

How does Raising Retake Costs Incentive Students?

2023/10/16

Higher education and subsidies

- **Higher education performance** matters for both economies and individuals: economic development, R&D, climate challenge, labor market outcomes,... (e.g., Hanushek and Woessman, 2015; Lovenheim and Smith, 2023)
- **Resource input** is large in Higher Education (UNESCO, 2022)
 - Per-student spending in HE tops the education system around the world
 - HE funding keeps rising faster than enrolment.
 - Public Investment in universities
- Subsidies to public universities ...
- The **efficiency** could improve, e.g., In OECD countries, only 39% HE students graduate on time and over 1/5 do not graduate after all (OECD, 2022)

Efficiency: student outcomes and incentives

- Incentivizing students to achieve better performance is a way to improve the efficiency of the use of HE resources and hence public financial investments in HE.
- Students' performance and hence outcomes are motivated through both financial and non-financial incentives, such as:
 - **Scholarships and grants:** need-based (Murphy and Wyness, 2023; Denning et al., 2019; Castleman and Long, 2016; Fryer, 2011); merit-based (Behrman et al., 2015; Fryer, 2011; Angrist and Lavy, 2009).
 - **Student loans:**
 - **Tuition Fees:** (Bietenbeck et al., 2023; Murphy et al., 2019; Beneito et al., 2018; Garibaldi et al., 2012)
 - Others, esp. non-financial incentives: grading systems, ranking, etc. (Fidjeland, 2023; Tan, 2023; Jalava et al., 2015; Grove and Wasserman, 2006; Oettinger, 2002)

Changes in tuition fees

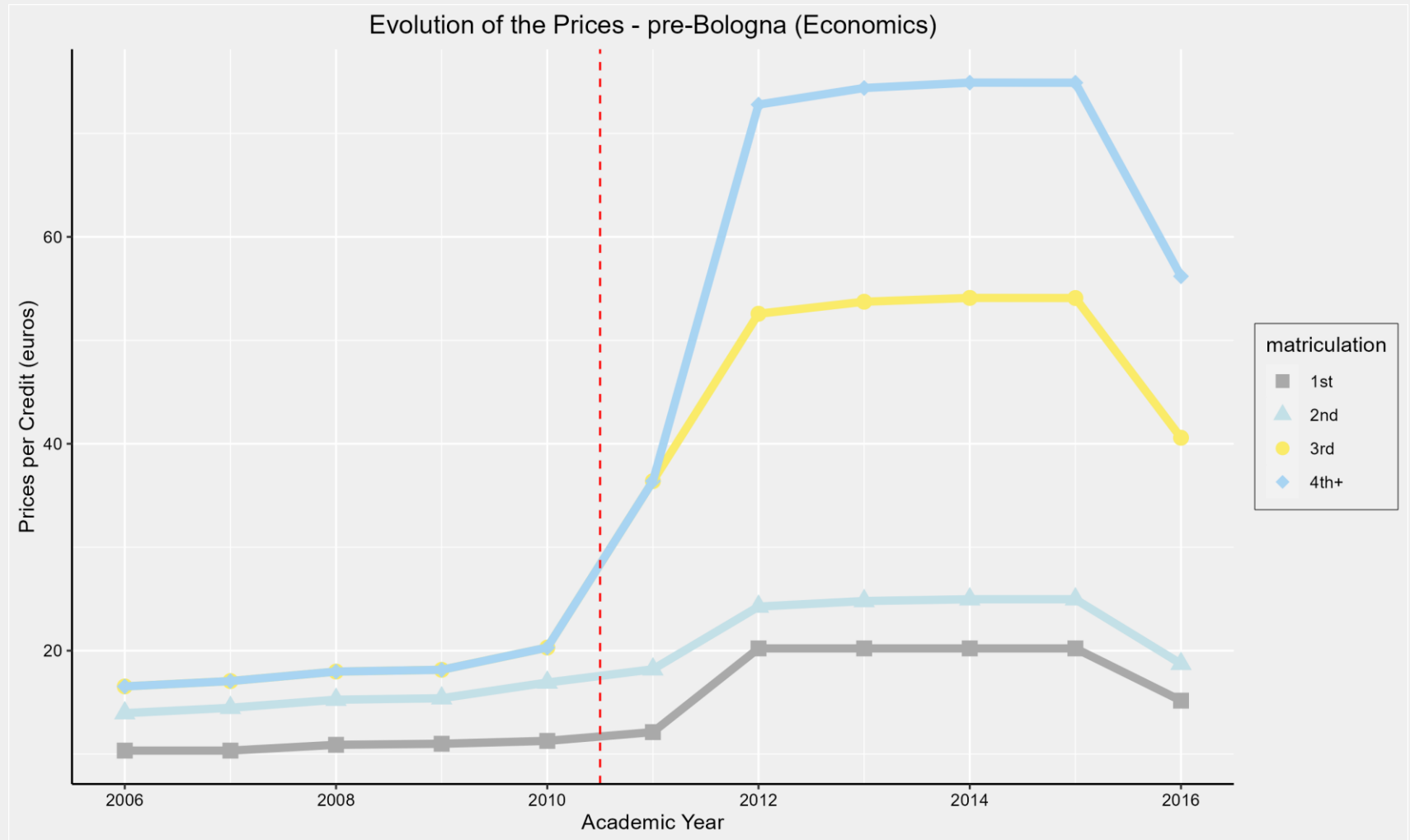
- It is not uncommon to see changes in tuition fees, either over time or across groups.
- Introduction, Abolishment, and Exemption
 - England's ()
 - Germanys ()
- Modifications and ...
 - Italy ()
 - a similar context in Valencia, Spain: ()

What could come with tuition changes?

- On the positive side:
- On the negative side:
- **Can tuition fees adjustment be a tool to achieve efficiency?**
- Our main contribution:

Overview of our findings

The rise in Catalonia



与其他政策变化有何不同？（文献、贡献）

- 可有可无（前面已经综述过了）

Anticipation and Perception

● precio de la universidad
Search term



+ Compare

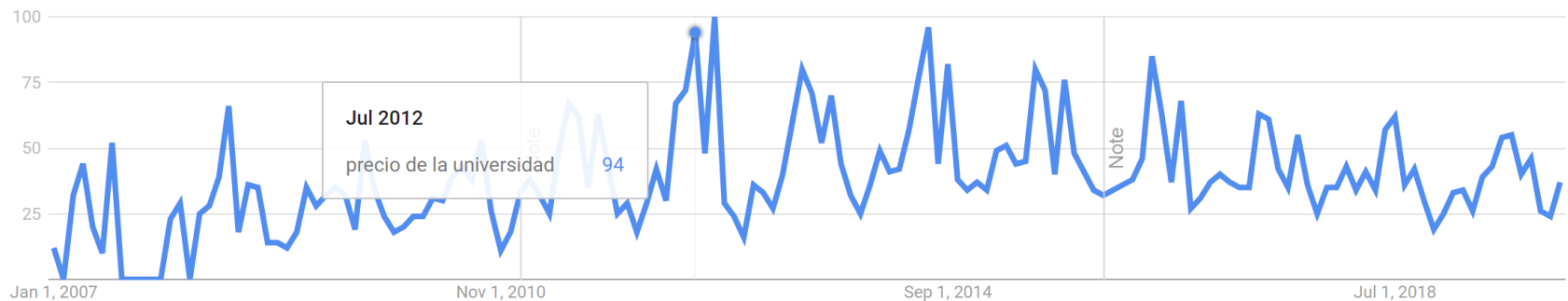
Spain ▼

1/1/07 - 12/31/19 ▼

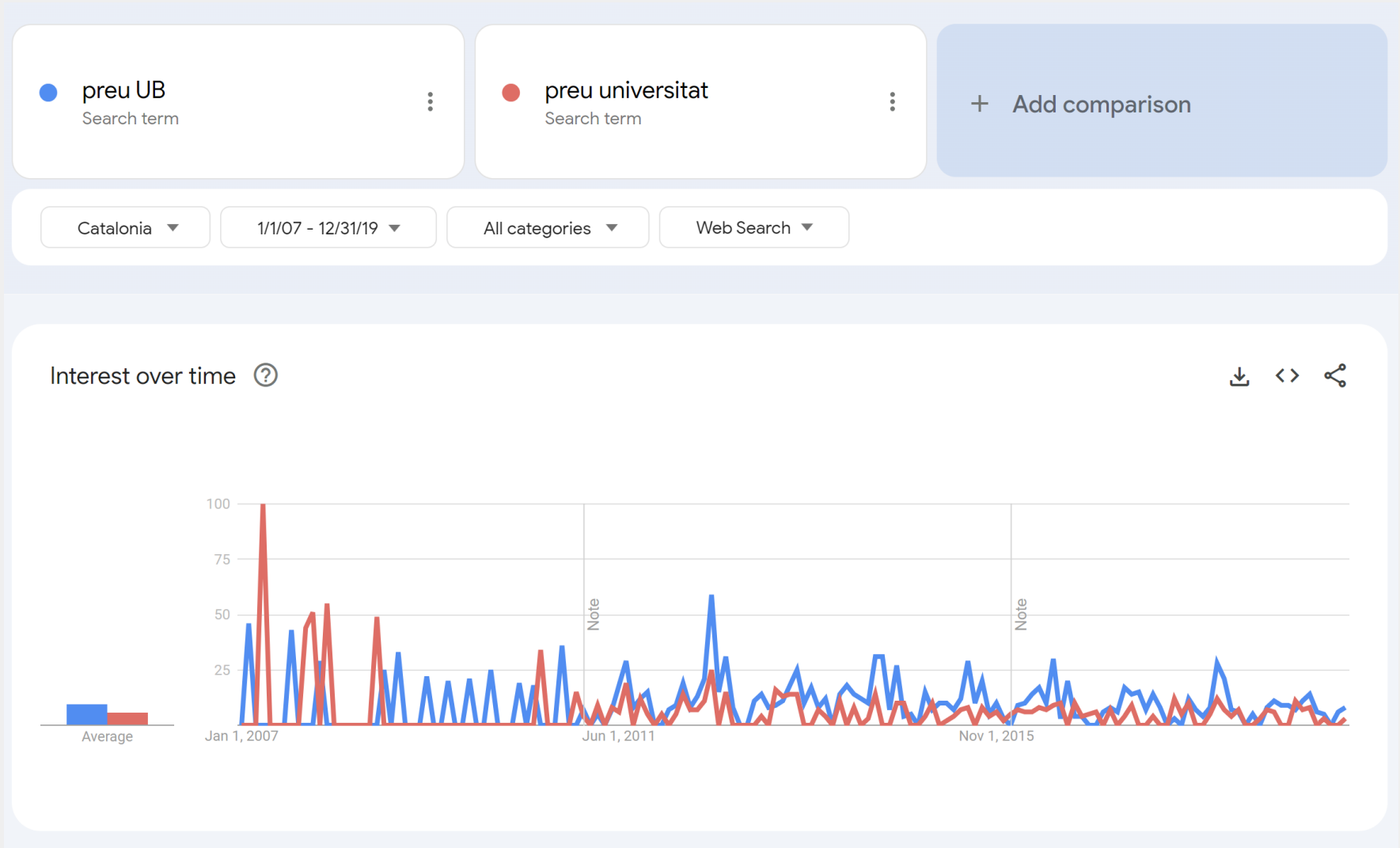
All categories ▼

Web Search ▼

Interest over time ⓘ



Anticipation and Perception



Data and Descriptive Statistics

Data Source: Administrative data from UB, 2007 to 2017.

- Sample: **undergraduate** students who enrolled at UB from **2007 to 2017**
- Information contained
 - **pre-enrolment characteristics:** entrance exam performance, districts(?), parental education and occupation, etc.
 - academic records: degree program, grades, retakes, subject selection, graduation dates, etc.
 - fees: total amounts (gross and net) each AY, total credit prices each AY, scholarship applied, scholarship status, etc.

Constructing a Balance Panel: We keep the observations for students in the 1st to 4th years of study to construct a balance panel of the student-year records.

Descriptive Statistics: Panel A background variables

- The pre-enrollment characteristics between the control cohort (2007) and the two treated cohorts (2008 and 2009) are largely **comparable**.

**Panel A:
background variables**

Variable (% of)	Control group Cohort 2007	Treatment group 1 Cohort 2008	Treatment group 2 Cohort 2009
foreigner	0.059 (0.236)	0.052 (0.223)	0.05 (0.218)
gender (female=0)	0.481 (0.5)	0.503 (0.5)	0.536** (0.499)
internet access	0.973 (0.162)	0.975 (0.156)	0.969 (0.174)
Economics major	0.4 (0.49)	0.361 (0.481)	0.408 (0.492)
Higher Education (father)	0.26 (0.439)	0.292 (0.455)	0.298 (0.458)
Higher Education (mother)	0.198 (0.399)	0.241** (0.428)	0.25** (0.433)
No Education(father)	0.02 (0.14)	0.018 (0.132)	0.014 (0.118)
No Education(mother)	0.024 (0.154)	0.017 (0.128)	0.017 (0.13)
Public sector (father)	0.328 (0.47)	0.366 (0.482)	0.347 (0.476)
Public sector (mother)	0.225 (0.418)	0.257 (0.437)	0.25 (0.433)
Unemployed (father)	0.005 (0.065)	0* (0)	0.003 (0.056)
Unemployed (mother)	0.014 (0.119)	0.022 (0.149)	0.022 (0.146)
Low skilled job (father)	0.033 (0.178)	0.02 (0.141)	0.036 (0.186)
Low skilled job (mother)	0.097 (0.296)	0.088 (0.283)	0.083 (0.276)
Students with parttime jobs	0.897 (0.303)	0.896 (0.306)	0.898 (0.303)
Number of students	713	841	640

Descriptive Statistics: Panel A by Year of Study (1)

- Here we compare the background characteristics among the three groups in the freshman & sophomore years.

Panel A:
background variables(YS==1)

Variable (% of)	Control group Cohort 2007	Treatment group 1 Cohort 2008	Treatment group 2 Cohort 2009
foreigner	0.059 (0.236)	0.052 (0.224)	0.049 (0.216)
gender (female=0)	0.481 (0.5)	0.504 (0.5)	0.535** (0.499)
internet access	0.973 (0.162)	0.975 (0.157)	0.969 (0.175)
Economics major	0.4 (0.49)	0.361 (0.481)	0.407 (0.492)
Higher Education (father)	0.26 (0.439)	0.29 (0.454)	0.297 (0.458)
Higher Education (mother)	0.198 (0.399)	0.24* (0.427)	0.247** (0.432)
No Education(father)	0.02 (0.14)	0.018 (0.133)	0.013 (0.112)
No Education(mother)	0.024 (0.154)	0.017 (0.128)	0.015 (0.125)
Public sector (father)	0.328 (0.47)	0.366 (0.482)	0.344 (0.475)
Public sector (mother)	0.225 (0.418)	0.255 (0.436)	0.251 (0.434)
Unemployed (father)	0.005 (0.065)	0* (0)	0.003 (0.056)
Unemployed (mother)	0.014 (0.119)	0.023 (0.149)	0.022 (0.147)
Low skilled job (father)	0.033 (0.178)	0.021 (0.141)	0.035 (0.183)
Low skilled job (mother)	0.097 (0.296)	0.088 (0.284)	0.082 (0.274)
Students with parttime jobs	0.897 (0.303)	0.895 (0.307)	0.899 (0.301)
Number of students	702	835	635

Panel A:
background variables(YS==2)

Variable (% of)	Control group Cohort 2007	Treatment group 1 Cohort 2008	Treatment group 2 Cohort 2009
foreigner	0.054 (0.226)	0.048 (0.213)	0.05 (0.218)
gender (female=0)	0.493 (0.5)	0.509 (0.5)	0.539 (0.499)
internet access	0.972 (0.166)	0.977 (0.15)	0.968 (0.176)
Economics major	0.422 (0.494)	0.375* (0.485)	0.406 (0.491)
Higher Education (father)	0.265 (0.441)	0.3 (0.459)	0.3 (0.459)
Higher Education (mother)	0.194 (0.396)	0.231 (0.422)	0.253** (0.435)
No Education(father)	0.019 (0.138)	0.013 (0.11)	0.014 (0.119)
No Education(mother)	0.026 (0.161)	0.015 (0.123)	0.018 (0.132)
Public sector (father)	0.33 (0.471)	0.372 (0.484)	0.344 (0.475)
Public sector (mother)	0.226 (0.418)	0.254 (0.436)	0.245 (0.431)
Unemployed (father)	0.002 (0.042)	0 (0)	0.002 (0.042)
Unemployed (mother)	0.016 (0.125)	0.018 (0.134)	0.022 (0.145)
Low skilled job (father)	0.036 (0.185)	0.018* (0.134)	0.037 (0.19)
Low skilled job (mother)	0.095 (0.294)	0.098 (0.298)	0.082 (0.274)
Students with parttime jobs	0.899 (0.301)	0.897 (0.304)	0.895 (0.307)
Number of students	576	653	562
	17.95%	21.80%	11.50%

Descriptive Statistics: Panel A by Year of Study (2)

- Here we compare the background characteristics among the three groups in the junior & senior years.

Panel A:
background variables(YS==3)

Variable (% of)	Control group Cohort 2007	Treatment group 1 Cohort 2008	Treatment group 2 Cohort 2009
foreigner	0.055 (0.228)	0.049 (0.216)	0.049 (0.216)
gender (female=0)	0.498 (0.5)	0.511 (0.5)	0.548 (0.498)
internet access	0.969 (0.173)	0.981 (0.139)	0.967 (0.179)
Economics major	0.418 (0.494)	0.373 (0.484)	0.415 (0.493)
Higher Education (father)	0.266 (0.442)	0.307 (0.462)	0.296 (0.457)
Higher Education (mother)	0.194 (0.396)	0.224 (0.417)	0.247** (0.432)
No Education(father)	0.021 (0.144)	0.011 (0.107)	0.013 (0.116)
No Education(mother)	0.027 (0.162)	0.015 (0.121)	0.018 (0.131)
Public sector (father)	0.335 (0.472)	0.373 (0.484)	0.343 (0.475)
Public sector (mother)	0.231 (0.422)	0.26 (0.439)	0.241 (0.429)
Unemployed (father)	0.002 (0.044)	0 (0)	0.002 (0.044)
Unemployed (mother)	0.018 (0.131)	0.018 (0.133)	0.019 (0.138)
Low skilled job (father)	0.038 (0.192)	0.018** (0.133)	0.035 (0.184)
Low skilled job (mother)	0.1 (0.3)	0.097 (0.296)	0.082 (0.274)
Students with parttime jobs	0.897 (0.303)	0.897 (0.304)	0.895 (0.307)
Number of students	520	611	513
	9.72%	6.43%	8.72%

Panel A:
background variables(YS==4)

Variable (% of)	Control group Cohort 2007	Treatment group 1 Cohort 2008	Treatment group 2 Cohort 2009
foreigner	0.052 (0.222)	0.048 (0.213)	0.05 (0.218)
gender (female=0)	0.496 (0.5)	0.502 (0.5)	0.552* (0.498)
internet access	0.972 (0.166)	0.978 (0.147)	0.966 (0.181)
Economics major	0.41 (0.492)	0.37 (0.483)	0.412 (0.493)
Higher Education (father)	0.269 (0.444)	0.313 (0.464)	0.302 (0.46)
Higher Education (mother)	0.199 (0.4)	0.229 (0.42)	0.254** (0.436)
No Education(father)	0.018 (0.134)	0.012 (0.109)	0.014 (0.118)
No Education(mother)	0.029 (0.166)	0.015 (0.123)	0.018 (0.133)
Public sector (father)	0.336 (0.473)	0.376 (0.485)	0.344 (0.476)
Public sector (mother)	0.226 (0.418)	0.263 (0.441)	0.244 (0.43)
Unemployed (father)	0.002 (0.045)	0 (0)	0.002 (0.045)
Unemployed (mother)	0.017 (0.127)	0.017 (0.13)	0.018 (0.133)
Low skilled job (father)	0.03 (0.172)	0.017 (0.13)	0.038 (0.191)
Low skilled job (mother)	0.098 (0.297)	0.094 (0.292)	0.084 (0.278)
Students with parttime jobs	0.898 (0.303)	0.894 (0.308)	0.892 (0.311)
Number of students	492	586	500
	5.38%	4.09%	2.53%
	29.91%	29.82%	21.26%

Descriptive Statistics: key outcomes

Panel B:
outcome variables

Variable name		Control group Cohort 2007	Treatment group 1 Cohort 2008	Treatment group 2 Cohort 2009
% of exams absent		0.215 (0.264)	0.172*** (0.239)	0.086*** (0.186)
	obs	2317	2685	2210
% of courses passed		0.574 (0.318)	0.61*** (0.315)	0.726*** (0.281)
	obs	2317	2685	2210
% of courses with good grades		0.056 (0.139)	0.056 (0.137)	0.061 (0.13)
	obs	2317	2685	2210
total credits taken		65.661 (14.78)	65.7 (14.137)	64.479*** (10.952)
	obs	2317	2685	2210
participation		0.813 (0.39)	0.8 (0.4)	0.865*** (0.342)
	obs	2852	3355	2555
graduation or not		0.371 (0.484)	0.499*** (0.5)	0.71*** (0.454)
	obs	713	841	640
duration of study		5.788 (1.873)	5.031*** (1.408)	4.392*** (1.514)
	obs	713	841	640

Identification strategy

Identification Strategy: the "student-year" specification (1)

$$y_{ics} = \alpha_c + \gamma_s + \beta D_{ics} + \theta X_i + \varepsilon_{ics}$$

- **Parallel trends** among cohorts across years of study (YS) in the absence of treatment
- α_c and γ_s : cohort (c , 2007 to 2017) and year-of-study (s , 1 to 4) FEs;
- y_{ics} : outcome of student i in the s -th year of study: exam passing rate, exam absence rate, persistence in college, etc;
- D_{ics} : treatment dummy taking 1 if i in c exposed to the rise in the s th YS.

Control group: 2007 cohort—not exposed to the fee rise until the 5th YS

Treated group 1: 2008 cohort—exposed to the first rise in 2011 (4th YS)

Treated group 2: 2009 cohort—exposed to the first rise in 2011 (3rd YS) and the second in 2012 (4th YS)

Identification strategy

Identification Strategy: the "student-year" specification (2)

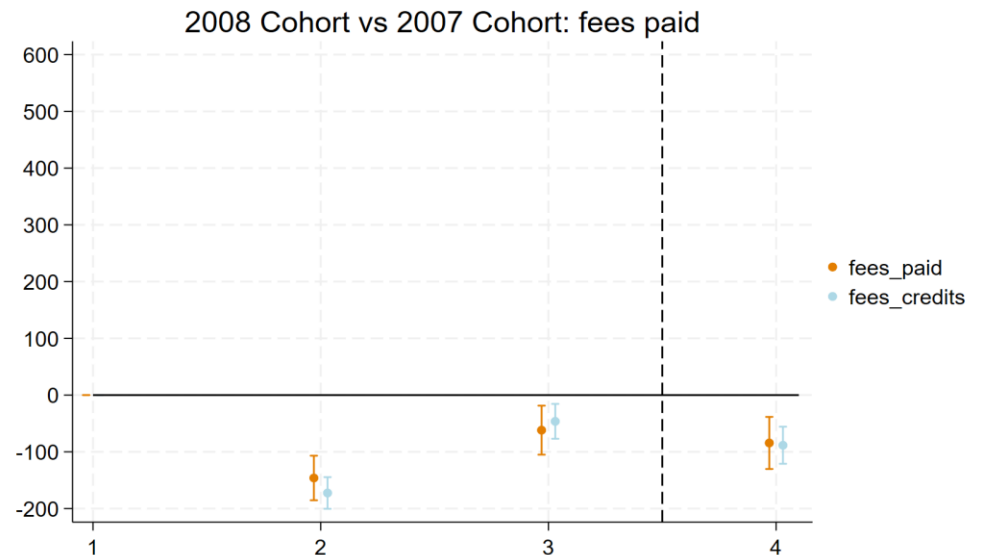
To avoid the confoundedness of composition changes resulting from non-random attrition, we modify the specification to:

$$y_{is} = \alpha_i + \gamma_s + \beta D_{ics} + \varepsilon_{is}$$

- α_i and γ_s : individual (i) and year-of-study (s) FEs;
- y_{ics} : outcome of student i in the s -th year of study;
- D_{ics} : treatment dummy taking 1 if i exposed to the rise in the s -th YS.

Empirical results (1): “First Stage”: law \rightarrow fees

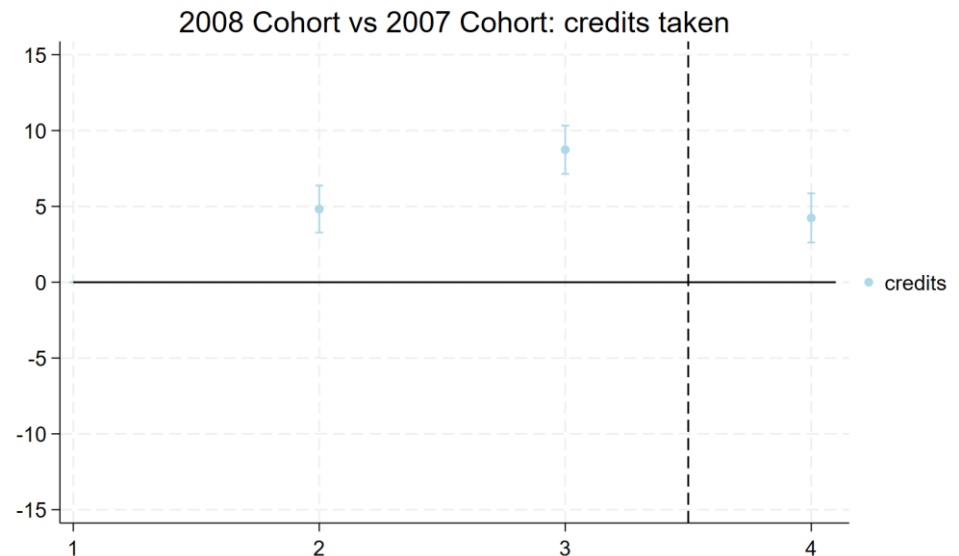
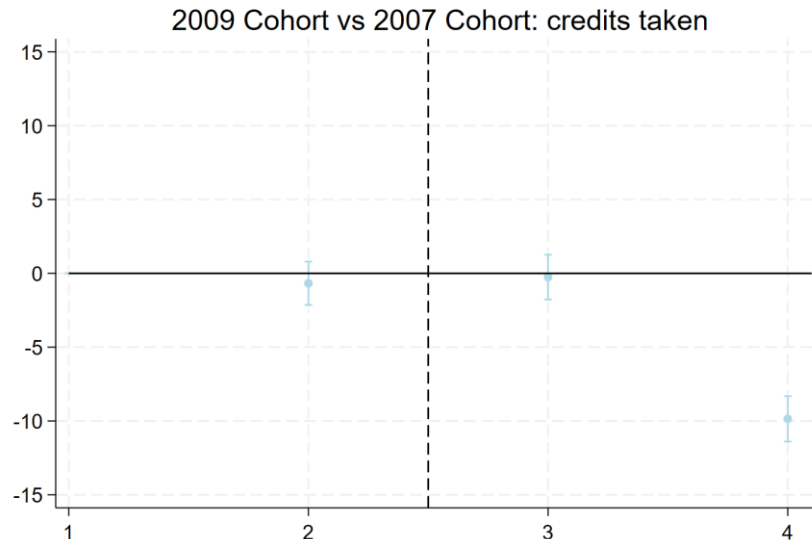
- It doesn't seem like the law significantly changed the final amount paid by students and the fees associated with credits taken, **except for** the 2009 cohort in their last year (2012, 2nd rise)



Empirical results (2): credits taken

- It is strange because 2008 people are taking more credits but paying less.
- **Maybe** there were **more failures**? Or maybe there is a mistake in the processing.

Still need to check...



Next steps

- More outcome? – figure out whether there is a way for students to choose “easier”/ “lower-level” options.
- Prepare a semester version of dataset #1 once have data with more sem info
- Start to explore dataset #2—filtering records of certain times of retaking and explore the effects.
- Heterogeneity:
 - Compulsory courses vs. all courses
 - Good students vs. bad students
 - Disciplines: Science, Engineering, Social Sciences, Humanities; or different experimentalidades