

Public Education in Greece: Insights from the Data

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RESEARCH QUESTION

What shapes students' educational trajectories?

WHY DOES IT MATTER?

- ▶ Education affects individuals' professional and broader economic trajectories (Card, 1999; Hanushek and Woessmann, 2008; Heckman et al., 2018).
- ▶ Greece has rich administrative data but limited systematic evaluation of education policies.
- ▶ Understanding how students, teachers, and institutional structures interact can support better policy interventions.

ADMINISTRATIVE DATA

- ▶ Public Middle and High School Students
- ▶ School Years: 2015–2025

myschool Data

Grades

Absences

Gender

Grade Level

School & Classroom

Teachers

National Exam Data

Scores

Application Lists

Admission Outcomes

Admitted Program

Overview

Achievement

Classrooms

Teachers

Preferences

Degree Programs

Second Attempt

TEI→AEI

Research Question & Methodology

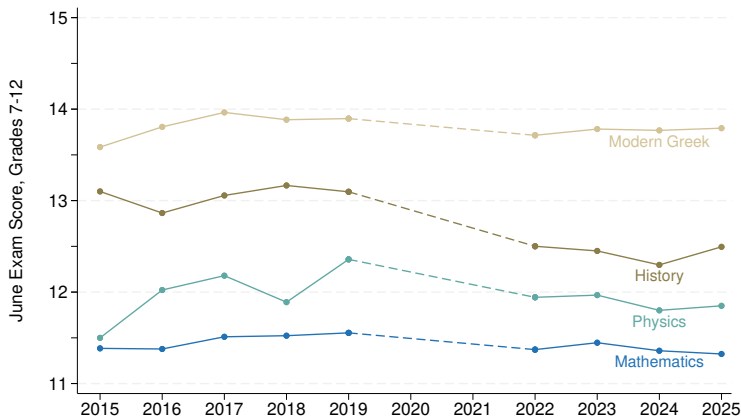
Research question

How has student academic performance evolved over time, particularly after the COVID-19 pandemic?

Methodology

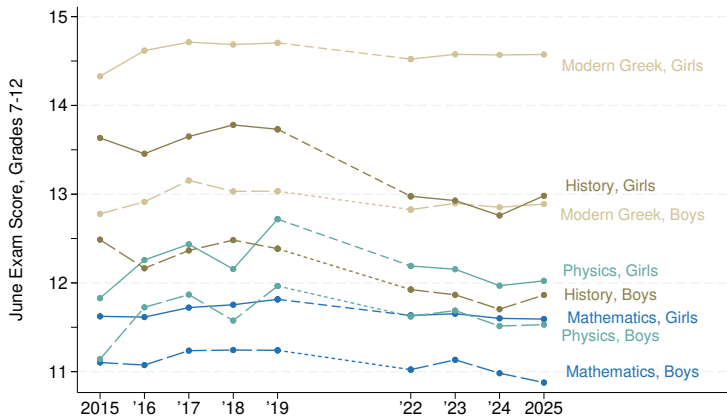
- ▶ We compute average June examination scores in grades 7–12 for four subjects (Mathematics, Physics, Modern Greek Language, and History).
- ▶ We compare trends over time separately and overall for boys and girls.

STUDENT ACHIEVEMENT OVER TIME



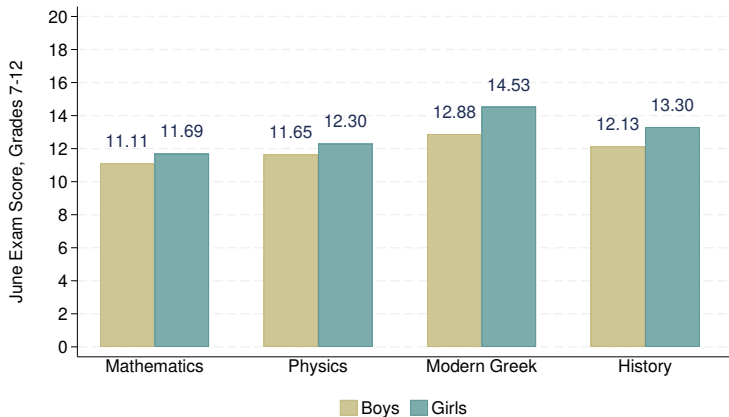
Notes: The figure displays average June examination scores for students in grades 7 through 12 by year. Scores are measured on a 0–20 scale.

STUDENT ACHIEVEMENT OVER TIME BY GENDER



Notes: The figure displays average June examination scores for students in grades 7 through 12 by year. Scores are measured on a 0–20 scale.

AVERAGE ACADEMIC PERFORMANCE BY GENDER AND SUBJECT



Notes: This figure reports mean June exam scores for boys and girls in Mathematics, Physics, Modern Greek Language, and History, averaged across grades 7–12. Scores are measured on a common scale within each subject and grade. Bars represent means by gender, and numerical labels indicate the corresponding average scores.

Research Question & Methodology

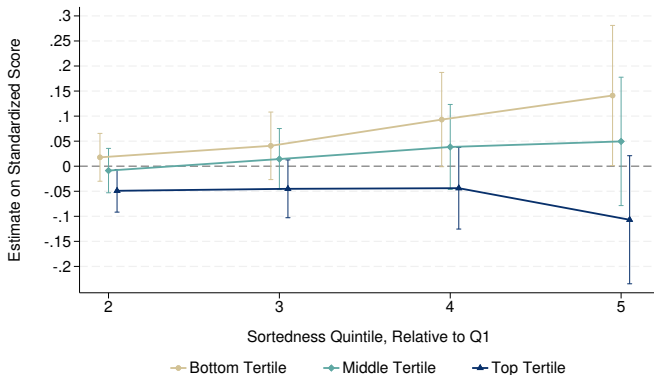
Research question

How does classroom composition affect students' academic learning growth?

Methodology

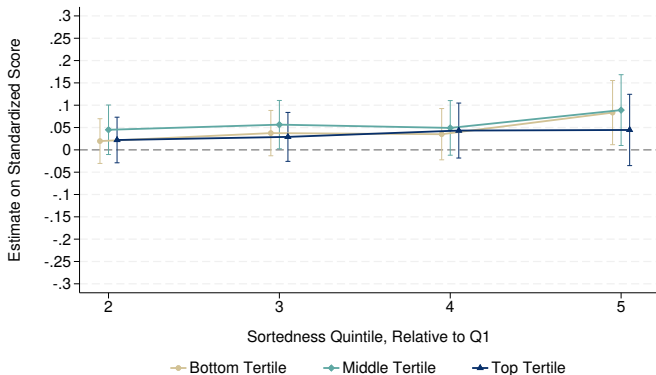
- ▶ Classroom composition varies quasi-randomly within each grade 10 cohort due to alphabetical assignment.
- ▶ We compare end-of-grade-10 performance among students with the same baseline performance in grade 9, across cohorts with varying degrees of sortedness.
- ▶ High *sortedness index*: classrooms differ more in students' prior performance (more “sorted” distribution). Low index: more mixed classrooms.

EFFECT OF COHORT PARTITION SORTEDNESS, GREEK



Notes: Cohort partition sortedness captures how homogeneous classrooms are. The vertical axis measures student achievement at the end of grade 10. The 1st quintile represents school cohorts with the least homogeneous classroom assignments, whereas the 5th quintile represents cohorts with the most homogeneous classroom assignments. Vertical lines denote 95 percent confidence intervals.

EFFECT OF COHORT PARTITION SORTEDNESS, MATH



Notes: Cohort partition sortedness captures how homogeneous classrooms are. The vertical axis measures student achievement at the end of grade 10. The 1st quintile represents school cohorts with the least homogeneous classroom assignments, whereas the 5th quintile represents cohorts with the most homogeneous classroom assignments. Vertical lines denote 95 percent confidence intervals.

Research Question & Methodology

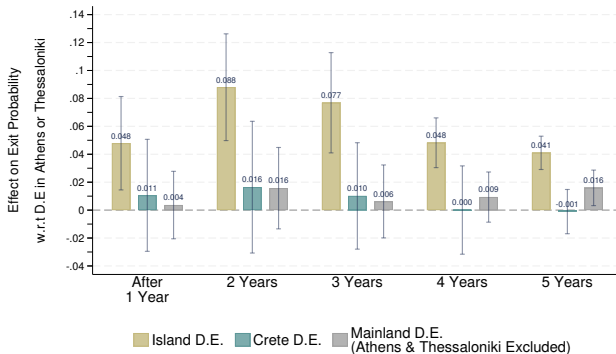
Research question

Does the probability of teacher departure vary depending on where they are assigned?

Methodology

- ▶ We follow all teachers assigned from 2016 onwards.
- ▶ We estimate the probability of moving within 1–5 years.
- ▶ We compare islands, Crete, and mainland Greece relative to Athens and Thessaloniki as the baseline.
- ▶ Moves reflect both teacher decisions and institutional transfer rules.

TEACHER MOBILITY



Notes: Bars report estimated differences in the likelihood of leaving a school district within 1 to 5 years of entry, relative to metropolitan districts in Athens and Thessaloniki. Island districts include the Aegean and Ionian islands except Crete, while mainland districts exclude the metropolitan districts of Athens and Thessaloniki. Estimates are obtained from linear probability models controlling for entry year, teacher gender, STEM specialization, number of schools served, school type, and school level. Vertical lines represent 95 percent confidence intervals.

Research Question & Methodology

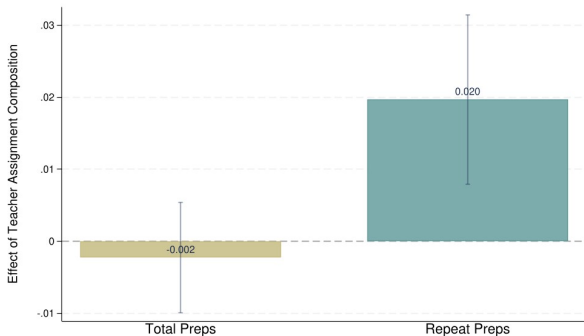
Research question

How does the composition of teacher assignments affect student performance?

Methodology

- ▶ We examine philologists (humanities teachers) in grade 10.
- ▶ For each teacher we measure how many distinct subjects they are assigned and how many additional assignments of the same subject in a different class.
- ▶ Alphabetical assignment of students to classrooms creates quasi-random variation in teacher assignments.
- ▶ We compare end-of-grade-10 performance among students with the same baseline performance in grade 9.

EFFECT OF TEACHER ASSIGNMENT COMPOSITION ON STUDENT PERFORMANCE



Notes: This figure examines how the composition of teacher assignments affects student academic performance in grade 10. Distinct (inter-subject) preparations refer to the number of different subjects a teacher prepares and teaches within the same academic year. Repeat (intra-subject) preparations refer to cases in which a teacher prepares and teaches the same subject more than once within a school year across different grades. The analysis focuses on philologists (PE02 teachers). All models control for prior student performance (grade 9), student and teacher gender, class size, teaching load (in

Research Question & Methodology

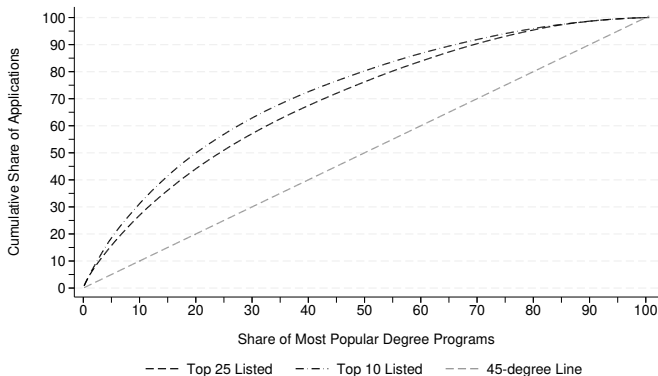
Research question

To what extent do applicants converge on the same programs when submitting their application lists?

Methodology

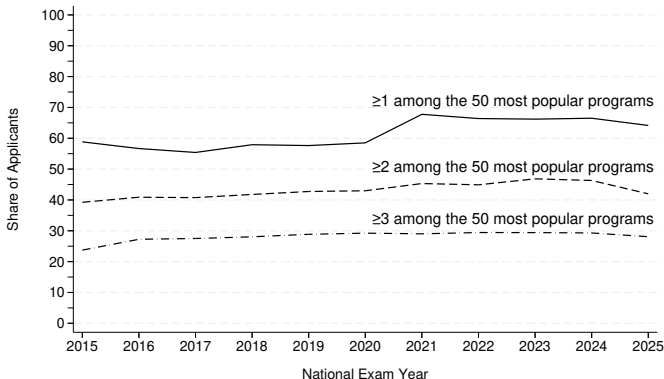
- ▶ We rank programs from most to least popular based on how frequently they appear in applicants' top choices.
- ▶ We compute what share of all applications is accounted for by the top 10%, 25%, 50%, etc. of programs.
- ▶ For each year, we identify the 50 programs most frequently appearing in applicants' top 5 choices and measure the share of applicants who include at least 1, 2, or 3 of them.

CONCENTRATION OF DEGREE PROGRAM PREFERENCES



Notes: Degree programs are ranked from the most to the least popular based on the number of applications received. The horizontal axis reports the cumulative percentage of degree programs, starting from the most popular (e.g., 10 corresponds to the top 10 percent of degree programs). The vertical axis reports the cumulative share of all applications accounted for by these programs.

DO APPLICANTS CONVERGE ON THE SAME PROGRAMS?



Notes: Degree programs are ranked separately within each year according to the number of times they appear in applicants' top 5 preference lists. The 50 most popular programs correspond to the 50 programs with the highest frequencies in a given year. The figure reports the share of applicants whose top 5 list includes at least one, two, or three of these programs.

Research Question & Methodology

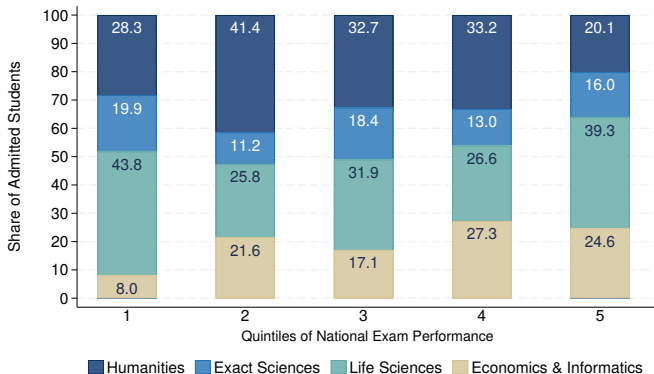
Research question

How do students of different performance sort across fields of study and programs linked to higher-demand occupations?

Methodology

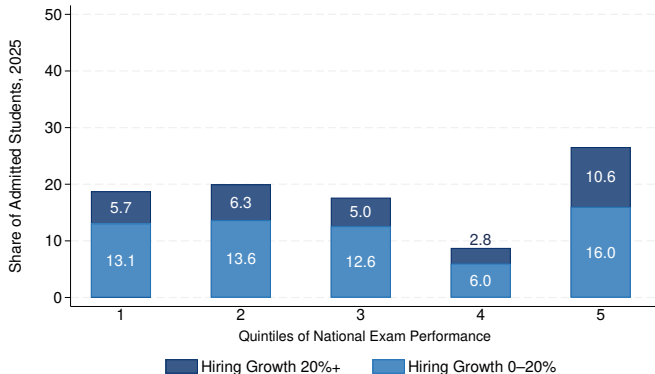
- ▶ We rank 2025 admitted students into quintiles based on their average national exam performance.
- ▶ We compute the distribution of admitted students by field of study.
- ▶ We map each program to occupational categories and classify sectors by historical hiring growth (0–20% and 20%+).

FIELD OF COLLEGE STUDY BY QUINTILE OF NATIONAL EXAM PERFORMANCE



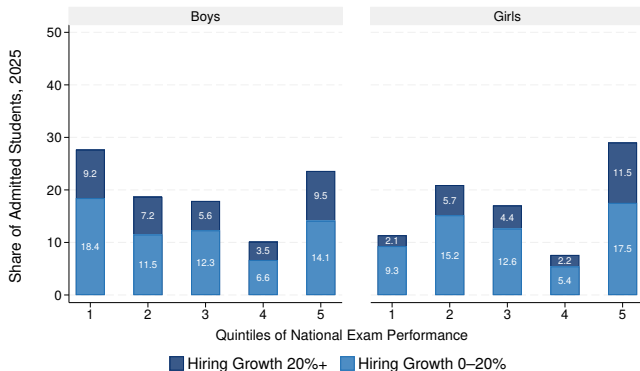
Notes: This figure shows the share of admitted students in each field of study (i.e., Humanities, Exact Sciences, Life Sciences, or Economics & Informatics) across quintiles of average national exam performance.

ENROLLMENT IN DEGREE PROGRAMS LINKED TO GROWING OCCUPATIONS



Notes: The figure presents the share of students admitted in 2025 to degree programs mapped to occupational categories with historical growth in hiring flows of 0–20 percent or greater than 20 percent. Estimates are shown separately by quintile of average performance on the national examinations.

ENROLLMENT IN DEGREE PROGRAMS LINKED TO GROWING OCCUPATIONS BY GENDER



Notes: The figure presents the share of students admitted in 2025 to degree programs mapped to occupational categories with historical growth in hiring flows of 0–20 percent or greater than 20 percent. Estimates are shown separately by quintile of average performance on the national examinations and by gender.

Research Question & Methodology

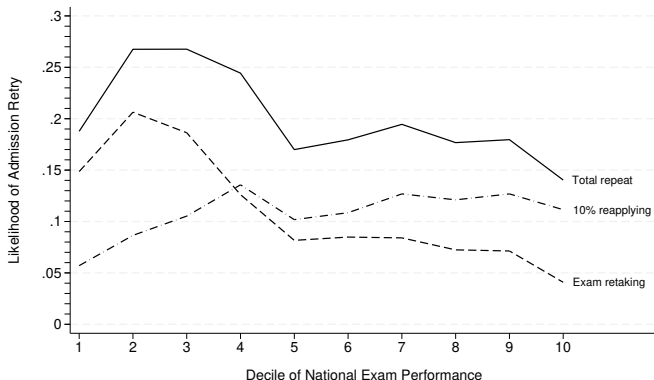
Research question

To what extent do applicants who retry the admissions process revise their preferences?

Methodology

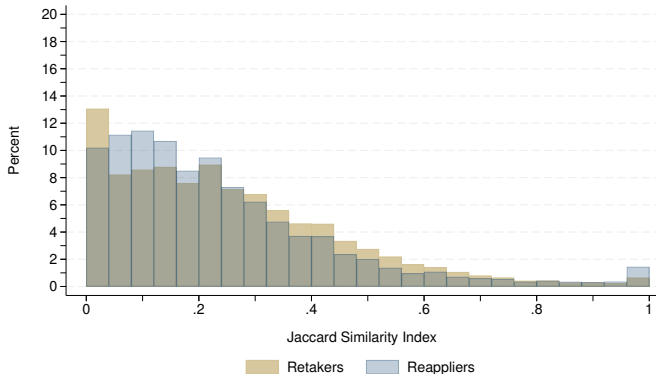
- ▶ We estimate the probability of retrying (via retaking exams or through the 10% track) by decile of national exam performance.
- ▶ We compare application lists across successive attempts to measure how often the same programs reappear.
- ▶ We examine whether programs are retained at the same or higher rank in subsequent preference submissions.

LIKELIHOOD OF ADMISSION RETRY



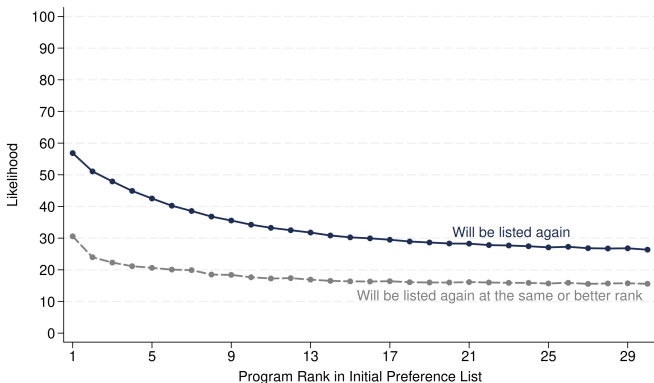
Notes: This figure displays the likelihood of retrying for university admission by decile of national exam performance. “Total repeat” includes all applicants who retry for admission, either by retaking the national exams or by reapplying through the 10 percent admission track. “Exam retaking” refers to applicants who retake the national exams. “10% reapplying” refers to applicants who reapply without retaking the national exams, using scores from a previous year.

SIMILARITY BETWEEN FIRST AND SECOND UNIVERSITY APPLICATION LISTS



Notes: The Jaccard index measures the similarity between the degree programs listed in a student's first and second university application forms. A value of 0 indicates that the two application lists have no degree programs in common, while a value of 1 indicates that they contain exactly the same degree programs.

FROM THE FIRST TO THE SECOND APPLICATION LIST: PERSISTENCE OF DEGREE PROGRAM CHOICES



Notes: The solid line shows the probability that a degree program listed at a given rank in the first application form is also listed in the subsequent application. The dashed line shows the probability that the same degree program is listed at the same or a higher rank in the subsequent application.

Research Question & Methodology

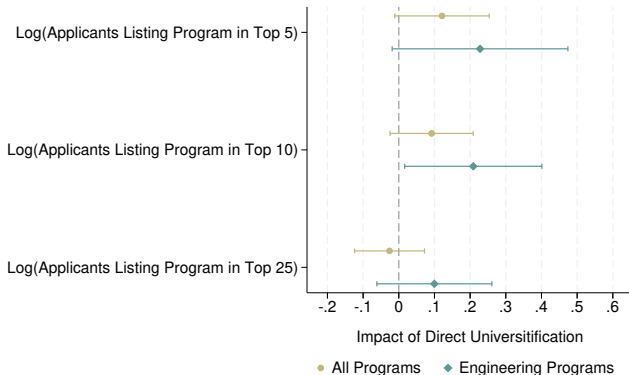
Research question

When a TEI department acquires university status, does applicant behavior change?

Methodology

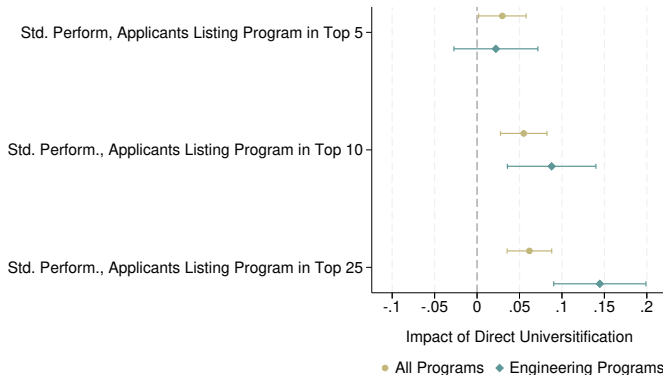
- ▶ We focus on cases of direct universitification, where a TEI department was converted into a university department with a similar academic field.
- ▶ We compare the same degree program before and after universitification.

IMPACT OF UNIVERSITIFICATION ON PROGRAM DEMAND



Notes: The figure reports estimates of the effect of direct universitification on applicant demand. Outcomes are the natural logarithm of the number of applicants listing a program among their top 5, 10, or 25 choices. Estimates control for program fixed effects, year fixed effects, and other forms of restructuring. Horizontal bars denote 95% confidence intervals based on standard errors clustered at the program level. Engineering estimates are estimated using only engineering programs.

IMPACT OF UNIVERSITIFICATION ON APPLICANTS' SCORES



Notes: The figure reports estimates of the effect of direct universitification on applicant quality. Outcomes are the average standardized national examination performance of applicants listing a program in their top 5, 10, or 25 choices. Estimates control for program fixed effects, year fixed effects, and other forms of restructuring. Horizontal bars denote 95% confidence intervals based on standard errors clustered at the program level. Engineering estimates are estimated using only engineering programs.

ADDITIONAL ANALYSES

- ▶ The role of schools and teachers in student learning growth
- ▶ Student absences
- ▶ Student-to-teacher ratio
- ▶ Relationship between in-school and national exam performance

BIBLIOGRAPHY I

- Card, D. (1999). The Causal Effect of Education on Earnings. In O. C. Ashenfelter and D. Card (Eds.), *Handbook of Labor Economics*, Volume 3A, pp. 1801–1863. Elsevier.
- Hanushek, E. A. and L. Woessmann (2008). The Role of Cognitive Skills in Economic Development. *Journal of Economic Literature* 46(3), 607–668.
- Heckman, J. J., J. E. Humphries, and G. Veramendi (2018). Returns to Education: The Causal Effects of Education on Earnings, Health, and Smoking. *Journal of Political Economy* 126(S1), S197–S246.