



GENDERING ACADEMIA

1

GEA Working Paper 1

GENDER ASYMMETRIES IN ACADEMIA. MAPPING THE MACRO-CONTEXT

Edited by Paola Villa

With contributions from Alessia Donà,
Annalisa Dordoni, Barbara Poggio,
Maria Luigia Segnana, Paola Villa

2021



**UNIVERSITÀ
DI TRENTO**



**UNIVERSITÀ
DEGLI STUDI
DI TORINO**



uniss
UNIVERSITÀ DEGLI STUDI DI SASSARI
dumas
DIPARTIMENTO DI SCIENZE UMANISTICHE E SOCIALI



**Università
degli Studi
di Palermo**





GEA Working Paper 1

**GENDER ASYMMETRIES IN ACADEMIA.
MAPPING THE MACRO-CONTEXT**

Edited by Paola Villa

With contributions from Alessia Donà, Annalisa Dordoni,
Barbara Poggio, Maria Luigia Segnana, Paola Villa

2021

Università degli Studi di Trento



**UNIVERSITÀ
DI TRENTO**

Pubblicato da
Università degli Studi di Trento
via Calepina, 14 - 38122 Trento

Impaginazione: Paola Villa
Copertina: Aragon Multiservice

Copyright © 2021 Università di Trento

tutti i diritti riservati

1 ed., anno 2021
ISBN 978-88-8443-955-0

TABLE OF CONTENTS

INTRODUCTION.....	6
1. EDUCATION POLICIES AND OUTCOMES	7
1.1 EDUCATIONAL TRENDS.....	7
1.2 WOMEN AND MEN IN EDUCATION	11
1.3 EDUCATION POLICIES.....	16
1.4 EDUCATION OUTCOMES.....	17
2. EMPLOYMENT, LABOUR MARKET POLICIES AND OUTCOMES.....	20
2.1 AN OVERVIEW	20
2.2 TERTIARY EDUCATION AND EMPLOYMENT CONDITIONS IN ITALY.....	23
3. FAMILY-FORMATION PRACTICES AND POLICIES.....	26
3.1 FAMILY MODELS.....	26
3.2 POLICIES.....	27
4. CARE & WORK-LIFE POLICIES AND PRACTICES.....	29
5. EQUAL OPPORTUNITY POLICIES AND PRACTICES	31
5.1 GENDER EQUALITY LEGISLATION	31
5.2 INSTITUTIONAL STRUCTURE FOR GENDER EQUALITY AND EQUAL RIGHTS.....	33
6. EQUAL OPPORTUNITY AND PROMOTION OF WOMEN IN ACADEMIA AND SCIENCE: POLICIES AND PRACTICES	35
6.1 THE MOST SIGNIFICANT RESEARCH INITIATIVES FOR GENDER EQUALITY IN EDUCATION & SCIENCE	35
6.2 THE PROCESS OF CHANGE: RESEARCH INITIATIVES AND ACTION PLANS FOR GENDER EQUALITY	37
6.3 TEACHING GENDER IN ITALIAN UNIVERSITIES.....	39
7. GENDER ASYMMETRIES IN ACADEMIC CAREERS IN ITALY	40
7.1 RECRUITMENT PROCEDURES IN THE ITALIAN UNIVERSITY SYSTEM.....	40
7.1.1 <i>Budget cuts and low funding in Tertiary Education and Research</i>	<i>41</i>
7.1.2 <i>The Research Quality Evaluation.....</i>	<i>41</i>
7.1.3 <i>The ‘Departments of Excellence’ programme</i>	<i>42</i>
7.1.4 <i>The National Scientific Qualification system and its gender effects</i>	<i>42</i>
7.2 INVESTIGATING THE ‘GLASS CEILING’ PHENOMENON IN ITALIAN ACADEMIA.....	42
7.2.1 <i>Participation in NQS.....</i>	<i>43</i>
7.2.2 <i>The gender productivity gap</i>	<i>43</i>
7.2.3 <i>National and local vertical discrimination</i>	<i>44</i>
7.2.4 <i>Bibliometric indicators and NQS results</i>	<i>45</i>
7.2.5 <i>The role of gender in the national committees.....</i>	<i>46</i>
7.3 THE EARLY STAGES OF THE ACADEMIC CAREER.....	47
7.3.1 <i>Post-doc and entry positions.....</i>	<i>47</i>
7.3.2 <i>New frontiers of work flexibility in Italian Academia</i>	<i>48</i>
7.4 CONSEQUENCES OF THE FLEXIBILIZATION OF THE EARLY STAGES OF THE ACADEMIC CAREERS.....	48
7.5 HIGHLY SKILLED MIGRATION AND THE BRAIN DRAIN.....	49
7.6 CURRENT CHALLENGES AND DEBATES ON WOMEN AND SCIENCE ISSUES	50
8. CONCLUDING REMARKS	53
ABBREVIATIONS AND ACRONYMS.....	55
APPENDIX	56
TABLES	56
FIGURES.....	61
BIBLIOGRAPHY	64

A. GENDER EQUALITY IN EDUCATION, EMPLOYMENT, FAMILY-FORMATION AND WORK-LIFE BALANCE ...	64
B. GENDER EQUALITY IN ACADEMIA AND WOMEN IN SCIENCE.....	66
WEBSITES.....	70

INTRODUCTION

Over the last few decades, women greatly improved their educational attainment, and their labour market ambitions increased accordingly. Along with these changes, the employment rate of women (especially mothers) increased to a significant extent in the decade before the Great Recession. However, gender gaps recorded in Italy in employment and unemployment rates remain amongst the highest in the EU28. The majority of highly educated women still has to overcome several obstacles to get access to the top positions. Thus, women are not fully integrated into the labour market or remain in its periphery. This stylised picture is also found at the university level where women remain a small minority among full professors, and even a smaller minority in leadership positions (among heads of department and rectors).

This report (GEA-WP1) presents an overview of the socio-economic context within which gender asymmetries in career advancement develop in the Italian university system. The focus is rather broad, spanning from education, employment, and family formation (considering trends, policies and outcomes) to equal opportunity policies and practices in the Italian society and in Academia. The analysis is based on empirical evidence available from major secondary sources (Eurostat, Oecd, Istat, Miur, etc.) and a review of the literature.

The report is structured in seven sections: 1. Education policies and outcomes; 2. Employment, labour market policies and outcomes; 3. Family-formation practices and policies; 4. Care and work-life policies and practices; 5. Equal opportunity policies and practices; 6. Equal opportunity and promotion of women in Academia and Science: policies and practices; 7. Gender equality: equal opportunity and promotion of women in Academia. Section 8. Concluding remarks.

The bibliography is organised in two distinct sections. Section A includes references to the literature on education, employment, family-formation and work-life balance; Section B includes references to the literature on gender equality in academia and women in science. The Appendix presents additional information and empirical evidence that supports some of the main points discussed in this report.

1. EDUCATION POLICIES AND OUTCOMES

1.1 Educational trends

Educational attainment. Since the beginning of the new century, Italy recorded significant increases in the educational attainment of young women and men. Despite these positive trends, young Italians have on average lower levels of education than their peers in Europe (see Appendix, fig. A.1). The 2019 *Education at a Glance* (EAG) by the Oecd shows that in 2018, the share of 25-34 year-olds without an upper secondary degree was far higher in Italy than the Oecd average (15 vs 24%) and the EU23 average (14%). Tertiary attainment rate among 25-34 year-olds in 2018 was the second lowest among Oecd countries, after Mexico (28% vs 23%). Moreover, it was much lower than the target set by the *Europe 2020* strategy¹.

In Italy, educational attainment is on the increase, even though it remains significantly lower than EU28 average (see tab. 1.1). The share of adult population (25-64 yrs.) with secondary education is much lower in Italy compared with EU28 average (with a 16.4 p.p. gap). The difference is even larger for the adult population with tertiary education (with an 18 p.p. gap). The picture does not improve when one considers young people. Tertiary educational attainment has been increasing for younger generations over the last decades, but not as fast as in the majority of European countries (see Appendix, fig. A.1). In 2018, Italy records the second lowest share of young adults (30-34 yrs.) with tertiary education (27.8%) within the EU28, after Romania (24.6%). It should be pointed out that part of the gap in tertiary education is due to the very low share of vocational and short-cycle university courses² (ISCED 2011, level 5), little developed in Italy compared to other EU countries (ANVUR 2019: 86).

Table 1.1 Main indicators on educational attainment in Italy and EU28 in 2008 and 2018

	Italy 2008	Italy 2018	Change 2008-2018 (p.p.)	EU28 2018	Gap IT-EU28 in 2018 (p.p.)
Share 25-64 yrs with secondary education (%)	53.3	61.7	+8.4	78.1	-16.4
Share 25-64 yrs with tertiary education (%)	14.3	19.3	+5.0	32.3	-18.0
Share 30-34 yrs with tertiary education (%)	19.2	27.8	+8.6	40.7	-21.5

Source: Eurostat database, in Istat, *Statistiche Report*, 15 luglio 2019.

Enrolment in tertiary education. Since 2004/05 up to 2012/13, Italy recorded a reduction in first-time tertiary entrants ('immatricolati'), as shown in the Appendix (tab. A.1). This was the result of two distinct factors. First, the positive temporary effect of the introduction of the 3+2 university courses on first-entrants into university had waned; second, the long economic downturn (2008-

¹ *Europe 2020* established that by 2020 at least 40% of 30–34-year-olds should have a tertiary (or equivalent) qualification. See <https://ec.europa.eu/eurostat/web/europe-2020-indicators>.

² *Istituti Tecnici Superiori*. Short-cycle tertiary programmes are relatively new in Italy. Only 1.7% of first-time entrants into tertiary education in 2017 entered these programmes. They should facilitate youth's entry into the labour market. In Italy, they are mainly addressed to male students and/or unable to attract female students (less than 1/3 of students enrolled in these programmes).

2013) produced an unexpected discouragement in enrolment into tertiary education³. Between 2010 and 2013 the transition rate from school to university dropped from 48.5% to 43.4% (ANVUR 2019: 29). Certainly, the reduction in transition rates from high school to university is a worrying phenomenon, given the still small share of graduates in Italy, even in the younger age groups. Since 2013/14, the number of first entry students started to grow again, returning in 2017/18 to the level recorded in 2008/09.

In the academic year 2017/18, there were around 1 million 665 thousand students enrolled in tertiary education (short-cycle, BA and Master degrees, or equivalent). The total number of university students enrolled per year is persistently decreasing, since the introduction of the university reform 3+2. This reflects, among other factors, the improvement in the average time required for graduation. This positive outcome is mirrored in the progressive increase in the share of ‘regular students’⁴: from 66.7% in 2010/11 up to 73.7% in 2017/18 (ANVUR 2019: 40-41).

Other indicators measuring ‘drop out rates’ (i.e. share of students dropping out from tertiary education, by degree) and ‘success rates’ (i.e. share of students completing their university degree within 10 years, by degree) by cohort of new entrants confirm a steady improvement of tertiary education: drop-out rates keep falling, and success rates keep increasing (ANVUR 2019: 43-57). However, there are systematic differences by academic field (with medicine performing better than math and computer science), sex (with women performing better than men), and geographical area (with the North performing better than the South).

Graduates. The trend in graduation and dropout rates shows a marked improvement in the most recent cohorts. In particular, it is noticeable the increase in the share of ‘regular students’ (for BA courses): from 19% in 2003 to 30.8% in 2013. The share of all students succeeding to graduate increases further the higher is the number of years considered: up to almost 60% after 8 years of enrolment (ANVUR 2019: 52).

The distribution of graduates by field of education shows a relative concentration in four fields (economics and statistics, political and social sciences, engineering, and medicine) that count for about 50% of graduates, both in 2007 and 2016 (tab. 1.2). The data show also some change over time: it is noticeable the increase in economics and statistics (+9,382), engineering (+4,770), linguistics (3,090), chemistry and pharmacology (+2,391), and the decrease in political and social sciences (-9,382), law (-3,776), and literature (-2,076). Table 1.2 reports the total number of graduates, and the absolute and the percentage change between 2007 and 2016.

An academic discipline (or field of study) is a branch of knowledge. There is no consensus on how some academic disciplines should be classified. This explains the lack of common definitions across international and national institutions collecting information on tertiary education by field of study. Box A.1 (in the Appendix) provide some information on available international sources, as well as the two classifications used in Italy by Istat (i.e., Istat groups) and by CUN (i.e. Cun areas).

Table 1.2 Graduates by field of education in 2007 and 2016 (No. and %)

³ In periods of high youth unemployment, the opportunity cost of staying in education is low (for the difficulties young people meet in getting a job). Therefore, what is expected is an increase in the number of young people staying in education.

⁴ The distinction between ‘regular’ and ‘non-regular’ students is based on the total number of years of enrolment compared to the number of years of study required for graduation.

Field of education (Istat group)	2007	2016	Abs. change	%change	Distribution (%)	
					2006	2016
Scientific	7.844	8.818	974	12,42	2,61	2,83
Chemical-pharmaceutical	6.859	9.250	2.391	34,86	2,29	2,97
Geo-biological	13.561	13.809	248	1,83	4,52	4,43
Medical	32.995	32.345	-650	-1,97	10,99	10,37
Engineering	36.017	40.787	4.770	13,24	12,00	13,08
Architecture	15.064	16.558	1.494	9,92	5,02	5,31
Agrarian	5.681	7.597	1.916	33,73	1,89	2,44
Economic-statistical	41.413	50.795	9.382	22,65	13,80	16,29
Political-social	39.985	30.440	-9.545	-23,87	13,32	9,76
Law	25.706	21.940	-3.766	-14,65	8,56	7,04
Literature	25.740	23.664	-2.076	-8,07	8,58	7,59
Linguistic	15.774	18.864	3.090	19,59	5,26	6,05
Teaching	15.487	14.392	-1.095	-7,07	5,16	4,62
Psychological	13.385	14.968	1.583	11,83	4,46	4,80
Physical education	3.820	6.920	3.100	81,15	1,27	2,22
Defense and security	800	644	-156	-19,50	0,27	0,21
Total	300.131	311.791	11.660	3,88	100,00	100,00

* Istat groups; 2016 is the last year available in I.Stat (January 2020).

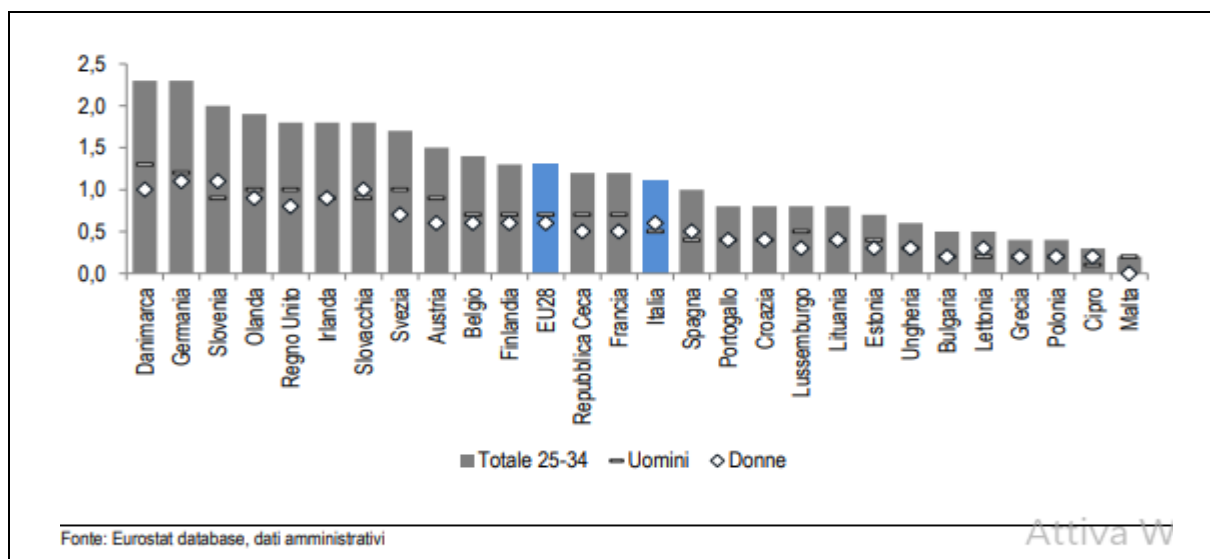
Source: Istat database (I.Stat).

In Italy, the difference in the employment rate of tertiary-educated adults is particularly large across fields of study. The employment rate is very high for adults that studied ‘information and communication technologies’ (87%) and ‘engineering, manufacturing and construction’ (85%), but relatively low for adults that studied arts (72%), humanities (78%) and ‘other’ STEM fields (e.g. natural sciences, mathematics and statistics, 78%).

Despite the signals from the labour market, in Italy the share of adults with a tertiary degree in engineering, manufacturing and construction is relatively low (15%), about 2 p.p. lower than the Oecd average (OECD 2019a, fig. 1). At the same time, Italy has the second highest share (29%) of tertiary-educated adults who studied arts and humanities, social sciences, journalism and information across Oecd countries. And these fields remain popular among younger generations (31% among new cohorts of graduates) (OECD 2019a: 2). It would be crucial for the university system to have a better understanding of the processes of choice about the field of education by young school-leavers, highlighting the differences between women and men. Ideally, the choice of the field of study should be made taking into account not only preferences and attitudes (including math skills), but also future prospects in the labour market.

Doctoral education. In 2014, 1.1 per thousand (‰) of people aged 25-34 had a PhD in Italy (Istat 2018). This figure, which summarizes a country's ability to provide potential future workers with the skills necessary to carry out highly qualified research activities, highlights that Italy's situation is slightly behind the EU average (1.3 ‰), but better than Spain, Portugal and Greece and several Central-Eastern countries. Denmark and Germany are the countries with the highest values (2.3 ‰), as shown in figure 1.1.

Fig. 1.1 Individuals aged 25-34 holding a doctoral degree in EU countries in 2014. Every 1,000 individuals



Source: Istat (2018), "L'inserimento professionale dei dottori di ricerca", *Statistiche Report*, 26 novembre 2018.

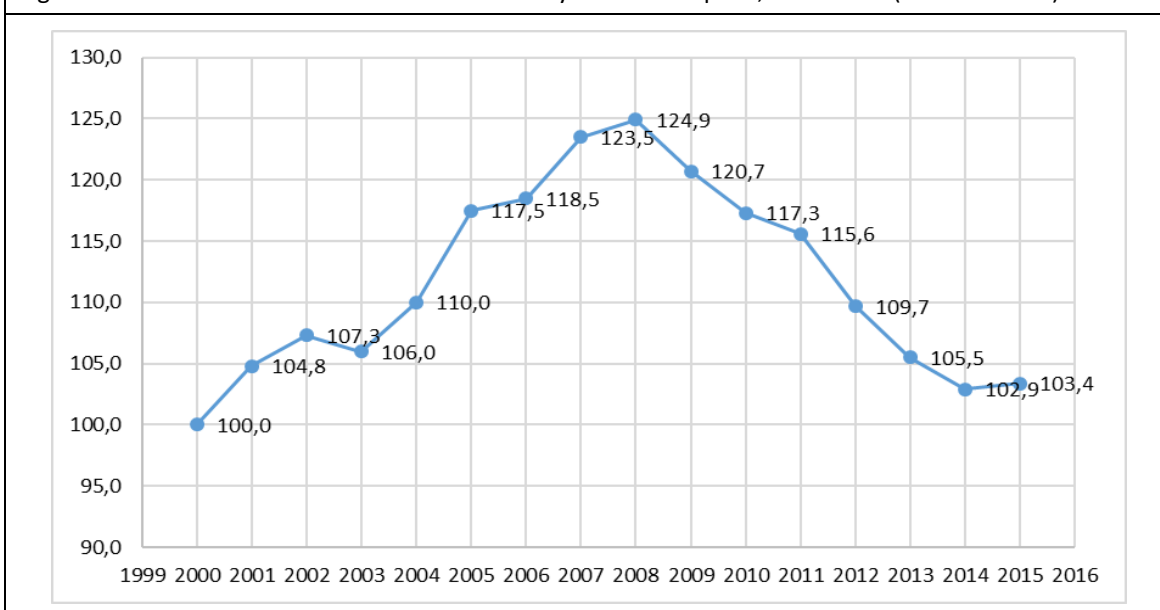
The number of doctoral students recorded a long period of constant growth from the introduction of the doctorate in the Italian university system in the mid-1980s until 2008. It remained roughly constant until around 2013 (see tab. 1.3). Subsequently, it began to decline slightly and then contracted sharply from 2013/14, when the effects of the new legislation on doctoral courses (D.M. 43/2013) began to become evident. The contraction in both the number of doctoral courses and doctoral students has been dramatic.

Tab. 1.3 – Doctoral courses and students enrolled in Italy, 2006/07-2015/16

Academic year	No. of courses	No. of students (total)
2006/07	2,897	40,121
2007/08	2,667	39,238
2008/09	2,695	39,281
2009/10	2,721	38,344
2010/11	2,623	36,392
2011/12	2,486	34,877
2012/13	2,286	34,921
2013/14	2,310	33,508
2014/15	2,221	32,771
2015/16	1,256	28,306
<i>Abs. change (2012/13–2015/16)</i>	<i>-1,030</i>	<i>-6,615</i>
<i>% change (2012/13–2015/16)</i>	<i>45.06</i>	<i>-34.57</i>

Source: ANVUR (2019), Tab. I.1.1.2.

Fig. 1.1 – Total revenue of state universities in Italy at constant price, 2000-2015 (index number)



Source: ANVUR (2019: 233).

Economic resources. Economic resources for education are low in Italy. According to OECD (2019a: 5), Italy spends about 3.6% of its GDP on education, one of the lowest levels of expenditure among OECD countries, below the OECD average of 5%). Total expenditure for tertiary education (including R&D) is only 0.9% of GDP in Italy, but 1.5% for OECD average. Expenditure per student in tertiary programmes is \$ 11,600 in Italy, compared to \$ 15,556 for OECD average.

The total revenue of the state universities (at constant prices) shows an upside-down U trend: it grew until 2008 and then gradually declined. In 2015 (last year available) total revenue was still slightly lower than in 2001 (fig. 1.1). Total spending followed the trend of revenue: from the maximum level recorded in 2008 (€ 13.5 billions) it gradually decreased (€ 11.8 billions in 2015) (ANVUR 2019: 226-8).

1.2 Women and men in education

Trends in educational attainment show that young women invest more in education than young men. This holds true also for Italy. Eurostat data on tertiary education (2019) show that in 2017, women accounted for 55.6% of all tertiary students in Italy (slightly higher than EU28 average, 54%). The share of women among tertiary students was a little higher among those studying for master's degrees (59.2%, higher than EU28 average, 57.1%), somewhat lower for those studying for bachelor's degrees (53.8%, about the same as EU28 average, 53.4%). Also, for doctoral studies, the majority of students were women (50.5%). The difference is very small, but it is significant given that in the EU28 as a whole, the majority of doctoral students were men (52.1%).

Women stay longer in education and achieve higher educational attainments. Young women are on average more likely than young men to complete their upper-secondary education on time and perform better at school leaving examinations at the end of compulsory education and upper secondary school. In Italy more women than men are enrolled in tertiary education (tab. 1.4). The difference is significant and persistent over time. Women not only outnumber men in tertiary education, but they also perform better, on average. It follows, that all major indicators on tertiary education show a better performance by women compared to men: transition rates from high-

school to university, enrolment rates, the share of graduates (BA and MA) among young people (tab. 1.5). Table 1.6 presents all main indicators to compare women’s and men’s educational performance, with reference to the most recent data available.

Tab. 1.4 Number of students enrolled in tertiary education (ISCE 2011: 5-8) in Italy by sex and female share (%), 2007-2016

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Change 2007-16
M	126.017	125.050	122.877	119.354	122.903	121.023	123.079	124.261	125.399	131.673	5.656
F	174.114	169.927	169.933	169.776	175.969	176.382	179.134	180.334	176.665	180.118	6.004
MF	300.131	294.977	292.810	289.130	298.872	297.405	302.213	304.595	302.064	311.791	11.660
%F	58,01	57,61	58,04	58,72	58,88	59,31	59,27	59,20	58,49	57,77	

Source: Istat database (I.Stat).

Table 1.5 Indicators on tertiary education by sex in Italy, 2008-2017 (%)

	1. Transition rates from high-school to university		2. Enrollment rate in tertiary education		3. Graduates for 100 people of 25 years		4. MA graduates for 100 people of 25 years	
	F	M	F	M	F	M	F	M
2008	71,0	60,1	47,9	35,2	43,7	30,6	22,3	15,2
2009	68,8	56,8	47,3	34,3	40,8	29,2	22,0	15,1
2010	68,3	57,9	47,6	34,4	39,4	27,9	22,3	15,0
2011	66,6	55,7	46,8	34,0	38,2	26,1	22,9	15,3
2012	63,6	52,5	45,6	33,0	39,8	26,6	24,3	16,3
2013	61,5	49,8	45,7	33,1	37,6	25,2	24,1	15,7
2014	55,2	44,1	44,1	32,2	39,6	25,5	23,6	15,3
2015	54,4	43,7	43,7	32,2	39,9	25,8	23,5	15,1
2016	55,6	45,0	43,8	32,4	39,6	26,4	23,3	15,7
2017	55,6	44,9	44,5	33,0	40,3	27,5	24,1	16,5

Source: Istat database (I.Stat).

As is well known, the proportion of men and women varies considerably between different fields of study. This pattern is fairly consistent throughout Europe (Eurydice 2010: 97; Eurostat 2019a) and the promotion of gender atypical fields of study still remains a major challenge. In tertiary education, the share of women is particularly high in “Education”, “Humanities & arts” and “Health & welfare”. In the area of “Social science, business and law”, which have by far the highest number of students, women are in a slight majority, while the area of “Services” is slightly male dominated. Finally, the areas of “Science” and “Agriculture” have an almost equal distribution of women and men. The only area markedly male-dominated is “Engineering, manufacturing and construction”, with Italy recording a gender gap smaller than the EU28 average (see fig. 1.2).

Figure 1.2 shows the difference (in absolute values) between the number of female and male graduates in STEM fields for 2017, with almost twice as many female as male graduates in the EU-28. In relative terms, the gender gap for this field of education was most marked in Luxembourg, Belgium and Austria (i.e. the number of male graduates was around three times as high as the number of female graduates); there were also relatively large differences in Finland, Germany, Malta, Ireland, the Netherlands, Spain and Lithuania. In Italy, the total number of graduates in STEM fields is lower than EU28 average, but with a relatively low difference between women and men.

Table 1.6 Performance indicators in tertiary education by sex in Italy, most recent data available (%)

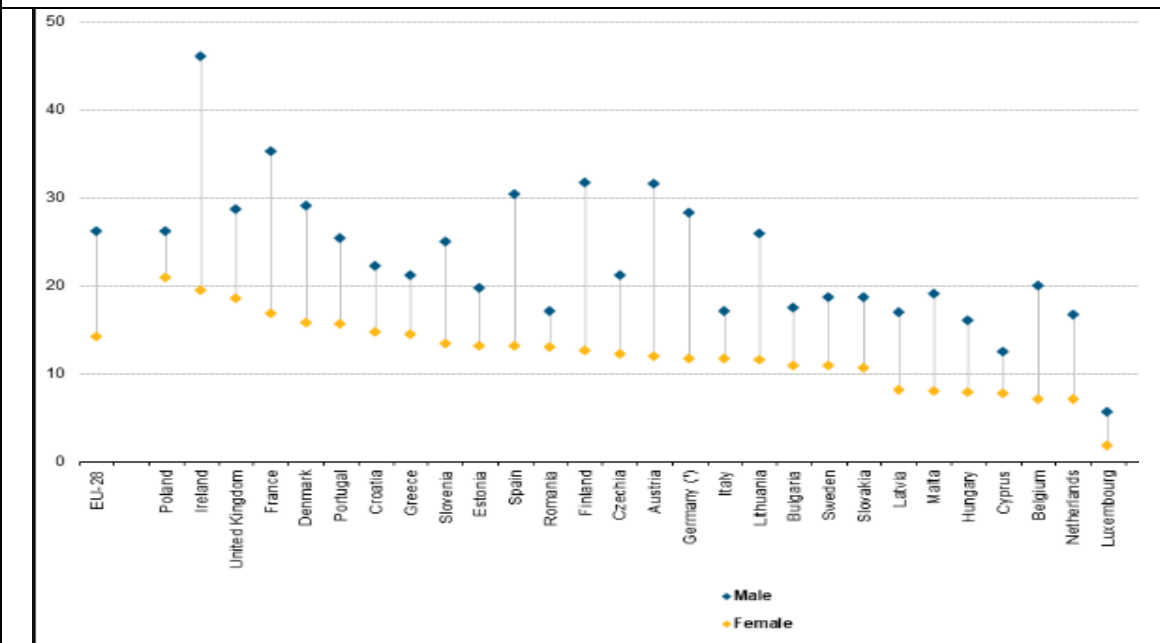
<i>Indicator</i>	<i>F</i>	<i>M</i>	<i>Notes</i> (definition and page in ANVUR 2019)
Drop-outs from Bachelor courses	10.5	14.1	Cohort of students enrolled in 2015/16 [p. 49]
Drop-outs from 5 years courses ('a ciclo unico')	6.4	9.4	"
Drop-outs from Master courses	5.8	6.1	"
BA graduates on time ('regular')	34.5	25.9	Cohort of BA students enrolled in 2013/14 graduating on-time [p. 56]
BA graduates within 6 years from first-entry into tertiary education	61.0	50.4	Cohort of BA students enrolled in 2013/14 graduating within 6 years [p. 56]
Rate of achievement of the first tertiary education degree (on the 25-year-old population)	41.5	28.2	Ratio between all students that obtained their first degree in 2017 and the population aged 25 yrs [p. 98]
Share of graduates by sex	57.7	42.3	Share of tertiary degrees issued in the academic year 2017/18 [p. 103]
Share of doctoral students by sex	50.0	50.0	Share of doctoral students enrolled in the academic year 2016/17 [p. 211]
PhD holders within 5 years	83.6	81.2	Cohort of graduate students enrolled in a PhD course in 2011 [p. 218]
PhD holders with a post-doc position ('assegnista') in 2017	23.3	23.4	Cohort of PhD holders (2012), 5 years after their doctoral degree [p. 220]

Source: ANVUR (2019).

Eurostat data, as well as Oecd data present some limitations, in the grouping of field of study and/or on the period of time considered (see Appendix, Box A.1). Other sources are available for looking at changes over time by sex in the field of study. This is important in order to have some hints on the educational choices made by women and men, and their changes over time. Some information are made available by Istat (I.Stat database) and by Miur (Anagrafe dottorati Miur-Cineca).

Table 1.7 shows the distribution of graduates in 2016 by sex and the absolute changes recorded over time by women and men by field of study. As expected, the distribution differs greatly by sex: four fields record over 60% of men (highlighted in bold character), eight fields record over 60% of women (highlighted in bold character), and only four fields have a balanced gender-mix: Architecture, Agronomy, Economics and statistics, Law.

Fig. 1.2 Tertiary education graduates in STEM by sex, 2017 (number per 1,000 inhabitants aged 20-29 years)



STEM: natural sciences, mathematics and statistics, information and communication technologies, engineering, manufacturing and construction.

Note: countries are ranked on the ratio of both sexes combined.

Source: Eurostat (2019), online data code: educ_uoe_grad04.

Table 1.7 Graduates in 2016 by field of study and sex in Italy, absolute values and shares (%) (Istat groups)

Istat groups	M (No.) 2016	M change (2007-2016)	F (No.) 2016	F change (2007-2016)	M shares in 2016 (%)	F shares in 2016 (%)
Scientifico*	5.962	565	2.856	409	67,6	32,4
Chimico-farmaceutico^	3.154	680	6.096	1.711	34,1	65,9
Geo-biologico^	4.662	16	9.147	232	33,8	66,2
Medico^	11.075	353	21.270	-1.003	34,2	65,8
Ingegneria*	30.688	2.293	10.099	2.477	75,2	24,8
Architettura	7.611	215	8.947	1.279	46,0	54,0
Agrario	3.805	645	3.792	1.271	50,1	49,9
Economico-statistico	26.309	5.282	24.486	4.100	51,8	48,2
Politico-sociale^	10.125	-6.174	20.315	-3.371	33,3	66,7
Giuridico	9.221	-1.270	12.719	-2.496	42,0	58,0
Letterario^	7.468	-11	16.196	-2.065	31,6	68,4
Linguistico^	2.870	849	15.994	2.241	15,2	84,8
Insegnamento^	1.089	-197	13.303	-898	7,6	92,4
Psicologico^	2.730	423	12.238	1.160	18,2	81,8
Educazione fisica*	4.376	2.173	2.544	927	63,2	36,8
Difesa e sicurezza*	528	-186	116	30	82,0	18,0
TOTALE	131.673	5.656	180.118	6.004	42,2	57,8

Legenda: * the majority of students are males; ^ the majority of students are females. The remaining four fields of study (architecture, agronomy, economics & statistics, law) are quite gender-balanced.

Source: Istat database (I.Stat).

It is also interesting to notice that between 2007 and 2016 there was a small increase of graduates, relatively balanced by sex (+ 5.656 for men, + 6.004 for women). At the same time, there were significant changes in the number of graduates by field, and some were similar in sign and

magnitude by sex. This is the case of the large increase of graduates in Engineering (with the increase in absolute number being larger among women) and in Economics and statistics (with the increase in absolute number being larger among men). Remarkable is the fall of graduates in Political sciences (much larger among men), as well as Law and Literature, but only for women. These changes seem to suggest that there are other factors behind preferences and attitudes in the choice of the field of study. If this were not the case, only marginal changes would be observed. This implies that young people make their educational choices taking into account the signals coming from the surrounding world.

The information on graduates by field of study and sex in Italy (summarised in tab. 1.7) shows an unbalanced gender distribution but also important differences by sex in the choices made over time in terms of field of study. This seems to suggest differences by sex in the reaction to signals coming from the context (the family, the media, the school, the university, the labour market). And this could be related to gender-related education disparities, including gender gaps in mathematics scores and numeracy. The emergence and persistence over time of gender gaps in math is an important research question, extensively investigated by researchers (mathematicians, psychologists, educators, etc.). In order to provide some hints on this issue, box 1.1 presents some key findings.

Box 1.1 Gender differences in mathematics performance

Key findings on gender differences in mathematics performance

- There are no gender differences in mathematical- and spatial-ability early in life. There are no gender differences in problem solving in elementary or middle school; differences favouring boys/ men emerge in high school and college (Ceci et al. 2014: 84-88).
- There are statistically significant gender differences in mathematics performance in the majority of Oecd countries (included in OECD PISA 2015), with Italy recording the second largest gender gap, after Austria. However, in several countries gender differences are small (non-statistically significant), while in Korea and Finland girls perform better than boys in math [Fig. 6.2, in: Oecd 2017: 100].
- There are countries (e.g., Iceland, Singapore, Indonesia) in which girls are at parity with or even excel over boys at the right tail of the mathematics distribution. Temporal data, ethnic data, and trans-state data all indicate that these ratios can and do change (Ceci et al. 2009; Ceci et al. 2014: 91-92).
- Gender gaps persist in mathematics, although girls and women have made impressive progress in educational attainment around the world. The mathematics gender gap appears to be persistent over time. Gender differences in mathematics performance changed little between 2012 and 2015 in the vast majority of countries.
- Comparisons between different OECD surveys (PISA and PIAAC) suggest that the gender gap in mathematics sometimes widens as teenagers (15 year-olds) move into adulthood (23-25 year-olds). Italy is an exception, where a reduction is observed [Fig. 6.3, in: Oecd 2017: 100].
- In higher education (and afterwards), young women are under-represented in STEM fields. In Oecd countries, women account for less than 20% of new entrants into tertiary-level computer science programmes and around 18% of engineering entrants (Oecd 2017: 106)

Possible reasons for gender differences in math skills (and decisions about field of study)

- Preferences and choices about field of study and future career are affected by self-concept in mathematics (more than achievement). Self-concept in mathematics is related to the desire to enter a career using mathematics. Gender differences in mathematics self-concept are smaller in more egalitarian countries, but both girls and boys have lower mathematics self-concepts and less interest in mathematics careers in comparison to less egalitarian countries. These findings reveal a policy paradox: policies aimed at training the next generation of STEM professionals often highlight the need to close the gender gap, but countries with smaller gender gaps have fewer boys and girls interested in mathematics-intensive careers (Goldman, Penner 2017).

- The dearth of women in STEM fields is rooted in boy’s and girl’s gender-career expectations. One contributory factor is entrenched stereotypes about which careers are suitable for men and which ones for women. These stereotypes are passed on to children by parents, teachers and society at large (Oecd 2017: 107).
- Parents are more likely to expect their teenage sons to work in STEM occupations than their daughters, even when girls perform just as well as boys in math and science (Oecd 2017: 107)
- Girls and young women are more likely than boys and young men to hold negative perceptions of their abilities in mathematics and to report anxiety and stress in problems and situations that involve math (Oecd 2017: 101)
- Girls (aged 15) report less self-confidence than boys doing a range of pure/ applied mathematics tasks. The confidence gender gap is much wider in math than in science problems (Oecd 2017: 101)
- In their teens, students (and their families) make important decisions about their study path they will follow towards their future. The dearth of women in some fields of study (e.g. engineering, computing) is rooted in boy’s and girl’s gender-related career expectations (Oecd 2007: 107)

Key policy messages

- Oecd (2017: 101) emphasises the importance of programmes aimed at challenging gender-stereotypical attitudes and expectations and at building girl’s self-confidence in STEM fields.
- In order to build student’s self-confidence, educators should encourage girls (and boys) to work hard from their youngest years to realise their potential, learn from their mistakes and solve problems on their own (Oecd 2017: 101)
- The findings about gender differences in self-concepts in mathematics reveal a policy paradox: policies aimed at training the next generation of STEM professionals often highlight the need to close the gender gap, but countries with smaller gender gaps have fewer boys and girls interested in mathematics-intensive careers (Goldman & Penner 2016).

References

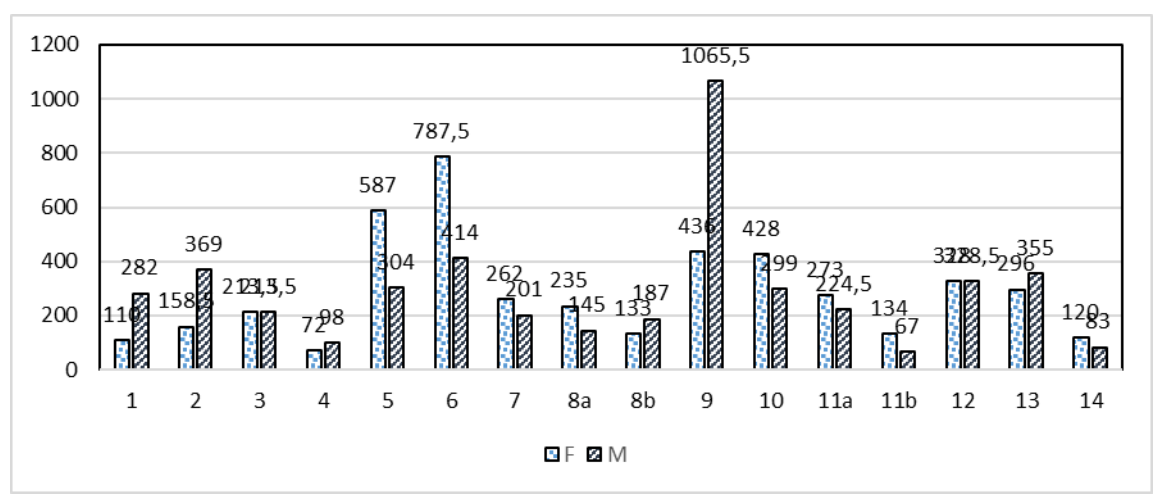
Ceci, S.J. Wendy M. Williams, and Susan M. Barnett (2009). "Women's underrepresentation in science: sociocultural and biological considerations". *Psychological bulletin* 135(2): 218-261.

Ceci, S.J. et al. (2014). 'Mathematical- and spatial-ability differences from in utero through high school' (pp. 84-93), in: "Women in academic science: A changing landscape." *Psychological Science in the Public Interest* 15(3): 75-141.

Goldman, A.D., & A.M. Penner (2016). "Exploring international gender differences in mathematics self-concept." *International Journal of Adolescence and Youth* 21(4): 403-418.

OECD (2017). 'Gender equality in education' (pp. 95-140), in: *The Pursuit of Gender Equality: An Uphill Battle*. Oecd: Paris

Fig. 1.3 Doctoral degrees by field of study (CUN areas) and sex, in 2018 (No.)



Source: Anagrafe dottorandi MIUR-CINECA (in ANVUR 2019: 212), CUN areas.

The balance between women and men by field of study slightly improves when the focus is on people enrolled in doctoral programs (ISCED 2011, level 8). Figure 1.3 shows that in 2017 there was an equal distribution between men and women among PhD students in several fields of study (CUN areas: 3, 4, 7, 8.b, 11.a, 12, 13 and 14). Women were still the vast majority in three areas (6, 5 and

10) even if the under-representation of men in these fields was less pronounced compared with the composition of graduate students. Women continued to be strongly under-represented in three areas (9, 2 and 1).

According to the Istat surveys on doctoral holders (Istat 2018: 2), the female component prevails among PhD holders, fluctuating around 51% over time (but with shares exceeding 55% in Southern universities). It should be pointed out that the difference in the female share of doctoral students between Italy and the EU28 average is entirely explained by exceptionally high share of female doctoral students in Southern universities (55%). This over-representation of women in the South of the country among doctoral students raises an important question. Do women tend to be ‘over-educated’ in order to overcome gender discrimination in the labour market? Put it differently, is the higher share of female doctoral students recorded in the South (in comparison to the North) related to the very poor employment opportunities of local labour markets?

As already discussed, the share of women with doctoral degree varies greatly between the different fields of study. It would be important to better understand how women make their choices regarding: i) the field of study when they enter tertiary education; ii) the field of research (i.e. sub-field of study) during their doctorate. These choices play a key role both in the labour market and in academia.

1.3 Education policies

In the EU’s *Europe 2020* strategy, education and training is recognised as a key policy area in contributing to Europe’s economic growth and social inclusion. The EU set a two-fold target in education by 2020: reducing the rates of early school leaving below 10%, and reaching at least 40% of 30-34-year-olds completing tertiary or equivalent education. Countries set their own related national targets. Over the last decade, several broad-ranging reforms were enacted in Italy aiming to improve educational and research outcomes, of the whole educational system (see box 1.2).

Box 1.2 Recent policy responses in education in Italy

In 2015, Italy has undertaken a broad-ranging school reform called *The Good School* (La Buona Scuola, Law 107/2015) to improve educational outcomes. Measures include increasing school autonomy, hiring a significant number of new teachers, introducing a merit-based component to teachers’ salaries and enhancing digital innovation and skills in schools.

In 2011, Italy established the *National Agency for the Evaluation of the University and Research System* (ANVUR) to evaluate higher education institutions and increase meritocracy in Italian research. So far, ANVUR has evaluated 133 research institutions, 95 of which were universities. Italy is among the first European countries to have piloted assessments of student learning outcomes at university level. Moreover, recent national priorities for the National Institute for the *Educational Evaluation of Instruction and Training* (INVALSI) include helping schools to focus on their effectiveness.

The EU-funded National Operational Programme 2014-20, *Per la Scuola: competenze e ambienti per l’apprendimento*, has measures to improve educational equity, quality, lifelong learning, links between school and work, technical and vocational education, education infrastructure, administrative and institutional capacity, and resource management.

Source: OECD (2017), *Educational Policy Outlook. Italy*, Paris: OECD

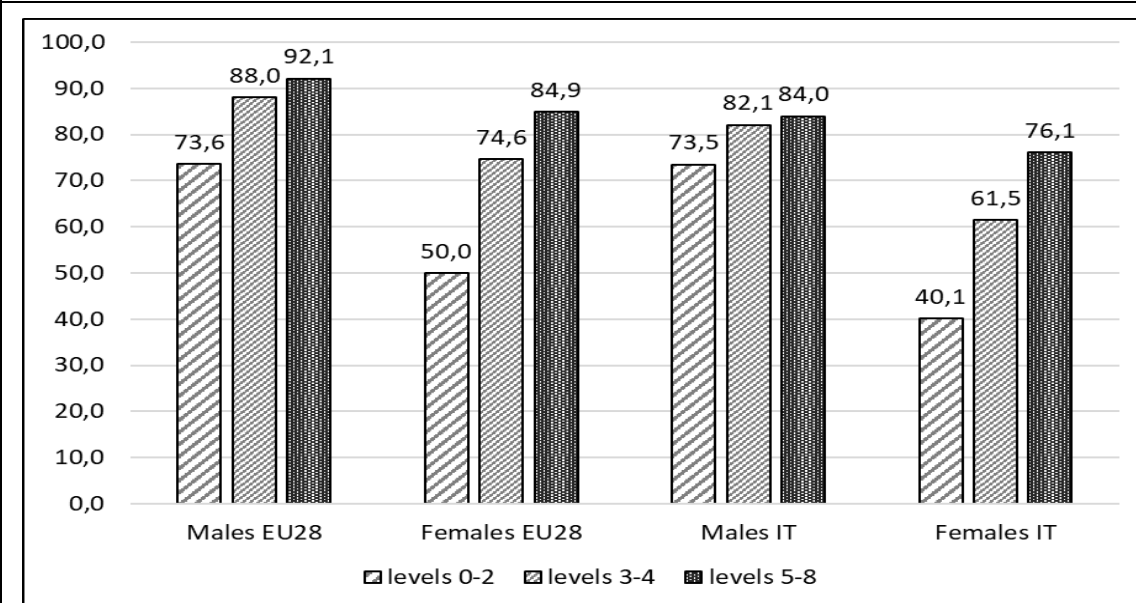
Despite some improvements, Italy still faces comparatively high dropout rates and low educational attainment rates in a comparative perspective. In addition, there are marked regional differences for many outcome measures. According to the OECD Survey of Adult Skills, Italy’s population is under-skilled compared to the OECD average (OECD 2017b, p. 4). Unemployment is also higher than average, and young people of all education and skill levels can have difficulty in accessing the labour

market. An under-utilisation of available skills and greater emigration of higher education graduates in recent years, combined with less immigration of highly-qualified and skilled graduates, are leading to a brain drain that could hinder Italy's competitiveness (see Section 7.5).

1.4 Education outcomes

It is widely documented that individuals with high educational attainment enjoy several advantages in comparison with individuals with low educational attainment. They have higher employment rates, lower unemployment rates, access to better-paid jobs, higher chances of career advancement, longer working life, and higher earnings.

Fig. 1.4 Employment rates by sex and educational attainment level of individuals aged 25-49 in Italy and EU28, 2019 (%)



Source: Eurostat database, variable code: lfsa_ergaedn.

In Italy, as in the rest of the EU, returns in education increase as the educational qualification increases, but returns are somehow lower. This is confirmed by data focusing on employment rates. Figure 1.4 shows employment rates by sex for adult individuals (aged 25-49) in Italy and in the EU, in 2018. It is confirmed that educational attainment plays an important role in the EU28 and in Italy, for both men and women. However, the disadvantage of individuals with low educational attainment is relatively small for men in Italy, in comparison with EU28 (-10.5 p.p. vs -18.5 p.p., respectively). And the reason for this difference is the comparatively low employment rate of Italian men with tertiary degrees. This suggests the hypothesis that in Italy young men are discouraged to invest in education by the difficulties they face in the labour market⁵. These difficulties are captured here by the relatively low employment rate of highly educated men in their prime: 84% in Italy compared to 92.1% in the EU28.

Women with low educational attainment record a very low employment rate, both in Italy and in the EU28 (40.1% vs 50%). Investing in education increases to a large extent the probability to enjoy economic independence through paid work. Investment in education significantly reduces the

⁵ The large share of small and micro firms plays a role in to the lack of demand of graduate students in Italy.

disadvantage compared to men, both in Italy and in the EU28. In the case of Italy, the gender gap in the employment rates reduces from 33.4 p.p. (for low education) to 7.9 p.p. (for high education). This suggests the hypothesis that both in Italy and in the EU young women are encouraged to invest in education in order to move towards gender equality (though economic independence), overcoming the difficulties faced in the labour market.

2. EMPLOYMENT, LABOUR MARKET POLICIES AND OUTCOMES

2.1 An overview

The Italian labour market is characterised by long-standing imbalances, which include low female participation rates, high youth unemployment rates, and a high degree of labour market segmentation. The process of labour market flexibilisation over the last 20 years has been characterised by partial and targeted forms of deregulation that introduced new employment contracts aimed at facilitating employment of young people. These initiatives were planned to respond to widespread unemployment and informal work episodes but also to reduce the extent of labour market segmentation (given the high degree of protection granted to core workers, employed in medium-large firms in the centre-north of the country). This duality between workers fully included in the labour market (being employed with an open ended contract, enjoying a high degree of employment protection) and marginal workers (in atypical and precarious form of employment, with limited or no employment protection) who actually constitute a major hindrance that young people and women must face when they approach labour market⁶.

The various labour market reforms resulted in significant increases in the share of precarious jobs (fixed-term contracts, temporary jobs, collaborators and other atypical contracts). Non-standard (i.e. flexible) jobs are often accompanied by poorer working conditions, low wages, income instability, and long-term income penalties. Moreover, there is a high risk of being trapped into precarious, low protected and low-wages work positions, especially among low educated, youth and women.

Two comprehensive labour market reforms were approved in recent years (in 2012 and 2014), followed by a less comprehensive reform (L. 96/2018, so-called 'Decreto Dignità', *Dignity Decree*) in 2018. The so called *Fornero reform*, approved in June 2012⁷, did not modify the overall approach to labour market regulation, though some attempts were made to increase the economic costs (for employers) of atypical contracts. A more substantial reform bill, the so-called *Jobs Act*, was passed in 2014 (followed by several decrees during 2015). This bill pursued a direction similar to the *Fornero reform*, by extending unemployment insurance and unemployment assistance, improving public employment services, and further reducing dismissal protection for workers in open-ended contracts. At the same time, it introduced some radical innovations in the regulation of permanent and temporary contracts, making it easier (and less costly) the use of flexible contracts. As a result, employers tend to hire young, inexperienced workers only if they can employ them with a temporary contract. A very large share of new hires is on temporary contracts, one of the highest rates among EU countries. Atypical work continues to be widespread among young people and women. Among people aged between 15 and 34 years, one employed person out of four has a temporary or a collaboration contract, with the percentage even higher among university

⁶ All these changes must be understood in the broader context of the family-centered welfare system, typical of Italy. Lack of social policies explicitly targeted towards youth, low unemployment benefits and the weakness of family provisions are additional factors, which contributed to increase levels of uncertainty during the initial phases of adult life (see Sections 3 and 4).

⁷ The 2012 reform (so called *Fornero reform*) aimed at reducing the labour market segmentation, tried to rebalance the use of different atypical and precarious contractual arrangements by: *i*) extending the cooling-off period between two fixed-term contracts; *ii*) reducing the fiscal incentive for some types of non-permanent contracts; *iii*) introducing tests to re-classify independent contractors as employees. Moreover, the reform planned the extension of the pool of workers eligible to standard unemployment benefit.

graduates. Nevertheless, atypical work is not limited to very young people, as one third of these workers are aged between 35 and 49 years.

Part-time work is the only type of contract that increased during the long recession (between 2008 and 2013) and in a totally involuntary way. It increased both among women and among men, though women were affected to a larger extent. During the recession, companies used part-time work as a strategy to deal with uncertainty and lack of growth. In nine cases out of ten, the growth of part-time work occurred in the female-dominated services sector – especially retail trade, hotels and restaurants, services for businesses, health and assistance – and concerned unskilled jobs and executive professions (Istat 2014).

*Trends in employment and employment rates*⁸. In Italy, between 2008 and 2013, total employment decreased by 984 thousand units, men in the vast majority of cases (-973 thousand) whose employment rate fell from 70.3% in 2008 to 64.8% in 2013, -5.5 p.p. (see Appendix, fig. A2). Thus, the employment crisis was particularly pronounced for men in the early or central phases of the adult life cycle (aged 25-49), especially for those with low levels of education. The more intense employment adjustment for men is consistent with the fact that the crisis affected, especially at the beginning, male-dominated sectors. GDP contracted most strongly in construction, manufacturing and agriculture, all sectors in which men account for a much larger share of the workforce than women (ESDE 2013; Istat 2014).

Since 2008 the employment rate of women held quite steadily even if female participation rate is considerably lower than that of men and one of the lowest in Europe (significantly lower than EU28 average). The employment rate moved only from 47.2% in 2008 to 46.5% in 2013 for women aged 15-64, and from 61.1% to 57.9% for women aged 25-49. The stability of women's employment is the result of a set of factors: i) the contribution of foreign-born employed women, who increased by 359 thousand units between 2008 and 2013, whereas Italian women decreased by 370 thousand units; ii) the increase in women who entered the labour market in the South to compensate their partners' unemployment; iii) the increase in women aged 50 years and over, due to the rise in retirement age (Istat database, I.Stat).

The Italian labour market was characterized during the long recession (2008-2013) by job destruction. Between 2008 and 2013 the number of unemployed people doubled and the unemployment rate reached 12.2% (+5.4 percentage points since 2008) (Istat 2014). This increase hit Southern Italy in particular (+7.7 percentage points since 2008), where the unemployment rate reached 19.7%, among the highest in Europe. The rate of long-term unemployment rose very sharply for youth and, to a much lesser extent, for the low skilled and prime-age men, while it remained stable for women and skilled workers. In a longer perspective, there are three major structural weaknesses: (i) lack of job creation because of insufficient economic growth over time; (ii) low job security because of a high risk of unemployment and an increasing share of precarious jobs; (iii) low income security, as the result of a welfare system unable to provide generous income supports to those in need.

Gender employment gap. Because of the worsening of employment conditions during the crisis, which was felt most by men, the gender gap continued to close. The gender gap for non-participation went from 11 points in 2008 to less than 8 points in 2013, but still far surpassing the

⁸ All data are from Eurostat database, Labour Force Surveys (LFS).

European average. In 2014 Italy continued to be among the worst performers in the Global Gender Gap Index (ranking 69th out of 142 overall), penalized above all by the economic participation and opportunity category (114th) (WEF 2014). Italy lags behind in women's access to the labour market, remuneration, career advancement, promotion to positions of leadership and new business initiatives. The gender gap is larger in the South, by almost 9 p.p. with respect to the Centre and North; it is greatest in the 35-54 years age group and is inversely proportional to educational attainment (Istat database, I.Stat).

Gender pay gap (GPG). In Italy, the average female employee earns 5% less than the average male employee, a considerably smaller GPG than the overall EU28 average (16%) (Eurostat 2019b). This gap refers to the 'unadjusted' gender pay gap (difference between average gross hourly earnings of male and female employees as % of male gross earnings). Therefore, there is the possibility that the rather low labour market participation of women to some extent distorts the picture of the gender pay gap, as data on highly educated women (better paid) can skew the statistic towards a more positive picture than is overall the case. More accurate analyses have showed that the distance between women and men significantly increases along the wage distribution. The growth is quite steadily among low and medium wages but there is a substantial acceleration among the highest wages. This result suggests the presence of a 'glass ceiling' (Istat 2013: 118).

Further analyses of the GPG by level of education highlight that the distance between women and men wages increases with education and it is particularly high among graduates. Istat (2013) estimated that on average the disadvantage of graduate women with respect to men with the same level of education is -10.8% (higher than the gap between women and men with a secondary degree that is -9.9). This suggests that the investment in education does not have an equalizing effect on men and women wages able to nullify the gender pay gap. This result is partially explained by three factors: i) the higher presence of women in the lowest paid sectors; ii) the high proportion of Italian graduate women employed in under-qualified work positions and part-time (Istat 2013); and iii) the low presence of women at the top of the work hierarchy also in female-dominated sectors.

Horizontal and vertical segregation. In Italy horizontal segregation is similarly pronounced for occupations and sectors as in the EU (Bettio, Verashchagina 2009). Women occupation should be promoted in male-traditional fields, in order to make full use of the female labour force potential. Two of the five most common industries for female employees, namely "Wholesale & retail" and "Manufacturing" are also among the top five male industries (26.6% of Italian women and 36.9% of men work in either of these two sectors). The remaining three industries show a clear horizontal segregation, exemplified by "Health care & social work", "Education" and "Accommodation & food service activities", which are typically female-dominated sectors throughout the EU. Also, the distribution of women and men across the type of occupations is characterized by a gender bias. Women are primarily engaged in the fields of "Service workers and shop and market sales workers", "Clerks", or "Professionals". These constitute the group of the female-dominated occupations. Men on the other hand rather pursue careers in technical fields, as "Craft and related trade workers" and "Technicians and associate professionals".

In terms of vertical segregation, there is evidence of positive trend for Italian women, even if their chances of reaching top positions are constantly lower than that for man (Bettio, Verashchagina 2009). The female share in corporate boards has increased considerably from a low 2% in 2003 up

to 33% in 2016 (Consob 2018), thanks to an innovative legislation (see Section 5.2, for details), that is nowadays considered a ‘best practice’ within the EU.

Work and family roles. The low female labour market participation goes together with traditional family roles. Women often do not participate in the labour market as their role in the family limits their possibilities to pursue a career (Villa 2012). The employment rate of women in their prime (aged 25-49) increases considerably from mothers to single women with no children. And the increase is more marked than in other EU countries. The impact of children is negative when they are small; it persists in terms of employment type (qualification, working hours and contract) and career continuity (Banca d’Italia 2012).

2.2 Tertiary education and employment conditions in Italy

AlmaLaurea (the Italian interuniversity consortium) publishes an annual report on the employment conditions of graduates (BA, MA, 3+2) that allows an analysis of changes over time and differences by type of degree (BA degrees, MA degrees, 3+2 degrees), field of study and sex.

The 2018 survey (AlmaLaurea 2019) confirms an improving trend in the employment conditions of graduates since 2014 (the first year of recovery, after the long recession, stated in 2008). Yet, the recovery has not filled the gap with respect to the pre-crisis conditions. Specifically, the employment rates of graduates (for all types of tertiary courses) are higher in 2018 than in 2014, but still lower than in 2008. Conversely, the unemployment rates are lower in 2018 than in 2014, but still higher than in 2008. Finally, net monthly earnings (in real terms) have started to increase again, after the the contractions during the long recession. Figure 2.1 shows the fluctuations in the employment rates of graduates interviewed one year after graduation, by type of course (BA, MA, 3+2 courses). The data show a very marked procyclical trend, with a slow recovery.

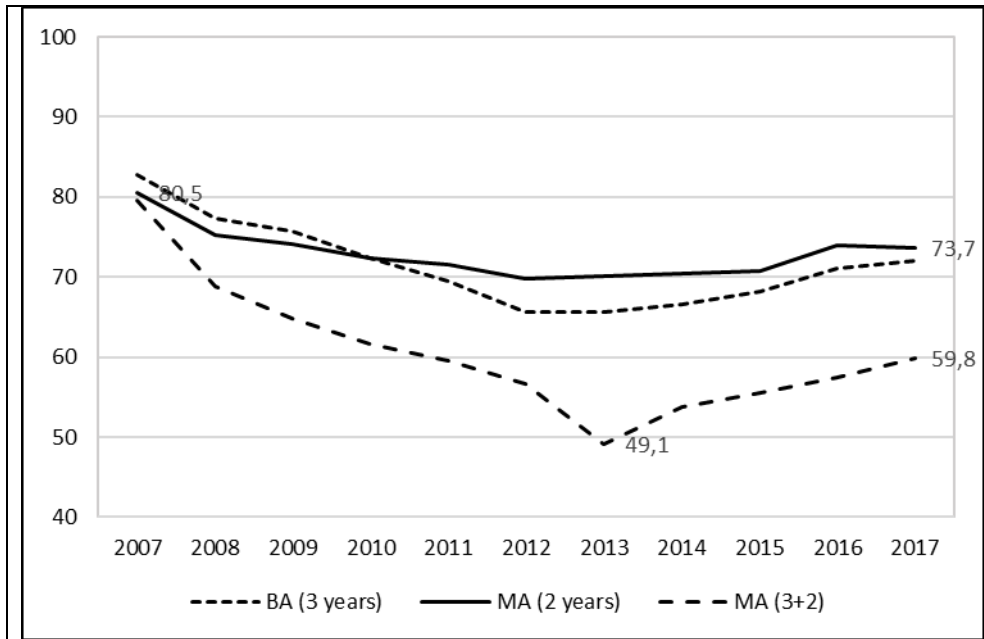
Further information highlights that the insertion of graduates into relatively stable job positions are slow. For example, the employment rates of BA graduates in 2013 is only 70,1% after 1 year (i.e. in 2014), it rises to 82,7% after 3 years (i.e. in 2016), and to 85,6 after 5 years (i.e. in 2018). Also, unemployment rates progressively shrink, while real earnings increase over time (see tab. 2.1). Female graduates suffer some disadvantages in entering employment, as shown by the gender gap in the employment rate. However, this gap is minor compared to women with secondary education.

Table 2.1 Employment rates, unemployment rates and net monthly real earnings of BA graduates in 2013, after 1, 3 and 5 years from graduation

	Employment rate (MF)	Employment rate (M)	Employment rate (F)	Gender gap	Unemployment rate (MF)	Net monthly real earnings (MF)
after 1 year (in 2014)	70.1	75.5	66.1	-5.4	22.2	1,082
after 3 years (in 2016)	82.7	86.9	79.5	-4.2	10.1	1,317
after 5 years (in 2018)	85.6	89.0	83.0	-3.9	6.9	1,468

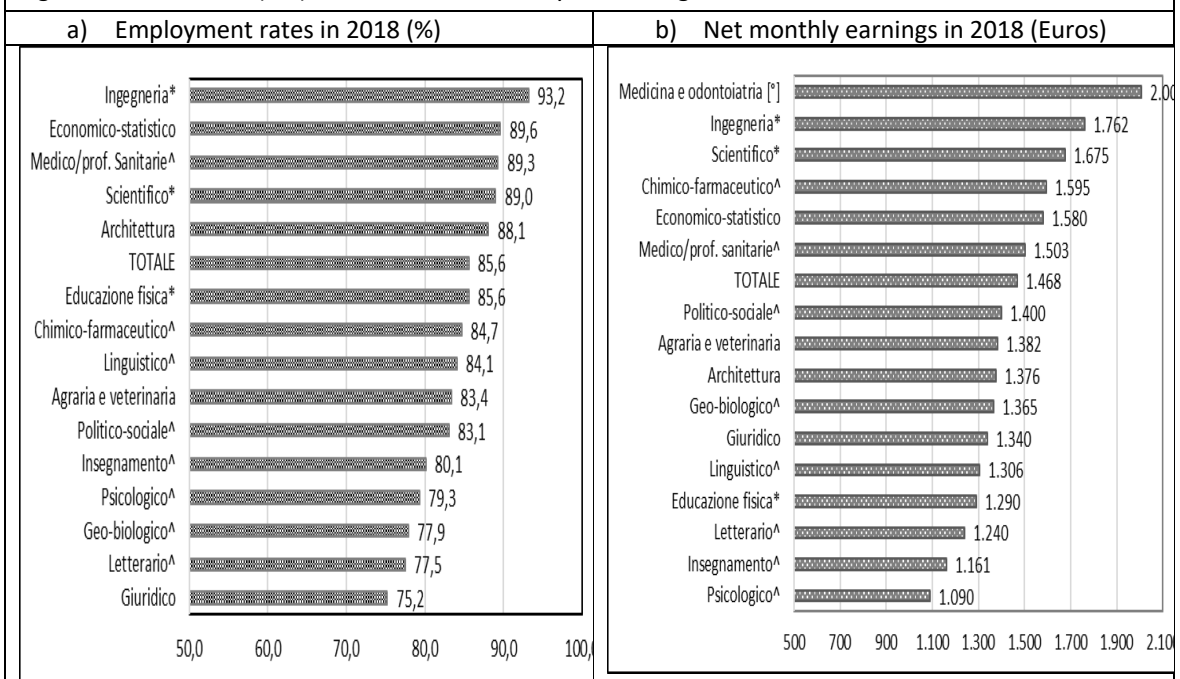
Source: AlmaLaurea (2019: Ch. 5, pp. 140, 141, 146, 166).

Fig. 2.1 Employment rate of graduates one year after graduation (%). Graduates in the years 2007-2017 interviewed one year after graduation



Source: AlmaLaurea (2019).

Fig. 2.2 BA Graduates (MF) in 2013 interviewed 5 years after graduation



Note : * the majority of MA graduates are males ; ^ the majority of MA graduates are females. The remaining four fields of study (architecture, agronomy, economics & statistics, law) are quite gender-balanced.

[°] Five years university degree (i.e. Laurea magistrale a ciclo unico).

Source : AlmaLaurea (2019 : p. 144, p. 166).

An analysis of the gender pay gap (net monthly earnings) for graduates would require considering a set of variables that cannot be summarized in simple descriptive statistics (presence of children, part-time work, field of study, sector of activity, type of employment contract). In order to provide a descriptive picture, figure 2.2 presents the employment rates and the net monthly earnings (of full-timers) by field of study of BA graduates in 2013 observed in 2018 (5 years after graduation). It is important to notice that the disciplines where males are the majority (indicated with *) tend to

occupy high positions in the ranking, conversely the disciplines where females are the majority (indicated with ^) tend to occupy the lowest positions in the ranking.

As is well known by feminist scholars, women's disadvantages in the labor market are reduced with increasing educational attainment, but they do not disappear. This is systematically confirmed by Istat surveys on high-school leavers and graduates (Istat 2016) and Almalaurea annual reports. Specifically, female employment rates are lower, unemployment rates are higher, the share of women in atypical jobs is higher, and net monthly pay is lower, *ceteris paribus* (i.e. after controlling for presence of children, working time, field of study). At the same time there are significant differences between the different fields of study (see fig. 2.2). This rises a crucial question: what are the main factors affecting women and men educational choices in terms of field of study?

The Istat (2018) survey on cohorts of doctoral holders provides information on their transition into employment. The main findings for the cohort of students having completed their PhD in 2012 (interviewed in 2018), can be summarised in the following key points.

1. *Average age* of PhD holders at the time of graduation is increasing: 33 yrs, for the 2012 cohort.
2. *Employment rate* (ER): is very high for both women and men (around 93.8%), but with difference between the North-West (96%) and the South (89%), and across fields of study. Industrial engineering records the highest ER (97.9), political and social sciences the lowest ER (90,7%) (Istat 2018: 6).
3. *Earnings*. Median net monthly earnings are € 1,789, higher with respect to MA graduates, but with large variations by fields of study, ranging from € 2,400 (medicine sciences) to € 1,517 (antiquity, philology, historical-artistic sciences). For the whole sample (unweighted averages), female earnings are lower than male earnings: € 1,983 and € 1,1610 (Istat 2018: 10)
4. *Share of women* completing their PhD in 2012: 53.33% (6,111 F, 5,348 M), but with large differences across fields of study (Istat 2018: 2).
5. *Profession* of the 2012 PhD cohort employed in 2018: 10.2% are employed as university staff (professors, researchers), 4% as researchers in public research bodies, 78,7% as management professions, and 7,2% in other professions (Istat 2018: 10). However, the share of PhD holders working for the university system is much higher (24.1%), if a broad employment definition is adopted, including also people with research grants ('assegnisti') and other type of temporary positions (i.e. 'collaborators') (Istat 2018: 7).

3. FAMILY-FORMATION PRACTICES AND POLICIES

3.1 Family models

Italy has gone through an important revolution in the types of family models due to a number of factors: ageing, increasing schooling and educational attainment, increasing female participation in the labour market, very low fertility rates and postponement of childbirth, decreasing marriage rate only partly compensated by increasing cohabitation, finally a higher risk of family dissolution. These trends have resulted in new types of families: made up of singles, unmarried couples, couples without children, and single-parent families.

Over the last three decades there has been a dramatic reduction in the number of average members per family in Italy (OECD 2019b, Indicator SF1.1). Couple families (with or without children) are the most frequent type of household (over 60%). Single-person households constitute about one fourth, a share relatively low compared to other countries. The lower proportion of single-person households in Italy is the result of the fact that young adults leave late the parental home and that elderly live with their children. Single-parent families constitute a significant minority of households in Italy, but it is on the increase. As in other countries, women head the vast majority of single-parent families. The average Italian family today is made up of one or two children. The reduction in the number of new births has led to an increase in the number of couples with only one child and a significant reduction of large families (3 or more children), while the number of couples without children is on the increase.

Italy's low female labour market participation goes together with a very low fertility rate (1.29 in 2018, Istat 2019b). This is one of the lowest fertility rates among Oecd countries (OECD 2019b, Indicator SF2.1). The total fertility rate (TFR) reached a minimum in Italy around 1995 (down to 1.19), since then a modest increase was recorded, up to 1.46 in 2010. But then it started again to decline. Moreover, about half of the small increase in TFR was due to the entry of foreign women (recording a higher TFR) in the country since the mid-1990s. In 2018, the TFR is 1.21 for Italian citizens and 1.94 for non-Italian citizens (Istat 2019b: 2).

In 2018, the mean age of women at the birth of their first child is 31.2, almost one year later than in 2010 (Istat 2019b), one of the highest in Oecd countries. The postponement of first births can be observed in the vast majority of countries since the 1970s. In Italy it increased significantly both from 1970 to the mid-1990s (by three years), and since the mid-1990s (by two years) (OECD 2019b, Indicator SF2.3). These variations relate to changes in the timing of family formation that have occurred over the last decades. Certainly, two factors help to explain these changes: the increasing educational attainment of women, and the dramatic deterioration of labour market conditions for young adults during the long recession of 2008-2013.

The specificity of the Italian case is testified by the combination of very low female employment rate (especially for low educated women) and very low fertility – especially in Southern Italy. The difficulties women face in entering employment, especially standard employment with adequate protection in case of maternity, is due to a sort of discrimination against their potential motherhood. Employers (in the private sector) do not recruit young women on a permanent basis in order to avoid having to comply with maternity and parental leave, demands of flexible working time, etc. This raises a sort of trade-off between employment and motherhood: young women are some how forced to choose between paid work and motherhood (Valentini 2012). As a matter of

fact, in Italy many young women postpone motherhood, looking for a stable job with adequate protection and this translates into a fertility rate significantly lower than the desired number of children (OECD 2019b, Indicator SF2.2).

3.2 Policies

Family formation practices, including the division of labour within the household and the decision to participate in the labour market, are interlinked with four broad policy areas: maternity and parental leave, the availability of care services, labour market regulations and income taxation.

Leave schemes provide parents the opportunity to spend time off work around childbirth (and later) and thereby facilitate work-life balance; moreover, they could also encourage fathers to share with mothers' child-care responsibilities. The provision of sufficient paid leave has a positive effect on the employment of mothers as it encourages them to remain active after having children.

In terms of maternity leave entitlements, the Italian system is well designed for dependent employment: the leave duration is neither too short, neither too long; and it is also relatively generous: 100% in the public sector and 80% in the private sector for five months. Much less generous benefits are foreseen for parental leaves (Murgia and Poggio 2009, 2013), which are paid the 30% of the parent's salary⁹ and are unpaid if the child is aged 3-8 years old. Parents may be absent from work, even simultaneously, for a period of six months each (continuously or piecemeal) up to a maximum of ten months. But if the father takes leave of absence for a continuous period amounting to more than 3 months, the 6-month limit is extended to 7, and the total amount of leave entitlement for the two parents becomes 11 months. A balanced use of leave entitlements by both parents has been shown to have positive effects in terms of distribution of household and care responsibilities and of female labour market outcomes (EC 2018). But this is not the case in Italy: administrative data (INPS) show that on average 88% of the time of parental leaves is taken up by women, and that each mother takes up 18 weeks of parental leave in the first three years of the child (Mundo 2012, in EP 2014: 27). In order to increase the involvement of fathers, the Fornero Reform (L. 92/2012) introduced a pilot compulsory paternity leave of one day at full salary, plus two optional extra days subtracted from the mother's mandatory leave. Despite this a symbolic step into the direction of a greater involvement of men, fathers' take-up of parental leave remains quite low, given the high gender gap in earnings and the traditional cultural norms still prevailing in Italian society (Mundo 2012; Naldini 2003; Naldini, Saraceno 2011). To overcome the limits of take up rate by fathers of parental leave, compulsory paternity leave, fully paid have been very recently increased to 10 days (see Section 5).

Moving to labour market regulation, in Italy several minor and major labour market reforms have been implemented over the last two decades, with the explicit goal of increasing labour market flexibility. The outcome has been a progressive enlargement of atypical contractual arrangements (including agency work, fixed-term contracts, temporary work, dependent self-employed work) with very little or no protection. This has resulted in pronounced labour market segmentation, with the weakest segments of the labour force (young, women, migrants) having difficulties in entering standard employment (open-ended employment relationships). The over-representation of young

⁹ In the Public Sector, the first month of parental leave is paid the 100% of the salary.

women amongst atypical workers, especially on contractual arrangements with limited or no protection, implies that many young women cannot rely on any income in case of maternity.

The tax system also plays a role in the division of labour within the household, discouraging the supply of the so called 'secondary earners' (i.e. women). In Italy the unit of labour income taxation is the individual. Nevertheless, the benefit system is not as child-related allowances and benefits are assessed against family income. In addition, the tax system grants a 'non-working spouse allowance', which is lost if the spouse (by and large the woman) takes up employment. The deductions and other transfers, calculated on the basis of household income, raise the effective marginal income tax rate of second earners (typically female spouses) and discourage them from participating in the labour market. The distortion is greater for women with limited earnings prospects and a husband with a low-income job. In short, as pointed out by the Bank of Italy (2014: 73), the tax-benefit system penalizes dual-earner couples and tends to discourage female participation. In 2013, Italy was addressed for the first time a country-specific recommendation to tackle financial disincentives to work.

4. CARE & WORK-LIFE POLICIES AND PRACTICES

The family has traditionally been the main provider of social protection and care services for people, according to what has been defined the “Mediterranean model of welfare state” (Bettio, Villa 1998; Trifiletti 1999; Naldini 2003; Naldini, Saraceno 2008). And this implies that a disproportionately share of unpaid work falls on women. Notwithstanding the increasing investment in education, traditional gender norms prevail, and women take the burden of unpaid work inside the family. This has hindered the participation of women in the labour market and the development of private and public services for the care of children, disabled and elderly people.

Time spent by men and women in domestic activities. The distribution of care and domestic work is particularly uneven in Italy, providing further evidence on the role played by cultural factors. While in many other advanced economies, men and women work approximately the same total number of hours – with men working more in the labour market and women more in the home – in Italy women work overall more hours, given the more unequal distribution of unpaid work between partners. Within families, even in couples where both partners work, domestic and childcare responsibilities weigh disproportionately on women. And there are no significant changes over time (Naldini, Saraceno 2011). According to time use survey, in 2008-09 women did 76 per cent of work in the home, just 2 percentage points less than in 2002-03, and 9 points less than in 1989 (Istat 2011a: 155-161)¹⁰. According to Oecd (2017c), after Turkey and Mexico, Italy has the third lowest female employment rate (47%), and one of the highest gender gap in terms of unpaid work, holding back female employment growth (see Appendix, fig. A.3).

Childcare services. In 2017, close to half (46.1 %) of all children aged less than three years were cared for exclusively by their parents, in Italy. Only 28.6% of small children (< 3 yrs) received formal childcare, about 4 p.p. more than in 2007, but still below the European target of 33% (Eurostat 2019a). Despite the financing of the Special Plan for the Development of Early Childhood Social and Education Services in 2007 (Law 296/2006), public childcare services are lacking. Only about half of the children in nursery school are enrolled in public nursery schools or schools operated under a convention. The main reasons cited for recourse to private facilities is the insufficient number of places available and the short school day (Bank of Italy 2014: 94-95). And the lack of childcare services continues to hinder women’s labour market participation in the early years of children’s lives (Istat 2019c).

Working-time arrangements of couples with children. Among couples with children (<14), the male breadwinner model remains the most common employment pattern, followed by the “one-and-a-half earner couple families” where men are still the main earners and women work part-time. The third most common employment pattern is “both partners working full-time”. This arrangement covers around one fourth of all couples (OECD 2019b, Family database).

Empirical analyses show that paid work reduces the amount of time mothers spend with their children only marginally. Working mothers compress their free time in order to have time to spend on domestic tasks; by the same token, when mothers work, the time fathers spend with their children tends to increase. Work for mothers, therefore, appears to favour a more equitable distribution of parental childcare.

¹⁰ See <https://www.istat.it/it/archivio/230102> for more recent Time Use Survey data (TUS 2013-14).

Occupational segregation, pay gaps and glass ceiling are less prominent issues in Italy than in many other European countries because, much more so than in other countries, women with lower earnings (especially those with low education) are more likely to leave the labour market after childbirth (Valentini 2012; Istat 2019c).

Lack of flexible working arrangements. Flexible working arrangements enable employees to vary their working hours and adapt them to their personal and family needs, improving the quality of work, which makes a better work-life balance possible. In Italy women reported about the same access to family related work schedule flexibility than men (EC 2014: 15-16). However, the share of female workers who can vary the start and/or end times of their working day is much lower in Italy (around 44%) than in the Netherlands (83%), Austria (67%), Island (65%), Slovenia (61%) and Belgium (58%). A similar picture emerges in terms of the percentage of employed people generally able to take whole days off for family reasons. In short, in Italy women with family responsibilities face serious reconciliation problems due to the lack of flexible working arrangements (especially in the private sector) and the traditional gender roles (perpetrating the unequal distribution of unpaid work within the household).

The “Law on reconciliation of work and family life” (included in L. 198/2006) is supposed to support local projects encouraging flexible working arrangements (in terms of hours, teleworking, job-sharing, hour savings, the possibility for the female self-employed to be substituted by a co-worker). However, lack of incentives for employers and lack of funds have not allowed the generalization of some successful best practices at local level (EP 2014: 28).

Reconciliation problems and inactivity. Although the non-symmetrical nature of work within families is gradually reducing, the difficulties of balancing work and life can be seen with greater intensity when there are small children involved. While the employment rate increases for men when there are small children, it decreases for women. As a result, the gap by sex in the employment rate is much higher when there are small children (Istat 2011c). It should be recalled that there are large differences between the South (recording extremely low employment rates for mothers) and the Centre-North (recording rates close to the EU27 average).

A national survey has shown that 46% of women who are inactive left work because of reconciliation problems (ISFOL 2010: 53). Administrative data (INPS) shows that 25% of women who gave birth in 2009 were not back to work three years later (Mundo 2012). Inactivity due to reconciliation problems is certainly very high in Italy, though with differences across the country. While in the Mezzogiorno a large number of women in their prime age abandon active life when they become mothers (and some when they get married), in the Centre-North they move to part-time jobs.

The availability of means of reconciling work and family commitments influences the decision on how much to work and where. Owing to the uneven distribution of roles between the sexes, shortcomings in the supply of care services (especially for the very young and the dependent elderly) have a greater impact on female participation choices. In particular, the availability of crèches is positively correlated with women’s working hours outside the home.

The introduction in 2012 of fully paid paternal leaves, and the very recent increase of compulsory paternal leave to 7 days¹¹, is an important provision, though not sufficient to overcome traditional

¹¹ For details see: <https://www.inps.it/nuovoportaleinps/default.aspx?itemdir=50584>

gender norms within the household. Clearly, the willingness of Italian men to engage in more unpaid housework will co-determine to what extent Italian women will be able not only to increase their participation in employment but also to be engaged in successful careers. This is especially important for women with high educational attainment.

Policies. Policy-makers have tried to address the gender unbalance in unpaid work in recent years focussing on two provisions: i) improving the availability and affordability of childcare services (for children aged <3 yrs.), and ii) increasing compulsory (and optional) paternity leave. The provision of childcare services is responsibility of local authorities; therefore, large differences across the country persist, at the disadvantage of Southern regions. In 2012, one day (fully paid) compulsory paternity leave was introduced as a symbolic measure. Recently, this provision was extended up to 7 days (2020 Budget Law). Working mothers are also entitled to a “baby-sitting voucher” worth 300 euros per month (for 11 months) that can be spent on private nannies or public or private crèches. All measures have always been fragmented and underfunded; they were seriously hit by budget cuts in recent years, driven by austerity policy (EP 2018: 47).

New policy interventions have focused on flexibility in the workplace (in both the private and public sectors) to improve work–life balance. In Italy, the regions (and the two autonomous provinces, Trento and Bolzano) were given the power to introduce legislation to remove all obstacles to genuine equality between the sexes. Policies for employees, female entrepreneurship and reconciling work and family life vary greatly from region to region. These disparities in public childcare services are driven by many different factors, but the main one is the availability of financial and economic resources to ensure service sustainability (Del Boca et al. 2016).

The new EU Directive (2019/1158/EU of the European Parliament and of the Council) of 20 June 2019 on work-life balance for parents and carers (and repealing Council Directive 2010/18/EU) has to be implemented by member states by August 2022. The measures under the directive include: the introduction of paternity leave (under the directive, fathers must be able to take at least 10 working days of paternity leave around the time of birth of their child); the ensurance that two out of the four months of parental leave are non-transferable between parents and compensated at a level that is determined by the Member State; the introduction of carers’ leave (workers providing personal care or support to a relative will be entitled to five days of leave per year) and extending the right to request flexible working arrangements to carers and working parents of children up to eight years old.

5. EQUAL OPPORTUNITY POLICIES AND PRACTICES

5.1 Gender equality legislation

Italy has put in place different measures having constitutional, legislative, and administrative nature on the elimination of gender discrimination and the respect for the principle of gender equality (see Appendix, box. A.3). This section provides an overview of the most significant acts.

The general principle of equality between women and men is enshrined in the Italian Constitution. Article 3 states: “All citizens have equal social dignity and are equal before the law, without distinction of sex, race, language, religion, political opinion, personal and social conditions”. Article 37 states: “Working women are entitled to equal rights and, for comparable jobs, equal pay as men. Working conditions must allow women to fulfil their essential role in the family and ensure

appropriate protection for the mother and child”. And Article 51 (amended in 2001) states: “Any citizen of either sex is eligible for public offices and elected positions on equal terms, according to the conditions established by law. To this end, the Republic shall adopt specific measures to promote equal opportunities between women and men”.

The gender equality principles set in the Constitution inspired several laws. However, achieving substantive equality between men and women is still a long way off. At the root of gender inequalities still shaping Italian society are traditional norms and values. A number of factors help to explain the difficulties faced in changing the familistic welfare regime – based on traditional gender roles – and meeting the new demands of a changing society. These include a highly male dominated decision-making arena and a gender-blind culture unwilling to promote women’s rights.

In this context, the development of a gender-equality policy was largely influenced by EU membership and the activities of the women movement (Guadagnini and Donà 2007). As from the 1970s, implementation of European directives on gender equality profoundly changed the Italian legal framework centred on the ‘woman-mother’ and helped overcome cultural and social resistance; this change started with the adoption of a law on equal treatment on the workplace (L. 993/1977). In the 1970s due to the women’s rights campaigns promoted by the women movement, there was the approval of the divorce law (1970) and the abortion law (1978), together with the reform of family law in 1975, which recognized the parity between partners within the family institution. To note, only with the approval of Law 66/1996, violence against women was considered a crime against the person.

In 2006 the National Code for Equal Opportunities between Women and Men (D. Lgs. 198/2006) was enacted, gathering into a single code all the laws in force on gender equality and women’s empowerment with the view of regulating the promotion of equal opportunities between women and men in all areas of society. The Code introduced the principle of gender mainstreaming: government authorities have to adopt a gender perspective in the drafting of laws, regulations and administrative acts, and in all policies and activities. Besides providing for general provisions, the Code focuses on the organisation of bodies established for the promotion of equal opportunities.

In the most recent years, some new measures were adopted to enhance women in leadership positions (see Appendix, box. A.3): gender balanced promotion in local government (L. 215/2012); mandatory quotas in the boards of companies listed in the Stock Exchange (L. 120/2011)¹²; mandatory quotas in companies owned by the public administration (at least 20% for the first year, and 33% for the following years) were established by Presidential decree (D.P.R. 251/2012) and mandatory quotas in general elections (L. 165/2017) (Donà 2018). Mandatory quotas in the boards of companies were introduced as temporary measures to end in 2022, but in 2019 they have been extended to other 3 board appointment renewals.

In 2009, a law introduced stalking as a type of punishable offence. In 2013, the Council of Europe convention on violence against women and domestic violence (so-called Istanbul Convention) became law by unanimous approval of the Parliament (L. 119/2013). In 2016 a law was approved

¹² The 2011 law establishes that the gender quota in the boards of directors for the least represented gender should increase up to 33% by 2015. The percentage of women in boards increased from 7% in 2011 to 33% in 2016 (Consob 2018).

on de facto unions outside the traditional civil marriage, including same-sex unions, the s.c. “civil pacts” (L. 76/2016, known as Cirinnà Law).

Concerning funding, the law on work-life balance measures (L. 53/2000) is partially not implemented due to lack of funding to cover the financial incentives for firms implementing more flexible working arrangements; also the law on violence against women (L. 119/2013) has not received adequate financial resources, given that the network of anti-violence centres lacks adequate funds (EP 2014: 5; Donà 2015)

To conclude, despite the significant amount of legislation approved, Italy is far away from achieving full equality between men and women: according to the *2020 Global Gender Gap Report* Italy ranks 76 out of 153 countries (WEF 2019).

5.2 Institutional structure for gender equality and equal rights

In Italy, the governmental machinery for equality¹³ is composed of several institutions (see Box 5.1). The Italian women’s policy machinery was established during the 1980s, starting with the labour market area, and was consolidated during the 1990s, both at the national and local levels. An important initiative was undertaken in 1997, by the then Prime Minister and the Minister for Equal Opportunities. It was enacted the National Directive to promote actions aiming at the attribution of responsibilities and rights to women; its aim was to mainstream gender equality in all institutional activities and policies, as part of the 1995 UN Beijing Platform of Actions obligations ratified by Italy and the EU. So far, gender mainstreaming is far from been adopted and implemented at the national level (in central government activities), while it is more widely adopted by local governments under EU structural funding requirements.

Since the outset of the Great Recession (fall 2008), different Governments ruled the country. Since then, gender equality issues and gender mainstreaming were put on aside. According to the 2017 Shadow Report (AAVV 2017), the role of the Equal Opportunity Department (DEO) progressively weakened in terms of political leadership and centrality. Moreover, special concerns raised in 2009 by the creation of a Department of Family Policies, distinct from the DEO. A risk was reported: «The complete lack of any co-ordination between the two Departments involves the risk that the new Department’s policies and actions may pose a hindrance to the full implementation of the CEDAW principles, and prioritize the value of the protection of the family over the eradication of the discrimination against women, also within the family» (AAVV 2017). This is what happened in 2019 under the populist government Conte I (formed by Lega and Five Star Movement). The then Minister for Family and Disability, openly against LGBT+ families, promoted measures ‘to protect’ the traditional (heterosexual) family, then considered under attack by liberal and secularized Europe. Hence, also in Italy there was a backlash against gender equality (as in other countries Verloo 2018) due to the rise of the populist radical right party Lega (Donà 2019).

The lack of attention to gender equality at the national level is mirrored also at the local level. At regional level, the Councillors for equality are almost near to disappear. Established by law in 1984, the main function of the Councillors for equality is to put into practice the principle of equal treatment for women and men in the field of labour. They can report offences to the juridical authorities and institute legal actions. Their role was reinforced and actually implemented only in

¹³ The influence of the EU resulted crucial in the set up of the Italian women’s policy machinery.

2000 (D. Lgs. 196/2000), when a national fund to implement the activities of the Equality Councillors was established and a national Network of Equality Councillors was set up in order to exchange best practices and to coordinate local activities. During the recent years, the need to cut public expenditure dramatically reduced the funds for Councillors' activities. According to Maione (2014) it is quite likely that this figure is going to disappear soon.

At the local level, Equal Opportunity Commissions (CPOs) were active in each institution of the public sector since 1988 (regional, provincial, municipal administrations, universities, local units of the national health system, etc.). Their performance is extremely diverse. Some confine themselves to dealing with minor problems while others are active in promoting gender equality in society at large (EP 2014: 12). The CPOs have recently been transformed (by L. 183/2010) into CUGs (Unified Committee for the rights of the employees), which combine the former CPOs with the committees for protection against mobbing (Tomio 2012).

Box 5.1: Equal opportunities and anti-discrimination institutional structure (current situation)

Institution	Main functions
<p><i>Prime Minister's Office</i></p> <p>i) Department for Equal Opportunities (since 1997), which includes the Office against Racial Discrimination (UNAR)</p>	<p>Activities in the EU and international arenas; monitoring the adoption of EU legislation; verification of the application of mainstreaming in government activities; law-making schemes, monitoring and assessment of the state of implementation of equal-opportunities policies.</p> <p>Gathering of complaints, and legal assistance; promotion of research activity for combating discrimination on different grounds of discrimination; networking with NGOs.</p>
<p>ii) Department of Family Policies (since 2009)</p>	<p>It is responsible, <i>inter alia</i>, for the promotion and co-ordination of relevant Government's action, aimed at ensuring the implementation of family policies and supporting both maternity and paternity.</p>
<p><i>Ministry of Labour</i></p> <p>i) National Committee for Equal Treatment (since 1983; reinforced as from 1991)</p> <p>ii) National Equal Opportunities Counsellor (from 1991)</p>	<p>Monitoring anti-discrimination legislation at the workplace.</p> <p>Approval and monitoring of affirmative-action programmes.</p> <p>Proactive work in the field of equal opportunities in the labour market.</p> <p>Inspection activities in cooperation with Labour Inspectors.</p>

6. EQUAL OPPORTUNITY AND PROMOTION OF WOMEN IN ACADEMIA AND SCIENCE: POLICIES AND PRACTICES

In Italy, the university system lacks policies and practices explicitly targeted to promote gender equality in academia and/or women in science. Recently, the need to promote equal opportunities entered the debate, and some initiatives were put in place. This section presents: i) the most significant initiatives for gender equality in education and women in science; ii) an overview of the scope and diffusion of gender studies within tertiary education.

6.1 The most significant research initiatives for gender equality in Education and Science

Italy has achieved full literacy for girls. In primary education, schooling rates for girls and boys are now equivalent; and, in most levels of secondary schools, girls perform better than boys. Over time there was a marked tendency for Italian women continuing their studies, especially at higher levels. Since the mid-1990s, women's educational attainment has been higher than that of men (see Appendix, fig. A.1). Despite these progresses, the field of study differs significantly between women and men, with an under-representation of women in STEM (see Section 1.2).

The number of women who take up a career in the scientific sector has remarkably increased over time, although only a minimal share achieves leadership positions. There is also a positive evolution in the number of women students and graduates in STEM, but the gender gap is still present and is particularly striking at the top level. In recent years the access to and participation of women in STEM was addressed by several initiatives.

In 2013, the pro-tempore Minister for Equal Opportunities signed a Memorandum of Understanding with the Ministry of Education, University and Research (MIUR) aimed at promoting equal opportunities in science. The aim was to set up, for the first time, a national strategy to increase the participation of women and girls in science and technology education, training, research and employment. A Consultation Panel (composed of experts from public administrations, universities and the civil society) was set up with the mission of elaborating proposals for achieving gender equality in science, fighting the under-representation of women in science, facilitating the advancement of female careers, and improving the presence of women in employment and, in particular, in decision making positions.

In Italy, the more relevant research projects on gender issues are those funded by the European Commission (EC) (i.e. Horizon 2020, FP7). Over the period 2015-2019, there were 13 research projects with an Italian institution (University or Research Institution) as Participant or Coordinator, focused on gender equality issues; 10 were completed, while another 3 are still active (see Box 6.1).

In 2019, the CRUI Group for Gender Budgeting (GB) published the Guidelines for implementing GB in Italian universities (CRUI 2019). GB has two main goals: (i) to provide a detailed picture of the various components of the University population by gender (students, teaching staff, administrative staff); (ii) to monitor the actions implemented for gender equality (including financial commitments).

It should be recalled that if, on the one hand, the Department for Equal Opportunities took initiatives to improve the position of women in science, on the other hand the MIUR implemented major reforms based on striking budget cuts (implying downsizing in full-time schooling and

teaching staff). The negative impact on women – as mothers, students, teachers, researchers, professors - has been substantial.

Box 6.1 – EU research projects: projects funded by the EU (Horizon 2020, 7FP) with an Italian institution (University or Research Institution) as Participant or Coordinator

A. The following ten research projects were active over the period 2015-2019:

1. FESTA “Female Empowerment in Science and Technology Academia” (2012-2017);
2. GENDERTIME “Transferring Implementing Monitoring Equality” (2013-2016);
3. GENDERCIT “Gender and Citizenship” (2013-2017);
4. GENOVATE “Transforming organisational culture for gender equality in research and innovation” (2013-2017);
5. GARCIA “Gendering the Academy and Research: combating Career Instability and Asymmetries” (2014-2017);
6. TRIGGER “Transforming Institutions by Gendering contents and Gaining Equality in Research” (2014-2017).
7. GENERA “Gender Equality Network in the European Research Area” (2015-2018);
8. LIBRA “Leading Innovative measures to reach gender Balance in Research Activities” (2015-2019);
9. EQUAL-IST “Gender Equality Plans for Information Sciences and Technology Research Institutions” (2016-2019);
10. SAGE “Systemic Action for Gender Equality” (2016-2019).

B. The following seven research projects are still active in 2020:

1. PLOTINA “Promoting gender balance and inclusion in research, innovation and training” (2016-2020). This project aims “to enable the development, implementation and assessment of self-tailored Gender Equality Plans (GEPs) with innovative and sustainable strategies for the Research Performing Organizations (RPOs) involved. This objective will be achieved by: i) Stimulating a gender-aware culture change; ii) Promoting career-development of both female and male researchers to prevent the waste of talent, particularly for women; iii) Ensuring diversification of views and methodologies (in this case by taking into account the gender/sex dimension and analysis) in research and teaching”;
2. GEECCO “Gender Equality in Engineering through Communication and Commitment” (2017-2021). This project “aims to establish tailor-made GEPs in 4 European RPOs and to implement the gender dimension in 2 RFOs (funding schemes, programmes and review processes). All participating RPOs are located in the STEM field, where gender equality is still a serious problem and whose innovations are increasingly important in the knowledge-based economies”.
3. TARGET “Taking a Reflexive approach to Gender Equality for institutional Transformation” (2017-2021). This research project “will initiate institutional change in seven gender equality innovating institutions (GEIIs) in the Mediterranean basin – including research performing organisations (RPOs), research funding organisations (RFOs) and a network of universities (...)TARGET will build the institutional capacity for a reflexive gender equality policy by: developing effective tools for each stage of the GEP/GES (audit, planning, implementation, monitoring, self-assessment) to be customised to the specific institution; supporting the development of competences to conduct a gender audit, to design, implement, monitor and self-assess a tailored GEP/GES; establishing a community of practice of relevant stakeholders within each GEII; initiating an organisational learning process within each GEII which combines self-assessment with GEP/GES evaluation”.
4. GENDER NET Plus “ERA-NET Co-fund Promoting Gender Equality in H2020 and the ERA” (2017-2022). This research project “aims to strengthen transnational collaborations between research programme owners and managers, provide support to the promotion of gender equality through institutional change and instigate the integration of sex and gender analysis into research and funding programmes”.
5. SUPERA “Supporting the Promotion of Equality in Research and Academia” (2018-2022). This research project aims “to implement 6 fully-fledged GEPs to articulate a structural understanding of gender inequalities, stereotypes and biases in research as a cross-cutting issue to tackle in their complex, multi-layered dimensions and the inclusion of a gender perspective in research and academia, with a holistic set of measures addressing the above-mentioned objectives of the EC’s strategy: Building gender sensitive career management and workplaces; Transforming decision-making towards accountability,

transparency and inclusiveness; Achieving excellence through strengthening the gender dimension in research and knowledge transfer”.

6. R-I PEERS “Pilot experiences for improving gender equality in research organisations” (2018-2022). This project aims at creating and validating pilot experiences aiming at disrupting the gender-biased approach and those unconscious rules that limit the participation and the career of women in research and innovation in the Mediterranean Area. To do so, we will leverage on the synergies of structured dialogues and women’ empowerment through skills and entrepreneurial perspective of research and innovation. The project objectives are: 1. Implementation and improvement of 7 GEPs in R&I related organisations; 2. Smooth the gap of gender representation in decision-making and research-performing processes; 3. Maximise the impact and the efficacy of gender content into the research programmes”.
7. Gender-SMART “Gender SMART Science Management of Agriculture and life sciences, including Research and Teaching” (2019-2022). This project “is about achieving gender equality in Research Performing and Research Funding Organizations operating in the agricultural and life sciences research field. This field, essential to humanity and strongly affected by gender biases, is of specific relevance to implement changes aiming at making research more open to societal challenges”.

Source: <https://cordis.europa.eu/>

6.2 The process of change: research initiatives and Action Plans for gender equality

The EU is committed to promote equality between men and women in all its activities, including research and innovation. Gender equality is one of the main priorities of the European research partnership for excellence and growth. Member States are requested to eliminate barriers to recruitment, retention, and career progression of women in research, to move towards gender balance in decision-making and to strengthen the gender dimension in research programs. Box 6.1 lists 19 research projects planning structural change initiatives. Interestingly, they share some key issues and policy proposals, including: the need to focus on areas of structural change; the design of Action Plans for gender equality, supported by high quality diagnoses; how to start the process of structural change within the organisations involved; monitoring & evaluation of changes produced by the Action Plans; the procedures for mutual learning between the project partners; the sustainability of gender equality plans (i.e. how to make change actually structural).

The following themes on structural change are shared by several projects: Excellence, Organisational Culture and Workplace, Integrating a gender perspective into research and teaching, Resistance to structural change, Gender Equality Plans.

Excellence. Several consortia have critically analysed ‘excellence’, focussing on five issues: i) how the concept of excellence is constructed and how it varies in relation to the national context (with different implications at regulatory, social and cultural level); ii) the influence of stereotypes on the idea of excellence and its use; iii) the uneven relationship between the idea of excellence and the practice of hiring and promoting academic staff; iv) the relationship between scientific excellence and diversity (i.e. gender, race, nationality).

Organisational Culture and Workplace. All projects consider explicitly a set of issues as an integral part of the Action Plans for gender equality: transformation of organisational culture (with reference to behaviours and working practices); language; styles of work and meeting (incl. daily interactions, formal and informal networks); power relations (incl. prevention of abuses and harassment). Different tools (courses, workshops, seminars, diffusion of internal research results) are suggested to promote and disseminate a gender equality culture.

Integration a gender perspective into research and teaching. Knowingly incorporating a gender perspective in all areas of scientific research emerges as a common axis in various projects,

especially the most recent ones. This is based on the belief that an appropriate consideration of sex and gender factors in research is a prerequisite for the progressiveness of scientific knowledge.

Resistance to structural change. Another shared issue is the analysis of resistances to structural changes. This is an integral part of the mapping of gender equality in the institutions. It is also considered for progress evaluation. Finally, it is one major aspect of the social dynamics to be considered while designing actions, through different forms of negotiation inside the institutions.

Gender Equality Plans (GEPs). Another shared issue concerns the methods to plan and customise the Action Plans for gender equality, or GEPs. These plans are prepared by the teams of the interested organisations, and should provide a detailed planning and a contextual revision during its implementation. Different procedures are suggested: after data collection, research work and common reflection; or before the project actually starts, on the basis of previous analyses of the state of art. Whatever the chosen solution, the design of the GEP is supported by accurate diagnoses, including research activities and data collection, which precede and often accompany it, allowing their progressive refinement.

More than one consortium highlighted the process of change. This can either involve almost simultaneously different types of actors within the organisations or proceed sequentially from the top management to the bottom (gradually reaching the departments). Whatever the choice made, participatory methodologies are adopted (such as the World Café or action-research) to involve as many relevant stakeholders as possible. The integration of top-down and bottom-up approaches for involving people in the promotion of gender equality is an issue at stake for several consortia. This results, in several cases, in the creation of networks which take part in designing and implementing activities (courses, workshops, mentoring schemes, etc).

Regarding the issue of monitoring and evaluating changes, all consortia faced the problem of how to measure, monitor and evaluate progress. In some cases, monitoring and evaluation activities are conducted all along the GEPs' lifespan, generally by a partner different from the promoters. Most projects involve the creation of a baseline of quantitative and qualitative data to be used as initial reference and to be periodically updated.

All consortia included forms of mutual learning and capitalisation of knowledge acquired, both for members of the consortium and for the benefit of future promoters of gender equality measures. This responds both to the EC (as specified in its calls), and to the need expressed by participants.

The persistence of achievements in terms of gender equality after the projects' lifespan is considered as the big challenge by all the consortia. In some projects, each partner implementing a GEP is expected to draft a sustainability plan in the second part of the project's implementation, based on their actual experience, and supported by an initial feasibility study drafted by the partner in charge of technical assistance. In other projects, the claim for sustainability is embedded in the approach chosen and supported by different tools, like permanent committees and extensive training programmes. In several projects, the choice made was to include sustainability among the dimensions to be considered in the evaluation of the Action Plans. Structural changes and active policies for gender equality are today the object of numerous studies (Poggio 2018a; Poggio 2018b; Lansu, Bleijenbergh, Benschop 2019; Leenders, Bleijenbergh, Van den Brink 2019).

6.3 Teaching gender in Italian universities

In Italy, more than in other countries, gender studies are blamed of ‘poor science’. This position is also found within academic institutions. This explains the little diffusion of degrees, courses, classes explicitly including a gender perspective.

Antonelli, Sarra, and Sorrentino (2013) did a mapping of the teaching courses explicitly considering a gender perspective in the Italian universities in the academic year 2011-12. The analysis considered: (i) the institutional framework (i.e. the boundaries set by the law for the organization of teaching), and (ii) the supply of gender sensitive courses in the Italian universities. The institutional framework, defined at the national level, intervenes at two levels. First, it identifies the ‘scientific disciplinary field’. Out of 165 fields (i.e. the research fields in which knowledge is organised by law), gender studies do not appear as a specific disciplinary field; and only in four fields (out of 165) gender is acknowledged as an ‘object of study’ (medieval history, modern history, contemporary history, social statistics). Second, the ‘classes of degrees’ (i.e. undergraduate programs and masters) are described in terms of educational goals, and teaching areas. The researchers focused their analysis on those fields characterised by teaching areas more likely to include a gender perspective (sociology, law, economics, history, medicine). None of the 78 classes of degrees examined are focused exclusively on gender issues; out of the 26 undergraduate programs and out of 52 master programs, only 6 and 11, respectively, included - among their educational goals - the need for a gender perspective in the study of social, cultural, political, economic phenomena or related to the human body. To sum up, the legal framework for university teaching does acknowledge the area of gender studies, though in an incoherent way (i.e. limiting to list the need for a gender perspective in certain disciplinary areas).

The way in which these abstract possibilities are translated into gender sensitive teaching programmes is disappointing. There are no degree programmes specifically focused on gender issues. In 2019/20, there were post-graduate courses on gender issues (Master) but no Master’s Degree Programme or Doctoral Programme. We could find some specific courses on the themes of gender issues, but the total number of these courses is very small, and concentrated in few teaching sectors: sociology, languages and foreign literature, and history. The teaching of gender studies is extremely limited in law and economics, despite the statutory provisions.

To sum up, the teaching of gender studies in tertiary education is still very limited, fragmented, disjointed and does not correspond either to the extension of research in this area or to the even contradictory and limited statutory provisions set by law for undergraduate and graduate programmes. Thus, entire degree programmes, crucial for the formation of the Italian ruling class, do not provide courses that include a gender approach.

7. GENDER ASYMMETRIES IN ACADEMIC CAREERS IN ITALY

The need to promote equal opportunity in the Italian university system recently entered the debate. Some initiatives were put in place, but without significant changes. The university system has gone through important legislative changes in the last decades (see Appendix, box. A.4), affecting the position of women in academia. This section focuses on these issues.

7.1 Recruitment procedures in the Italian university system

The Italian university system consists of 97 institutions: 67 state universities; 19 non-state universities; and 11 telematic universities. In 2019/20, the academic and administrative staff amounts to 125,605 units, of which 55,426 units are academic staff (full professors, associate professors, researchers), plus 14,459 post-doc positions (*assegnisti*). About 26,870 external teachers (*docenti a contratto*), with annual contracts, must be added to the total academic staff¹⁴.

The academic staff has a hierarchical and pyramidal structure:

- at the base, temporary positions characterised by precarious non-standard contracts: post doctoral fellows (*assegnisti/e*) and collaborators (*collaborator/trici*);
- the entry position into *structured staff* is that of temporary researcher RTD-a (with a fixed-term contract of type A);
- temporary researchers RTD-b (with a fixed-term contract of type A), is a sort of tenure-track position (conditional to the acquisition of the national scientific qualification, NSQ);
- associate professors (with tenure)
- full professors (with tenure).

The Italian university system is regulated by national laws and by the statutes of universities. Recruitment procedures, employment conditions and salaries fall under the control of nation-wide laws. Salaries vary only by academic position and seniority; ‘payment by result’ (according to research productivity and/or teaching load) is forbidden by law. Every academic is characterised by an academic position (full professor, associate professor, researcher of type A or B) and one academic discipline. There are 383 academic disciplines (*settori scientifico disciplinari*), grouped into 14 research areas. Any vacancy is coded by a research sector, and applicants are evaluated by professors of the same sector. Given the public nature of the employment contract, academic staff is recruited through public competitions; decisions by the selecting committee have to be based on objective criteria and transparency of the selection process.

The institutional design of selection procedures for recruitment and promotions changed radically over the last four decades (see Appendix, box. A.4, for additional information).

1979-1998: centrally managed nation-wide competitions were used to recruit (i.e. promote) associate and full professors; assistant professors (with tenure) were recruited through local competitions (though the selecting committee was appointed at the national level).

1999-2004: recruitment procedures became entirely local. Each university could organise its own selection procedures (for assistant professors, associate professors and full professors) through local committees.

¹⁴ Additional information is available at MIUR web page: <https://www.miur.gov.it/universita>.

2005-2009: recruitment procedures for associate and full professors were changed again by the so called *Moratti reform* (L. 230/2005). It involved a random extraction (by lottery) of 4 external professors out of a pool of previously elected professors (at the national level, in the same research field) and an internal commissioner appointed by the faculty which decided to run the competition. This new procedure intended to avoid the formation of ad hoc committees (i.e. collusive behaviour favouring local candidates) and to increase competition.

Since 2010: the recruitment procedure (for associate and full professors) was reorganized and partially re-centralized. The so called ‘Gelmini reform’ (L. 240/2010) established a National Scientific Qualification (NSQ, i.e. *Abilitazione Scientifica Nazionale* (ASN)) as a necessary prerequisite for access to permanent positions, associate and full professor.

7.1.1 Budget cuts and low funding in tertiary education and research

The Italian university system suffers from poor funding (Ocse 2019a; Almalaurea 2019). This is due to the modest investments traditionally devoted to tertiary education, and to the impact of fiscal consolidation during austerity (see Section 1.1, for additional information).

According to the European University Association, Italy recorded a 17.3% cut in public funding for tertiary education from 2008 to 2017. The funding cut resulted, among other things, in a significant contraction in the number of tenured and fixed-term positions (-14.9%). As a result, the average age of academic staff and the teaching load increased. The Ordinary Financing Fund (FFO), the main source of entry of universities, was around 7.3 billion euros in 2018. After a contraction between 2009 and 2015 (-8%), it started to rise again in the more recent years. Furthermore, public funds based on specific criteria (rewarding tertiary education institutions on the basis of an assessment of the results achieved) was increased from 20% (of total funding) in 2015 to 24% in 2018. This ‘reward share’ should increase up to a maximum of 30%. This increase was decided by ministerial actions related to the ‘Triennial Planning’ and the Research Quality Evaluation (VQR).

Investments in Research and Development (R&D) are also modest in Italy. According to Eurostat database on science, technology and innovation, in the past two decades, the intensity of expenditure in R&D increased by 0.34 p.p., reaching 1.35% of GDP in 2017. Although the trend is positive and shows a progressive increase in resources dedicated to the R&D sector, Italy has not been able yet to bridge the gap with other EU countries (for Germany, France and the UK, percentages of 3.02, 2.19 and 1.66 are recorded). Italy is still far from the EU target set for 2020: 1.53%. In this context, tertiary educational attainment remains low in Italy compared to other EU countries. See Section 1.1 for additional information.

7.1.2 The Research Quality Evaluation

The Research Quality Evaluation (VQR) was established at the national level in 2004 in order to enhance the production of high quality research. VQR assessment is used for the allocation of the ‘reward share’ of the Ordinary Financing Fund (FFO) to universities. A national body, ANVUR, has the task of evaluating the quality of the research products, mainly through a peer review. The first evaluation round (VQR 2004-2010, which refers to the years of publication 2004-2010) started in July 2011 (D.M. 17/2011) and results were published in summer 2013. The second evaluation round (VQR 2011-2014) started in June 2015 (D.M. 458/2015) and results were published in February 2017. At present, the third evaluation round (VQR 2015-2019) is taking place.

Many criticisms were raised about the ‘bibliometric evaluation system’ used by ANVUR (based on quantitative indicators). In preparation of the VQR 2015-2019, ANVUR entrusted a group of

independent international experts to prepare a report highlighting the strengths and weaknesses of the first two VQRs. The results were published (on ANVUR website) in March 2019.

7.1.3 The ‘Departments of Excellence’ programme

The ‘Departments of Excellence programme’ is an institutional innovation with extraordinary funding (with an annual budget of 271 million euros) from the Ministry of Education and University (MIUR). This programme, introduced by the 2017 budget law (L. 232/2016), identifies and finances what are supposed to be the best 180 University Departments for the quality of the research produced and the quality of a five-year development project (2018-2022). Again, ‘quality’ has been assessed through bibliometric quantitative evaluations. The additional resources made available by this programme have (temporarily) helped some Departments. However, it cannot be a solution in a context of budget cuts and precariousness. In particular, it does not help researchers in the early stages of their career to exit precariousness.

7.1.4 The National Scientific Qualification system and its gender effects

In December 2010 a comprehensive reform, known as the ‘Gelmini reform’, introduced new rules for the recruitment procedures of academic staff (see Appendix, box. A.4). A two-step procedure was established for promotions to associate professor and to full professor. First, candidates have to be apply at the national level in order to be acknowledged the National Scientific Qualification (NSQ). National committees (appointed at the national level, by research filed) have to identify the candidates that deserve the scientific qualification (*‘idoneità’*) for which they applied (associate professor, full professor).¹⁵ Second, candidates have to win a ‘local competition’. Each Department has to decide to open (or not) a public competition to recruit from outside (or promote from inside) somebody for a specific position (associate professor, full professor) in a specific research field.

The ‘Gelmini reform’ changed not only the recruitment process (introducing the two-step procedure) and the rules for the setting up of national committees, but also strengthened the importance of ‘merit evaluation’. It indirectly opened the door to the problematic relationship between ‘merit evaluation’ and ‘quantitative indicators’ for scientific productivity, and to the legitimacy and quality of the ‘bibliometric evaluation system’¹⁶. In recent years, a heated debate started on this bibliometric evaluation system (Biagioli 2018).

7.2 Investigating the ‘glass ceiling’ phenomenon in Italian Academia

As shown in Section 1.2, women represent well over 50% of the reference student population at all levels: first-entry into tertiary education, students enrolled in tertiary education, total number of graduates in the academic year, ‘regular’ graduates, students enrolled in doctoral courses, and PhD holders. The transition from tertiary education to academic career shows a decreasing share of women along the hierarchical scale. In 2017, women were 50.3% of postdoctoral researchers (*assegni di ricerca*), 46.6% of university researchers (with permanent or fixed term contracts), 37.5% of associate professors and 23.0% of full professors (Villa 2019).

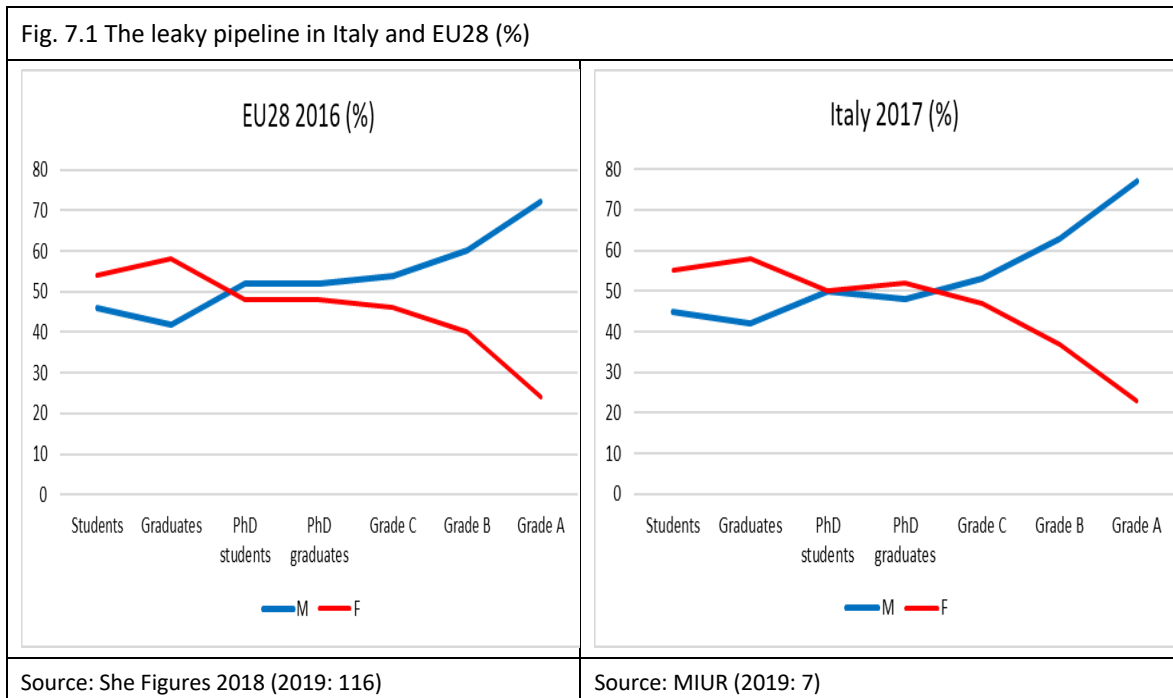
Three concepts are used to illustrate the disadvantages suffered by women in academia:

- i) **vertical segregation** of women in academic career: there is a high number of women at the bottom, while few women reach the top positions;

¹⁵ The NSQ has a fixed duration (initially 4 yrs, then increased to 6 yrs, recently to 9 yrs).

¹⁶ On the indicators in the procedure for the present period, 2018-2020 see: D.M. 589/2018.

- ii) **glass ceiling**: there is an invisible barrier that prevents women from accessing the top positions;
- iii) **leaky pipeline**: there is a progressive reduction in the share of women as one moves up the path of academic career, after the end of education (see fig. 7.1).



These three concepts consider gender asymmetries in academic career from different perspectives, partly overlapping, and with some limitations. In particular, there cannot be glass ceiling without gender vertical segregation. Also, the leaky pipeline is a powerful graphical representation of the disadvantage suffered by women in academia, but it suffers from severe distortions due to the comparison of different cohorts of individuals (observed at different ages).

The debate on gender asymmetries in academic careers is still ongoing today. Drawing on the literature, the following issues are here discussed: 1) women's participation in NSQ; 2) the gender productivity gap; 3) national vs local discrimination; 4) bibliometric indicators and NSQ results; and 5) the role of gender in national committees.

7.2.1 Women's participation in NSQ

On average, there is a lower number of women compared to men participating in the competition for NSQ (with differences across research fields). In 2014 the share of applicants on total 'potential candidates' was 48% among women, but 54% among men (Baccini 2014; Baccini, Rosselli 2014).

De Paola, Ponzio and Scoppa (2014) compared potential with effective applicants to NSQ. After controlling for productivity and a number of individual and field characteristics, women have a lower probability of applying for NSQ competition of about 4 p.p. (which amounts to a difference of about 8%). This lower propensity to enter competition is especially relevant for women in the lower tail of the distribution of scientific productivity and in fields in which productivity is not easily measurable. All in all, the results show a significant but small gender difference in competitive attitudes in Italy, much lower than the differences of about 25-30% found by Bosquet et al. (2014) in France and of 15 p.p. found by Christofides et al. (2009) in Canada.

7.2.2 The gender productivity gap

The gender productivity gap has been extensively documented in the literature. Baccini et al. (2014) studied 942 permanent researchers from various fields in Italy and found that women were less productive than men, confirming what was previously documented (Abramo et al. 2009). The determinants of individual scientific performance were considered (for 2008-2010). The gender effect was moderately significant, affecting all the research production measures negatively. This suggests that in Italy, women face more difficulties than men in publishing, *ceteris paribus*.

Further insights into the existence of a gender gap in productivity in other countries do not confirm its existence, without reservations. For instance, in Canada (after controlling for various factors) the difference disappears and the gap is decreasing over time, especially for the younger generations (Arensbergen, van der Weijden, van den Besselaar 2012). In the USA, gender discrimination was an important cause of women's underrepresentation in scientific academic careers (Ceci and Williams 2011), but today it has ceased being a valid cause of women's underrepresentation in math-intensive fields Ceci et al. (2014). However, there are also exceptions within this changing landscape. According to Lundberg and Stearns (2019), in the USA, the progress of women has stalled in Economics over the last two decades, in contrast to the experience in other disciplines.

7.2.3 National vs local discrimination

Exploiting the features of the system currently governing academic promotions in Italy, recent papers compared gender gaps in national and local competitions (De Paola, Ponzo, Scoppa 2018), and the evolution over time of the results of two NSQ across disciplines (Manzo 2017).

As already discussed (Section 7.1.4), the success in promotion (to associate or to full professor) involves a two-step competition. Candidates (who decide to apply) are evaluated by a national committee that has to assess if they can be acknowledged a National Qualification. Then, qualified candidates compete in local competitions for a limited number of open positions. Given this two-step procedure, do men and women obtained similar results in each stage?

De Paola, Ponzo, and Scoppa (2018) carried out a probit analysis of the national competitions (NSQ 2012-2014) and the local competitions. Their analysis shows that gender differences do not emerge at the national level (ie. in the competition for a National Qualification), but women have a lower probability of winning a local competition (after controlling for several measures of scientific productivity and individual characteristics). This result implies that gender gaps in promotion (i.e. recruitment at the local level) tend to be larger when the number of openings shrinks. And this is consistent with the gender norm that when the number of positions is limited, men are given priority over women.

Gender discrimination is not only spatially different (local vs. national competition) but also vertically different (associate vs full professors' promotions). For associate professors, the probability of promotion for individuals who obtained the NSQ to associate professor is about 55%, but women suffer a 12% reduction with respect to men in the chances of being promoted 'locally'. For full professors, the probability of promotion for individuals who have obtained the NSQ to full professor is 10.4%, but women suffer a 20% reduction with respect to men of being promoted 'locally' (De Paola, Ponzo, Scoppa 2018). Overall, discrimination takes place mostly at the local level, and its extent depends on the relative number of positions at the local level. When the number of positions is low, the difference in the promotion rate by sex is around 10 p.p.; but when positions are abundant gender discrimination tends to disappear.

The gendered probability of success and the Glass Ceiling Index across disciplines. If a spatial discrimination is taking place in Academia in Italy (local versus national competition) the vertical discrimination is surely improving but still alive. Manzo (2017) examined the results of two NSQ (2012-2013; 2016-2018) using the Glass Ceiling index (GCI) and looking at the career profiles of a uniform stratified sample across different disciplines. The analysis shows for both associate and full professors, a partial improvement suggesting an apparent success of female participants in national competitions. But this success looks very partial to a deeper analysis. On the one hand, the GCI improvement does not map the gender stock composition of the lower hierarchical levels (researchers, associate professors): the share of promotion is 16% and 46% lower than the share of women researchers and associate professors. On the other hand, in the first NSQ (2012-2013) a significant self-selection shaped female participation because of the role played by the 'median requirements' that affected especially the lower tail of the productivity distribution. The same self-selection is identified also in the partial results of the NSQ (2016-17) especially in the case of applications for full professors.

The perceived obstacles. Manzo (2017, chapter IV) examined a uniform stratified sample of 50,331 individuals (academic staff in the Italian Universities, December 2015) in order to identify the gender gap in the career profiles and the related perceived obstacles. The multiple correspondence and cluster analysis shows different bottlenecks in the academic career profiles by different disciplines, aggregated by three macro areas: 1) Medicine and Health Sciences; 2) Social Sciences and Humanities; and 3) Hard Sciences. The perception of the male-oriented cooptative mechanisms emerges as the most important perceived obstacle across disciplines. It records higher means, always significantly different by gender.

Taken together, these results suggest that in the Italian Academia, women's conditions still show vertical segregation as well as a persistent perception across disciplines of biased cooptative mechanisms. The introduction of local competition uncovers an additional gender promotion differential where spatial segregation (national versus local) plays a role.

7.2.4 Bibliometric indicators and NSQ results

Starting in 2011, bibliometric indicators – based on research 'productivity' - gained a central role in the national research assessment (VQR) as well as in the entire body of the recruitment procedures (NSQ). As is known, indicators based on citations (used both in NSQ procedures and in VQR), include self-citations. Thus, researchers can increase their ranking just by self-citing their own work.

To become associate and full professor, a candidate's work must reach certain 'bibliometric thresholds', established at the national level (by ANVUR). Only if two out of three thresholds – including citations (i.e. *h-index*) are reached, the candidate enters the final step, the evaluation by a committee of peers.

Baccini et al. (2019) produced a comparative analysis of the trends in self-citations for the G10 countries in 2000-2016, documenting a net increase of the Italian 'inwardness indicator' (the ratio between the total number of country self-citations and the total number of citations of that country). Italy became, globally and for most research fields, the country with the highest inwardness and the lowest rate of international collaborations. This change occurred in the years following the introduction in 2011 of national procedures regulating promotions in academic careers, governed by bibliometric indicators. An explanation of the peculiar Italian trend is a generalized strategic use of citations in the Italian scientific community, both in the form of

strategic author self-citations and of citation networking. This shows of how metrics can be misused, with significant gender effects given the lower propension of women to networking (Shen 2013) and to self-citation (King et al. 2017).

7.2.5 The gender composition of national scientific committees

The national committees are made of five professors: four randomly extracted from a list of professors employed in Italy (who meet some minima scientific requirements), and one external professor (teaching abroad), identified at the central level on the basis of his/her international reputation. These rules make it possible to estimate the effect of the national committees composition by sex on gender differences in the probability of success.

The research results are ambiguous. Scoppa and De Paola (2011) found that the presence of women in the national committees enhanced the probability of success of female candidates (in the first NSQ), reducing the bias against women produced by “all-male committees”. Surprisingly, De Paola, Ponzio and Scoppa (2014) found that the probability of success for female candidates in NSQ competition reduced, when they carried out a similar analysis for the second NSQ.

According to Bagues et al. (2017) the ‘surprising’ outcome in NSQ competition is due to the evaluation system that tends to change when a committee includes both sexes (as if all members tend to adopt more stringent evaluating criteria). This result is based on a large-scale assessment of the causal impact of the gender composition of scientific committees on national qualifications. The empirical analysis exploited the exceptional evidence provided by two large-scale randomized natural experiments in two different countries: Italy and Spain. The database includes information on all national qualification that were conducted in Italy (in 2012–2014) and in Spain (in 2002–2006). Overall, these evaluations involved approximately 100,000 applicants and 8,000 evaluators in all disciplines. The results show no evidence, in the two evaluation systems considered, that female candidates benefit from the presence of a larger share of women in evaluation committees.

When candidates’ observable productivity is taken into account, the remaining gender gap is equal to 1.5 p.p. Italy and 1.4 p.p. in Spain, and it is statistically significant in both countries (Bagues et al. 2017). However, there is no empirical support, neither from the average in the two countries nor from the majority of subsamples analyzed, to suggest that the presence of women in evaluation committees decreases the gender gap in a statistically significant way. On the contrary, in Italy, gender-mixed committees exhibit a significantly larger gender gap than committees composed only of male evaluators. An extra woman in a committee of five members increases the gender gap by somewhere between 0.4 and 3.3 p.p. In the Spanish case, any sizable impact is rejected. An additional woman in a committee of seven members may decrease the gender gap by at most 0.5 p.p. or it might also increase it by up to 1 p.p.

To conclude, the research on the issues highlighted above, shows that Italian Academia is far from being a land of equal opportunities, despite the changes recorded since 2010. The evaluation system has been criticised, and still debated today, from a gender perspective¹⁷.

¹⁷ See De Paola, Scoppa 2015; Pautasso 2015; Abramo, D’Angelo 2015; Abramo, D’Angelo, Rosati 2016; Abramo, D’Angelo 2016; Baccini, De Nicolao 2016; Franceschini, Maisano 2017; Benedetto et. al. 2017; Bagues, Sylos-Labini, Zinovyeva 2017; Abramo, D’Angelo 2018. In the international debate, other critical issues concern the evaluation of publications, the academic peer review system, and women’s positions in scientific societies (Helmer et al. 2017; Murray 2018; James et al. 2019; Potvin et al. 2018).

7.3 The early stages of the academic career

7.3.1 Post-doc and entry positions

Over the last two decades, the recruitment process of academic staff changed substantially, increasing the flexibilisation of the research positions at the ports of entry into academic career (see Appendix, box. A.4). In 2005, the Moratti Reform eliminated the two permanent entry positions: ‘assistant professor’ and ‘researcher’. They were replaced by two new types of ‘fixed-term researcher’, one dedicated to research and one to teaching. It also extended the possibility of using precarious contracts in universities. Besides extending the use of post-doc contracts (*assegni di ricerca*), it introduced the possibility of ‘collaboration contracts’ (*collaborazioni di ricerca*). In 2010, the Gelmini Reform further modified the entry positions (fixed-term researchers) into academic career by introducing two types of fixed-term contracts: RTD-a and RTD-b. Type A is non-tenured track, while type B gives the possibility of becoming Associate Professor. At present, the general *academic career path* is organised around five positions:

1. *Postdoctoral researcher (assegnista di ricerca): temporary position.* Each contract can last from a minimum of one year to a maximum of three years. It is possible to have more than one contract over time (up to a maximum of 6 years in the same University, 12 years in different Universities).
2. *Fixed-term researcher of type A (RTDa): temporary position.* Three-year contract, renewable for another two years (3+2).
3. *Fixed-term researcher of type B (RTDb): tenure track position.* Non-renewable three-year contract, at the end of which it is possible to directly access the role of Associate Professor, if passed the NSQ, and conditional on a positive evaluation by the Department.
4. *Associate professor: with tenure.*
5. *Full professor: with tenure.*

Many years of precarious and temporary contracts are foreseen in the Italian academic career (ARTeD 2017).

The first step (after PhD award) is to enter (through a local competition) a postdoctoral position (*assegnista*). This position does not imply an employment contract, with all associated individual rights (e.g. social security provisions, pension contributions); rather, it is analogous to a scholarship grant (similar to the position of PhD students). Post-doc researchers are not part of the academic staff: they are considered halfway between work and education. These research positions are usually financed by a grant on research funds (e.g. EU research funds) in order to do research on a specific topic for a specific period of time, without teaching duties. People entering this position were not eligible for unemployment benefits, parental leave or other social security provisions (except mandatory maternity leave) until 2017. Currently, postdoctoral researchers have right to unemployment benefit (DIS-COLL, activated in 2015 for ‘collaborators’, see Appendix, box. A.4), to maternity leave and pension contributions.

The second step is to win a local competition for RTDa (‘fixed-term researcher of type A’): a temporary contract (three-years, renewable for another two). It includes both research and teaching duties (see Appendix, box A.4). Young researchers with a RTDa contract are part of the academic structured staff.

The third step is the transition into a RTDb position (‘fixed-term researcher of type B’) through a local competition (with external commissioners). It is a sort of tenure-track position. with a

maximum duration of 3 years, not renewable. It includes both research and teaching duties (see Appendix, box. A.4). The access to this position is subordinated to a three-year experience either as RTDa or as post-doc researcher. At the end of the RTDb contract (at the end of the third year), conditional on the acquisition of the national qualification (NSQ), the Department can directly promote the researcher as associate professor.

Given the average age of completion of the PhD in Italy, these three steps imply that a researcher is considered “young”, hence in a temporary and precarious position, up to the age of 39-40.

7.3.2 New frontiers of work flexibility in Italian academia

In recent years, other precarious positions, different from the postdoctoral research contract (*assegno di ricerca*), began to be used to an increasing extent in Italian universities: i) teaching collaborations (*docenze a contratto*); ii) research collaborations (*collaborazioni di ricerca*); iii) research scholarships (*borse di ricerca*).

Universities can rely on ‘external collaborators for teaching activities’ (with short-term contracts, lasting one academic year) for different purposes: to take advantage of experts with a scientific or professional curriculum; to meet specific teaching needs; or to promote internationalization. Sometimes, these positions are covered by young researchers after or during their PhD. Overall, in state universities in 2017-2018, *every 100 people involved in teaching activities, 39 are external collaborators and only 61 are ‘structured’ professors or researchers* (MIUR 2019). The teaching load of these external collaborators is presumably lower than average teaching load of professors and researchers, however it is indicative of a trend aimed at containing ‘structured’ teaching staff.

Instead of increasing resources for new ‘structured’ positions, in 2005 the ‘Moratti reform’ introduced the possibility to open temporary positions as ‘research collaborations’ (*collaborazioni di ricerca*), in addition to post doc positions (*assegni di ricerca*) already established in 1997. These are self-employed contractors, without any guarantee or labor protection, supplying teaching and/or research activities (coordinated by the faculty/department). Nowadays, PhDs and young scholars often accept to be recruited as research collaborators.

Finally, PhDs may participate in a local competition for a ‘research scholarship’ (not considered ‘work’ but ‘education’). These young researchers with scholarships do some research activities, but without any labour rights (i.e. pension contributions, maternity leave, unemployment benefits). Some universities recruit young PhD holders in this position, instead of postdoctoral contracts, due to the lower total costs (as income taxation and social contributions do not apply). This is the last frontier of flexibilization.

7.4 Consequences of the flexibilization of the early stages of the academic careers

The imbalance between permanent and non-permanent positions in academia is the result of: a) the legislative innovations in the recruitment process, enhancing flexibility in the early stages of academic career; b) the budget cuts imposed to the university system.

From a long-term perspective, the reforms implemented over the last 15 years resulted in the marginalisation of young researchers. In the decade 2004-2013, only 6.7% of those who held a temporary research position at the university achieved a permanent position (Toscano et al. 2014).

At present, a high share of ‘assegnisti’ is still bound to leave academia. In fact, the average of the last 4 years shows that there are about 860 RTD-b per year and about 13,600 ‘assegnisti’ per year.

It follows that only the 6.3% of 'assegnisti will continue their academic career (ADI 2020). This suggests that there is a serious issue concerning the dispersion of highly qualified competences and professional skills developed inside the academic system. The high insecurity in the first stages of academic career tends to affect negatively young researchers' ability to plan their present and future work: 84.3% of the respondents think that their insecure work position negatively affects their work performance and 50% are unable to imagine their professional future in 10 years time.

According to ADI estimates on Cineca data (ADI 2019a), precarious academic staff in universities exceeds permanent academic staff (68,428 vs 47,561 people) in 2018, with significant gender differences. The share of women decreases along the hierarchical structure: 50.3% among post-docs, 41.1% among fixed-term researchers (RTDb), 37.5% among associate professors, only 23.1% among full professors. According to ADI survey (ADI 2019b), 56.2% of PhDs expect to leave academia at the end of their temporary contracts (but 29% among those with a RTDa contract).

According to MIUR data, about 52% of all fixed-term researchers (RTDb, RTDa, post-docs) is over 38 years old (in 2017/18). For a large share of these researchers, the probability of career advancement (entering a permanent position) is very low. Some will stay in Academia taking up marginal academic activities (research and/or teaching), but in dead-end precarious positions. Others will look for work outside academia (e.g. public administration, teaching at school, in the private sector)¹⁸. Others will move abroad in order to develop their academic career.

Precariousness in academia and its effects on career advancement and personal life are key issues from a gender perspective. Various studies analysed them and are still high on the agenda today, especially in Italy¹⁹.

7.5 Highly skilled migration and the brain drain

In recent years, growing attention has been devoted to the phenomenon of brain drain, i.e. the emigration of people with tertiary education for better pay or conditions. The lack of research policies and funding in Italy made the country less able than others to attract and retain talents (OECD 2017a, *Education Policy Outlook*: 4). This situation did worsen over time (in a context of a long economic crisis, fiscal consolidation, severe budget cuts and almost no economic growth).

Inability to attract foreign talent. Italy's problem lied in its limited capacity to attract skilled human capital, rather than in the fact that a percentage of our graduates moved abroad. Over the last six years, there has been an increase in the share of young graduates moving to EU countries with better employment opportunities (especially Germany and the UK); this tends to reinforce the hypothesis that Italy lacks the capacity to attract and retain talent.

Italian talent mobility. Studies on the destination countries of the Italian highly skilled workers (in particular, those employed in STEM fields) suggest that there is a high proportion of scientists, engineers and researchers among highly skilled emigrants. A major problem is the negative net flows between incoming and outgoing talent, exacerbated by the high qualification levels of those leaving the country compared to those arriving (Constant, D'Agosto 2010; Monteleone, Torrisi

¹⁸ Unfortunately, the PhD degree is not valued outside academia, in Italy. See ADI (2019c).

¹⁹ Among them Toscano et al. 2014; Murgia, Poggio 2015; Bellè et al. 2017; Bozzon et al. 2017; Bozzon, Murgia, Villa 2017a; Murgia, Poggio 2018; Herschberg, Benschop, Van den Brink 2018; Steinþórsdóttir et al. 2019.

2012). Lack of funding and sponsorship, lower salary levels (compared to many foreign countries), the non-meritocratic criteria in the allocation of funds, and the lack of adequate infrastructure and equipment are considered the main causes of scientific migration.

A recent article on the Italian brain drain published by the *Financial Times*²⁰ states that nearly 10% of Italian nationals live overseas, and emigration rates are rising. Even worse, most of the leavers in recent years are educated professionals in the prime of their working life. In 2017, one-third of the Italian citizens who moved abroad had university degrees (up 41.8% since 2013). For many migrants, the decision to leave is about the growing conviction that Italy it is not a place where the well-educated and ambitious can build a successful life. This is synthesised in an effective way by the words of Chiara (associate professor in Italy):

“The most talented young students are all fleeing academic careers. They know the career path is incredibly long. There is no money for research funding or doctorates. Even if you’re brilliant and get national accreditation to teach in a university, it’s rare that a tenure job will open.”

Gender mobility strategies and the effects of precariousness on scientific migration have been studied in different countries, and are now the subject of numerous studies (Nikunen, Lempiäinen 2018; Bataille, Le Feuvre, Kradolfer Morales 2017; Cohen et al. 2019).

7.6 Current challenges and debates on gender and career advancement in Italy

As argued above, Italy lacks a university policy able to attract, retain and promote talent, and to reconfigure the academic structure in a more gender balanced way. High levels of insecurity and precariousness negatively affect the early stages of academic career, but also young researchers’ ability to manage and plan work and private life. Moreover, little has been done to promote equal opportunities in Italian universities. Since the 1980s, groups of researchers (mainly women) promoted a variety of initiatives for the enhancement of equal opportunities in academia, with mixed results. Initiatives were taken first in STEM, then in few other fields. Economics is a recent example that deserves attention. Box 7.1 summarizes the initiatives undertaken by SIE (Italian Society of Economics) for the promotion of equal opportunities in academia.

Box 7.1 The initiatives undertaken in recent years by SIE (Società Italiana di Economia) for the promotion of equal opportunities in academia

SIE is active in the promotion of gender equality in academia by producing reports, collecting data, and making proposals to other institutions. Here are listed initiatives of the SIE’s gender committee (1)-(4) or initiatives taken by other institutions to which SIE contributes (5)-(6).

1. SIE, Commissione di genere (2019). *La dimensione di genere della governance universitaria* (edited by Alessandra Casarico et al.)

The report shows a clear gender inequality in the Italian universities.

2. SIE, Commissione di genere (2014, 2016). *Rapporti 2014 e 2016* (edited by di Marcella Corsi)

Link: https://siecon3-607788.ccdn77.org/sites/siecon.org/files/media_wysiwyg/ii-rapporto-commissione-genere-sie2.pdf

These reports - based on surveys about the career obstacles of SIE members - show that in a gender perspective: “There is no significant differences in the training phase. Gender differences become more evident in the initial stages of the career and in the difficulties in career progression, for which the access to the top positions is gender biased. The glass-ceiling effect is noticeable in the lower involvement of

²⁰ «Italy counts the cost of its brain drain”, by Renée Kaplan, *Financial Times*, 7 November 2019.

women in managerial and evaluative roles of Italian universities. Furthermore, family commitments weight on the career profile for almost 60% of women, with less time spent on research than their peers”.

3. SIE, Commissione di genere. Initiatives on data and quantitative analysis

a) *La professione dell'economista: uno sguardo di genere* (edited by Giulia Zacchia)

Link: <https://www.siecon.org/it/chi-siamo/organizzazione/commissioni/commissione-di-genere/dati>

Data on gender differences of Italian academic economists in Italy, in line with consolidated foreign experiences (e.g. Annual reports of the CSWEP in the USA and biennial of the RES Women’s Committee in the UK) and in continuity with the monitoring activity of SIE members carried out by the previous Gender Commission of the SIE (2014 and 2016 Reports “SIE Members: A gender view”). The data comes from various databases (ANVUR, CINECA, MIUR, REPRISE) and are organized by: Education, Career profiles and Allocation of research funds in a gender perspective. The final focus is on SIE’s members.

b) *Il Fondo per le Attività Base di Ricerca 2017. Partecipazione al bando ed esiti della valutazione per sesso* (edited by Francesca Bettio e Fernanda Mazzotta)

The allocation of research funds is examined in a gender perspective.

Link: https://siecon3-607788.c.cdn77.org/sites/siecon.org/files/media_wysiwyg/fabbr_valutazione_di_genere_2.pdf

4. SIE, Commissione di genere, Linee guida per la parità di genere in eventi scientifici

SIE promotes gender equality in conferences, seminars and scientific events, by suggesting the guidelines and the rules in order to ensure adequate representation of both sexes in scientific events, conferences, workshops, scientific and organizing committees.

Link: <https://www.siecon.org/it/chi-siamo/51app-guida-la-parita-di-genere-eventi-scientifici>

5. MIUR: Indicazioni per azioni positive del MIUR sui temi di genere nell’università e nella ricerca, 18 maggio 2018

The work of this group indicates guidelines and good practices for research fundings and university governance in a gender perspective.

Link: https://siecon3-607788.c.cdn77.org/sites/siecon.org/files/media_wysiwyg/indicazioni_per_azioni_positive_del_miur_sui_temi_di_genere_nell_universita_e_nella_ricerca_0.pdf

6. Conferenza dei rettori delle università italiane (CRUI): Gender Budgeting

On the basis of European Parliament Resolution (2003) *Gender budgeting – Building public budgets from a gender perspective*; and (2011) *Gender mainstreaming in the work of the European Parliament* as well the I of Horizon 2030, a group within the CRUI suggested the guidelines for gender budgeting by Italian Universities, looking at the harmonization and comparison of the ongoing practices.

Link: <https://www.cruai.it/bilancio-di-genere.html>;
https://www2.cruai.it/cruai/Linee_Guida_Bilancio_di_Genere_negli_Atenei_italiani.pdf

Surprisingly, other research fields in SSH (e.g. Sociology and Political Science) have no initiatives on gender issues. Finally, it should be mentioned that projects aiming to enhance the role of women in science and fight discrimination have been promoted by central government institution for equal opportunities or universities, mainly under EU funds (7FP and Horizon 2020). But these projects are few and isolated, not being part of a national strategy to promote women in science.

Another point to note is the very limited and fragmented diffusion of gender studies in tertiary education. Entire degree programs, crucial for the formation of the Italian ruling classes, do not provide courses that include a gender approach.

The debate on gender and career advancement shed some light on the gender effects of evaluation procedures, in particular how bibliometric criteria and productivity measures may negatively affect women’s probability of success. To add, the measures introduced to evaluate scientific research

and teaching activity in order to rationalize the central system of (decreasing) public funding for universities are currently under discussion within the academic community. To note, Italy is a country with no experience in evaluation, and this lack of experience is mirrored in the current difficulties to introduce and implement an effective system of university evaluation.

8. CONCLUDING REMARKS

Notwithstanding the advances of recent decades, in Italy the employment rate of women is still considerably lower than that of men. Italy lags behind in women's access to the labour market, remuneration, career advancement, promotion to positions of leadership and new business initiatives. Investing in education can be interpreted as a strategy pursued by women in order to reduce the disadvantages suffered in the labour market. The education gap had been closed, and nowadays young women have a better educational attainment level than men. Less marked, but still noticeable, is the concentration of women graduates in traditionally female field of education (e.g. education and humanities), in general SSH, while the STEM fields (e.g. engineering, computer science) remain male-dominated field of study. However, significant changes occurred over the last decade in the distribution of men and women by field of study in tertiary education. Available data reveal a shifting picture that deserves further attention by policy makers as well as researchers for a better understanding of educational choices, and existing differences by gender.

Gender gaps in the labour market are still large. Female employment rates remain low, especially in Southern Italy and in general for women with low education. Young women are more likely than young men to be unemployed, and to be employed in less stable forms of employment and in the lowest-paid sectors (horizontal segregation). But the disadvantages suffered by women in terms of economic independence – i.e. access to paid work – are lower, the higher is their educational attainment. This suggests the hypothesis that in Italy young women are encouraged to invest in tertiary education, including doctoral degrees, in order to move towards gender equality (though economic independence), overcoming the difficulties faced in the labour market. This interpretation seems to be supported by the very high shares of women with a doctoral degree in Southern Italy (around 55%), in comparison with Northern Italy (around 47%). In other words, some of these women are 'over-qualified': their very high educational attainment (PhD degree) is not required for their jobs, but it is used as a strategy to overcome gender biases in the labour market.

Lack of services for children (and for the elderly) combined with rigid work arrangements make it hard to reconcile work and family life. Female employment rates are lower than male rates; career progress is difficult; and young women are over-represented in atypical and precarious jobs. The increasing precarisation of young people has specific negative repercussions for young women, given the limited or no protection in case of maternity. In the case of young women highly educated, this may result in the postponement of the decision to have children (or to have no children or a number lower than that desired), and/or in poor career advancement. It is a well-known fact that an adequate policy mix is required in order to support women in reconciling work and family, effectively promoting female employment. This should include access to standard jobs (good quality, open-ended positions), affordable childcare, neutral tax and benefit systems, flexible working time arrangements and the provision of paid leave for both parents. This applies to all women with family responsibilities, therefore to women in Academia, but taking into account the specificities related to teaching and research activities in university.

Women's position in Italian society has been deeply affected by socio-cultural changes and EU requirements since the beginning of the 1970s. However, transformations in the structures of the society have not been always consistent with it. Political parties were slow to respond to the requests of civil society movements including women's movement. The persistence and the dominance of a conservative and traditional political discourse has meant the difficulties to

promote norms, legislation and measures aimed to promote women's roles other than the 'caring role' and their presence in all the fields of society. The problem of efficient institutional mechanisms for promoting, enacting and monitoring legislation on gender equality has never been satisfactorily solved at the national level of central government, as witnessed by the variety of solutions adopted over the years. The Department for Equal Opportunities, established in 1997, has been headed by various Ministers, whose action has always been impaired by lack of resources, short terms of office, and sometimes even lack of experience in gender issues. The importance of gender inequality vs other grounds of discriminations has been interpreted by each minister very differently, according to political parties' membership, culture and openness to civil society. In 2019 a Ministry for Equal Opportunities and the Family is once again present in the government; we will see if this will allow a change of course for the future.

Academic careers have undergone profound changes over the last two decades, affecting the position of women by introducing radical changes in access and promotion rules. The changing institutional framework has stimulated a lively debate on gender and career advancement in Italian universities. Since these processes have gone hand in hand with the drastic reduction in the financial resources for tertiary education and research, the consequences at the individual and structural level are ambivalent.

On the one hand, the current situation of the Italian university system is quite alarming: i) over one third of the university research staff has a non-permanent position; these positions are all concentrated among the new generation of researchers; ii) the severe budget cuts of the university system produced a serious contraction of permanent teaching staff which negatively affects the current efficiency of the university both in teaching and research activities.

On the other hand, the new rules for academic career access and advancement affect only marginally gender asymmetries: i) they do not seem to reduce the female disadvantage in promotions (at least in the short run); ii) these new rules, by creating different levels of competition (national and local) and the use of cut-off indicators, have ambivalent effects, not easy to disentangle. They not only change the level at which discrimination takes place, but also affect individual strategies. This suggests that a strategic use of some quantitative indicators (e.g. self-citations) could undermine the presence of women in the scientific arena.

To conclude, the review of the literature (briefly presented in this report) on gender differences in academic careers, shows that Italian Academia is far from being a land of equal opportunities despite the institutional changes introduced (since 2010) with the goal to make Italian Academia a level playing field.

ABBREVIATIONS AND ACRONYMS

(and translations)

ADI	Associazione Dottorandi e Dottori di Ricerca Italiani (Association of Doctoral Students and Doctoral holders, Italy)
ANVUR	Agenzia Nazionale di Valutazione del sistema Universitario e della Ricerca (Agency for the Evaluation of the University and Research)
art.	Article
ASN	Abilitazione Scientifica Nazionale (National Scientific Qualification, NSQ)
CPO	Comitato Pari Opportunità (Equal Opportunity Committee)
CRUI	Conferenza dei Rettori delle Università Italiane (Conference of Rectors of Italian Universities)
CUG	Comitato Unico di Garanzia
CUN	Consiglio Universitario Nazionale (National University Council)
D.Lgs.	Decreto legislativo (Legislative decree)
DEO	Department of Equal Opportunities
D.M.	Decreto Ministeriale (Ministerial Decree)
D.P.R.	Decreto del Presidente della Repubblica (Presidential Decree)
EC	European Commission
EP	European Parliament
EU	European Union
FFO	Fondo diFinanziamento Ordinario (Ordinary Financing Fund)
FP7	Seventh Framework Programme
GB	Gender Budgeting
GCI	Glass Ceiling Index
GEP	Gender Equality Plan
ISCED	International Standard Classification of Education
L.	Legge (Law)
LFS	Labour Force Survey
MIUR	Ministero dell'Istruzione, dell'Università e della Ricerca (Ministry of Education, University and Research)
NSQ	National Scientific Qualification (Abililazione Scientifica Nazionale, ASN)
p.p.	percentage points
RTDa	Researcher (fixed-term) type A (three-year duration)
RTDb	Researcher (fixed-term) type B (tenured track position)
Post-doc	Assegnista di ricerca
SIE	Società Italiana di Economia (Italian Society of Economics)
SSH	Social Sciences and Humanities
STEM	Science, Technology, Engineering and Mathematics
UN	United Nations
VQR	Valutazione della Qualità della Ricerca (Research Quality Evaluation)
WEF	World Economic Forum

APPENDIX

BOXES

Box A.1: Fields of education (academic disciplines) at the international and national level

An academic discipline (or field of study) is a branch of knowledge. A scholar's discipline is commonly defined and recognized by a university faculty. That person will be accredited by learned societies to which he/she belongs along with the academic journals in which he/she publishes. However, no formal criteria exist for defining an academic discipline. There is no consensus on how some academic disciplines should be classified (e.g., whether anthropology and linguistics are disciplines of social sciences or fields within the humanities). More generally, the proper criteria for organizing knowledge into disciplines are also open to debate.

EUROSTAT database: tertiary education students/graduates by broad field (and sex) in EU 28 countries. Online code: educ_uae_enrt03. Data for Italy is available, but with a very high share on 'unknown' (over 1/3). The grouping of fields is very broad (10 fields).

OECD database (OECD.Stat): tertiary education students/graduates by field of education (and sex) in OECD countries. Italy is included in the database. However, information in OECD database is not updated (available only up to 2012).

OECD Education at a Glance (EAG 2019): tertiary education students/graduates by broad field of education (also by sex) in OECD countries. Italy is included in the EAG database. These are the seven broad fields of study: 1. Arts and humanities; 2. Social sciences, journalism and information; 3. Business, administration and law; 4. Natural sciences, mathematics and statistics; 5. Information and communication technologies; 6. Engineering, manufacturing and construction; 7. Health and welfare.

ISTAT database (I.Stat): tertiary education students/graduates by disciplinary field (and sex). Istat identifies 16 disciplinary fields (so called 'gruppi ISTAT'). However, the relationship with the classification used in Italian universities (i.e. the 14 CUN areas) is not made clear. See Box A.2 for the classification of disciplinary fields by Istat (16 groups) and by CUN (14 areas).

Box A.2: The classification of disciplinari fields in Italy: Istat groups and CUN areas (and translation in English)

<i>Istat groups</i> (Italian)	<i>Istat groups</i> (English)
1. Scientifico 2. Chimico-farmaceutico 3. Geo-biologico 4. Medico 5. Ingegneria 6. Architettura 7. Agrario 8. Economico-statistico 9. Politico-sociale 10. Giuridico 11. Letterario 12. Linguistico 13. Insegnamento 14. Psicologico 15. Educazione fisica 16. Difesa e sicurezza	1. Scientific 2. Chemical-pharmaceutical 3. Geo-biological 4. Medical 5. Engineering 6. Architecture 7. Agrarian 8. Economic-statistical 9. Political-social 10. Law 11. Literature 12. Linguistic 13. Teaching 14. Psychological 15. Physical education 16. Defense and security
<i>CUN areas</i> (Italian)	<i>CUN areas</i> (English)
1. Scienze matematiche e informatiche 2. Scienze fisiche 3. Scienze chimiche 4. Scienze della terra 5. Scienze biologiche 6. Scienze mediche 7. Scienze agrarie e veterinarie 8.a Architettura 8.b Ingegneria civile 9. Ingegneria industriale e dell'informazione 10. Scienze dell'antichità, filologico-letterarie, storico-artistiche 11.a Scienze storiche, filosofiche e pedagogiche 11.b Scienze psicologiche 12. Scienze giuridiche 13. Scienze economiche e statistiche 14. Scienze politiche e sociali	1. Mathematical and computer sciences 2. Physical sciences 3. Chemical sciences 4. Earth sciences 5. Biological sciences 6. Medical sciences 7. Agricultural and veterinary sciences 8.a Architecture 8.b Civil engineering 9. Industrial and information engineering 10. Ancient, philological-literary, historical-artistic sciences 11.a Historical, philosophical and pedagogical sciences 11.b Psychological sciences 12. Legal Sciences 13. Economic and statistical sciences 14. Political and social sciences

Box A.3: Main legislative acts to promote women's rights and gender equality – Italy

<i>SOURCE</i>	<i>MAIN DISPOSITION</i>
Constitution (1948): Art. 3 Art. 37 Art. 51	Formal equality between men and women Pay equality between men and women Equal access to public office
Law 868/1950	Physical and economic protection of working mothers
Law 898/1970	Divorce law
Law 1204/1971	Protection of working mothers
Law 1044/1971	Childcare facilities under local government
Law 151/1975	Family law reform
Law 903/1977	Equality of treatment between men and women on the workplace
Law 194/1978	Abortion Law
Law 125/1991	Positive action for achieving parity between men and women at work
Law 215/1992	Positive action for female entrepreneurship
Law 66/1996	Measures against sexual violence
Law 53/2000	Measures to promote reconciliation of work- family life
Reform of art. 51 of the Constitution	Legal Recognition of electoral gender quota
Law 154/2001	Measures against intimate violence
Legislative Decree 198/2006	National code of equal opportunities between women and men
Legislative Decree 196/2007	Equal treatment between men and women in access to and supply of goods and services (Implementation of EEC Directive 2004/133/CE)
Law Decree 11/2009	Measures against gender violence and stalking.
Law 120/2011	Law on mandatory quotas on Boards (For public and private board composition, no more than 2/3 members of the same sex on the board)
Law 215/2012	Law on mandatory quotas on local elections (For local elections, no more than 2/3 candidates of the same sex on the lists; gender preferences)
Law Decree 93/2013	It includes measures against gender violence (converted in Law 119/2013)
Law 65/2014	Law on mandatory quotas for the European Parliament elections (candidates of both sexes on the lists; gender preferences)
EU Istanbul Convention 2014	Council of Europe Convention on preventing and combating violence against women and domestic violence (implemented in 2014)
Legislative Decree 80/2015	It provides for up to three months' leave for women victims of violence
Law 205/2017 (Budget law for 2018)	It foresees prevention obligations for employers regarding sexual harassment and harassment

Source: Economist Intelligence Unit (2011) <http://www.globaltalentindex.com/>

Box A.4: University laws and reforms - Italy

SOURCE	MAIN DISPOSITION	COMMENT
'Berlinguer Reform': L. 425/1997; D.M. 509/1999; L. Quadro 30/2000.	- Research contracts (<i>assegni di ricerca</i>) are established (1997). - The National Evaluation Committee for funding is established. - University teaching cycles are reorganized: first level degrees (3 year courses); second level degrees (2 year courses); course credits are introduced.	The process of quantifying merit and competition of individual universities for public funding begins. The evaluation of excellence allows access to public resources. The key principles of the process are autonomy of the universities, competition between universities for funding, quantification of the merit.
D. Lgs. 204/1998; D. Lgs. 381/1999; L. 370/1999; D.M. 178/2000.	The Steering Committee for Research Evaluation (CIVR), and the National Committee for the Evaluation of the University System (CNVSU) are established.	CIVR and CNVSU are predecessor committees of ANVUR. The process of institutionalization and systematization of the evaluation of teaching and research activity is increasingly affirmed, in order to increase competition between Italian universities.
'Moratti Reform': L. 53/2003; D.M. 270/2004.	- The Degree Classes are rearranged, the Master's Degree is established, which is equivalent to the old four-years Degree. - The autonomy of individual universities is strengthened. - The Evaluation System is strengthened.	The Moratti Reform continues with the setting of the previous Berlinguer Reform, strengthening autonomy and competition based on a central evaluation. It should also be noted that the evaluation process is still to be implemented: implementation will only take place in 2010 with the Gelmini Reform. The Reform eliminated the two full-time entry positions, "assistant professor" and "researcher" which were replaced by two new types of "fixed-term researcher", one more dedicated to research and one to teaching. Furthermore, the Reform has extended the possibility of using precarious contracts in universities. In fact, in addition to extending the use of post doc contracts (<i>assegni di ricerca</i>), it has established collaboration contracts (<i>collaborazioni di ricerca</i>).
L. 286/2006	The National Agency for University and Research Evaluation (ANVUR) is established	CIVR and CNVSU (see above) are abolished; a new body (ANVUR) is established. It should also be noted, once again, that the regulation for the implementation of the Agency's activities was enacted with a delay, only in 2010 with the Gelmini Reform.
D.M. 565/2007	Extraordinary plan for the recruitment of researchers in Italian universities	This Plan allocated 20 million Euros to universities for competition calls for new researcher positions. The distribution of funds among the universities, which must provide for the co-financing of places, took place considering these criteria: 20% on the CIVR surveys of the scientific research activity; 80% based on the total number of PhD students, postdoctoral researchers and researchers (RTI + RTD) in 2004-2007.
'Gelmini Reform':	- Career phases are established and rules for career changes and new	The Reform systematized the steps of the academic career as we know them today establishing two new types of fixed-term research contracts:

L. 240/2010	<p>positions are introduced (RTDa and RTDb).</p> <ul style="list-style-type: none"> - The National Scientific Qualification (NSQ) is established. - The process for VQR (Regulation and implementation) is implemented and implemented. 	<ul style="list-style-type: none"> - RTD - Type A three-year contracts, extendable for two years, for one time only, after a positive evaluation of the teaching and research activities carried out. It is still a temporary position. - RTD - Type B three-year contracts reserved for candidates who have benefited from type A contracts, or who have obtained national scientific qualification (NSQ), or who, for at least three years, even if not consecutive, have benefited from research grants or similar in foreign universities. Subject to qualification, there is a transition to Associate Professor for them. The Gelmini Reform establishes for the NSQ, National Scientific Qualification for the first level (Full Professors) and the second level (Associate Professors) of the professorship, a two-phase procedure: national and local. There are national commissions by sector, to assess the suitability (from 4 to 6 to 9 years) plus a local competition by disciplinary scientific sector. <p>The national commissions for the NSQ are composed of five members: four extracted from those professors with minimum scientific requirements for the disciplinary field (thresholds, bibliometric indicators) and an external professor (selected on the basis of international reputation).</p> <p>The Reform continues the quantification and evaluation process and has opened the door to the problematic relationship between merit and bibliometric indicators for scientific productivity.</p>
D.M. 17/2011	First cycle of VQR (2004-2010)	After the first evaluation cycle (2011-2014), a second evaluation cycle took off in June 2015 (D.M. 458/2015). The results of this second cycle were published in February 2017. The third VQR cycle (2015-2019) took off in November 2019 (D.M. 1110/2019).
Budget Law for 2017 (L. 232/2016)	<ul style="list-style-type: none"> - 'Departments of Excellence' programme. - The five-year frequency of the VQR is established. 	The "Departments of Excellence" programme, supported by extraordinary financial resources, had to identify and finance 180 Departments (in the 14 CUN areas), with an annual budget of 271 million euros, over a period of 5 years. It has temporarily helped some departments in a context of scarce resources, still rewarding the merit of some Departments instead of planning funding for all public universities.
'Jobs Act': L. 81/2017; Legislative decree 22/2015)	Extension of unemployment benefits (the Dis-Coll) to PhD students with scholarships, research collaborators and research fellows ("assegnisti/e").	<p>First form of unemployment insurance for young researches with a post-doc position ("assegnista").</p> <p>It is an unemployment benefit with a maximum of 6 months, from 80% of the net salary received and then up to 20%, set up first for collaborators in the private sector and then also extended to PhD students with scholarships and fellows.</p> <p>Previously, enrollment in the INPS Separate Management (with a minimum payment of contributions) was already foreseen for these researchers ("assegnisti/e"), but no unemployment allowance was foreseen. The protections already present before 2017 were compulsory and optional maternity, parental leave, accident insurance.</p>

TABLES AND FIGURES

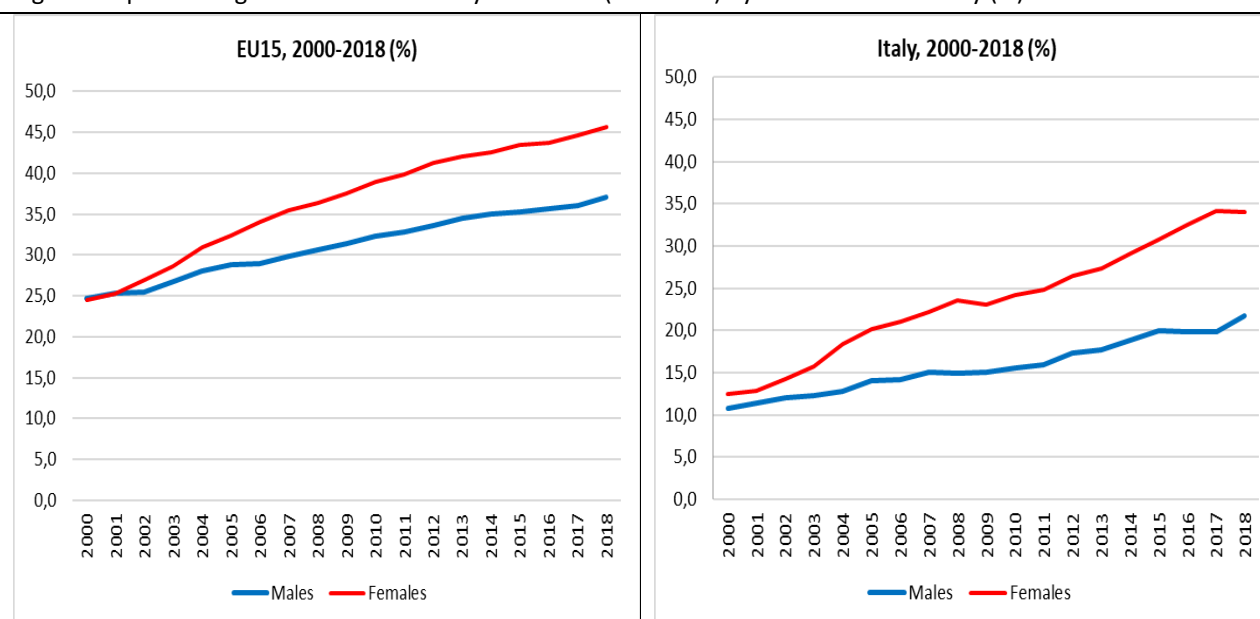
Tab. A.1 – First-time tertiary entrants by type of curriculum, 2002/03-2017/18 (absolute numbers)

A.A.	Corsi di Laurea triennale	Corsi di Laurea a Ciclo Unico	CdL Vecchio ordinamento non riformati*	Totale
2002/2003	304.695	20.895	3.786	329.376
2003/2004	308.588	19.192	4.828	332.608
2004/2005	307.544	19.949	5.049	332.542
2005/2006	296.674	17.547	4.235	318.456
2006/2007	255.547	47.144	3.092	305.783
2007/2008	253.499	47.914	3.252	304.665
2008/2009	243.668	45.244	3.073	291.985
2009/2010	244.632	48.617	2.299	295.548
2010/2011	239.120	46.790	2.133	288.043
2011/2012	233.734	45.452		279.186
2012/2013	227.828	41.344		269.172
2013/2014	229.537	39.248		268.785
2014/2015	230.197	40.531		270.728
2015/2016	240.862	35.301		276.163
2016/2017	254.579	35.673		290.252
2017/2018	256.834	34.023		290.857

* immatricolati nei corsi v.o. in Giurisprudenza (fino all'a.a. 2005/06) e in Scienze della formazione primaria (fino all'a.a. 2010/2011)
(Fonte: elaborazione su dati Anagrafe Nazionale Studenti)

Source: ANVUR (2019), Tab. I.1.1.2 (p. 29).

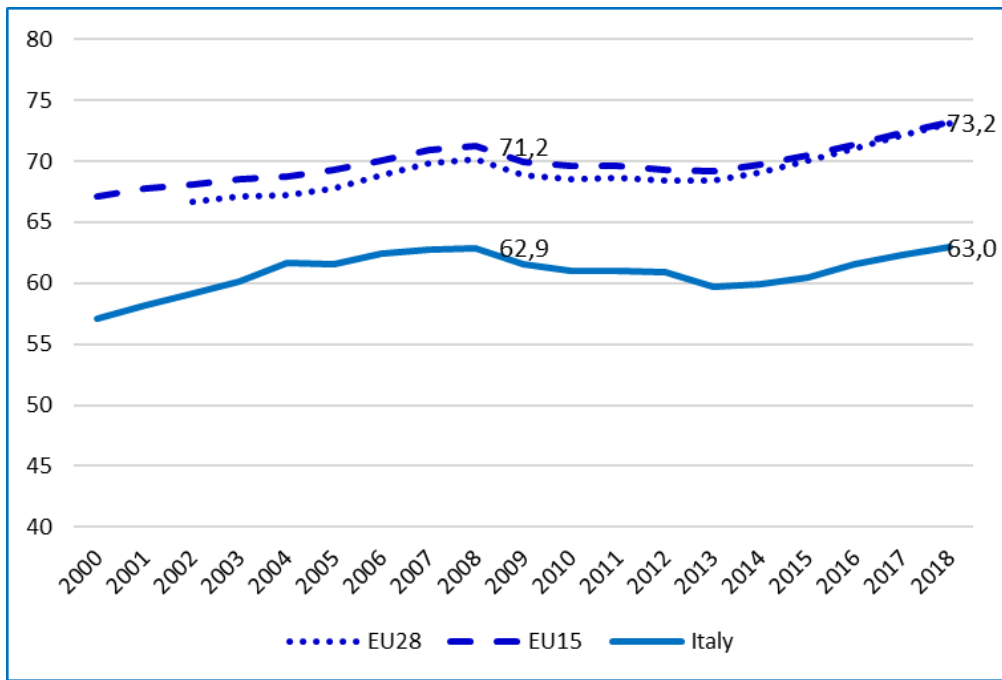
Fig. A.1 Population aged 30-34 with tertiary education (levels 5-8) by sex in EU15 and Italy (%)



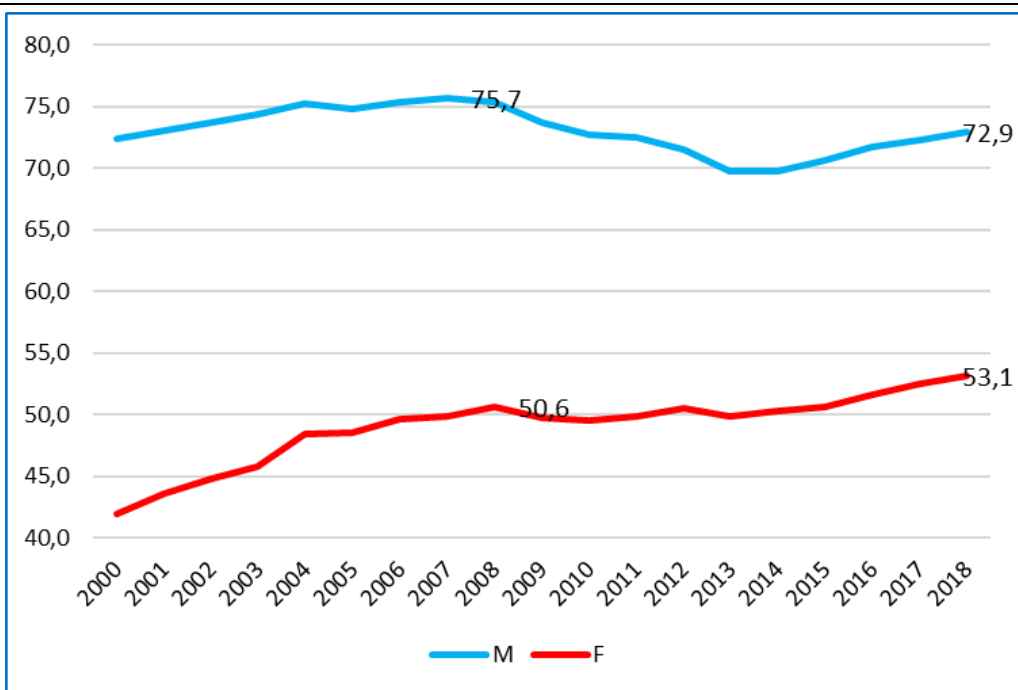
Source: Eurostat database, variable code: edat_lfse_12

Fig. A.2 Employment rates, 2000-2018, % (population aged 20-64)

a) Total population (MF) in Italy, EU15 and EU28.

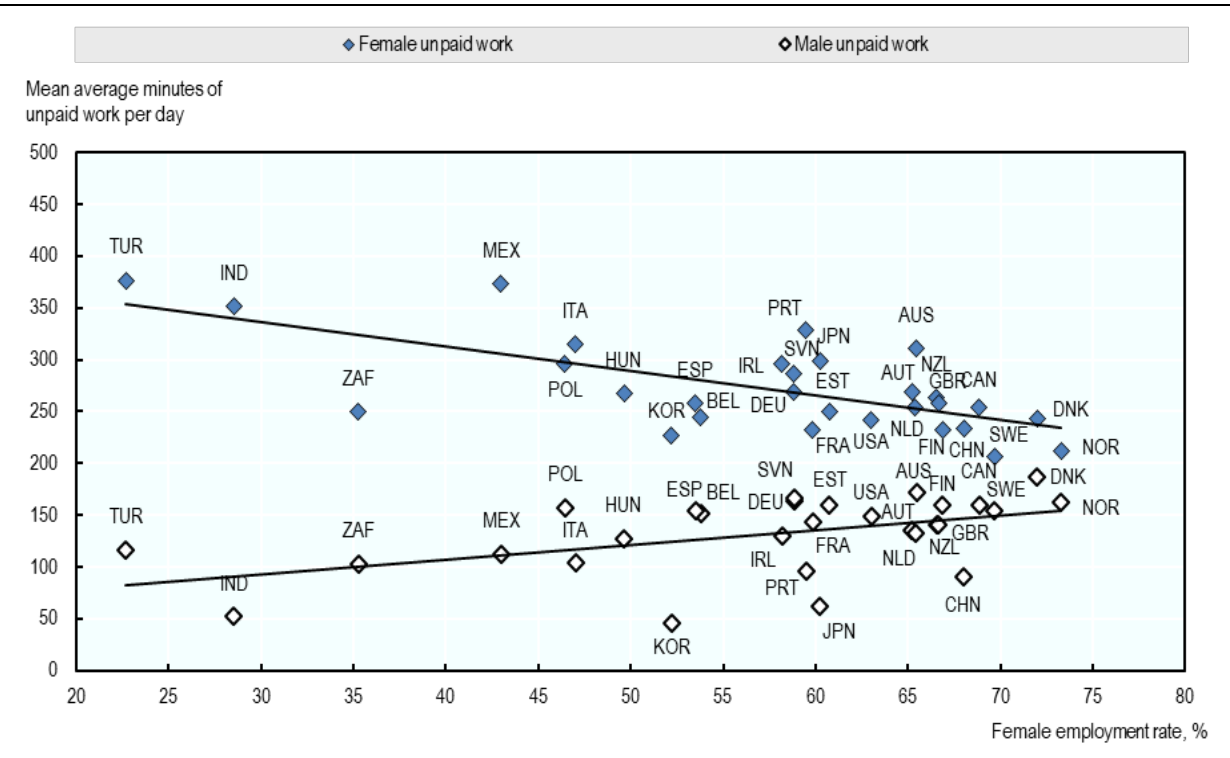


b) Men and women in Italy



Source: Eurostat database, variable code: lfsa_ergan.

Figure A.3 - Gender balance in unpaid work correlates with greater female employment rate in OECD countries*



Source: OECD (2017), Secretariat estimates based on national time-use surveys and Labour Force Surveys for employment rates.

BIBLIOGRAPHY

A. Gender equality in education, employment, family-formation and work-life balance

- AAVV (2017) Shadow Report – Cedaw alternative Report – Italy art. 2 and art. 5. With reference to the Seventh periodic report of Italy on the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW). Available at: https://tbinternet.ohchr.org/Treaties/CEDAW/Shared%20Documents/ITA/INT_CEDAW_NGO_ITA_27687_E.pdf
- AlmaLaurea (various years). Condizione occupazionale dei Laureati. Available at: www.alma laurea.it
- ANVUR (2019). *Rapporto Biennale sullo Stato del Sistema Universitario e della Ricerca 2018*. PARTE I: La formazione terziaria. https://www.anvur.it/download/rapporto-2018/ANVUR_Rapporto_Biennale_2018_Sezione_1.pdf
- Banca d'Italia (2012). *Annual Report for 2011*. Abridged Version, Banca d'Italia, Roma.
- Banca d'Italia (2014). *Annual Report for 2013*. Abridged Version, Banca d'Italia, Roma.
- Bettio, Francesca, and Alina Verashchagina (2009). Gender segregation in the labour market. Root causes, implications and policy responses in the EU (EC's Expert Group on Gender and Employment, EGGE). Available at: <http://www.voced.edu.au/content/ngv44251>
- Bettio, Francesca, and Paola Villa (1998). "A Mediterranean Perspective on the Break-down of the Relationship between Participation and Fertility", *Cambridge Journal of Economics*, 22: 137-171.
- Consob (2018). "Gender diversity e performance delle società quotate in Italia". Available at: <http://www.consob.it/documents/46180/46181/qdf87.pdf/8954940f-223c-422f-b0fc-bc8c9b6b806a>
- Del Boca Daniela, Christopher Flinn, Daniela Piazzalunga, Chiara Pronzato, Giuseppe Sorrenti & Matthew Wiswal (2016). "Child Care Policies in Different Countries", Report Fondazione Rodolfo Benedetti. Available at http://www.frdb.org/be/file/_scheda/files/DeBocaETal_full_reportCOVER.pdf
- Donà, Alessia (2015), "La nuove norme contro la violenza di genere in Italia: possono le pressioni internazionali superare i vincoli dell'eredità di policy?", *Rivista Italiana di Politiche Pubbliche*, n. 1: 115-142.
- Donà, Alessia (2018). "Eppur si muove. The tortuous adoption and implementation of gender quota in conservative Italy, in R. Rubio Marin and E. Lepinard (eds.). *Transforming gender equality: The irresistible rise of gender quotas in Europe*, Cambridge University Press.
- Donà, Alessia (2019). "The populist Lega from ethno-regionalism to radical right-wing nationalism: backsliding gender equality policies with the help from the anti-gender movement", *European Journal of Politics and Gender*, 3(1), 161-163.
- EC (European Commission) (2014). *Report on Progress on equality between women and men in 2013*, Commission Staff Working Document, SWD (2014) 142 final, Brussels, 14 April 2014.
- EC (European Commission) (2018). *Paternity and parental leave policies across the European Union*. Luxembourg: Publications Office of the European Union
- EC (European Commission) (2019). *2019 Report on equality between women and men in the EU*. Luxembourg: Publications Office of the European Union
- EP (European Parliament) (2014). The Policy on Gender Equality in Italy. In-depth Analysis for the FEEM Committee, PE 493.052. Available at: <http://www.europarl.europa.eu/RegData/etudes/note/join/2014/493052/IPOL-FEMM>
- EP (European Parliament) (2018). "Backlash in Gender Equality and Women's and Girls' Rights, study request by FEMM committee". Available at [https://www.europarl.europa.eu/RegData/etudes/STUD/2018/604955/IPOL_STU\(2018\)604955_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2018/604955/IPOL_STU(2018)604955_EN.pdf)
- ESDE (2013). "The gender impact of the crisis and the gap in total hours worked", Chapter 3 in: *Employment and Social Development in Europe* (ESDE). Available at: <http://ec.europa.eu/social/main.jsp?catId=738&langId=en&pubId=7684>
- Eurostat (2019a). "Tertiary education statistics". *Statistics explained*

- Eurostat (2019b). «Living conditions in Europe – childcare arrangements», *Statistics explained*. https://ec.europa.eu/eurostat/statistics-explained/index.php/Living_conditions_in_Europe_-_childcare_arrangements
- Eurostat (2019c). «Gender pay gap statistics», *Statistics explained*. https://ec.europa.eu/eurostat/statistics-explained/index.php/Gender_pay_gap_statistics
- Eurydice (2009). “Gender Differences in Educational Outcomes: Study on the Measure Taken and Current Situation in Europe.” Available at: <http://www.eurydice.org>
- Guadagnini Marila and Alessia Donà (2007). “Women’s Policy Machinery in Italy between European Pressures and Domestic Constraints”. In Joyce Outshoorn and Johanna Kantola (eds.) *Changing State Feminism*, Londra, Palgrave, pp. 165-181.
- Isfol (2010). *Perché non lavori? I risultati di un’indagine Isfol sulla partecipazione femminile al mercato del lavoro* (edited by Roberta Pistagni), Roma: I libri FSE, Isfol.
- Istat (2011a). “Il sovraccarico di lavoro familiare delle donne”, in: Rapporto annuale 2010, Roma, pp. 155-161.
- Istat (2011c). “Le interruzioni di lavoro per la nascita di un figlio: le ‘dimissioni in bianco’”, in: *Rapporto annuale 2010*, Roma, pp. 153-155.
- Istat (2013). *Rapporto annuale 2013. La situazione del paese*, Roma: Istat.
- Istat (2014). *Rapporto annuale 2014. La situazione del paese*, Roma: Istat.
- Istat (2016). “I percorsi di studio e lavoro dei diplomati e dei laureati”. *Statistiche Report*, 26 settembre 2016
- Istat (2018). “L’Inserimento professionale dei dottori di ricerca. Anno 2018”. *Statistiche Report*, 26 novembre
- Istat (2019a). “Livelli di istruzione e ritorni occupazionali. Anno 2018”, *Statistiche Report*, 15 luglio 2019
- Istat (2019b). “Natalità e fecondità della popolazione residente. Anno 2018”, *Statistiche Report*, 25 novembre
- Istat (2019c). “Conciliazione tra lavoro e famiglia. Anno 2018”, *Statistiche Report*, 18 novembre
- Maione, Valeria (2014). “Consigliere di parità o dame di carità”, *inGenere*, 7 October. Available at: <http://www.ingenere.it/>
- Mundo, Antonietta (2012). “Analisi dei dati sull’utilizzo del congedo parentale: focus sulla situazione del Paese”, presentation at the seminar ‘Maternità, paternità & lavoro: istruzioni per l’uso’, INAIL, Roma.
- Murgia, Annalisa and Barbara Poggio (2009) “Challenging Hegemonic Masculinities. Men’s Stories on Gender Culture in Organizations”, *Organization*, 16(3): 407-423.
- Murgia, Annalisa and Barbara Poggio (2013). “Fathers’ Stories of Resistance and Hegemony in Organizational Cultures”, *Gender, Work and Organization*, 20(4) 413-424.
- Naldini, Manuela (2003). *The family in the Mediterranean welfare states*, Abingdon and New York: Routledge.
- Naldini, Manuela, and Chiara Saraceno (2008). « Social and family policies in Italy : Not totally frozen but far from structural reforms. » *Social Policy & Administration* 42(7) : 733-748.
- Naldini, Manuela, and Chiara Saraceno (2011). *Conciliare famiglia e lavoro. Vecchi e nuovi patti tra sessi e generazioni*. Bologna : Il Mulino.
- OECD (various years). *Education at a Glance*. Paris, OECD
- OECD (2017a). « Gender equality in education », in OECD (2017). *The Pursuit of Gender Equality: An Uphill Battle* (Ch. 6, 7 and 8): 95-120.
- OECD (2017b). *Education Policy Outlook: Italy*, Paris: OECD Publishing
- OECD (2017c). « Gender inequality in unpaid work », in OECD (2017). *The Pursuit of Gender Equality: An Uphill Battle* (Ch. 17): 189-198.
- OECD (2019a). *Education at a Glance. Country Note. Italy*. Paris, OECD
- OECD (2019b). *Family database*, <http://www.oecd.org/social/family/database.htm>
SF1.1 “Family size and household composition”;
SF2.1 “Fertility Rates”; SF2.2 “Ideal and actual number of children”;

SF2.3 “Age of mothers at childbirth and age-specific fertility”;
 LMF 1.1 “Children in households by employment status”;
 LMF1.3 “Maternal employment by partnership status”.

- Tomio, Patrizia (2012). “Gli organismi di parità universitari, il loro sviluppo e coordinamento”, *Meno di zero*, Anno III, 8-9. <http://menodizero.eu/>
- Trifiletti, Rossanna (1999). “Southern European Welfare Regimes and the Worsening Position of Women”, *Journal of European Social Policy*, 9: 49-64.
- Valentini, Chiara (2012). *O I figli o il lavoro*, Milano: Feltrinelli.
- Verloo, Mieke (2018). *Varieties of opposition to gender equality in Europe*. London: Routledge.
- Villa, Paola (2012). “Club Med. Issues for gender equality and intergenerational solidarity in Mediterranean countries”, *European Women’s Voice*, Spring: 16-18.
- WEF (World Economic Forum) (2014). *The Global Gender Gap Index. Italy*
<http://reports.weforum.org/global-gender-gap-report-2014/economies/#economy=ITA>
- WEF (World Economic Forum) (2019). *Global Gender Gap 2020*. Available at:
https://tbinternet.ohchr.org/Treaties/CEDAW/Shared%20Documents/ITA/INT_CEDAW_NGO_ITA_27687_E.pdf

B. Gender equality in academia and women in science

- Abramo, Giovanni, Ciriaco Andrea D’Angelo, Alessandro Caprasecca (2009). “Gender differences in research productivity: A bibliometric analysis of the Italian academic system”. In *Scientometrics*, 79(3): 517–539.
- Abramo, Giovanni and Ciriaco Andrea D’Angelo (2016). “Refrain from adopting the combination of citation and journal metrics to grade publications, as used in the Italian national research assessment exercise (VQR 2011–2014)”. In *Scientometrics* 109(3): 2053-2065.
- Abramo, Giovanni, and Ciriaco Andrea D’Angelo (2015). “The VQR, Italy’s second national research assessment: Methodological failures and ranking distortions”. In *Journal of the Association for Information Science and Technology* 66(11): 2202-2214.
- Abramo, Giovanni, & Ciriaco Andrea D’Angelo (2018). “On tit for tat: Franceschini and Maisano versus ANVUR regarding the Italian research assessment exercise VQR 2011-2014”. In *arXiv preprint arXiv: 1810.12635*.
- Abramo, Giovanni, Ciriaco Andrea D’Angelo and Francesco Rosati (2016). “Gender bias in academic recruitment”. In *Scientometrics*, 106(1): 119-141.
- ADI (2019a). “Quali prospettive per i post-doc? 2019”. <https://dottorato.it/content/viii-indagine-adi-su-dottorato-e-postdoc>
- ADI (2019b). “VIII Indagine ADI su Dottorato e Postdoc”. <https://dottorato.it/content/viii-indagine-adi-su-dottorato-e-postdoc>
- ADI (2019c). “Valorizzare il dottorato nelle imprese e nelle pubbliche amministrazioni”. <https://dottorato.it/content/3-valorizzare-il-dottorato-nelle-imprese-e-nelle-pubbliche-amministrazioni>.
- ADI (2020). “IX Indagine ADI su Dottorato e Postdoc: Abolire l'assegnazione di ricerca”. <https://dottorato.it/content/indagine-adi-2020>
- Arensbergen, Pleun, Inge van der Weijden and Peter van den Besselaar (2012). “Gender differences in scientific productivity: a persisting phenomenon?”. In *Scientometrics*. 93(3): 857-868.
- Antonelli, Francesco, Giada Sarra and Roberta Sorrentino (2013), “Il sesso mancante nell’università italiana.” In *InGenere.it*, www.ingenere.it/articoli/il-sesso-mancante-nelluniversitaliana
- AETeD (2017). “Il Precariato nelle Università dopo la legge 240/2010 (“Gelmini”). http://www.uniarted.it/wp-content/uploads/2017/01/2017-01-24-Precariato_Analisi_e_Proposte6.pdf
- Baccini, Alberto (2014). “Le donne sono state discriminate nell’abilitazione scientifica nazionale?” In *Roars*, 28 October. <https://www.roars.it/online/le-donne-sono-state-discriminate-nellabilitazione-scientifica-nazionale/>

- Baccini, Alberto, Lucio Barabesi, Martina Cioni & Caterina Pisani (2014). "Crossing the hurdle: the determinants of individual scientific performance". In *Scientometrics*, 101(3): 2035-2062.
- Baccini, Alberto and Annalisa Rosselli (2014), "Abilitazione scientifica nazionale, miglioramenti da migliorare." In *InGenere.it*, 28 ottobre. <https://www.ingenere.it/articoli/abilitazione-scientifica-nazionale-miglioramenti-da-migliorare>
- Baccini, Alberto and Giuseppe De Nicolao (2016). "Do they agree? Bibliometric evaluation versus informed peer review in the Italian research assessment exercise." In *Scientometrics* 108(3): 1651-1671.
- Baccini, Alberto, Giuseppe De Nicolao and Eugenio Petrovich E. (2019). "Citation gaming induced by bibliometric evaluation: A country-level comparative analysis". In *PLOS ONE*, 14(9).
- Bagues, Manuel, Mauro Sylos-Labini and Natalia Zinovyeva (2017). "Does the gender composition of scientific committees matter?". In *American Economic Review* 107(4): 1207-38.
- Bataille, Pierre, Nicky Le Feuvre, and Sabine Kradolfer Morales (2017). "Should I stay or should I go? The effects of precariousness on the gendered career aspirations of postdocs in Switzerland." In *European Educational Research Journal* 16(2): 313-331.
- Bellè, Elisa, Rossella Bozzon and Annalisa Murgia (2017). "Inside/Out. Storie di precarietà nell'università italiana." In Francesca Coin, Alberta Giorgi, Annalisa Murgia (Eds.). *In/disciplinate: soggettività precarie nell'università italiana*, Edizioni Ca' Foscari Culture del lavoro 4: 59-74.
- Benedetto, Sergio, Daniele Checchi, Andrea Graziosi and Marco Malgarini (2017). "Comments on the paper "Critical remarks on the Italian assessment exercise". In *Journal of Informetrics* 2(11): 622-624.
- Biagioli, Mario (2018). "Impact or perish. L'ossessione per l'impatto delle pubblicazioni scientifiche genera frodi e condotte abusive." In *Roars*, 27 March. <https://www.roars.it/online/tag/indicatori-bibliometrici/>
- Bosquet, Clément, Pierre-Philippe Combes, Cecilia García-Peñalosa, Sarra Ben Yahmed, and Camille Dufour (2014). 8. Le monde universitaire, un laboratoire d'analyse des différences d'avancement de carrière des hommes et des femmes. *Regards croisés sur l'économie*, (2): 158-165.
- Bozzon, Rossella, Annalisa Murgia, and Barbara Poggio (2017). "Work-life interferences in the early stages of academic careers: The case of precarious researchers in Italy." In *European Educational Research Journal* 16(2-3): 332-351.
- Bozzon, Rossella, Annalisa Murgia and Paola Villa (2017). "Precariousness and gender asymmetries among early career researchers: a focus on STEM fields in the Italian academia." In *Polis* 31(1): 127-158.
- Ceci, Stephen, J., Donna K. Ginther, Shulamit Kahn and Wendy M. Williams (2014). "Women in Academic Science: A Changing Landscape." *Psychol Sci Public Interest*. 15(3): 75-141.
- Ceci, Stephen, J. and Wendy M. Williams (2011). "Understanding current causes of women's underrepresentation in science." In *PNAS* 108 (8): 3157-3162. Available at <https://www.pnas.org/content/108/8/3157>
- Christofides, Louis N., Michael Hoy and Ling Yang (2009). "The gender imbalance in participation in Canadian Universities (1977-2005)." CESifo Working Paper, No. 2791.
- Cohen, Scott, Paul Hanna, James Higham, Debbie Hopkins and Caroline Orchiston (2019). "Gender discourses in academic mobility." In *Gender, Work & Organization*, <https://doi-org.proxy.unimib.it/10.1111/gwao.12413> 1-17.
- Constant, Amelie F., and Elena D'Agosto (2010). "Where do the brainy Italians go?" *The labour market impact of the EU enlargement*. Physica-Verlag HD, 247-271.
- CRUI (2019). *Linee guida per il Bilancio di Genere negli Atenei italiani*, <https://www.cru.it/bilancio-di-genere.html>.
- De Paola, Maria, Michela Ponzio, Vincenzo Scoppa (2014). "Donne sull'orlo di una crisi di competizione". *Lavoce.Info*, 29 July. <https://www.lavoce.info/archives/29143/donne-competezione-universita/>
- De Paola, Maria, Michela Michela and Vincenzo Scoppa (2017). Gender differences in the propensity to apply for promotion: Evidence from the Italian Scientific Qualification, *Oxford Economic Papers*, 69(4): 986-1009.

- De Paola, Maria, Michela Ponzio and Vincenzo Scoppa (2018). "Are Men Given Priority for Top Jobs? Investigating the Glass Ceiling in Italian Academia". In *Journal of Human Capital* 12(3): 475-503.
- De Paola, Maria and Vincenzo Scoppa (2015). "Gender discrimination and evaluators' gender: evidence from Italian academia". In *Economica*, 82(325): 162-188.
- D.M. (2018). D.M. 8 agosto 2018, N. 589 – Tabelle valori – Soglia candidati e commissari. https://abilitazione.miur.it/public/documenti/2018/Tabelle_Valori_Soglia_ALLEGATI_DM_589_2018.pdf
- Franceschini, Fiorenzo and Domenico Maisano (2017). "Critical remarks on the Italian research assessment exercise VQR 2011–2014." In *Journal of Informetrics* 11(2): 337-357.
- Gaiaschi, Camilla (2019). "Same job, different rewards: the gender pay gap among physicians in Italy." In *Gender, Work & Organization*.
- Helmer, Markus, Manuel Schottdorf, Andreas Neef and Damian Battaglia (2017). "Gender bias in scholarly peer review". In *Elife* 6: 1-18.
- Herschberg, Channah, Yvonne Benschop and Marieke Van den Brink (2018). "Precarious postdocs: A comparative study on recruitment and selection of early-career researchers." In *Scandinavian Journal of Management* 34(4): 303-310.
- King, Molly. M., Carl T. Bergstrom, Shelley J. Correll, Jennifer Jacquet and Jevin D. West (2017). "Men set their own cites high: Gender and self-citation across fields and over time". *Socius: Sociological Research for a Dynamic World*, 3: 1-22
- James, Alex, Rose Chisnall and Michael J. Plank (2019). "Gender and societies: a grassroots approach to women in science". In *Royal Society Open Science* 6(9): 1-11.
- Lansu, Monic, Inge Bleijenbergh and Yvonne Benschop (2019). "Seeing the system. Systemic gender knowledge to support transformational change towards gender equality in science." In *Gender, Work & Organization* 1-17 <https://doi.org/10.1111/gwao.12384>.
- Leenders, Joke, Inge L. Bleijenbergh and Marieke Van den Brink (2019). "Myriad potential for mentoring: Understanding the process of transformational change through a gender equality intervention." In *Gender, Work & Organization* 1-16 <https://doi.org/10.1111/gwao.12385>.
- Lundberg, Shelly and Jenna Stearns. (2019). "Women in Economics: Stalled Progress." *Journal of Economic Perspectives*, 33 (1): 3-22.
- Manzo Francesca (2017). "Abilitazione Scientifica Nazionale (ASN) e progressione di carriera dei docenti universitari italiani". Ph.D. Thesis, University of Naples.
- Maxwell, Nicola, Linda Connolly and Cairiona Ní Laoire (2019). "Informality, emotion and gendered career paths: The hidden toll of maternity leave on female academics and researchers." *Gender, Work & Organization* 26(2): 140-157.
- MIUR (2019a). "Le carriere femminili in ambito accademico", Gestione Patrimonio Informativo e Statistica. <http://ustat.miur.it/documenti/>
- MIUR (2019b). "Il personale docente e non docente nel sistema universitario italiano - a.a 2017/2018". Gestione Patrimonio Informativo e Statistica. <http://ustat.miur.it/documenti/>
- Monteleone, Simona and Bruno Torrì (2012). "Geographical analysis of the academic brain drain in Italy." *Scientometrics* 93(2): 413-430.
- Murgia, Annalisa and Barbara Poggio (2015). "Il progetto GARCIA. Università e Ricerca in ottica di Genere: superare le asimmetrie e l'instabilità lavorativa.", In S. Avveduto et al., Eds., *Scienza, genere e società. Prospettive di genere in una società che si evolve*. CNR-IRPPS: 247-252.
- Murgia, Annalisa and Barbara Poggio (eds.) (2018). *Gender and precarious research careers*. London, NY: Routledge.
- Murray, Dakota, et al. (2018). "Author-reviewer homophily in peer review" (preprint). In *bioRxiv*.
- Nikunen, Minna, and Kirsti Lempiäinen (2018). "Gendered strategies of mobility and academic career." In *Gender and Education*: 1-18 doi.org/10.1080/09540253.2018.1533917.
- OECD (2017). "Gender equality in education". In *The pursuit of gender equality: An uphill battle*, Paris: OECD

- Pautasso, Marco (2015). "The Italian university habilitation and the challenge of increasing the representation of women in academia". In *Challenges*, 6(1): 26-41.
- Poggio, Barbara (2017). "Women and men in scientific careers: new scenarios, old asymmetries." *Polis* 31(1): 5-16.
- Poggio, Barbara (2018a) "Structural changes in higher education in the neoliberal age. Insight from Connell's theory", in R. Connell, P. Martin, J. W. Messerschmidt, M. Messner, Eds., *Gender Reckonings: New Social Theory and Research*, New York, NY University Press, pp. 234-260.
- Poggio, Barbara (2018b). "Gender politics in academia in the neoliberal age." In R. Connell, P. Martin, J. W. Messerschmidt, M. Messner, Eds., *Gender reckonings: New social theory and research*, New York, NY University Press, pp. 173-93.
- Potvin, Dominique A., Emily Burdfield-Steel, Jacqueline Potvin and Stephen Heap (2018). "Diversity begets diversity: A global perspective on gender equality in scientific society leadership". In *PloS one* 13(5): e0197280.
- Sala, Emanuela and Roberta Bosisio (2017). "Gender inequalities in Italian academia: What future for female academics?". In *Feminismo/s* 29: 347-368.
- Scoppa, Vincenzo and Maria De Paola (2011), "Sorteggio non fa rima con merito", Lavoce.info, 8 March. <https://www.lavoce.info/archives/26805/sorteggio-non-fa-rima-con-merito/>
- Shen, Helen (2013). "Mind the gender gap". *Nature News*, 495: 22-24"
- Solera, Cristina and Rosy Musumeci (2017). "The persisting glass ceiling in academia: a multidimensional cross-national perspective." In *Polis* 31(1): 17-44.
- Steinþórsdóttir, Finnborg S., Thomas Brorsen Smidt, Gyða M. Pétursdóttir, Þorgerður Einarsdóttir, and Nicky Le Feuvre (2019). "New managerialism in the academy: Gender bias and precarity." In *Gender, Work & Organization* 26(2): 124-139.
- Toscano, Emanuele, Francesca Coin, Orazio Giancola, Barbara Gruening, Francesco Vitucci and Claudio Riccio (2014). "RICERCARSI – Indagine sui percorsi di vita e lavoro del precariato universitario". Available at: <http://www.research.lancs.ac.uk/portal/files/278645196/Ricercarsi.pdf>.
- Villa, Paola (2019). "Economics, gender and Academia", 25 November 2019, Seminar, DEM, University of Trento

Websites

<https://dottorato.it/indagini>

<http://ec.europa.eu/eurostat>

http://ec.europa.eu/index_it.htm

<http://home.epws.org>

<http://menodizero.eu/>

<http://www.donnescienza.it/>

https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Tertiary_education_statistics

<https://ec.europa.eu/eurostat/web/science-technology-innovation/data/database>

<https://www.anvur.it/apport-biennale/apport-biennale-2018/>

<https://www.crui.it/bilancio-di-genere.html>

<https://www.eui.eu/ProgrammesAndFellowships/AcademicCareersObservatory/AcademicCareersbyCounty/Italy>

<https://www.miur.gov.it/abilitazione-scientifica-nazionale>

<https://www.miur.gov.it/istituzioni-universitarie-accreditate>

<https://www.miur.gov.it/settori-concorsuali-e-settori-scientifico-disciplinari>

<https://www.miur.gov.it/web/guest/settori-concorsuali-e-settori-scientifico-disciplinari>

www.anvur.org/index.php?lang=it

www.bancaditalia.it

www.cun.it/homepage/

www.ingenera.it

www.ISTAT.it

www.istruzione.it/

www.lavoce.info

www.OECD.org/

www.quing.eu/index.php

www.roars.it/online/

www.weforum.org