



Double barriers? Gender and migration background in STEM studies access

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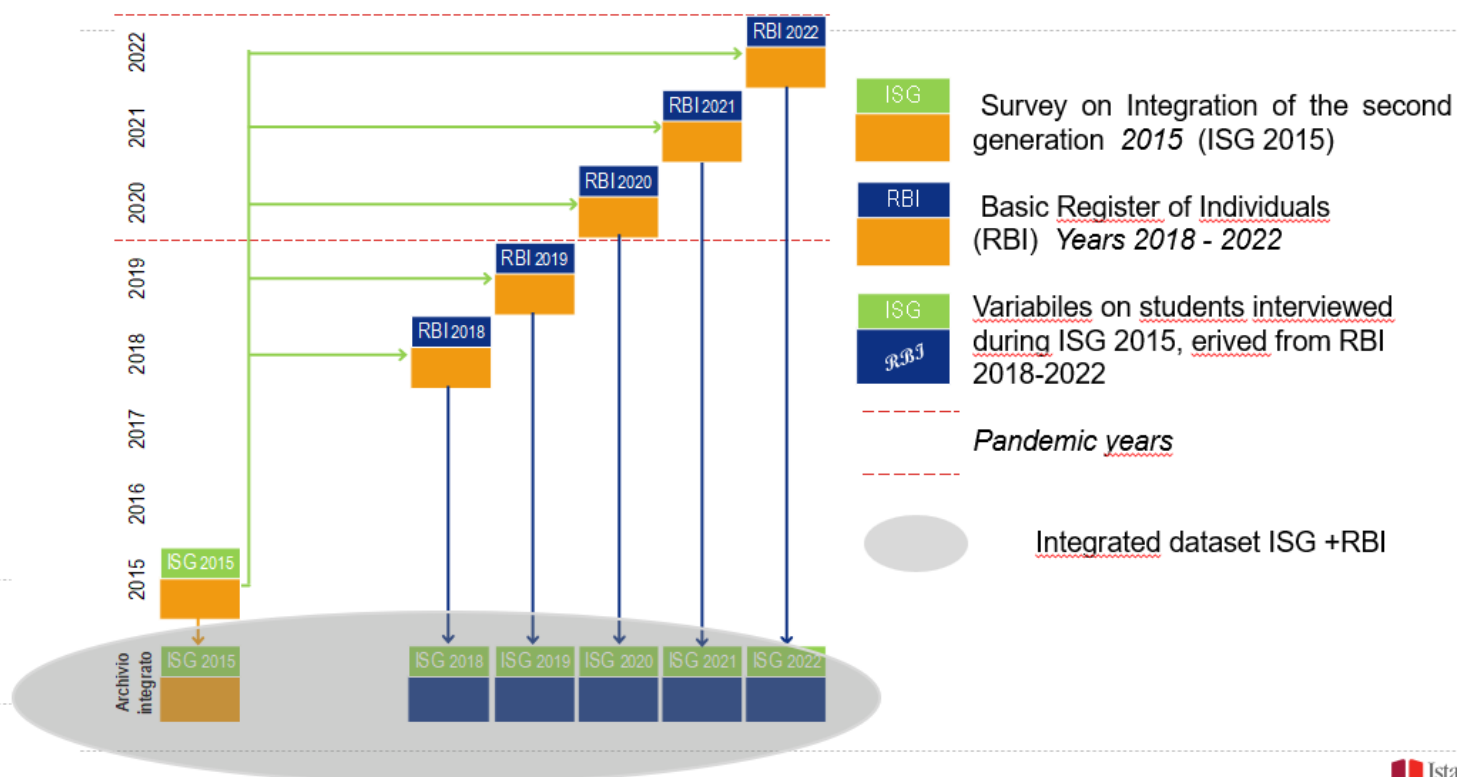
Background

- Istat thematic research lab: «Transition to adulthood and territorial mobility of second generations in Italy». Participants (Istat): Cinzia Conti (co-coordinator), Massimo Strozza (co-coordinator), Eugenia Bellini, Francesca di Patrizio, Francesca Dota, Roberto Petrillo, Fabio Massimo Rottino
Experts: Oliviero Casacchia – La Sapienza Università di Roma, Filomena Racioppi – La Sapienza Università di Roma, Paolo Turchetti - Mur
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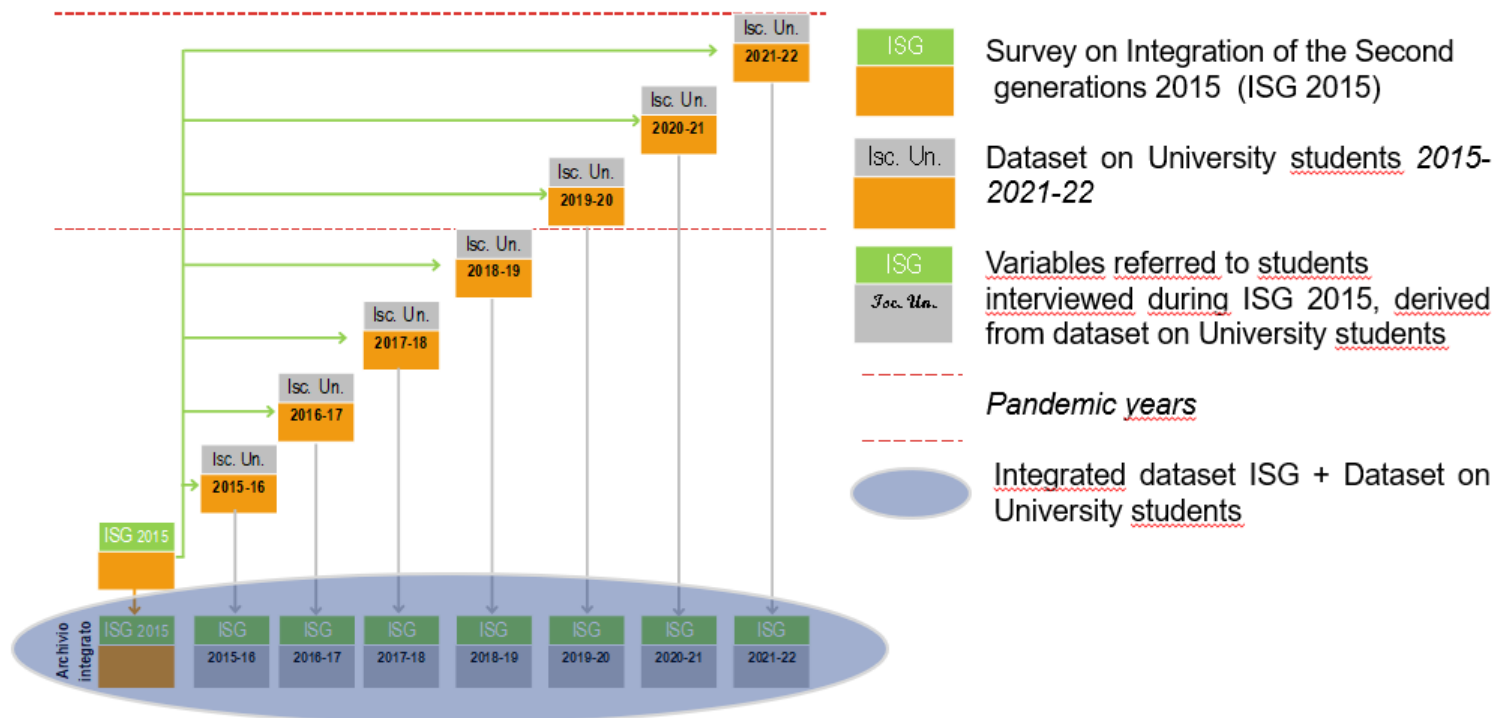
Research experiences

- Alessio Buonomo, Cinzia Conti, Giuseppe Gabrielli e Fabio Massimo Rottino
- «La transizione scuola-università degli alunni di origine straniera: un primo approccio esplorativo», la Rivista delle Politiche Sociali / Italian Journal of Social Policy, 1/2023
- Alessio Buonomo, Cinzia Conti, Giuseppe Gabrielli, Fabio Massimo Rottino, Salvatore Strozza, «School and Inequalities due to Migratory Background: the Results of ISTAT Surveys on Children and Young people» presented at the Age.it meeting «The Demography of Ageing», Rome October 3rd 2024
- Alessio Buonomo, Cinzia Conti, Giuseppe Gabrielli, Fabio Massimo Rottino, Salvatore Strozza «Do aspirations during upper school influence university enrollment of immigrants' children?» Rivista Italiana di Economia Demografia e Statistica, Vol. LXXIX-2 April-June 2025

Longitudinal perspective: Register of resident population



Longitudinal perspective: Dataset on University students



The focus: double barriers?

- International literature and our research experiences reveal a major challenge for foreigners in the transition to university studies
- In Italy, According to the latest data released by the Ministry of University and Research (MUR), women represent nearly 56% of all university enrollments in the 2024/2025 academic year, but less than 38% in the STEM fields.
- The international literature has paid considerable attention not only to the transition from secondary school to university but also to the role of ethnic factors in influencing the type of choices made, especially about STEM.
- Studies conducted in Canada (Finnie and Child, 2018) examines the factors influencing Canadian students' decisions to pursue STEM (Science, Technology, Engineering, and Mathematics) fields. Key findings reveal that students' STEM participation is strongly influenced by academic preparation in math and science during high school, parental education, and family income, with additional gender-based and ethnic variations. Another interesting example underlines that students' STEM achievements are influenced by the socioeconomic status and occupational background of their parents (Gutfleish, Kogan, 2022). The study reveals significant disparities, showing that students from higher-status occupational backgrounds tend to achieve better in STEM, with gender and ethnic origin further affecting outcomes.

Hypotesis

The study will focus particularly on which factors (territorial and school-related), behaviours (relational, participatory, cultural), and characteristics (personal, family, migratory) are associated with the choice of different scientific-disciplinary groups, with a focus on STEM disciplines. The hypothesis is that in Italy, gender and citizenship may play an important role in the choice of a STEM path, and that foreign girls could be doubly disadvantaged. Some scholars suggest that gender differences in education may be affected by the migration experience (Ravecca, 2010).



Descriptive results: gender and citizenship

	Enrolled at University		
	male	female	total
Italian	44,2	60,5	52,0
Foreign citizen	25,0	44,9	34,8
Total	42,0	58,6	50,0



Italian represent only a control group: Italian student in the same classes (same schools) of foreign students. Italian students in classes without foreign or in schools without foreign students are not included in the sample

	enrolled NOT Stem		
	male	female	total
Italian	24,8	48,9	36,4
Foreign citizen	12,4	36,5	24,2
Total	23,4	47,4	35,0



	enrolled stem		
	male	female	total
Italian	19,3	11,6	15,6
Foreign citizen	12,6	8,5	10,6
Total	18,6	11,2	15,0

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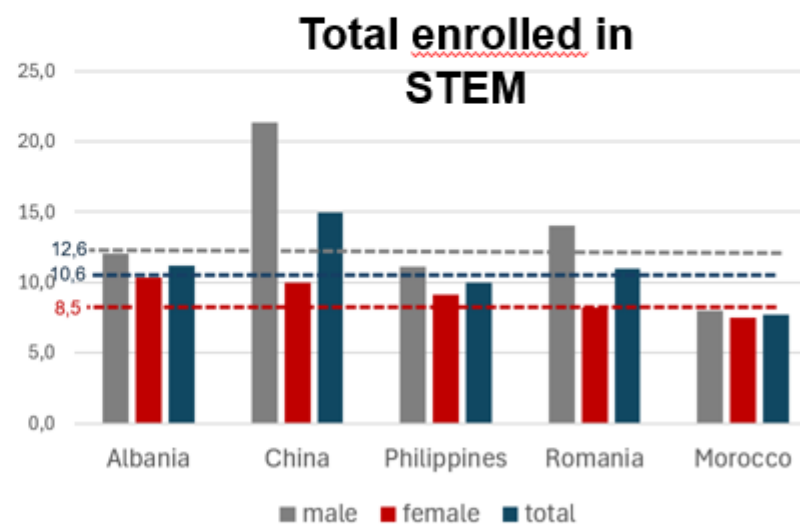
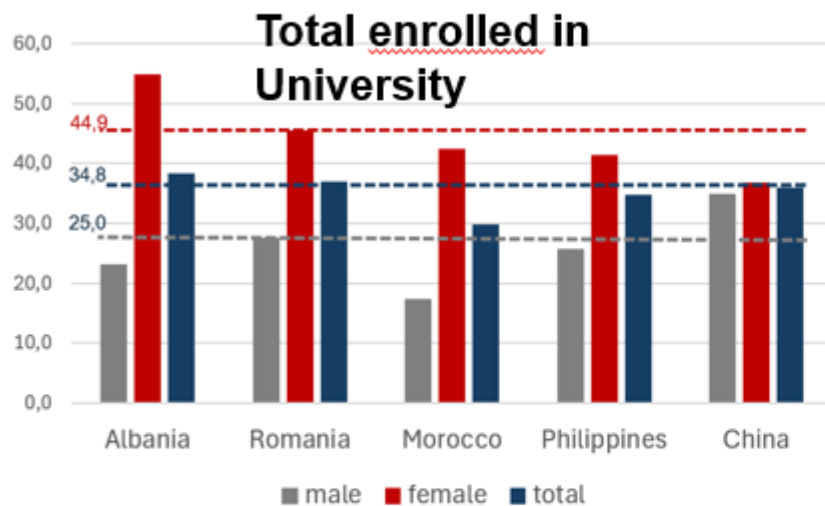
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Descriptive results: principal outcomes

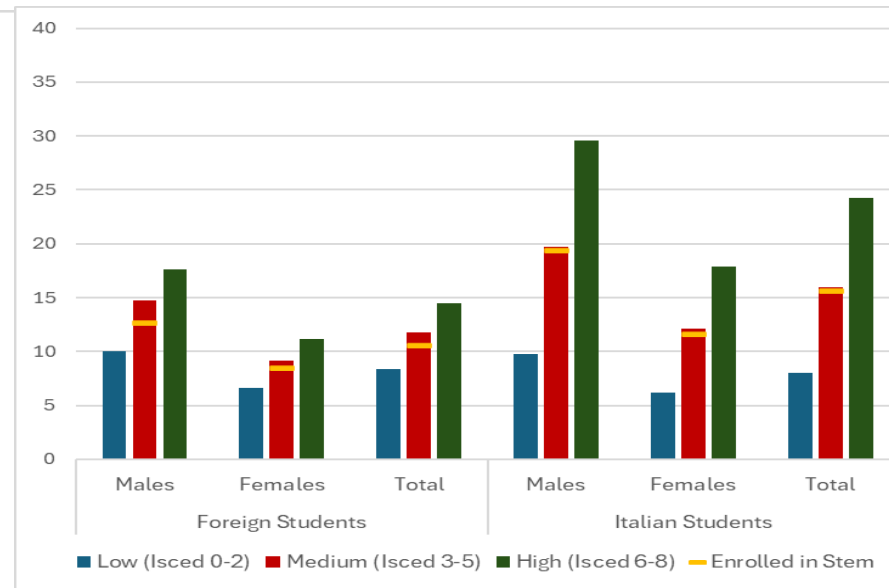


Descriptive results: principal outcomes

ISG 2015 Students Enrolled in STEM by Citizenship, Gender and Plans after Secondary School

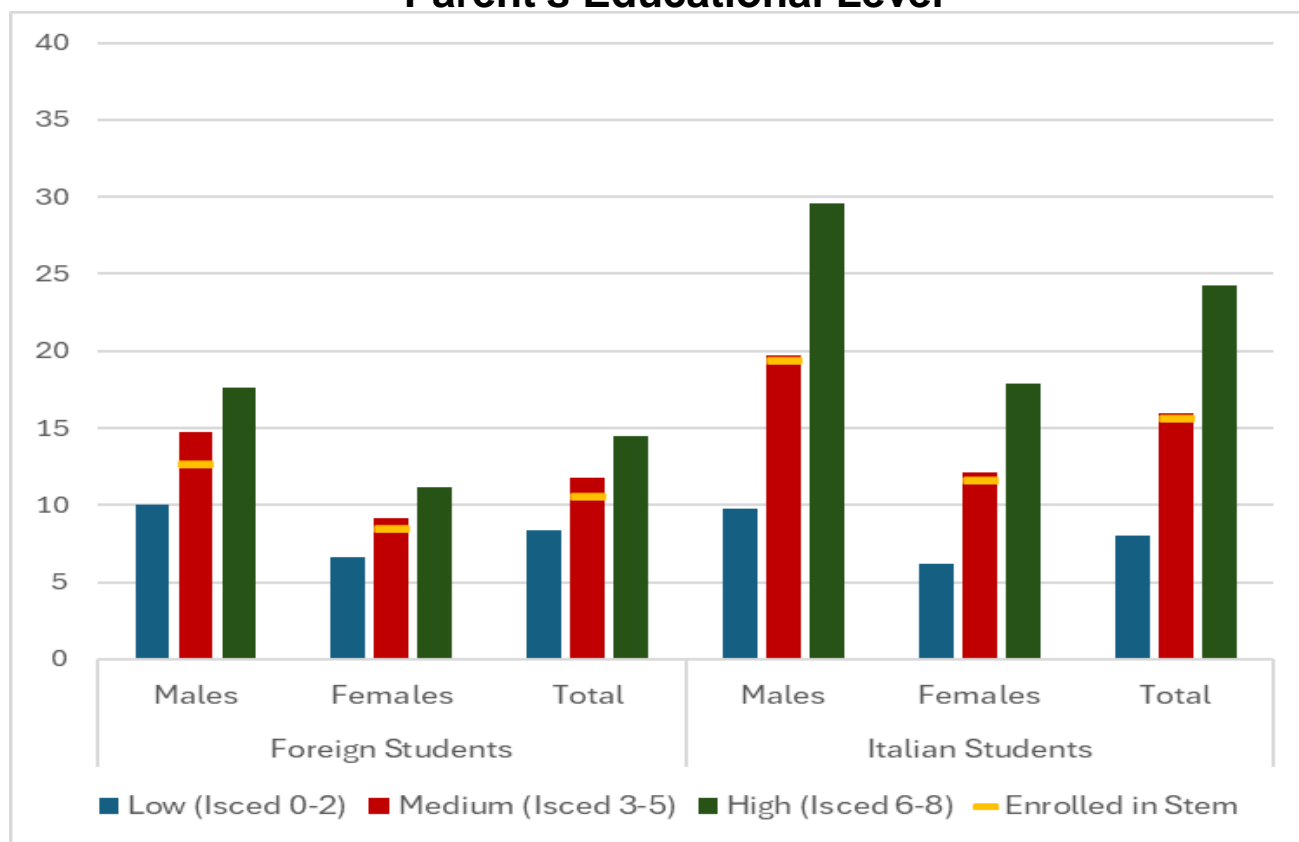


ISG 2015 Students Enrolled in STEM by Citizenship, Gender and Parent's Educational Level

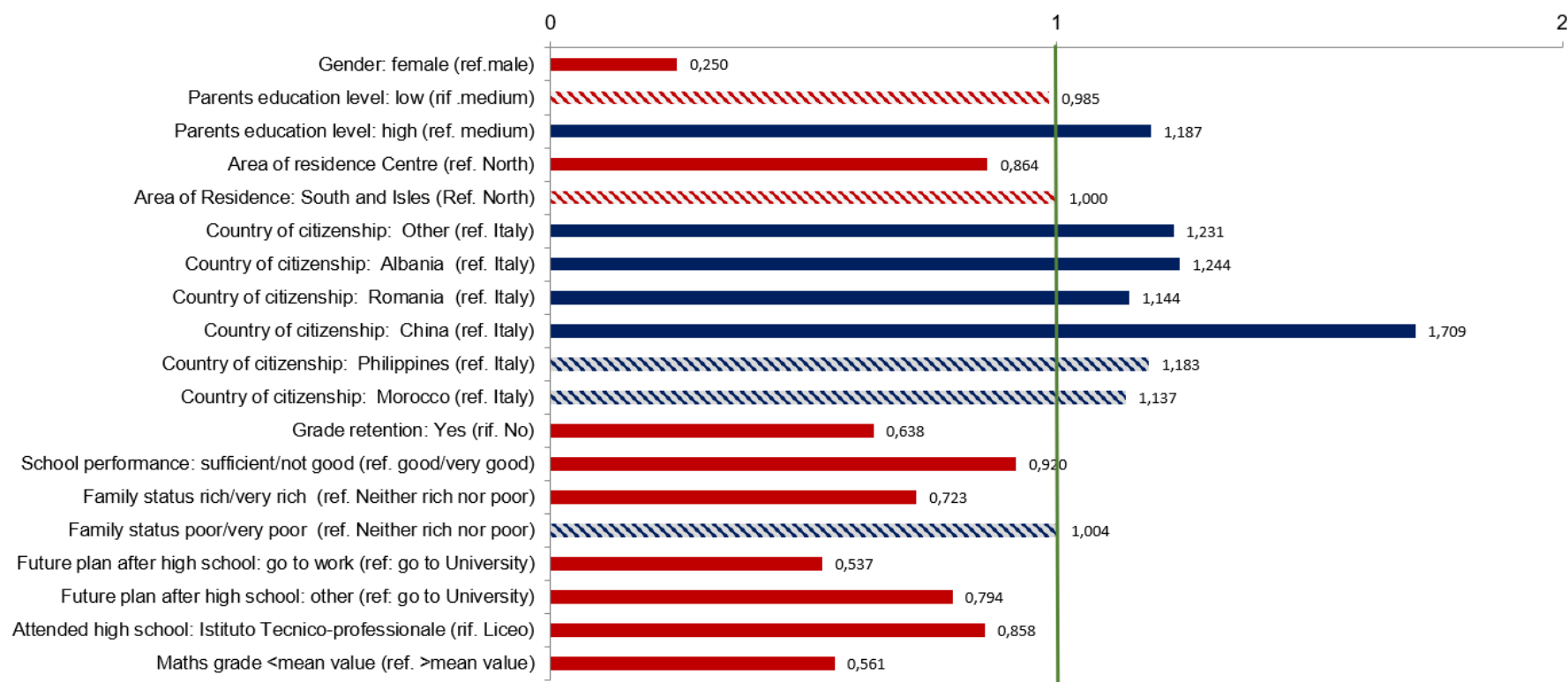


Descriptive results: principal outcomes

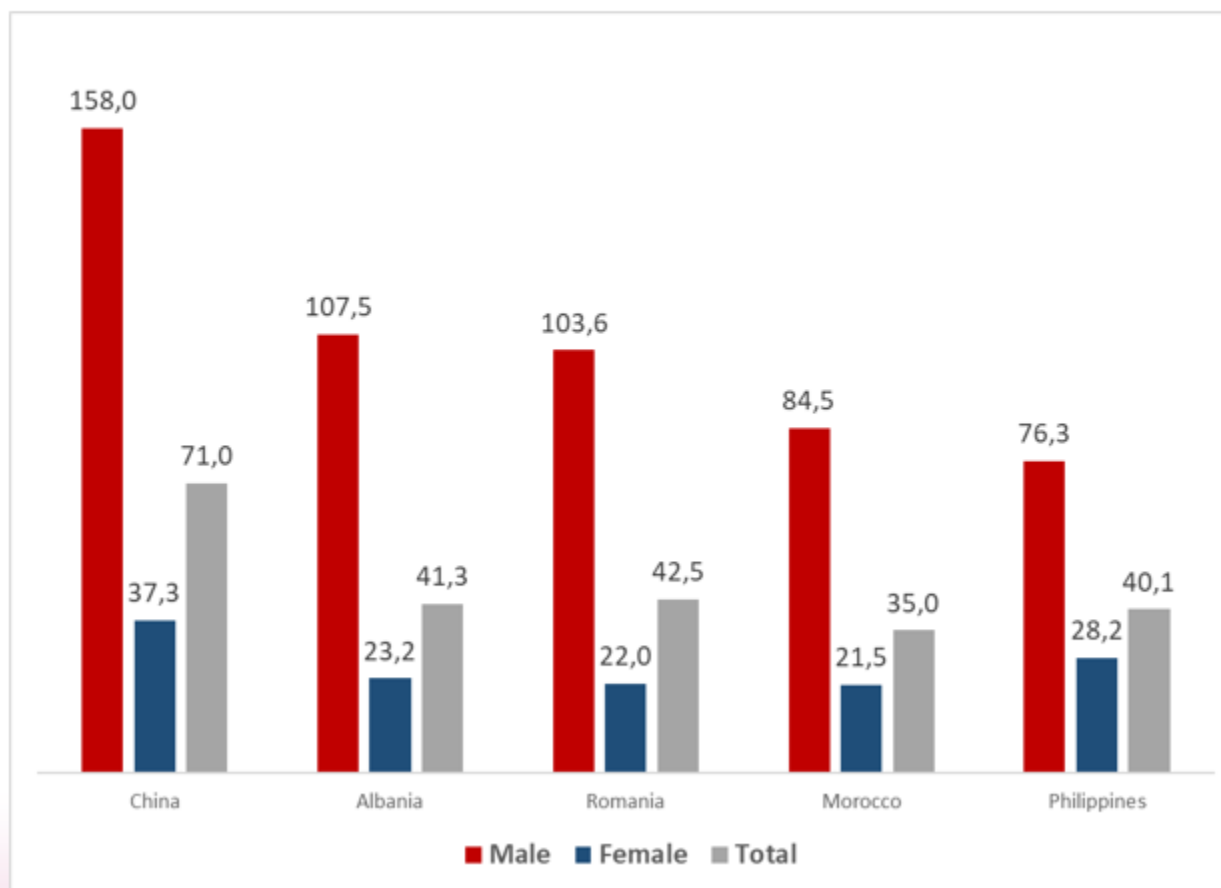
ISG 2015 Students Enrolled in STEM by Citizenship, Gender and Parent's Educational Level



Regression model: enrolled in STEM/ enrolled in NOT STEM



Coexistence ratio between STEM and non-STEM students by selected citizenships and gender



Final remarks and future developments

- Important role of gender and citizenship in university choices
- Foreign girls encounter a double barrier
- Strong investment in STEM disciplines among students with a migrant background. This behavior is observed almost exclusively among male students.
- Importance also of other factors: previous educational path and family characteristics
- Possible selection effects. Students who reach university — especially among young foreigners — are often those with stronger academic profiles or higher motivation, which could partially explain their overrepresentation in certain fields such as STEM.
- Future analyses will aim to apply models that take these potential selection mechanisms into account, in order to better understand the dynamics underlying educational inequalities.
- Attention to new citizens