HOW WOMEN'S WORK HORIZON IS CHANGING: AN ANALYSIS OF OCCUPATIONS ACROSS GENERATIONS[1]

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Abstract In 2022, despite the gradual improvement of the female employment rate, the Italian labour market still shows a significant gender gap. Although the growth in women's educational attainment has increased their participation in the labour market and maintained it even during the economic crisis of 2008-2013 and the health crisis of 2020, it has not yet translated into better professional qualifications for them. There is a double disadvantage for working women: "horizontal" and "vertical" segregation. However, a more detailed analysis of data on occupations by gender and age suggests that something is gradually changing. This study analyses the different gender composition of the workforce in specific occupational groups, comparing different generations (25-39 years, 40-54 years and 55-69 years), with the aim of identifying and quantifying the change occurred in women's employment over the last two decades.

1 The background

In 2022, in an economic and social context deeply affected by the recent pandemic emergency and the related economic crisis, the Italian labour market still shows a significant gender gap, despite the gradual improvement in the female employment rate. Women have a lower employment rate (51.1% compared to 69.2% of men) and a higher unemployment rate (9.4% compared to 7.1%), but their disadvantage is also strongly reflected in an analysis of the characteristics and type of work they do, as well as their educational and life paths. The growth in women's educational attainment has increased their participation in the labour market, making it more sustainable during the period of crisis that characterised a large part of the decade 2004-2014 and during the recent Covid-19 health emergency. However, they still face significant barriers to full employment. Although women have surpassed the average educational attainment of men (65.3% of women with diploma compared to 60.1% of men, 23.1% of women and 16.8% of men with tertiary education) and are increasingly participating in the labour market, this has not yet translated into an

[1] This article is a joint effort by the authors. In particular, Barbara Boschetto edited paragraphs 1, 2 and subparagraph 3.2, and Elisa Marzilli edited paragraph 3.1. Conclusions are written jointly.

advantage for them in terms of higher occupational qualifications. In addition, girls are still under-represented in scientific fields of study: the share of young women (25-34 years) graduating in STEM (science, technology, engineering and mathematics) is half that of men (17.6% compared to 33.7%) (Istat, 2022). Although the gender gap significantly reduces with increasing educational attainment, it never disappears: in 2022, the employment rate of female graduates aged 15-64 is 77.7%, for men is 84.7%. The reason could be the disciplines chosen by women, less expendable on the labour market. This is partly probable, but the data show that, with the same degree, 87.3% of women is employed compared to 90.4% of men in the health field and 79.3% compared to 89.3% in the STEM field, confirming that gender biases and stereotypes persist even with equal starting conditions and favour gender segregation. At the same time, reconciling work and family life remains particularly difficult for women (Truc, 2022). The birth of children is a critical and very delicate period for the situation of women on the labour market, much more than for men, and the responsibility of taking care of younger children limits their employment even more. While the employment rate of women aged 25-49 without children reaches 76.6% in 2022, the employment rate of mothers with children under 6 years is still 55.5% (Istat, 2023a). Moreover, part-time work is not always a reconciliation tool of work and care, especially when it is not chosen by the worker (involuntary part-time) but imposed by the employer (Maestripieri, Insarauto, 2020). In 2022, 31.8% of women works part-time compared with 8.3% of men (involuntary part-time is 16.5% for women and 5.6% for men). The presence of children requires the use of work-life balance strategies to minimize the loss of employment and underemployment of women. In the light of the above, it is interesting to examine the data on occupations by gender to see if anything is really changing on the employment horizon for women. In the last two decades, female employment on the one hand, has been supported by numerous gender policies[2] and a greater diffusion of tertiarisation and flexibility of the labour market, on the other it has also been affected by the effects of the economic crisis and the health emergency (Lugli, 2021). The aim of this work is to identify the changes that have recently occurred in the women's labour market. It analyses the different gender composition in specific

[2] Numerous strategies for gender equality conducted at international level (Millennium Development Goals in 2000, Agenda 2030 in 2015), require the Italian state and some large companies to develop inclusive gender policies, with the aim of involving women at risk of marginalization in the labour market. Policies for reducing the gender gap have aimed to promote women's participation in the labour market, reduce the wage gap between men and women, eliminate barriers to women's advancement or cultural practices that preclude women from equal opportunities. The main policy instruments have included: parental leave reserved for mother, father or both parents (mandatory or optional); care services such as daycare centers and preschools; gender budgeting on company boards; obligation for large companies to report on the status of male and female staff and wages; support for female entrepreneurship.

occupational groups, comparing the incoming generation of workers (25-39 years) with the outgoing generation (55-69 years), the more educated workers with the less educated ones and the workers belonging to different geographical areas. The gender gap by occupation will be analysed not through the traditional groups of the Classification of Occupations[3], but rather through an ad-hoc-aggregation of occupations, that allows us to overcome the classification criteria of CP[4] partially. Since a temporal comparison with this group typology was made for the first time on this occasion, the analysis is mainly descriptive, however logistic models were developed to support the descriptive evidence, the main results of which are reported.

2 Occupational segregation by gender

Occupational gender segregation refers to the unequal treatment of men and women in employment. Rather than discrimination, the word segregation focuses on the factor of distinction/separation that exists between men and women in the workplace. There have been numerous studies aimed at measuring segregation, both nationally and internationally, in order to understand its causes and consequences (INAPP, 2022; Save the Children, 2023). The economic literature distinguishes two forms of occupational segregation: horizontal segregation, referring to the concentration of employment female representation in a limited number of sectors and professions, and the vertical segregation, referring to the female concentration at the lower levels of the hierarchical scale within the same occupation (Rosti, 2006).

Horizontal segregation is linked to the persistence of gender stereotypes that influence women themselves in their study paths and professional choice (Barigozzi, Montinari, 2022). It translates into gender prejudice which considers women more suitable for certain jobs (teachers, secretaries, cleaners, hairdressers, nurses, shop assistants, cashiers, etc.) and whereby derives the feminisation of some productive and service sectors (social services, teaching, textiles, commerce, administration).

[3] The ISTAT Classification of Occupations (CP), which is linked to the International Classification of Occupations ISCO-08, is the tool for classifying labour market occupations into specific occupational groupings, which is useful for the communication, dissemination and integration of statistical and administrative data on occupations, while ensuring comparability at international level. Since 2023, ISTAT has adopted the CP2021 Classification of Occupations, the result of a revision of the previous version (CP2011) and further alignment with ISCO-08.

[4] This ad-hoc-aggregation allows us to overcome the classification criteria of the CP partially, which group together in the same level those occupations that require the same level of skills, and distinguish occupations by area of competence only in the subsequent levels. Traditional professional groups, without an ad-hoc-aggregation, could have hidden important aspects of the gender changes that have occurred in recent years. In the second CP's major group, for example, scientific professions and those related to teaching coexist, but among the former there is a clear male prevalence while among the latter there is a clear female prevalence, so it is preferable to keep them separate. Ad-hoc aggregation keeps not only some occupations but also some areas separate.

These jobs are often characterised by low pay, low skills and poor career prospects, but are more compatible than others with the management of family responsibilities (close to home, with flexible working hours, with routine tasks that do not require transfers and overtime, etc.) (Wiswall, Zafar, 2018). In 2022, this phenomenon is still widespread: about half of women's employment is concentrated in just 20 occupations, while men's employment is concentrated in 54 occupations. The most common occupations for women are general business and secretarial workers, salespersons, carers, domestic workers, nurses and cleaners, and primary school teachers. Among specialist occupations, there are those related to education - nursery and primary school teachers, secondary literature teachers, specialists in the education and training of the disabled people - and women practicing law. Among technical occupations, we find only health and care occupations, but also executive office occupations, such as general affairs, secretarial and accounting occupations. Skilled occupations in trade and services are more common among women, such as shop assistants, cashiers, bartenders, hairdressers and personal care workers, Finally, in unskilled occupations, women are more employed as domestic helpers, office and industrial cleaners and servants. Compared to women's employment, men's employment is certainly more varied. Vertical segregation refers to the difficulty for women to gain access to top positions within organisations or to skilled and specialised professions that are more often reserved for men, such as entrepreneurs, judges, engineers, doctors, academics, etc. The existence of vertical segregation highlights the existence of a *glass ceiling* that hinders women's career progression and excludes them from top positions with greater responsibilities. In the debate on gender segregation, this study contributes to highlighting the quantitative aspects of the phenomenon both in terms of horizontal and vertical segregation, using data on occupations, also offering a temporal comparison over 18 years. The focus is conducted on four specific occupational fields, two with a traditional male prevalence (managerial and scientific) and two with a female prevalence (healthcare and education) in which, however, women are historically confined to the lowest levels.

3 Analysis of occupations

3.1 Four fields under observation: small but significant progress for women

This study is based on data from the ISTAT Labour Force Survey and, more specifically, on the variable "occupation". In particular, this study considered a specific aggregation of occupations into 12 groups from the Classification of Occupations - CP2011 (Table 1), excluding the armed forces[5]. The specific

[5] It was preferred to exclude the armed forces because of the recent entry of women into this sector.

aggregation groups occupations starting from the II and III digit of the CP2011 occupational classification, prioritising the field of competence according to the logic of *job families* (Table 1). Up to now, the 2022 average has been used to give the most recent picture of the distribution of employment by occupation. From now, in order to provide a longer time comparison and at the same time make the estimates stronger, on the 2004-2005 averages, the first two years of the latest *historical series*, and the 2021-2022 averages, the first two available years of the *new series*[6], will be used.

Table 1 – *Ad hoc aggregation of occupations into 12 groups (percentage composition on two-year average 2021-2022).*

Group	Description	%	Group	Description	%
1	P.A. managers and entrepreneurs	2.8	7	Clerks	12.5
2	STEM	8.2	8	Sales and restaurant workers	14.5
3	Health occupations	6.6	9	Building, metal workers	14.8
4	Teachers and researches	5.8	10	Agriculture, food, textile workers	7.5
5	Legal-financial occupations	7.2	11	Transport and storage	5.7
6	Socio-cultural occupations	6.2	12	Low-skilled professions (cleaners, carers)	8.2
				Total	100

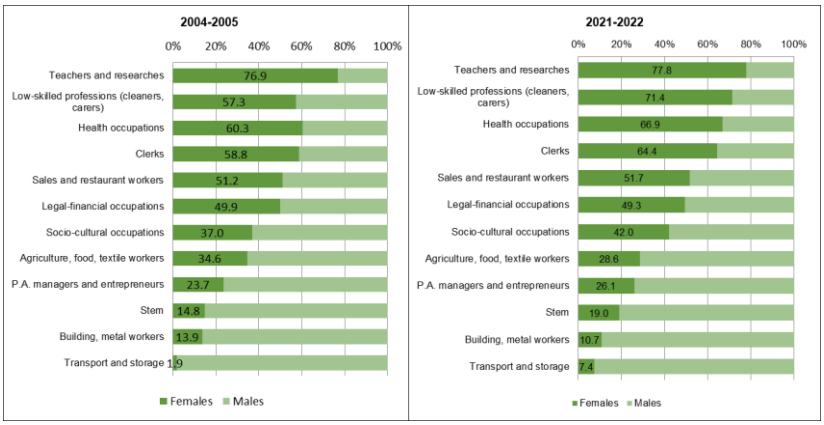
Source: ISTAT, Labour Force Survey.

The comparison over time allows analysing the dynamics that have taken place in the work, and more specifically in occupations, over the last 18 years, capturing aspects of growth and progress as well as stagnation and critical issues. Although the overall employment rate of women increased by 3.2 percentage points, it is important to check whether this increase was accompanied by an improvement in the quality of their employment, particularly in terms of overcoming traditional gender segregation. In fact, the number of women in employment has increased not only in traditionally female-dominated occupations such as carers, clerks or nurses (in particular, care and cleaning services have moved into second place in terms of

[6] All countries of the European Union, since January 2021 implemented the new Regulation (EU) 2019/1700 of the European Parliament and of the Council. For the Labour force survey, it introduces changes in the definition of household and employed persons, using a new questionnaire. Details of the changes introduced from 2021 are at link https://www.istat.it/it/archivio/252689. The data collected from 2021 are new data series, while those collected up to December 2020 represent the old series. The proposed time comparison thus contains a break in the historical series, but the comparison between old and new series, for the overlap period 2018-2020, shows a completely similar trend in the estimates between the two series and with that of the period 2021-2022.

female presence like Figure 1 shows), but also in some occupations usually reserved for men. This is the case, for example, of occupations related to transport and storage, of socio-cultural technical occupations, of STEM occupations, and of managerial profiles, although the increase in the latter is lower than the average increase.

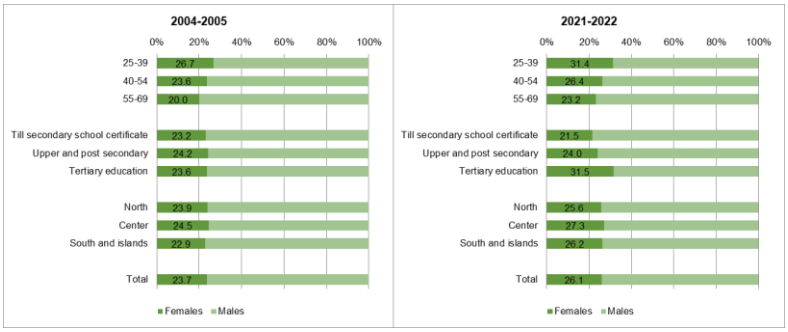
Figure 1 – *The 12 groups of occupations by sex. Two-year average 2004-2005 and 2021-2022 (percentages).*



Source: ISTAT, Labour Force Survey.

Public administration managers or entrepreneurs in small and large business companies: over the last 18 years, there has been a significant decline in the number of people employed in the most highly qualified occupations, profiles traditionally dominated by men. In the 2021-2022 biennium, their share of total employment is 2.8% (5% in 2004-2005) and among them, the share of men is significantly higher than that of women (73.9% *vs* 26.1%).

Figure 2 – *Managers and entrepreneurs by sex, age classes, level of education attained and territory. Two-year average 2004-2005 and 2021-2022 (percentages).*

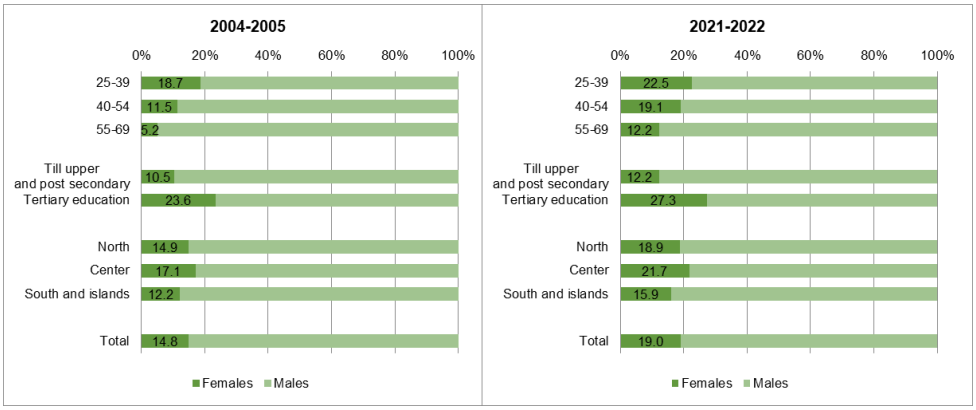


Source: ISTAT, Labour Force Survey.

In a context of persistent male dominance, very small positive signs for the female component should be noted. In fact, the increase in the share of women is lower than their average growth: from 23.7% in 2004-2005 to a presence of 26.1% in the most recent period (Figure 2). The largest increases were among younger women aged 25-39, from 26.7% to 31.4%, and among women with tertiary education, from 23.6% to 31.5%. Finally, the increase, which is widespread in all regions, is proportionally greater in the South (from 22.9% to 26.2%).

STEM: data on women is still not very encouraging, with women still under-represented in scientific professions. Some studies suggest that women make up around 30% of the world's researchers, and less than a third of female students choose to study subjects such as maths and engineering at university (UNESCO, 2017). In Italy, only 20% of girls chooses to study STEM subjects in 2021, confirming them as traditionally male occupations, as remarked by the main European indicators on Specialised and Technical Human Resources - HRST (Istat, 2023b). The origin of this gap depend on several factors. Firstly, certain stereotypes linked to the perception of a greater inclination of women towards humanistic subjects and men towards scientific subjects. Secondly, a labour market that favours the recruitment of young men, but also the lack of support measures - especially for freelancers - to ensure continuity of employment in the event of maternity leave. Moreover, in male-dominated disciplines, women may find it more difficult to form networks or be less willing to compete (Casarico, Lattanzio, 2020).

Figure 3 – *STEM occupations by gender, age classes, highest educational attainment and territory. Two-year average 2004-2005 and 2021-2022 (percentages).*



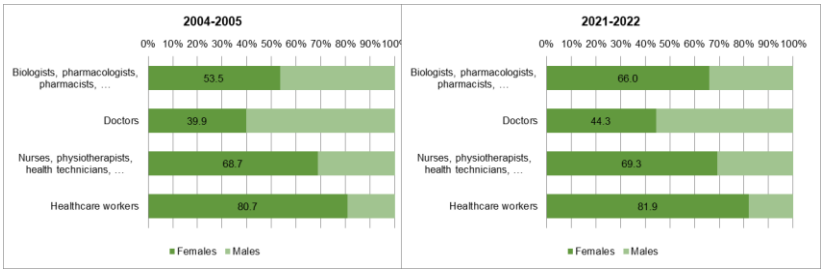
Source: ISTAT, Labour Force Survey.

In this background, it is not surprising that in the 2021-2022 two-year average, only one fifth of those employed in STEM (8.2% of the total employment) are women (19.0%). However, it is important to note how the comparison over time

reveals interesting progress in terms of overcoming segregation. Firstly, the female share of the total has increased by 4.2 percentage points compared to the past, from 14.8% in 2004-2005 to 19.0% in 2021-2022 (Figure 3). The increase is more significant among middle-aged and older women, in fact at the beginning of the period their share was negligible (5.2% among women over55). In addition, the share of women in tertiary education has increased to 27.3% (from 23.6% in the past). At territorial level, the Centre has the highest share of STEM employed women (21.7%) and the highest growth (+4.6 points) compared to the other geographical areas. Overall, STEM employed women are better educated than men: the share of tertiary educated women is higher not only in professional STEM occupations (93.2% vs. 83.8%) but also in technical occupations (42.2% vs. 18.5%), confirming a higher proportion of over-educated women.

Health and life occupations: they account for 6.6% of total employment. Although the health sector as a whole consists of female-dominated occupations (66.9% women), there are significant differences within it. While women represent the great majority of healthcare workers in 2021-2022 (81.9%) and around two-thirds of specialists in life sciences (66.0%) and technicians in health and life sciences such as nurses (69.3%), they are still a minority among medical doctors (44.3%) (Figure 4). In 2021-2022 the medical doctors (general practitioners, surgeons, pathologists, dentists...) are 1.2% of total employed people.

Figure 4 – *Health occupations by typology and sex. Two-year average 2004-2005 and 2021-2022 (percentages).*

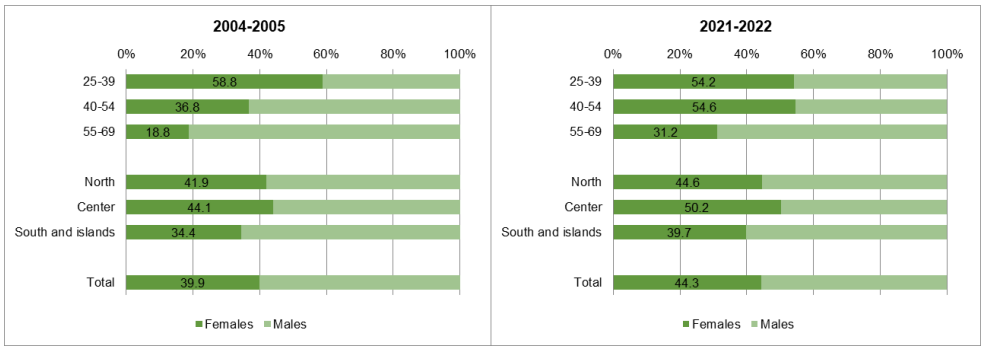


Source: ISTAT, Labour Force Survey.

The medical occupation has traditionally been almost exclusively male. However, there was already a paradigm shift at the beginning of the observation period: among youngest doctors (25-39 years), the proportion of women was already higher in 2004-2005. Today, although women are still a minority, there has been an overall increase of 4.4 percentage points compared to the past, while other professions of the same field have remained essentially stable. In addition, women have overtaken men in the youngest age group (under 55), where their share is around 54.0% (Figure 5). The most significant progress over time was made by

women in the middle age group (40-54 years), whose share increased by almost 18 percentage points to 54.0%, and to a lesser extent by older women (12.4 points), reaching 31.2%. At territorial level, the increase occurred mainly in the Centre, where the share of women increased by more than 6 percentage points. In Western society, the progressive "feminisation" of health occupations has become an important reality that is changing the face of modern medicine. In Italy, too, the presence of female doctors is growing, and the overtaking has already taken place in almost all specialisations, surprisingly even in those that used to suffer from a more typically masculine connotation, first surgical specialisations.

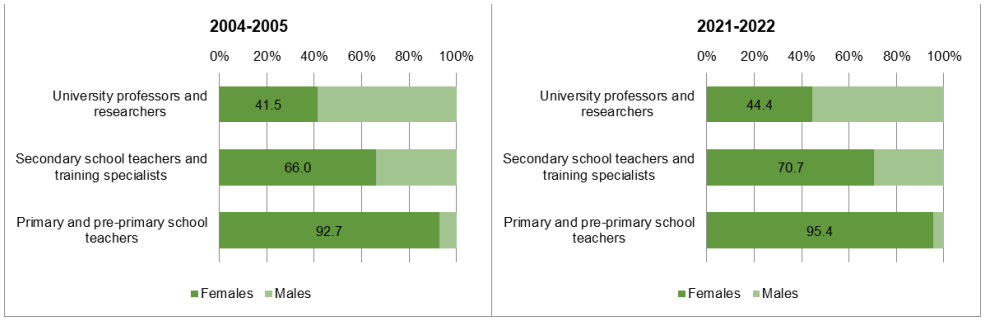
Figure 5 – *Medical occupations by sex, age classes and territory. Two-year average 2004-2005 and 2021-2022 (percentages).*



Source: ISTAT, Labour Force Survey.

Education, training and research occupations: women show a clear advantage in this field that accounts for 5.6% of total employment. Although this sector as a whole is clearly dominated by women (77.8%), there are some clear differences within it: while women account for almost all primary and pre-primary teachers (95.4%) and the great majority of lower and upper secondary teachers (70.7%), they are still a minority among university teachers and researchers (44.0%) (Figure 6). In the academic field, women are not only less present, but also less likely to reach positions of responsibility; they fail to achieve the desired and elevated roles during their university careers. However, even in this sub-group there are signs of improvement. Although men are still the majority in 2021-2022, it is important to highlight the situation of gender parity achieved in the younger generation (25-39 years), where the share of women is 51.2%. The most significant progress over time is recorded for older women (55-69 years), whose share increased by 16 points to 42%, and in the North, where the increase was 6.6 points and the share reached 43.3%.

Figure 6 – *Teachers and researchers by typology and gender. Two-year average 2004-2005 and 2021-2022 (percentage).*

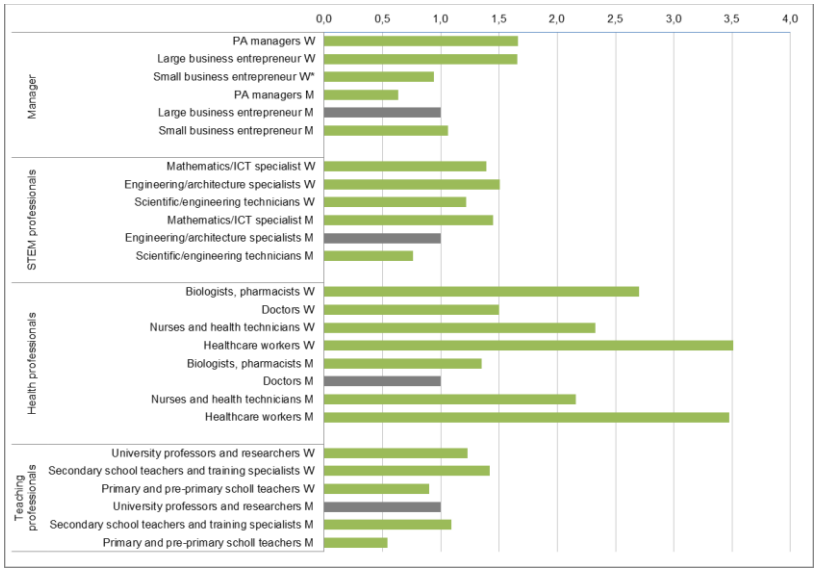


Source: ISTAT, Labour Force Survey.

3.2 Comparison over the time: logistic model

Multinomial logistic regression models were used to support the descriptive analysis in order to show the different probability of being employed in the analysed occupations, in the recent period (2021-2022) compared to the past (2004-2005). To examine the interaction between occupation, gender, and period, the model was applied to the four groups of occupations (dependent variables) stratified by gender. The time variable has been used as independent variable, adjusted for other potential confounders, including age, geographical area and citizenship (Figure 7). Among managerial occupations, the profiles showing a higher propensity to be employed in the last two years are female PA managers and female entrepreneurs of large enterprises, with an odds ratio of 1.66 times more than male entrepreneurs of large enterprises, taken as the reference category (95% CI: 1.46-1.89 the former and 1.49-1.84 the latter). Among the STEM specialists, the propensity to be employed as female engineers is 50% more than male engineers are (odds ratio 1.51, 95% CI: 1.38-1.65) and it is greater for male maths and ICT specialists (odds 1.45, 95% CI: 1.36-1.55). In the Health occupations the healthcare workers in 2021-2022 have a propensity three times and half more than the male doctor in the 2004-2005 to be employed, both for women (odds ratio 3.51, 95% CI: 3.26-3.) and for man (odds ratio 3.48, 95% CI: 3.08-3.93). Female pharmacists and biologists (odds 2.70), female nurses (odds 2.33) and female doctors (odds 1.50) have also greater propensity than male doctors to be employed. Among teaching professionals, the women teachers of secondary school and university professors and researchers show greater propensity to be employed (odds 1.42 and 1.23) than male university professors.

Figure 7 – *Probability of being employed in some professional groups. Ods ratio. 2021-2022 vs 2004-2005.*



Source: ISTAT, Labour Force Survey.

4. Conclusions

Data from the Labour Force Survey show that in the recent period, compared to the past, women have a higher probability of being employed in more specialised profiles. It happens not only in some occupational fields where female component always held lower profiles (health and training), but even in those areas whose occupations have always been the prerogative of men (managerial profiles and stem occupations). However, data shows that our country remains severely disadvantaged in terms of female employment, especially in the skilled profiles. It is therefore ever more urgent to strengthen and incentivise tertiary education for both sexes, especially in the technical-scientific field, in order to close the gap with other European countries, improve human capital and invest in highly specialised sectors that are strategic for competitive growth in the knowledge society. The tentative signs of improvement in the female component appear insufficient for many of the skilled sectors highlighted in this analysis. There is therefore an urgent need for institutions and companies to introduce equality and diversity management policies: the set of practices and policies aimed at valuing diversity within a working environment, whether it be gender, sexual orientation, ethnic origin, culture, physical ability, etc., as well as systems for evaluating companies and institutions themselves

on their ability to promote diversity. Finally, the reconciliation of work and family life and, last but not least, social policies to promote a culture of equality and combat gender bias should be strengthened: indeed, data show that for women, education alone is not enough to achieve equal treatment with men in the labour market.

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