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Aina, Carmen; Cappellari, Lorenzo; Francesconi, Marco

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Student performance may not improve when universities are choosier

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Student Performance may not Improve when Universities are Choosier

Carmen Aina
Lorenzo Cappellari
Marco Francesconi

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Student Performance may not Improve when Universities are Choosier

Abstract

We use unique administrative data from a leading Italian University to estimate whether the use of admission tests and conditional progression schemes are effective strategies to select high-performing students. Previous work has mainly focused on the effect of selectivity policies on widening university access by individuals from ethnic minorities and disadvantaged background.

JEL-Code: I21.

Keywords: college student performance, college admission, institutional selectivity, difference-in-difference design.

Carmen Aina
University of Piemonte Orientale
Vercelli / Italy
carmenaina@libero.it

Lorenzo Cappellari
Department of Economics
Catholic University of Milan
Largo Gemelli 1
Italy – 20123 Milan
lorenzo.cappellari@unicatt.it

Marco Francesconi
University of Essex
Colchester / UK
mfranc@essex.ac.uk

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1. Introduction

A number of studies have examined the extent of access and participation to higher education, especially among individuals from disadvantaged groups (Kane, 2006). Much less, instead, is known about the effect of institutional selectivity on college students' academic performance (Hoxby, 2009). Can admission tests and performance-based progression schemes select in high-performing undergraduates? Do such policies have a lasting influence over students' entire university careers?

Education research has long established that selectivity is beneficial (Thomas, 2003). There is growing evidence, however, that challenges this view, documenting that more selective universities are not particularly effective in fostering learning and cognitive development during college years (Pascarella et al., 2006). When student ability is private information and hard to observe, screening — through admission tests and conditional progression schemes — could in principle provide an effective mechanism to separate high-ability students from low performers (Stiglitz, 1975). Given the repeated nature of the admission process from one cohort of students to the next, selectivity can also establish a reliable reputation device through which high-ability individuals sort themselves into highly selective institutions (MacLeod and Urquiola, 2009). Despite these arguments, much of the existing evidence about the link between selectivity and student performance is essentially correlational. The objective of this paper is to address this issue using unique administrative data from a leading private University in Italy.

2. Institutional Background

A comprehensive description of the Italian university system is beyond the scope of this paper (Bratti et al., 2008). Here, we briefly emphasize two distinctive aspects which are relevant to our analysis. First, access to public universities used to be open and virtually free to all individuals holding a recognized secondary school qualification — except for specific departments, such as Medicine. This was not the case, however, for private universities, which, in addition to tuition fees, could have granted admission on the basis of secondary school test results and/or additional entry tests. Second, in all public and private universities alike, there was no official limit to the number of years a student could have been enroled in a specific program

(Garibaldi et al., 2010). Progression, therefore, was typically not conditional on past performance, and achievement of the degree was independent of the number of years spent in a program. For instance, in standard four-year programs, students actually obtained their degree after 7.5 years on average, with only one in seven students completing within the minimum period.[1]

Our objective is to estimate the effects of admission tests and conditional progression schemes on a number of outcomes measuring student performance. In fact, we estimate the effects of *interrupting* such schemes, taking advantage of variation in the timing of the interruptions across departments in a large private University. Since the 1970s, a number of departments within this institution set up selectivity schemes with the explicit objective of attracting high-performance students. Admission tests were in-class written examinations that tested candidates' general knowledge. Conditional progression schemes, instead, referred to department-specific rules whereby students were not allowed to proceed to (and take exams from) a subsequent year of study, unless they passed all (or a minimum number of) previous years' exams.

In the middle of the 1990s, the sector experienced major changes, with the opening of several new universities. This process, in turn, led to a massive expansion of the aggregate supply at the same time when the population exposed to the opportunity of entering tertiary education was shrinking, because of the pronounced baby bust occurred since the early 1970s. As a result, the University under study responded with the gradual elimination of all selectivity schemes, which also potentially implied efficiency savings.

During the sample period, admission tests were in operation in the departments of Economics and Political Science, which discontinued them from 1993/94 onwards, and in Banking and Finance, which stopped them in the following academic year. All other four-year programs, which did not have entry tests, define our control group. Conditional progression schemes were used by Economics up to 1992/93 and Mathematics and Physics up to 1998/99, and were never discontinued by Political Science. All other departments never introduced them.

[1]The essence of these features — free, low-cost access and uncapped completion period — still remains to date even after the 2001 reform, which sorted university education into two sequential tiers of study, three-year undergraduate courses followed by two-year master courses.

3. Data and Methods

We use unique administrative data on 49,157 students, the universe of individuals enrolled in all departments offering four-year programs between 1990/91 and 2000/01.[2] Of these, 35,124 students had obtained a first degree by August 2008. Figure 1 displays the trends in the four outcome variables analyzed in this paper.[3] Students in both treatment and control groups experienced a reduction in the probability of graduating from 80% in 1990 to 70% at the time when selectivity policies were still in place (panel A). Their chances remained stable after the elimination of such policies. About a quarter of all graduates obtained a degree with top marks in control departments (panel B), while treatment-group students were only half as likely to attain this outcome. We observe an acceleration in the proportion of students (in both groups) graduating within the minimum period of four years, from less than 10% before the policy changes to 25% at the end of the sample period (panel C). Similarly, the elimination of admission tests accompanied a substantial increase in the fraction of graduates who obtained their degree within the minimum period *and* with top marks from 2–3% among students enroled in the early 1990s to about 10% among students enroled in the late 1990s (panel D).

Our empirical strategy is based on a difference-in-difference (DD) design. Taking advantage of the variation resulting from the different timing of the interruption of admission tests and conditional progression schemes across departments, we estimate separate linear probability models for each of the outcomes just described. In all regressions we control for secondary-school final grade and indicators of gender, secondary-school type, whether students enroled immediately after secondary-school completion, and region of residence. We also performed several checks to account for a variety of time variations. For sake of brevity, we shall present results only from a specification with group-specific quadratic trends.

[2]The start of the sample period is the first year for which data are available, while the end is the year prior to the 2001 reform mentioned above. To avoid complications, data collected after 2001 are excluded.

[3]In the figure, treatment and control groups are defined on the basis of admission test interruptions. Similar trends emerged when we used conditional progression withdrawals, and are thus not shown.

4. Results

Table 1 presents the DD estimates of the treatment effect. The interruption of admission tests led to a small statistically insignificant reduction of 2.9 percentage points in the probability of completing a degree. This effect is echoed by an even smaller reduction, of about 0.4 percentage points, due to the interruption of conditional progression schemes.

Conditional on obtaining a degree, the withdrawal of conditional progression is always associated with a worsening performance, although this relationship is never statistically significant, except in the case of completing the degree within the minimum period and with top marks (an effect, however, that is significant only at the 10% level). Removing admission tests is, instead, always associated with an *improved* performance, although again this is not significant in two of the three outcomes. The outcome with a significant effect estimate is graduating with top marks: the elimination of admission tests led students to increase their probability of graduating with top marks by 4.2 percentage points (a 20% increase over the baseline probability).

We performed several checks to assess the robustness of our results and identify the presence of heterogeneous responses. In particular, we re-estimated our analysis using group-specific linear trends or, alternatively, common linear and quadratic trends. We also changed our basic specification by including a large set of interaction terms. Finally, we redefined our outcome-specific treatment groups after excluding sequentially each department in the group. All such tests invariably confirmed the results shown in Table 1. In addition, we found evidence that some of the advantageous effect of conditional progression was associated with Economics but not with other departments, with Economics students experiencing a reduction in the probability of obtaining their degree by about 4 percentage points after the interruption of the scheme, and the probabilities of completing within the minimum period and of achieving the degree with top marks by 8 and 4 percentage points, respectively. Finally, part of the perverse effect of admission tests seemed to be driven mainly by Banking and Finance, with students from that department showing a 6-percentage-point increase in the probability of completing their degree within the minimum time and a 5-percentage-point increase in the probability of completing within the

minimum period and with top marks, after the elimination of the test.

5. Discussion

The evidence presented in this paper is inconsistent with the long-standing view that student performance improves when universities adopt stringent selection strategies. It is important to understand why. We outline two possible, not mutually exclusive, explanations. First, such strategies might be largely ineffective in the Italian context, which was (and, to a large extent, still is) characterized by a sizeable fraction of high-quality public universities whose undergraduate recruitment was not driven by selectivity. Institutional selectivity by private universities, therefore, may never be successfully sustained in such an environment, where public institutions can offer a valuable 'outside option' to students' enrolment decisions. One weakness of this line of argument, however, is that selective strategies have been, and continue to be, successfully adopted by other private Italian institutions which base their recruitment selectivity exactly on academic performance (Garibaldi et al., 2010).

Second, it is possible that both admission tests and conditional progression schemes ceased to be effective only during their last years in operation because of the change in environment between then and when they were first implemented in the 1970s and 1980s. The 1990s witnessed a phenomenal expansion of the aggregate supply of university slots, which led to a considerable increase in uncertainty and competitive pressure felt by all incumbents, including the University under study. The changed environment seemed to have pushed this institution to a recruitment strategy based on securing market shares, placing lesser emphasis on selectivity. Also this line of argument, however, is not entirely satisfactory. Student intake in treatment departments, in fact, *decreased* sharply after the interruption of the selectivity policies while it mildly increased in control departments, even though departments in both groups had to face greater external competition for students. Moreover, competition is generally believed to induce positive incentive effects rather than fostering bad practice among educational service providers (Rothstein, 2006).

More generally, in a world characterized by greater uncertainty about student ability, the presence of selectivity policies might aggravate recruitment problems on the one hand, but could represent a powerful reputation signal on the other

(MacLeod and Urquiola, 2009). Concentrating effort around such policies, therefore, could come with short-run costs of reduced student intake, but might pay off in the longer-run with greater student quality and increased performance, and, eventually, better recruitment prospects.

Two points about this discussion are in order. First, the absence of a relationship between institutional selectivity and student performance ties in well with the growing body of economics literature that emphasizes the importance of early as opposed to late child investments (Cunha and Heckman, 2010). Within this context, university selectivity policies are a form of late (and arguably small) investments, which are thus likely to have little salience on the accumulation of skill formation, especially if they have not been preceded by earlier crucial investments.

Second, a caveat should be raised on external validity. We cannot claim that the elimination of selectivity policies has invariably no effect on academic quality and attainment, even in a context within which our institution operated, a context characterized by dramatic sectoral changes with supply expansions, pronounced reduction in the local student population, and heightened uncertainty about student quality. An alternative way of taking the lack-of-effect results forward is to design simpler and possibly more effective selectivity strategies (such as shifting the whole university system in Italy closer to the Anglo-Saxon model with admissions based on reliable standardized tests, with progression linked to passing all exams in a given year as a prerequisite to enrol in the subsequent year of study, and with substantially fewer exam sessions each year), and to devote more resources to such policies when they are actually implemented.

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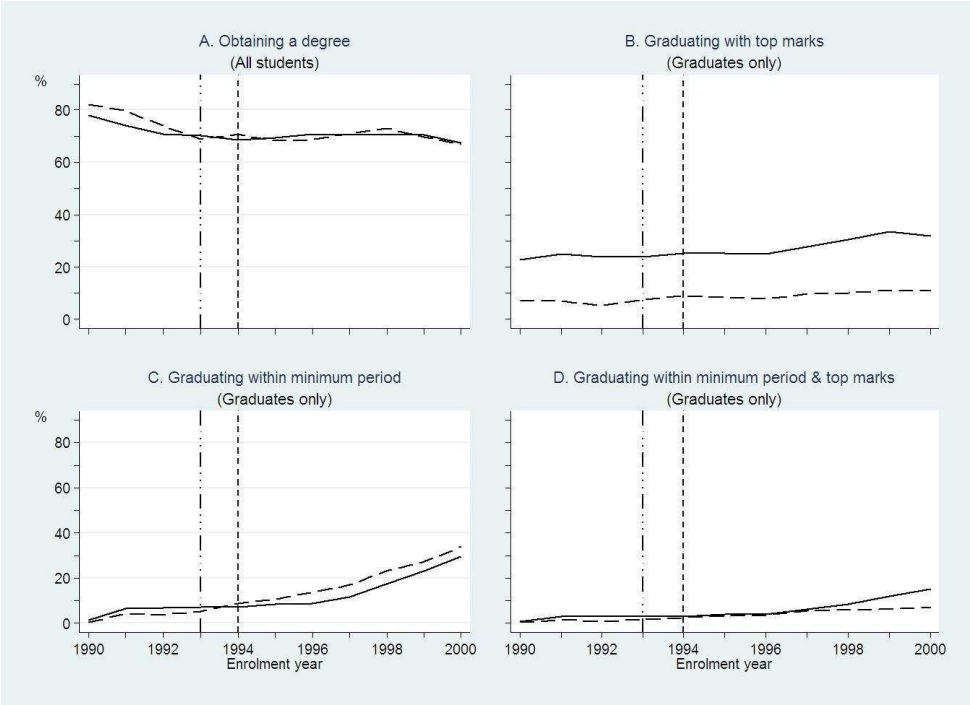

Figure 1: Trends in Educational Performance — All Departments

Note: Solid and dashed lines refer to control and treatment groups, respectively. Vertical lines show when admission tests were interrupted for Economics and Political Science (dashed/dotted line) and for Banking and Finance (short dashed line). Control group consists of students enroled in Language and Linguistics, Education, Law, Modern Literature and Philosophy, Mathematics and Physics.

Table 1: Effect of Admission Tests and Conditional Progression Schemes on Academic Performance

	Obtaining a degree (All students)	Graduating with top marks (Graduates only)	Graduating within the minimum period (Graduates only)	Graduating within the minimum period and with top marks (Graduates only)
Baseline probability	0.714	0.194	0.111	0.045
A. Admission tests				
Treatment effect	–0.029	0.042*	0.001	0.011
	(0.019)	(0.019)	(0.016)	(0.011)
B. Conditional progression				
Treatment effect	–0.004	–0.023	–0.014	–0.016
	(0.015)	(0.015)	(0.013)	(0.008)

Note: Standard errors in parentheses. Other variables included in all regressions are high-school final grade, linear and quadratic group-specific time trends, and indicator variables for gender, type of high school (5 dummy variables), whether high-school was a private institution or not, whether the student enroled immediately after high-school completion or not, and region of residence (20 dummy variables).
* Statistically significant at the 0.05 level.