Can Grading Policies influence the competition among Universities of different sizes?

Gli effetti delle politiche di valutazione sulla competizione fra atenei di dimensioni diverse

Gabriele Lombardi and Antonio Pio Distaso

Abstract One of the main commonplaces about students' population at the Higher Education level is that freshmen are attracted by universities which adopt soft grading policies, so to achieve their graduation in the easiest way as possible. At the same time, very little evidences are generally provided about the effect that such a strategy can have on the universities, if adopted. Thanks to the Italian University Register (ANS), we analyze the cohorts of Italian freshmen between 2010-2012. As it will be shown, if universities would compete each other through grading policies, only those which already have a competitive advantage can benefit from this strategy, while the others might only slide down into a vicious circle.

Abstract *Si ritiene usualmente che gli studenti universitari preferiscano scegliere università che sono solite assegnare alte valutazioni, così da laurearsi più facilmente. Ciononostante in letteratura si è indagato poco l'effetto che può avere sugli atenei il fatto di alleggerire le proprie politiche di valutazione. Grazie ai dati disponibili all'interno dell'Anagrafe Nazionale Studenti (ANS) si osservano gli immatricolati al primo anno delle coorti 2010-2012. Dall'analisi emerge che se le università competessero attraverso politiche di valutazione più leggere, gli unici a beneficiarne sarebbero gli atenei che presentavano già vantaggi competitivi preesistenti, mentre gli altri peggiorerebbero ulteriormente la propria attrattività.*

Key words: Grading Policies, Higher Education, Student Population, Mixed Logit

Gabriele Lombardi
Area Organizzazione e Sistemi Informativi (AOSI), Rettorato, via Banchi di Sotto 55, 53100, Siena (Italy), e-mail: gabriele.lombardi3@unisi.it

Antonio Pio Distaso
Department of Economics and Statistics (DEPS), P.zza S. Francesco 7-8, 53100, Siena (Italy) e-mail: antoniopio.distaso@student.unisi.it

1 Introduction

The present article pursues two main goals. The first aim is to control the effect that softening grading policies by universities have both on the student decision process and on academic institutions' reputation. On the one side, the artificial increasing of grades can be seen as a strategy played by directorates in order to attract students, but also signaling to the job market that very good scholars were trained [1]. On the other side, studies about soft grading policies on students and universities suggest how they can push out the first and cause a reputation loss for the latter [6]. The second aim is to provide useful hints about the universities' attractiveness in the peculiar Italian framework. Indeed, several works show how Italian departments suffer a perverse incentive structure [3] which rewards both the number of students enrolled and the speed needed for reaching graduation [8], so exacerbating the strong disparities between North and South in the country. Consequently, if students positively evaluate soft grading policies both the goals can be easily reached, at the expense of their competence. If this is not true, the two objectives conflict each other. Moreover, several investigations about Italy highlight how students prefer to enrol in northern universities for several reasons: *i)* to anticipate the job market reaching in advance those regions with the lowest unemployment rates [4]; *ii)* links and connections among universities and local areas in the South are below the national average [5]; *iii)* students positively reward heterogeneity in the educational offer [2]. From this last point of view, it is sufficient to think that nowadays only 3 'Giant' Universities (i.e. more than 40,000 enrolled) over 10 are located in the South. On the other side, 7 over 10 'Small' universities (i.e. less than 5,000 enrolled) are located between South and Islands. This could be the umpteenth factor exacerbating the competition among southern and northern universities, with the first dramatically caught in a vicious circle, as the second in a virtuous one, constantly increasing the gap. Consequently, in the next section the McFadden's Choice Model will be briefly explained. Data are jointly obtained from University Student Register (ANS)[1], Ministry of University and Research (MUR) and National Institute of Statistics (ISTAT). As it will be clarified, a competitive advantage emerges for 'Giant' and 'Medium' universities against 'Big' and 'Small', respectively, in the possibility of using both grading policies and fees as a leverage for attracting students. On the other side, territorial characteristics consistently attract students toward the norther regions.

2 Data and Model

In order to explore the determinants of students' university choice, a McFadden's Choice Model [7] will be performed, setting for each student a set choice including

[1] Data - drawn from the Italian "Anagrafe Nazionale della Formazione Superiore"- has been processed according to the research project "From high school to the job market: analysis of the university careers and the university North-South mobility" carried out by the University of Palermo (head of the research program), the Italian "Ministero Università e Ricerca", and INVALSI.

all the italian public universities which host a degree course in a specific degree class. The intrinsic assumption is that each student decides *what* she wants to study, before than *where* she wants to study it. The model can be summarized as:

$$max\, L(\beta,\lambda_j) = \prod_{i=1}^{I}\prod_{j=1}^{J}(p_{ij})^c \Longrightarrow p_{ij} = \frac{e^{x'_{ij}\beta + w'_i\lambda_j}}{\sum_{l=1}^{m} e^{x'_{ij}\beta + w'_i\lambda_j}},\ j = 1,...,J. \qquad (1)$$

Thus, p is the probability that each student i chooses a university j. β and λ are respectively the sets of coefficients associated to the alternative-specific x and case-specific w covariates. The dichotomic variable c identifies the choosen institution.

Four models will be estimated for 'Giant' (i.e. i.e. more than 40,000 enrolled), 'Big' (i.e. 20,000 to 40,000 enrolled), 'Medium' (i.e. 5,000 to 20,000 enrolled), and 'Small' Universities (i.e. less than 5,000 enrolled).

Table 1 shows how the three main alternative-specific indicators were calculated. The *Grade Ratio* (GR) measures the average combination between average grade v and number of credits CFU earned by each enrolled student i provided by any degree course d in a specific academic year y. Then, it is divided by the same average calculated on all the degree courses of the country in the same degree class c. From this point of view, GR represents a proxy of how much soft grading policies of a certain course are with regard to all its competitors. Similarly, the *Dropout Ratio* (DR) is calculated on the dichotomous variable r, which counts the number of students abandon a specific degree course during the first year, being interpreted as a proxy of how hard grading policies are. At last, Average Fees $\bar{F}$ are calculated as the average fee f payed from each student enrolled in a certain university u, as computed by the MUR. Finally, controls are included for the difference between the youth unemployment rate by gender and province of course and residence, and for distance between course and residence (i.e. *shoe leather cost*).

Table 1 Formulas for the calculation of the three main indexes in the analysis.

Grade Ratio	**Dropout Ratio**	**Average Fees**
$\mathrm{GR}_{d\|y} = \frac{\frac{1}{I_{d\|y}}\sum_{i=1}^{I_{d\|y}} \bar{v}_{i\|d,y}\, CFU_{i\|d,y}}{\frac{1}{I_{c\|y}}\sum_{i=1}^{I_{c\|y}} \bar{v}_{i\|c,y}\, CFU_{i\|c,y}}$,	$\mathrm{DR}_{d\|y} = \frac{\frac{1}{n_{d\|y}}\sum_{i=1}^{I_{d\|y}} r_{i\|d,y}}{\frac{1}{I_{c\|y}}\sum_{i=1}^{I_{c\|y}} r_{i\|c,y}}$,	$\bar{F}_{u\|y} = \frac{1}{I_{u\|y}}\sum_{i=1}^{I_{u\|y}} f_{i\|u,y}$.

Not shown in the estimations presented in Section 3 for the sake of brevity, also case-specific covariates are included in the analysis: type of High school attended by each student and final grade awarded, and academic year of first academic enrollment. Descriptive Statistics are shown in Table 2, for the entire sample but also differentiated for the size of chosen universities.

Finally, as a robustness check, Table 4 will present the same analysis with the addition of the universities' ranking scores provided by the CENSIS, the cities' cost of life obtained averaging the mean price of coffee, bus tickets, bread and a "pizza

Table 2 Descriptive Statistics (mean) of alternative and case specific variables.

	Descriptive Statistics				
	Entire Sample	**Giant**	**Big**	**Medium**	**Small**
Alternative-specific					
Grade Ratio	0.973	0.974	0.947	1.023	0.948
Dropout Ratio	1.009	0.996	1.012	1.022	1.074
Average Fees	920.332	971.402	825.978	976.922	834.435
Δ Unemp. Rate	-1.221	-1.237	-1.141	-1.618	-0.146
Distance (mt.)	90,014.89	91,853.45	86,873.12	97,122.98	66,946.76
Case-specific					
Female	0.568	0.566	0.577	0.553	0.589
Classyc Lyceum	0.158	0.178	0.153	0.121	0.121
Other HS	0.44	0.407	0.433	0.510	0.528
HS Final Mark	78.14	78.571	78.032	77.620	76.751
A.y. 2010	0.338	0.338	0.346	0.33	0.319
A.y. 2011	0.337	0.338	0.331	0.342	0.342
A.y. 2012	0.325	0.324	0.323	0.328	0.339

and beer" based dinner, and the Student-Teacher ratio for each university (Source: CENSIS for the both of them). This variables are not included in the main analysis since they are accessible only for the a.y. 2010 and 2011, and information is not available for all the considered universities.

3 Discussion and conclusion

Before to observe results in Table 3, it is important to clarify how the computed Odds Ratio cannot be compared across the four models, since they refer to different subsamples. Clearly, the first evidence to be pointed out is that soft grading policies are in general a repulsive factor for students' choice, with the only exception of Medium size universities. At the same time, the Dropout Ratio is not significant for Small universities and always significant and greater than 1 for all the others. So, if soft grading policies would be adopted as a strategical tool, following the hypothesis that students positively evaluate them, it would be a mistake. It is also important to point out that, even if we used a one year lag in computing the two ratios, there is no guarantee that students actually can be aware of the 'easiness' of the course they are applying for. Maybe information can be spread from older students by a mouth-to-mouth, but also in this case the conclusion which fits better our results is that students prefer 'harsher' courses. This can be explained simply by the will of holding a degree with the highest reputation as possible. On the other side, territorial characteristics provide results much more coherent. Students want to move toward locations with low unemployment rates and distance consistently emerges as a 'shoe-leather cost'. But, Small universities are a special case. Indeed, looking at Table 2, students who choose them move from their surroundings. Generally, this

choice is due to economic needs, or to the fact that a small university with a high reputation is settled in the nearby, so making irrelevant the issue of moving toward a province with a lower unemployment rate.

Table 3 Odds Ratios and Standard deviation (between brackets) of alternative specific covariates for Giant, Big, Medium and Small subsamples.

	McFadden's Choice Model							
	Giant		**Big**		**Medium**		**Small**	
	OR	σ	**OR**	σ	**OR**	σ	**OR**	σ
Grade Ratio	0.636***	(0.019)	0.461***	(0.015)	1.199	(0.050)	0.648***	(0.070)
Dropout Ratio	1.295***	(0.017)	1.063***	(0.013)	1.199***	(0.022)	0.965	(0.044)
Average Fees	1.001***	(0.000)	0.999***	(0.000)	1.001*	(0.000)	0.962***	(0.001)
Δ Unemp. Rate	0.974***	(0.001)	0.977***	(0.001)	0.974***	(0.001)	0.999	(0.003)
Distance	0.999***	(0.000)	0.999***	(0.000)	0.999 ***	(0.000)	0.999***	(0.000)
Case-Specific Controls	*Yes*		*Yes*		*Yes*		*Yes*	
N. Observations	2,048,494		1,722,385		812,629		85,494	

Looking at the results on average fees, an interesting result emerge. First, let us notice that in Table 2 Giant and Medium universities exhibit means much higher with regard to Big and Medium ones. Then, in Table 3 average fees have a positive significant effect for Giant and Medium, and negatively significant for the other two. The possible explanation is that in the Italian framework a double competition appears. Namely, Giant universities compete versus Big ones, while Medium compete versus Small. Apparently, as in the common expression 'the big fish eats the small', bigger universities can impose higher fees on students with regard to their smaller respective competitors, without losing their competitiveness. From this point of view, a larger (w.r.t. the respective competitor) university has a strong competitive advantage, considering that the great majority of them are settled in the Centre/North of Italy. Universities with a competitive disadvantage need to lower their fees in order to attract more students, and they will be further penalized by trying to improve their appeal softening their own grading policies.

Table 4, even suffering for an important loss of information, provides useful hints through inserting more controls about universities' reputation and cities' characteristics. In particular, it seems that Big universities needs lower fees and higher grades in order to compete with the Giant ones. On the other side, grading policies lose almost completely their effect for Medium and Small universities for which is much more important to be settled in the cheapest cities. On the other side, the cost of life does not matter for Giant and Big, probably because they are already settled in the most expensive cities, which are also the most attractive ones. If significant, the Student-Teacher Ratio has a positive effect, probably because it is driven by its numerator: students prefer to apply in universities where they can find a larger number of their peers. In general, the hypothesis of a double competition by size turns up to be reinforced for 'Giant vs Big' and weakened for 'Medium vs Small'.

Table 4 Robustness check: Odds Ratios and Standard deviation (between brackets) of alternative specific covariates for Giant, Big, Medium and Small subsamples.

	McFadden's Choice Model							
	Giant		**Big**		**Medium**		**Small**	
	OR	σ	**OR**	σ	**OR**	σ	**OR**	σ
Grade Ratio	0.655***	(0.058)	3.160***	(0.502)	0.868	(0.101)	0.713	(0.200)
Dropout Ratio	1.268***	(0.048)	1.769***	(0.124)	1.059	(0.064)	0.539***	(0.073)
Average Fees	1.005***	(0.000)	0.937***	(0.001)	1.013***	(0.005)	1.011***	(0.002)
Δ Unemp. Rate	0.972***	(0.004)	0.950***	(0.006)	0.968***	(0.006)	1.007	(0.008)
Distance	0.999***	(0.000)	0.999***	(0.000)	0.999 ***	(0.000)	0.999***	(0.000)
CENSIS Score	0.993*	(0.004)	0.990***	(0.004)	1.031***	(0.007)	1.007	(0.017)
Student-Teacher Ratio	1.001	(0.001)	1.020***	(0.002)	1.039***	(0.003)	1.021	(0.023)
Cost of Life	1.031	(0.027)	0.944	(0.038)	0.748***	(0.008)	0.450***	(0.055)
Case-Specific Controls	*Yes*		*Yes*		*Yes*		*Yes*	
N. Observations	233,682		128,854		86,283		18,630	

As in the main literature, the solution to the problems of competitiveness suffered by several Italian universities has to be searched in a policy intervention for mitigating the gap among the two areas of the country. At the same time, interconnections between the Higher Education system and the local areas have to be reinforced, so reducing migrations aimed to reach the healthiest job markets in advantage.

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