GENDER PAY GAP AND EMPLOYMENT INEQUALITIES:

Analyzing Trends Over a Decade in Europe

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Summary

Introduction and Objectives

In recent decades, the issue of gender disparity in the workplace has gained increasing attention globally. The gender pay gap and the gender employment gap represent two fundamental metrics for understanding gender equity in job opportunities and wages. The gender pay gap refers to the average difference between the earnings of men and women, while the gender employment gap measures the difference in employment rates between the two sexes. This study aims to analyze these two dimensions in Europe, examining trends over time and variations among different countries.

In recent years, many governments have introduced laws and policies to promote greater female empowerment in the labor market. In Italy, for example, the introduction of gender quotas has sought to ensure greater female representation on the boards of listed companies and in public institutions. These measures have received both praise for their potential to promote gender equality and criticism regarding their effectiveness. Critics argue that such measures may lead to a "feminization" of positions without addressing the underlying structural roots of gender disparity, such as corporate culture and ingrained gender biases. Additionally, there are concerns that the implementation of gender quotas may result in a form of positive discrimination, leading to conflicts and resistance within organizations. This analysis aims to understand the magnitude of the problem, assessing whether and to what extent it exists, where improvements are being made, and focusing on the issue through the analysis of objective data.

Methodology and Data

This analysis aims to clearly present the structure of the recorded data through explanatory graphs created using Tableau. The data were collected from Eurostat and pertain to 25 European countries; countries for which data were unavailable were excluded.

Specifically, data related to the gender pay gap (GPG) were gathered. This metric focuses on the average wage values between men and women in each country. The unadjusted GPG represents the difference between the average gross hourly wage of men and that of women, expressed as a percentage of the average gross hourly wage of men.

To calculate the GPG, all paid employees working in companies with at least 10 employees are considered. The data are collected according to the NACE Rev. 2 classification, which is an economic activity classification system used in the European Union. NACE Rev. 2 encompasses various economic sectors, from agriculture (code B) to services (code S), while excluding the public sector (code O). This methodology provides a comprehensive view of gender wage disparities, facilitating the analysis of trends and variations among the various European countries.

However, the available data only included information related to individual nations. Due to a lack of reliable data on aggregated gender pay gap values for Europe, I extensively processed the data using Excel. I extracted the GPG by weighing the known values of individual nations according to the labor force population in each country for each year. For these calculations, Eurostat served as the data source.

This approach allowed me to obtain an estimated GPG for Europe, considering only the 25 countries for which usable data were available, using a weighted average.

Subsequently, data related to the gender employment gap for these countries over the same time frame were also collected. The gender employment gap is defined as the difference between the employment rates of men and women. The employment rate is calculated by dividing the number of persons aged 20 to 64 in employment by the total population of the same age group. This indicator is based on data collected from the EU Labour Force Survey.

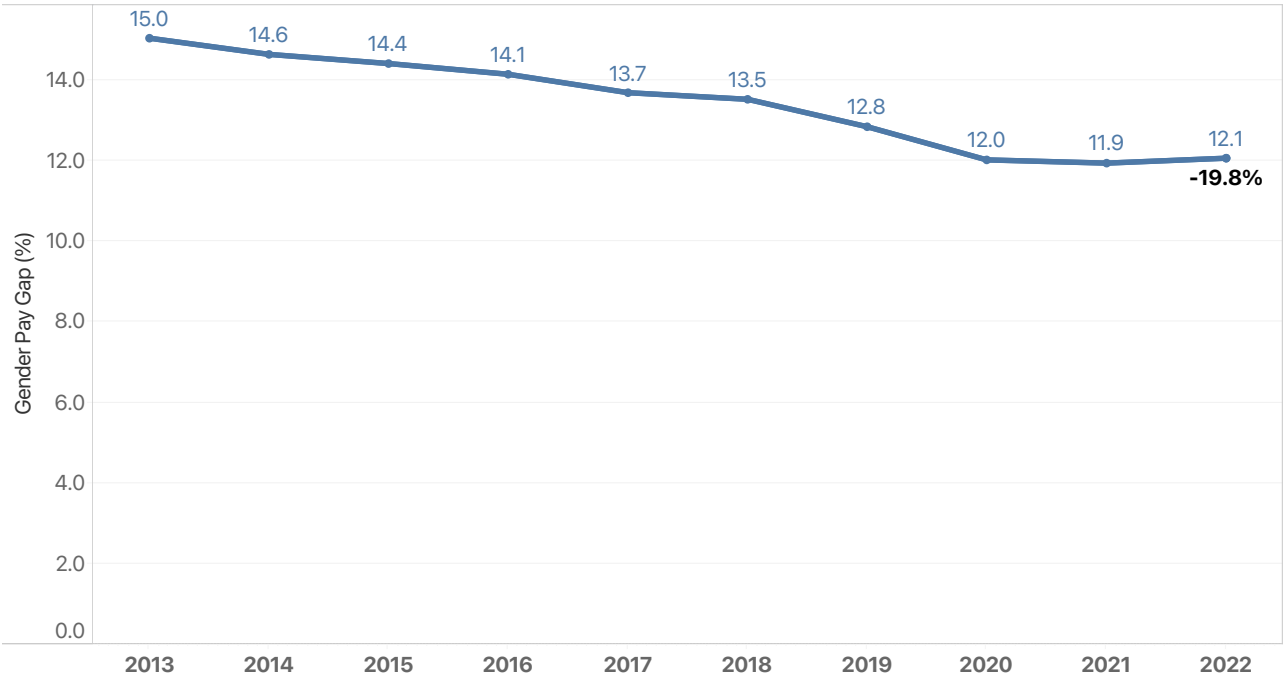
To deepen the analysis, unadjusted GPG values were also examined across different sectors of activity. This approach allows for evaluating whether the gender pay gap issue is evenly distributed across economic sectors or concentrated in specific ones. Again, for calculating the overall values for Europe, a weighted average was used, considering the number of workers in each country for a given year.

Tableau was instrumental in visualizing these data, enabling effective analysis and comparison of trends across the selected countries.

Gender Pay Gap Dynamics

In this section, I focus on analyzing the extent of the gender pay gap recorded in Europe between 2013 and 2022. The graph below shows that in 2013, the gender pay gap was 15%. This implies that, based on a hypothetical gross hourly wage of €10 for a man, a woman earned on average only €8.50 per hour.

Figure 1: Gender Pay Gap (%) in Europe (2013-2022)



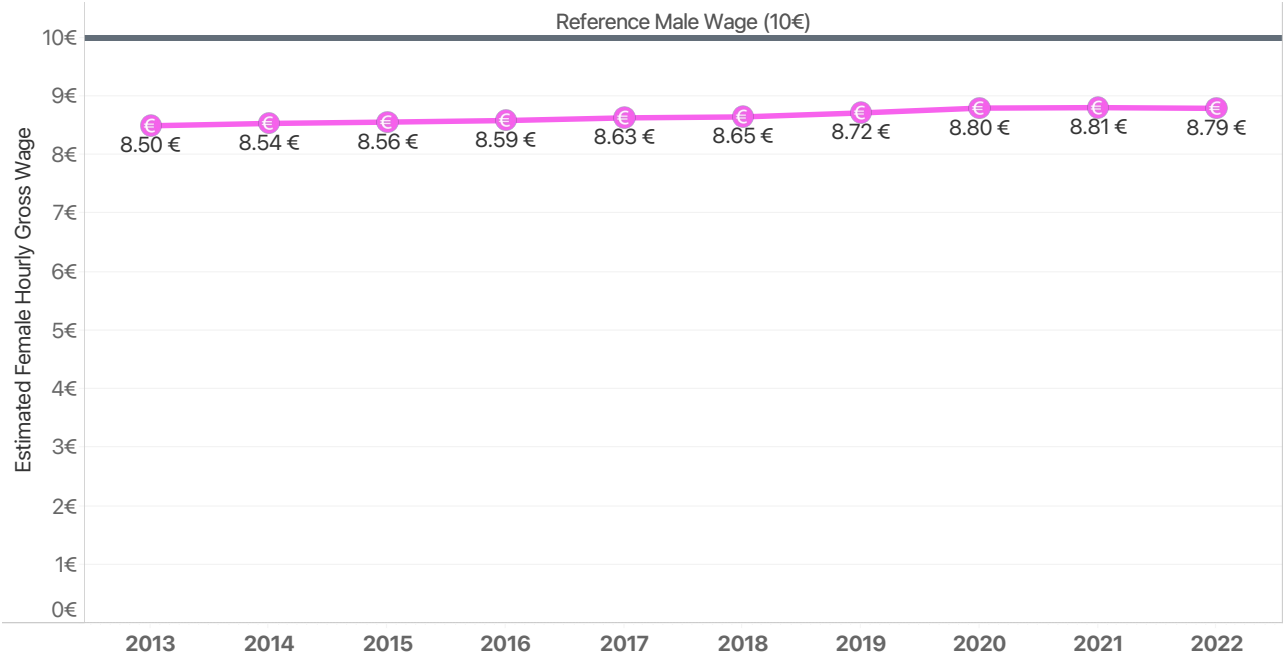
Data source: Eurostat

The analysis of the graph indicates that, despite a slight fluctuation in 2021, the gender pay gap has shown a slow but steady decrease over the years, reaching a value of 12.1% in 2022. In this scenario, the average hourly wage for a woman would rise to €8.79.

Although the absolute difference between the two periods may seem modest, the percentage change of 19.8% (shown in the graph) underscores a significant improvement. Therefore, it can be stated that the gender pay gap in Europe has substantially decreased over the last decade, signaling progress toward gender equity in wages.

The following graph (Figure 2) illustrates the practical implications of the gender pay gap by showing how a woman's gross hourly wage might vary from 2013 to 2022, based on a reference gross hourly wage of €10 for men.

Figure 2: Hypothetical Gross Hourly Wage of Women in Europe (2013-2022) Based on GPG Data Compared to Men



Data source: Eurostat

Next, I sought to understand whether the gender pay gap values and the decreasing trend are common across the selected countries or if there are peculiarities among nations. Are there countries with particularly high or low levels? Are there countries where a decreasing trend is not observed?

The first representation is a heatmap that shows lower GPG values in blue and higher values in red, encapsulating all this information. It is evident that, excluding some countries, particularly Switzerland, Malta, Latvia, Poland, and Slovenia, the gender pay gap has decreased over time (in the heatmap, shades of blue dominate as you move to the right).

Figure 3: Gender Pay Gap (%) across European Countries

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Luxembourg	6.2	5.4	4.7	3.9	2.6	1.4	1.3	0.7	-0.2	-0.7
Italy	7.0	6.1	5.5	5.3	5.0	5.5	4.7	4.2	5.0	4.3
Romania	4.9	4.5	5.6	4.8	2.9	2.2	3.3	2.4	3.6	4.5
Belgium	7.5	6.6	6.4	6.0	5.8	5.8	5.8	5.3	5.0	5.0
Poland	7.1	7.7	7.3	7.1	7.0	8.5	6.5	4.5	6.2	7.8
Slovenia	6.3	7.0	8.2	8.1	8.4	9.3	7.9	3.1	3.8	8.2
Spain	17.8	14.9	14.1	14.8	13.5	11.9	9.4	8.9	8.7	8.7
Cyprus	14.9	14.2	13.2	12.3	11.2	10.4	10.1	10.1	10.2	10.2
Malta	9.7	10.6	10.7	11.6	13.2	13.0	11.6	10.0	10.5	10.2
Sweden	14.6	13.8	14.0	13.3	12.5	12.1	11.8	11.2	11.2	11.1
Lithuania	12.2	13.3	14.2	14.4	15.2	14.0	13.3	13.0	12.0	12.0
Europe	15.0	14.6	14.4	14.1	13.7	13.5	12.8	12.0	11.9	12.1
Portugal	13.3	14.9	16.0	13.9	10.8	8.9	10.9	11.4	11.8	12.5
Bulgaria	14.1	14.2	15.5	14.6	14.3	13.9	14.1	12.7	12.2	13.0
Netherlands	17.2	17.0	16.1	15.6	15.1	14.7	14.6	14.2	13.5	13.0
Denmark	16.5	16.0	15.1	15.1	14.8	14.6	14.0	13.9	14.2	13.9
France	15.5	15.5	15.6	15.9	16.3	16.7	16.2	15.6	14.7	13.9
Norway	15.5	14.5	16.0	14.5	13.7	13.2	13.2	13.4	14.3	14.4
Finland	18.8	18.4	17.5	17.5	17.1	16.9	16.6	16.7	16.5	15.5
Latvia	16.0	17.3	18.4	19.7	19.8	19.6	21.2	22.3	14.6	17.1
Hungary	18.4	15.1	14.0	14.0	15.9	14.2	18.2	17.2	17.3	17.5
Germany	22.1	22.3	21.8	21.1	20.4	20.1	19.2	18.3	17.6	17.7
Slovakia	18.8	19.7	19.7	19.2	20.1	19.8	18.4	15.8	16.6	17.7
Czechia	22.3	22.5	22.5	21.5	21.1	20.1	19.2	16.4	15.0	17.9
Switzerland	17.6	17.4	17.9	17.4	17.6	18.6	18.6	18.4	17.7	17.9
Estonia	29.8	28.1	26.7	24.8	24.9	21.8	21.7	21.1	20.5	21.3

Gender Pay Gap
-0.7 29.8

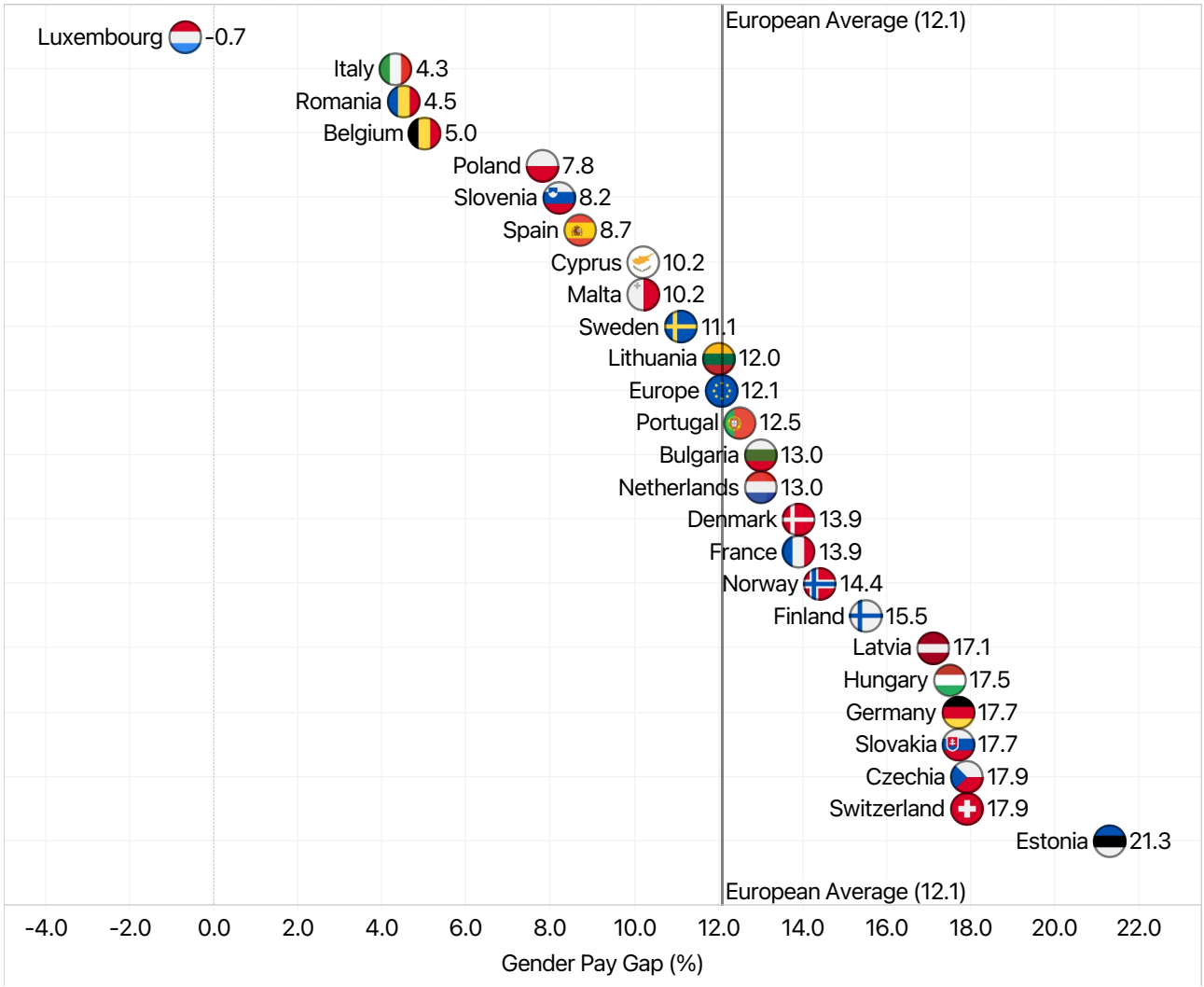
Data source: Eurostat

From the heatmap shown in figure 3, it is easy to observe how the GPG is significantly distributed across European nations (the colors gradually fade from top to bottom).

To visualize the gender pay gap levels of the nations in a specific year more explicitly, a second interactive graph was created. The countries are represented by their flags and are ordered so that those with the lowest gender pay gap are at the top. In 2022, Luxembourg is the country with the lowest gender pay gap, even recording a negative value (-0.7%), meaning women earn, on average, more than men! Italy ranks second, which is surprising: a GPG of 4.3% implies that, given a hypothetical gross hourly wage of €10 for a man, a woman earns on average €9.57, compared to the €8.79 of the European average.

Among all the visualizations, the one related to 2022 is the most interesting, as it's the most recent.

Figure 4: Gender Pay Gap (%) by Country in 2022



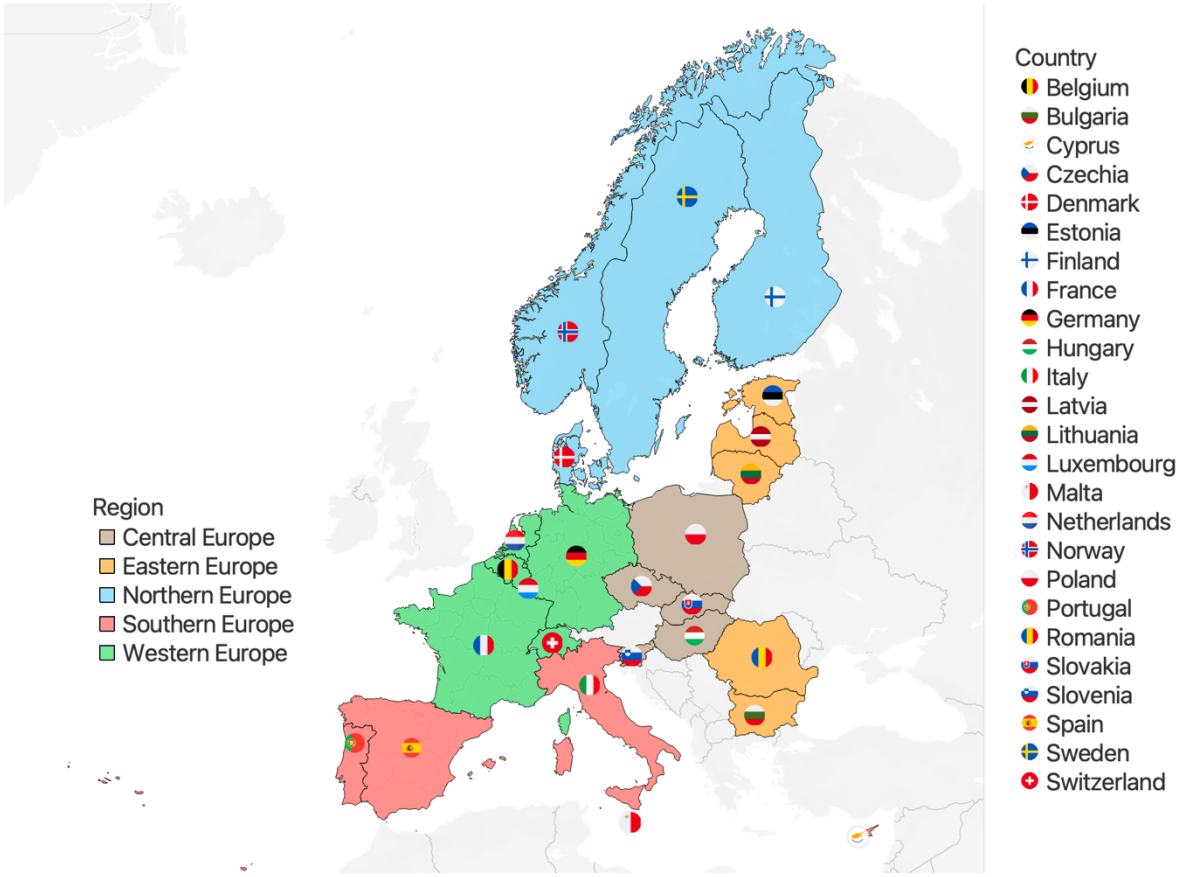
Data source: Eurostat

This graph allows for a quick identification of which countries exhibit better GPG levels compared to the European average (indicated by a vertical line) and which have a worse average.

The country with the highest gender pay gap in 2022 is Estonia, with a GPG of 21.3%, which means that the estimated wage, as mentioned earlier, would only be €7.83.

To understand whether there are geographical and cultural connections, I grouped the countries by their respective European regions, as shown in the map below.

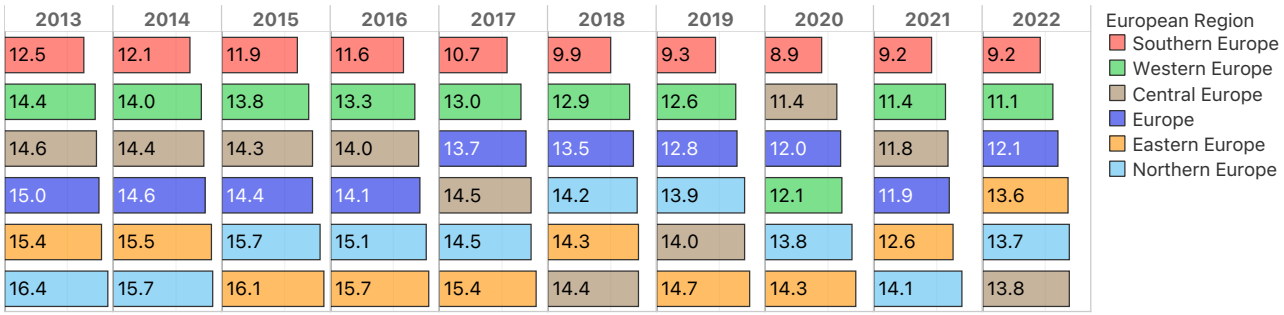
Figure 5: Geographical Division of Europe



This grouping was carried out not only based on geographical location but also considering cultural proximity. In particular, I divided Europe into five regions: Southern Europe (Italy, Spain, Portugal, Malta, Cyprus), Western Europe (Switzerland, France, Belgium, Netherlands, Luxembourg, Germany), Central Europe (Slovenia, Slovakia, Hungary, Poland, Czech Republic), Eastern Europe (Bulgaria, Romania, Estonia, Latvia, Lithuania), and Northern Europe (Denmark, Norway, Sweden, Finland).

Subsequently, I plotted the average values for each region and the overall average for Europe over time in a graph, ranking them from the best (with the lowest GPG) to the worst.

Figure 6: Gender Pay Gap (%) across Europe: Regions Ranked by GPG



Data source: Eurostat

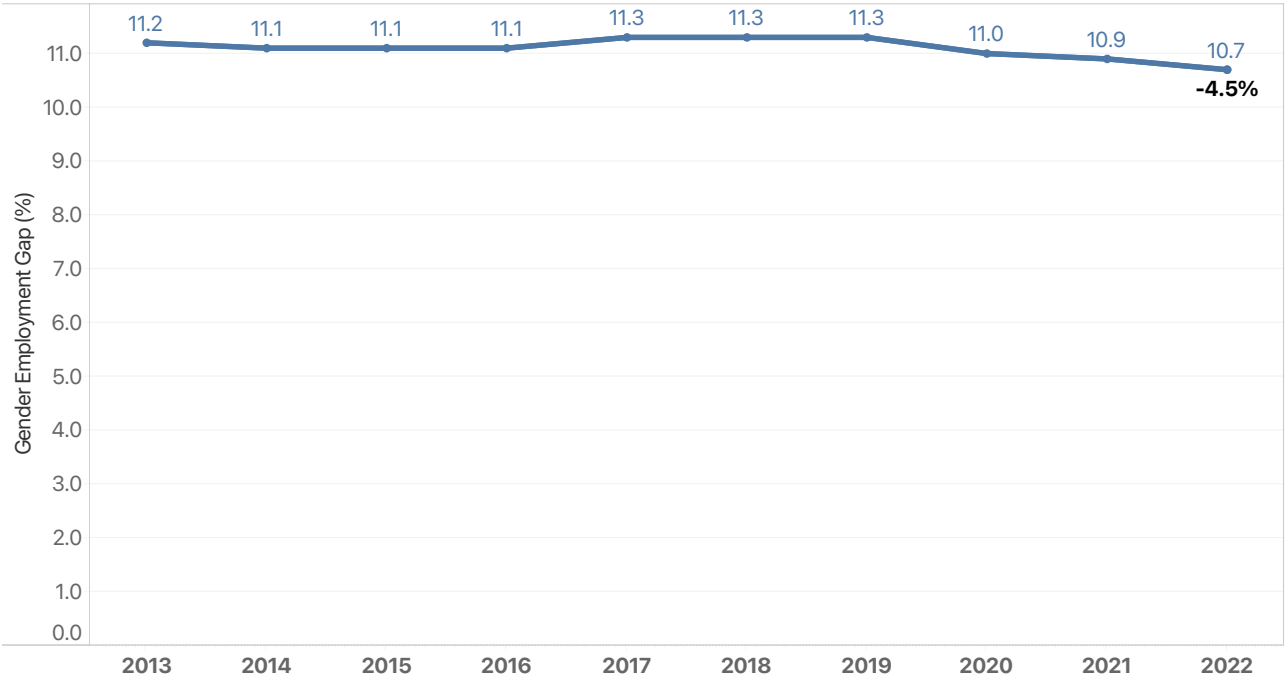
Interestingly, European regions alternate in ranking over the years, not showing a true geographical relationship with the data. However, Southern Europe represents a significant exception, recording the lowest gender pay gap values in each analyzed year, from 12.5% in 2013 to 9.2% in 2022. This insight will be particularly relevant when we analyze the gender employment gap.

Gender Employment Gap Dynamics

While analyzing the gender pay gap is certainly useful for understanding women's working conditions, it is not the whole picture. Another extremely important indicator is the gender employment gap (GEG), which expresses the difference in employment rates between men and women aged 20 to 64. A higher value indicates that there are significantly fewer working women compared to working men.

To begin, I visualized the trend of the GEG from 2013 to 2022. Similar to the gender pay gap, there has been a steady decrease: at the European level, the GEG decreased from 11.2% to 10.7%, reflecting a percentage reduction of 4.5% over the decade.

Figure 7: Gender Employment Gap (%) in Europe (2013-2022)



Data source: Eurostat

In this context, it can be observed that progress is being made at the European level, but at a very slow pace. Additionally, a decrease of just under 5% in the gender employment gap might merely reflect the need for more women to join the workforce, which does not necessarily correlate with an improvement in their overall conditions.

To organize all the information regarding the gender employment gap, I created a heatmap, as done before when analyzing the GPG.

Figure 8: Gender Employment Gap (%) across European Countries

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Lithuania	2.6	2.5	2.4	1.9	1.0	2.3	1.6	1.7	1.4	0.8
Finland	2.9	2.0	2.1	3.2	3.8	3.8	3.3	3.3	2.0	1.2
Estonia	5.2	6.5	6.3	6.8	4.9	6.0	6.0	4.4	3.7	2.9
Latvia	4.2	4.5	4.1	2.8	4.3	4.3	3.7	3.7	4.8	3.1
Denmark	6.3	7.4	7.8	6.9	6.7	7.0	7.2	7.0	6.9	5.4
Norway	3.5	4.0	3.5	2.6	3.0	3.9	3.8	3.4	4.8	5.7
Sweden	5.3	4.8	4.4	4.1	4.4	4.5	5.2	5.3	5.4	5.7
France	6.9	6.1	5.9	6.1	6.6	6.4	5.9	5.7	6.2	5.8
Portugal	6.1	6.5	6.4	6.2	7.1	6.5	6.8	5.6	5.7	5.8
Luxembourg	14.1	12.9	11.7	11.0	7.9	8.0	9.1	7.1	7.4	6.5
Slovenia	8.0	7.8	8.5	6.5	6.9	7.1	6.5	5.9	6.7	6.9
Bulgaria	5.4	5.8	6.3	6.8	7.6	7.7	8.1	8.3	8.4	7.5
Belgium	10.2	8.7	8.3	9.3	9.8	8.4	8.0	8.1	7.7	7.6
Germany	9.5	9.1	8.6	8.1	7.8	8.0	8.0	7.5	7.4	7.7
Netherlands	9.9	10.9	10.6	10.5	9.9	9.6	8.9	8.4	8.2	7.9
Switzerland	10.9	9.8	9.7	9.0	9.4	9.1	8.7	8.3	7.8	7.9
Slovakia	9.8	9.8	9.9	9.2	7.6	8.5	7.7	7.3	8.5	8.1
Hungary	8.1	9.4	9.6	9.7	11.1	10.7	11.0	11.2	10.6	9.8
Europe	11.2	11.1	11.1	11.1	11.3	11.3	11.3	11.0	10.9	10.7
Spain	9.6	10.2	11.2	11.5	11.9	12.1	11.9	11.4	10.8	11.2
Cyprus	10.4	7.7	8.3	9.7	9.5	10.4	11.6	12.0	12.2	12.1
Poland	13.7	13.6	13.0	13.4	14.0	13.8	14.6	14.8	13.9	12.9
Malta	28.6	26.8	26.8	25.5	24.1	22.3	22.0	18.9	17.6	13.3
Czechia	17.2	17.5	16.6	16.0	15.8	15.2	15.0	15.3	15.4	14.9
Romania	17.2	17.5	17.7	17.7	17.3	18.5	19.2	19.3	20.1	18.6
Italy	19.2	18.9	19.7	19.9	19.7	19.7	19.4	19.7	19.2	19.7

Gender Employme..
0.8 28.6

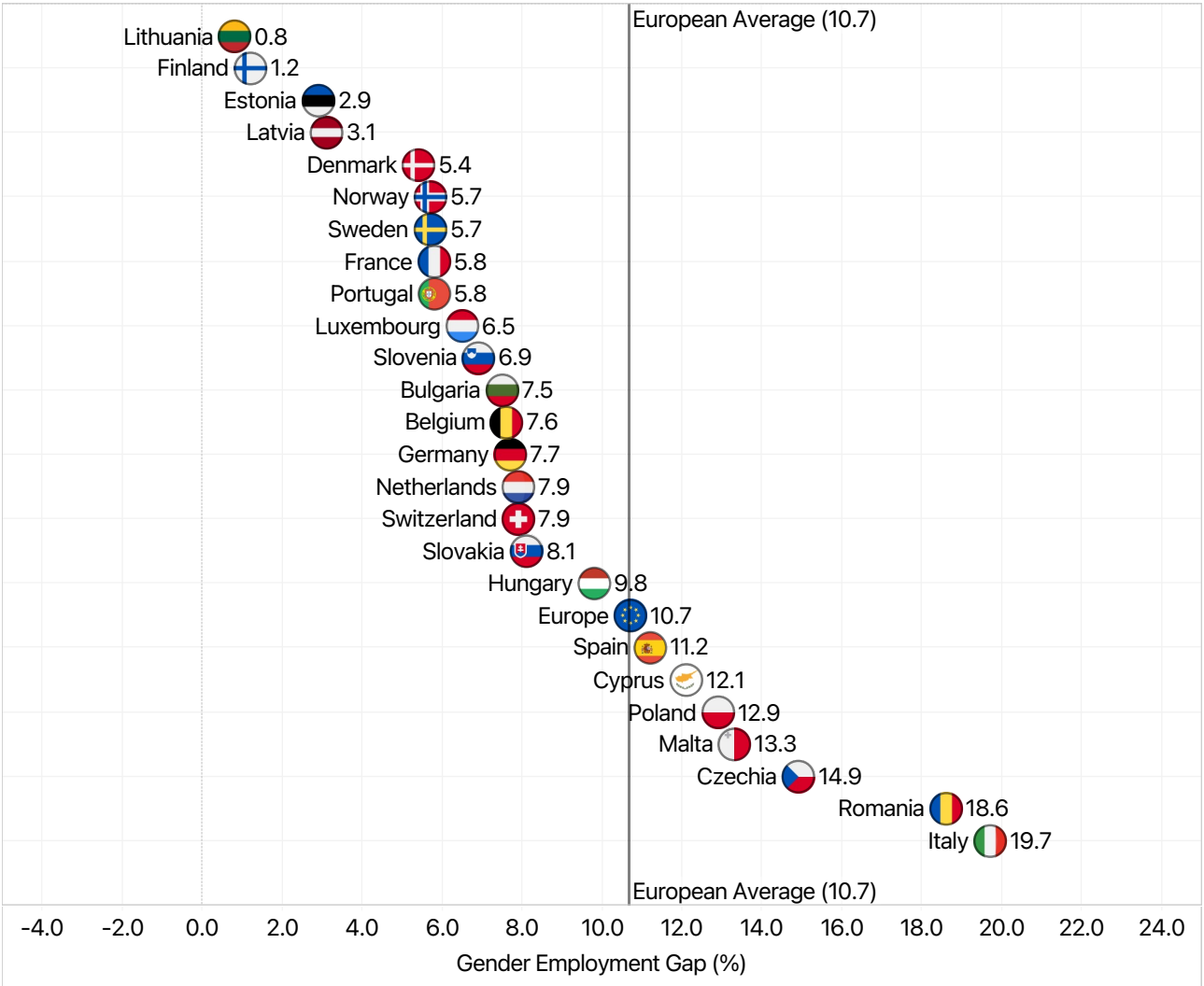
Data source: Eurostat

The heatmap for the gender employment gap shows a much less varied distribution of values compared to the gender pay gap. This representation clearly indicates that four countries stand out with significantly higher values than the average. These countries are Malta, the Czech Republic, Romania, and Italy.

Specifically, the heatmap reveals that most European countries exhibit average to low gender employment gap values, while the before mentioned countries demonstrate a greater disparity, highlighting a disadvantageous situation for women in the labor market. This trend suggests that, unlike other metrics, the gender employment gap may be influenced by specific national factors, warranting further investigation to understand the underlying reasons for these differences.

Subsequently, as done for the gender pay gap, I constructed a graph illustrating how gender employment gap values vary across different countries over the years. The countries are ordered so that those with the least gender disparity appear at the top, while those with the greatest disparity are positioned at the bottom.

Figure 9: Gender Employment Gap (%) by Country in 2022

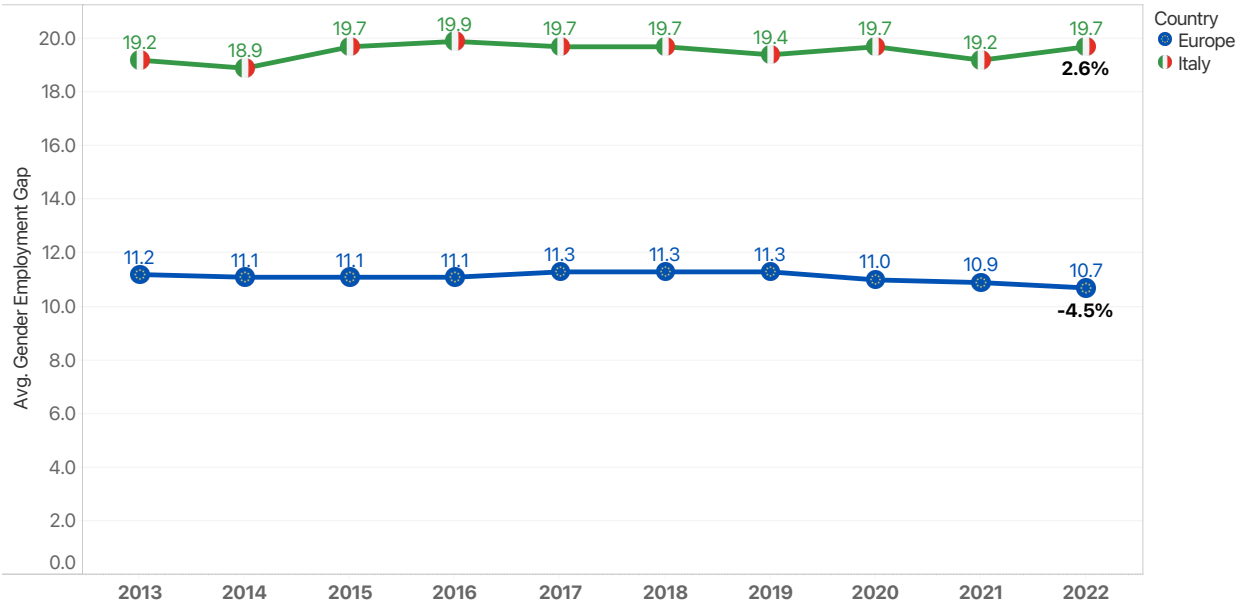


Data source: Eurostat

Again, it is striking to observe that Italy ranks as the worst country for female employment in 2022, especially considering that it is one of the best countries in terms of the gender pay gap for that same year.

Moreover, Italy not only exhibits the highest levels of the gender employment gap but has also seen an increase in recent years. Although this growth is relatively modest (2.6% in ten years), it contrasts with the European average, where the gender pay gap has decreased by 4.5%.

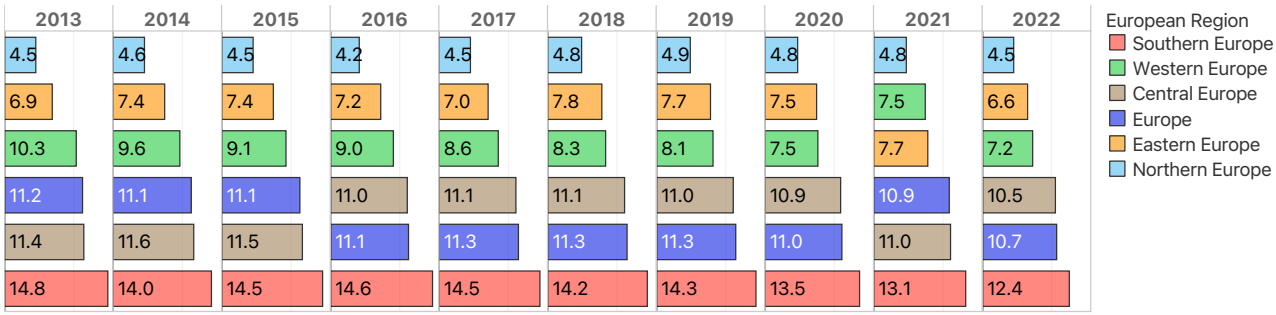
Figure 10: Gender Pay Gap (%) in Italy VS Europe Overall Values (2013-2022)



Data source: Eurostat

In general, what has been noted about Italy is also reflected in the southern European countries. The subsequent graph clearly shows that over the years, southern Europe consistently remains the region with the highest gap between male and female employment, while, as noted earlier, it is the region with the lowest gap regarding gross hourly pay.

Figure 11: Gender Employment Gap (%) across Europe: Regions Ranked by GEG



Data source: Eurostat

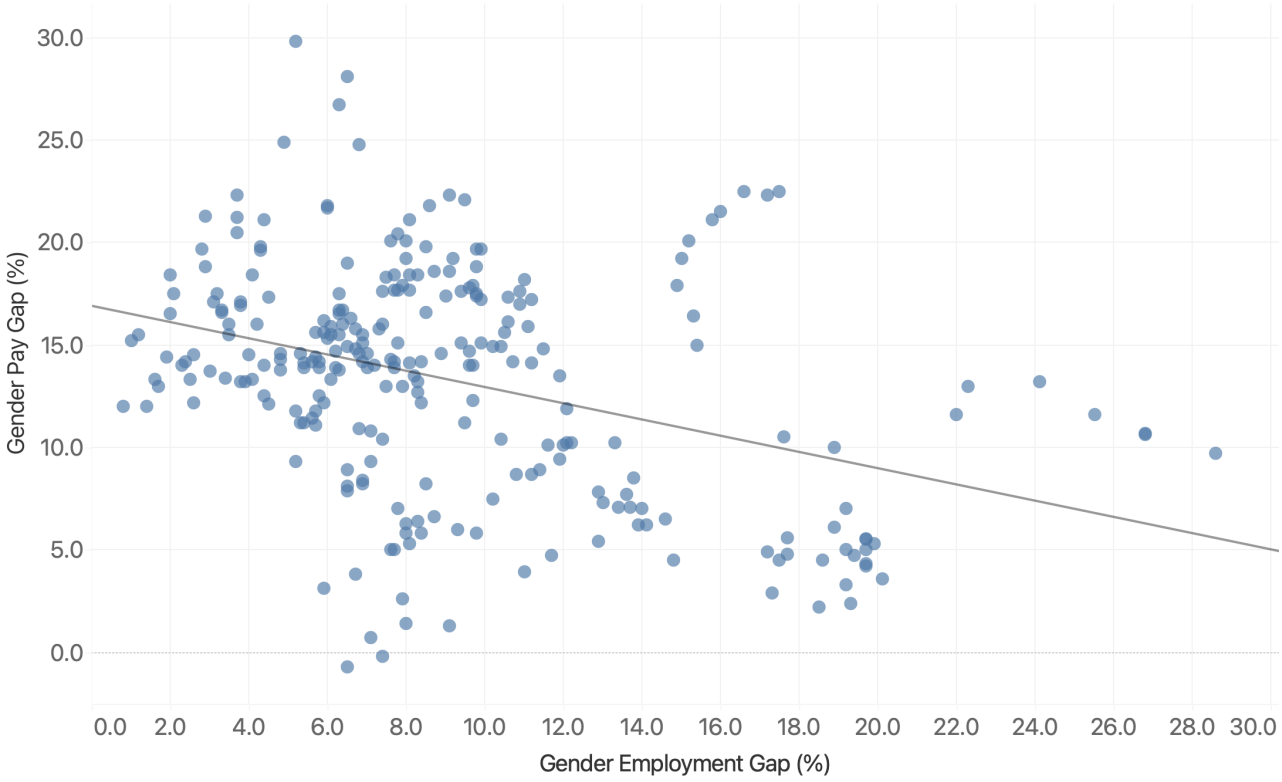
Analysis of the Relationship between Gender Pay Gap and Gender Employment Gap

After visualizing how the gender pay gap and employment gap have evolved over the years and how they vary across different countries, I aimed to explore any connection between these two variables.

Although it may seem counterintuitive, there appears to be an inverse association between the two metrics: in a country with a high Gender Pay Gap (GPG), we expect a low Gender Employment Gap (GEG) and vice versa.

This phenomenon can be visualized in a scatter plot that displays every combination of GPG and GEG values for the ten years considered and the 25 countries involved.

Figure 12: Relationship Between GPG and GEG



Data source: Eurostat

As can be observed, the trend line fitted to the observations has a negative slope, indicating that as one variable increases, the other tends to decrease.

In light of these results, the situation in Italy no longer seems so paradoxical, even though it undoubtedly represents an extreme case in this regard. However, it is important to emphasize that a graphical representation alone is insufficient to determine the magnitude and significance of the relationship. To achieve this, it is useful to fit a linear regression model to the data, the results of which are presented below.

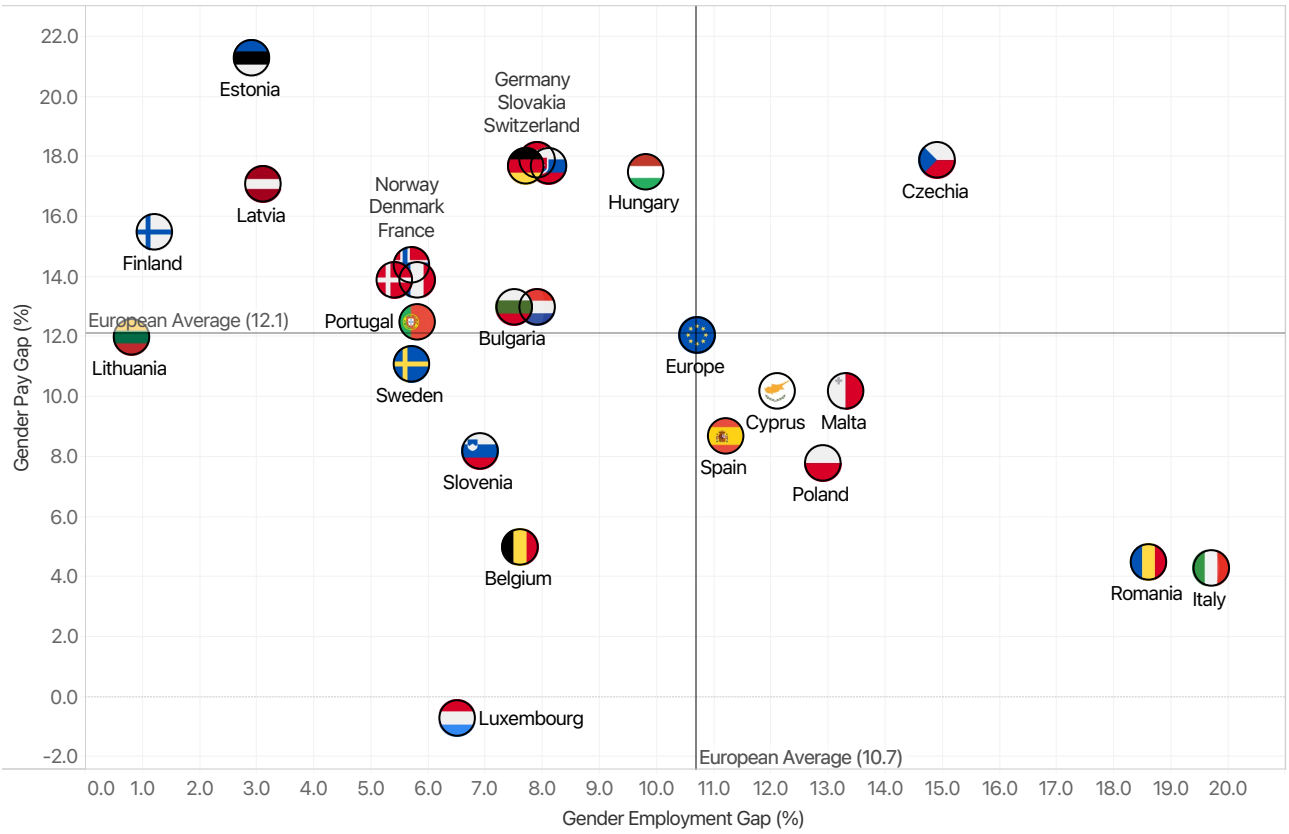
Figure 13: Linear Regression Results: Effect of Gender Employment Gap on Gender Pay Gap

Variables	Coefficients	Standard Error	t-value	p-value	Significance
Intercept	16.9087	0.6478	26.1037	< 0.0001	***
GEG	–0.3964	0.0615	–6.4444	< 0.0001	***

As hypothesized, there exists an inverse relationship between the two variables. The results of this regression indicate that for every 1% increase in the Gender Employment Gap, we expect a corresponding decrease of just under 0.4% in the Gender Pay Gap. Additionally, the regression results are supported by very small p-values, allowing us to conclude that the relationship is statistically significant.

Another approach to understanding the relationship between the two variables is to map the countries based on the most recent data recorded in 2022.

Figure 14: Relationship Between GPG and GEG Across European Nations in 2022



Data source: Eurostat

The graph displays various countries plotted according to their Gender Pay Gap (%) values on the y-axis and Gender Employment Gap (%) values on the x-axis. Additionally, two reference lines are included: a vertical line indicating the European average level of Employment Gap and a horizontal line representing that of Pay Gap. The intersection of these two lines creates four quadrants, allowing us to visualize countries with low Gender Pay Gap (GPG) and low Gender Employment Gap (GEG) in the bottom left quadrant, those with high GPG and high GEG in the top right, countries with low GPG but high GEG in the top left, and finally, countries with high GPG and low GEG in the bottom right quadrant. Here, "low" and "high" refer to values below and above the European average for that year, respectively.

One reason this inverse relationship may exist is that the dynamics related to the Gender Pay Gap and the Gender Employment Gap are certainly influenced by numerous socio-cultural, economic, and legislative factors. For instance, regulations related to labor, such as parental leave policies and measures to support female employment, can significantly impact women's participation in the labor market and the wages offered. In many nations, the presence of regulations promoting gender equality and family support can encourage greater female participation, helping to reduce both the Pay and Employment gaps. Conversely, in contexts where such regulations are lacking, there may be low female participation accompanied by a high Pay Gap.

Therefore, understanding these relationships requires a thorough analysis of public policies and social norms that influence the labor market. Only by considering the interaction of these variables can we hope to outline effective strategies to address gender inequalities in the workplace.

Gender Pay Gap in Economic Sectors

The final part of this analysis focuses on the gender pay gap within different economic sectors, aiming to assess whether the Gender Pay Gap (GPG) is distributed uniformly or if there are sectors where the disparity is particularly pronounced.

The heatmap below illustrates the variation of the GPG across various sectors over the past few years.

Figure 15: Gender Pay Gap (%) Across Economic Sectors (2013-2022)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Transportation and storage	4.4	4.3	3.2	3.4	3.8	3.4	3.2	2.8	3.5	2.8
Accommodation and food service activities	11.0	10.7	10.9	11.2	10.3	9.8	9.6	9.5	8.8	9.5
Education	11.3	10.5	10.5	10.5	10.4	11.0	11.1	10.6	10.6	10.5
Manifacturing	20.4	19.8	19.2	18.9	18.6	18.3	17.9	17.3	17.0	16.7
Human Health and Social Work	19.6	19.0	19.2	18.4	18.1	18.1	17.1	16.9	17.1	16.8
Arts, entertainment and recreation	19.1	18.9	19.6	19.0	18.3	17.1	18.0	17.7	16.9	17.4
Professional, scientific and technical activities	19.4	19.3	19.3	18.8	19.6	19.1	18.5	18.1	18.0	18.0
Information and communication	19.4	18.7	19.0	19.1	19.6	19.3	19.8	19.4	19.0	19.1
Financial and Insurance	29.5	29.0	27.9	27.6	27.6	27.0	26.6	26.6	26.0	25.6

Gender Pay Gap
2.8 29.5

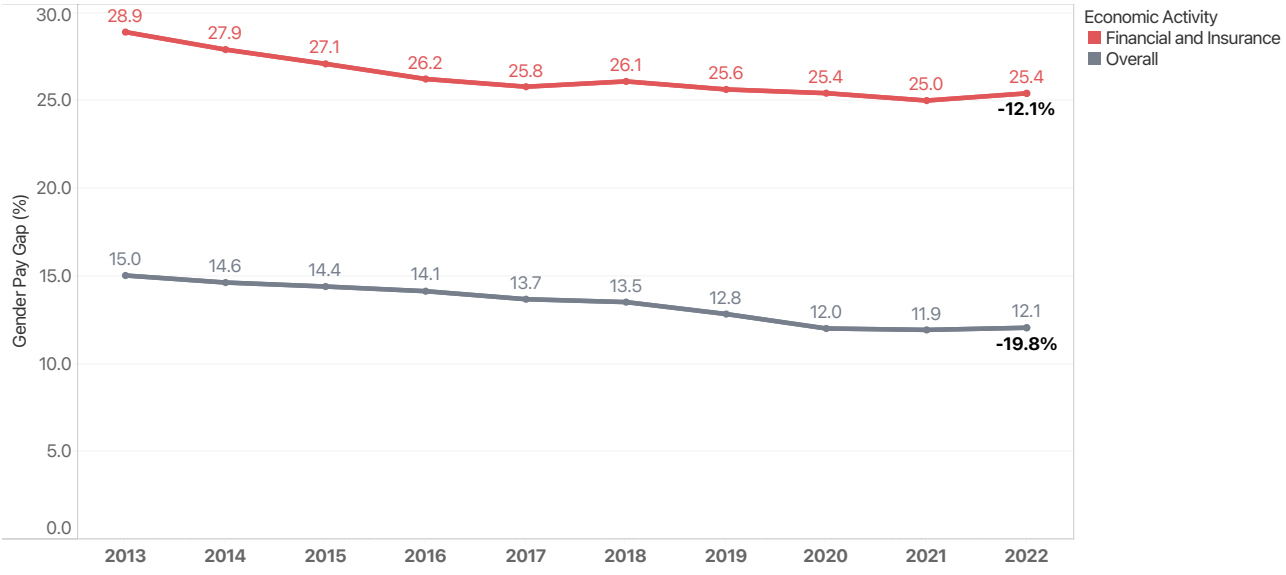
Data source: Eurostat

A general trend towards reducing wage disparity is observed in most sectors. This trend reflects the overall European aggregate.

However, differences between sectors are still significant. Among the various sectors, "Transportation and Storage" emerges as having the lowest GPG each year from 2013 to 2022. In contrast, the "Financial and Insurance" sector reports one of the highest wage disparities, with a GPG that, despite decreasing since 2013, remains at 25.6% in 2022.

The next graph focuses on the financial sector, showing how it significantly deviates from the overall average.

Figure 16: Gender Pay Gap (%) in the Financial Sector VS Overall



Data source: Eurostat

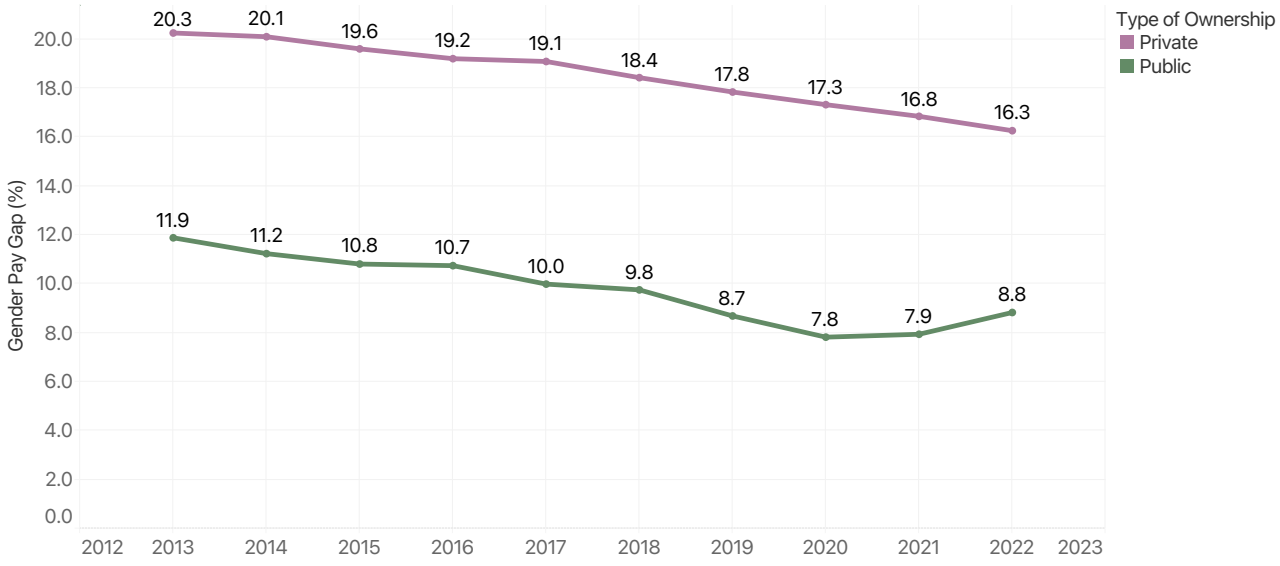
In fact, the GPG in the financial sector is more than double the general average (25.4% compared to 12.1% in 2022), and its reduction trend is less pronounced. While the aggregate GPG has decreased by 19.8%% over the past decade, the reduction in the financial sector has only been 12.1% (going from a level of 28.9% in 2013 to 25.4% in 2022).

This data highlights that, despite progress, the financial sector remains one of the most affected by the gender gap. Factors that may explain this persistence include the prevalence of men in leadership positions and the challenges women face in career advancement.

Analyzing sectoral differences, it is evident that various economic areas respond differently to policies promoting gender equity.

In this regard, a significant difference can be observed between the public and private sectors.

Figure 17: Gender Pay Gap (%) by Ownership Type (2013-2022)



Data source: Eurostat

Programs and regulations aimed at promoting wage equality seem to have had a more significant impact in publicly owned companies, where the GPG has decreased from 11.9% in 2013 to 8.8% in 2022. In contrast, the private sector continues to record GPG levels above the European average (16.3% in 2022). This suggests that wage equity policies have been more successful in public sectors, likely due to greater regulation and salary control, while the private sector may require further interventions and specific measures to effectively reduce the gender wage disparity.

Conclusion

In summary, the analysis of the gender pay gap and gender employment gap in Europe from 2013 to 2022 reveals a complex and varied landscape. Despite slow but steady progress in reducing the wage gap, gender disparities continue to persist across different economic sectors and countries.

Measures implemented to promote gender equality, such as gender quotas, have the potential to enhance female representation, but it is essential that they are accompanied by broader policies addressing the structural roots of inequality. The data analysis shows that while some countries, like Luxembourg, are making significant strides, others, such as Italy, face substantial challenges, highlighting the importance of considering the specific cultural and regulatory context of each nation.

The inverse relationship between the gender pay gap and gender employment gap suggests that progress in one area does not always translate to the other, emphasizing the need for an integrated approach. Policymakers and businesses

must develop coordinated strategies to tackle gender disparities, ensuring that women not only enter the workforce but are also equitably compensated for their contributions.

Finally, the sectoral analysis indicates that while some sectors are witnessing a reduction in wage disparities, others, such as the financial sector, require more targeted interventions. Only through ongoing and concerted efforts we can hope to achieve true gender equity in the workplace.