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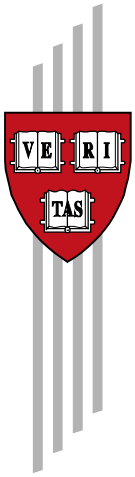

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A Generation of Italian Economists

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Abstract

We examine the role of financial aid in shaping the formation of human capital in economics. Specifically, we study the impact of a large merit-based scholarship for graduate studies in affecting individuals' occupational choices, career trajectories, and labor market outcomes of a generation of Italian economists with special focus on gender gaps and the role of social mobility. We construct a unique dataset that combines archival sources and includes microdata for the universe of applicants to the scholarship program and follow these individuals over their professional life. Our unique sample that focuses on the high end of the talent and ability distribution also allows us to analyze the characteristics of top graduates, a group which tends to be under-sampled in most surveys. We discuss five main results. First, women are less likely to be shortlisted for a scholarship as they tend to receive lower scores in the most subjective criteria used in the initial screening of candidates. Second, scholarship winners are much more likely to choose a research career and this effect is larger for women. Third, women who work in Italian universities tend to have less citations than men who work in Italy. However, the citation gender gap is smaller for candidates who received a scholarship. Fourth, women take longer to be promoted to the rank of full professor, even after controlling for academic productivity. Fifth, it is easier to become a high achiever for individuals from households with a lower socio-economic status if they reside in high social mobility provinces. However, high-achievers from lower socio-economic status households face an up-hill battle even in high social mobility provinces.

JEL Codes: I22, I24, J16, J24
Keywords: Human capital formation; Financial aid; Career trajectories; Gender gaps

[*]Contact details: Nano: enrico.nano@graduateinstitute.ch; Panizza: ugo.panizza@graduateinstitute.ch; Viarengo: martina.viarengo@graduateinstitute.ch. This paper is dedicated to the memory of Alberto Giovannini. We gratefully acknowledge the support received from Compagnia di San Paolo for giving us access to its historical archives. We are especially grateful to Ilaria Bibollet and her team for their support in accessing the archival materials. We thank Anusha Chari for comments and Radu-Nicolae Barza for excellent research assistance. Panizza was a recipient of the Jona Scholarship during his graduate studies at Johns Hopkins University. Viarengo was a recipient of the Graduate Scholarship of the Einaudi Foundation offered by Compagnia di San Paolo during her graduate studies at Northwestern University. The usual caveats apply.

1 Introduction

Italy does relative well in terms of economic research. More than 11% of the prestigious ERC grants in economics, finance and management given over 2007-2020 were awarded to researchers based in Italy, the corresponding share for sociology, political sciences, and law is less than 6%.[1] This is somewhat surprising because economics is more likely to require technical training than other social sciences and, until the 1980s, Italy did not have any formal doctoral program. A generation of Italian economists was formally trained abroad, partly thanks to a number of scholarship programs managed by banks and foundations and specifically targeted to economics. In this paper, we use hand-collected primary source data on applications to the largest and most generous of these merit-based scholarship programs to examine the human capital formation and career dynamics of a generation of Italian economists with special focus on gender gaps and the role of social mobility.

The role that financial aid can play in improving educational outcomes and reducing inequalities has been documented, especially in compulsory schooling, in different contexts. However, evidence is lacking on how funding for graduate studies for top achievers can affect their educational and career trajectories. To the best of our knowledge, we provide the first analysis of how financial aid for top achievers helped shape a generation of economists.

Our database is representative of Italians who graduated with top marks between 1978 and 1994 and were interested in pursuing a career in economics. This is a unique sample that focuses on the high end of the talent and ability distribution as it only includes students who graduated from university with first class honors.[2] Therefore, besides studying the effect of the scholarship program that we examine, our data also allow us to analyze the characteristics of top graduates, a group

[1] The European Research Council (ERC) offers three main categories of grants: Starting Grants, Advanced Grants and Consolidator Grants. In the SH1 category (Economics, Finance, and Management), researchers based in Italy were awarded 37 out of 327 grants. In the SH2 category (Sociology, Social Anthropology, Political Science, Law, Social Studies of Science and technology), researchers based in Italy were awarded 28 out of 473 grants (https://erc.europa.eu/projects-figures/erc-funded-projects/results). Note that there is a large number of Italian ERC recipients who work in universities outside Italy, but most ERC recipients who work in Italian universities are Italian.

[2] While the minimum requirement for applying to the scholarship program we examine was a top grade of 110/110, more than 80% of our sample consists of graduates who received 110/110 *summa cum laude*.

which tends to be under-sampled in most surveys. Existing studies show that social mobility, which varies significantly across Italian provinces with a steep North-South gradient, correlates with average educational outcomes (Güell et al., 2018 and Acciari et al., 2019). Our unique dataset allows us to glimpse at the right tail of the distribution of educational outcomes and shows that, also for this selected group of students, individuals with low socio-economic background are at a disadvantage, and that this is especially the case if they come from low-social mobility provinces.

Our analysis relies on a rich dataset that we have constructed by drawing on archival material and other sources to reconstruct individual-level career histories. We have information that covers the professional life-cycle of these highly talented individuals, starting from their secondary education (type of degree and grade of the high-school leaving certificate), covering college and graduate education, their first job, and up to their current employment. We have detailed information on educational background (type of degree, high school/university attended, academic performance) and socio-economic status as well as other demographic characteristics (age, gender, province of origin) which allow linking our analysis to the literature on social mobility. We also reconstruct the career trajectory of these graduates and collect detailed information on various measures of their scholarly productivity. This unique dataset allows us to study the characteristics of both applicants and winners, and to follow them over time.

In studying the characteristics of our sample of high achievers, we focus on gender and socio-economic background and on their interaction with social mobility. The paper has five main results. First, we find that women were less likely to be shortlisted for a scholarship, and that this finding is robust to controlling for a rich set of individual characteristics. When we study the reason for this gender gap, we find that it is mostly associated with the fact that women received lower scores in the most subjective among the criteria used in the initial screening of candidates. Specifically, women are not significantly different from men when it comes to scores based on fully objective criteria such as the final university grade or average grades in economic exams. However, they have lower scores in more subjective criteria such as whether the "general profile" of the candidate is a good fit for the scholarship program. These findings are consistent with the presence of implicit bias. When we do not control for sample selection, we find that conditional on being short-listed there is no gender difference in the probability of winning a scholarship. However, controlling for sample selection reveals the presence of a gender gap also in the selection of winning candidates.

Second, when we focus on shortlisted candidates, we find no gender differences in the choice of a research career, but we find that scholarship winners are much more likely to choose a research career than other shortlisted applicants. We also find that this scholarship effect is twice as large for women than for men, and that it is particularly large for residents of low-social mobility provinces.

Third, when we study candidates who decided to follow a research career, we find lower citation counts for women who spent a substantial share of their career in Italy. There is, instead, no citation gender gap for Italian research economists who work outside Italy. We also find that there are no differences in academic productivity (measured by citations) between candidates that received a scholarship and candidates who did not. However, we find that the citation gender gap is smaller when we focus on candidates who received a scholarship. In other words, while men who received a scholarship are not significantly different in terms of academic productivity from male researchers who did not receive a scholarship, women who received a scholarship appear to be more productive than female researchers who did not receive a scholarship. This result could either be explained by the fact that the selection committee was more effective in selecting high potential women than in selecting high potential men or due to the fact that the bar was higher for women than for men. The findings on implicit bias mentioned above are in line with the latter interpretation.

Fourth, when we look at the career progression of academic economists, we find that women take longer to be promoted to the ranks of associate and full professor, even after controlling for academic productivity. This effect is particularly large for promotion to full professor and for economists based in the UK and North America.

Our fifth main result is related to the interaction of socio-economic status and social mobility. As one may expect, we find that it is easier to become a high achiever (and hence be included in our sample) for students from lower income households if they come from provinces characterized by higher social mobility. However, we find that socio-economic background matters even for this sample of high achievers. Specifically, we find that candidates with lower socio-economic background are less likely to graduate cum laude, are less likely to study economics or law, and are

more likely to have attended a professional high-school. Along these dimensions there is no difference between candidates who come from high and low social mobility provinces.

In this paper, we contribute to three strands of literature. The first strand is the literature that studies the impact of financial aid for education. The core of the existing research has examined the role of subsidizing the cost of education with need-based and merit-based scholarships at both the primary and secondary level (e.g., Angrist et al. 2006; Chingos and Peterson 2015), with a more limited number of papers focusing on post-secondary education (e.g., Kane 1995; Dynarski 2002, 2003). Research on the impact of scholarships for graduate studies is scarcer and, to the best of our knowledge, limited to a recent study which examines the effect of a merit-based scholarship awarded to doctoral students by the Social Science and Humanities Research Council of Canada (Chandler 2018).[3] This paper finds no significant effect of the scholarship program on the probability of completing the doctoral program but a small and positive impact on the probability of having a tenure-track faculty position nine years after receiving the scholarship. This latter finding is in line with our result that scholarship winners are more likely to choose a research career, but our data allow us to probe further and study the effect of the scholarship program over a much longer period of time and evaluate its effect on career progression and academic productivity.

The second strand is the literature on gender gaps in professional occupations and career dynamics in academia, with special focus on women in economics. Gender gaps in economics are among the largest in the social sciences, and women remain significantly under-represented in economics in both Europe and the United States (Auriol et al. 2019; Goldin et al. 2019; Lundberg and Stearns 2019), with gender gaps being especially large in finance and macroeconomics (Chari and Goldsmith-Pinkham, 2018). These gender gaps are even larger than the ones observed in other fields such as science, technology, engineering, and mathematics (STEM) (Bayer and Rouse 2016). Existing research has documented that gender gaps already exist at the undergraduate level (Avilova and Goldin 2020), they increase at the level of doctoral studies, and then further widen with seniority along the academic career trajectory (Lundberg 2020). Looking at data over the last 20 years, Lundberg and Stearns (2019) highlight the lack of significant progress and document that approximately 35% of PhD students, and 30% of assistant professors in economics are women. In

[3] Jacob and Lefgren (2011) focus on the impact of a grant for postdoctoral training.

terms of academic employment, women in economics are less likely to get tenure, and it takes longer for them to achieve it (Ginther and Kahn 2004, 2021). Ginther and Kahn (2021) use data from US universities for the period 2009-2018 and find that, controlling for publications, citations, and grants, female academic economists were 15% less likely to be promoted to associate professor than comparable men, with this gender gap being particularly strong for less research-intensive institutions. The same authors also show that there is no evidence of such a gender gap in other social sciences and STEM disciplines

Our data corroborate this evidence as they show gender gaps in promotion to both associate and full professor, with the latter being larger than the former and robust to controlling for academic productivity. Surprisingly, we find that these gaps are larger in Anglo-Saxon universities (UK, Australia, Ireland, and North America) which are often deemed to be more meritocratic than universities in continental Europe. Our results showing that in Italian universities the gender gap is always statistically significant for promotions to full professor and not statistically significant for promotion to associate professor is in line with the results of De Paola et al. (2018). These authors study promotions in the Italian university system using data for 2012-14 and, controlling for citations, find that there is a statistically significant gender gap only for promotions to full professor.

The third strand is the literature on social mobility (see, among others, Carneiro and Heckman 2003, Chetty et al. 2014a, Chetty et al. 2014b, Chetty et al. 2020, Heckman and Landersø 2021). Existing research has shown the key role that education, among other factors, plays in improving equality of opportunity and leading to greater social mobility (e.g., Goldin and Katz 2008, Blanden et al. 2011, Card et al. 2018). To the best of our knowledge, we are the first to examine social mobility and labor market outcomes in academia. Our work is closely related to Güell et al. (2018) and Acciari et al. (2019) who measure social mobility for all Italian provinces and show that social mobility is positively correlated with several socioeconomic indicators, including educational outcomes and negatively correlated with inequality. We add to this literature by showing that social mobility also matters for high-achievers and by documenting that members of households with lower socio-economic status are more likely to become top achievers if they reside in high social mobility provinces. We also show that no matter what the underlying level of social mobility is, high achievers from lower socio-economic status still tend to attend less prestigious high schools

(professional schools instead of liceo), are less likely to study economics or law, and are less likely to graduate cum laude.

The rest of the paper is structured as follows. Section 2 provides background information about the scholarship program that we study. Section 3 describes the data collection process and provides a description of the dataset. Section 4 studies the profiles of applicants and winners and Section 5 describes the career paths of the economists included in our sample. Section 6 concludes.

2 A brief history of the Luciano Jona scholarship program

The Luciano Jona scholarship program was created and financed by the Istituto Bancario San Paolo di Torino (Sanpaolo), a large Italian bank headquartered in Turin. Sanpaolo's origins date back to 1579, when a religious brotherhood known as "Compagnia di San Paolo" created a "Monte di Pietà" (an institutional pawnbroker which was then common in Europe) with the objective of providing the poor with low interest rate loans.

In the 17th Century, the Monte di Pietà began managing the public debt of the state of Savoy and, over the 18th and 19th centuries, it became a full-fledged bank. After the 1929 banking and financial crisis, Sanpaolo became a public law credit institute. In 1992, when Sanpaolo was the second largest Italian bank in terms of deposits (Mediobanca, 1993), the bank was transformed into a joint-stock company, with the foundation Compagnia di San Paolo becoming its largest shareholder. After a series of mergers, Sanpaolo became part of Intesa Sanpaolo, one of the two largest Italian banks nowadays.

Given its origin as a charitable institution, Sanpaolo always allocated a large budget for *operazioni benefice, culturali e di pubblico interesse* (charitable, cultural, and public interest operations). In 1979, this budget amounted to approximately 6 billion Italian lira ($7.5 million). This was close to two-thirds of Sanpaolo's total profits, which in 1979 were just above 9 billion Italian lira (Mediobanca, 1981).

In 1978, a university graduate who had been admitted to the economics PhD program at MIT asked Sanpaolo for financial support. The Board of the bank agreed to provide such support and decided

to create a scholarship program named after its former president Luciano Jona. In a meeting that took place on December 21 1978, the Board allocated 400 million Italian lira to finance 25 scholarships for students interested in pursuing graduate-level studies in economics and management. The number of scholarships was reduced to 15 in 1983, further reduced to 10 in 1988 and to 5 in 1995, when the program was terminated. In 1988, it was also decided that Jona scholarships would no longer fund graduates interested in pursuing MBAs and other business-related degrees.

The selection procedure was carried out in two stages. In the first stage, the staff of Sanpaolo scored each candidate based on a set of criteria that usually included the candidate's academic curriculum, extra-curricular activities, knowledge of foreign languages, quality of the motivation letter, general profile of the candidate in relation to his/her age, and coherence of the study program with the scholarship's objectives. In the second stage, a committee, which included both Sanpaolo management and external evaluators, used these scores and other unspecified criteria to allocate the scholarships among the candidates shortlisted in the first stage. All Italian citizens who had graduated from an Italian university in subjects related to economics, business, law, political sciences and statistics with a grade of at least 110/110 and who were less than 27 years of age at the time of application were eligible to apply for a Jona scholarship.

The scholarships were generous. Until 1983 there was no specified amount and successful candidates would individually negotiate the scholarship amount with Sanpaolo. In 1983, the scholarship started covering tuition fees plus an annual salary of $18,000 for students enrolled in programs in the US and 15,000 ECU for students enrolled in programs in Europe. These amounts were then increased to $22,000 and 18,000 ECU, respectively in the early 1990s.[4] To put these amounts in context, in 1982 the average salary for assistant professors of economics in large US public universities was $24,000 (Curtis and Kisielewski, 2015). While the Luciano Jona scholarship was not the only program that funded Italian students interested in pursuing graduate-level studies in economics, it was by far the largest and most generous scholarship program of this type.[5] As

[4] The scholarship was awarded for one year and was renewable once.

[5] In 1987, Bank of Italy offered up to 8 scholarships, Banco di Napoli 7 scholarships, Mediocredito Centrale 7 scholarships, Banco di Sicilia 4 scholarships, Credito Italiano 3 scholarships, Banco di Roma one scholarship, and Cassa di Risparmio di Venezia one scholarship. With the exception of the scholarship offered by Banco di Roma, these scholarships were significantly less generous in terms of annual salary than

there was no application fee and it was advertised throughout the country, it is reasonable to assume that most eligible young Italian graduates interested in pursuing graduate-level studies in economics applied to the scholarship program.

3 Data Collection

We use primary source data on Jona Scholarship applicants which we hand-collected in the archives of the Compagnia di San Paolo in Turin. We started by exploring the archives and gathering all relevant information about the Jona scholarship program (minutes of the Sanpaolo board, calls for applications, composition and minutes of the selection committees, methodologies for scoring the applications, and shortlists prepared by Sanpaolo staff). Then, we manually scanned (using a smartphone app) all the hardcopy applications stored in the archives (there were no hardcopy applications for the year 1984).[6] Figure 1 shows a standard application form for the 1991/92 round of Jona scholarships.

For the years 1979-80 and 1986-95, these hardcopy applications also included the score assigned by Sanpaolo staff (for instance, the application of Figure 1 received a score of 10). Instead, scores for all applicants were not available for 1981-85 (in these years we only had the scores of the winners).

Next, we digitized and coded all the information contained in the original application forms together with the scores assigned to each candidate by Sanpaolo staff members and the candidate status as: (i) winner (260 applicants); (ii) shortlisted candidate who was not awarded a scholarship (595 candidates); (iii) neither winner nor shortlisted (2,747 candidates).[7] As the scoring method

the Lucian Jona scholarship, providing a weighted average of ECU 9,500, vs. ECU 15,000 provided by the Jona scholarship. Moreover, not all of them could be renewed for additional years of study.

[6] As each application consisted of at least two pages and the archives contained more than 3500 application forms, this task required several weeks of work.

[7] The information collected includes: gender, age, undergraduate major, university and final grade of the undergraduate degree, place of residence, type of high school degree and grade (information on place of residence and high school degrees was not available for all applicants), whether the applicants had already applied in previous years and whether the applicant was already studying abroad at the moment of the application. For years for which we could not find an official shortlist, we identified as shortlisted all the candidates with a score greater or equal to the lowest among the scores of candidates who were awarded a scholarship. We also collected data for the few non-shortlisted candidates who graduated with "dignità di stampa" and "menzione" and treated them as shortlisted candidates for 1981-85.

changed over the years (in 1979, scores ranged between 33 and 47 and in 1994, they ranged between 3 and 12), we built standardized scores centered on either the year-specific average or on the year-specific threshold for shortlisted candidates.

Table 1 describes our sample. On average, we have 240 applicants per year, with a maximum of 377 applicants in 1994 and a minimum of 106 applicants in 1995 (the year in which the scholarship program was terminated). In the first years of the program, only one-quarter of applicants were women, but the share of female applicants increased to 41% in the 1990s. The success ratio (defined as number of winners over total number of applicants) was well above 10% in the first years of the program but decreased to about 4.5% in the 1990s.

We cannot check whether our sample of Jona applicants is representative of all Italian graduates who in the 1980s and early 1990s aspired to become professional economists. However, we can compare our dataset of Jona applicants with a list of individuals who did become successful research economists. With this objective in mind, we collected the names of the 156 Italian economists who belong to the top 5% REPEC ranking and identified 107 top 5% Italian economists who met the eligibility criteria and therefore could have applied for the Jona scholarship.[8] We then compared these names with our list of Jona applicants. Figure 2 shows that a large majority of highly ranked Italian economists who were eligible to apply for a Jona scholarship did apply for the scholarship. Specifically, our database of Jona applicants includes: (i) all top 10 Italian economists listed in REPEC; (ii) 41 (82% of the total) of the top 50 Italian economists listed in REPEC; and (ii) 77 economists (72% of the total) of the 107 Italian economists in the top 5% REPEC list.

4 The profiles of applicants and winners

Among winners, there is an overall unconditional gender gap of about 3.2 percentage points (given an unconditional probability of being awarded a scholarship of 7.3%, this is a substantial gap)

[8] We collected the data using the REPEC ranking for October 2019. Note that we use the World ranking and not the ranking for Italy as the latter does not include Italian economists who do not have an affiliation in Italy. The list of 49 non-eligible economists includes those who: (i) did their undergraduate work in a non-Italian university; (ii) received their undergraduate degree before 1978; (iii) received their undergraduate degree after 1994; (iv) did not meet the age requirements of the scholarship program.

which is statistically significant at the 1% confidence level. If we look at individual years, we find statistically significant gender gaps in 1981, 1982, 1990, 1994, and 1995. There are also three years (1983, 1991, 1992) in which the share of female applicants who received a scholarship is larger than the share of male applicants who received a scholarship, but the difference between the two groups is not statistically significant.

Table 2 describes our data by grouping candidates by their university of origin (i.e., the university where they received their undergraduate degree). While there are 52 originating universities in our sample, the 14 universities listed in Table 2 originated 82% of applications and 87% of successful applications. Roma and Bocconi are the universities with the largest number of applicants (20% and 12% of the total respectively) followed by LUISS and the University of Torino. Candidates from the University of Roma received the largest number of scholarships, followed by Torino, Bocconi, and Bologna. If we look at success ratios, we find that candidates from Torino, Bologna, Modena, and Palermo are overrepresented among the winners (with a statistically significant difference between the share of winners and the share of candidates) and that candidates from LUISS, Bari, and the remaining universities not listed in Table 2 are underrepresented among the winners. Figure 3 shows that, in almost every year, candidates from Torino and Bologna had an above average probability of being awarded a Jona scholarship (the exceptions were 1991 and 1992 for Bologna), while candidates from Bocconi had above average success ratios from 1987 to 1992. There is no clear pattern for candidates from other universities with a large number of applicants.

More than 2/3 of candidates in our sample have an undergraduate degree in economics, 12% in political science, 8% in law, 4% in statistics, 4% have another STEM degree, and 2% another type of undergraduate degree (Table 3). Among women, there is a slightly larger share of candidates with a political science degree (17%) compensated by a smaller share of candidates with a STEM degree. Compared with the overall pool of applicants, scholarship recipients have larger shares of graduates in economics and statistics, and a smaller share of candidates with law, STEM, and other degrees.

When Italian students graduate from university, they receive a grade which ranges between 66/110 and 110/110 (this grade is computed using both the student's GPA and the quality of the final thesis,

each university has its own system of weighting these two components).[9] Students who receive 110/110 can also receive three further honors: (i) *cum laude*; (ii) academic mention; (iii) *Dignità di stampa* (the thesis is worthy to be published). While all graduates with a final grade of at least 110/110 could apply for a scholarship, 82% of applicants surpassed this minimum requirement. Nearly three quarters of applicants received 110/110 cum laude, 3% of candidates received 110/110 cum laude and special mention, and 5% 110/110 cum laude and dignità di stampa. There is no significant gender gap along any of these dimensions. Among scholarship recipients, 71% had a final grade of 110/100 cum laude, 3% 110/110 cum laude and special mention, and nearly a quarter received 110/110 cum laude and dignità di stampa. The likelihood of being awarded a scholarship for candidates with dignità di stampa was 5.5 times higher than for candidates who did not receive this honor (33% versus 6%). In the sample of winners, a slightly larger share of women was awarded dignità di stampa.

With respect to the type of high school, 85% of candidates went to a typical pre-university high school (Liceo Classico or Liceo Scientifico), 10% to an accounting or commercial high school (ragioneria or perito aziendale), 3% to another type of liceo (typically a liceo linguistico, a school that specializes in foreign languages), and 2% to other professional schools (Table 4).[10] In the sample of female applicants, the shares of candidates that attended an accounting school or another liceo is slightly higher than in the full sample (13% and 7%, respectively). Focusing on scholarship recipients, we find that 91% of successful candidates attended liceo classico or liceo scientifico (85% in the sample of female scholarship recipients) and 5% attended an accounting school (8% among women).

Italian students also receive a final grade when they graduate from high school. Before 1996, this grade ranged between 36 and 60 (the range is now 60-100). The average high school final grade in the sample of applicants is 52.7/60 (median 54/60, there is no difference between male and female applicants) and the average high school final grade in the sample of scholarship recipients is 54.8/60 (median 58/60). On average, female scholarship recipients had higher final high school grades than male recipients and the difference between the two groups is statistically significant at the 95% confidence level.

[9] A few engineering schools grade out of 100. For these schools we rescaled the grades to the 66-110 range.
[10] This information is available for a subset of candidates.

As explained above, our analytical sample is representative of high achieving college graduates who wanted to pursue rigorous graduate training with the aim of becoming professional economists. With respect to the gender dimension, we focus on highly accomplished women. They have the same level of human capital accumulated through high school and college as men. They chose comparable fields of study as the men in our sample and have similar academic performance. This is important for the rest of the analysis because it highlights that the traditional channels through which gender gaps emerge along the academic career – from education to employment – do not apply here. As discussed earlier, existing research has emphasized to what extent gender gaps increase along the leaky-pipeline. They already emerge in high school with fewer girls than boys choosing quantitative subjects, and then continue through both undergraduate and graduate education, with the share of women completing a bachelor degree and a PhD in economics which has not increased in the past twenty years and remains lower than in other disciplines in the social sciences and even in STEM. Here, we look at a sample of women who are top achievers, have a comparable level and same type of educational attainment and academic performance as men, and are also similar in terms of career aspirations: they want to undertake graduate studies to become professional economists.

4.1 Socioeconomic background

As our hand-collected data do not include information on socioeconomic status, we proxy the background of the candidates by matching information on their permanent address (we have this information for 95% of the sample, for the rest of the sample we use the city of residence) with data on residential real estate prices sourced from the Osservatorio del Mercato Immobiliare (OMI) of the Italian Revenue Agency at the Ministry of Economy and Finance.[11] This is a good proxy for socio-economic status because the data we use are at the "OMI zone" level which is defined as a geographic unit between the city and the neighborhood levels where real estate prices are

[11] We geocoded the permanent addresses, identified the OMI zone using R and GIS software, and assigned to each address the corresponding OMI zone value. Whenever possible, we used the value for civilian houses in good condition. Since each OMI zone has different characteristics, in some cases this value was not available. In these cases, we used another type of residential estate (villas, low-cost apartments, or dwelling typical of the area) or a different condition (poor or very good). As OMI only reports the minimum and maximum commercial values, we used the average of these two values.

homogenous and have a similar behavior over time. One caveat is that the earliest available OMI valuations covering all Italian towns are of 2012. Hence, our proxy for socio-economic status relies on the assumption that the relative price of houses across OMI zones did not change dramatically over time. We tested this assumption for all OMI zones that were present in both 2012 and 2005, the earliest available data. We looked at the variation over time in real estate prices across neighborhoods within provinces and found that the relative ranking remained stable over time, with a median change of only 15 out of 132 rank positions and with 25% of OMI zones changing at most 5 positions.[12]

We were able to geocode and assign an OMI zone value to about three-quarters of the candidates in our sample. OMI zone values range between 288 and 13,000 euro/m^2, with a mean of 2,869, a median of 2,538, and a standard deviation of 1,566 euro/m^2.

The last column of Table 3 shows that applicants with a degree in Economics, Law, Statistics, and STEM disciplines tend to have higher OMI values than graduates in Political Sciences and Other disciplines and that there are no large differences between graduates who received a grade of 110/110 cum laude (the most common grade in our sample) and graduates who received the highest honor (in fact, the OMI value is slightly lower for the latter group). However, the average OMI value for individuals who graduated with 110/100 is €2,309, while the average OMI value for individuals who received 110/110 cum laude is €2,998. The last column of Table 4 shows that applicants who went to a Liceo lived in zones with higher OMI values with respect to applicants who went to a professional or business-oriented high school.

4.2 Social mobility

To explore the correlation between average housing prices in the area of residence of applicants and social mobility in the province of residence, we use the province-level rank-rank slope (RRS) computed by Acciari et al. (2019). As the rank-rank slope measures the correlation between the

[12] The detailed analysis on the changes in real estate prices across neighborhoods within provinces over time is available upon request.

relative position of parents and children in the income distribution, higher values are associated with lower social mobility.[13]

As a first step, we split the sample into low and high social mobility provinces by defining as high social mobility provinces those with a RRS value below the median in our sample. Table 3 shows that the average OMI value of applicants who reside in high social mobility provinces is about two-thirds that of applicants who come from low social mobility provinces (€2,309 versus €3,361). In high social mobility provinces, it is thus relatively easier for individuals with a lower socio-economic status to become high achievers than in low social mobility provinces. As mentioned above, individuals with a higher socio-economic status are more likely to study Economics and Law but, in this respect, there are no differences between high and low social mobility provinces. The same applies for the type of high school. Individuals with a more privileged background are always more likely to choose a Liceo in both high and low social mobility provinces.

We now explore the relationship between a continuous measure of social mobility and OMI values. The top panel of Figure 4 corroborates the results of Tables 3 and 4 and shows that applicants from provinces characterized by low social mobility tend to reside in zones with higher OMI values than applicants who reside in zones with high social mobility. It is worth noting that Tables 3 and 4 and the top panel of Figure 4 are likely to downplay the role of social mobility. This is because there are large regional differences in OMI values and areas with low OMI values also tend to be areas characterized by low social mobility. Specifically, Acciari et al. (2019) show that social mobility tends to be lower in Southern Italy, and cities and towns in Southern Italy also tend to have lower OMI values than cities in Northern Italy (in 2012, the average OMI value in Northern and Central Italy was €1,130 per square meter and the average OMI value in Southern Italy was €630; in our sample, which only includes graduates with top grades, the average OMI value in Northern and Central Italy is €3,020 and that in Southern Italy is €2,300). When we control for these regional differences in OMI values, we find an even tighter negative correlation between OMI values of applicants and social mobility (bottom panel of Figure 4).

[13] Acciari et al. (2019) provides the following example: "consider two children, one from parents in the top decile and one from parents in the bottom decile of the national distribution—a gap corresponding to a differential in their fathers' earnings of around 43,500 euros. An RRS of 0.25 means that, when adults, these children will be on average still two deciles apart."

Table 5 shows that winners tend to reside in zones with higher OMI values and that male applicants have higher average OMI values than female applicants. However, male and female winners tend to reside in zones with similar OMI values. The bottom panel of Table 5 compares OMI values expressed as percentage deviation from the region's average. Applicants reside in areas with OMI values which are about 92% above the regional average, the difference with the regional average is higher for scholarship winners, but the difference with the full pool of applicants is not statistically significant. If we focus on high social mobility provinces (these are provinces with an RRS index below 0.205), we find a smaller deviation with respect to the regional average in OMI values (72%), but a statistically significant difference between winners and non-winners. Residents in low social mobility provinces are instead characterized by relatively higher OMI values (a fact also illustrated in Figure 4), but for these residents there is no statistically significant difference between scholarship winners and the rest of applicants.

4.3 Winners versus Shortlisted applicants

Having described the characteristics of applicants and winners with a series of simple tabulations, we now probe further with a set of regressions aimed at uncovering the characteristics of successful and shortlisted applicants. The first two columns of Table 6 show that the gender gap described in Table 1 is robust to controlling for year and either region (column 1) or university (column 2) fixed effects.[14] The point estimates suggest a gender gap of approximately 2 percentage points (about one-third lower than what we found in Table 1, which did not control for region and year fixed effects). Given that the share of successful applicants in our sample is approximately 7%, this is a substantial gap indicating that women were 25% less likely to be awarded a scholarship than men.

Next, we explore to what extent the gender gap is explained by differences in candidates' observable qualities as measured by their final university and high school grades, differences in age, the presence of repeated applications, or by the composition of the scholarship commission.

[14] Given that for 1984, we only have information on the 15 candidates who were awarded a scholarship, all the regressions of this section do not include data for 1984. For candidates for which we do not have a home address, we proxy the region of origin using the location of the university where they completed their undergraduate degree. The results of column 1 do not change if we drop observations for which we do not have the full address. Columns 3-7 only use observations with a full address.

Column 3 of Table 6 controls for the final university grade using the three dummies described above (110/110 is the excluded dummy) and for the final high school grade, treated as a continuous variable ranging between 36 and 60. As expected, a higher final university grade is associated with higher probability of being awarded a scholarship and the effect is particularly large for the highest honor (dignità di stampa). In fact, nearly 50% of applicants with dignità di stampa (63 out of 127) were awarded a Jona scholarship. It is instead more surprising that the high school degree remains highly significant even after controlling for performance at university. The point estimate implies that, other things equal, an applicant who graduated from high school with 60 was 7 percentage points more likely to receive a scholarship than an applicant who received a 36.

Column 4 shows that those who applied for a scholarship while they were already studying abroad were more likely to be successful but neither age at the moment of application nor repeated applications mattered. Applicants who graduated from universities which had at least a representative in the scholarship commission were instead more likely to receive a scholarship. The point estimate is large and suggests that, other things equal, having a representative in the commission increases the likelihood of receiving a scholarship by nearly 50%.

Columns 3 and 4 show that the gender gap is not statistically significant when we control for these variables (even though it remains close to 2%). Column 5 controls for university major and shows that graduates in law and STEM discipline are between 5 and 4 percentage points less likely to receive a scholarship than economics graduates (the excluded group), while there are no statistically significant differences between graduates in economics and each of political sciences, statistics, and other disciplines. The fact that the female dummy is no longer statistically significant once we control for undergraduate major is due to the fact that women are slightly underrepresented in economics and overrepresented in political sciences and law.[15]

In columns 6 and 7 we explore the role of socioeconomic background and its interaction with social mobility. We find that there is no statistically significant correlation between OMI values and the likelihood of being awarded a scholarship and that, contrary from what suggested by the simple

[15] Women account for 33% of applicants but for only 29% of applicants with a degree in economics; 39% of applicants with a degree in law are women and 45% of applicants with a degree in political sciences are women.

bivariate comparisons of Table 5, the relationship between OMI value and the probability of being awarded a scholarship is not affected by social mobility at the province's level. In fact, OMI value stops being significantly correlated with the probability of winning a scholarship as soon as we control for final university grade, a variable which is strongly positively correlated with OMI values (bottom panel of Table 3).

In Table 7, we estimate a set of models similar to those of Table 6, but focus on the likelihood of being shortlisted. Most results are qualitatively similar to those of Table 6, with the following two notable exceptions. First, the result that women are less likely to be shortlisted than men is now robust to including the full set of controls. The difference ranges between 8 and 9 percentage points (as 25% of candidates are shortlisted, these point estimates suggest that women are 30% less likely to be shortlisted than men) and between 4 and 5 percentage points in the models with the full set of controls (a corresponding to a 20% gender gap). Second, candidates who have representatives from their university of origin in the selection committee are no longer more likely to be shortlisted than other candidates. This result makes sense as the selection committee awarded the scholarships on the basis of a shortlist prepared by Sanpaolo employees but committee members did not contribute to forming the shortlist.

As mentioned, shortlisted candidates were identified using a set of scores assigned by Sanpaolo staff. We have information on these scores for the years 1979-80 and 1986-95. Figure 5 compares the distribution of the standardized total score of female applicants with that of male applicants. It shows that, for applicants who are close to the shortlisting threshold of 10, the distribution for female applicants always lies to the left of the distribution for male applicants. A Kolmogorov-Smirnov test confirms that the distributions for male and female candidates are significantly different from each other.

In column 1 of Table 8, we estimate a model in which the dependent variable is the standardized total score and the set of controls include the same variables as in column 5 of Table 7. We find that, controlling for individual characteristics, women receive lower scores than men. In the remaining 8 columns, we study the correlates of individual sub-scores using both OLS (even-numbered columns) and ordered probit models (odd-numbered columns). When we study scores based on fully objective criteria (final university grade and average grade in economics exams,

columns 2-5), we find that, controlling for individual characteristics, there are no statistically significant differences between male and female applicants. Next, we look at a criterion based on the number of economics exams (columns 6 and 7) and find that, in this case, there is a substantial gender gap. This result indicates that either female applicants took fewer economics exams than male applicants (note that we are controlling for undergraduate major) or that there was a bias in the definition of an economics exam. Finally, we look at the correlates of the least objective criterion (i.e., the general profile of the candidate) and also find a negative and statistically significant coefficient for the female dummy (columns 8 and 9).[16]

Recent research has shown to what extent unconscious biases may affect evaluations, with the bias being stronger in the subjective components of appraisals. A number of related studies in this area have found that women are more likely to receive lower ratings in subjective scores than similar men, even after controlling for measures of productivity (see among others Broder 1993, Bagues and Esteve-Volart 2010, Witterman et al. 2019). Among other factors, the identity and characteristics of the evaluator (e.g., gender) may affect the assessment of subjective appraisals according to the findings of both experimental and non-experimental studies (De Paola and Scoppa 2015, Boring 2017, Mengel et al. 2019). The literature has also shown what institutional settings and organizational practices may be effective to mitigate biases in performance evaluations and reduce gender inequalities (Bohnet et al. 2015, Bohnet 2016). Table 9 describes the share of women in the distribution of the total score and of its components. It shows that the share of women drops dramatically in the right part of the distribution (a fact already highlighted in Figure 5), which is what matters for the probability of being shortlisted.

Next, we study the likelihood of being awarded a scholarship conditional on being shortlisted. Columns 1-7 of Table 10 estimate models identical to those of columns 1-7 of Table 6, but restricting the sample to shortlisted candidates. We now find that only three variables are statistically significant: (i) the high school final grade (the point estimate suggests that for each additional point in the final grade shortlisted candidates were approximately 0.8 percentage points more likely to be awarded a scholarship); (ii) the commission dummy, with a point estimate suggesting that shortlisted candidates with an undergraduate degree from a university represented

[16] This negative coefficient survives after controlling for the number of economics exams (the score studied in columns 6 and 7; results not reported here).

in the selection committee were 15 percentage points more likely to receive a scholarship; and (iii) the law dummy, indicating that candidates with a law degree were 15 percentage points less likely to receive a scholarship than candidates with an economics degree.

One problem with the results of columns 1-7 of Table 10 is that they are likely to suffer from selection bias. Consider, for instance, a situation in which the quality of shortlisted women is higher than the quality of shortlisted men. Such a situation (which is consistent with the presence of a gender gap in Table 7) would lead to a pool of shortlisted female candidates with higher quality with respect to shortlisted men. In such a situation, lack of discrimination should be reflected by a higher likelihood of awarding a scholarship to a woman, and a zero coefficient for the female dummy would be consistent with the presence of a gender bias.

In columns 8 and 9, we try to address this issue by using a two-step Heckman selection model, with bootstrapped standard errors. In order to avoid identifying the model through the non-linearity of the first stage, we exclude 4 of the university undergraduate major dummies from the second stage (the only undergraduate major dummy that seems to matter for shortlisted candidates is that for candidates with a law degree). Column 8 reports the results of the selection equation. As expected, the results are qualitatively similar to those of column 5 of Table 7 (the point estimates are different because in Table 7 we used a linear probability model and we now estimate a probit model). The results of the second stage (column 9) are instead different from those that we obtained in the regressions that did not control for selection. The most interesting finding is that, controlling for selection, we find a large and statistically significant gender gap also for shortlisted candidates.[17] Note that the inverse Mills ratio (lambda in column 9) is highly significant, indicating that selection bias in columns 1-7 is an important issue.

5 The career paths of Italian economists

[17] Note that the difference between the results of column 9 and those of column 5 are indeed due to the fact that in column 9 we control for selection and not to the fact that in column 9 we do not include a full set of undergraduate major dummies. If we estimate the model of column 5 by only controlling for the Law dummy, we obtain results similar to those of columns 9. Moreover, if we estimate the system of columns 8-9 by including the full set of university majors in both stages (i.e., we identify the model using the non-linearity of the first stage), again we obtain results similar to those of column 9.

In this section we use information on the career paths and publication records of the shortlisted candidates to analyze career choices, academic productivity, and career progressions of our sample of Italian economists.

5.1 Becoming a research economist

We carried out the data collection by searching for candidates' CVs using both LinkedIn and Google searches and then used these CVs to establish whether a candidate became a research economist. We defined as research economists all candidates who have written at least one academic article and/or had an academic appointment during their career.

We were able to find CVs and/or published material for 96% of shortlisted candidates and assumed that candidates for whom we could not find a CV or published articles were not research economists. The core of the literature that examines gender gaps in the economics profession has focused on what happens among economists who choose an academic career (CSWEP 2021, WINE 2020). Only a few studies have studied gender gaps in careers outside academia (e.g., Hospido et al. (2019) examine the career progression in the research and statistics departments of the European Central Bank; Bryan (2019) documents to what extent the large majority of top graduate students from leading U.S. universities start their employment in academia).

Out of 825 shortlisted candidates, 367 (45% of the total) have been research economists for their entire professional career, 44 (5% of the total) were research economists for part of their career, and the remaining 50% chose another profession (Table 11).[18] The share of research economists is higher among scholarship winners (65%) and even higher (70%) for scholarship winners if we only consider post 1987 applications (bottom panel of Table 11). This is the year when Sanpaolo decided to stop sponsoring candidates interested in MBAs and other business-related degrees. While there are no differences between the career choices of all shortlisted men and those of all shortlisted women, women who received a scholarship were more likely than men to become a research

[18] We defined as always being a research economist, a candidate that spent all her career in either academia or in an institution (like a central bank or an international organization) which produces academic research. We defined as mixed career economists, those who spent part of their career in academia (or in an institution that produces academic research) and part of their career in activities that do not involve academic research.

economist (73% of female scholarship winners became research economics versus 62% of male scholarship winners).

Table 12 shows that these results are robust to controlling for region and year of application. Column 1 shows that successful candidates are 25% more likely to choose a research career compared to other shortlisted candidates and that there are no statistically (or economically) significant differences between men and women in the probability of choosing a research career.[19] Columns 3-5 confirm that winning a scholarship has a stronger correlation with the probability of choosing a research career for women. In fact, our point estimates suggest that the effect of winning a scholarship is twice as large for women than for men (the interactive coefficient of column 5 is close to being statistically significant at the 10% confidence level with a p-value of 0.12).

We also find that the correlation between winning a scholarship and choosing a research career is nearly twice as large for candidates who live in low social mobility provinces with respect to candidates who live in high social mobility provinces (34% versus 18%, compare columns 6 and 7). However, the difference between the two groups is not statistically significant (column 8). We probe further and explore the role of socio-economic background (proxied by the percentage deviation between OMI values in the zone of residence and the regional average OMI value) and its interaction with social mobility. Surprisingly, we find that candidates with lower socio-economic background are more likely to choose a research career and (column 1 of Table 13), and that this result is driven by residents in low social mobility provinces (compare columns 2 and 3). The difference between the two groups, however, is not statistically significant (column 4).[20]

5.2 Academic impact

[19] In Table 12 we code mixed research career economists as having chosen a research career if they spent at least 25% of their career in academia or in a research institution.

[20] We also explored whether the variables of Tables 12 and 13 are correlated with the probability of returning to Italy after obtaining a degree abroad and we found that the individuals who received a PhD were less likely to return to Italy, while gender, socio-economic status and being a scholarship holder are not statistically significant. These additional results are available from the authors upon request.

To measure academic impact, we collected the CVs of all short-listed candidates who chose a research path and built detailed profiles of their career trajectories and research output.[21] Instead of measuring academic productivity by relying on the number of publications, or the prestige and ranking of the academic journals where the papers are published, we focus on the ultimate impact of the research output as proxied by the number of times a published article is cited in other publications. We start by looking at citation patterns by focusing on gender and its interaction on having been awarded a scholarship. Existing research in economics has found mixed evidence about the existence of gender gaps in citations of scholarly publications. While an earlier descriptive study by Ferber (1988) found a gap favoring men, the core of the research has found no evidence of gender gaps (Hamermesh 2018, Bransch and Kvasnicka 2017). However, a recent study by Card et al. (2020), which examines articles published in four leading economics journals, has documented a gender gap favoring women of 25%, when comparing citations between similar all female-authored and male-authored papers controlling also for referees fixed effects. This suggests that referees in top journals may hold higher standards for women than for men.

Table 14 reports summary statistics for citations of different groups of research economists. Four patterns are evident from these simple tabulations: (i) there are no large differences in citations between successful candidates and shortlisted candidates who did not receive a Jona scholarship (this is especially the case if we focus on the median); (ii) candidates who chose a full career outside Italy have, on average, higher citation counts than applicants who spent their whole career in Italy; (iii) on average, women have less citations than men; and (iv) the difference between men and women is smaller for shortlisted candidates who spent their whole career outside Italy.

In Table 15, we use data for all applicants who spent at least 10% of their career as research economists and estimate a set of models in which the dependent variable is the log of the number of citations and the explanatory variables are a set of individual characteristics plus region and year fixed effects.[22] The point estimates suggest that, as already seen in Table 14, women are less cited

[21] We were able to obtain bibliometrics for all shortlisted candidates who chose a research career. However, there are 21 shortlisted candidates with a research career for whom we could not find a detailed CV. Citation and h-index data were retrieved from Publish or Perish during August-September 2018. In the paper we measure productivity using citations, but we obtain qualitatively similar results with the h-index.

[22] There are 5 economists with zero citations which we drop from the sample. We obtain similar results if we include these 5 economists and use ln(1+citations).

than men and that having won a Jona scholarship is not significantly correlated with the number of citations (column 1). However, the gender effect is much smaller for candidates who received a Jona scholarship. The estimates of column 2 suggest a large and statistically significant gender effect for candidates who were not awarded a scholarship, but a much smaller (by about 50%) and not statistically significant difference between men and women who were awarded a scholarship (the point estimate of the female dummy for non-scholarship winner is -0.658 and that for scholarship winner is -0.658+0.291 =-0.367). This result is consistent with the idea that women who were awarded a scholarship are relatively better than women that were not awarded a scholarship, an effect that we do not find for men. Alternatively, the results could indicate that the scholarship program was particularly effective in allowing high potential women to pursue a successful research career, as also suggested by the results of Table 12.

Column 5 shows that the results are robust to controlling for OMI zone value, the percentage of time spent in a research job, and having a PhD. About 75% of the individuals included in the regressions of Table 15 have a PhD (77% in high social mobility provinces and 74% in low social mobility regions) and more than 90% of them have spent their full career in research, with only 5% of these economists having spent less than 50% of their career in research. As expected, we find higher citations counts for economists with a PhD and for economists who spent a larger share of their career in research. In the last two columns, we split the sample into high and low social mobility provinces. We find that the gender gap and the attenuating role of receiving a scholarship is much higher in low social mobility provinces. We also find that the socio-economic background is only marginally significant in high-social mobility regions, with a coefficient that suggests a negative correlation between socio-economic background and citations.

Next, we check whether there are differences in citations counts among research economists who work in different countries and across different types of institutions. Columns 1-3 of Table 16 use the model of the last three columns of Table 15 augmented with a set of dummies that track the last job of the economists included in our sample.[23] We classify these economists into 5 groups: (i) academic job in the US or Canada (the excluded group); (ii) academic job in Italy; (iii) academic

[23] We do not control for the female-winner interaction, but the results do not change if we include this control.

job in the UK, Ireland, or Australia; (iv) academic job in other European countries; (v) job in an international organization, central bank, or in the private sector.

The results for the main set of controls are similar to those of Table 15. The "last job" dummies indicate that US-based academic economists receive substantially more citations than economists who work in other countries. The negative coefficient is particularly large for economists who have an academic job in Italy (column 1). The results are essentially identical when we split the sample between candidates from high and low social mobility provinces (columns 2 and 3). In column 4, we also interact the "last job" variable with the female dummy. In this setting, the main effect of the female dummy should be interpreted as the citation gender gap for Italian economists who have an academic job in the US or Canada (the excluded group). The point estimates of column 4 indicate that there is no gender gap in citation counts for Italian economists who work outside Italy but that there is a sizable gender gap for economists who work in Italy. The positive (albeit not statistically significant) coefficient for female Italian economists who work in the US is consistent with the results of Hamermesh (2018), Bransch and Kvasnicka (2017), and Card et al. (2020).

5.3 Career progression

The under-representation of women economists, especially in leadership positions, remains significant in any sector, ranging from academia to the public and private sectors (Hanspach et al. 2021, Sule et al. 2020). We use survival analysis to study the drivers of career progression for Italian academic economists by focusing on the two major steps in an academic career: promotion to the rank of associate professor and promotion to the rank of full professor. As documented earlier, a significant share of individuals in our sample undertakes an academic career. One of the advantages of examining the career trajectories in academia is that, in spite of some differences across countries, the career patterns of academics are more homogeneous and easier to compare than career trajectories in the private sector, international organizations, and public administration. Moreover, the performance of academics is easier to compare. While the exact weight may vary in the performance assessment, academic publications and their quality represent a core component in the reviews for promotion.[24]

[24] Beyond research, teaching and service are also part of the assessment of academic performance in the promotion reviews.

We start with the Kaplan-Meier nonparametric estimator which summarizes the length of spells from the end of graduate studies to promotion to either associate or full professor. Survival analysis is especially well suited for our objective because it allows to model the expected duration of time until a given event happens (in our case promotion to associate or full professors) while allowing for censoring (i.e., for the possibility that this event has not yet happened or will not happen within the time-frame in which we observe the data).

The left panel of Figure 6 plots the time to promotion to associate professor and shows that Italian female economists tend to have slower careers than Italian male economists. The estimates suggest that 50% of Italian male academic economists are promoted to the rank of associate professor 8 years after completing their highest degree, while women take about 12 years to reach the 50% threshold. Moreover, about three quarters of male economists are promoted to the rank of associate professor within 25 years after completing their highest degree, but about one-third of women never reach this rank, even 40 years after completing their studies (in Italy, assistant professors can have tenure).

The right-hand panel of Figure 6, shows that gender gaps are much larger when we focus on promotion to full professor. In this case, we find that 50% of men are promoted within 14 years after completing their graduate studies, while women take 25 years to reach the 50% threshold. Moreover, while three quarters of men are promoted to the rank of full professor within 25 years after completing their graduate studies, about 40% of women never reach the rank of full professor.

To probe further, we study the drivers of career progression with a Cox proportional hazard model. The top panel of Table 17 focuses on time to promotion to associate professor for all academic economists in our sample. The table reports raw coefficients, negative values indicate hazard ratios below one and hence a slower career progression. The first column confirms the findings of Figure 6 and shows that women take more time to be promoted to the rank of associate professor and that the gender gap is statistically significant. Columns 2-4 show that this result is robust to including year and region fixed effects and controlling for having a PhD. The point estimates imply hazard ratios that range between 0.63 and 0.71 (*exp(-0.34)=0.71* and *exp(-0.47)=0.63*) and thus suggest that the "hazard" of promotion to associate professor is about 30% lower for women. As expected,

we find that having a PhD increases the likelihood of promotion (given that the hazard ratio is about 2, the point estimate suggests that having a PhD doubles the hazard of being promoted). Column 5 shows that citations are strongly associated with the probability of being promoted to associate professor with one extra log citation increasing the hazard ratio by 28%. When we control for citations, the female coefficient remains negative (with a hazard ratio of 0.78), but with a p-value of 0.17, no longer statistically significant. Albeit not always statistically significant at conventional level, these findings are consistent with existing research on gender gaps among economists in academia showing that gender gaps in promotion cannot be fully explained by observable measures of productivity (Ginther and Kahn 2004, 2021 Bayer and Rouse 2016).

The second panel of Table 17 focuses on economists who spent most of their career in Italy. We find a gender gap also in this sample of Italy-based economists, which is statistically significant only when including year and region fixed effects and controlling for having a PhD. On the other hand, when we control for citations, we find that the female coefficient becomes statistically insignificant (the p-value is 0.59). We find large and always statistically significant gender gaps when we focus on academic economists outside Italy (third panel of Table 17), with hazard ratios that range between 0.51 (column 1) and 0.18 (column 3). The estimated PhD coefficient is very large because almost all economists in this sample have a PhD. Column 5 shows that citations are associated with the speed of promotion, namely with an increase in the hazard ratio of 85% for each extra log citation. Finally, we focus on academic economists in the UK and North America (bottom panel of Table 17). In this case, we find gender gaps which are always statistically significant and larger than what we found in the other subsamples. The point estimates suggest hazard ratios that range between 0.51 (column 1) and 0.17 (column 3). As in all subsamples, citations are positively associated with promotion rates, but in this case the coefficient of having a PhD cannot be estimated as everyone in this sample has a PhD.

In Table 18 we focus on promotion to the rank of full professor. As already illustrated in the right panel of Figure 6, we find gender gaps which are much larger than those for promotion to associate professor. Moreover, the gender gap remains statistically significant also when we control for citations. The point estimates imply hazard ratios that range between 0.50 (column 3) and 0.67 (column 5). We also find that the effects of having a PhD and a higher number of citations are larger than when we study promotion to associate professor. The second and third panels show that

the coefficients remain negative and, in most cases, statistically significant for both Italian-based and non-Italian based economists. As in the case for promotion to associate professor, we find large and always statistically significant gender gaps for economists based in the UK and North America (bottom panel). While this latter result may seem puzzling, it can be explained with the *up-or-out* tenure-track system, common in North America but not in Italy, and by the more dynamic market for non-academic economists outside Italy. Those who enter an academic career in Italy are unlikely to switch to another job and, eventually, may get promoted. Outside Italy, instead, academic economists who do not receive tenure are more likely to move out of academia and appear in our data as never having been promoted. While the small sample does not allow to econometrically test this hypothesis, our data show that 18% of economists who started an academic career outside Italy decided to leave academia. Among men, this dropout ratio was 14.7% and among women it was 25%. The dropout rate among economists who started their academic career in Italy, instead, was less than 2% and did not include any woman.

These findings show that gender gaps increase with seniority. They are consistent with another study on Italian academia (De Paola et al. 2018) and other studies examining gender gaps along the career trajectory in Europe and the United States (e.g., Ginther and Khan 2004, 2021, Auriol et al. 2019, Lundberg and Stearns 2019, Khan 2020). In this paper, by taking the longitudinal dimension, we also quantify how much longer it takes for women to get promoted at each step of the academic career. Moreover, we document that in an academic system like the Italian one, where in general there is no explicit *up-or-out* tenure-track system, a significant share of women remains in academia but never reaches the top ranks of the profession.[25]

6 Conclusions

In this paper, we have provided the first analysis of the role that a prominent merit-based scholarship for graduate studies played in shaping the human capital formation of a generation of Italian economists. Our sample focuses on a group that tends to be under-represented in surveys: individuals at the high end of the talent and ability distribution. That is, our sample includes students

[25] Possible explanatory factors for the persistence of gender gaps on both the supply-side and demand-side are discussed by Goldin et al. (2019), Lundberg and Stearns (2019), Boustan and Langan (2019), Bayer and Rouse (2016), and Bertrand (2011).

who graduated from college with first class honors and were interested in undertaking a rigorous graduate training to pursue a career in economics. Our unique dataset allows us to follow these graduates along their professional life-cycle, along their career trajectory, up to their current employment.

Our results show that scholarship winners are more likely to undertake a career in research, and women who received a scholarship are more likely than men to become a research economist. This effect is particularly large for residents of low-social mobility provinces. While there are no initial gender gaps in educational attainment, academic performance and aspirations among individuals in our sample, we find that gender gaps emerge in the early stages of the career trajectory and then increase with seniority, and persist after controlling for measures of productivity.

We also examine the interaction between socio-economic status and social mobility. We find that it is easier to become a high achiever for individuals who come from lower income households if they reside in provinces characterized by higher social mobility. However, we find that socio-economic status and family background remain important and matter even for this sample of high achievers.

Our study raises some important questions for future research. It highlights the importance of examining the dynamic aspect of both educational and professional careers to better understand at what stage and how gaps emerge and evolve along the life-cycle. It also suggests the importance of studying the underlying mechanisms that lead to the formation of these gaps, by considering the possible interplay between supply-side and demand-side factors. Together these aspects have major implications for the design of effective policies and interventions to ensure equality of opportunity.

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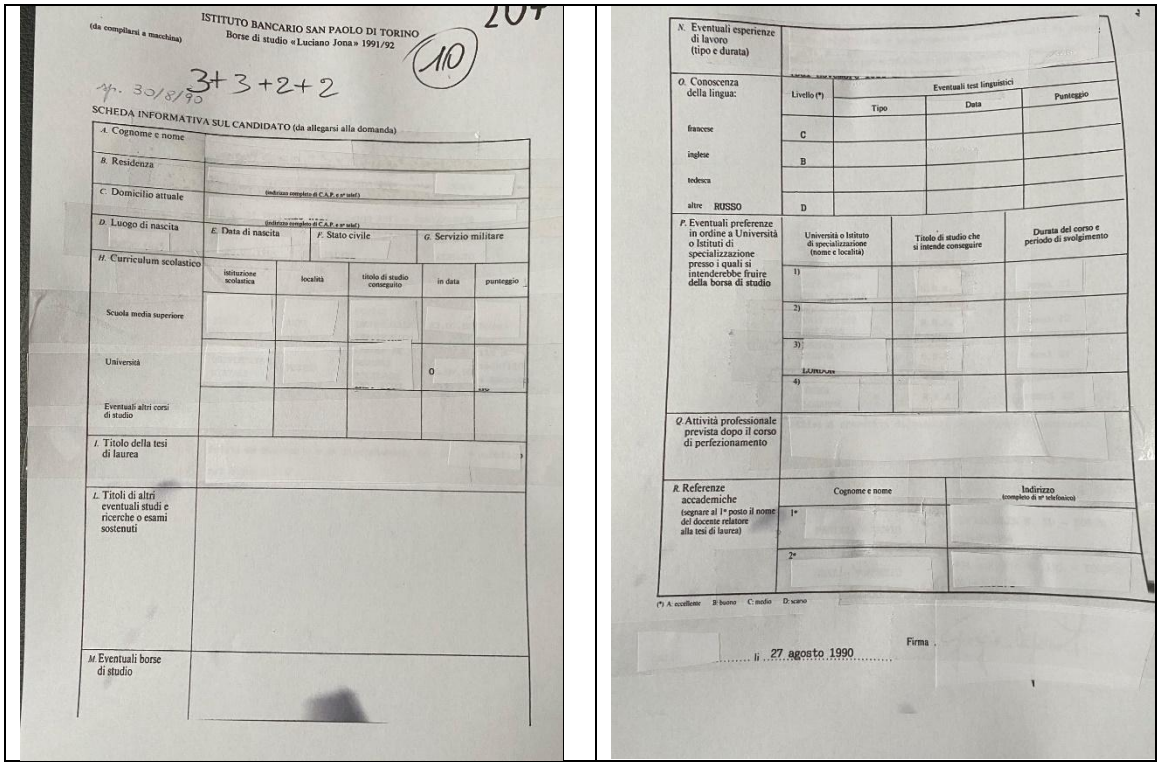
Figure 1: Application form for 1991/92



ISTITUTO BANCARIO SAN PAOLO DI TORINO
Borse di studio «Luciano Jona» 1991/92

(da compilarsi a macchina)

SCHEDA INFORMATIVA SUL CANDIDATO (da allegarsi alla domanda)

A. Cognome e nome
B. Residenza
C. Domicilio attuale
D. Luogo di nascita
E. Data di nascita
F. Stato civile
G. Servizio militare
H. Curriculum scolastico
Scuola media superiore
Università
Eventuali altri corsi di studio
I. Titolo della tesi di laurea
L. Titoli di altri eventuali studi e ricerche o esami sostenuti
M. Eventuali borse di studio

N. Eventuali esperienze di lavoro (tipo e durata)
O. Conoscenza della lingua:
francese
inglese
tedesca
altre RUSSO
P. Eventuali preferenze in ordine a Università o Istituti di specializzazione presso i quali si intenderebbe fruire della borsa di studio
Q. Attività professionale prevista dopo il corso di perfezionamento
R. Referenze accademiche (segnare al 1° posto il nome del docente relatore alla tesi di laurea)

Firma

li 27 agosto 1990

Figure 2: Share of REPEC ranked Italian economists who applied for Jona scholarships

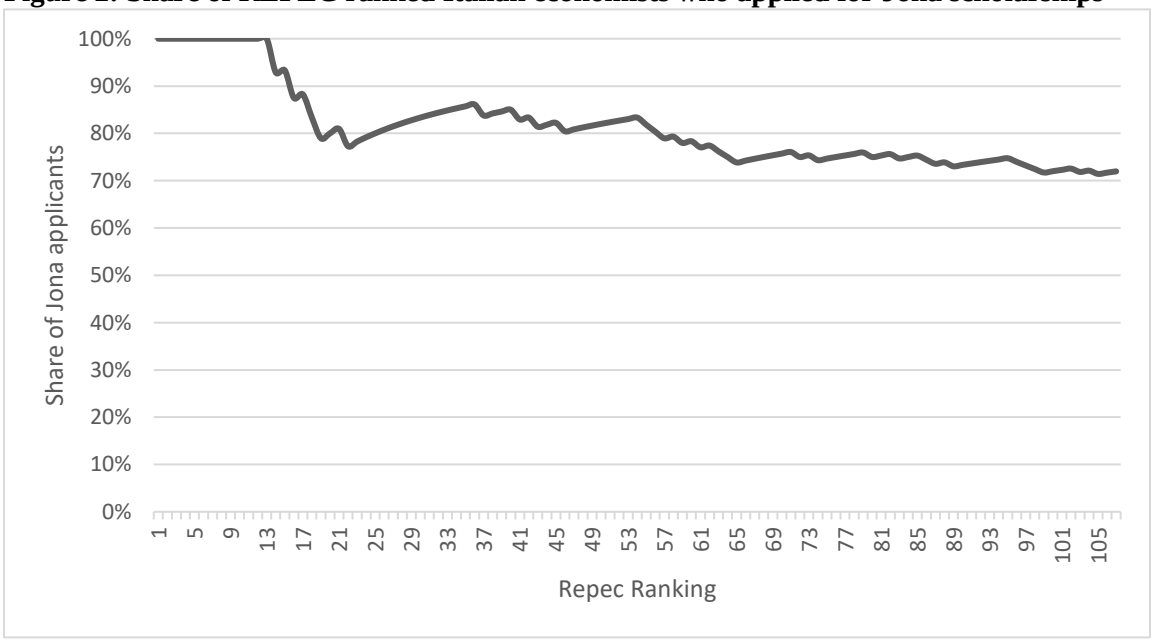


Figure 3: Share of successful candidates by university of origin

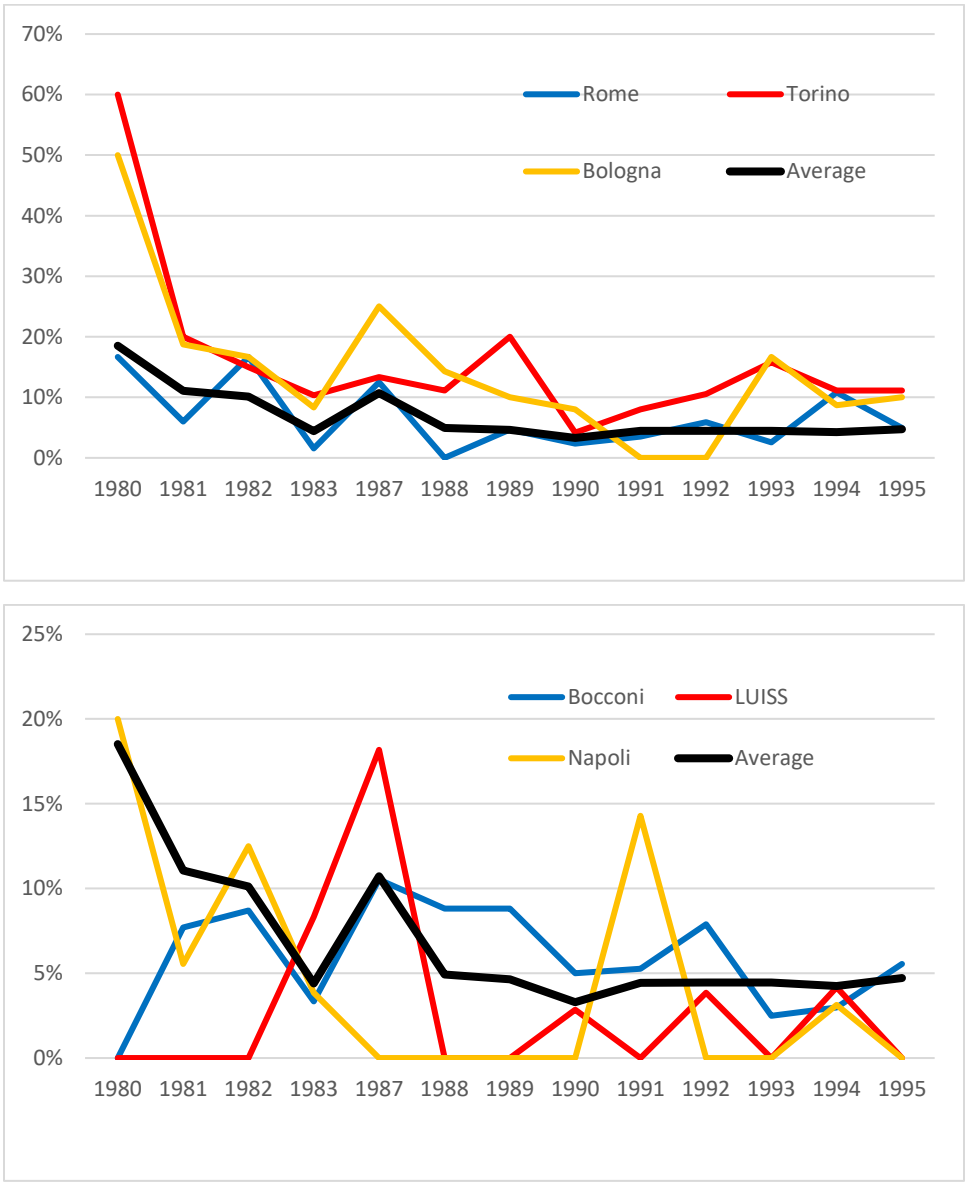
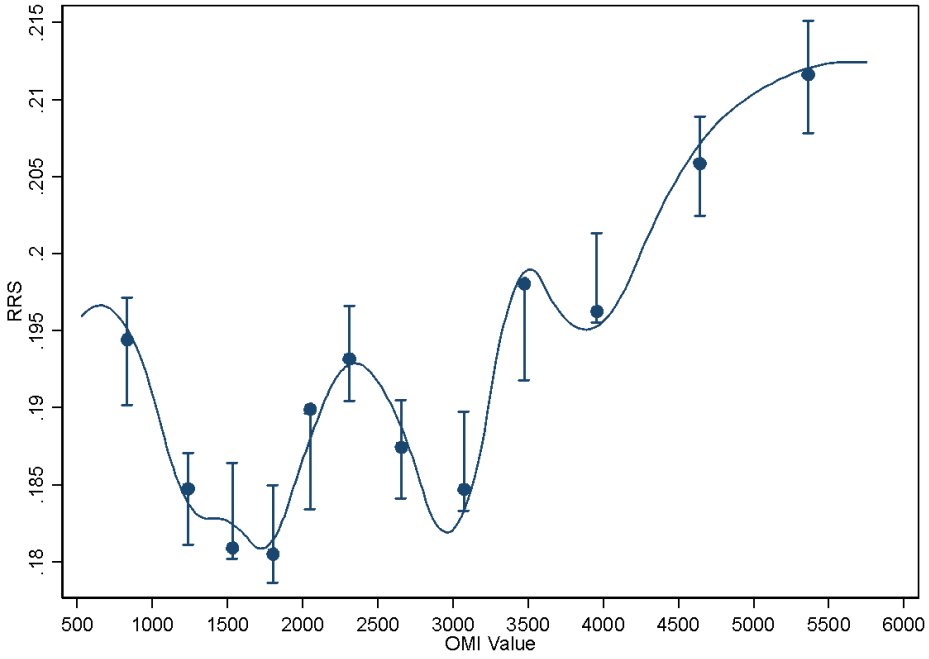


Figure 4: Social immobility and house values of applicants

Province-level rank-rank slope and average home value of applicants' OMI zone (binned regression with 12 groups)



Province-level rank-rank slope and average home value of applicants' OMI zone, conditional on average OMI value in the region of the applicant (binned regression with 12 groups)

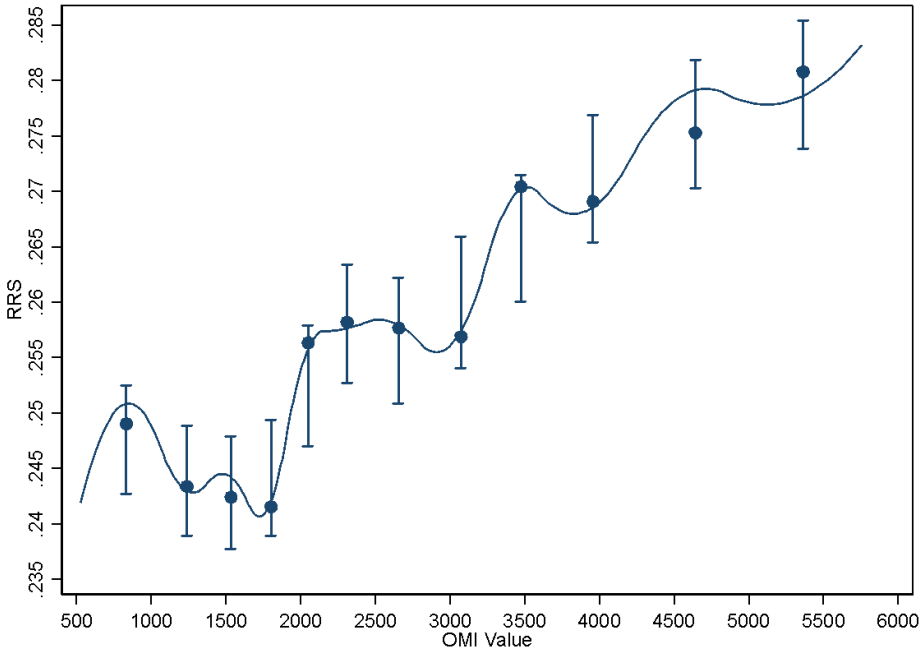


Figure 5: Distribution of scores by gender

Figure 6: Gender and career progression

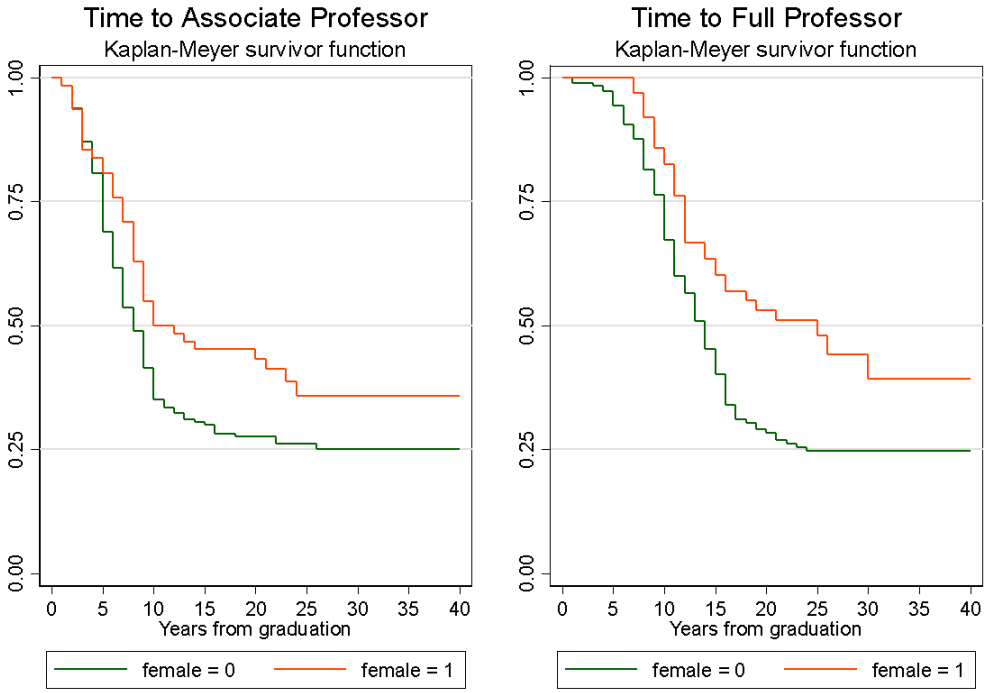


Table 1: Number of applicants and winners by year and gender

	Applications		Winners			
Year	**Nr**	**Female (%)**	**Nr**	**%**	**Female (%)**	**Gender gap**
1979	183	25%	26	14.1%	23%	1.4%
1980	135	27%	25	18.5%	20%	6.3%
1981	226	23%	25	11.1%	12%	7.1%*
1982	247	24%	25	10.1%	12%	6.6%*
1983	341	25%	15	4.4%	33%	-2.0%
1984	n/a	n/a	15	n/a	n/a	n/a
1985-86	330	24%	30	9.1%	20%	1.8%
1987	140	34%	15	10.7%	20%	6.5%
1988	223	30%	11	4.9%	18%	2.8%
1989	237	29%	11	4.6%	36%	1.6%
1990	334	37%	11	3.3%	18%	2.7%*
1991	225	42%	10	4.4%	50%	-1.5%
1992	224	34%	10	4.5%	40%	-1.1%
1993	224	34%	10	4.5%	30%	0.8%
1994	377	50%	16	4.2%	19%	5.2%***
1995	106	43%	5	4.7%	0%	8.0%***
Total	**3,568**	**32%**	**260**	**7.3%**	**24%**	**3.2%*** **

Table 2: Number of applicants and winners by university of origin

	Applications		Winners		
University	Nr	Share	Nr	Share	Share winners/ share applications
Roma	636	18.7%	51	19.6%	1.05
Milano Bocconi	459	13.5%	29	11.2%	0.83
Roma LUISS	286	8.4%	10	3.9%	0.46***
Torino	274	8.1%	42	16.2%	2.01***
Napoli	240	7.1%	13	5.0%	0.71
Bologna	182	5.4%	22	8.5%	1.58***
Siena	110	3.2%	9	3.5%	1.07
Bari	105	3.1%	2	0.8%	0.25**
Genova	91	2.7%	7	2.7%	1.01
Modena	89	2.6%	17	6.6%	2.50***
Firenze	87	2.6%	5	1.9%	0.75
Pisa	82	2.4%	8	3.1%	1.28
Palermo	78	2.3%	8	3.1%	1.34**
Milano Cattolica	75	2.2%	4	1.5%	0.70
Other	601	17.7%	32	12.4%	0.70***
Total	**3389**	**100%**	**259**	**100%**	

Table 3: Undergraduate degree

	All		Females		Winners		Female winners		OMI Value Euro/m^2		
	N	%	N	%	N	%	N	%	ALL	HSM	LSM
	Subject										
Economics	2,426	71%	717	64%	193	75%	46	74%	2,924	2,360	3,531
Political science	411	12%	185	17%	32	12%	9	15%	2,499	2,053	2,891
Law	276	8%	109	10%	9	3%	0	0%	2,813	2,123	3,263
Statistics	131	4%	55	5%	16	16%	4	6%	3,260	2,214	3,834
STEM	130	4%	22	2%	6	2%	0	0%	2,691	2,636	2,737
Other	52	2%	28	3%	3	1%	3	6%	2,304	2,081	2,528
Total	3,426	100%	1,116	100%	259	100%	62	100%	2,846	2,309	3,361
	Final grade										
110/110	607	18%	196	18%	3	1%	0	0%	2,422	2,026	2,940
110L/110	2,500	74%	839	76%	183	71%	46	74%	2,998	2,384	3,608
Menzione	89	3%	27	2%	9	3%	0	0%	2,420	1,419	2,553
Dignità di stampa	190	5%	41	4%	63	24%	16	26%	2,677	2,536	2,776
Total	3,426	100%	1,116	100%	259	100%	62	100%	2,846	2,309	3,361

Table 4: Type of high school

	All		Females		Winners		Female winners		Omi value Euro/m^2		
	N	%	N	%	N	%	N	%	ALL	HSM	LSM
Liceo classico	1,044	41%	293	39%	122	48%	26	43%	3,139	2,541	3,662
Liceo scientifico	1,130	44%	297	39%	110	43%	25	42%	2,747	2,282	3,218
Other licei	83	3%	49	7%	7	3%	4	7%	3,391	2,298	4,161
Accounting/Commercial	244	10%	99	13%	14	5%	5	8%	2,111	1,734	2,606
Other professional	61	2%	14	2%	2	1%	0	0	2,208	1,761	2,739

Table 5: Applicants and OMI zone values

	All	Winners	Non-Winners
All	2,702	2,780	2,694
Males	2,744	2,832	2,734
Females	2,590[a]	2,611	2,589[a]
Percentage deviation from regional average			
All	92%	96%	92%[b]
High social mobility provinces	72%	78%	71%[b]
Low social mobility provinces	113%	117%	113%

[a] significantly lower than males, [b] significantly lower than winner

Table 6: Probability of being awarded a scholarship (Linear Probability Model)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Female	-0.023***	-0.022**	-0.016	-0.017	-0.015	-0.014	-0.015
	(0.009)	(0.009)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
110L			0.079***	0.078***	0.073***	0.069***	0.069***
			(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Menzione			0.129***	0.120***	0.114***	0.114***	0.116***
			(0.042)	(0.043)	(0.043)	(0.044)	(0.044)
D. stampa			0.314***	0.310***	0.304***	0.311***	0.312***
			(0.037)	(0.037)	(0.037)	(0.038)	(0.038)
Grade HS			0.002***	0.002***	0.003***	0.003***	0.003***
			(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Abroad				0.089***	0.087***	0.085***	0.084***
				(0.031)	(0.031)	(0.031)	(0.031)
Age				0.002	0.001	0.001	0.001
				(0.005)	(0.005)	(0.005)	(0.005)
Repeated				0.011	0.009	0.006	0.006
				(0.022)	(0.022)	(0.022)	(0.022)
Commission				0.032*	0.031*	0.026	0.028
				(0.019)	(0.019)	(0.019)	(0.019)
Undergrad							
Polit science					-0.012	-0.005	-0.005
					(0.019)	(0.019)	(0.019)
Law					-0.055***	-0.051***	-0.051***
					(0.016)	(0.016)	(0.017)
Statistics					0.052	0.045	0.045
					(0.037)	(0.036)	(0.036)
STEM					-0.041*	-0.041*	-0.040*
					(0.022)	(0.022)	(0.022)
Other					-0.045	-0.040	-0.041
					(0.039)	(0.039)	(0.039)
OMI						0.014	0.017
						(0.013)	(0.019)
OMI*HS							0.000
							(0.028)
HS							0.022
							(0.030)
Constant	0.090**	0.308***	0.205	0.142	0.160	0.029	0.005
	(0.036)	(0.054)	(0.168)	(0.219)	(0.219)	(0.157)	(0.160)
N. Obs.	3,444	3,275	2,419	2,417	2,417	2,314	2,314
R^2	0.044	0.061	0.114	0.122	0.127	0.130	0.130
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	No	Yes	Yes	Yes	Yes	Yes
University FE	No	Yes	No	No	No	No	No

Robust standard errors in parentheses. ***p<0.01, ** p<0.05, * p<0.1

Table 7: Probability of being shortlisted for a scholarship (Linear Probability Model)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Female	-0.091***	-0.080***	-0.047***	-0.047***	-0.041**	-0.045***	-0.045***
	(0.015)	(0.015)	(0.016)	(0.016)	(0.016)	(0.017)	(0.017)
110L			0.197***	0.193***	0.185***	0.186***	0.187***
			(0.013)	(0.013)	(0.013)	(0.014)	(0.014)
Menzione			0.716***	0.712***	0.700***	0.696***	0.695***
			(0.045)	(0.045)	(0.045)	(0.046)	(0.046)
D. stampa			0.735***	0.729***	0.720***	0.721***	0.723***
			(0.028)	(0.029)	(0.029)	(0.029)	(0.029)
Grade HS			0.004***	0.004***	0.004***	0.004***	0.004***
			(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Abroad				0.147***	0.145***	0.154***	0.153***
				(0.032)	(0.032)	(0.033)	(0.033)
Age				-0.003	-0.002	-0.003	-0.003
				(0.007)	(0.007)	(0.007)	(0.007)
Repeated				0.051*	0.047*	0.041	0.041
				(0.027)	(0.027)	(0.027)	(0.027)
Commission				0.008	0.011	0.010	0.009
				(0.022)	(0.022)	(0.023)	(0.023)
Undergrad							
Polit science					-0.036*	-0.029	-0.028
					(0.022)	(0.022)	(0.022)
Law					-0.096***	-0.087***	-0.087***
					(0.022)	(0.022)	(0.022)
Statistics					0.017	0.017	0.018
					(0.039)	(0.040)	(0.040)
STEM					-0.083***	-0.079***	-0.079***
					(0.030)	(0.030)	(0.030)
Other					-0.090**	-0.090**	-0.088**
					(0.041)	(0.042)	(0.043)
OMI						-0.005	0.019
						(0.018)	(0.025)
OMI*HS							-0.049
							(0.038)
HS							0.026
							(0.040)
Constant	0.378***	0.832***	0.789***	0.828***	0.838***	0.428**	0.410**
	(0.056)	(0.036)	(0.148)	(0.223)	(0.221)	(0.194)	(0.200)
N. Obs.	3,444	3,275	2,419	2,417	2,417	2,314	2,314
R^2	0.100	0.162	0.448	0.456	0.461	0.461	0.462
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	No	Yes	Yes	Yes	Yes	Yes
University FE	No	Yes	No	No	No	No	No

Robust standard errors in parentheses. ***p<0.01, ** p<0.05, * p<0.1

Table 8: Individual scores

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Total	Final grade		Econ grades		Econ exams (nr)		Profile	
Female	-0.361***	-0.011	-0.206	-0.039	-0.068	-0.146***	-0.325***	-0.129**	-0.142**
	(0.103)	(0.014)	(0.142)	(0.049)	(0.081)	(0.039)	(0.089)	(0.063)	(0.072)
110L	2.686***	0.982***	5.449***	0.923***	1.079***	0.276***	0.596***	0.302***	0.346***
	(0.168)	(0.017)	(0.544)	(0.093)	(0.116)	(0.076)	(0.169)	(0.102)	(0.117)
Menzione	4.055***	1.944***	9.231***	1.144***	1.428***	0.260**	0.515*	0.437***	0.498***
	(0.239)	(0.044)	(0.764)	(0.126)	(0.214)	(0.118)	(0.263)	(0.157)	(0.178)
D. stampa	4.884***	2.368***	10.587***	1.176***	1.669***	0.378***	0.876***	0.506***	0.595***
	(0.229)	(0.052)	(0.816)	(0.104)	(0.187)	(0.088)	(0.205)	(0.145)	(0.166)
Grade HS	0.051***	0.000	0.004	0.024***	0.041***	0.007*	0.014*	0.021***	0.025***
	(0.008)	(0.001)	(0.011)	(0.004)	(0.006)	(0.003)	(0.008)	(0.005)	(0.006)
Abroad	0.769***	0.063*	0.702**	0.044	0.004	0.098	0.234*	0.522***	0.621***
	(0.159)	(0.038)	(0.283)	(0.073)	(0.146)	(0.061)	(0.139)	(0.106)	(0.127)
Age	-0.015	-0.013*	-0.105	-0.059***	-0.107***	0.045**	0.083**	0.011	0.012
	(0.048)	(0.007)	(0.067)	(0.022)	(0.036)	(0.018)	(0.040)	(0.031)	(0.035)
Repeated	0.676***	-0.018	-0.187	0.100	0.197	0.055	0.117	0.461***	0.550***
	(0.141)	(0.024)	(0.189)	(0.065)	(0.126)	(0.045)	(0.102)	(0.091)	(0.106)
Comm.	0.089	-0.042	-0.284	-0.115	-0.176	0.058	0.065	0.195	0.228
	(0.222)	(0.035)	(0.315)	(0.112)	(0.181)	(0.098)	(0.230)	(0.123)	(0.139)
Undergr.									
PS	-0.377**	-0.012	-0.108	0.223***	0.426***	-0.573***	-1.072***	-0.129	-0.140
	(0.158)	(0.018)	(0.198)	(0.074)	(0.135)	(0.077)	(0.152)	(0.101)	(0.116)
Law	-1.228***	-0.025	-0.673	-0.005	0.030	-1.162***	-2.036***	-0.330*	-0.419**
	(0.280)	(0.041)	(0.464)	(0.151)	(0.224)	(0.122)	(0.315)	(0.170)	(0.199)
Stats	-0.109	-0.020	-0.196	0.174	0.376	-0.227***	-0.519***	-0.077	-0.083
	(0.241)	(0.025)	(0.201)	(0.108)	(0.237)	(0.084)	(0.180)	(0.134)	(0.155)
STEM	-2.377***	-0.052**	-0.680***	-1.065***	-1.289***	-1.473***	-2.701***	-0.015	0.025
	(0.469)	(0.020)	(0.248)	(0.320)	(0.392)	(0.213)	(0.577)	(0.304)	(0.351)
Other	-3.114***	0.010	0.075	-1.473***	-1.938**	-1.779***	-3.710***	-0.060	-0.099
	(0.750)	(0.064)	(0.354)	(0.527)	(0.851)	(0.105)	(0.535)	(0.427)	(0.494)
/cut1			-6.145**		-2.125*		-0.582		-1.578
			(2.397)		(1.135)		(1.134)		(1.152)
/cut2			-1.721		-1.272		0.743		-0.161
			(2.256)		(1.135)		(1.148)		(1.153)
/cut3			4.490**		-0.287		3.608***		0.844
			(2.286)		(1.139)		(1.165)		(1.155)
/cut4			7.131***				4.334***		2.002*
			(2.296)				(1.171)		(1.157)
/cut5							5.318***		3.313***
							(1.219)		(1.167)
Const.	6.299***	1.624***		1.939***		0.934*		1.669*	
	(1.669)	(0.489)		(0.647)		(0.510)		(0.974)	
N. Obs.	1,164	1,164	1,164	1,164	1,164	1,024	1,024	1,027	1,027
R^2	0.571	0.872		0.317		0.466		0.289	
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Model	OLS	OLS	O-prob	OLS	O-prob	OLS	O-prob	OLS	O-prob

Robust standard errors in parentheses. ***p<0.01, ** p<0.05, * p<0.1

Table 9: Share of female applicants by scores

Standardized score			Individual scores								
			Final grade		Economics grades		Economics exams		Profile	
	%	N.		%	N.	%	N	%	N	%	N
<5	44.6%	121	0			50%	152	51.1%	223	33.3%	21
5	42.3%	130	1	41.7%	304	39.3%	351	50.3%	388	46.3%	324
6	44.6%	213	2	38.7%	1,567	36.9%	629	33.2%	1,268	42.0%	769
7	43.1%	290	3	27.2%	151	36.2%	947	25%	40	32.9%	605
8	33.3%	324	4	23.2%	56			12.5%	16	28.6%	199
9	37.1%	382	5					0	3	25%	24
10	30.7%	280									
11	24.5%	159									
>11	13.7%	73									
All	36.2%	1,972		37.9%	2,079	37.9%	2,079	38.3%	1,938	38.2%	1,942

Table 10: Probability of being awarded a scholarship, conditional on being shortlisted (Linear Probability Model)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
								Heckman	
								1st	2nd
Female	0.002	-0.009	-0.009	-0.006	-0.005	0.005	0.005	-0.223***	-0.051*
	(0.034)	(0.034)	(0.034)	(0.034)	(0.035)	(0.036)	(0.036)	(0.082)	(0.031)
110L			-0.206	-0.217	-0.198	-0.233	-0.218	2.075***	0.440
			(0.290)	(0.293)	(0.285)	(0.281)	(0.276)	(0.266)	(0.328)
Menzione			-0.402	-0.436	-0.416	-0.431	-0.409	4.021***	0.606
			(0.295)	(0.300)	(0.293)	(0.289)	(0.284)	(0.424)	(0.387)
D. stampa			-0.197	-0.210	-0.188	-0.208	-0.190	4.307***	0.831**
			(0.293)	(0.297)	(0.290)	(0.286)	(0.281)	(0.350)	(0.387)
Grade HS			0.004	0.005*	0.005*	0.008***	0.008***	0.024***	0.011***
			(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.006)	(0.004)
Abroad				0.028	0.028	0.011	0.011	0.657***	0.153***
				(0.046)	(0.046)	(0.046)	(0.046)	(0.137)	(0.046)
Age				0.022	0.016	0.019	0.018	-0.018	0.010
				(0.015)	(0.015)	(0.015)	(0.015)	(0.033)	(0.020)
Repeated				0.009	0.014	0.009	0.008	0.156	0.054
				(0.041)	(0.042)	(0.043)	(0.042)	(0.113)	(0.059)
Commission				0.158***	0.154***	0.145**	0.154**	0.089	0.161***
				(0.056)	(0.057)	(0.061)	(0.062)	(0.115)	(0.059)
Undergrad									
Polit science					-0.018	-0.001	-0.003	-0.236*	
					(0.059)	(0.060)	(0.060)	(0.124)	
Law					-0.156*	-0.149*	-0.148*	-0.724***	-0.256***
					(0.080)	(0.083)	(0.083)	(0.166)	(0.092)
Statistics					0.092	0.087	0.084	0.141	
					(0.087)	(0.092)	(0.094)	(0.230)	
STEM					-0.049	-0.057	-0.053	-0.405*	
					(0.119)	(0.122)	(0.120)	(0.237)	
Other					-0.073	-0.073	-0.081	-0.782	
					(0.198)	(0.191)	(0.196)	(1.337)	
OMI						0.024	0.029		
						(0.038)	(0.058)		
OMI*HS							0.011		
							(0.082)		
HS							0.060		
							(0.086)		
lambda									0.463***
									(0.086)
Constant	0.367**	0.422***	0.384	-0.182	-0.037	-0.135	-0.199	-0.286	-0.688
	(0.185)	(0.075)	(0.382)	(0.556)	(0.555)	(0.520)	(0.522)	(2.299)	(0.631)
N. Obs.	810	808	761	760	760	719	719	2,417	2,417
R^2	0.201	0.207	0.224	0.238	0.243	0.246	0.248		
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reg. FE	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Un. FE	No	Yes	No	No	No	No	No	No	No

Robust standard errors in parentheses, in columns 8 and 9 are bootstrapped. ***p<0.01, ** p<0.05, * p<0.1

Table 11: Career choices of shortlisted candidates

Type	All shortlisted applicants		Successful candidates	
	N	%	N	%
Always a research economist	367	45%	143	56%
Mixed career	44	5%	22	9%
Other	414	50%	89	35%
	Female Candidates			
Always a research economist	89	44%	38	63%
Mixed career	14	7%	6	10%
Other	99	49%	16	27%
	Post 1987			
Always a research economist	206	45%	50	64%
Mixed career	18	4%	6	8%
Other	230	51%	22	28%

Table 12: Probability of choosing a research career, gender and social mobility

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Winner	0.255***	0.255***	0.206***	0.411***	0.224***	0.181***	0.335***	0.314***
	(0.044)	(0.044)	(0.050)	(0.097)	(0.049)	(0.063)	(0.064)	(0.058)
Female		-0.002			-0.047	-0.028	0.030	-0.003
		(0.042)			(0.051)	(0.064)	(0.056)	(0.041)
Female*Winner					0.136			
					(0.087)			
HS*Winner								-0.11
								(0.079)
HS								0.050
								(0.090)
Constant	0.342	0.342	0.379	0.449	0.348	0.506***	0.651	0.465***
	(0.270)	(0.270)	(0.266)	(0.301)	(0.266)	(0.148)	(0.376)	(0.156)
Observations	739	739	557	182	739	363	367	730
R^2	0.121	0.121	0.122	0.260	0.124	0.128	0.183	0.125
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample	All	All	Men	Women	All	HSM	LSM	All
Winner+F*W					0.325			
P-Value					0.000			

Robust standard errors in parentheses. ***p<0.01, ** p<0.05, * p<0.1

Table 13: Probability of choosing a research career, socio-economic background, and social mobility

	(1)	(2)	(3)	(4)
Winner	0.249***	0.173***	0.330***	0.249***
	(0.045)	(0.064)	(0.067)	(0.045)
Female	-0.011	-0.035	0.037	-0.009
	(0.043)	(0.065)	(0.058)	(0.043)
OMI	-0.101**	-0.065	-0.130*	-0.164**
	(0.046)	(0.068)	(0.075)	(0.073)
OMI*HS				0.097
				(0.098)
HS				-0.111
				(0.114)
Constant	0.580***	0.563***	0.753*	0.661***
	(0.138)	(0.157)	(0.383)	(0.174)
Observations	695	356	339	695
R^2	0.130	0.131	0.195	0.132
Year FE	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes
Univ Major	No	No	No	Yes
Sample	All	HSM	LSM	All

Robust standard errors in parentheses. ***p<0.01, ** p<0.05, * p<0.1

Table 14: Citations of shortlisted research economists

	Mean	Median	St. Dev	Min	Max	N. Obs.
			All Shortlisted			
Always a research economist	3,296	996	9,243	0	121,340	391
Mixed career	620	92	1,702	0	9,536	48
			Shortlisted with full career in Italy			
Always a research economist	1,548	619	2,934	0	28,735	178
Mixed career	110	64	157	0	621	16
			Shortlisted with full career abroad			
Always a research economist	5,572	2008	13,089	3	121,340	176
Mixed career	751	118	1,898	0	9,536	29
			Scholarship winners			
Always a research economist	2,920	928	6,932	7	70,250	144
Mixed career	888	124	2,140	0	9,536	22
			Scholarship winners with full career in Italy			
Always a research economist	2,003	772	4,144	13	28,735	69
Mixed career	99	14	213	0	621	8
			Scholarship winners with full career abroad			
Always a research economist	4,193	1,600	9,333	8	70,250	63
Mixed career	1,549	461	2,769	5	9,536	12
			All Shortlisted Women			
Always a research economist	1,908	527	3,594	0	24,124	96
Mixed career	528	150	1,542	0	6,077	15
			Shortlisted Women with full career in Italy			
Always a research economist	715	352	982	0	3,756	39
Mixed career	52	5	85	0	150	3
			Shortlisted Women with full career abroad			
Always a research economist	4,995	1,650	4,995	15	24,124	40
Mixed career	153	110	174	36	619	10
			All female scholarship winners			
Always a research economist	1,882	527	3,514	26	15,673	38
Mixed career	231	110	231	0	619	6
			Female scholarship winners with full career in Italy			
Always a research economist	582	310	579	85	2,263	17
Mixed career	2.5	2.5	3.5	0	5	2
			Female scholarship winners with full career abroad			
Always a research economist	3,525	1,438	4,895	26	15,673	16
Mixed career	296	150	296	69	619	3

Table 15: Citations

	(1)	(2)	(3)	(4)	(5)
Female	-0.518**	-0.658*	-0.928***	-0.700*	-1.269**
	(0.243)	(0.360)	(0.323)	(0.400)	(0.533)
Winner	0.107	0.043	0.071	0.174	-0.019
	(0.259)	(0.276)	(0.262)	(0.358)	(0.469)
F*W		0.291	0.293	0.005	0.910
		(0.498)	(0.439)	(0.603)	(0.687)
OMI			-0.219	-0.555*	-0.100
			(0.221)	(0.333)	(0.324)
PhD			1.606***	1.524***	1.713***
			(0.273)	(0.469)	(0.337)
% Res			3.227***	3.056***	3.531***
			(0.694)	(1.005)	(0.972)
Constant	3.765**	3.757**	3.848***	4.316***	1.141
	(1.584)	(1.595)	(0.968)	(1.264)	(1.267)
N. Obs.	348	348	330	186	144
R^2	0.146	0.147	0.356	0.394	0.432
Year FE	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes
Sample	All	All	All	HSM	LSM
Female+F*W		-0.367	-0.635	-0.695	-0.359
P-Value		0.273	0.0268	0.123	0.362

Robust standard errors in parentheses. ***p<0.01, ** p<0.05, * p<0.1

Table 16: Citations across countries

	(1)	(2)	(3)	(4)
Female	-0.729***	-0.681**	-0.770**	0.260
	(0.197)	(0.286)	(0.312)	(0.547)
Winner	0.147	0.305	0.068	0.153
	(0.236)	(0.321)	(0.448)	(0.236)
OMI	-0.259	-0.562*	-0.284	-0.236
	(0.211)	(0.314)	(0.338)	(0.212)
PhD	1.448***	1.453***	1.507***	1.453***
	(0.281)	(0.477)	(0.349)	(0.283)
% Res	3.326***	3.234***	3.554***	3.310***
	(0.742)	(1.100)	(1.059)	(0.744)
Last job				
Italy	-1.695***	-1.750***	-1.726***	-1.451***
	(0.291)	(0.396)	(0.451)	(0.320)
UK/Irl/Aus	-1.330***	-1.315*	-1.597***	-1.009*
	(0.470)	(0.760)	(0.600)	(0.550)
Other EU	-1.151***	-1.204**	-1.082*	-0.964*
	(0.423)	(0.591)	(0.549)	(0.493)
Int. Org.	-1.310***	-1.176**	-1.499***	-1.161***
	(0.346)	(0.480)	(0.513)	(0.371)
Italy*Female				-1.183**
				(0.598)
UK/Irl/Aus*Female				-1.417
				(0.968)
Other EU*Female				-0.982
				(0.928)
Int. Org.*Female				-0.824
				(0.674)
Constant	5.055***	5.400***	2.794**	4.833***
	(1.062)	(1.456)	(1.333)	(1.096)
N. Obs.	330	186	144	330
R^2	0.409	0.459	0.467	0.414
Year FE	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes
Sample	All	HSM	LSM	All

Robust standard errors in parentheses. ***p<0.01, ** p<0.05, * p<0.1

Table 17: Progressions to Associate Professor (survival analysis)

The table reports coefficients. Positive values as associated with hazard ratios above 1 and thus faster career progressions (longer survival as assistant professor)

	(1)	(2)	(3)	(4)	(5)
	Full sample				
Female	-0.339**	-0.402**	-0.470**	-0.461**	-0.251
	(0.164)	(0.174)	(0.183)	(0.182)	(0.183)
PhD				0.714***	0.409*
				(0.212)	(0.234)
Ln(citations)					0.248***
					(0.053)
N. Obs.	2,399	2,399	2,399	2,399	2,343
	Career in Italy				
Female	-0.276	-0.327	-0.426**	-0.389*	-0.118
	(0.189)	(0.203)	(0.208)	(0.205)	(0.218)
PhD				1.425***	1.143***
				(0.264)	(0.277)
Ln(citations)					0.261***
					(0.067)
N. Obs.	1,482	1,482	1,482	1,482	1,426
	Career outside Italy				
Female	-0.671*	-0.926***	-1.722***	-1.780***	-1.161*
	(0.360)	(0.355)	(0.623)	(0.608)	(0.595)
PhD				34.849***	33.677***
				(1.282)	(1.229)
Ln(citations)					0.618**
					(0.252)
N. Obs.	917	917	917	917	917
	Career in UK and North America				
Female	-0.701*	-0.976**	-1.788***		-1.205***
	(0.378)	(0.404)	(0.595)		(0.445)
PhD					
Ln(citations)					0.636*
					(0.353)
N. Obs.	375	375	375		375
Year FE	No	Yes	Yes	Yes	Yes
Region FE	No	No	Yes	Yes	Yes

Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 18: Progressions to Full Professor (survival analysis)

The table reports coefficients. Positive values as associated with hazard ratios above 1 and thus faster career progressions (longer survival as assistant/associate professor)

	(1)	(2)	(3)	(4)	(5)
	Full sample				
Female	-0.532***	-0.602***	-0.686***	-0.682***	-0.403**
	(0.179)	(0.183)	(0.201)	(0.197)	(0.193)
PhD				0.868***	0.456*
				(0.237)	(0.266)
Ln(citations)					0.330***
					(0.064)
N. Obs.	3,899	3,899	3,899	3,899	3,836
	Career in Italy				
Female	-0.568**	-0.657***	-0.699***	-0.683**	-0.462
	(0.227)	(0.243)	(0.269)	(0.273)	(0.290)
PhD				1.298***	0.984***
				(0.337)	(0.363)
Ln(citations)					0.246***
					(0.082)
N. Obs.	2,623	2,623	2,623	2,623	2,560
	Career outside Italy				
Female	-0.444	-0.502*	-1.050**	-1.147**	-0.582
	(0.286)	(0.280)	(0.436)	(0.454)	(0.439)
PhD				38.064	36.851
				(0.000)	(0.000)
Ln(citations)					0.719***
					(0.164)
N. Obs.	1,276	1,276	1,276	1,276	1,276
	Career in UK and North America				
Female	-0.594*	-0.708**	-1.408**		-1.156*
	(0.318)	(0.323)	(0.620)		(0.648)
PhD					
Ln(citations)					1.135***
					(0.280)
N. Obs.	639	639	639		639
Year FE	No	Yes	Yes	Yes	Yes
Region FE	No	No	Yes	Yes	Yes

Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1