INTERREGIONAL MOBILITY OF UNIVERSITY STUDENTS IN ITALY: THE IMPACT OF UNIVERSITY'S POLICIES AND SIZE ON THE ATTRACTIVENESS OF REGIONS

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Abstract. The interregional mobility of students to Italian universities represents a complex and constantly evolving phenomenon of growing importance within the context of the country's higher education landscape. Several studies have been conducted to analyse underlying causes, current trends and wider implications of this phenomenon.
The article aims to analyse universities' attractiveness at the regional level, disaggregating data according to students' gender and type of degree course. This study also assesses the influence of policy interventions and the size of universities on universities' capacity to attract more students. The macro-data were extracted from the National Student Registry of MIUR Cineca. In particular, the first dataset was extracted from the "students" section with various levels of territorial disaggregation, and the second from the "contributions and interventions" section. Applying a linear regression model, it was possible to identify the main areas for policy intervention and to assess the extent to which the size of universities can generate a greater inflow of students to certain regions. The results of this research can contribute to understanding the dynamics shaping higher education in Italy and enrich the perspective of higher education policymakers.

1. Introduction

The study of university student mobility is of central importance to the analysis of the role that universities play in regional development. In particular, the term interregional student mobility is used to describe the temporary movement of individuals from one region to another within the same nation across regions for the purpose of attending educational institutions at the post-secondary level (Attanasio et al., 2020).

The analysis of internal university mobility in Italy is based on the examination of aggregated administrative data. These data are accessible in two ways: either through the National Student Registry of the Ministry of Education, Universities and Research (ANS, hereinafter) or by consulting individual data from the archives of each university, which are organized according to different spatial scales (regional, provincial and municipal levels). The studies conducted thus far, based on ANS data, have employed indicators of outgoing (from the region of residence) and incoming (to the region of study) mobility (CNVSU, 2011; ANVUR, 2018). These studies have demonstrated that the direction of Italian university student mobility is

predominantly unidirectional, with students mainly moving from the South to the Centre-North (Enea and Attanasio, 2019). Furthermore, northern regions have the greatest capacity for retaining graduates (ISTAT, 2010). This is evidenced by the tendency of southern students who graduate from universities in the Centre-North to eschew returning to their region of origin, instead remaining in the cities where they pursued their studies (Dotti et al., 2013; SVIMEZ, 2014; Vecchione, 2017).

As posited by Strozza (2010) and Impicciatore (2017), these are migrations in progress, denoting mobility toward graduation and subsequently the movement of graduates toward their initial employment opportunities.

Research on student mobility in Italy indicates that mobility for study purposes - defined as the propensity to pursue one's studies in a province or region other than the own - is driven primarily by certain conditions present or absent in the macro-area of origin (Ordine and Rose, 2007; Dal Bianco et al., 2009). Strozza (2010) posits that student mobility is driven primarily by certain conditions present or absent in the macro-area of origin. For instance, the absence of universities able to meet local demand has been identified as a significant factor influencing student mobility (Bruno and Genovese, 2008).

Bruno and Genovese (2012) put forth an origin-bound gravity model for the analysis of student flows at the regional level. The relative attractiveness of each region (i.e., the capacity of a region to draw students from another region) is determined by a score that considers the quality of services provided by universities in that region and the level of social, economic, and cultural well-being characteristic of that region.

The striking disparities between regions (in favour of northward mobility) in the proportion of individuals who have opted to pursue a course of study available at an Athenaeum outside their region of origin raise questions about the underlying causes. These disparities are the result of external factors, such as differences in social composition and the geographic distribution of enrolees raises the question of whether there are real university effects, whereby some universities - due to the quantity and size of the Athenaeum, as well as the policy interventions adopted in favour of the greater reception of off-campus students, known as movers[1] - induce a greater and more consistent attraction to different locations than others.

With regard to Ateneo initiatives that may encourage greater numbers of off-site students to enrol, a study by Hossler et al. (2009) posits that financial assistance and opportunities for academic collaboration are key factors in enhancing the probability of student enrolment. Financial grants can alleviate financial constraints, while academic collaborations can enrich the overall educational experience. However, as

[1] In Italy, the terms movers and stayers are employed in academic literature to differentiate between off-site university students who relocate for educational purposes and those who remain in their place of origin (Martini e Romano, 2017; Ciriaci e Muscio, 2011; Dotti et al.; 2013).

evidenced by the findings of Baum and Ma (2007), interventions that are specifically focused on housing subsidies may, while reducing the overall cost of student expenditures, fail to enhance the appeal of the institution in question. This is likely due to the influence of other environmental and quality-of-life factors (such us safety, access to public transportation, cost of living, professional opportunities, natural and green spaces and climate)

In their analysis of the impact of institution size on student integration and satisfaction, Berger and Milem (2000) employed a variety of methodological approaches. The researchers discovered that larger institutions often provide a plethora of resources and opportunities, yet they may also be perceived as less attractive due to the sense of anonymity and the challenge of accessing individualized support. Pascarella and Terenzini (2005) propose that smaller institutions tend to offer a more personalized and supportive environment, which may enhance their appeal for some students. However, the dearth of resources and opportunities in comparison to larger institutions may ultimately limit their overall attractiveness.

In this intricate context, studies have also demonstrated that in regions with a greater number of institutions, there is a heightened level of competition, which can enhance the provision of services and subsidies to attract students (Hoxby, 1997).

Based on the literature, we pose two research questions that this contribution endeavours to address.

RQ1: Based on the regional distribution, which universities are the most attractive? Do mobile university students exhibit differences in terms of gender or degree path preference (e.g., bachelor's, master's, etc.)?

RQ2: To what extent can Ateneo policies that aim to support off-campus students with scholarships, grants, housing, etc., effectively encourage more students to enrol in an Ateneo located in a different region from their home region? Additionally, how does the size of the universities influence this phenomenon?

2. Data and method

This paper employs macro-data from the National Student Register, an administrative database established by Law 170/2003 and implemented by Ministerial Decree 9/2004.

The initial dataset ("students" section of the Register) encompasses the two academic year intervals between 2021- 2022, and 2022- 2023. It includes regional-level data, disaggregated by gender, region of origin, region of destination, and degree program chosen.

The second dataset was derived from the "contributions and interventions" section of the National Student Registry and pertains to the number of interventions conducted by universities during the 2022-23 academic year.

A specific Attractiveness Index was constructed to observe interregional student mobility in Italy. The Attractiveness Index (AI_i) provides a measure of the proportion of off-campus students who enrol in a specific Italian region in comparison to the total number of students enrolled[2] in all Italian regions.

$$AI_i = \frac{N_{os\_i}}{\sum_{j=1}^{n} N_{os\_j}} x\ 100\ (i = 1,2,3 \dots, n = 20); (j = 1,2,3 \dots, n = 20)$$

The location of the institution is as follows: the term *N_(os_i)* represents the number of off-site students enrolled in region *i*. The sum of the total number of students enrolled in each region (both local and off-site) is represented by $\sum_{j=1}^{n} N_{os\_j}$.

A linear regression model (Ordinary Least Squares) was estimated to investigate the impact of Athenaeum initiatives on the appeal of regions with regard to the number of off-site students enrolled. The model correlates the indicator of regional attractiveness with the university's interventions and size in terms of capacity. The dependent variable of the model is the Attractiveness Index and it includes several independent variables related to the number of students who benefit from interventions enrolled in first- and second-level degree programs, aggregated by type of Athenaeum intervention and the size of the Athenaeums.

The formula for a linear regression model (OLS) can be expressed as follows:

$$AI_i = \beta_0 + \beta_1 \cdot UP + \beta_2 \cdot US + \epsilon$$

where the indicator AI_i is used to quantify the relative attractiveness of regions. *UP* represents the impact of university interventions, specifically policies enacted by the institution. *US* represents the size in terms of capacity. β_0 is the intercept of the model, and β_1 and β_2 are the regression coefficients. The term ε represents the error term.

Next, we included fixed effects to the model using Italian geographical macro-areas (North, Centre, and South-Islands). The categories of the macro-area are included as dummy variables to account for any systematic variations in the dependent variable (AI) across macro-areas. Reference formula can be expressed as follows:

$$AI_i = \beta_0 + \beta_1 \cdot n104 + \beta_2 \cdot n101 + \beta_3 \cdot n81 + \beta_4 \cdot n94 + \beta_5 \cdot n92 + \beta_6 \cdot mega + \beta_7 \cdot big + \beta_8 \cdot medium + \beta_9 \cdot small + \beta_{10} \cdot nAtenei + \beta_{11} \cdot macro + \epsilon$$

[2] Student enrolled in a degree course in academic year t/t+1: a student enrolled in a degree course in academic year t/t+1 on 31/7/t+1.

The variables pertaining to the University's policy interventions in favor of non-resident students are as follows: additional subsidies; soft loans provided by the ICC; part-time collaborative activities; scholarships, except for postgraduate grants, which are reported in the appropriate section; grants for accommodation; allocated accommodation places.

The following variables (treated dichotomously) consider the size[3] of the universities in question: the term *mega university* is used to describe institutions with an enrollment of over 40,000 students. The category *large* encompasses universities with an enrolled number of students between 20,000 and 40,000. A university is considered *medium-sized* if it has an enrolled number of students between 10,000 and 20,000. A university is classified as *small* if its enrolled student population is less than 10,000[4].

3. Results: attractive regions

A review of the Italian regions reveals considerable heterogeneity in the phenomenon of university student mobility (Figure 1a). The data for the 2021-2022 and 2022-2023 academic years indicate that Trentino-Alto Adige has the highest number of out-of-town university students. The Attractiveness Index (AI_i) for these regions is as follows: Molise (62.8%), Emilia-Romagna (48.2%), Lazio (44.5%) (see Figure 1a). These regions are notable for their capacity to attract students from other parts of Italy, which serves to underscore the significance of their educational institutions and the opportunities they provide to students.

Trentino-Alto Adige, which exhibits the highest level of attractiveness, demonstrates a noteworthy capacity to attract students from across the country. Notwithstanding its relatively modest size and population, Molise has an AI of 49%. Emilia-Romagna recorded a 48.2% IA and Lazio 44.5%[5].

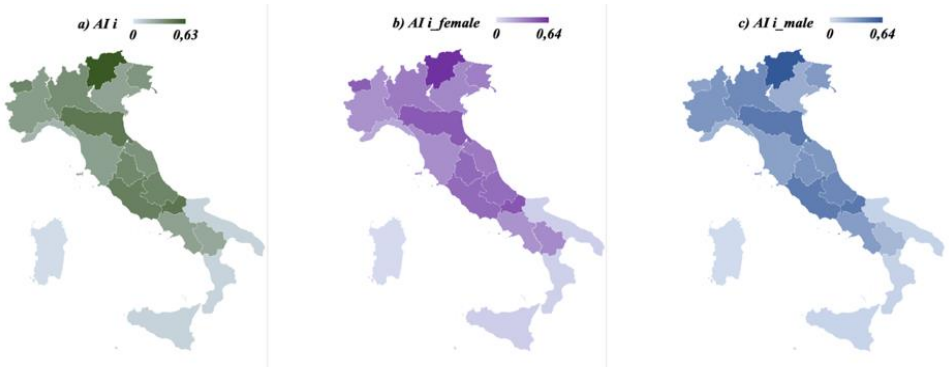
The data on the Attractiveness Index (AI_i) at regional level by gender (Figure 1b&c) for the academic years 2021-2022 and 2022-2023 indicates that in the region of Valle d'Aosta, 47.3% of out-of-residence university students are female and 29.3% are male. In Veneto, 32.2% of students attending courses off-campus are female, while 24.1% are male. In Basilicata, 31.4% of students attending courses off-site are female, compared with 19.2% male. These data demonstrate that female students are more likely to be mobile than male students in these regions.

[3] For the classification of the size of the universities, the classification used by Center for Social Investment Studies (CENSIS) was considered.

[4] Variables related to the size of the university have been treated as categorical because the original data provide this information this format.

[5] Please refer to CENSIS (Center for Social Investment Studies): Annual reports on the quality of Italian universities and trends in student mobility.

Figure 1 – *Attractiveness Index (AI_i) at the regional level (a), for females (b), and males (c), for the a.y. 2021-'22 to 2022-'23.*

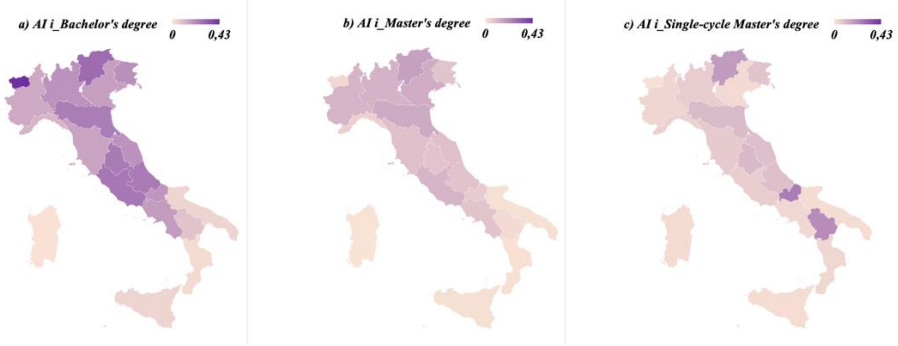


Source: own elaborations based on ANS data.

As shown in Figure 2, most female university students relocate to other regions to pursue master's degree programs, which serves to illustrate a notable trend in academic gender mobility. According to the data, 16.3% of female students relocate to Trentino-Alto Adige, 13.8% to Emilia-Romagna and 13.3% to Veneto to attend master's degree.

The mobility of students pursuing three-year degree courses is more limited and concentrated mainly in Centre Italy, with Lazio registering a significant percentage of 26% (Figure 2a).

Figure 2 – *Attractiveness Index (AI_i) at the regional level by type of degree program for females: (a) Bachelor's degree, (b) Master's degree, (c) Single-cycle Master's degree, for the a.y. 2021-'22 to 2022-'23*[6].



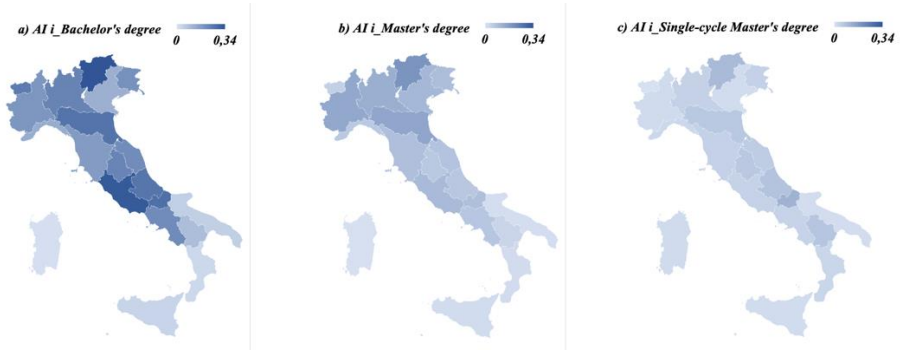
Source: own elaborations based on ANS data.

[6] The map regarding the Attractiveness Index of old-school degree programs has been omitted because the data show no significant differences between regions, neither in number of students nor in gender distribution.

Many male university students in Italy relocate to other regions to enrol on three-year degree courses (Figure 3a). This trend in academic mobility is particularly evident in Trentino-Alto Adige (33.9%), Lazio (32.7%) and Emilia-Romagna (26.5%), where the majority of students choose to pursue their degree courses.

Conversely, mobility for master's degrees is constrained and predominantly concentrated in Northern Italy, with Trentino-Alto Adige accounting for a notable proportion of 18.7% (Figure 3b). The mobility of students pursuing single-cycle Master's degrees and degrees from the old system is relatively low and confined to a single region. This may be attributed to the fact that these courses necessitate a long-term commitment, frequently at the same institution, which renders relocation to another region a less viable or appealing option.

Figure 3 – *Attractiveness Index (AI_i) at the regional level by type of degree program for males: (a) Bachelor's degree, (b) Master's degree, (c) Single-cycle Master's degree, for the a.y. 2021-'22 to 2022-'23.*



Source: own elaborations based on ANS data.

4. The impact of university policies and size on the attractiveness of Italian regions

The analysis of the data indicates that only a limited number of university interventions were identified as having a significantly positive influence on the mobility of out-of-state students. In particular, the results of the regression model (Table 1, M1) indicates that the effect of the number of other subsidies related to student merit is positive and significant. A one-unit increase in the number of subsidies is associated with an increase in attractiveness, indicating that subsidies enhance the appeal of the university (Hossler et al., 2009). The formation of collaborative relationships with students has been identified as a highly beneficial strategy. A one-unit increase in the number of such relationships is associated with

a 0.004-unit increase in attractiveness, indicating that these partnerships play a pivotal role in enhancing the university's appeal.

The impact of policies linked to forms of contributions, such as subsidised loans granted by credit institutions, the allocation of scholarships, and housing contributions, on the university's attractiveness, is not significant. In fact, these policies have a negative effect on the mobility of students outside their region. Indeed, with regard to accommodation subsidies, an increase of one unit in accommodation subsidies is associated with a decrease in attractiveness of 0.05 units, indicating that accommodation subsidies have a negative impact on the university's attractiveness.

These results prompt the formulation of two categories of Athenaeum policy interventions. The first category of contributions is merit-based or collaborative in nature, requiring the student to engage in certain activities in order to obtain the contribution. The second category of contributions is not merit-based (e.g., baccalaureate grade, average exam grade) or collaborative in nature, but is based on income requirements.

It is notable that most large universities, often referred to as “mega universities”, are situated in the northern regions of Italy. The northern and central regions of Italy exhibit a greater variety of universities in terms of size than their southern counterparts and islands. Regions such as Lombardy and Lazio which have larger populations, offer a wide range of academic institutions of all sizes, from small universities to large university centres. Conversely, smaller regions or regions with smaller populations, such as Valle D'Aosta and Molise, demonstrate a very limited presence of mostly small universities.

In terms of the impact of university size on attractiveness, two distinct perspectives exist. One posits that students gravitate towards larger universities due to factors associated with reputation, infrastructure, and career prospects (Hoxby, 2009). The other perspective postulates that the size of universities may be less attractive due to factors linked to a lack of personalised support (Berger and Milem, 2000; Pascarella and Terenzini, 2005).

The regression model shows a significant, negative relationship between the ability to attract out-of-state students and the size of universities, particularly for the categories of large, medium and small universities. This suggests that, compared to mega-universities (the reference category), smaller institutions tend to have lower attractiveness. However, a positive and relevant factor for regional attractiveness seems to be the number of universities present in a region, which appears to have a significant influence on the choice of out-of-town students. This result indicates that a greater overall supply of academic institutions contributes to making a region more competitive in the university landscape (Table 1, M1).

Table 1 – *Results from OLS regression models without (M1) and with macro-area fixed effects (M2) on the attractiveness of Italian regions, for the a.y. 2022-'23.*

AI_i	M1			M2		
	Coef.	Str. Err.	P>t	Coef.	Str. Err.	P>t
-N. Additional subsidies	0.000***	0.000	0.001	0.000***	0.000	0.000
-N. Soft loans provided by the ICC	-0.015***	0.002	0.001	-0.015***	0.003	0.004
-N. Part-time collaborative activities	0.005***	0.000	0.000	0.006***	0.000	0.000
-N. Scholarships	-0.001**	0.000	0.026	-0.001	0.000	0.105
-N. Grants for accommodation	-0.004***	0.001	0.006	-0.004**	0.001	0.019
-N. Allocated accommodation places 92	0.000	0.001	0.565	0.000	0.001	0.805
-Mega	0.219	0.666	0.751	0.344	1.013	0.745
-Large	-2.750***	0.570	0.001	-2.854***	0.707	0.007
-Medium	-2.416***	0.633	0.005	-2.401**	0.721	0.016
-Small	-3.067***	0.599	0.001	-3.219***	0.851	0.009
-Number of universities	1.540***	0.186	0.000	1.505	0.226	0.001
Fixed Effects	NO			YES		
North	-	-	-	-	-	-
Centre	-	-	-	0.341	0.961	0.735
South and Islands	-	-	-	0.270	0.746	0.730
Intercept	1.360*	0.678	0.080	1.372*	0.921	0.187

Source: own elaborations based on ANS data.
Notes: Robust Standard Errors: *** p<0.01, ** p<0.05, * p<0.1.

The inclusion of dummy variables for macro-areas (M2) changed some coefficients compared to the model without fixed effects (M1). Additional subsidies and subsidized loans remain significant, but the negative effect of subsidized loans decreases slightly. Part-time collaborative activities show a slight decrease in the coefficient, suggesting that differences between macro-areas partially influence the positive effect observed in M1. Scholarships are no longer significant in M2, while housing subsidies remain negative (-0.00), but with a lower coefficient than in the initial model.

For university size, the coefficients for large (-2.75 to -2.85), medium (-2.41 to -2.40) and small (-3.06 to -3.21) universities remain negative and significant, but with a slight reduction in magnitude. The number of universities continues to be highly significant (1.54 to 1.50), confirming its importance in regional attractiveness. The macro-area variables are not significant (Center 0.34, South and Islands 0.27), suggesting that, once controlled for other factors, regional differences do not significantly influence attractiveness.

Comparing the two models shows that some variables, such as scholarships and housing subsidies, are affected when controlling for macro-areas, while others, such

as the number of universities or the size of universities, retain their significance regardless of regional differences. This approach allows the direct effects of the variables considered to be more precisely distinguished from the effects due to macroregional inequalities.

5. Final remarks

The impact of policies that facilitate interregional mobility of university students is a significant consideration for universities. Firstly, the mobility of students has an impact on the contribution income of enrolled students and the Ordinary Financing Fund, which is increasingly linked to the standard costs. This effect determines the ability of universities to finance a significant proportion of research and teaching activities. Consequently, it has implications for the positioning of Southern universities in the annual rankings of Italian universities, which influence their reputation, as well as being a valuable resource for attracting new students.

The regions of the Centre-North are perceived as more attractive by both male and female students, particularly those pursuing professionalised courses from the bachelor's degree onwards.

The scientific literature, as discussed in the introductory paragraph, provides a context and theoretical support for the results observed both through the attractiveness index and in the regression model. This confirms that only some of the independent variables, in this specific case of an endogenous nature, actually influence the attractiveness of educational institutions. These are variables linked to interventions aimed at a policy of making students protagonists and not beneficiaries of subsidiary contributions. Furthermore, the size of the university is not a relevant factor of attractiveness.

The university's policies, which are designed to provide support to students in the form of scholarships, grants and accommodation, are not aligned with the needs of students who are predisposed to engage in mobility outside of their region. The latter cohort likely responds to a specific profile determined by a range of external variables. Besides, the efficacy of these policies in facilitating access to higher education is questionable. While they are designed to promote welfare and equal opportunities, they have not had a significant impact on the student population they are intended to serve.

In conclusion, targeted interventions could have a positive effect on student mobility, thereby enhancing the attractiveness of different Italian regions as destinations for higher education. Understanding these elements is crucial to develop effective strategies that can improve the attractiveness of educational institutions, promoting a more balanced distribution of students across the country.

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