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Italian graduates' geographical mobility patterns: selectivity and regional inequalities

Francesca Tosi[1] · **Roberto Impicciatore**[1] · **Rosella Rettaroli**[1]

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Abstract
The attraction and retention of graduates are crucial for Italy's regional development, especially given the north–south divide. We investigate the interregional migration patterns of Italian graduates, distinguishing between pre- and post-graduation mobility. Analysing the Istat survey on university graduates' vocational integration 2015, we identify five mobility profiles: university stayers, repeat migrants, late migrants, return migrants and non-migrants. Through multinomial logistic regression models, we explore the relationship between school-leaving and university graduation marks and the propensity to move. The results show that south-to-north mobility is positively selected based on educational performance, while post-graduation returns to the south are inversely related to these outcomes. Return migrants often come from families with greater socio-economic resources, characterized by self-employed parents. Southern Italy loses its most qualified graduates, with negative impacts on regional growth and territorial disparities. Without targeted policies to attract highly qualified graduates back to the south, selective mobility is likely to deepen the existing economic divide.

Keywords Student mobility · Graduate mobility · School-to-work transition · Interregional Inequalities · Italy

Rationale and background

The tradition of excellence in some Northern Italian universities has undoubtedly contributed to attracting students from across the country over the past decades. However, other pull factors must also be considered in explaining interregional student mobility, such as

✉ Francesca Tosi
francesca.tosi12@unibo.it

Roberto Impicciatore
roberto.impicciatore@unibo.it

Rosella Rettaroli
rosella.rettaroli@unibo.it

[1] Department of Statistical Sciences, University of Bologna, Via delle Belle Arti 41, Bologna 40126, Italy

better employment prospects, higher per capita wages and the institutional quality of the destination areas.

Recent studies indicate that in Italy student mobility mirrors worker mobility, implying that—regardless of a university's reputation—the choice of university location may be a strategic decision for young people aiming for a more promising and rewarding future in the labour market (Dotti et al., 2013). Therefore, it is unsurprising that students who relocate for their studies rarely return home after graduating (Ciriaci, 2014; Dotti et al., 2013; Vecchione, 2017), with a significant portion of the most dynamic youth permanently settling in their new regions (Impicciatore & Tosi, 2019).

This issue becomes even more significant when considering classical economic theories on the positive self-selection of migrants in terms of skills and motivation (Chiswick, 1999; Schwartz, 1976). This is particularly crucial for the Italian economy, historically characterized by a persistent north–south divide and where social and economic inequalities are closely linked to specific regions (Felice, 2013; Graziani, 1978), resulting in significant interregional migratory movements over the past decades (Impicciatore & Strozza, 2016).

Despite its importance and potential policy implications, the combined analysis of attracting and retaining top-performing students and graduates remains underexplored. As highlighted in the international context (Wahba, 2015), a common limitation in the study of internal migration is the failure to account for the dual selection process of migration: who migrates and who returns. This is largely due to the lack of appropriate data on the characteristics of migrants, particularly high-skilled ones (Faggian et al., 2017). The existing literature mainly focuses on the attraction of students from the south or the socio-demographic characteristics of southern graduates relocating to the centre-north (Capuano, 2012; D'Agostino et al., 2019; Nifo & Vecchione, 2014; Santelli et al., 2022; Tosi et al., 2019). However, there is much less discussion about local economies' ability to benefit from the interregional exchange of talent, which depends on their capacity to retain the top-performing graduates after they enter the labour market.

Overall, combating brain drain should be a major aspect of regional economic policy, especially in Italy, where significant geographic imbalances exist. In this context, the role of university spillovers in fostering local innovation and development has indeed emerged as a critical concern (Abramovsky et al., 2007; Anselin et al., 1997; Faggian & McCann, 2009).

Focusing on the Italian case, this paper has three primary aims. Firstly, it examines the selectivity of highly educated young people transitioning from school to work, considering complex migratory trajectories that combine pre- and post-graduate mobility. Secondly, by embedding the analysis in a territorial perspective, it highlights regional disparities in the capacity to attract and retain top-performing students in the local labour market, with particular attention to the north-south divide. Hence, the paper investigates whether complex mobility trajectories also confirm the disadvantage of southern regions in terms of human capital loss compared to northern regions, and whether return migrations can compensate for the permanent departures of the best-performing students. Finally, the present analysis explores the role of family background in shaping mobility trajectories, with a specific focus on return migration in the southern regions.

To accomplish these goals, we identify sequential mobility trajectories of Italian university graduates across different regions using the Istat survey on university graduates' vocational integration 2015 (Istat, 2018). Following the existing literature (Champion et al., 2024; DaVanzo, 1976, 1983; Faggian et al., 2006), we distinguish between *university stayers* (*ante lauream* mobility only), *repeat migrants* (*ante lauream* and *post lauream* mobility towards a third region), *late migrants* (*post lauream* mobility only), *return migrants* (*ante*

lauream and *post lauream* mobility towards the region of origin), and *non-migrants* (no mobility at all). To the best of our knowledge, such a level of detail has never been adopted for the Italian case.

Through multinomial logistic regressions, we model the propensity for different mobility patterns conditioned on individual school and academic performance, considering a set of control variables including personal characteristics and parental background. Our results reveal a positive association between school and academic performance and the likelihood of migration for all mobility trajectories, except for return migration. The higher mobility of top-performing students seems to exacerbate the disadvantage of southern regions. Specifically, south-to-north mobility is positively correlated with academic performance, while return migration after graduation is negatively correlated. Finally, within a general context of a positive association between the propensity to move and the parental background, those who return to the south after graduation tend to have family characteristics that favour their entry into the labour market (e.g. parents who are self-employed), more so than in the rest of Italy.

The remainder of the paper is structured as follows. The "Literature review" section outlines the literature review. The "The Italian setting" section illustrates the Italian setting in terms of internal mobility, student mobility and regional differences and how the study contributes to the existing theoretical debate, while the "Research questions" section specifies the research questions. The "Methodology" section describes the data and methods used in the empirical analysis, while findings are set out in the "Results" section. Finally, the "Discussion and conclusions" section provides the conclusions and elements for discussion.

Literature review

The literature has extensively examined the factors influencing student migration, particularly focusing on the location choices of highly skilled individuals (Venhorst et al., 2011). Specific factors of attraction include the prestige of higher education institutions and the availability of social and cultural services in urban areas (Bacci & Bertaccini, 2020; Baryla & Dotterweich, 2001; Ciriaci, 2014). Migration decisions may be also driven by the desire to live in cities with a favourable environment and greater cultural and social amenities, the prospect of a higher quality of life (Ballarino et al., 2022; Nifo & Vecchione, 2014) and pre-existing connections and social ties (Genova & Boscaino, 2024; Genova et al., 2024). Nevertheless, economic factors are often seen as the primary determinants of location choices (Beine et al., 2014; Détang-Dessendre, 1999; Gottlieb & Joseph, 2006). In general, regional economic disparities are considered a significant factor in internal migration flows (Coulombe, 2006). Student mobility—frequently the first step in internal migration—often follows broader migration patterns, especially when the expected return on education in the local labour market is consistently lower compared to other areas. This has been ascertained by Faggian and McCann (2009) for the case of UK, where labour market spillovers between universities and regions are mainly influenced by the local economy's strength rather than the university's quality, except in cases where the university has a strong local focus. From this perspective, student relocation can be seen as a major driver of both social and geographical mobility (Champion et al., 2017; Fielding, 1992; Holdsworth, 2009; Impicciatore & Panichella, 2019).

Within this macro-level framework, the literature indicates the existence of selective migration processes. A common assertion in migration studies is that migrants typically exhibit favourable self-selection for labour market success due to their higher skills (Borjas, 1994; Chiswick, 1999; Kanbur & Rapoport, 2005; Kwok & Leland, 1982). Individuals with stronger personal capabilities have a greater propensity to relocate, driven by expectations of better employment returns. Such selectivity is especially relevant among tertiary students and recent graduates, with studies consistently showing that the most talented students are more likely to move (Faggian & McCann, 2006; Tosi et al., 2019). High-achieving individuals are also thought to possess a greater ability to adapt to new environments and leverage relocation opportunities (Coulombe & Tremblay, 2009; Fratesi & Riggi, 2007; Giannetti, 2001).

This evidence raises concerns about the potential negative consequences of the uneven distribution of talent from poorer to wealthier regions. Student migration may concentrate the most talented individuals where the returns to skills are higher, exacerbating regional disparities (Berry & Glaeser, 2005; Fielding, 1992; Leach, 1996; Vandenbussche et al., 2006). Broadly speaking, skilled individuals are crucial for regional development and local economic growth (Corcoran & Faggian, 2017; Faggian et al., 2017; Kanbur & Rapoport, 2005; Kitagawa et al., 2022). Graduates are especially vital as they transfer knowledge from higher education to the labour market (Marinelli, 2013), and higher education institutions can act as catalysts for brain gain processes (Dotti et al., 2013). Thus, they can participate in a virtuous cycle where a robust innovation system attracts talent, strengthening it further and making it more appealing to talented individuals (Marinelli, 2013). Additionally, local economies benefit from the influx of students from other regions through the development of the real estate market, business growth and expansion of tourism and economic activities (Ballarino et al., 2022). In sum, internal migration should be understood not only as a mechanism for labour reallocation but also in terms of the knowledge flows it generates (Iammarino & Marinelli, 2015).

On the other hand, regions may struggle to fully capitalize on their investments in the development of expertise when human mobility is present (Justman & Thisse, 2000). This issue becomes particularly relevant when outmigration is not offset by adequate human capital acquisition and occurs in contexts with low intergenerational mobility. Research on Italy has shown that the internal migration of highly educated individuals can negatively impact regional development (Becker et al., 2004; Faini, 2003; Piras, 2005), leading to a reduction in human capital in economically weaker areas that export young students (Nifo & Vecchione, 2014) and thus impeding the convergence between different subnational regions (Fratesi & Percoco, 2014; Fratesi & Riggi, 2007). To maintain competitiveness, regions must not only attract graduates from other areas but also retain its own university graduates, whether they are natives or immigrants. Therefore, a territory must provide young individuals with appropriate higher education facilities and institutions, as well as ensure favorable labour market conditions that limit graduate outmigration (Faggian & McCann, 2009; Kitagawa et al., 2022; Venhorst et al., 2011).

At the individual level, significant emphasis is placed on the decision to stay in the university region or move elsewhere after graduating. A post-graduation move is more likely for those who have already relocated for university, with a distinction between those returning to their home area and those moving to a new area (Champion et al., 2024). Previous research has highlighted that students who move to another region for higher education are less likely to return home afterward (Ciriaci, 2014; Gottlieb & Joseph, 2006; Groen,

2004). The decision to remain in the place where higher education was attained can be linked to individual characteristics. Faggian and colleagues (2006) suggested that human capital encourages permanent migration, as high university grades and qualifications tend to decrease the likelihood of truncating the migration process and returning home for work. Parental background may also strongly influence migration trajectories. Students with parents from upper social classes—particularly high-income self-employed individuals (Barbieri, 2003)—may be discouraged from moving or encouraged to return after graduation, as such parents often provide better prospects, including employment opportunities within family enterprises, due to the inheritability of certain professions (Capuano, 2012; Laband & Lentz, 1992; Montgomery, 1991), or act as role models or supporters for their children's career (Lindquist et al., 2015). Some recent contributions (Fini et al., 2022) look at the relationship between the probability of entering self-employment and graduates' mobility paths in the Italian context, finding that stayers and return migrants are more likely to become self-employed, whereas onward movers are more likely to enter a salaried job. However, there is still a significant gap in research examining the individual characteristics linked to specific mobility patterns, such as returning to one's region of origin after graduation or moving to a third region, while considering both individual achievements and the influence of family background (Faggian et al., 2017; Tosi et al., 2019).

The Italian setting

Despite the 1.4 million internal migrants reported annually on Population Registers, Italy remains a country with lower levels of internal mobility compared not only to the United States but also to other European countries (Bell et al., 2015). Nevertheless, a clear and persistent south-to-north migration flow exists. It has played a crucial role in driving social change and contributing to the modernization of the country, particularly in the post-World War II period (Rosina & Impicciatore, 2022), and it continues to be an important feature of internal mobility today. Although not reaching the levels observed in the 1960s and 1970s, this phenomenon is far from being negligible, registering over 100,000 annual migrations in the past two decades. Student mobility constitutes a significant aspect of this phenomenon, frequently serving as the initial stage in internal geographical displacement (Impicciatore & Tosi, 2019; Giambona et al., 2017). Data from MUR[1] reveal that in the last two decades, almost 25,000 southern students have enrolled annually at universities located in the centre and the north of the country. The attractiveness of northern universities for southern students has further increased during this period, notwithstanding the expansion of tertiary education supply (Impicciatore & Tosi, 2019). The percentage of students from the south attending universities in the central-northern regions increased from 17% in the 2003/04 academic year to nearly one in four students in more recent years. In contrast, this trend was not observed in other areas: today, only 3.6% of northern students and around 14% of students from the centre relocated to a different macro-region (Tosi, 2024). The unidirectional south-to-north trajectory is confirmed across different levels of higher education (Genova et al., 2021).

In Italy, tertiary education is provided through publicly funded universities. After earning a high school diploma, students can enrol in nearly any field of study at the tertiary level, with tuition fees based on their economic circumstances. Mobility typically occurs at

[1] Ministry of University and Research (https://ustat.mur.gov.it/).

the beginning of the university career, as 80% of south-north moves involve enrolment in a bachelor's degree program, while the remaining 20% pertains to additional mobility in the first year of a master's degree program (Ferrara & Nisticò, 2018). Furthermore, southern students who graduate from universities in the central-northern regions often do not return to their region of origin but tend to stay in the cities where they studied (Dotti et al., 2013; Vecchione, 2017). This persistent south-to-north flow of students is primarily driven by the perceived higher prestige of universities in the north (Ciriaci, 2014; Impicciatore & Tosi, 2019) as well as the greater employment opportunities and higher returns to education (Genova et al., 2024; Santelli et al., 2019). This is supported by the fact that student mobility trajectories in Italy tend to parallel worker mobility patterns (Dotti et al., 2013; Fratesi & Percoco, 2014).

In fact, labour market characteristics and returns to education differ significantly between the two areas, impacting migratory behaviour (Fratesi & Percoco, 2014). Compared to the rest of the country, Southern Italy (or *Mezzogiorno*) has lower employment opportunities and wages (Felice, 2013), reduced demand for skilled workers, smaller wage returns for university degrees (Brunello & Cappellari, 2008; Pozzoli, 2009) and higher levels of professional position inheritance (Barone, 2012). Thus, the dualistic socio-economic structure is reflected in a strongly geographically differentiated labour market. While Northern and Central Italy include highly innovative regions with strong interactions among local economic actors and institutions, good scientific and technological infrastructure, and effective policies, the south lags behind, specializing mostly in traditional and low-technology industries with weak innovation and systemic linkages (Iammarino & Marinelli, 2015).

Research questions

The aim of this paper is to study the selectivity of young movers transitioning from school to work, considering complex migratory trajectories that combine pre-graduation movements for study and post-graduation movements for work, from a geographical perspective. Following the literature discussed in the two previous sections, the following research questions arise.

The first relates to the selectivity based on individual achievements: What is the relationship between school and academic performance and the propensity to move before and after graduation? Are top-performing students more likely to relocate?

The second research question focuses on the north-south divide. The south tends to lose valuable human capital to the centre-north due to positively selected emigration dynamics. Do pre- and post-graduation mobility confirm this trend? Specifically, can return migration compensate for the permanent departures?

Finally, the third research question focuses on the role of family background in shaping mobility trajectories. As seen in the literature, self-employed parents especially may encourage or incentivize their children to return after graduation especially in contexts characterized by a higher level of inheritance of professional positions. Do children of self-employed parents tend to have a higher propensity to return to their region of origin?

Methodology

Data

The data employed in this study is the Istat survey on university graduates' vocational integration 2015, which is part of the official statistics' system for surveying the school-to-work transition in Italy.[2] Although being about a decade old, the data is still relevant and remains representative of the current situation of Italian graduates. The reference population consists of individuals who graduated from an Italian university in 2011. Such population comprises 299,449 individuals (of which 58.9% are women) distributed across 90 universities. The main objective of the survey is to assess the employment status of young people four years after obtaining their qualification.

The original sample is made of 58,400 observations. Since we are interested in observing the geographical mobility behaviour of Italian graduates during their school-to-work transition, we exclude from the analytical sample those who were still in education at the time of the interview and those who completed further levels of education between 2011 and 2015 (22,983 individuals, amounting to 39.4% of the total sample), that is during the 4-year period after their graduation.[3] After also dropping the observations corresponding to graduates who obtained their high-school diploma abroad, those with missing geographical information, and those missing details about graduation marks (overall accounting for 0.8% of the sample), we obtain a final analytical sample of 34,739 observations.

For each surveyed individual, we have geographical information on three key locations that help reconstruct mobility trajectories. The first one is the place of residence before enrolling at university; the second one is the place of university attendance and completion; the third one is the place where graduates live at the time of the interview (i.e. 4 years after obtaining their highest educational title).[4] This information is provided by Istat at the regional (NUTS2) level.

Concerning graduates' individual academic performance, we use the available information on school-leaving final grades, measured on a 60–100 scale (101 being to the maximum "100 *cum laude*" evaluation), and university graduation marks, measured on a 66–110 scale (111 corresponding to the maximum "110 *cum laude*" evaluation). Given that educational achievements are not randomly distributed across regions in Italy (Battistin & Schizzerotto, 2019) and are strongly influenced by the type of school attended (*liceo*, teaching/arts, technical or vocational) and the field of tertiary education (as categorized by Istat into nine major disciplinary groups),[5] we standardize Italian graduates' marks

[2] The 2015 edition of the survey was the most recent available at the time this article was written. Although it is now about a decade old, the data remains relevant and continue to represent the current situation of Italian graduates.

[3] We decided to exclude graduates who obtained further educational levels after 2011 also because the survey does not convey information (e.g. graduation marks, educational field, place of graduation) about such higher educational levels. Furthermore, doctoral students who benefit from a research fellowship and medical specialization school students are considered as workers and not in education.

[4] Ideally, for those who have a master's level degree, we would include information about mobility occurred between the first and the second cycle of tertiary education. Unfortunately, the survey does not report such information, therefore for these individuals we can only consider the geographical information about the most recent and highest educational level completed.

[5] See Figs. 7 and 8 in the Appendix for a graphical distribution of school-leaving grades and university graduation marks by geographical area.

Table 1 Graduate mobility profiles based on interregional mobility trajectories

Profile	*Ante lauream* mobility	*Post lauream* mobility	Sequential moves
1. University stayer	Yes	No	School ➔ University = Domicile
2. Repeat migrant	Yes	Yes	School ➔ University ➔ Domicile (in a third destination)
3. Late migrant	No	Yes	School = University ➔ Domicile
4. Return migrant	Yes	Yes	School ➔ University ➔ Domicile (in the region of origin)
5. Non-migrant	No	No	No moves

Source: Authors, based on Faggian et al. (2006) and DaVanzo (1983)

across three broad geographical areas (north, centre and south) by type of school and field of study. We then sum the resulting standardized grades from both school and university levels to identify the best-performing students as those who obtained the highest grades at both educational levels, relative to the type of school attended by area of school attendance and the chosen field of tertiary studies by area of university completion.

Finally, we identify interregional mobility trajectories according to five groups of mobility profiles that summarize all possible sequential moves as seen in Faggian et al. (2006) and DaVanzo (1983) (Table 1): (1) *university stayers*, who move to another region to attend university and who remain in the same region four years after graduation; (2) *repeat migrants*, who leave their region of school attendance to study in another region and then move onwards to a third one; (3) *late migrants*, who attend school and university in the region of origin and then move to a different region after graduation; (4) *return migrants*, who leave their region of school attendance to study in another region and then go back to their region of origin and (5) *non-migrants*, who do not move at any point remaining in the same region where they attended school.

Figure 1 shows how the five graduate mobility profiles are distributed across the 20 Italian regions of domicile at the time of the interview—i.e. where graduates live four years after they completed education—to understand which territories lose, attract or retain skilled young people. By ranking regions according to the proportion of *university stayers*, we see that Emilia-Romagna (14.1%), Lazio (10.5%), Umbria (9.4%) and Tuscany (8.9%) are the regions that attract and retain the most immigrant students after graduation. Conversely, southern regions (Apulia, Sardinia, Calabria, Basilicata and Sicily) are characterized by the weakest retention capacity, with university stayers accounting for an average of 0.6%.[6] Among the regions attracting graduates who completed tertiary education elsewhere (*repeat* and *late migrants*), the preferred destination is Lombardy (15.3%), followed by Trentino-Alto Adige (14.8%), Emilia-Romagna (14.3%), Liguria (13.4%) and Lazio (12.6%). Finally, the regions with the highest share of stayers or returnees are primarily in the south—Campania (97.1%), Sicily (96.9%), Apulia (94.4%) and Sardinia (94.3%).

[6] Aosta Valley is the smallest region in Italy, representing 1.1% of the national territory and hosting the smallest regional population (nearly 124 thousand individuals). The region also hosts one tertiary education institution, the University of Valle d'Aosta/Université de la Vallée d'Aoste, which has currently less than 1000 enrolled students. It follows that the corresponding analytical sample of graduates in our data set is very small (48 non-weighted observations), which makes regional evidence at this level to be treated with caution while interpreting the results.

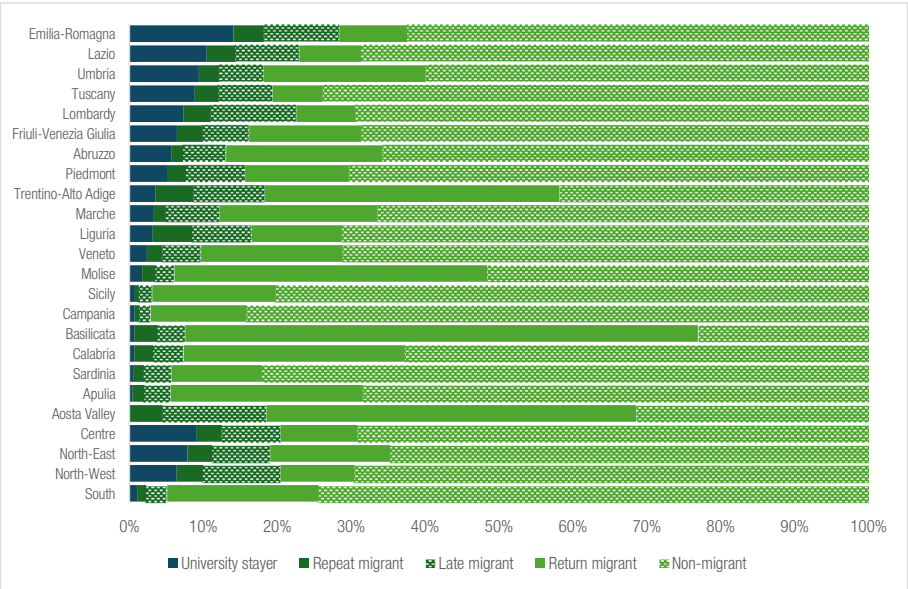

Fig. 1 Mobility outcomes of Italian university graduates by destination region (weighted observations, row %). Source: Own elaborations of Istat survey on university graduates' vocational integration (2015)

Methods

To assess Italian graduates' mobility outcomes conditioned on individual academic achievements and net of other possible confounders, we apply multinomial regression modelling to the data. We estimate the probability of experiencing one of the distinct five mobility trajectories by constructing a random indicator variable Y_{ij} indexed $1, 2, \ldots, J$, where $J = 5$, that takes the value of 1 when individual i's response falls into the j th category, and 0 otherwise. Let X_i be a vector of covariates associated with the i th individual, and β_j the corresponding parameter vector. To measure the conditional probability of falling into the j th outcome category given the covariate vector, the multinomial logits are estimated as follows:

$$\log\left(\frac{Pr\{Y_{ij} = j|X_i\}}{Pr\{Y_{ij} = 1|X_i\}}\right) = X_i\beta_j, \text{with j} = 1,2,\ldots,J-1$$

The vector of covariates X_i includes a set of individual-level, family background and contextual characteristics. Individual features include standardized marks, squared standardized marks, gender, age at graduation (21–22, 23–24, 25–29, 30 +), field of tertiary study (Humanities, Economics and Statistics, Social policy, Sciences, Law, Engineering, Architecture, Medical and Health, Sports science), highest title obtained (bachelor, master, 4- or 5-years single-cycle degree). Family background information includes parental education measured as the highest title earned by any of the two parents (none/primary/missing, lower secondary, upper secondary, tertiary), and whether the respondent has either parent in self-employed occupation. Contextual characteristics are linked to the region where the university was attended and include the standardized value of the average regional gross

domestic product (GDP) per capita over the eight years prior to the year of graduation (2004–2011); a regional index of university quality, calculated as the regional average of the scores measured for each Italian university by Censis-Repubblica for years 2016–2017, which serves as a proxy for university quality in the region; and a dummy variable indicating the presence of a university with more than 40,000 students in the region, to control for the presence of large campuses and a broad range of fields of study.

Three specific configurations of the model have been developed. In model A, we interact the standardized marks with the area of residence before enrolling in university. In model B, we focus on south-to-north mobility by re-estimating model A on the sub-sample of southern students who moved to the centre-north for tertiary education. In this case, the only possible mobility profiles observed are *university stayer*, *repeat migrant* and *return migrant*. Finally, we focus on the role of parental background by interacting the area of origin with parental occupation (model C) to predict the probability of returning to the area of origin for all students. This is analysed both as an overall estimate and separately for graduates whose standardized marks fall within the bottom 25% and the top 25% of the distribution.

Results

Figure 2 (resulting from model A) shows the adjusted predicted probabilities of matching each graduate mobility profile by standardized marks and area of origin, accounting for all considered confounding factors. The first key finding is that Italian graduates are

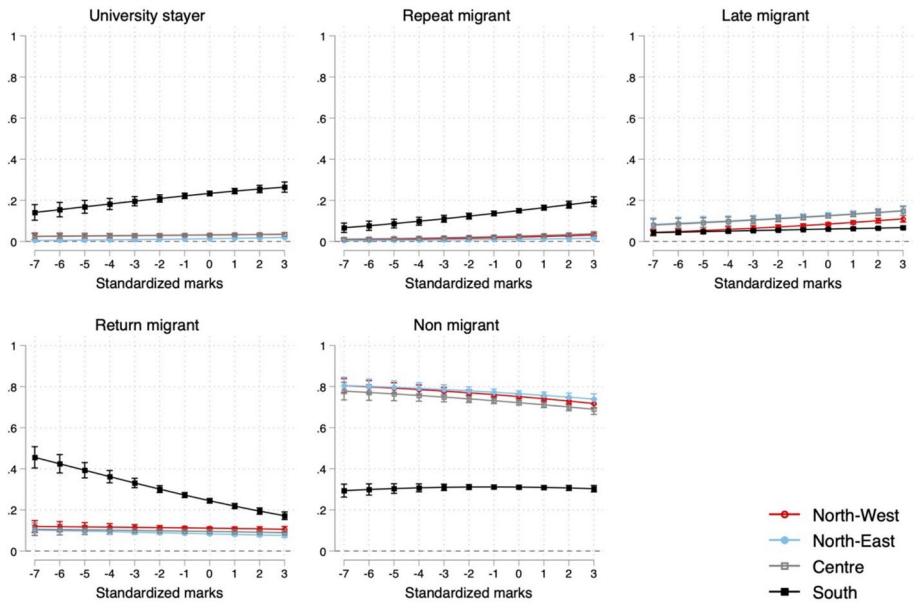

Fig. 2 Adjusted predicted probabilities of Italian graduates' mobility outcomes by standardized marks and graduates' area of origin (95% CI). Model A. Note: The complete set of estimates is available in the Appendix Table 2. Source: Own elaborations of Istat survey on university graduates' vocational integration (2015)

most likely to be *non-migrant*, indicating that, in most cases, young people tend to enrol in university in the same region where they reside while attending high school. A second finding is that graduates from Southern Italy tend to exhibit mobility patterns that are almost always distinct compared to graduates from other areas. On the one hand, for graduates originating from the centre or north, academic performance tends to be independently related to the propensity to move except in the case of the *late migrant* profile, for which there is a slightly positive association with standardized marks. On the other hand, southern students' propensity to experience student or graduate mobility is significantly and positively associated with marks, except for the specific case of the *return migrant* category, where our estimates predict significantly lower probabilities of matching this mobility profile as graduates' overall performance increases.

Our second research question addresses mobility patterns and outcomes specific to southern students who graduate from a central-northern university (south-to-north trajectory). For this group, model B estimates (Fig. 3) show that, as individual academic performance increases, the predicted probability of being *return migrants* decreases rapidly, while the predicted probability of being either *repeat migrant*—or especially *university stayers*—increases.

Finally, we investigate whether the mobility outcomes of Italian graduates are associated with parental occupation (model C). As shown by the estimated predictions in Fig. 4, graduates from Southern Italy with at least one self-employed parent have significantly higher probabilities of being *return migrants* compared to those with no self-employed parents. This finding is consistent with Fini and colleagues (2022), who observed that returnees are more likely to enter self-employment compared to onward migrants, and it supports the idea that graduates are more inclined to return to their places of origin if they have

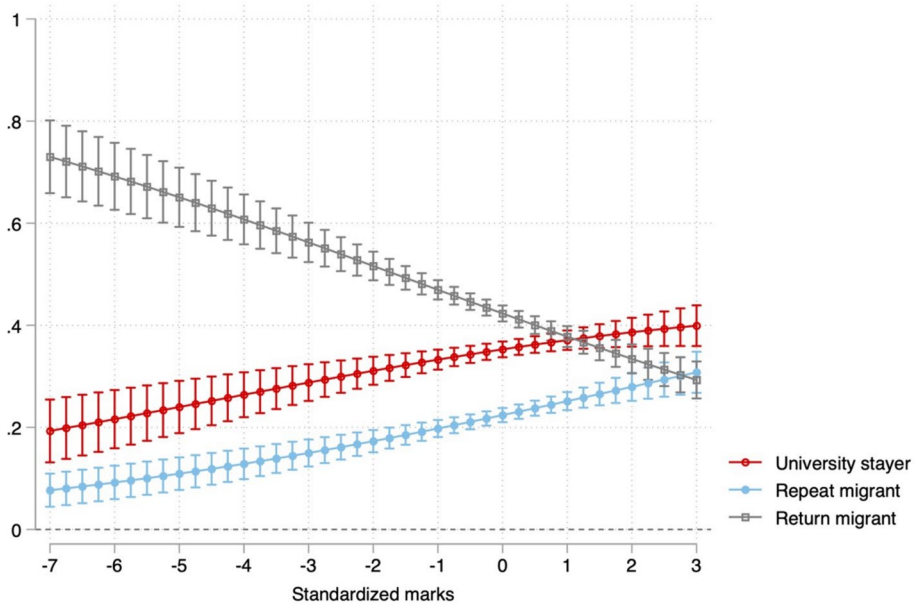

Fig. 3 Adjusted predicted probabilities of Italian graduates' mobility outcomes by standardized marks (south-to-north mobile graduates only, 95% CI). Model B. Note: The complete set of estimates is available in the Appendix Table 3. Source: Own elaborations of Istat survey on university graduates' vocational integration (2015)

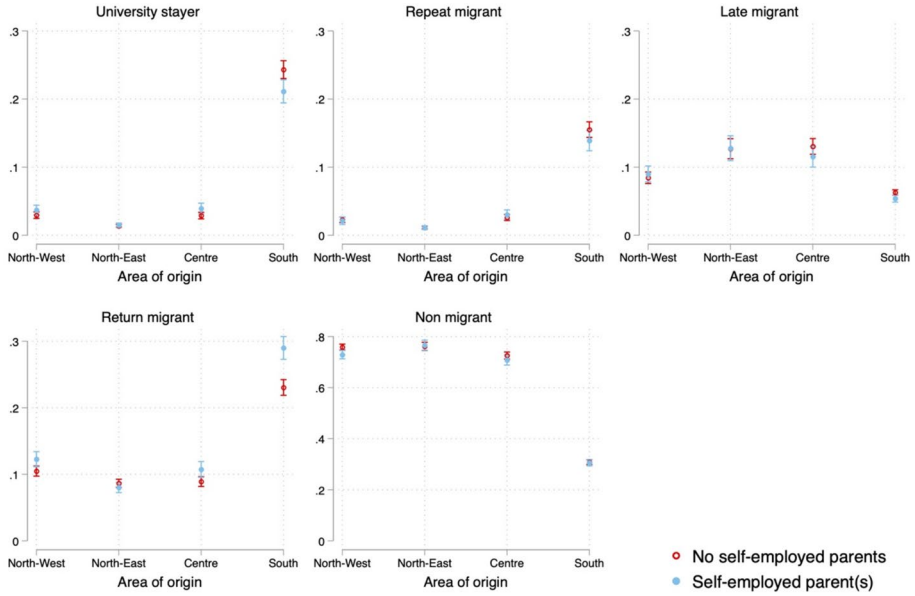

Fig. 4 Adjusted predicted probabilities of Italian graduates' mobility outcomes by parental occupation and graduates' area of origin (95% CI). Model C. Note: The complete set of estimates is available in the Appendix (Table 4). Source: Own elaborations of Istat survey on university graduates' vocational integration (2015)

better employment prospects due to the professional networks provided by their families (Laband & Lentz, 1992; Montgomery, 1991).

Interestingly, when the same average prediction is measured considering the children of self-employed parents whose standardized marks fall either within the bottom 25% or the top 25% of the distribution, the probability to be *return migrant* is significantly lower among the highest performing graduates, while the opposite is true for graduates with lower marks (Fig. 5). While this evidence is observed for all areas, the associated probability is markedly higher for southern graduates. As a robustness check, we re-estimated model C by substituting parental self-employment with parental education, which is a commonly used proxy for family background (model D, see Fig. 6 in Appendix). In this case, the model does not predict statistically significant probabilities associating graduates' area of origin with the *return migrant* outcome category, indicating that family resources per se do not incentivize graduates to go back home after completing education. Rather, it is the extent to which certain professional positions are inheritable that re-attracts graduates to their home regions, i.e. parental occupational profile.

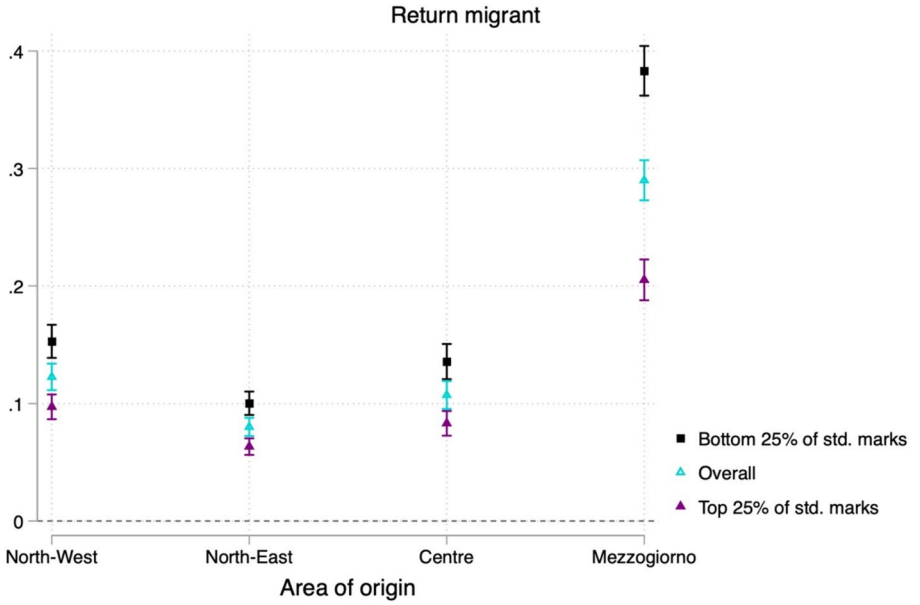

Fig. 5 Adjusted predicted probabilities of Italian graduates' mobility outcomes by graduates' area of origin and academic career (graduates with self-employed parents only, 95% CI). Model C. Source: Own elaborations of Istat survey on university graduates' vocational integration (2015)

Discussion and conclusions

Universities have a direct impact on the economic, social and political development of their territories. One way they exert such influence is by serving as providers of a highly skilled immigrant labour force (Kitagawa et al., 2022). The existing literature highlights that cities with higher education institutions can act as escalators for the surrounding region (see, e.g. Fielding, 1992). Typically, aspiring students are drawn to a city for its educational offerings and, after graduation, leverage the investment they have made in their human capital (Venhorst et al., 2011). The competitiveness of a region significantly depends on its ability not only to attract high-achieving university graduates from other regions but also to retain its own. Investigating the interregional exchange of talent, both before and after graduation, provides valuable insights into regional development, workforce dynamics and the impact of tertiary education policies.

In this paper, we aimed at studying the selectivity of young movers transitioning from school to work from a geographical perspective. We have thus identified and analysed complex interregional migration trajectories based on three pieces of geographical information:

the region of upper secondary education, the region of tertiary education and the place of residence four years after graduation. This allowed us to distinguish between those who moved before and/or after graduation and those who return to their region of origin once their education is completed.

Results show that graduates from the South of Italy exhibit distinctive mobility patterns that are strongly influenced by their individual educational performance, compared to graduates from other areas of the country. For southern graduates, all forms of onward mobility—both before and after graduation—are positively associated with successful educational careers, regardless of their destination. Conversely, return mobility to the region of origin is inversely related to school and academic performance. Among southern students who moved to the central-northern regions for university, there is a clear positive relationship between marks and the likelihood of staying in the region of graduation or migrating elsewhere. On the other hand, those who achieve lower educational outcomes are more likely to return to their region of origin in the south after graduation. This means that the southern regions of Italy lose their most highly performing individuals to the north of the country. Finally, young people who tend to go back to their places of origin after graduation are also selected based on parental background, namely their parents have a self-employed occupational profile, which is supposed to ensure direct employment prospects. Such evidence regards graduates from any area of the country but is especially significant for southern, underperforming students, who, on average, are more likely to return to their regions of origin to enter the job market after completing their studies.

Our findings indicate that student and graduate mobility may aggravate economic disparities between regions in Italy. Performance-selective interregional mobility is likely to hinder the growth of the least developed regions, notably impeding the south from fully leveraging its most valuable labour force. As highlighted in other contexts, such as the UK (Champion et al., 2024), while some return migration occurs after university, the initial loss of top-performing school leavers experienced by the sending regions is usually not fully recovered. Conversely, regions that attract and retain talented young individuals, particularly high-performing graduates, benefit both quantitatively and qualitatively through the mechanism of pre- and post-graduation mobility. These are usually the regions that are already more dynamic in terms of economic opportunities and labour market conditions. This suggests that, in the absence of specific policies aimed at strengthening the circularity of internal student migration and easing the return of the top-performing ones to their places of origin, the spatial mobility of highly achieving individuals might in fact exacerbate regional divergence instead of facilitating regional convergence. Such policies should include boosting labour demand and economic vitality in the weakest Italian territories, especially the south. Rather than focusing on preventing student emigration, efforts should prioritize fostering regional brain gain, similar to strategies used for international migration. Student mobility enhances knowledge and skills, potentially boosting career prospects, much like the benefits emphasized for international student exchanges, such as the Erasmus program. Migration circularity should be promoted, particularly by encouraging national and international student exchange programs in Southern Italy. However, this

alone is not sufficient. Italy is facing significant challenges, including a declining number of school-age youth, which will inevitably affect university enrolments in the coming years; a lower-than-average share of graduates compared to OECD countries, and an exceptionally high percentage of NEETs—young people who neither study nor work—who struggle to achieve residential independence from their parents (Rosina & Impicciatore, 2022). These issues are especially pronounced in the south.

Recent proposals (Billari, 2023) could be particularly beneficial for regions struggling to retain top students. First, attracting more international students is crucial, as Italy has the lowest share of foreign students among OECD countries (about 5% in 2018, compared to an OECD average of over 10%). Second, expanding post-secondary education programs that integrate apprenticeships with formal education could help engage students who might otherwise forgo university. Third, efforts should focus on reducing the dropout rate among enrolled students.

Our results highlight the distinctive pattern of disparities across the country and the persistence over decades of migration flows from the poorer southern regions to the wealthier ones in the north. The north–south divide has been one of the most debated issues in the country for decades (for a review see Felice, 2013), with Southern Italy containing some of the most socio-economically vulnerable regions in the European Union.[7] This analysis yields results that are closely intertwined with the peculiar characteristics of the Italian territory. However, it is also worth noting that in Italy internal migrants are less selected in terms of education compared to other European countries such as France, Germany or Sweden (Panichella & Impicciatore, 2024). Thus, the catalysing effects of student mobility to the detriment of weaker areas could be significant even in these contexts. Comparative analyses could further enhance our understanding of this issue.

Our analysis has some limitations that are worth discussing. First, geographical investigations of socio-economic phenomena should ideally be carried out at the sub-regional level to be as informative as possible (Champion et al., 2024). Unfortunately, the data at our disposal does not provide territorial information at a more granular level than NUTS2, so we cannot provide information at the municipal or even the province (NUTS3) level. Second, it would be ideal to observe territorial mobility outcomes at different points in time to accurately reconstruct spatial mobility history. However, our statistical information, collected four years after graduation in a retrospective manner and for only a few points in time, does not allow for a proper longitudinal analysis of student and graduate mobility patterns. Finally, the data used in this paper (collected in 2015 and released in 2018) is the most recent available source of information on the educational and professional outcomes of Italian graduates. Future developments of the present study include replicating the analysis using more timely data as soon as it is made available through the Italian official statistics offices.

[7] Source: Statistics Explained. Living conditions statistics at regional level.

Appendix

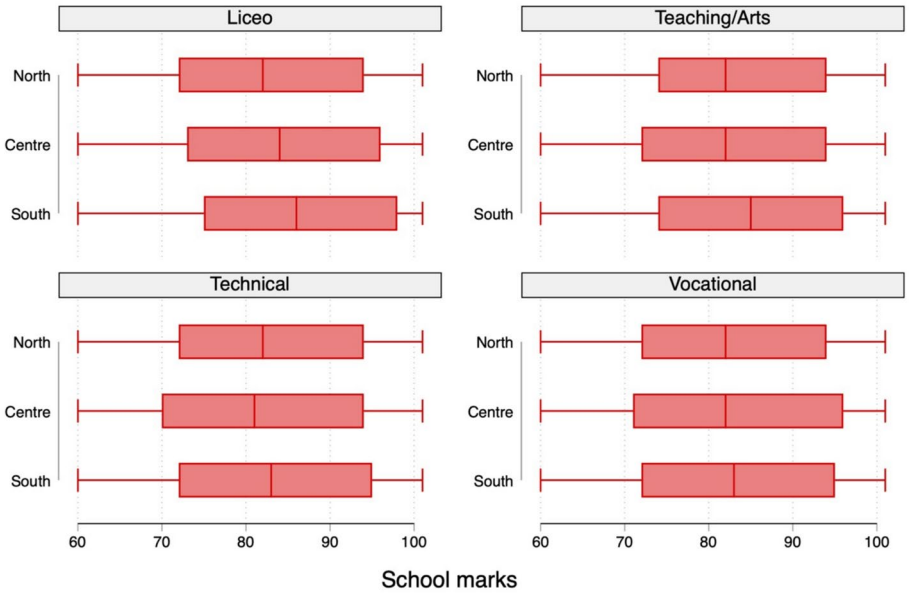

Fig. 6 Distribution of school graduation marks by type of school and area of school attendance. Source: Own elaborations of Istat survey on university graduates' vocational integration (2015)

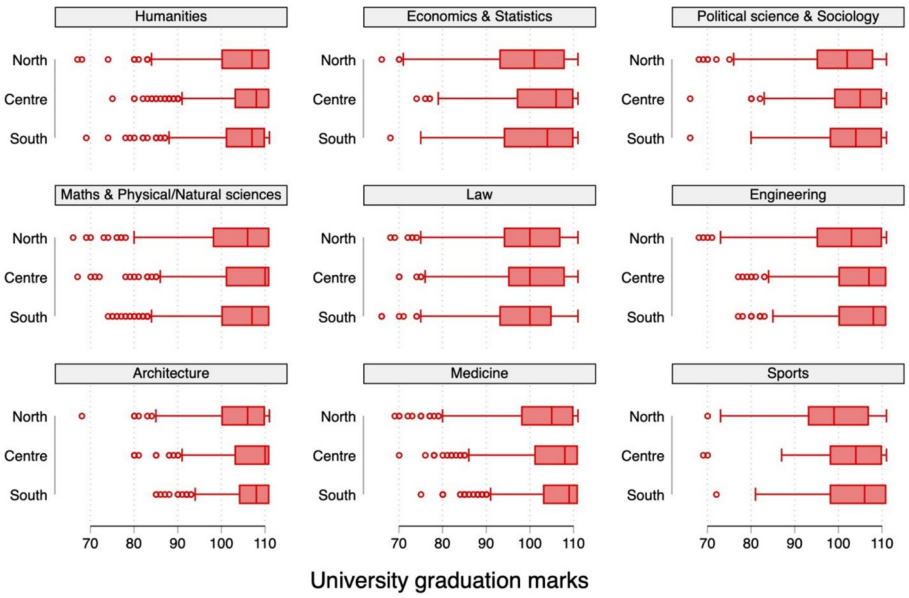

Fig. 7 Distribution of graduation marks by study field and area of university attendance. Source: Own elaborations of Istat survey on university graduates' vocational integration (2015)

Table 2 Model A—Multinomial logit estimates of Italian graduates' mobility outcomes by graduates' skills and area of origin (relative risk ratios, base outcome: non-migrant)

	University stayer		Repeat migrant		Late migrant		Return migrant	
	RRR	(Std. Err)	RRR	(Std. Err)	RRR	(Std. Err)	RRR	(Std. Err)
Standardized marks	1.048	(0.05)	1.147***	(0.06)	1.080***	(0.03)	0.996	(0.03)
Standardized marks (squared)	1.010	(0.01)	1.025***	(0.01)	1.011*	(0.01)	1.010*	(0.01)
Standardized marks # area of origin (ref. centre)								
North-west # Std. marks	1.003	(0.06)	1.018	(0.07)	1.030	(0.04)	1.004	(0.03)
North-east # Std. marks	1.101	(0.07)	0.991	(0.07)	0.994	(0.04)	0.981	(0.03)
South # Std. marks	1.022	(0.05)	0.974	(0.05)	0.971	(0.03)	0.903***	(0.03)
Area of origin (ref. centre)								
North-west	0.963	(0.10)	0.783**	(0.09)	0.640***	(0.04)	1.148**	(0.06)
North-east	0.363***	(0.04)	0.361***	(0.04)	0.967	(0.06)	0.786***	(0.04)
South	44.321***	(3.94)	32.133***	(3.07)	0.938	(0.08)	12.387***	(0.77)
Parents' education (ref. none, primary or missing)								
Lower secondary	1.110	(0.08)	1.379***	(0.11)	1.111**	(0.05)	1.009	(0.04)
Upper secondary	1.433***	(0.11)	1.789***	(0.15)	1.473***	(0.08)	1.051	(0.05)
Tertiary	0.598**	(0.15)	1.472*	(0.32)	1.157	(0.16)	1.241*	(0.14)
Has self-employed parent(s) (ref. no)								
Yes	1.025	(0.06)	0.987	(0.06)	0.934*	(0.04)	1.200***	(0.04)
Gender (ref. male)								
Female	0.995	(0.06)	0.744***	(0.05)	0.823***	(0.03)	0.800***	(0.03)
Age at graduation (ref. 21–22)								
23–24	1.238	(0.25)	1.182	(0.25)	0.927	(0.11)	0.850*	(0.08)
25–29	1.106	(0.22)	0.985	(0.20)	0.786**	(0.09)	0.853	(0.08)
30 +	0.950	(0.20)	0.902	(0.20)	0.545***	(0.07)	1.555***	(0.16)
Field of study (ref. humanities)								
Econ & stats	0.882	(0.10)	0.725***	(0.08)	0.915	(0.07)	0.705***	(0.05)
Social policy	1.284**	(0.14)	1.175	(0.13)	0.992	(0.08)	1.056	(0.07)
Sciences	1.355***	(0.14)	1.047	(0.11)	1.549***	(0.11)	0.852**	(0.06)

Table 2 (continued)

	University stayer		Repeat migrant		Late migrant		Return migrant	
	RRR	(Std. Err)	RRR	(Std. Err)	RRR	(Std. Err)	RRR	(Std. Err)
Law	1.013	(0.12)	0.608***	(0.09)	0.636***	(0.06)	1.344***	(0.09)
Engineering	1.303**	(0.14)	1.044	(0.11)	1.699***	(0.12)	0.599***	(0.04)
Architecture	1.244	(0.17)	0.983	(0.15)	0.933	(0.10)	1.025	(0.09)
Medical & health	1.720***	(0.19)	1.049	(0.13)	0.906	(0.07)	1.025	(0.07)
Sports sciences	1.159	(0.22)	0.577**	(0.13)	0.497***	(0.08)	0.965	(0.09)
Type of degree (ref. bachelor's)								
5-year cycle degree	2.602***	(0.26)	1.171	(0.13)	0.970	(0.07)	0.760***	(0.04)
Master's degree	2.537***	(0.25)	1.740***	(0.18)	1.372***	(0.08)	1.081	(0.05)
Regional GDP per capita	1.074***	(0.00)	1.062***	(0.00)	0.990***	(0.00)	1.054***	(0.00)
University quality index	1.144***	(0.01)	1.132***	(0.01)	0.983***	(0.01)	1.061***	(0.00)
University > 40 k students	1.745***	(0.15)	1.365***	(0.12)	1.036	(0.06)	0.676***	(0.03)
Constant	0.000***	(0.00)	0.000***	(0.00)	1.888	(0.94)	0.000***	(0.00)
Observations	34,739							

Notes: Significance at 0.10 (*), 0.05 (**) and 0.01 (***)

Source: Own elaborations of Istat survey on university graduates' vocational integration (2015)

Table 3 Model B—Multinomial logit estimates of Italian graduates' mobility outcomes by graduates' skills (south-to-north mobile graduates only, relative risk ratios, base outcome: return migrant)

	University stayer		Repeat migrant	
	RRR	(Std. Err)	**RRR**	(Std. Err)
Standardized marks	1.209***	(0.04)	1.289***	(0.05)
Standardized marks (squared)	1.002	(0.01)	1.022	(0.01)
Parents' education (ref. none, primary or missing)				
Lower secondary	1.012	(0.11)	1.413***	(0.18)
Upper secondary	1.095	(0.13)	1.444***	(0.19)
Tertiary	0.384***	(0.13)	0.904	(0.30)
Has self-employed parent(s) (ref. no)				
Yes	0.639***	(0.06)	0.722***	(0.07)
Gender (ref. male)				
Female	1.366***	(0.12)	0.961	(0.09)
Age at graduation (ref. 21–22)				
23–24	1.501	(0.44)	1.559	(0.48)
25–29	1.264	(0.37)	1.109	(0.34)
30 +	0.607	(0.19)	0.573*	(0.19)
Field of study (ref. humanities)				
Econ & stats	1.332*	(0.22)	1.030	(0.19)
Social policy	1.109	(0.18)	1.067	(0.19)
Sciences	1.598***	(0.27)	1.420*	(0.26)
Law	0.747	(0.14)	0.445***	(0.10)
Engineering	3.747***	(0.64)	2.837***	(0.52)
Architecture	1.354	(0.30)	0.855	(0.23)
Medical & health	2.215***	(0.41)	1.700***	(0.34)
Sports sciences	1.846**	(0.54)	0.468*	(0.20)
Type of degree (ref. bachelor's)				
5-year cycle degree	3.302***	(0.51)	1.526**	(0.27)
Master's degree	2.175***	(0.31)	1.521***	(0.24)
Regional GDP per capita	1.008	(0.01)	0.994	(0.01)
University quality index	1.071***	(0.02)	1.069***	(0.02)
University > 40 k students	4.265***	(0.75)	2.353***	(0.42)
Constant	0.000***	(0.00)	0.001***	(0.00)
Observations	3,618			

Notes: Significance at 0.10 (*), 0.05 (**) and 0.01 (***)

Source: Own elaborations of Istat survey on university graduates' vocational integration (2015)

Table 4 Model C—Multinomial logit estimates of Italian graduates' mobility outcomes by graduates' area of origin and parental occupation (relative risk ratios, base outcome: non-migrant)

	University stayer		Repeat migrant		Late migrant		Return migrant	
	RRR	(Std. Err)	RRR	(Std. Err)	RRR	(Std. Err)	RRR	(Std. Err)
Standardized marks	1.096***	(0.02)	1.147***	(0.03)	1.074***	(0.02)	0.958***	(0.01)
Standardized marks (squared)	1.009	(0.01)	1.025**	(0.01)	1.012**	(0.01)	1.012**	(0.01)
Self-employed parent # area of origin (ref. centre)								
North-west # self-employed parent	0.920	(0.19)	0.809	(0.19)	1.236*	(0.16)	0.973	(0.11)
North-east # self-employed parent	0.729	(0.15)	0.791	(0.18)	1.119	(0.15)	0.712***	(0.08)
South # self-employed parent	0.590***	(0.10)	0.721*	(0.13)	0.948	(0.11)	1.016	(0.11)
Area of origin (ref. centre)								
North-west	0.993	(0.13)	0.844	(0.11)	0.604***	(0.04)	1.157**	(0.08)
North-east	0.423***	(0.05)	0.386***	(0.05)	0.930	(0.07)	0.894	(0.06)
South	54.757***	(5.90)	35.978***	(3.99)	0.953	(0.09)	12.642***	(0.91)
Parents' education (ref. none, primary or missing)								
Lower secondary	1.104	(0.08)	1.375***	(0.11)	1.109**	(0.05)	1.010	(0.04)
Upper secondary	1.422***	(0.11)	1.782***	(0.15)	1.469***	(0.08)	1.050	(0.05)
Tertiary	0.595**	(0.15)	1.467*	(0.32)	1.157	(0.16)	1.247*	(0.14)
Has self-employed parent(s) (ref. no)								
Yes	1.466***	(0.21)	1.244	(0.19)	0.895	(0.08)	1.285***	(0.11)
Gender (ref. male)								
Female	0.994	(0.06)	0.744***	(0.05)	0.822***	(0.03)	0.798***	(0.03)
Age at graduation (ref. 21–22)								
23–24	1.220	(0.25)	1.175	(0.24)	0.923	(0.11)	0.844*	(0.08)
25–29	1.088	(0.22)	0.977	(0.20)	0.779**	(0.09)	0.847*	(0.08)
30 +	0.937	(0.20)	0.897	(0.20)	0.545***	(0.07)	1.561***	(0.16)
Field of study (ref. humanities)								
Econ & stats	0.882	(0.10)	0.724***	(0.08)	0.912	(0.07)	0.700***	(0.05)
Social policy	1.281**	(0.14)	1.171	(0.13)	0.991	(0.08)	1.049	(0.07)
Sciences	1.355***	(0.14)	1.047	(0.11)	1.551***	(0.11)	0.850**	(0.06)

Table 4 (continued)

	University stayer		Repeat migrant		Late migrant		Return migrant	
	RRR	(Std. Err)	RRR	(Std. Err)	RRR	(Std. Err)	RRR	(Std. Err)
Law	1.013	(0.12)	0.608***	(0.09)	0.635***	(0.06)	1.338***	(0.09)
Engineering	1.304**	(0.14)	1.043	(0.11)	1.696***	(0.12)	0.594***	(0.04)
Architecture	1.246	(0.17)	0.983	(0.15)	0.929	(0.10)	1.026	(0.09)
Medical & health	1.715***	(0.19)	1.047	(0.13)	0.905	(0.07)	1.024	(0.07)
Sports sciences	1.158	(0.22)	0.578**	(0.13)	0.496***	(0.08)	0.956	(0.09)
Type of degree (ref. bachelor's)								
5-year cycle degree	2.610***	(0.26)	1.175	(0.13)	0.973	(0.07)	0.763***	(0.04)
Master's degree	2.552***	(0.25)	1.747***	(0.18)	1.376***	(0.08)	1.090*	(0.06)
Regional GDP per capita	1.074***	(0.00)	1.062***	(0.00)	0.990***	(0.00)	1.055***	(0.00)
University quality index	1.143***	(0.01)	1.131***	(0.01)	0.983***	(0.01)	1.061***	(0.00)
University > 40 k students	1.740***	(0.15)	1.359***	(0.12)	1.030	(0.06)	0.672***	(0.03)
Constant	0.000***	(0.00)	0.000***	(0.00)	1.888	(0.94)	0.000***	(0.00)
Observations	34,739							

Notes: Significance at 0.10 (*), 0.05 (**) and 0.01 (***)

Source: Own elaborations of Istat survey on university graduates' vocational integration (2015)

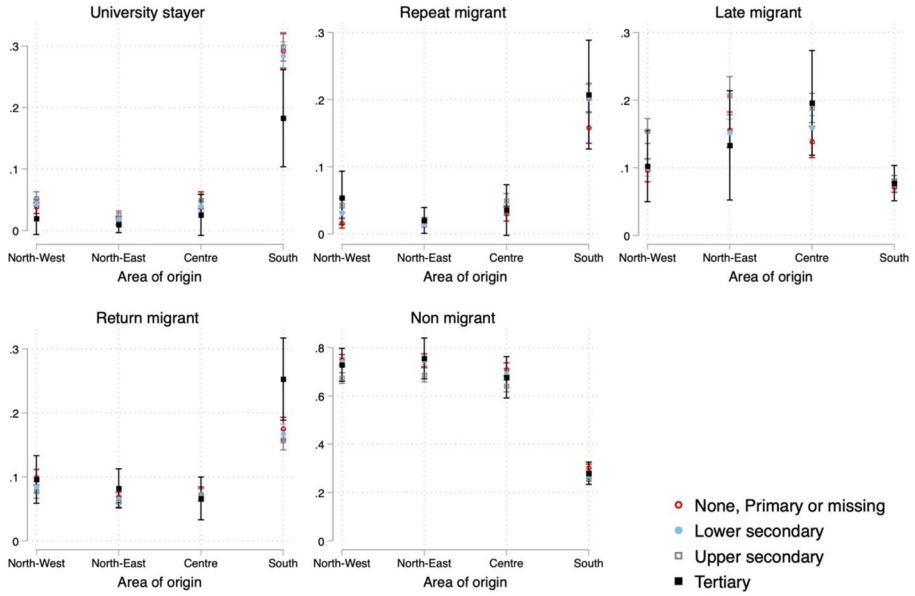

Fig. 8 Adjusted predicted probabilities of Italian graduates' mobility outcomes by parental education and graduates' area of origin (model D, 95% CI). Source: Own elaborations of Istat survey on university graduates' vocational integration (2015)

Author contribution Francesca Tosi: writing—review and editing, writing—original draft preparation, validation, software, methodology, investigation, formal analysis, data curation, conceptualization, funding acquisition; Roberto Impicciatore: writing—review and editing, writing—original draft preparation, validation, methodology, investigation, formal analysis, conceptualization; Rosella Rettaroli: writing—review and editing, writing—original draft preparation, validation, supervision, methodology, investigation, formal analysis, conceptualization.

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Data availability The datasets generated and analysed during the current study are not publicly available due to privacy restrictions applied to Istat micro-data. Additional information on the datasets is available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate Not applicable.

Conflict of interest The authors declare no competing interests.

References

Abramovsky, L., Harrison, R., & Simpson, H. (2007). University research and the location of business R&D. *The Economic Journal, 117*(519), C114–C141.

Anselin, L., Varga, A., & Acs, Z. (1997). Local geographic spillovers between university research and high technology innovations. *Journal of Urban Economics, 42*(3), 422–448.

Bacci, S., & Bertaccini, B. (2020). Assessment of the university reputation through the analysis of the student mobility. *Social Indicators Research*. https://doi.org/10.1007/s11205-020-02322-x

Ballarino, G., Colombo, S., Panichella, N., & Piolatto, M. (2022). Human capital dynamics: The geographical mobility of high-school graduates towards university in Italy. *Regional Studies, 56*(6), 921–939. https://doi.org/10.1080/00343404.2021.1912723

Barbieri, P. (2003). Social capital and self-employment: A network analysis experiment and several considerations. *International Sociology, 18*(4), 681–701.

Barone, C. (2012). *Le trappole della meritocrazia*. Il Mulino.

Baryla, E. A., Jr., & Dotterweich, D. (2001). Student migration: Do significant factors vary by region? *Education Economics, 9*(3), 269–280. https://doi.org/10.1080/09645290110086135

Battistin, E., & Schizzerotto, A. (2019). Threat of grade retention, remedial education and student achievement: Evidence from upper secondary schools in Italy. *Empirical Economics, 56*, 651–678. https://doi.org/10.1007/s00181-018-1443-6

Becker, S., Ichino, A., & Peri, G. (2004). How large is the «brain drain» from Italy? *Giornale Degli Economisti, 63*(1), 1–32.

Beine, M., Noël, R., & Ragot, L. (2014). Determinants of the international mobility of students. *Economics of Education Review, 41*, 40–54. https://doi.org/10.1016/j.econedurev.2014.03.003

Bell, M., Charles-Edwards, E., Ueffing, P., Stillwell, J., Kupiszewsky, M., & Kupiszewska, D. (2015). Internal migration and development: Comparing migration intensities around the world. *Population and Development Review, 41*(1), 33–58. https://doi.org/10.1111/j.1728-4457.2015.00025.x

Berry, C. R., & Glaeser, E. L. (2005). The divergence of human capital levels across cities. *Papers in Regional Science, 84*(3), 407–444.

Billari, F. C. (2023). *Domani è oggi: costruire il futuro con le lenti della demografia*. Egea.

Borjas, G. (1994). The economics of immigration. *Journal Of Economic Literature, 32*(4), 1667–1717.

Brunello, G., & Cappellari, L. (2008). The labour market effects of *Alma Mater*: Evidence from Italy. *Economics of Education Review, 27*(5), 564–574. https://doi.org/10.1016/j.econedurev.2007.05.004

Capuano, S. (2012). The south–north mobility of Italian college graduates An Empirical Analysis. *European Sociological Review, 28*(4), 538–549. https://doi.org/10.1093/esr/jcr023

Champion, T., Cooke, T., & Shuttleworth, I. (2017). Internal migration in the developed world: Are we becoming less mobile? *Routledge*. https://doi.org/10.4324/9781315589282

Champion, T., Green, A., & Kollydas, K. (2024). The gainers and losers from the United Kingdom's university-related migration: A subregional analysis of Graduate Outcomes Survey data. *Population, Space and Place, 30*(5), e2757. https://doi.org/10.1002/psp.2757

Chiswick, B. R. (1999). Are immigrants favorably self-selected? *American Economic Review, 89*(2), 181–185. https://doi.org/10.1257/aer.89.2.181

Ciriaci, D. (2014). Does university quality influence the interregional mobility of students and graduates? The Case of Italy. *Regional Studies, 48*(10), 1592–1608. https://doi.org/10.1080/00343404.2013.821569

Corcoran, J., & Faggian, A. (2017). Graduate migration and regional development: An international perspective. In J. Corcoran & A. Faggian (Eds.), *Graduate migration and regional development: An international perspective* (pp. 1–10). Edward Elgar.

Coulombe, S. (2006). Internal migration, asymmetric shocks, and interprovincial economic adjustments in Canada. *International Regional Science Review, 29*(2), 199–223.

Coulombe, S., & Tremblay, J. F. (2009). Migration and skills disparities across the Canadian provinces. *Regional Studies, 43*(1), 5–18.

D'Agostino, A., Ghellini, G., & Longobardi, S. (2019). Out-migration of university enrolment: The mobility behaviour of Italian students. *International Journal of Manpower, 40*(1), 56–72.

DaVanzo, J. (1976). Differences between return and nonreturn migration: An econometric analysis. *International Migration Review, 10*(1), 13–27.
DaVanzo, J. (1983). Repeat migration in the United States: Who moves back and who moves on? *The Review of Economics and Statistics, 65*(4), 552–559.
Détang-Dessendre, C. (1999). Reciprocal link between exit from unemployment and geographical mobility. *Environment and Planning A, 31*(8), 1417–1431.
Dotti, N. F., Fratesi, U., Lenzi, C., & Percoco, M. (2013). Local labour markets and the interregional mobility of Italian university students. *Spatial Economic Analysis, 8*(4), 443–468. https://doi.org/10.1080/17421772.2013.833342
Faggian, A., & McCann, P. (2006). Human capital flows and regional knowledge assets: A simultaneous equation approach. *Oxford Economic Papers, 58*(3), 475–500. https://doi.org/10.1093/oep/gpl010
Faggian, A., & McCann, P. (2009). Universities, agglomerations and graduate human capital mobility. *Tijdschrift voor Economische en Sociale Geografie, 100*(2), 210–223.
Faggian, A., McCann, P., & Sheppard, S. C. (2006). An analysis of ethnic differences in UK graduate migration behaviour. *Annals of Regional Science, 40*(2), 461–471. https://doi.org/10.1007/s00168-006-0061-y
Faggian, A., Rajbhandari, I., & Dotzel, K. R. (2017). The interregional migration of human capital and its regional consequences: A review. *Regional Studies, 51*(1), 128–143. https://doi.org/10.1080/00343404.2016.1263388
Faini, R. (2003). Is the Brain Drain an Unmitigated Blessing? *WIDER Working Paper Series*, Articolo DP2003–64. https://ideas.repec.org//p/unu/wpaper/dp2003-64.html. Accessed 20 July 2024.
Felice, E. (2013). *Perché il Sud è rimasto indietro*. Il Mulino.
Ferrara, A. R., & Nisticò, R. (2018). La mobilità degli studenti universitari in Italia. *Rivista Economica Del Mezzogiorno., 1–2*, 117–138. https://doi.org/10.1432/91437
Fielding, A. J. (1992). Migration and social mobility: South East England as an escalator region. *Regional Studies, 26*(1), 1–15. https://doi.org/10.1080/00343409212331346741
Fini, R., Meoli, A., & Sobrero, M. (2022). University graduates' early career decisions and interregional mobility: Self-employment versus salaried job. *Regional Studies, 56*(6), 972–988.
Fratesi, U., & Riggi, M. R. (2007). Does migration reduce regional disparities? The role of skill-selective flows. In *Review of Urban & Regional Development Studies: Journal of the Applied Regional Science Conference* 19(1), pp 78–102.
Fratesi, U., & Percoco, M. (2014). Selective migration, regional growth and convergence: Evidence from Italy. *Regional Studies, 48*(10), 1650–1668. https://doi.org/10.1080/00343404.2013.843162
Genova, V. G., & Boscaino, G. (2024). Chain migration and student mobility in Sicily. *Higher Education*, 1–18. https://doi.org/10.1007/s10734-024-01336-5
Genova, V. G., Ruiu, G., Attanasio, M., Ermacora, M., & Breschi, M. (2024). Student mobility in Southern Italy: An empirical analysis of preferential patterns. *Genus, 80*(1), 17.
Genova, V. G., Tumminello, M., Aiello, F., & Attanasio, M. (2021). A network analysis of student mobility patterns from high school to master's. *Statistical Methods & Applications, 30*, 1445–1464.
Giambona, F., Porcu, M., & Sulis, I. (2017). Students mobility: Assessing the determinants of attractiveness across competing territorial areas. *Social Indicators Research, 133*, 1105–1132.
Giannetti, M. (2001). Skill complementarities and migration decisions. *Labour, 15*(1), 1–31.
Gottlieb, P. D., & Joseph, G. (2006). College to work migration of technology graduates and holders of doctorates within the United States. *Journal of Regional Science, 46*(4), 627–659.
Graziani, A. (1978). The Mezzogiorno in the Italian economy. *Cambridge Journal of Economics, 2*(4), 355–372.
Groen, J. A. (2004). The effect of college location on migration of college-educated labor. *Journal of Econometrics, 121*(1–2), 125–142.
Holdsworth, C. (2009). 'Going away to uni': Mobility, modernity, and independence of English higher education students. *Environment and Planning A, 41*(8), 1849–1864. https://doi.org/10.1068/a41177
Iammarino, S., & Marinelli, E. (2015). Education–job (mis) match and interregional migration: Italian university graduates' transition to work. *Regional Studies, 49*(5), 866–882.
Impicciatore, R., & Panichella, N. (2019). Internal migration trajectories, occupational achievement and social mobility in contemporary Italy. A life course perspective. *Population, Space and Place, 25*(6), e2240.
Impicciatore, R., & Strozza, S. (2016). Lasciare il Mezzogiorno. *il Mulino*, 1/2016. https://doi.org/10.1402/82260
Impicciatore, R., & Tosi, F. (2019). Student mobility in Italy: The increasing role of family background during the expansion of higher education supply. *Research in Social Stratification and Mobility, 62*, 100409. https://doi.org/10.1016/j.rssm.2019.100409

Istat (2018). Survey on university graduates' vocational integration 2015. Italian national institute of statistics.

Justman, M., & Thisse, J.-F. (2000). Local public funding of higher education when skilled labor is imperfectly mobile. *International Tax and Public Finance, 7*(3), 247–258. https://doi.org/10.1023/A:1008705528650

Kanbur, R., & Rapoport, H. (2005). Migration selectivity and the evolution of spatial inequality. *Journal of Economic Geography, 5*(1), 43–57.

Kitagawa, F., Marzocchi, C., Sánchez-Barrioluengo, M., & Uyarra, E. (2022). Anchoring talent to regions: The role of universities in graduate retention through employment and entrepreneurship. *Regional Studies, 56*(6), 1001–1014. https://doi.org/10.1080/00343404.2021.190413

Kwok, V., & Leland, H. (1982). An economic model of the brain drain. *The American Economic Review, 72*(1), 91–100.

Laband, D. N., & Lentz, B. F. (1992). Self-recruitment in the legal profession. *Journal of Labor Economics, 10*(2), 182–201.

Leach, J. (1996). Training, migration, and regional income disparities. *Journal of Public Economics, 61*(3), 429–443.

Lindquist, M. J., Sol, J., & Van Praag, M. (2015). Why do entrepreneurial parents have entrepreneurial children? *Journal of Labor Economics, 33*(2), 269–296. https://doi.org/10.1086/678493

Marinelli,. (2013). Sub-national graduate mobility and knowledge flows: An exploratory analysis of onward- and return-migrants in Italy. *Regional Studies, 47*(10), 1618–1633. https://doi.org/10.1080/00343404.2012.709608

Montgomery, J. D. (1991). Social networks and labor-market outcomes: Toward an economic analysis. *The American Economic Review, 81*(5), 1408–1418.

Nifo, A., & Vecchione, G. (2014). Do institutions play a role in skilled migration? The Case of Italy. *Regional Studies, 48*(10), 1628–1649. https://doi.org/10.1080/00343404.2013.835799

Panichella, N., & Impicciatore, R. (2024). The selectivity of internal movers: An analysis of the relationship between education, social origin, and geographical mobility in Europe. *Population Studies, 78*(3), 393–411.

Piras, R. (2005). Il contenuto di capitale umano dei flussi migratori interregionali: 1980–2002. *Politica Economica, 3*, 461–491.

Pozzoli, D. (2009). The transition to work for Italian university graduates. *Labour, 23*(1), 131–169. https://doi.org/10.1111/j.1467-9914.2008.00442.x

Rosina, A., & Impicciatore, R. (2022). *Storia demografica d'Italia. Crescita, crisi e sfide*. Roma: Carocci editore.

Santelli, F., Scolorato, C., & Ragozini, G. (2019). On the determinants of student mobility in an interregional perspective: A focus on Campania region. *Statistica Applicata-Italian Journal of Applied Statistics, 1*, 119–142.

Santelli, F., Ragozini, G., & Vitale, M. P. (2022). Assessing the effects of local contexts on the mobility choices of university students in Campania region in Italy. *Genus, 78*(5), 1–25. https://doi.org/10.1186/s41118-021-00144-4

Schwartz, A. (1976). Migration, age, and education. *Journal of Political Economy*, *84*(4, Part 1), 701–719. https://doi.org/10.1086/260472

Tosi, F. (2024). Transizione scuola-lavoro, mobilità dei giovani qualificati e disuguaglianze territoriali in Italia. *BANCARIA, 6*, 24–33.

Tosi, F., Impicciatore, R., & Rettaroli, R. (2019). Individual skills and student mobility in Italy: A regional perspective. *Regional Studies, 53*(8), 1099–1111. https://doi.org/10.1080/00343404.2018.1528008

Vandenbussche, J., Aghion, P., & Meghir, C. (2006). Growth, distance to frontier and composition of human capital. *Journal of Economic Growth, 11*, 97–127.

Vecchione, G. (2017). Migrazioni intellettuali ed effetti economici sul Mezzogiorno d'Italia. *Rivista economica del Mezzogiorno*, *3*. https://doi.org/10.1432/88873

Venhorst, V., Van Dijk, J., & Van Wissen, L. (2011). An analysis of trends in spatial mobility of Dutch graduates. *Spatial Economic Analysis, 6*(1), 57–82. https://doi.org/10.1080/17421772.2010.540033

Wahba, J. (2015). Selection, selection, selection: The impact of return migration. *Journal of Population Economics, 28*, 535–563.