

**MASTER UNIVERSITARIO IN ANALISI DATI PER LA BUSINESS INTELLIGENCE E  
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**GENDER EQUALITY IN RESEARCH  
CASE STUDY ON CNR RESEARCHERS AND POSSIBLE BIAS IN THE COMPETITIONS**

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Even after years of equal opportunity policies at European and national level, the number of female researchers remains comparatively low.

In Europe and in Italy men outnumber women when employment rates, hierarchical positions and research outputs are concerned, in terms of number of publications, citations received, inventions' patents and funding success rates.

The aim of the study is to provide a short analysis on the possible reasons of gender gap in the research field, followed by an overview of the situation in terms of gender balance in the research sector in Europe and in Italy. The study also focuses on CNR (Consiglio Nazionale delle Ricerche) researchers, and some competitions to assess whether there might be bias in the selection procedure that might penalize female candidates.

The gender gap has always existed, and it has been and still is subject to study to assess whether there are innate cognitive abilities that would steer men and women through a particular path in their academic and working carrier. There is no proof in the research literature that would link the gender to innate cognitive abilities, but the environment and social and cultural influences might shape these cognitive abilities. It is demonstrated that the presence of explicit and implicit stereotypes play an important role in women's approach, interest and performances in scientific areas. The scene is even worsened by the implicit and explicit bias to which persons called to evaluate women and men in the scientific fields are subject.

Why doctoral graduates are gender balanced on average in Europe and in Italy, but still only one third of researchers are women?

The EU and the member states are addressing the problem of gender gap in particular in STEM areas. There is still room for improvement, but figures reveal positive trends both in Europe and in Italy, showing a decreasing gap.

The study on CNR personnel shows that the number of researchers has increased during 2007-2017, but this growth was driven by first grade researchers, whereas senior end directors have decreased. While the gender gap is almost non-existent amongst first grade researchers, and it remained consistent through years, it is quite high in hierarchical position and although women are catching up the gap is still considerable.

The descriptive analysis on the competitions shows a disproportion of female successful candidates versus female participant candidates, with the exception of year 2017 for the position of director, when the rate of successful women was higher than that of candidate women. Nevertheless, the tests on proportions and chi-squared tests for each year don't allow to reject the hypothesis of equal proportions between participants and successful candidates.

The predominance of male successful candidates may be explained by a slightly higher score's average in men and the presence of more excellences amongst men.

The study also makes a point on the composition of the evaluating commissions, since the presence of female members and president may influence the evaluation according to the gender of the participant. The representation of women in the commissions is very low, whether as member or president. However, tests have been run to assess the independence of the successful candidate's gender from the commission's president's and members' gender, and the independence cannot be rejected.

At this level of analysis, it seems that no bias occurs according to the gender of the commission's members and presidents.

However, it is assessed that the gap between men and women in research in CNR is existent, mostly in hierarchical positions, and this issue should be brought under discussion and be addressed with concrete measures as per EU and Italian regulations.

Gender equality is not only a concern for women but for the entire society. Scientific excellence can be reached only involving the best talented researchers regardless of their gender and breaking down the barriers that prevent women from developing their skills fully. This process won't come automatically, that is why regulations have been put in place to encourage a virtuous behaviour that we hope all member states, Italy included, will adopt until the gender gap will be filled.