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TO STAY OR TO MOVE? FRESHMEN  
AND UNIVERSITY ACCESSIBILITY IN ITALY

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## ABSTRACT

*The paper analyses the effects of the number of university degree courses available in the province of residence on the probability of studying in that province rather than moving to a different one. The supply of degree courses outside the province of residence is weighted by a spatial matrix where the distance between the province of residence and any other province is imputed in minutes. The results confirm that the probability of enrolling in a faculty located in the same province of residence is positively correlated to the number of courses available. In particular, the probability of enrolling at university in the province of residence is higher for the departments where the attendance is compulsory (i.e. Engineering). The enrolment behaviour of freshmen differs according to gender, with females more sensitive to the supply of local degree courses.*

*Keywords:* freshmen, university accessibility, number of degree courses, spatial distance.

*JEL Classification:* I23.

## 1. INTRODUCTION

It is acknowledged that the Italian tertiary education system shows lower performance than the education systems in more developed countries, according to several profiles. For example students' entry and survival rates in the Italian tertiary education system are among the lowest in the OECD countries. According to the OECD (2011), despite an increase in educational achievement - mainly for the most recent cohorts - Italy is at the bottom part of the education distribution among the OECD countries, and shows a persistent gap with other developed countries. For instance, in 2009, the fraction of Italy's population aged 15-64 with tertiary education was 15%, while the average in the OECD countries was around 30%; for the 25-34 group the respective figures were 20% and 37%. This gap with the best performing countries has been constant across the years and is a sign of the inability of the Italian higher education system to tackle its problems effectively. This gap persists even though most colleges are public and admission is open to any individuals holding a high school diploma regardless of type.<sup>1</sup>

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<sup>1</sup> Pre 1969, access to university was conditional on an academically oriented secondary

This poor performance is related to the Italian tertiary education system.<sup>2</sup> In contrast to the situation in many other European countries, for example, Germany which has a well-established system of higher vocational education, in Italy tertiary education is university-based. Also, the number of degree awarding institutions is relatively low and unevenly distributed across the Italian territory, involving high mobility costs for students that do not live within a reasonable commuting distance.

In 2004 there were 71 universities and 4 polytechnic in Italy;<sup>3</sup> 29 established between 1979 and 2004 and 18 established between 1990 and 1998. However, the process of expansion did not continue for long enough to achieve an acceptable territorial diffusion (Figures 1-3).

Since 1998, the tertiary education system has undergone a gradual process of regionalization, involving an increased number of universities opening local branches to extend the area covered by their offers and to bring colleges closer to the potential student population. This action was aimed at overcoming the shortage of student residences. Figure 4 depicts this trend; it also shows the number of provinces (i.e. equivalent to a county) (10) with no undergraduate degree course provision in 2007.

FIGURE 1. - Italian Universities in 1919



Source: Own elaboration of MIUR-CNSVU data.

school qualification (i.e. *licei*). Individuals with technical and professional high school diplomas were allowed to enrol for a university degree course only after approval of law no.910/69.

<sup>2</sup> For a comprehensive description of the Italian tertiary education system after the introduction of the 2001 reform see Bratti et al. (2008) and Bratti et al. (2010).

<sup>3</sup> This includes 11 telematic universities, 5 doctoral and postdoctoral schools, the Scuola Normale of Pisa and 3 universities for foreigners.

FIGURE 2. - *Italian Universities in 1979*



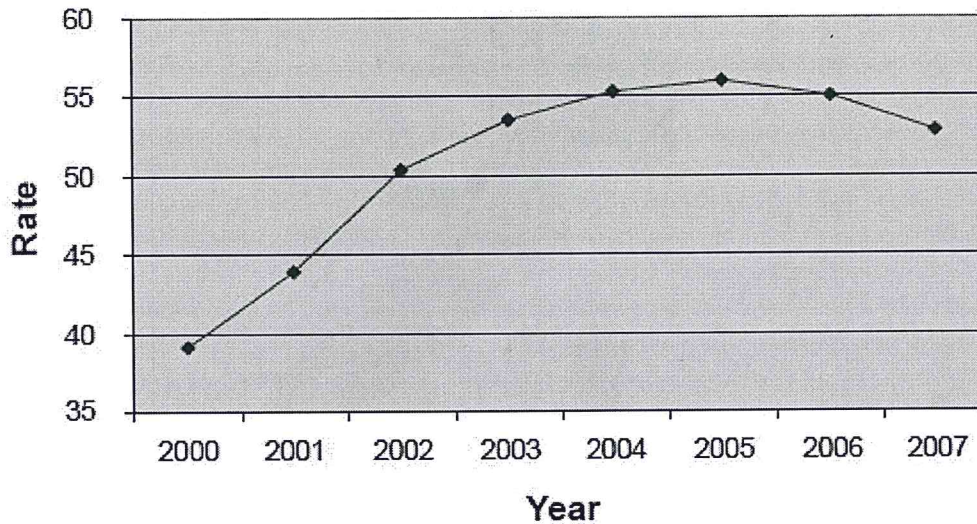
Source: Own elaboration of MIUR-CNSVU data.

FIGURE 3. - *Italian Universities in 2011*



Source: Own elaboration of MIUR-CNSVU data .



FIGURE 4. - *Provinces with no degree courses in the period 2000-2007*

Source: Own elaboration of MIUR data (2000-2007).

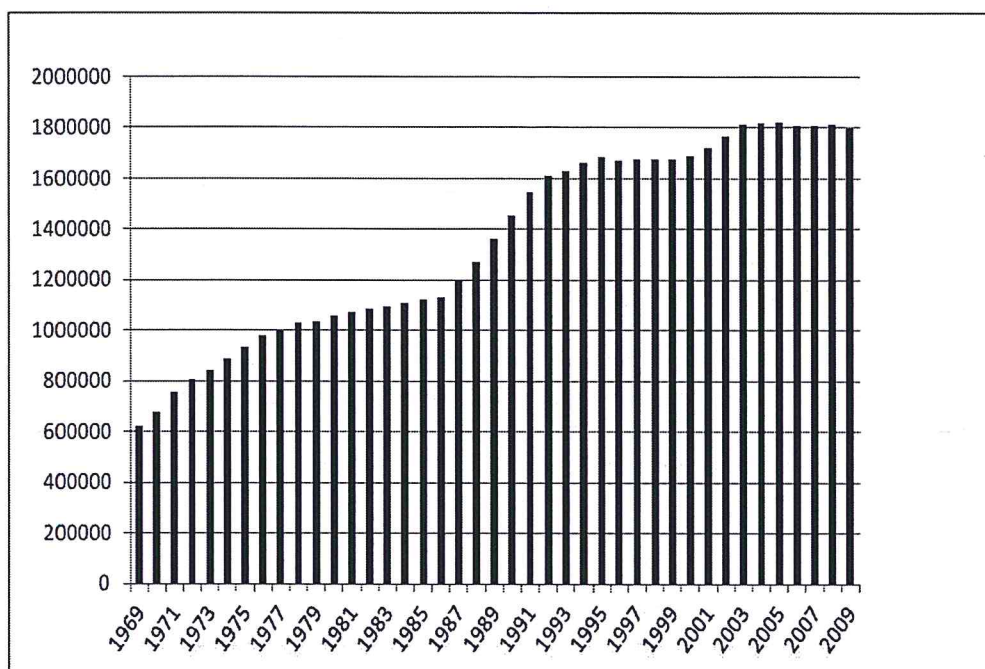
In 2001, the Italian tertiary education system underwent a major change, mainly to the structure of course programmes, due to the implementation of the Bologna process.<sup>4</sup> Before the reform, there was one university degree award in Italy – the *Diploma di Laurea*. The time required for an undergraduate degree varied, depending on the field of study, between four and six years. After the reform, undergraduate studies were reorganized into two cycles of a first level degree, the *Laurea Triennale*, which takes three years, and a second level degree, the *Laurea Magistrale*, which takes five years.

The reduction in study time and in the number of exams, in combination with the process of regionalization, should have reduced the costs of investing in tertiary education and stimulated human capital accumulation. However, aggregate enrolment rates (Figure 5) do not show evidence of this. Enrolment increased up to 2004, after which time there has been a negative trend. \*

The number of student halls of residence (or similar) in Italy is very small, and the system of grants and scholarships<sup>5</sup> is poorly developed. Thus, despite low fee levels, the indirect costs of higher education are high, especially for students who are not financially well endowed, and reduces intra-national mobility.

<sup>4</sup> The Bologna process is aimed at creating convergence in the higher education systems in the EU in order to enhance the employability and mobility of EU citizens. Italy had some advantage since its tertiary education system partly satisfies the requirements of this intervention, namely harmonization of the degree supply. The Bologna process promotes the adoption of a common framework of comparable degrees, especially through the introduction of undergraduate and postgraduate levels, with the ultimate goal of greater compatibility and comparability in the systems of higher education.

<sup>5</sup> Italian subsidies for education by private entities, as a percentage of GDP, was 0.15 in 2000; the OECD mean was 0.24% (OECD, 2003).

FIGURE 5. - *Number of students enrolled at a university in 1969-2009*

Source: Own elaboration of ISTAT-MIUR data (1969-2009).

Besides, Italian families are attuned to thinking that education is a state-financed investment, although a large quota of the returns from education are private. The Italian education system is almost entirely public with only a marginal number of programmes supplied by private institutions. As a result, Italians are reluctant to sustain the higher mobility costs that would be involved their children to enrol in a metropolitan university. There are few reasons to justify leaving one's home town for college education. The Italian tertiary education system tends not to be differentiated in terms of degree programmes and, so far, Italian universities have not pursued policies of specialisation or excellence to attract more distant students - especially from abroad (Cipollone et al., 2012).

In this context, this paper investigates which degree courses secondary school graduates include in their decision set when choosing a university. In other words: do De freshmen privilege the degree courses available in their province of residence and in the counties nearby or do they take into consideration the university courses across the country?

The university decision process can be split into two phases. First, students with a secondary school diploma choose whether to enrol at a university, or to end their studies and try to enter the labour market. In the second stage, those who want to continue studying decide on their university degree programme and faculty (i.e.

where they will study). In the absence of mobility costs<sup>6</sup> and assuming no major differences in quality and reputation among public universities, it is rational to expect that potential students will take account of the whole university supply, regardless of its location. However, if mobility costs matter and there is a perception that the quality of universities across the territory is almost identical, the choice of where to study will be conditioned by accessibility, and colleges closest to home will be preferred over more distant ones. The analysis focuses on this second stage in the university decision process.

According to the above reasoning, we would expect that the share of freshmen enrolled in any degree course programme located in the province of residence – with respect to the total number of freshmen residing in that province – would be positively influenced by the number of university courses available in that province. Thus, proximity is a particularly important issue in the context of <sup>labour</sup>Italy, especially in light of the ongoing process of reform<sup>7</sup> aimed at reducing the number of local branches of Italian universities and reshaping the territorial distribution of tertiary education. This effort is reversing the 1980s policy of establishing more new universities and opening local branches of old universities. \*

The main result of this study confirms that mobility costs are relevant: participation in tertiary education is positively correlated to its supply in the reference province. Accordingly, it is likely that reducing university accessibility will decrease the overall number of freshmen, since many secondary high school graduates will not move to enrol in a university outside their area of residence. A fraction of high school leavers could not, in the absence of adequate financial aid, afford university study, another fraction would not consider the returns from this investment sufficient to offset the costs<sup>8</sup> – particularly in a labour market where demand for graduates and level of salaries paid to graduates are both quite low.

The rest of the paper is organized as follows. Section 2 provides a survey of the reference literature. Section 3 discusses the empirical identification strategy and the variables of interest. Section 4 presents the empirical model. Section 5 reports the results from panel data estimations for Italian districts. Section 6 concludes.

## 2. RELATED LITERATURE

A number of studies have examined the extent of participation in higher education in order to provide evidence of the determinants of this process. Several dimensions have been explored, especially the effect of parental background, students' abilities, neighbour and peer effects, labour market conditions, and the specific characteristics of the tertiary institutions (e.g. level of tuition fees, selection, etc.) (see Aina, 2012; Francesconi et al., 2011; Manski, 1992; Di Pietro, 2002; Moretti,

<sup>6</sup> Monetary and psychological.

<sup>7</sup> In particular, the DM 17 requirement of at least 4 professors for each year of course.

<sup>8</sup> Even the psychological costs.

2004; Brunello and Checchi, 2007; Garibaldi et al., 2012; Hoxby, 2009). According to research that has been ongoing for nearly a century, in general, the baseline assessment of the advantage of investing in further years of education is that the social returns to education must exceed the private returns (Becker, 1962).

We consider the economic and non-economic benefits associated with education to test whether, in the college choice process, potential Italian students are influenced by the spatial location of tertiary institutions. In other words, we investigate whether distance is a deterrent to the relative number of freshmen. Education research shows that distance discourages individuals from enrolling at a university because of the costs, both direct and indirect - that must be sustained (DesJardins et al., 1999; Frenette, 2005, 2009). While the issue of access to higher education and the effects of family characteristics, individual ability, financial aid and peer groups have been explored in the literature, less is known about whether and how regional aspects influence educational attainment.

Participation in higher education can be affected by distance to the institutions or by individual/family financial conditions. In relation to the financial argument, there is a consensus that parental investment plays a central role in shaping children's education (Hanushek, 1992; Cunha and Heckman 2010), and that, in general, better off families with no financial constraints, increase the probability of their offsprings' transition into higher education, *ceteris paribus* (Ermisch and Francesconi, 2001; Blanden and Gregg, 2004).

As a result of the ongoing changes that are affecting most of the tertiary education system, many researchers are turning their attention to how distance influences higher education entry rates. Starting with the study by Tinto (1973), a positive link has been found between college proximity and college enrolment/attendance, especially among individuals with financial constraints and/or lower expectations of returns in the labour market (Lauer, 2002). Overall, the greater the distance to the university the higher the financial and social costs the student incurs. If the individual decides to move to another area to attend a further education programme, he/she will face both pecuniary costs and also the costs related to an unfamiliar experience, for example, need to forge new social and interpersonal relations.

Using Canadian household survey data and a dataset of university postal codes, Frenette (2004; 2006) shows a negative relationship between college distance and university participation since, unsurprisingly, students who live close to a higher institution can cut their costs by living with their parents. Frenette (2004) also provides evidence that the category of students that takes the fullest advantage of the college proximity is composed of individuals from disadvantaged parental background. With regard to the newly established Canadian universities observed, Frenette (2009), like Card (1995), confirms that the availability of more higher education institutions increases university attendance among local youth.

Spiess and Wrohlich (2010) provide evidence for the German case. They assess whether the distance to university influences the transition to higher education and show that distance does matter for the decision to enrol at college, regardless of the educational and financial parental backgrounds of students.

The spatial dimension is taken into account by Raymond et al. (2006) to identify the determinants of the transition from high school to higher education in the Netherlands and by Rephann (2002) and Holzer (2006) for the case of Sweden. These contributions confirm that students living closer to a specific type of higher education institutions are more likely to continue studying. This finding underlines that the policy of decentralization of the higher education system - guided mainly by geographical equity concerns - has been efficient at increasing equality of opportunity related to college enrolment.

Some researchers have analysed the role of community colleges, especially in the US, and find that students from low-income families in particular face a lot of difficulties in financing their university studies and are the group that benefits most from this type of institution. Community colleges also increase aggregate educational attainment and improve labour market conditions - especially in terms of higher wages - of those individuals who otherwise would not have participated in tertiary education (Kane and Rouse, 1999; Mykerezzi et al., 2009). Bruno and Genovese (2012) apply a gravity model technique using aggregate regional level data and find that this approach is able to forecast Italian university students' mobility.

To sum up, based on the above, in order to achieve a better understanding of and more precise results for higher education participation, the analysis should include not only individual and family characteristics but also geographical dimensions, to enlarge the set of variables that influence the transition to colleges.

The present study differs from previous analyses in several respects. First, it provides evidence that can be used to evaluate whether expansion of the higher education system through the opening of new universities or the decentralization of degree course programmes, has been effective at attracting freshmen from the province in which the new provision is located. This should provide some insights for policymakers seeking to introduce improvements into the whole university system. Second, it investigates how the role of distance from a potential college varies by departments. Third, it adds to our rather sparse knowledge on the mechanisms that drive Italian individuals to access tertiary education.

### 3. EMPIRICAL ANALYSIS

#### 3.1. *Data and Variables*

Two sources of data are available to test for the main determinants that affect the freshman decision to enrol at the university located in the province of residence rather than one located in another town. The data are drawn from Ministry of Education (MIUR) statistics and the National Institute for Statistics (ISTAT). They refer to the 103 Italian districts (Provinces), that is, they are at the Italian NUTS-3 geographic aggregation level, for the period 2004 to 2009. Although the sample period is short, this empirical analysis provides evidence on the relevance of degree course availability in the province of residence, that is, evidence on students' preferences



to continue studying in the province in which they live. This avoids interference from other factors that might influence freshmen behaviour, such as the introduction of the 2001 university reform or the «3+2».

### 3.2. *Dependent variable*

The dependent variable is based on the variable *stayer* which refers to the decision to enrol in a degree course programme provided in the province of residence. It is defined as the ratio of the number of freshmen residing in the province  $i$  and enrolled in any degree course programme available in the province  $i$  at time  $t$ , to the total number of freshmen residing in the province  $i$ , regardless of the province of university enrolment at time  $t$ .

$$Stayer_{it} = \frac{\text{Number of freshmen}_{it}}{\text{Total amount of freshmen}_{it}}$$

where:

$i = 1, \dots, 103$ .

$t = 2004, \dots, 2009$ .

For the period under consideration we can disaggregate freshmen residing in/coming from the province  $i$ , into two groups. The first is composed of individuals enrolled at the university in the province of residence  $i$  and the second comprises people from the province  $i$  who are enrolled in a faculty located in a different province. This indicator allows us to accurately evaluate the decisions made by the freshmen in each Italian province, about where to attend university, based on university enrolment data at province level for each academic year. The variable will be equal to zero if the province does not host any degree programmes in that specific year. We can also identify the percentage of «*stayers*» among females and males.

### 3.3. *Control variables*

The choice to enrol for a university course has been made already, when the student is deciding what and where he/she will study, which means that the barriers to university enrolment (i.e. lack of ability and financial/cultural resources) have been overcome. Identification of the factors explaining the preference for a college in a specific province is based mainly on the number of degree programmes offered. We control for the number of degree courses available in each province and the total number of degree programmes in the rest of the Italian territory weighted by the distance from the reference province.

The first indicator considers the dimension of the local supply of tertiary education, which is expected to be positively correlated with the presence of a university

in a given district. As we would expect, the higher the number of faculties in the province the higher the corresponding likelihood of a higher number of degree course offerings and vice versa if there is only one university or university branch in the province.<sup>9</sup>

The second measure accounts for the spatial distance from the supply of higher education in the rest of the country, excluding the province considered. We divide the number of degree programmes by a spatial weight matrix where the distance between province  $i$  and province  $j$  is defined in terms of number of minutes required to drive from the main town in province  $i$  to the main town in province  $j$ . This means that the number of degree programmes offered by a province that is very distant from the individual's province of residence, counts less for his/her choice with respect to the supply in a more proximate province. The idea is to understand whether, in a context where mobility costs matter, proximity to a college promotes attendance rather than a move to another town for further education. Then we should expect that, for a given province or county, the quota of *stayers* will be positively influenced by the local supply of tertiary education, and that the supply of universities outside the province will be less important, possibly following a distance decay pattern.

In the empirical model, for each province, in order to test the role of geographic proximity and accessibility, we define a variable that captures the weighted supply of degree courses that are within 90 minutes distance, rather than accounting for total weighted supply available at the national level. This average number of courses within a given commuting distance, indicates whether local supply and easily accessible supply are substitutes or complements. The aim is to provide evidence on whether or not local supply appears to be in competition with total supply in the commuting area.

Also, to test whether the probability of attending a degree course in the province of residence varies with field of study, we control for the type of faculty chosen, using dummy variables. The departments considered are: Economics, Law, Agricultural Studies, Architecture, Engineering, Literature and Languages, Medicine (including professions related to medical studies such as nursing, physiotherapy, etc.), Political Science, Mathematics and Physics, Sociology, Psychology and Pharmacy. The variables refer to each province and take the value 1 if the faculty is available in that particular province in a specific year, and zero otherwise.

Finally, to investigate potential labour market effects on the decision to attend a local college rather than to move to a distant one, we include provincial rate of unemployment for each year considered (ISTAT, 2010).

To describe the link between local university supply and the ratio of *stayers*, the variables are plotted on separate graphs by discipline and geographical area. We can say, generally, that the percentage of freshmen who decide to attend a local college rather than move to another town is positively correlated to the number of degree

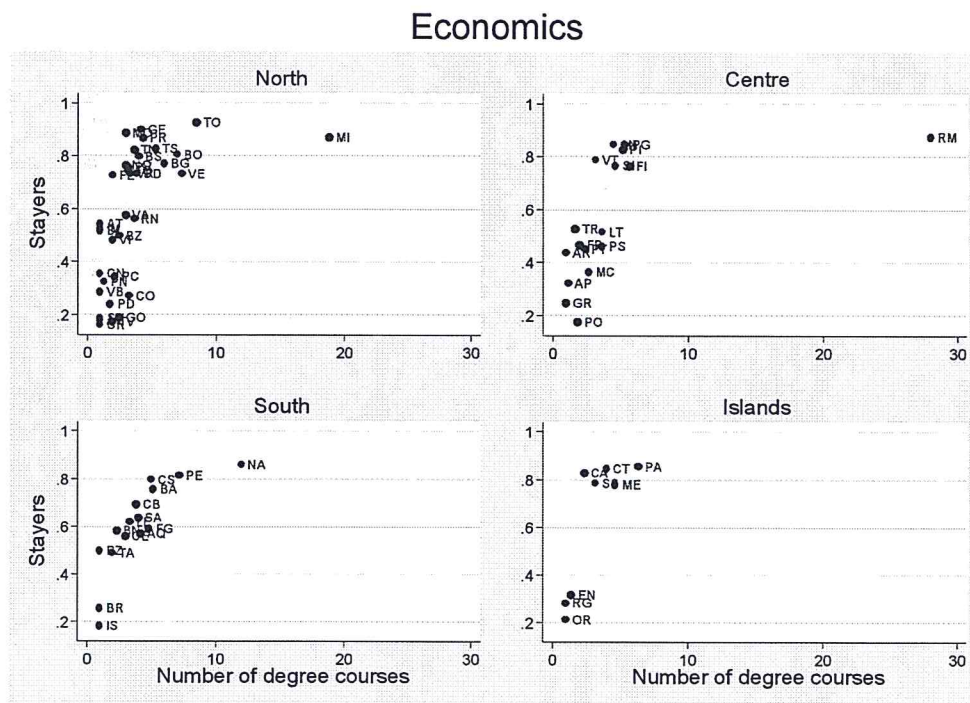
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<sup>9</sup> Many Italian universities have branches in several provinces in order to: (a) provide degree courses in districts, other than the province of the main university, and (b) facilitate access to higher education for people living at a long distance from a university town.

courses provided locally. At the faculty level an increase in total tertiary education supply implies a rise in the quota of students who enrol in a local degree course.

Figure 6 plots this relationship for Economics students and shows that, disregarding the macro areas, the fraction of students who study in the province of residence is below 50% if the local supply is constituted by only one degree course. The quota of *stayers* increases with the number of courses. The results are similar for freshmen enrolled in Law (Figure 7). For Pharmacy, if the number of degree courses available in the province is equal to or higher than 4 (Figure 8) the fraction of stayers increases (by at least 80%). If the province offers only one degree programme the percentage of individuals choosing to study in the area of residence is less than 40. For Medical students (Figure 9) the pattern differs among provinces since enrolment is conditional on passing an admissions test.

FIGURE 6. - Link between enrolment in Economics in the province of residence and number of degree courses by macro-areas.

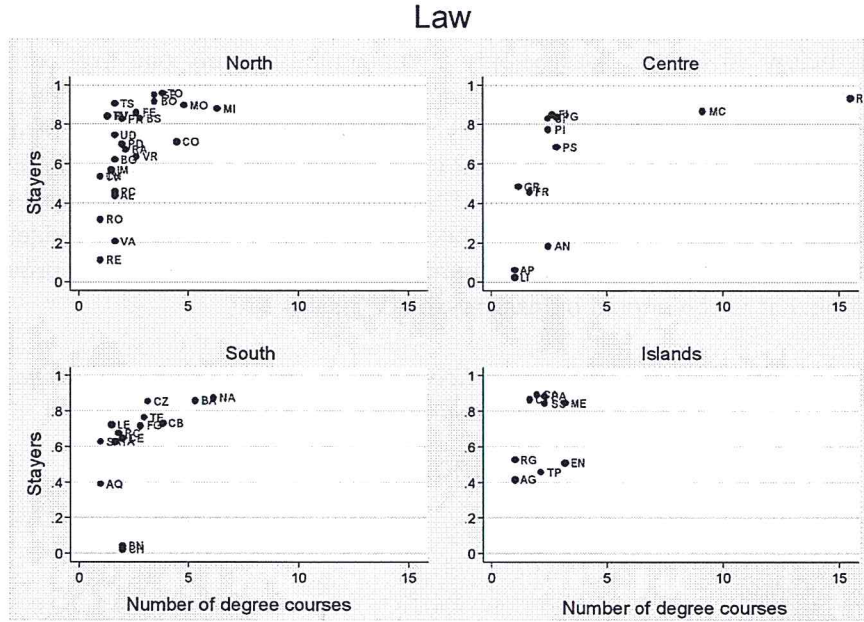


Source: Own elaboration of MIUR data (2004-2009).

Overall, the graphs in figures 6 and 7 suggest that if the number of degree courses in a province is low (e.g. if the province only includes a branch of a university), the percentage of *stayer* is low and likely includes students facing constraints, such as financial ones.<sup>10</sup>

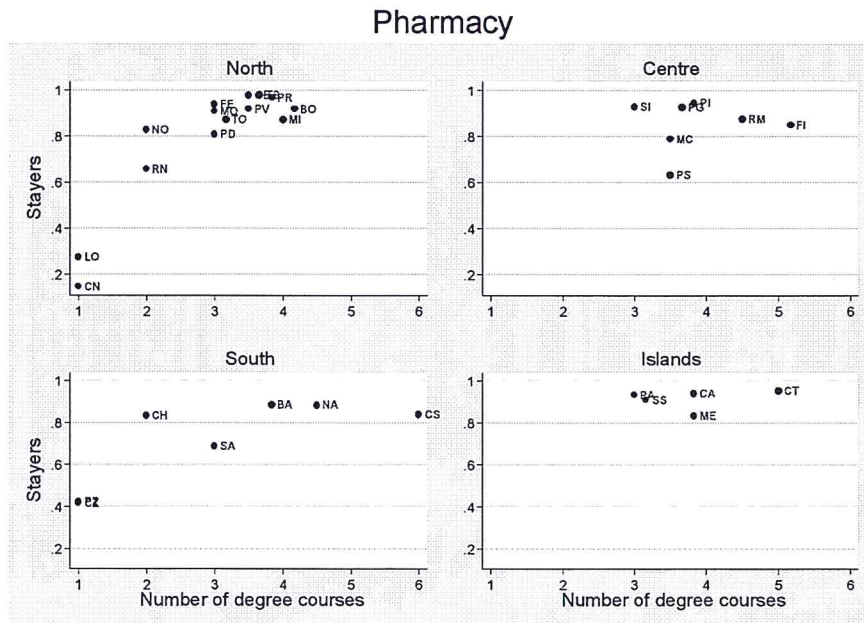
<sup>10</sup> Plots for all the other departments are available upon request from the authors.

FIGURE 7. - Link between enrolment in Law in the province of residence and the number of degree courses by macro-areas



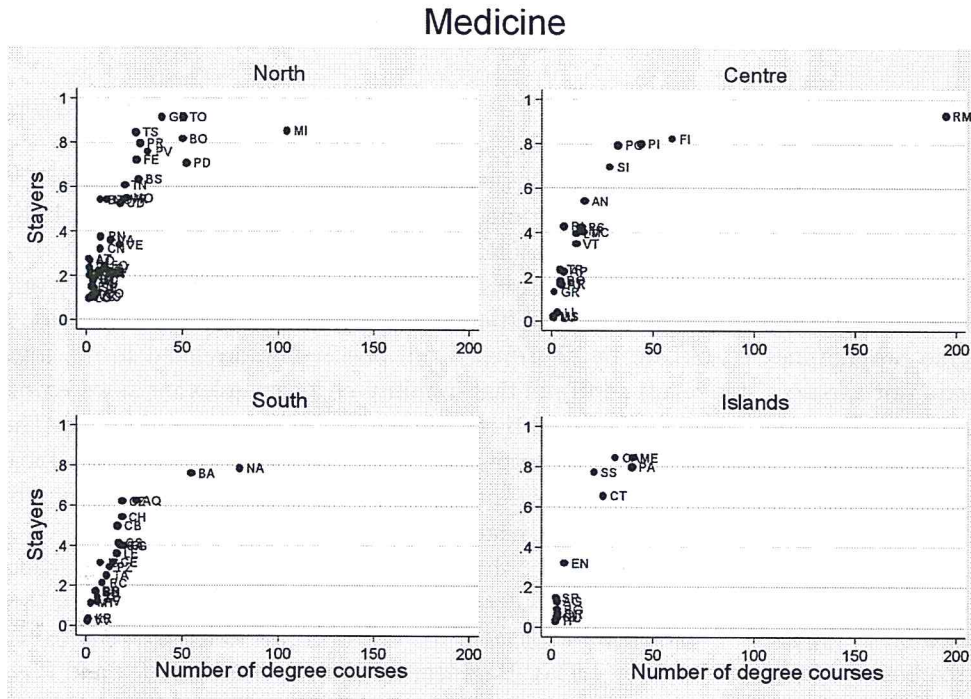
Source: Own elaboration of ISTAT-MIUR data (1969-2009).

FIGURE 8. - Link between enrolment in Pharmacy in the province of residence and the number of degree courses by macro-areas.



Source: Own elaboration of MIUR data (2004-2009).

FIGURE 9. - Link between enrolment in Medicine in the province of residence and the number of degree courses by macro-areas



Source: Own elaboration of MIUR data (2004-2009)

#### 4. EMPIRICAL MODEL

In order to exploit the longitudinal dimension of the data we apply a panel data technique. We run a Hausman test to decide between fixed or random effects, where the null hypothesis is that the preferred model is random effects versus the alternative – i.e. the fixed effects. Basically, we test whether the errors are correlated with the regressors or not. As the null hypothesis is rejected, we perform a fixed effects model, so we can explore the relationship between predictor and outcome variables within the province, analysing the impact of variables that vary over time.

The model can be written as:

$$y_{it} = \alpha_0 + D_{it}\beta + F_{it} + F_{it}\gamma + C_{it}\delta + U_{it} + u_{it}$$

where  $u_{it}$  is the error term. Let  $y$  be the quota of freshmen enrolled at a university in the province of residence, varying by province and year. Among the explanatory variables, the vector  $D$  includes the number of degree courses available in each province and year in the analysis. Vector  $F$  includes 12 dummy variables for the faculties considered in this study. Vector  $C$  refers to the weighted total supply, excluding the local supply of higher education. Vector  $U$  represents unemployment rates. All the covariates used in the estimates vary by district and year.

We also estimate a model where vector  $C$  is replaced by the weighted college supply for all the provinces within 90 minutes drive from the reference district. Finally, both specifications are run separately by gender.

## 5. RESULTS

The six columns in Table 1 report the number of specifications applied, and the sign of each explanatory variable underlines its effect on the probability of studying at university in the same province of residence.

In column (I) the quota of *stayer* is explained by the local university supply and the remaining weighted supply. The coefficient associated with the number of local degree programmes is statistically significant and positively correlated to the total fraction of *stayers*. This result confirms that mobility costs are relevant since enrolment in tertiary education is influenced by its supply in the reference province. The weighted supply of higher degree programmes in the county, excluding the local supply, is negatively associated with the probability of studying in the province of residence, but it is not statistically significant.

The coefficients of the dummies for the departments analysed underline differences in students' behaviour. In particular, we note that the probability of further education in the area of residence increases if the following faculties are established in the county: Political Science (4.9%), Engineering (1.4%), Mathematics and Physics (1.3%), Economics (4.0%) and Sociology (3.0%). The fact that some disciplines are more sensitive to geographical proximity of university degree programmes could be related to several aspects. For instance, some faculties are not equally widespread among districts so they are more attractive to local students because of the narrow array of alternative degree programmes in that field. Alternatively, the fact that attendance at lectures is compulsory or strongly recommended for some subjects, such as Engineering, may make them more attractive to local students because of the implied costs of attendance.

The rate of unemployment is instead not statistically significant, although the negative sign may indicate that, if local labour market prospects are poor, freshmen are more likely to move to other provinces – perhaps with better labour conditions.

The specification in column (II) – where total weighted supply refers only to counties at 90 minutes distance from the province of residence – shows that neither local nor no local supply are statistically relevant. However, the negative sign of both these coefficients suggests that if we limit the choice to only university supply within a certain commuting radius, no local supply is preferred in the decision process about where to enrol at college. Estimates for field of study are in line with those in specification (I). Again, the fact that the coefficient of Medical students is not statistically significant shows that the presence of this faculty in a province does not significantly affect the chances of local students enrolling in these courses since college admission is based on passing an entrance exam.

The results for the estimates based on gender are reported in columns (III) and

TABLE 1. - *Estimates of the probability of studying in the province of residence*

Variables	Stayers					
	Total		Females		Males	
	(I)	(II)	(III)	(IV)	(V)	(VI)
Number of degree courses in the province	0.001***	-0.001	0.001***	0.004	0.001***	-0.007*
Economics	0.040***	0.041***	0.042***	0.041***	0.038***	0.040***
Political Science	0.049***	0.049***	0.056***	0.056***	0.039***	0.041***
Law	0.006	0.006	0.009	0.009	0.001	0.002
Pharmacy	0.019	0.018	0.033	0.034	0.033	0.001
Engineering	0.014*	0.014*	0.006	0.005	0.027***	0.028***
Architecture	0.012	0.013	0.004	0.003	0.022**	0.024**
Mathematics and Physics	0.013***	0.012**	0.005	0.005	0.023***	0.021***
Literature and Foreign Languages	-0.013	-0.013	-0.016*	-0.016*	-0.010	-0.010
Agricultural Studies	0.0016	0.016	0.008	0.008	0.027**	0.027**
Medicine	0.007	0.008	0.010*	0.011*	0.004	0.005
Sociology	0.030*	0.030*	0.014	0.014	0.048**	0.048**
Psychology	0.002	0.002	0.010	0.010	-0.007	-0.008
Rate of unemployment	-0.000	0.000	0.000	0.000	-0.000	-0.000
Weighted university supply	-0.002		0.001		-0.006***	
Weighted university supply within 90 minutes		-0.002		0.003		-0.007**
Constant	0.292***	0.270***	0.227***	0.216**	0.369***	0.335***
Number of observations	618	618	618	618	618	618
Number of districts	103	103	103	103	103	103

\*\*\*, \*\* and \* significant at 1, 5 and 10 percent, respectively.

(IV) for females and (V) and (VI) for males. The coefficients capturing level of accessibility to university courses, that is, local supply, do not show differences in magnitude or statistical significance among the two subsamples (see columns III and V). As expected, the number of degree courses available in the area of residence increases the probability of studying in the same province, confirming the importance of accessibility for continuing in further education. However, some gender differences emerge for no local supply and field of study. In particular, the weighted supply of higher degree programmes in the province, excluding the local supply, is statistically significant and negatively associated with the probability of studying in the province of residence only for males, which means that if no local supply increases the mobility of freshmen also increases. Rizzica's (2012) results, using micro data for the Italian case, are similar. In particular, she found that females are more likely to attend higher education if the local provision of degree courses increases. The explanation relies on a cultural model which assigns to daughters the role of family caregivers, thus modifying the value of their human capital accumulation and enhancing the opportunity costs of their schooling. With re-

gard to faculties, in those where there are more male than female students, the provision of these types of courses does not statistically affect the likelihood of studying in the province of residence for the group of females. However, males are positively affected by this supply, shown by the magnitude of the corresponding coefficients which are larger than those observed for the whole sample. For instance, local freshmen shown an increase of about 2.7% for Engineering versus 1.4% for the entire sample, and increase by about 2.2% for Architecture, 2.7% for Agricultural Studies<sup>11</sup> and 2.3% for Mathematics and Physics. If we take into account the faculties where the preferences among the female subsample are greater, the results are reversed. For example, for Political Science, women are more likely to attend a local degree programme (5.6%) than men. Finally, females are positively influenced by the local supply of degree courses in Medicine with enrolment 1% higher, despite enrolment is conditional on passing an admission test.

These estimates are all confirmed if we replace total no local supply by no local supply based on commuting distance (i.e. 90 minutes drive from the reference district). Nevertheless accessibility in this specification shows some differences. Contrary to what we found for the whole sample, where both types of university supply were not statistically significant, the results are different for the regressions based on gender. For females, local and no local supply are not statistically significant but positively correlated with the likelihood of studying in the province of residence. For males, both local and no local supply are statistically significant, but male freshmen are more likely to move from the province of residence to study, with the sign associated to local and no local supply being negative. The fact that males are more mobile than their female counterparts is rational since their returns from education are higher than those associated with women, as empirically observed in a recent study of Bosio and Leonardi (2010) that uses data on Italian graduates after introduction of the «3+2» reform.

## 6. CONCLUDING REMARKS

This paper analysed the role of local degree course supply in shaping the decision to attend a university in the province of residence rather than one in another province, to check the effectiveness of expansion of tertiary education in Italy for increasing the number of freshmen enrolled in the university system and the share of local students attending degree courses in the area of residence. The descriptive statistics show and the estimates confirm that freshmen are positively affected by the total number of degree courses provided locally, and that sensitivity to the geographical proximity of degree programmes is not equally distributed amongst departments. For instance, freshmen in Political Science are more likely to study in the province of residence (about 5%). Our estimates show also that females are

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<sup>11</sup> The coefficients associated to Agricultural Studies and Architecture were not statistically significant for the entire sample.




more sensitive to the degree courses supplied in the province of residence than to the number of degree courses available in other provinces; the opposite is true for males.

The results of this study suggest that the process of expansion and regionalization of the Italian higher education system has been positive for promoting access for individuals from less favourable backgrounds – for instance, those with financial constraints – and those suffering more discrimination in society, that is, females. Considering that in the decision process for enrolment at university, most individuals are affected mainly by the degree course provision in the province of residence, policy aimed at reducing the number of tertiary courses could have serious negative effects on shares of freshmen. To contain the risk of limiting access to higher education, especially for high ability but not financially well off students, implementation of such intervention should be accompanied by a programme of financial aid and greater specialization in the tertiary education supply. This would mean that the choice to enrol at a university would be based not just on personal/household financial conditions, and would be more related to motivation and ability. Policy makers should be aware that without the introduction of measures to overcome potential budget constraints, reduction in the supply of higher education could have consequences in relation to freshmen.

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