



Migration-Related Differences in Academic Outcomes: Insights from the Italian Higher Education System

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Received: 26 May 2025 / Accepted: 27 November 2025
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Abstract

This study investigates differences in academic attainment among Italian students, international students, and second-generation students enrolled in Bachelor's degree programmes at Italian universities in the 2015/2016 academic year. Drawing on longitudinal administrative data and applying multinomial logistic regression models, we analyse the influence of socio-demographic factors and prior educational achievement on academic outcomes. The results show significant differences in academic attainment between Italian students and those with a migrant background, with nuanced distinctions between groups based on citizenship and prior educational background. This research highlights the need for policy interventions to enhance educational opportunities for students with a migrant background.

Keywords Students with migrant backgrounds · University · Bachelor completion · Dropout · Italy

Introduction

Recent demographic and social statistical research about higher education in Italy has shown that students with migrant backgrounds display significant heterogeneity, varying in the reason for their stay (Norton et al., 2022), country of origin, sex,

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age at arrival in the host country (Aiello et al. 2020, Di Patrizio et al., 2023; ISTAT, 2020; MUR, 2025), and socio-economic background (Azzolini & Barone, 2013; Contini & Triventi, 2016). Each of these factors plays an important role in shaping academic outcomes (e.g., Freudenthaler et al., 2008; Giudici et al., 2021; Heath et al., 2008; OECD, 2022; Ravecca 2010; Schnell & Azzolini, 2015).

A common distinction in the Italian literature is between international students (IS), defined as students with foreign citizenship who completed high school in a different country, and second-generation students (SG), who hold foreign citizenship but completed high school in the country where they enrol in university (Giudici et al., 2021). This distinction reflects a limitation of the available data, since most Italian data do not collect information on parents' country of birth or citizenship. Traditional immigration countries have long had substantial shares of SG within their education systems. At the same time, there has been a substantial increase in the number of IS across all destination countries in recent decades, except during the COVID-19 pandemic (OECD, 2022; Schnell & Azzolini 2015).¹ This growth highlights the evolving landscape of higher education, where both SG and IS are becoming increasingly prominent. The two groups, although distinct, emphasise the growing diversity and complexity within education systems worldwide.

In Italy, research on the attainment of students with migrant backgrounds has emerged only recently, driven by the increasing numbers of migrant students in schools (ISTAT, 2020) and universities (MUR 2025). This demographic shift has required the education system to adapt as an increasingly diverse student population has created challenges in addressing language barriers, supporting integration, and ensuring equal access to education for all students. Most existing studies in the Italian literature have focused on school-level attainment (e.g., Azzolini et al. 2019; Gabrielli & Impicciatore, 2022; Mussino & Strozza, 2012), while evidence on attainment at higher academic levels is sparse, largely due to the limited availability of data. Where available, research either uses institution-specific data (Belloc et al., 2010; Giudici et al., 2021) or provides a descriptive overview of migrant students in Italian universities (Aiello et al., 2020).

To our knowledge, international literature has largely overlooked the Italian case, as immigration is relatively recent compared to other European countries. Yet, this omission is problematic, as higher education plays a crucial role in shaping opportunities for social mobility and integration. Without systematic evidence on the university trajectories of students with migrant backgrounds, both academic understanding and policy interventions risk being incomplete. At the same time, the specific features of the Italian educational system (see Section [The Italian context](#)) mean that results observed elsewhere are only partially transferable. Moreover, existing studies—both internationally and in Italy—have typically focused on either IS or SG, but rarely analysed them simultaneously.

All things considered, the present study represents the first national-scale analysis of higher education trajectories of students with migrant backgrounds in Italy. By

¹ In 2022, the number of admissions of IS to universities in OECD countries neared 2 million, representing a 24% increase from 2019, and the highest number ever recorded (OECD, 2023).

using longitudinal administrative microdata from the *Anagrafe Nazionale Studenti* (ANS) of the Italian Ministry of University and Research (MUR), which cover the full population of students enrolled at Italian universities, this study analyses differences between Italian students, IS, and SG enrolled in first-year Bachelor's programmes during the 2015/2016 academic year. Specifically, tracking students for four years, the study pursues three aims: (1) to assess whether IS and SG differ from Italian students in their likelihood of completing a Bachelor's degree, dropping out, or remaining enrolled at the end of the study period; (2) focusing only on Italian and SG students, to explore variation within SG students by country or area of origin; and (3) to analyse whether cultural and linguistic proximity to Italy is associated with more favourable outcomes for SG students. By doing so, the study sheds light on how individual, structural, and contextual factors shape academic attainment in a relatively new immigration country, offering insights relevant for comparative research on higher education and migration.

Background

Theoretical Framework and International Empirical Evidence

Educational outcomes for students with migrant backgrounds are shaped by both their prior academic preparation and the choices they make along their educational trajectories. Following Boudon's framework (1974), these mechanisms can be distinguished into *primary effects*, which reflect differences in academic performance due to social and economic resources, and *secondary effects*, which capture differences in educational choices conditional on performance, shaped by aspirations, cultural and social capital, and perceived returns to education. Building on the work of Bourdieu (1986) and Coleman (1988), research highlights that cultural, social, and economic capital strongly influence educational outcomes. For instance, students with greater access to social networks, parental guidance, and culturally valued resources tend to achieve higher academic success, while limited access to these forms of capital can hinder attainment (Parcel & Dufur, 2001; Pishghadam & Zabihi, 2011; Sullivan, 2001). These mechanisms provide a framework for understanding variation in academic outcomes. Migration background itself is not a direct determinant of attainment; instead, it reflects unequal exposure to the resources and constraints described above. In this sense, international research has usually differentiated between IS and SG, whose distinct educational experiences give rise to specific patterns of advantage and disadvantage. For IS, outcomes are often shaped by pronounced primary effects, such as language barriers, adaptation difficulties, weaker academic preparedness, and detachment from the broader university community that native students do not experience (Andrade, 2006; Andrade & Evans, 2009; Norton & Fatigante, 2018; Sherry et al., 2010; Slantcheva-Durst & Knaggs, 2019; Smith & Khawaja, 2011; Tavares, 2021). These disadvantages increase the risk of dropout and hinder integration into the university environment. Such differences can also be linked to the unequal distribution of social and cultural capital upon arrival: IS often lack

the local networks and familiarity with the host country's educational norms that support academic success (Bourdieu, 1986; Coleman, 1988).

In contrast, SG students illustrate the importance of secondary effects. Even when prior performance is comparable to native peers, SG tend to pursue more demanding tracks and continue their studies, reflecting mechanisms, such as parental expectations, intergenerational transmission of cultural capital, and the perception of education as a safeguard against discrimination (Feliciano, 2020; Griga & Hadjar, 2014; Ichou, 2014; Mishra, 2020; Waters & Brooks, 2013). This pattern—sometimes referred to as *positive selection* or *immigrant optimism*—demonstrates how access to cultural and social capital can facilitate academic attainment despite structural disadvantages (Cebolla-Boado, 2011; Dollmann, 2017; Feliciano & Lanuza, 2017).

Empirical evidence also highlights heterogeneity in SG outcomes across countries and regions of origins (Orupabo et al., 2020). In Western Europe, SG from non-European, low- and middle-income backgrounds often perform worse and face higher dropout risks, whereas some—such as Indians in the UK and Norway, and Chinese in the UK—outperform the majority population (Heath et al., 2008). After controlling for social background and prior achievement, SG also tend to enrol in more demanding or prestigious programmes than peers from non-immigrant backgrounds (Cebolla-Boado, 2011; Griga & Hadjar, 2014; Waters & Brooks, 2013). These patterns can be understood theoretically through *migrant selectivity theory* (Feliciano, 2005, 2020), which posits that SG outcomes depend on parents' education and socioeconomic characteristics in the country of origin. Moreover, *contextual* and *institutional factors* in the host country—such as school structures, integration policies, and labour market conditions—mediate the translation of parental selectivity and optimism into actual attainment (Heath et al., 2008; Ichou, 2014), explaining cross-country heterogeneity in SG outcomes.

An additional source of heterogeneity concerns sex-specific academic patterns. Prior research shows that male and female students often follow distinct trajectories in higher education attainment (e.g., Richardson et al., 2020), and these differences may be particularly pronounced among students with migrant backgrounds (Freudenthaler et al., 2008; Lagomarsino & Ravecca, 2014, p. 41; Ravecca, 2010). From an intersectional perspective, Gross et al. (2016) highlight that migration background and gender jointly shape educational opportunities and constraints, with women of migrant origin in some cases outperforming their male peers. These findings emphasise that educational trajectories are not gender-neutral. Scholars attribute these differences to a combination of individual and contextual factors, including personal attributes, socioeconomic status, and the adaptability of secondary school systems (Alyahyan & Düşteğör, 2020).

Taken together, these theoretical and empirical insights provide a coherent framework for analysing migration-related differences in academic outcomes in Italy.

The Italian Context

The Immigration Phenomenon

Italy shifted from being an emigration country to an immigration country in the 1980s, a transition that has led to a significant increase in the number of children born to immigrant parents.² This has become evident in the Italian education system, first in kindergartens in the 1990s, then in primary and secondary schools from the beginning of the 2000s (see Fig. 1A in the Supplementary Information). By the 2020s, these cohorts had reached university age, and their presence in Italian universities had emerged as an important issue.

National statistics report that nearly 22,813 students with foreign citizenship enrolled in Italian universities during the 2023/2024 academic year, accounted for 7% of the total. Considering both SG and IS together, Eastern European citizens were the largest group (25% of the foreign student population in 2023/2024), with substantial communities from Romania (9.6%) and Albania (6.6%). These were followed by students from North Africa, with Moroccan students representing the largest group (3.2%) and Asia (in particular, China 6.7% and India 4.3%) (MUR, 2024). Starting from the 2013/2014 academic year, SG outnumbered IS. However, from 2015/2016 onward, the proportion of migrant students who were SG gradually declined. The only exception was during the pandemic, when the share of SG reached 40.7% in 2022/2023. This trend was primarily due to a substantial increase in IS, whose numbers have more than doubled over the past decade (Giudici et al., 2024).

The Education System

In Italy, education is compulsory from ages 6 to 16. The first cycle comprises eight years of primary and lower secondary schooling, after which students continue into upper secondary education. At this stage, the system is tripartite (Contini & Scagni, 2013), offering a choice between general (licei), technical (istituti tecnici), and vocational (istituti professionali) tracks. The general track is the most frequently chosen pathway (it accounts for over 50% of enrolments) and is primarily oriented toward university preparation. It is followed by the technical track (about one third of enrolments), which combines general education with vocational and technological training and provides access to both higher education and the labour market, and the vocational (less than one fifth) programmes, which are designed mainly for direct entry into employment (MI, 2025). Despite these distinctions, access to the tertiary level is generally open to all secondary graduates—who typically enter university between the ages of 18 and 19—although some fields of study are subject to selective entrance examinations.

² In 2023, approximately 21% of the overall migrant population consisted of children of immigrants (1,081,142 individuals aged 0-18). This group constituted 11.2% of the resident youth population (ISTAT, 2023).

Since the signing of the Bologna Agreement in 1999 (DM 509/1999), the tertiary level has undergone significant transformations and has been structured into three cycles: the *laurea triennale* (bachelor's degree), a three-year programme; the *laurea magistrale* (master's degree), a two-year programme; the *dottorato di ricerca* (PhD), a three-year programme. However, some degree programmes, including Medicine and Architecture, have remained single-cycle courses, typically lasting five or six years.

Although all three upper-secondary education pathways formally grant access to higher education, progression rates differ markedly. Graduates from technical and vocational schools are considerably less likely to continue their studies compared to those from the general track. This divergence is even more pronounced among students with a migrant background: 51% of Italian students and nearly 34% of migrant students enrol in higher education (MIUR, 2016). Unlike their Italian peers, migrant students in Italy are disproportionately concentrated in technical and vocational schools (Barban & White, 2011; Borrini & De Sanctis 2018; Ferrara & Brunori, 2024). This pattern contrasts with trends observed in other European countries (except Germany)—especially Northern European countries with a long-standing history of immigration—where, controlling for other factors, children of immigrants are more likely than their native peers to enrol in more demanding academic tracks (Birkelund, 2020; Dollmann, 2017; Dollmann & Weißmann, 2020). At the same time, coming from a non-academic track does not prevent them from enrolling at university; This, however, it may lead academically weaker students to embark on less feasible educational trajectories, resulting in widening ethnic gaps in dropout rates and achievement (Birkelund, 2020).

Regarding academic career, it is worth noting that, in Italy, 58.7% of students who graduated in 2024 completed their studies within the time limits established by university regulations. According to Almalaurea, in 2023 Bachelor's graduates took, on average, 34% longer to complete their studies than the prescribed duration of the programme. Differences are evident in relation to geographic mobility: students who obtained their secondary school diploma abroad took 16.1% longer to complete their studies than those who graduated from secondary school in Italy and pursued university studies in the same region (Almalaurea, 2025). Moreover, empirical analysis based on local case studies shows that children of migrants experience longer time to complete their study programmes and higher dropout rates than their Italian peers (Azzolini & Barone, 2013; Giudici et al., 2021).

Considering that research on the academic achievement of migrant students in Italy remains underdeveloped, particularly at the national level, this study is of particular interest in the relevant literature, as it provides novel evidence on immigrant-native gaps in long-term educational outcomes within a comprehensive education system such as the Italian one, in which the decision to enter university can be deferred until the completion of upper-secondary education.

Empirical Evidence in Italy

Italian literature has extensively explored educational differences between native and migrant students in primary and secondary schools across the country. These differences manifest early in the educational path and persist into secondary school, notably in absences, delays, and dropout rates (Azzolini & Barone, 2013; Contini & Azzolini, 2016; Strozza, 2008). Official statistics show that 26.4% of students with foreign citizenship experienced school delays in the 2022/2023 school year, compared with only 7.9% of Italian students. The largest gap occurs in upper secondary school, where the percentages of students with school delay rise to 48.0% and 16.0%, respectively. For the same school year, the dropout rate for students with foreign citizenship was 40.3%, versus 13.7% for Italian students (MUR, 2024).

PISA results further support evidence of the impediments experienced by students with foreign citizenship. These reveal significant educational discrepancies in Italy (Santagati & Ongini, 2016). The challenges encountered by SG throughout their school career contribute to a selective process at university entry that has varying degrees of impact across different communities. Studies show that migrant students are less likely to enrol in tertiary education than their Italian peers, underscoring their continuing disadvantage from high school to university (Bertozzi, 2018; Di Patrizio et al., 2023; Lagomarsino & Ravecca, 2014; Paba & Bertozzi, 2017; .

A range of factors contribute to these educational differences, including socioeconomic status, cultural background (Azzolini et al., 2019), negative school-related attitudes and behaviours, language barriers (Triventi et al., 2022), and the quality of relationships with peers and teachers. These elements are crucial for school integration, particularly for the most marginalised groups (Colombo et al., 2014; Gabrielli et al., 2022). Addressing these elements early on is essential, as they directly influence SG students' preparedness and ability to pursue higher education. Recently, Gabrielli and Impicciatore (2022) highlighted the most significant educational challenges that immigrant children face in Italy, showcasing their high rate of early disengagement from education and training in contrast to their European counterparts.

Overall, due to the relatively recent nature of the immigration phenomenon in Italy compared to other European countries, the Italian educational system still lacks comprehensive strategies to effectively address the issues faced by disadvantaged students with a migratory background (Gabrielli & Impicciatore, 2022).

As noted above, research in Italy has predominantly addressed the native-migrant gap in primary and secondary schooling, while tertiary education has received far less attention. This neglect is largely due to an absence of comprehensive longitudinal data at the national level, which has restricted Italy's inclusion in comparative studies. Most existing work therefore relies on surveys or specific institutional microdata. For instance, Belloc et al. (2010) examined dropout rates within the Economics and Business faculty at Sapienza University of Rome, finding that non-Italian students were less likely to dropout than their Italian peers. Similarly, Norton et al. (2022) conducted a survey-based typification of IS at the same university, highlighting significant heterogeneity in their experiences and profiles, while Giudici et al. (2021) compared academic attainment of IS and SG with that of Italian students at Sapienza and observed substantial differences in Bachelor's degree

completion rates, with SG resembling Italians more than IS. At the national level, Aiello et al. (2020) provide a valuable descriptive overview of migrant students in Italian higher education, but their study does not analyse the determinants of attainment in detail, nor does it consider variation by country of origin or cultural proximity. Consequently, important dimensions of migrant students' trajectories in Italian universities remain unexplored—a gap this study directly addresses.

Research Hypotheses

Drawing from the aforementioned theoretical framework and empirical evidence on school achievement and academic attainment, we formulated the following hypotheses:

Hypothesis 1 (H1):

Migrant students (both IS and SG) are expected to experience lower academic attainment than Italian students, reflected in longer times to complete a Bachelor's degree and higher dropout rates. These differences are expected to be more pronounced for IS, due to stronger primary effects (e.g., language barriers and lower initial academic preparedness). By contrast, SG—who completed their schooling in Italy—are expected to achieve outcomes closer to those of Italian students, supported by secondary effects such as immigrant optimism, parental expectations, and familiarity with the Italian education system;

Hypothesis 2 (H2):

While SG students share the common experience of completing an Italian high school diploma, their academic attainment is expected to vary according to area of origin. Specifically, SG from low- and middle-income countries are expected to achieve lower academic attainment than SG from high-income countries, potentially due to differences in socioeconomic background and other structural factors;

Hypothesis 3 (H3):

Cultural and linguistic proximity—such as shared language families and similar educational norms—and integration patterns are expected to shape variation in SG academic attainment. Specifically, SG students from countries that are culturally and linguistically closer to Italy are expected to achieve outcomes more similar to Italian students, while SG students from more distant backgrounds are expected to show lower academic attainment.

Data and Methods

Data

We used administrative data from the ANS³ of the MUR, which contain information on the university careers of the entire student population enrolled in Italian universities from 2008 to 2022.

Our data comprise 236,266 students enrolled in a three-year Bachelor's degree⁴ in the 2015/2016 academic year. We tracked the entire population for four years, a timeframe considered reasonably long to observe students' academic attainment (e.g., Priulla et al., 2021). This allowed us to include students who graduated within or close to the standard program length (3 years), ensuring comparability in study duration and minimising confounding from unusually prolonged trajectories.

We excluded students enrolled in online universities and those who transferred to online universities within three years (9,143 students, 3.9%). This is due to the distinct graduation patterns of students at online universities, who tend to complete their Bachelor's degrees more quickly than those enrolled in traditional universities (Priulla et al., 2021). Furthermore, the analysis does not include Italian students who pursued higher education abroad. This is because their sample size is relatively small (852 students, 0.4%). We also excluded 4,985 students (2.1%) who transferred to five-year degree programmes (e.g., Law, Medicine, and other health-care programmes).⁵ Finally, we excluded students who did not complete the administrative enrolment process (7024, 3%). Therefore, the final student cohort analysed consists of 214,246 students (203,476 Italians, 6,325 SG, and 4,445 IS).

The data include a wide range of information on students' socio-demographic characteristics (e.g., sex, age at enrolment, citizenship), type of high school attended, final mark at high school and annual university records which provide information on completion status, dropout or study persistence, field of study at university, and the macro-area of the institution (for further details, see Section [Main independent and control variables](#)).

Before proceeding, we should identify some limitations to the ANS data. Firstly, it is important to note that information about students' high school careers, specifically the type of high school they attended, their final high school mark, and information about whether they enrolled at a university in a different region from the one where they attended high school, is limited to students who completed their high school education in Italy, thus only Italians and SG. Secondly, the data do not include information about students' parents' socioeconomic background and education, which, according to the literature (Agasisti & Longobardi, 2014), can influence

³ National Student Registry.

⁴ Please note that within the Italian tertiary education system, there are study programmes known as 'single-cycle programmes' (*corsi a ciclo unico*), which extend over five or six years. Students enrolled in these programmes were excluded from the analysis.

⁵ Students who transferred to five-year degree programmes were excluded from the analysis, as their graduation timelines differ substantially from those in three-year programmes. Most transfers—typically to healthcare programmes—occur within the first one or two years of enrolment, making their trajectories not directly comparable to the rest of the cohort.

students' educational outcomes. Thirdly, we do not have information about migrants' age at arrival in Italy, which is an important factor in students' academic expectations (Riccardi et al., 2019). Finally, we selected the 2015/2016 cohort as the most up-to-date cohort that allows a four-year follow-up and avoids potential biases from the COVID-19 pandemic, which could have influenced students' academic progress and behaviours, particularly those from vulnerable backgrounds.

Methods

Operationalisation of the Dependent Variable

Our dependent variable, '*student status*', captures the academic attainment of students and is operationalised through three mutually exclusive categories:

- 1) Still enrolled: our reference category. This includes students who remain enrolled in the Italian university system at the end of the fourth year; therefore, they have not yet completed their Bachelor's degree. This category captures extended time-to-degree and ongoing academic persistence, regardless of whether the student has switched institutions or degree programmes within the national system.
- 2) Dropout: this category follows the definition by Priulla and Attanasio (2023), identifying students who have not re-enrolled in the Italian university system for two consecutive academic years before obtaining a Bachelor's degree. This criterion explicitly measures system dropout, indicating academic disengagement or failure to progress.
- 3) BA completion within the standard timeframe: this category includes students who successfully complete their Bachelor's degree within the four-year timeframe. It serves as our clearest indicator of academic success.

This variable is designed to explore the spectrum of academic attainment, from persistence and challenges to withdrawal and completion, thus enabling a comparison between Italian and migrant students.

It should be noted that, in this study, the operationalisation adopted to measure dropout also helps circumvent potential bureaucratic biases. In the Italian context, non-EU students with study-related residence permits often avoid submitting a formal university withdrawal, as doing so could jeopardise their residency status. As a result, relying exclusively on official withdrawal records would underestimate the extent of dropout among migrant students. Indeed, previous studies based on administrative withdrawal data reported lower dropout rates for migrant students compared to Italians (Belloc et al., 2010; Giudici et al., 2021; see Section [Empirical evidence in Italy](#)). By adopting a status-based definition that considers students' enrolment and degree completion over time, our measure provides a more accurate account of academic trajectories across different student groups.

Main Independent and Control Variables

We use two classifications for our main explanatory variable, depending on the model (see Section “[Analytical strategy](#)” for details).

1. ‘*Student group*’ categorises students based on their high school diploma and citizenship. Following the literature (e.g., Andrade & Evans, 2009; Feliciano, 2020; Giudici et al., 2021; Orupabo et al., 2020), both IS and SG display distinct behaviours, as do students from low- and middle-income countries (LMIC) and high-income countries (HIC).⁶ Combining information on high school diploma and citizenship, we define five groups:

‘Italians – *reference category*:’ students with Italian citizenship and an Italian high school diploma;

‘Second-generation students from LMIC (SG – LMIC):’ students with citizenship from a LMIC and an Italian high school diploma;

‘Second-generation students from HIC (SG – HIC):’ students with citizenship from an HIC and an Italian high school diploma;

‘International students from LMIC (IS – LMIC):’ students with citizenship from a LMIC and a foreign high school diploma;

‘International students from HIC (IS – HIC):’ students with citizenship from an HIC and a foreign high school diploma.

Before proceeding, our operationalisation of SG students is worth noting. In line with previous research in the Italian context (e.g., Giudici et al., 2021), the definition of the SG student group reflects the constraints of our data, which do not include parental country of birth. While this operationalisation may underestimate the size of the SG population—since some students may have acquired Italian citizenship before university enrolment—it nonetheless captures a meaningful subgroup of students with a migrant background who completed their schooling in Italy. This is particularly relevant given that, in Italy, young people born to migrant parents can typically apply for citizenship only upon turning 18, and the naturalisation process is often lengthy. As a result, many students with a migrant background are still formally classified as foreign citizens at the time of enrolment. We therefore regard this as a reasonable and informative approach for analysing the academic trajectories of SG students.

2. ‘*Student’s area of origin*’ categorises migrant students by citizenship, identifying eleven groups: ‘Italians – *reference category*,’ ‘Albania,’ ‘China,’ ‘Morocco,’ ‘Romania,’ ‘other Central-Eastern European countries (other CEE countries),’ ‘other European countries (other EU countries),’ ‘other HIC,’ ‘Latin America,’ ‘other African countries,’ ‘other Asian countries.’

⁶ This study distinguishes migrants from low- and middle-income countries (LMIC)—those coming from Central-Eastern Europe (CEE), Africa, Asia (except for Israel and Japan), and Latin America—from migrants from all other countries, i.e., high-income countries (HIC) (World Bank, 2023).

We also control for socio-demographic and academic variables (see “[Analytical strategy](#)” for which controls are included in each model):

- age at enrolment (‘ ≤ 19 years old’ or ‘ > 19 years old’): distinguishes students on a regular path from those who experienced repeated years in high school or other potential delays;
- macro-region at the time of enrolment (‘North,’ ‘Centre’ or ‘South and Islands’): accounts for regional differences in educational provision (Abramo et al., 2016);
- field of study of enrolment at university⁷(‘Agriculture & Services,’ ‘Arts, Humanities & Education,’ ‘Business & Law,’ ‘Engineering,’ ‘Health & Welfare,’ ‘Natural sciences, Mathematics & Statistics, ICT’ or ‘Social sciences’): captures differences in academic pathways (Priulla & Attanasio, 2023);
- type of high school diploma obtained (‘humanistic/scientific lyceum,’ ‘other lyceum,’ ‘technical,’ ‘vocational’ or ‘other’): reflects prior educational preparation and can be used as a proxy for parents’ socioeconomic background and education (Ballarino & Panichella, 2016; see Section [Discussion](#) for details);
- high school final mark (continuous variable): the grade achieved at the end of upper-secondary school. It indicates prior academic achievement, following established literature linking school performance to university outcomes (Usala et al., 2025). It is expressed on a 60–100 scale, with 60 as the minimum passing grade. The mark combines performance in written and oral examinations. Although teachers are involved in assessment, the exam is standardised nationwide;
- mobility at enrolment (‘stayer’ or ‘mover’): distinguishes students who relocated for university from those who enrolled locally, as mobility can influence academic performance and adjustment (Attanasio & Priulla, 2020).

Finally, it should be noted that we deliberately decided not to include in the model direct measures of students’ academic performance during university, such as GPA or credits earned. While these variables are known to be strong predictors of academic outcomes (Priulla et al., 2021), they are either unavailable in a harmonised form across institutions or conceptually very close to our dependent variable (dropout, persistence, graduation). Including them would therefore risk conflating explanatory and outcome variables. Nonetheless, we acknowledge that part of the differences observed between student groups may be mediated by university performance, as well as by economic, cultural, or institutional factors, which future research should address more explicitly.

Analytical Strategy

To analyse differences in academic attainment between Italian, SG, and IS students, we apply a generalised multinomial logistic regression model:

⁷ We grouped the field of study of enrolment at university according to the ISCED-F 2013 classification. For further details, see: <https://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-fields-of-education-and-training-2013-detailed-field-descriptions-2015-en.pdf>.

$$\left(\frac{P(Y = j|X_i)}{P(Y = j^*|X_i)} \right) = X_{ij}^T \beta \quad (1)$$

where:

$P(Y = j|X_i)$ is the probability that the outcome Y for observation i falls into category j ,

$P(Y = j^*|X_i)$ is the probability of the reference category j^* ,

X_{ij}^T is the transpose of the vector of predictor variables for observation i ,

β_j is the vector of coefficients specific to category j .

To test our hypotheses, we conducted three separate analyses.

In the first analysis, we consider the whole sample, with the main independent variable being '*student group*': (1) 'Italians – *reference category*,' (2) 'SG – LMIC,' (3) 'SG – HIC,' (4) 'IS – LMIC,' (5) 'IS – HIC.' The model controls for age at enrolment, macro-region at the time of enrolment, and field of study of enrolment at university (Fig. 1).

Given the absence of certain control variables for IS students (as already described in the [Data](#) section), the second and third analyses focus exclusively on Italian and SG students. Therefore, in the second analysis, the main independent variable, '*student group*,' consists of three categories: (1) 'Italians – *reference category*,' (2) 'SG – LMIC,' (3) 'SG – HIC'. In the third analysis, we consider the specific citizenship of migrant students, focusing on the larger communities in Italy; therefore, the main explanatory variable is '*student's area of origin*' with the eleven categories described above. In these latter analyses, the models control for age at enrolment, macro-region at the time of enrolment, field of study of enrolment at university, type of high school diploma, high school final mark, and mobility at enrolment.

Following the literature documenting sex-specific pathways in academic attainment (e.g., Giudici et al., 2021; Lagomarsina & Ravecca, 2014, p.41; Priulla et al., 2021; Priulla & Attanasio, 2023; Richardson et al., 2020), we treat sex as more than a control variable. While our primary focus is not to test interaction effects between sex and migration background or sex differences per se, male and female students often follow distinct academic trajectories, particularly among those with a migrant background. For example, patterns in high school track choice, field of study at university, and Bachelor's degree completion differ by sex within each student group, and ignoring these patterns would risk overlooking important heterogeneity. Furthermore, preliminary analyses including an interaction term between student group and sex (see Table 1A in the Supplementary Information) showed significant differences in academic attainment. To account for these distinct patterns, we estimated separate models by sex.

We estimate relative risk ratios and then for interpretability, we present our results by computing the average marginal effects (AMEs). AMEs express the effect on the probability of observing an outcome of interest as either categorical covariate changes or as a one-unit increase in a continuous covariate, averaged across the other covariates included in the model.

Descriptive statistics are provided in Table 1. All analyses were conducted using R statistical software.

Results

Descriptive Analysis

Table 1 shows the distribution of socio-demographic characteristics and academic attainment by student group.

Migrant students, who comprise 5% of the student population in Italian universities, exhibit distinct demographic characteristics and academic attainment. Most Italian and migrant students are females (53.6% of Italians, 61.7% of SG, and 52.6% of IS). SG students primarily originate from Eastern European countries like Romania (21.6%) and Albania (17.8%), followed by countries in the Americas (12.5%), Africa (12.3%), and Asia (10%). IS are mainly from Asia (33.1%), other European countries (26.5%), and Africa (22.1%). Sex differences are particularly striking among IS, with most males from Asia (37.0%) and Africa (32.0%) and most females from China (19.9%), Central Eastern Europe (16.2%), Albania (7.5%), and Romania (7.1%). Similar trends appear among SG, albeit less pronounced.

Differences also emerge in the educational backgrounds of students who completed high school in Italy. Italian students are concentrated in scientific lyceums (38.7%), while more than half of SG attended technical and vocational schools (57.1%). Gender differences are also evident: female students are more frequently found in classical (14.0%, 7.4% for males) and other lyceum tracks (29.1%, 6.2% for males), whereas male students are predominantly enrolled in scientific and technical schools. These patterns are consistent across Italians and SG students and mirror broader gendered dynamics in secondary educational choices. Unfortunately, for IS students, this information is not available, as the dataset does not collect details on secondary school diplomas obtained abroad.

Italian students consistently outperform SG across high school types, with those from scientific and humanistic lyceums achieving the highest marks and those from vocational schools achieving the lowest. Furthermore, females generally perform better than males, a pattern observed in both Italian and SG, except among students from classical and scientific lyceums.

Regarding university careers, differences emerge across the three groups in terms of field of study at the university level, persistence, and academic success. Both Italian and migrant students, regardless of whether they are SG or IS, tend to choose scientific and social programmes, but sex distribution varies significantly.

Female students are more represented in humanities and education programmes (31.3% for Italians, 29.2% for SG, 31.3% for IS), whereas male students are

Table 1 Student demographic and academic characteristics by student group and sex

	Italian		SG		IS		Total	
	M	F	M	F	M	F	M	F
Area of origin								
<i>Italy</i>	100	100	0.0	0.0	0.0	0.0	95.4	94.6
<i>LMIC</i>	-	-	95.0	96.2	86.5	88.1	4.2	5.0
<i>HIC</i>	-	-	5.0	3.8	13.5	11.9	0.4	0.4
of which								
<i>Albania</i>	-	-	17.4	18.0	4.7	7.5	0.5	0.7
<i>Romania</i>	-	-	19.0	23.2	1.8	7.1	0.5	0.9
<i>Central-Eastern Europe</i>	-	-	15.1	18.7	5.6	16.2	0.6	1.0
<i>China</i>	-	-	4.0	2.3	20.8	19.9	0.5	0.5
<i>Morocco</i>	-	-	5.0	5.5	3.0	1.6	0.2	0.2
<i>Latin America</i>	-	-	13.5	11.8	5.8	8.0	0.4	0.6
<i>Other African countries</i>	-	-	8.8	5.9	29.0	11.6	0.7	0.5
<i>Other Asian countries</i>	-	-	8.4	6.2	16.2	9.7	0.6	0.4
<i>Other European countries</i>	-	-	3.7	4.7	3.2	5.9	0.1	0.3
<i>Other HIC</i>	-	-	5.1	3.6	9.9	12.6	0.4	0.3
Type of high school								
<i>Classical</i>	7.8	14.7	1.6	4.4	-	-	7.4	14.0
<i>Scientific</i>	49.6	32.0	22.8	17.9	-	-	47.3	30.6
<i>Other Lyceum</i>	6.5	30.2	5.8	22.3	-	-	6.2	29.1
<i>Technical</i>	30.7	17.3	51.6	33.7	-	-	30.2	17.3
<i>Vocational</i>	5.4	5.8	14.6	17.8	-	-	5.4	6.0
<i>Other high school</i>	-	-	4.7	4.7	-	-	1.7	1.4
<i>Foreigner</i>	-	-	-	-	100	100	1.8	1.5
Mean high school diploma grade								
<i>Classical</i>	79.3	81.4	78.4	78.2	-	-	79.3	81.3
<i>Scientific</i>	77.9	80.5	75.2	75.5	-	-	77.8	80.4
<i>Other Lyceum</i>	77.0	80.1	73.4	76.4	-	-	76.9	80.0
<i>Technical</i>	77.5	79.9	74.5	76.0	-	-	77.4	79.7
<i>Vocational</i>	76.8	79.2	73.6	75.3	-	-	76.6	78.8
<i>Other high school</i>	76.8	79.8	70.6	78.4	-	-	76.5	79.7
Mean age at enrolment								
<i>Time to completion ≤ 3 a.y</i>	18.5	18.4	19.2	19.5	21.4	20.2	18.5	18.4
<i>Time to completion > 3 a.y</i>	19.2	19.2	20.3	20.2	23.2	21.3	19.3	19.4
Field of study of enrolment at university								
<i>Agriculture & Services</i>	9.0	5.9	4.1	3.5	4.6	6.2	8.8	5.9
<i>Arts, Humanities & Education</i>	11.2	31.3	10.7	29.2	15.3	31.3	11.3	31.2
<i>Business & Law</i>	15.0	10.8	16.2	18.5	19.4	16.1	15.1	11.2
<i>Engineering</i>	29.2	8.7	33.2	8.0	33.0	16.7	29.4	8.7
<i>Health and welfare</i>	4.9	11.8	5.2	12.5	2.7	10.0	4.9	11.8

Table 1 (continued)

	Italian		SG		IS		Total	
	M	F	M	F	M	F	M	F
<i>Natural sciences, mathematics and statistics, ICT</i>	15.7	12.6	16.2	7.8	9.6	8.9	15.6	12.4
<i>Social sciences</i>	15.0	18.8	14.4	20.4	15.3	16.9	15.0	18.8
Student status after 4 years								
<i>Still enrolled</i>	27.2	22.3	33.7	31.9	35.5	31.4	27.5	22.8
<i>Dropout</i>	18.4	12.0	34.3	23.3	35.8	30.5	19.2	12.8
<i>BA's completion</i>	54.4	65.6	32.0	44.8	28.8	38.1	53.3	64.4
Mean of the final BA completion								
<i>Time to completion < = 3 a.y</i>	102.0	104.0	99.7	101	97.7	98.7	102.0	104.0
<i>Time to completion > 3 a.y</i>	95.1	97.8	92.2	94.3	87.5	91.1	94.9	97.6
Total enrolled students (N)	94,456	109,020	2,421	3,904	2,109	2,336	98,986	115,260

Percentages should be read in columns. SG refers to second generation students; IS refers to international students

Authors' elaboration on ANS data

concentrated in engineering programmes (29.2% for Italians, 33.2% for SG, 33.0% for IS). Interestingly, among IS, males are slightly more concentrated in humanities and education programmes (15.3%) than both their Italian (11.2%) and SG counterparts (10.7%), and much less in natural sciences and mathematics programmes (IS 9.6%, Italians 15.7%, SG 16.2%).

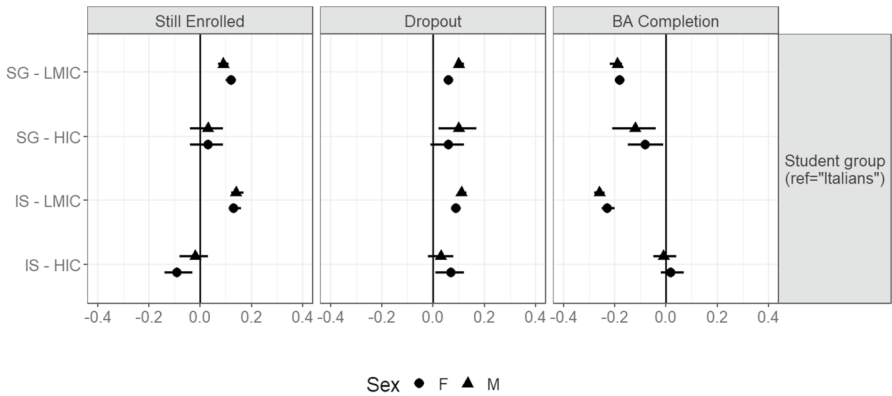
There is a notable gap in dropout rates between Italian and migrant students, with the latter exhibiting higher levels. This gap is especially pronounced among males, where differences between males and females range from approximately 5 to 11 percentage points (pp) across the groups. Additionally, migrant students (both SG and IS) have lower Bachelor's degree completion rates within the standard timeframe, trailing Italians by more than 22 pp. They also tend to graduate with lower final marks, particularly IS students (Table 1).

Regression Analyses

In this section, we report only the results about the effect of the main independent variable on student status. Full results, including associations with control variables, are provided in Tables 2A, 3A, and 4A in the Supplementary Information.

Differences in Academic Attainment between Italian, SG and IS Students

Figure 1 presents the results of the multinomial logistic regression for the student group, expressed as AMEs, on the probability of being still enrolled, dropping out, or completing a Bachelor's degree, separately for males and females. This model includes the entire population of students enrolled at Italian universities



Notes: (1) Model also controls for age at enrolment, macro-region at enrolment, field of study of enrolment at university. (2) The full model with the corresponding table with AME values and p-values is provided in Table 2A in the Supplementary Information. (3) SG – LMIC refers to second-generation students from low- and middle-income countries; SG – HIC refers to second-generation students from high-income countries; IS – LMIC refers to international students from low- and middle-income countries; IS – HIC refers to international students from high-income countries. 95% CI. Source: Authors' elaboration on ANS data.

Fig. 1 Multinomial logistic models on students' academic attainment for the whole sample by sex. AMEs are reported

and accounts for available sociodemographic and academic characteristics. The results reveal clear differences in academic attainment across student groups.

For both sexes, migrant students, whether SG or IS, show a lower likelihood of completing a Bachelor's degree within the standard timeframe and a higher likelihood of dropout or remaining enrolled (with the exception of male and female SG students from HIC), compared to Italian students. When examining the effect sizes, we observe that the disadvantage is generally larger for IS than for SG. Differences also vary by country group: students from high-income countries (HIC) are closer to Italians in their outcomes than those from low- and middle-income countries (LMIC).

Among female students, SG students from LMIC are 17.8 pp (p -value < 0.001) less likely to complete a Bachelor's degree within the standard timeframe, IS from LMIC 22.6 pp (p -value < 0.001) less likely, and SG from HIC are 8.3 pp (p -value 0.019) less likely than Italian females. SG from LMIC and IS from LMIC also show higher probabilities of remaining enrolled (+11.9 pp, p -value < 0.001 and +13.4 pp, p -value < 0.001 , respectively), while dropout is more frequent among SG from LMIC (+5.9 pp, p -value < 0.001), IS from LMIC and HIC (+9.2 pp, p -value < 0.001 , and +6.6 pp, p -value 0.012, respectively), than the reference category. However, differences in BA completion for IS from HIC and in dropout or remaining enrolled for SG from HIC relative to Italians are not statistically significant.

Gaps appear more pronounced among male students. Specifically, SG male students from LMIC are nearly 20 pp (p -value < 0.001) less likely to complete a Bachelor's degree within the standard timeframe than Italian males, with higher probabilities of both dropout (+10.3 pp, p -value < 0.001) and remaining enrolled

(+9.0 pp, p -value < 0.001). SG from HIC are 12.4 pp (p -value 0.004) less likely to complete a Bachelor's degree within the standard timeframe, and this pattern is mainly explained by their higher likelihood of dropout (+9.8 pp, p -value 0.009), while no differences are observed between this group of students and their Italian counterparts.

Differences in Academic Attainment between Italian and SG

As explained in the [Data](#) section, variables such as type of high school diploma obtained, final high school mark, and mobility at the time of enrolment are not available for IS students. Since these factors capture crucial aspects of students' pre-academic preparation and readiness for university, we restricted this step of the analysis to Italian and SG students only. This allows us to better account for differences in background characteristics that are known to influence academic attainment.

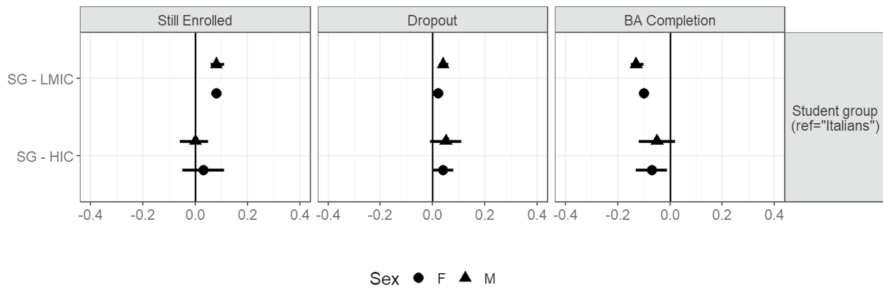
Figure 2 presents the results of the multinomial logistic regression on student status—BA completion, dropout, or still enrolled—for Italian and SG students, separately for females and males; AMEs are reported. Compared with the previous model including IS, the overall pattern of migrant disadvantage remains, but the gaps between SG and Italian students become smaller.

Specifically, for females, the disadvantage of SG students from LMIC decreases substantially: the BA completion gap narrows from -17.8 pp (p -value < 0.001) to -10.2 pp (p -value < 0.001), the dropout differential falls from $+5.9$ pp (p -value < 0.001) to $+1.8$ pp (p -value < 0.001), and the likelihood of being still enrolled declines from $+11.9$ pp (p -value < 0.001) to $+8.4$ pp (p -value < 0.001). For SG students from HIC, the changes are smaller: the BA completion gap is slightly reduced from -8.3 pp (p -value 0.019) to -7.0 pp (p -value 0.025), while differences in dropout and being still enrolled remain not statistically significant.

A similar attenuation emerges among male students. For SG students from LMIC, the BA completion gap decreases from -19.3 pp (p -value < 0.001) to -14.6 pp (p -value < 0.001), and the dropout differential diminishes from $+9.8$ pp (p -value 0.009) to $+4.8$ pp (p -value < 0.001), while the AME for being still enrolled remains around $+9.0$ pp. For SG students from HIC, the BA completion gap becomes statistically non-significant (from -12.4 pp, p -value 0.004 to -5.6 pp, p -value 0.283); dropout differences shrink from $+9.8$ (p -value 0.009) to $+5.7$ (p -value 0.048), and differences in the AMEs of being still enrolled remain statistically non-significant.

Notably, across both sexes and origins, the AMEs for being still enrolled are consistently larger than those for dropout (Fig. 2).

So far, migrants have been considered a single, homogeneous group, since they all hold an Italian high-school diploma. However, this approach may obscure or attenuate differences between citizenships due to heterogeneity in their attitudes and behaviours in countries of origin, and cultural factors. To address this issue,



Notes: (1) Model controls for age at enrolment, type of high school, high school final mark, mobility at enrolment, macro-region at enrolment, and field of study of enrolment at university. (2) The corresponding table with AME values and p-values is provided in Table 3A in the Supplementary Information. (3) SG – LMIC refers to second-generation students from low- and middle-income countries; SG – HIC refers to second-generation students from high-income countries; IS – LMIC refers to international students from low- and middle-income countries; IS – HIC refers to international students from high-income countries. 95% CI.
Source: Authors' elaboration on ANS data.

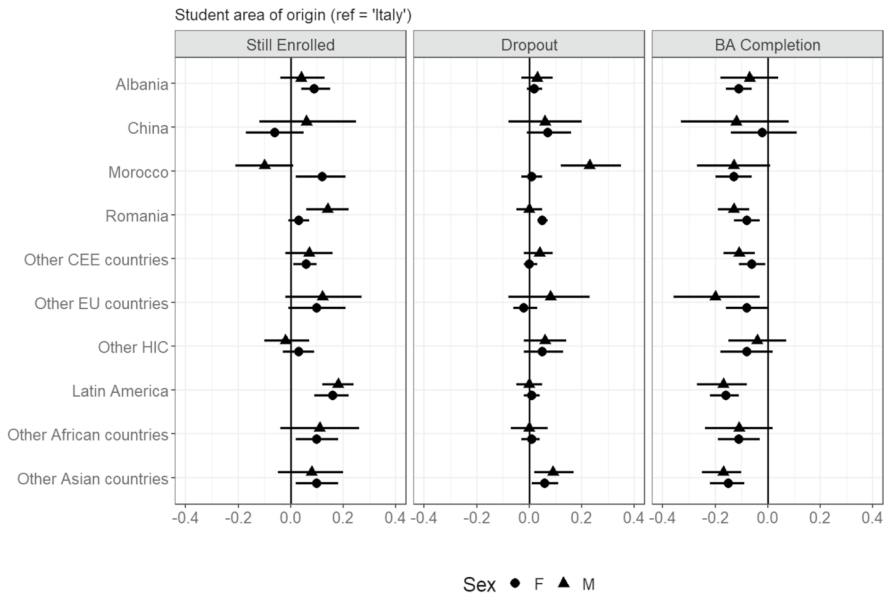
Fig. 2 Multinomial logistic models on students' academic attainment for Italians and SG by sex. AMEs are reported

Figure 3 presents AMEs derived from our analysis by the student's country or area of origin.

Our findings show some differences in magnitude between Italians and SG students across countries or areas of origin. This is particularly evident among males, who show a larger gap with their Italian counterparts, especially in terms of Bachelor's degree completion, compared to females. Overall, for migrant students, regardless of sex, country or area of origin, their longer time-to-degree is mainly due to a higher likelihood of remaining enrolled rather than a higher likelihood of dropping out.

Among females, students from Latin America stand out, facing a significant 16.4 pp (p -value < 0.001) decrease in the likelihood of completing a Bachelor's degree, mainly due to a higher probability of still being enrolled at the end of the follow-up (+15.6 pp, p -value < 0.001), with no differences observed for dropout. A similar pattern is observed for Moroccan students (-13.0 pp BA completion; +12.0 pp still enrolled; no differences for dropout), students from other African countries (-11.0 pp BA completion; +10.3 pp still enrolled; no differences for dropout), Albanians (-11.2 pp BA completion; +9.3 pp still enrolled; no differences for dropout), students from other CEE countries (-6.3 pp BA completion; +5.9 pp still enrolled; no differences for dropout), and students from other Asian countries (-15.4 pp BA completion; +9.7 pp still enrolled; +5.7 pp for dropout). For Asian students, even though the likelihood of being still enrolled is higher than that of dropping out, they also show a slightly higher likelihood of dropping out compared to Italian females. Conversely, no differences in academic outcomes are observed for Chinese students or students from other HIC.

Among males, Latin American (-17.3 pp BA completion; +17.7 pp still enrolled; no differences for dropout) and Romanian students (-13.2 pp BA completion; +13.6 pp still enrolled; no differences for dropout) show a similar pattern,



Notes: (1) Model controls for type of high school, high school final mark, age at enrolment, mobility at enrolment, macro-region of enrolment, and field of study of enrolment at university. (2) The corresponding table with AME values, p-values and full results is provided in Table 4A in the Supplementary Information. (3) SG – LMIC refers to second-generation students from low- and middle-income countries; SG – HIC refers to second-generation students from high-income countries; IS – LMIC refers to international students from low- and middle-income countries; IS – HIC refers to international students from high-income countries. 95% CI.
Source: Authors' elaboration on ANS data.

Fig. 3 Multinomial logistic model on students' academic attainment for Italians and SG by sex and student's area of origin. AMEs are reported

where their longer time to degree is fully explained by their prolonged stay in the Italian university system. Moroccan males are the only group exhibiting a markedly higher probability of dropout (+23.3 pp, p -value < 0.001) compared to Italians.

No differences emerge for students from Albania, China, or other HIC (Fig. 3).

Discussion

This study is the first to investigate differences in academic attainment between Italian students, international students (IS), and second-generation students (SG) enrolled in Bachelor's degree programmes at Italian universities. By distinguishing IS and SG—two groups often analysed separately in international research—this analysis sheds light on how migration background relates to university trajectories in Italy. Drawing on national-level longitudinal administrative data, it provides novel evidence in a context where research has so far relied mainly on surveys or institution-specific data. In doing so, the study addresses a gap in comparative higher

education research by situating Italy—a relatively new immigration country—within the broader international debate on inequality in academic attainment.

Our findings indicate that, compared to their Italian peers, students with migrant backgrounds are less likely to complete a Bachelor's degree on time—thereby experiencing prolonged enrolment—and are also more likely to dropout, supporting *H1*. This disadvantage is especially pronounced among IS. By contrast, SG students—who completed their schooling in Italy—exhibit outcomes closer to those of Italians. Within this overall pattern, area of origin adds another layer of complexity. Compared to Italians, the gap is larger for students from low- and middle-income countries, who show systematically lower academic attainment than their peers from high-income countries, with the gap particularly sizeable among IS.

For migrants from high-income countries, the gaps are relatively small and mixed. Specifically, among females, SG students are less likely to complete a Bachelor's degree than their Italian peers, and this result is mainly due to a higher probability of dropping out, with no differences in persistence; conversely, IS exhibit longer persistence in study and a higher likelihood of dropping out compared to Italians, but they are equally likely to complete their Bachelor's degree.

Overall, this result reflects the difference between IS and SG students. IS face the strongest disadvantages, which is consistent with Boudon's (1974) notion of primary effects and with research highlighting the challenges of linguistic, psychological, and socio-cultural adaptation (Baker & Siryk, 1989; Bourdieu, 1986; Rienties et al., 2012). At the same time, IS are highly heterogeneous: some arrive through chain migration with established communities such as Romanians, Latin Americans, and Africans, while others are recruited via internationalisation programmes with no local ties (Norton et al., 2022).

SG students, in contrast, share the Italian schooling experience and have already navigated key stages of integration, likely reflecting the importance of secondary effects (Boudon, 1974; Cebolla-Boado, 2011; Coleman, 1988).

It should be noted that although our findings are in line with the existing literature, confirming the stronger disadvantages for IS than SG (Giudici et al., 2021), our administrative data cannot disentangle the considerable heterogeneity within the IS population. Therefore, caution is needed when interpreting these results.

To further explore and explain differences in academic attainment and to include other important variables (e.g., the type of high school attended, final high school mark) that may underpin such differences between the groups identified, in our second analysis we restricted the population to SG and Italian students only, because this information is not available for IS. Although SG students exhibit outcomes more similar to Italians, our results indicate that even after controlling for these important factors, SG students still experience lower academic attainment relative to the majority population, with the gap more pronounced among SG students from LMIC, while it narrows or disappears among SG students from HIC. The difference observed between migrants from LMIC and HIC is in line with the migrant selectivity theory (Feliciano, 2005, 2020) and supports our second hypothesis (*H2*). Specifically, the lower Bachelor's degree completion rates within the standard timeframe observed among SG students stem less from dropout than from longer enrolment periods, pointing to delays in completion rather than outright attrition.

These results resonate with the ‘double origin gap’ (Gabrielli & Impicciatore, 2022), whereby SG face disadvantages tied both to socioeconomic background and to their migration history. Unlike their Italian counterparts, newly arrived SG are often placed in classes with younger students due to language proficiency needs. This can influence their academic progression, lead to delays, and result in early school exits (Minello & Dalla Zuanna, 2013). However, our results also highlight that attainment gaps persist even when controlling for age at enrolment or when upper-secondary information—such as the type of high school attended or the final high school mark, which reflects students’ ability and preparedness—is taken into account. This suggests that the lower timely completion among SG students is not primarily driven by differences in prior academic ability. Rather, we can speculate that these students face other structural or contextual barriers—such as economic constraints, the need to combine work and study, or limited access to support—which may hinder their academic progression. Although we do not have direct measures of these factors, our findings point to the importance of considering barriers beyond academic preparedness in understanding attainment gaps.

Finally, our analysis of SG students by specific citizenship or area of origin reveals substantial heterogeneity (*H3*). Students from Africa, Latin America, and other Asian countries face significant challenges in obtaining Bachelor’s degrees from Italian universities, whereas SG from other European countries, HIC, and China exhibit academic attainment levels closer to that of Italians. Notably, despite the increasing presence of SG students from Albania and Romania in the Italian higher education system, they continue to lag behind their Italian peers, particularly among female students. These findings align with the cultural divergence hypothesis proposed by Furnham and Alibhai (1985), which suggests that students from non-Western backgrounds may experience heightened psychological and socio-cultural stress that potentially affects their academic success. However, two exceptions emerged in our results: SG students from China and from Latin America.

Chinese students stand out from other non-Western groups, achieving academic outcomes comparable to those of Italians. This likely reflects specific cultural or socioeconomic backgrounds and educational values—particularly a strong emphasis on academic achievement and adaptability to foreign educational environments—that help to bridge the cultural divide often experienced by other non-Western students. Although our data do not directly provide information on students’ social background of origin, prior research by Ballarino and Panichella (2021) and Contini and Triventi (2016) suggests that, in the Italian context, high school type can serve as a proxy for socioeconomic status, with students attending Classical and Scientific Lyceums typically belonging to middle- or upper-class backgrounds. A high proportion of Chinese SG students attend Classical and Scientific Lyceums (28.6% among women and 38.1% among men), similar to students from other European (28.4% among women and 35.2% among men) and HIC (36.5% among women and 35.1% among men) backgrounds. They also have the highest mean high school grades (79.2 among females and 80.3 among males), closely matching those of Italian students (80.3 for females and 77.7 for males). This finding is also consistent with Heath et al. (2008), who analysed the educational outcomes of second-generation

minorities in ten Western European countries and found that Chinese students in Britain outperform the majority population.

Conversely, SG students from Latin America—despite cultural and linguistic proximity to Italy—display the lowest levels of academic attainment. They also tend to perform worse during high school, with a very low proportion attending Classical and Scientific Lyceums (16.1% of females and 12.9% of males) and the lowest mean high school grades (71.1 for females and 70.4 for males). See Table 5A in the Supplementary Information for details.

Finally, it should be noted that for all hypotheses, results sometimes show a positive coefficient for both ‘still enrolled’ and ‘dropout’ status, particularly among SG students. This outcome suggests a complex pattern in the academic attainment of migrant students, where SG may initially demonstrate persistence by remaining enrolled beyond the expected timeframe but ultimately encounter challenges that further delay or prevent degree completion. These challenges could include financial pressures, difficulties with language or cultural adaptation, and limited access to academic support, all of which can contribute to delayed progress or an eventual decision to dropout despite an initial commitment to continue their studies (Contini et al., 2018; Da Re et al., 2025).

Although our administrative data cover the academic attainment of all students enrolled at Italian universities, they have some inherent limitations. Some factors known to shape students’ academic attainment and differences among students from different migratory backgrounds are not captured, and their absence may bias our estimates. Notably, a key limitation of this study is the lack of direct information on students’ socioeconomic background and parental education. Since these are strong determinants of educational outcomes and strongly mediate migration-related differences (Agasisti & Longobardi, 2014; Azzolini & Barone, 2013; Heath et al., 2008), part of the disadvantage we attribute to migration background may instead reflect unobserved socioeconomic differences. This omission likely inflates the estimated gaps between Italians and migrants. At the same time, while our models include previous school performance and type of high school attended, which have been shown in prior studies to be strongly correlated with parental resources and can partially capture socioeconomic differences (Ballarino & Panichella, 2021; Contini & Triventi, 2016), this approach is only possible for Italian and SG students, limiting comparability with IS. This asymmetry may partly explain why the disadvantage of IS appears larger than that of SG, since relevant background factors could not be controlled for in their case. Nevertheless, without direct measures of parental socioeconomic background, the results should be interpreted with caution.

As described in detail in the [Main independent and control variables](#) section, our operationalisation of SG students follows common practice in the Italian context (Giudici et al., 2021). Given the lengthy bureaucratic process required to obtain Italian citizenship—typically only possible at age 18—many students with a migrant background are still classified as foreign citizens at the time of enrolment. While this approach captures a meaningful subgroup of SG students, it may limit comparability with studies that define second-generation migrants based on parental birthplace.

Citizenship is our only indicator of migrants’ origin, which could underestimate the number of migrant-background students (due to naturalisation), and obscure

intra-country diversity. For IS, despite their growing presence in Italian universities, the lack of information on prior schooling and grades restricts our ability to explain their outcomes.

Finally, we deliberately chose not to include direct indicators of students' academic performance during university (e.g., GPA or credits earned). Although these measures strongly predict academic attainment, they are conceptually very close to our outcome variables—dropout, persistence, and graduation—and including them could conflate explanatory and dependent factors.

Taken together, these limitations highlight the need for complementary data sources. Future research could use surveys or mixed-methods approaches to more fully capture the diversity of migrant-background students, explore the factors shaping IS outcomes, and clarify how migration background interacts with socioeconomic conditions in influencing academic trajectories.

Conclusion

This study provides the first national-scale longitudinal evidence on the higher education trajectories of Italian, international (IS), and second-generation (SG) students. Our findings reveal systematic inequalities in academic attainment, shaped by migration background, gender, and area of origin. IS face the greatest disadvantages, while SG students' outcomes are intermediate.

While the study's limitations mean the results identify broad patterns rather than precise causal effects, it establishes a critical baseline by highlighting which student groups are most at risk and at which stages disadvantages emerge.

From a policy perspective, the study does not prescribe specific interventions but highlights where support could be most effective. IS and SG students from low- and middle-income countries face persistent disadvantages, and policies providing financial support, language assistance, and tailored programmes may help reduce barriers to completion.

More broadly, Italy's experience as a relatively new immigration country provides a unique opportunity to understand integration processes under conditions different from better-studied contexts, offering insights relevant to other European countries facing emerging migration patterns or similar educational challenges.

Abbreviations *AME*: Average marginal effect; *ANS*: Anagrafe Nazionale Studenti (National Student Registry); *CEE*: Central-Eastern European; *IS*: International students; *SG*: Second generation students; *HIC*: High-income countries; *LMIC*: Low- and middle-income countries; *PP*: Percentage points

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s12134-025-01337-y>.

Acknowledgements None.

Author Contribution ET: conceptualisation, methodology, formal analysis, writing, review and editing. AP: preparation of the dataset, methodology, formal analysis, writing. CG: conceptualisation, methodology, writing, review. DV: conceptualisation, methodology, review. All authors read and approved the final manuscript.

Funding Open access funding provided by Università degli Studi di Roma La Sapienza within the CRUI-CARE Agreement.

Data Availability The data used in this study have been processed under the research protocol for the study “From high school to the job placement: analysis of university careers and university mobility from Southern to Northern Italy” among the Ministry of University and Research, the Ministry of Education and Merit, the University of Palermo as the lead institution, and the INVALSI Institute. For the University of Enna - KORE, the reference researcher is Fabio Aiello. Due to institutional agreements and privacy regulations, the data are not publicly available outside of this research framework.

Declarations

Ethical Approval Not applicable.

Clinical Trial Number Not applicable.

Competing interests The authors declare no competing interests.

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