

Workshop “Unequal Graduate Outcomes: International perspectives over the Long-Term”

Social Origin, Skills and Graduates’ Outcomes in Employment in Brazil: How Does it Vary across Fields of Study and Institutions?

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Motivation and research problem

Although the system has expanded rapidly in recent decades, completing higher education in Brazil continues to be a highly selective and unequal transition (Carvalhoes and Ribeiro, 2019; Knop and Collares, 2019; Rodrigues, 2023).

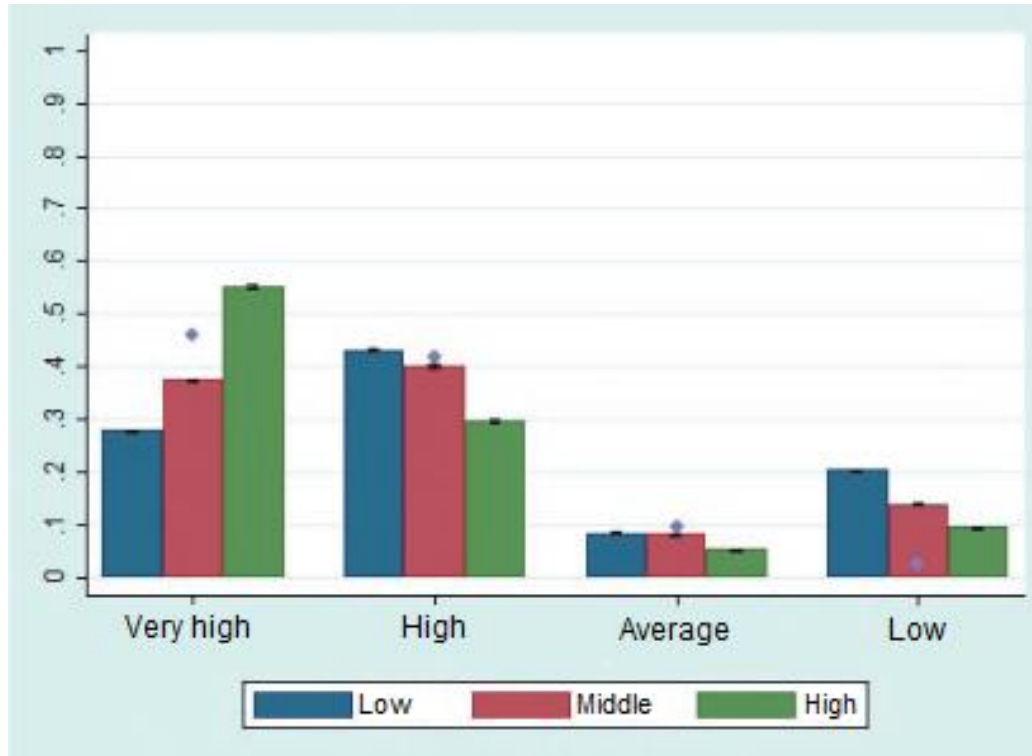
The participation of graduates in the labor market itself is highly heterogeneous, which has consequences for different outcomes of interest, such as wages, possibility of career progression and social recognition (Reis and Machado, 2015; Ribeiro and Schelegel, 2010; and Vieira, 2023a, 2023b).

Higher education matters for the results of graduates, but in a heterogeneous way (between types of diplomas, social groups, types of institutions, etc.) (Ribeiro and Schlegel, 2015; Caseiro and Maciente, 2019; Vieira, 2023).

*Since 2014, the National System of Evaluation of Higher Education (SINAES) has included follow-up actions for graduates in institutional evaluation.

Appendix: College completion is highly stratified among majors and institutions

Predicted probabilities of graduation by course returns and students' socioeconomic level (Brazil, 2007-2009)



Source: Carvalhaes and Ribeiro (2019), based on Enade/Inep 2007-2009.

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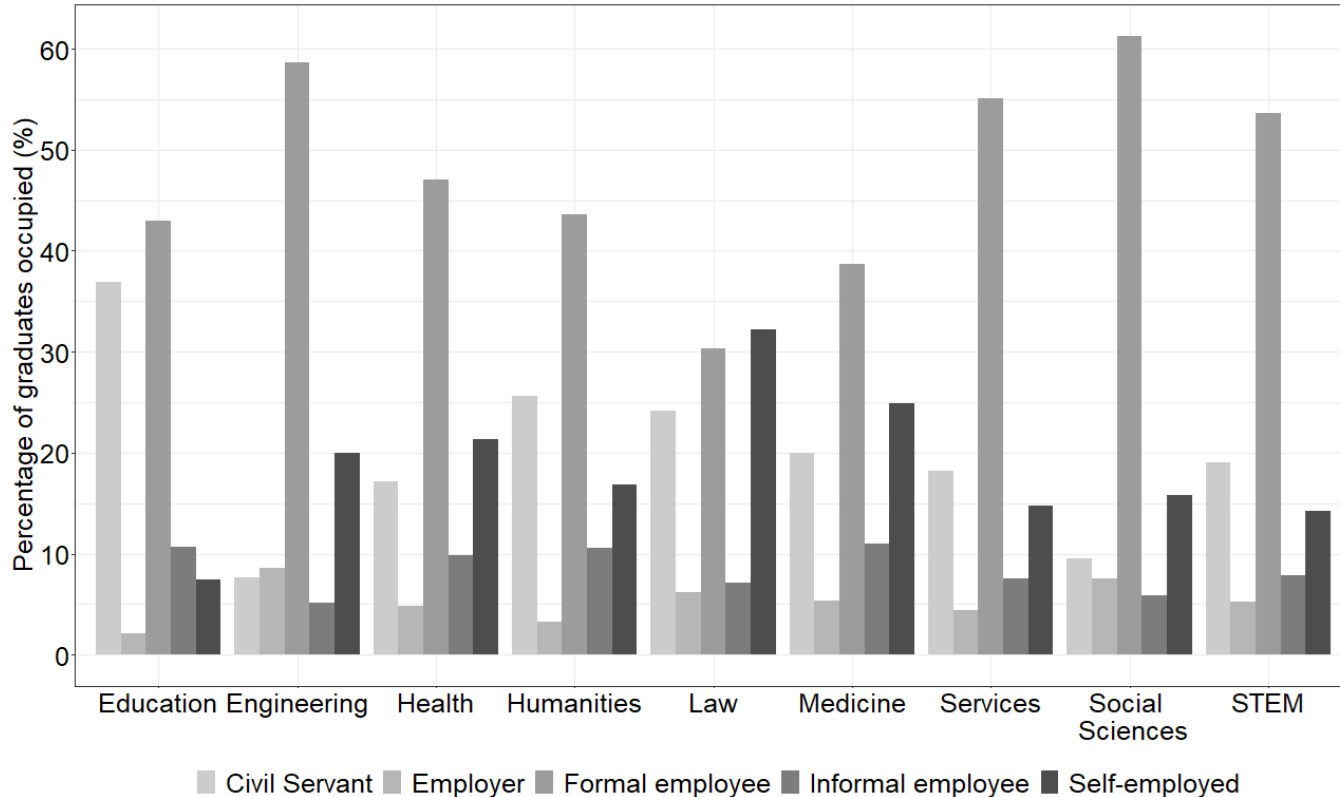
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Appendix: Participation in labor market varies across fields of study

Percentage of graduates among occupational positions, by field of study (Brazil, 2010)



Source: Population Census 2010.

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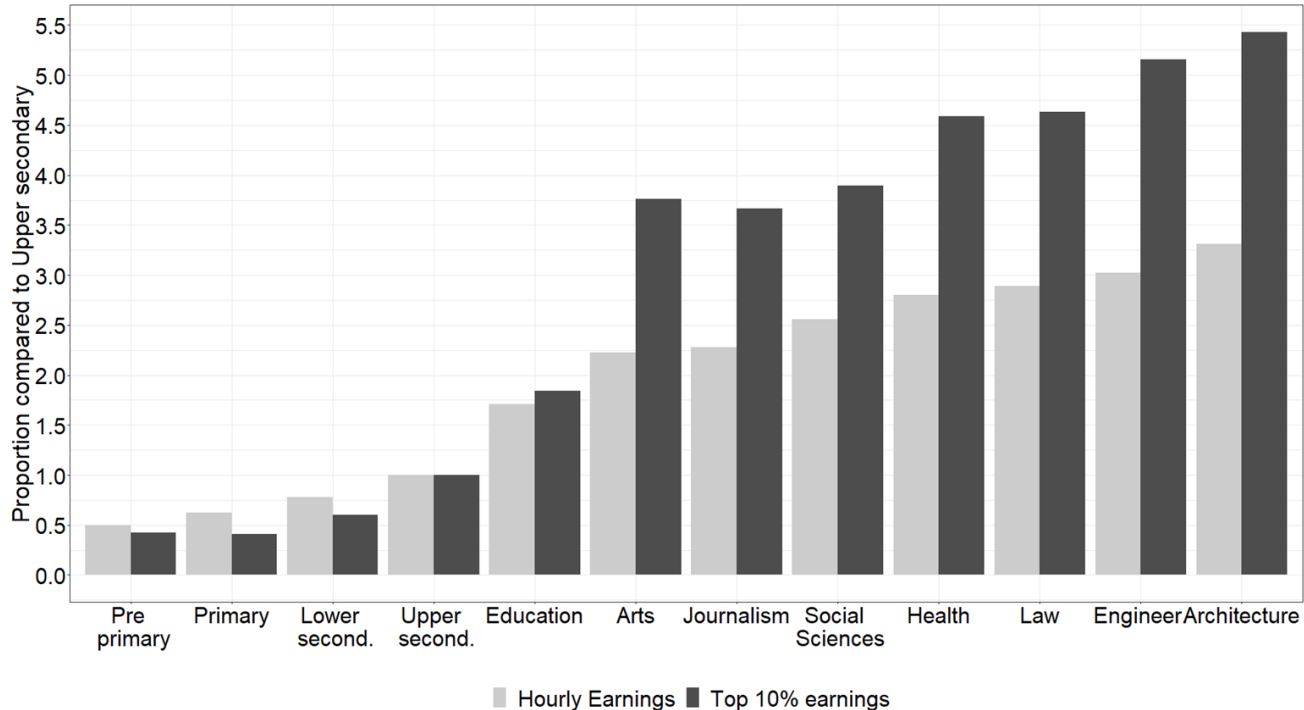
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Appendix: Graduates outcomes in labor market are horizontally stratified

Hourly earnings and participation in top 10% earnings compared to upper secondary (selected fields of study) (Brazil, 2010)



Source: Population Census 2010.

Research questions

- (1) Do graduates of different undergraduate courses have higher or lower wage and occupational returns than they would have had they graduated from another major? In other words, does the observed returns result from selectivity bias or from a genuine effect of college education?
- (1) How, if at all, do the returns to undergraduate courses vary? Do we find evidence of negative or positive selection hypotheses?

Data and analytical strategy

Data sources

- a. Population Census 2010;
- b. National Exam of Student Performance (Enade) 2009-2011
- c. Annual Report of Social Information (RAIS) 2010-2015.

Outcomes

- a. Elite occupation (managers and professionals);
- b. Hourly wage;
- c. Top 10% earnings.

Treatment and Covariates

College major; Gender, race, age at graduation, socioeconomic status, region, moved to study, specific and general test scores.

Analytical strategy

Augmented inverse probability weighted regressions (AIPW) (Giani et al. 2020; Glynn and Quinn 2010): seek to overcome the problem of differential selection into “treatment” (e.g. Witteveen and Attewell, 2017; Payne, 2023).

Selection on observables: reweighting by inverse probability of graduation (AIPW)

Sample reweighting in three steps:

1. Estimate the probability of the individual being in the selected sample of graduates from the study area, subject to the observed covariates.
2. Calculate the inverse probability of being in the sample (i.e. less likely to complete receive higher weights and vice versa).
3. Estimate reweighted regression on the selected sample using the IP from the first two steps as weights.

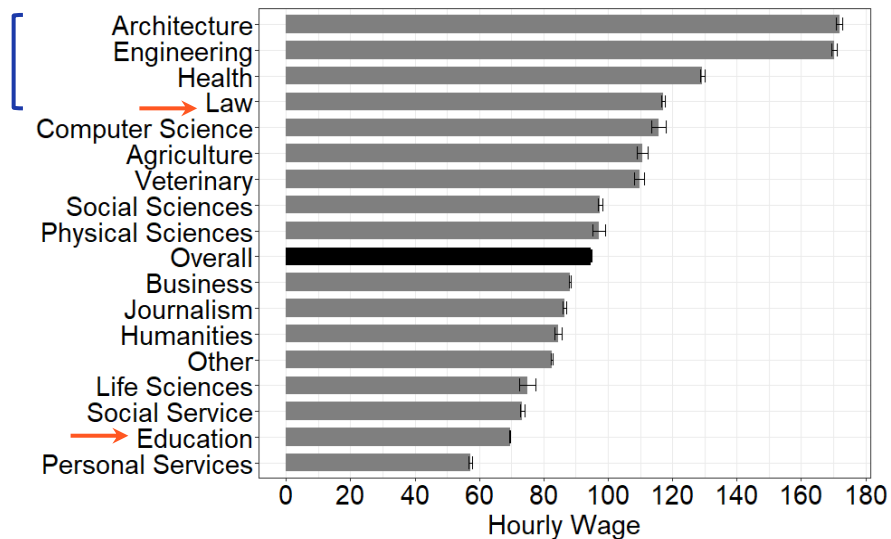
Additional steps we follow:

- We estimate the treatment effects of college majors on outcomes at a population level.
- Then we estimate models separately by socioeconomic status, measured by parents' education.
- We are also testing models separated by gender, race, propensity score strata.

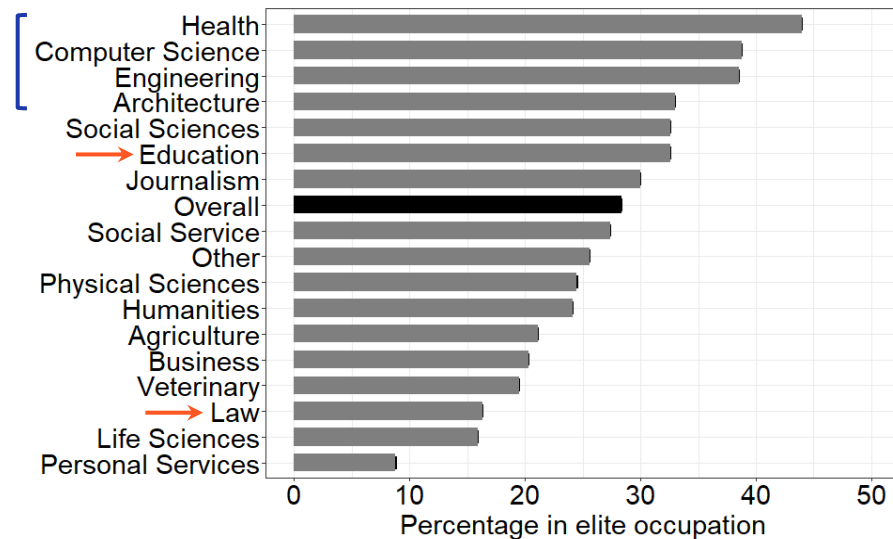
Descriptives by college major

Descriptive statistics by college major: hourly wage and elite occupation (Brazil, 2010-2015)

A - Hourly Wage



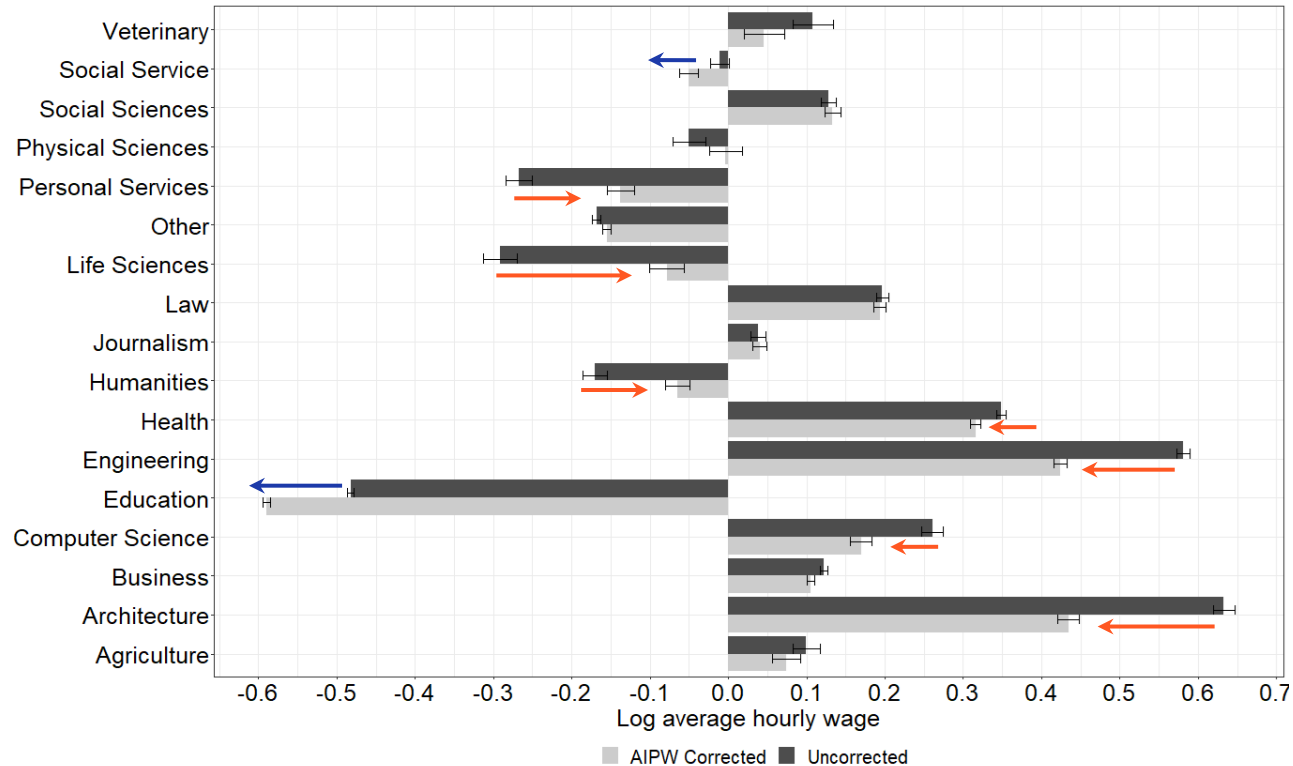
B - Elite occupation



Source: Enade/Inep 2009-2011, RAIS/MTE 2010-2015.

Effect of college major on earnings (full sample)

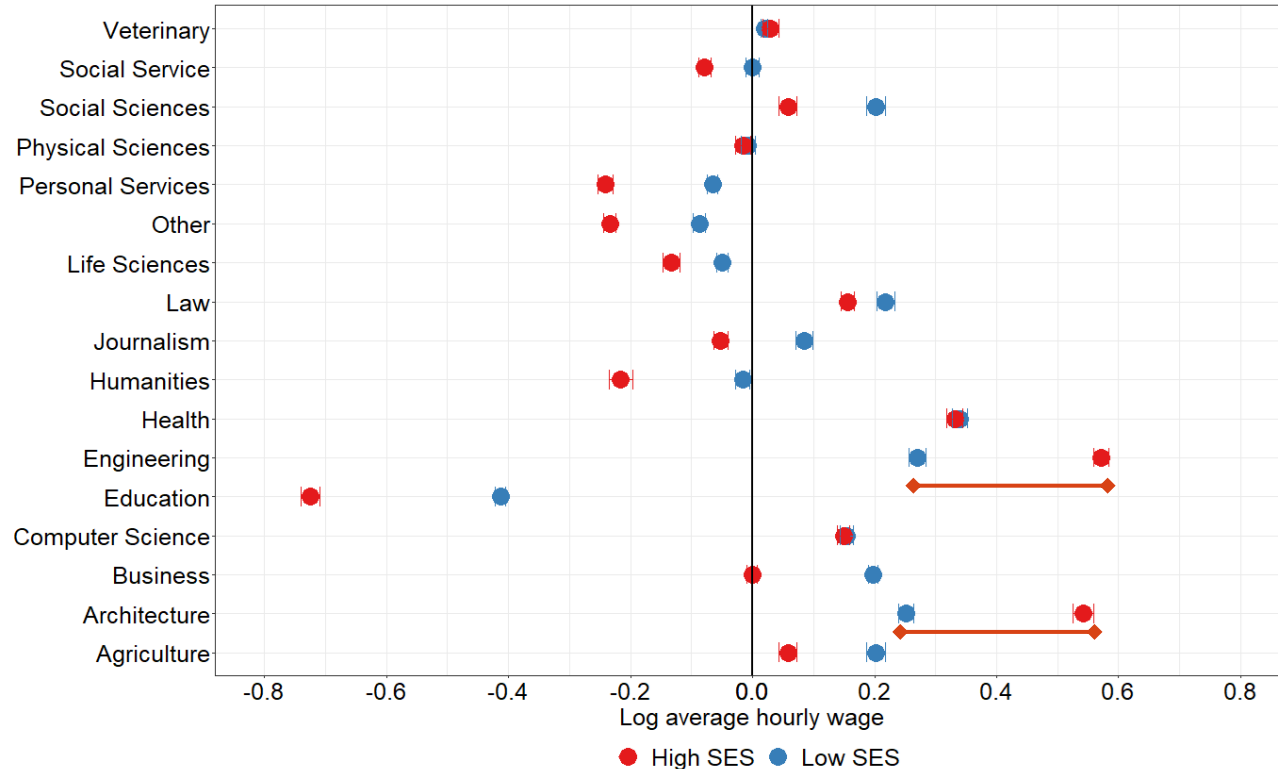
Average Treatment Effects of college major on logged average hourly wage using AIPW-corrected and uncorrected models (Brazil, 2010-2015)



Source: Enade 2009-2011, RAIS 2009-2015.

Effect of college major on earnings (by SES group)

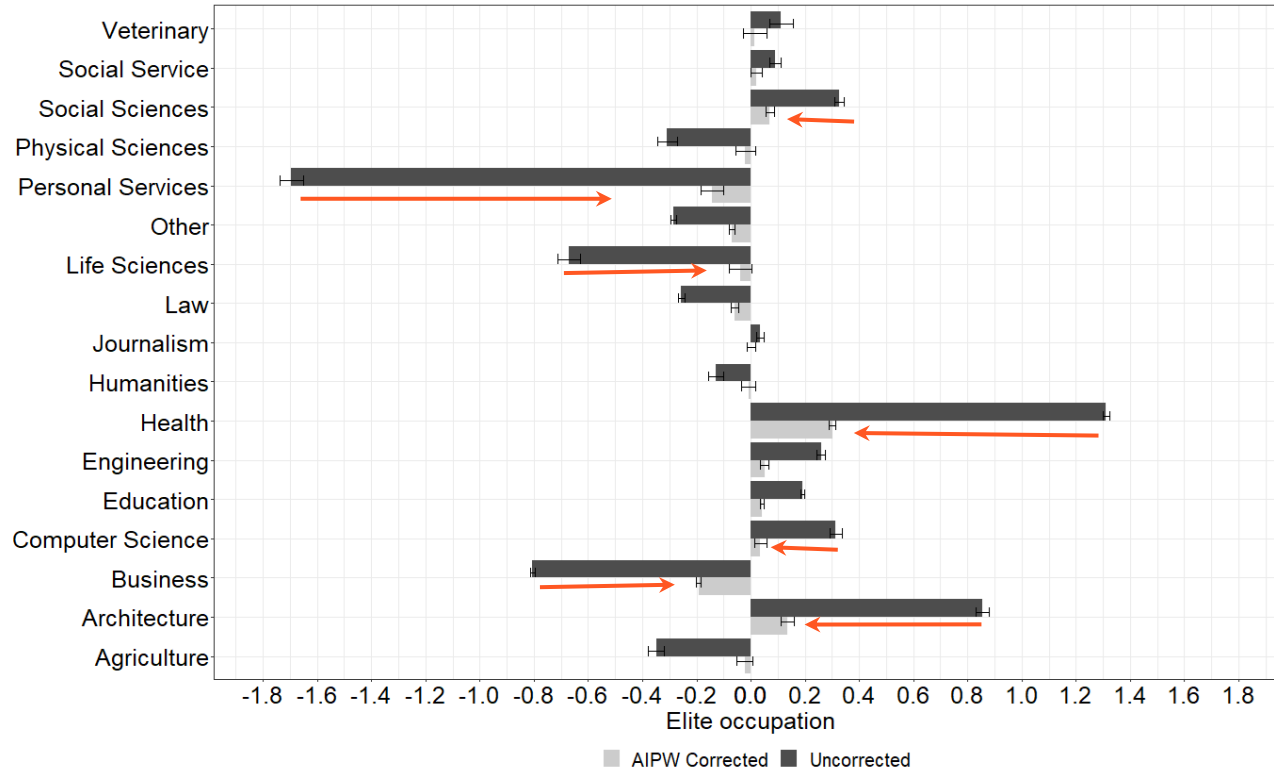
Average Treatment Effects of college major on logged average hourly wage using AIPW-corrected, by socioeconomic status (Brazil, 2010-2015)



Exceptions to the pattern
Low>High:
Engineering,
Architecture,
Health, C.S., P.S.

Effect of college major on elite occupation (full sample)

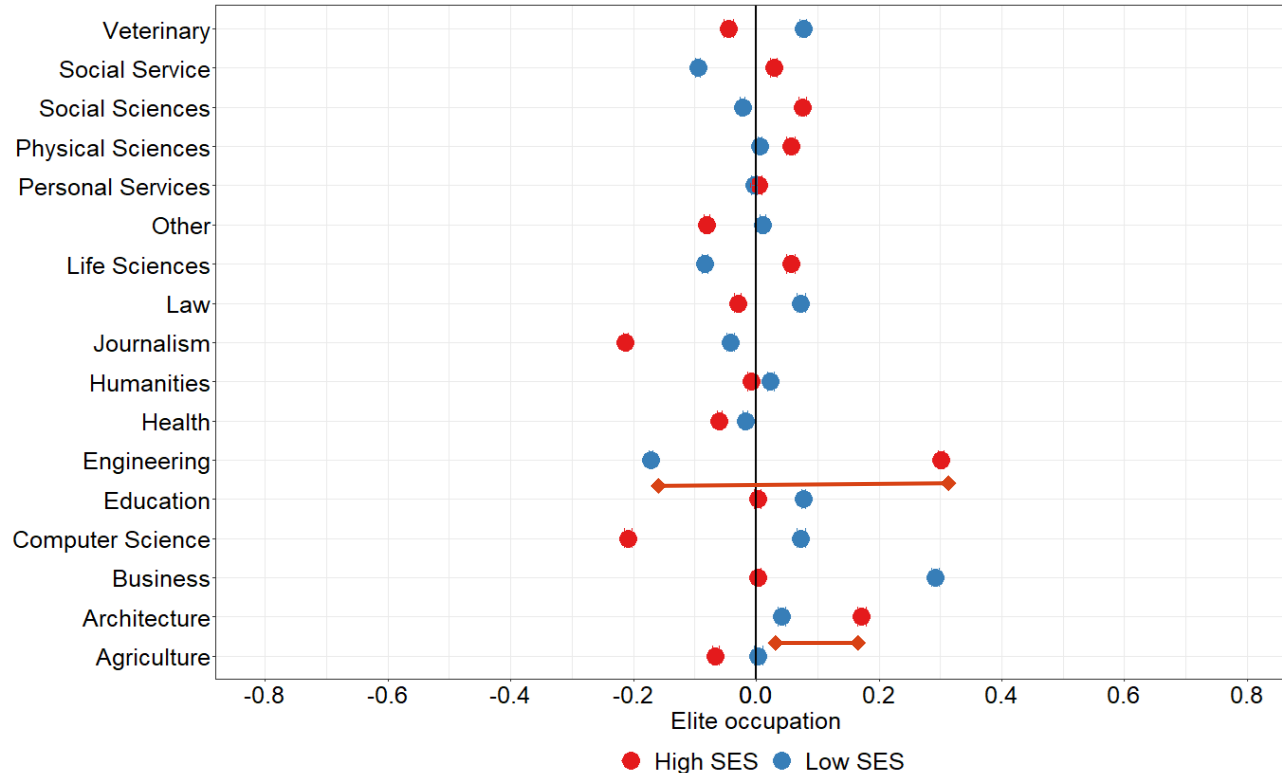
Average Treatment Effects of college major on elite occupation using AIPW-corrected and uncorrected models (Brazil, 2010-2015)



Source: Enade 2009-2011, RAIS 2009-2015.

Effect of college major on elite occupation (by SES group)

Average Treatment Effects of college major on elite occupation using AIPW-corrected, by socioeconomic status (Brazil, 2010-2015)



More mixed results:

- High SES: different return levels.
- Low SES: low occupational return (except for C.S.).

Conclusions

We find evidence that the effect of sample selectivity on the graduates outcomes in the labor market varies greatly between fields of study and labor market outcomes.

Although there is evidence of negative selection in some Fields of study, those with high returns (Architecture, Engineering, Health) show an inverted pattern, favoring above all high-SES graduates.

The results seems to support human capital and signaling hypotheses, but also points to limits for the “equalizing effect” of the diploma in Brazil.

Meanwhile, some questions remain open: Do degree effects persist after controlling for selection into formal employment? How do the effects vary between other institutional dimensions (type of institution, sectors etc.)?

Thank you!

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