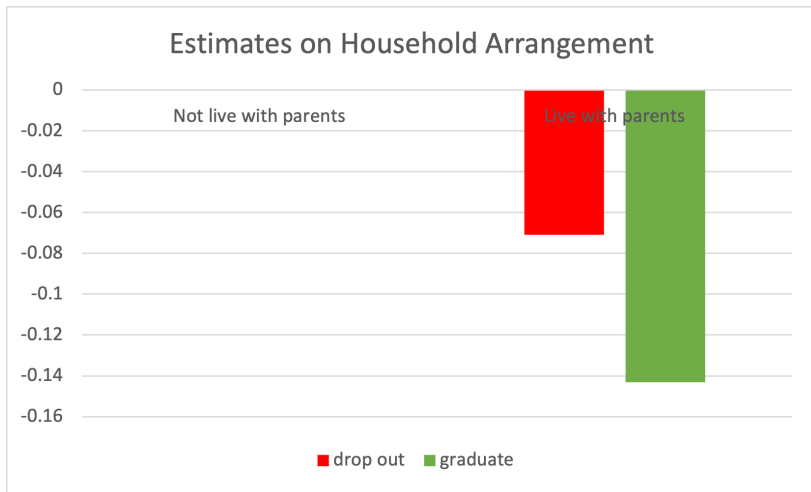- STEM majors and health related majors more likely to graduate

Estimates on School
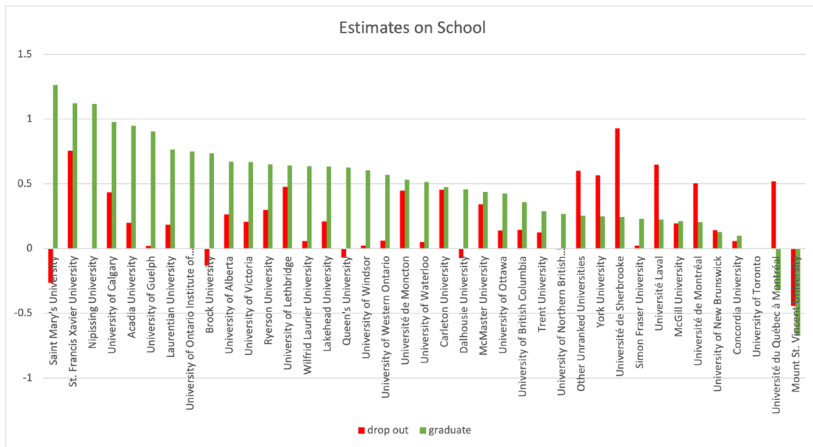
- Compared to University of Toronto, most schools more likely to graduate, and also more likely to drop out

Results (linked to T1FF sample)

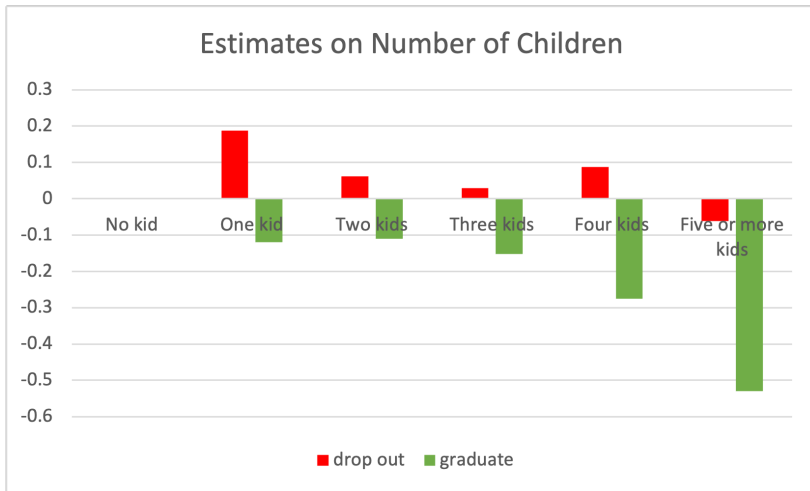Estimates on Marital Status

- Married/common law: less likely to drop out, more likely to graduate

Estimates on Household Arrangement

Not live with parents | Live with parents

drop out | graduate

- Live with parents: less likely to drop out, less likely to graduate

Estimates on Number of Children

Legend: ■ drop out ■ graduate

- Have kids: more likely to drop out, less likely to graduate

Other patterns:

- Older students more likely to drop out and less likely to graduate

- If part-time, more likely to drop out and less likely to graduate

- During COVID years (2019-2021), students more likely to drop out, no significant effect on graduation

Conclusions

- This paper studies the time-to-degree and time-to-dropout of doctoral students in Canada.

- Some interesting patterns by gender, immigration status, major, and school.

Policy implications:

- More support for female (and humanities) students to reduce time-to-degree.

- Reducing international students will further decrease the production of PhD in Canada.

Thank you!