

Exploring the Impact of the Covid-19 Pandemic on the Gender Pay Gap: Variations Across Industries in the United Kingdom

Author: Daan Jan Willem Dekker
University of Twente
P.O. Box 217, 7500AE Enschede
The Netherlands

28-06-2023

ABSTRACT,

This exploratory study investigates the impact of the Covid-19 pandemic on the gender pay gap within the United Kingdom, specifically focusing on variations across industries predominantly occupied by men or women. Utilizing self-reported data on the gender pay gap from employers with over 250 employees, the study aims to analyze the extent and nature of the gender pay gap during the pandemic. Employing exploratory data analysis techniques, the research examines trends and patterns within the gender pay gap, providing insights into its variations across different industries. By narrowing the scope to the gender pay gap analysis, this study contributes to the existing literature and enhances our understanding of the effects of the pandemic on gender wage disparities within the UK workforce. These findings can serve as a valuable reference for further research and discussions surrounding gender pay gaps, potentially informing future policy discussions and initiatives aimed at reducing gender wage disparities.

Graduation Committee members:

Maximilian Goethner

Igors Skute

Keywords

Covid-19, gender pay gap, United Kingdom, exploratory data analysis, industry variations, wage disparities,

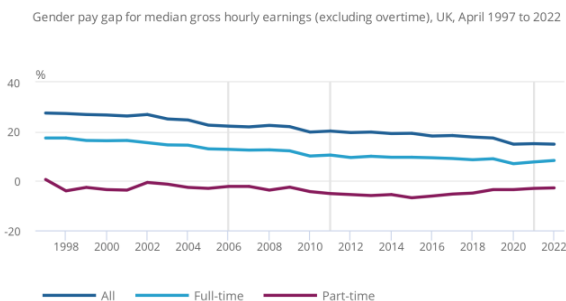
This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.



1. INTRODUCTION

The gender pay gap is a perennial feature of labor markets across the globe. While the gap has decreased since many countries have passed minimum wage laws and laws mandating equal treatment of women at the workplace, gender wage differential remains an element of the labor markets all over the world. This bachelor thesis is based around the UK where the pay gap has decreased since the introduction of the equal pay act in 1975. This Equal pay act prohibits any less favorable treatment between men and women in terms of pay and conditions of employment. The gender pay gap of full-time is now at its narrowest since the Equal Pay Act came into force in 1975. At that time, the pay gap between men's and women's average hourly earnings in full-time employment was 28.7 percent compared with 12.0 percent in 2006. (ONS, 2008) In 2021, the gap amongst full-time employees was 7.9%, up from 7.0% in the 2020s. In 2022, the gap among full-time employees increased to 8.3%, up from 7.7% in 2021. This is still below the gap of 9.0% before the coronavirus pandemic in 2019 (ONS, 2022). Estimates for 2020 and 2021 are subject to more uncertainty than usual therefore the ONS recommends looking at the longer-term trend. These percentages are the difference between men's and women's hourly earnings as a percentage of men's hourly earnings.

Figure 1. The gender pay gap has been declining slowly over time, falling approximately a quarter over the last decade



Note. Gender pay gap for median gross hourly earnings (excluding overtime), UK, April 1997 to 2022

Source: Office for National Statistics – Annual Survey of Hours and Earnings (ASHE)

This is calculated from the Annual survey of hours and Earnings or ASHE which samples from all employee jobs in all sizes of company. The Office of National Statistics uses a different method of calculating the gender wage gap than the EU. Which uses the Structure of earnings survey, abbreviated as SES, in which they report the unadjusted gender wage gap. In 2015 the gender pay gap in the UK was significantly larger compared to some other developed countries. The unadjusted gender wage gap for the UK was 20.59%. That is still relatively high compared to other developed countries. (ONS, 2022) This is the reason why this thesis focuses on the UK.

As previously mentioned the gender pay gap has been decreasing since 1975. To increase the transparency and hopefully close the gender pay gap further the UK government decided to make reporting the pay difference between men & women mandatory for employers with 250 or more employees. The ASHE gender pay gap analysis is different from the gender pay gap based on compulsory reporting.

There are a lot of factors that influence the gender pay gap. Part-time vs full-time, skill requirement for the job etc. The gap has been decreasing but the Covid-19 pandemic has disrupted the national labor market and its economic impact is still felt throughout the world. Besides the economic impact it had on the world, the Covid-19 pandemic also had a major social impact on the world, including the potential worsening of the gender pay gap.

Across the globe the coronavirus has had a major impact on the labor market and the global economy. Business dealt with a decrease in the demand and production, and a lot of employees were forced to work from home or lost their jobs. The impact of Covid-19 on the labor market differs significantly between men and women, with women being disproportionately affected. (Singh et al., 2022). This is because women are overrepresented in sectors that were hit the hardest by the pandemic. Sectors like the catering industry, retail and the travel industry (Alon et al., 2020). In addition women often face perilous working conditions such as flex contracts, part time jobs and low wage jobs, which has put them at more risk of losing their jobs during the pandemic.

In the UK, women have also been hit the hardest by the pandemic. A study from 2021 showed that working women in the UK have dropped by 2.4% whilst working men have only dropped by 0.5% (ONS, 2021). This has led to an increase in the gender gap on the labor market, because women lost their jobs or had to work less hours than men according to the ONS (2021). In addition to that, women more often than men had to take on the care duties within the household because of the closing of schools, day care centers and child care centers, which meant that women had to work less hours or had to quit their jobs entirely to take care of their family (Alon et al., 2020).

Conducting further research on the impact of the COVID-19 pandemic on the labor market, particularly in relation to the gender pay gap, holds significant importance. This line of inquiry allows for a deeper understanding of the underlying reasons and dynamics shaping the gender pay gap during the Covid-19 pandemic. Analyzing self-reported data provided to the government facilitates the exploration of whether the pandemic has exacerbated or altered pre-existing gender pay disparities. Furthermore, this research endeavors to identify unique contributing factors such as specific industry sectors or the disproportionate impact on female dominated industries.

2. THEORETICAL FRAMEWORK

2.1 The Gender Pay Gap

The gender pay gap is the difference in pay between men and women expressed as a percentage of men's pay. If the pay gap between men and women is 15%, women earn 15% less on average than men. Gender pay gaps can be positive or negative, with a negative gender pay gap implying that women earn more than men on average. Gender pay gaps are an important part of analyzing and tracking equal pay progress both nationally and within organizations. While the general definition of the pay gap between men and women is widely accepted, the precise measurement varies. The Office for National Statistics calculates the gender pay gap as the difference between average hourly earnings (excluding overtime) of men and women as a proportion of average hourly earnings (excluding overtime) of men's earnings. (White, 2022)

In the UK, since the Equal Pay Act was enacted 47 years ago, there has been steady progress toward gender equality in paid employment. Although equal pay has a relatively short legislative history, both in the UK and globally, the idea that women should be paid equally for work of equal value to that of the opposite sex has much older foundations. The Sex Disqualification (Removal) Act, which went into effect in 1919, was the first piece of gender-specific employment legislation, making it illegal for women to be denied access to a variety of professions and vocations based on their sex or marriage. Although equal rights advocates applauded the legislation, its practical effects were minimal. Significant measures of recourse were not discussed, legislated, or implemented until the post-war period. Despite advances in Europe and around the world, the United Kingdom took its time developing and implementing equal pay legislation that met international and European employment standards. While the Conservative Government implemented equal pay for "like work" in the non-industrial Civil Service in 1955, it took the UK 19 years to ratify the ILO Convention and thus be legally bound by its provisions. In 1970, the labor government finally made equal pay a legal requirement. Given the widespread use of separate pay scales for men and women in companies in the UK at the time, it was decided that the Act would not go into effect until 1975. The Equality Act 2010 (Gender Pay Gap Information) Regulations 2017 which came into force on April 6 2017 require all organizations that employ more than 250 people to report on their gender pay gap on an annual basis. The overarching goal of the Equality Act 2010's equal pay provisions is to require equal pay and other contractual terms for men and women in the workplace. The stated goal of the gender pay gap reporting legislation is to increase pay transparency.

2.2 Covid-19-pandemic

The Covid-19 pandemic has had a deep impact on the world on almost every aspect of society. The virus first showed up in

Wuhan, China in December of 2019 and spread quickly throughout the world, which led to a global health crisis.

The pandemic heavily influenced the economy and labor markets of most countries. Governments had to take drastic measures like closing down businesses and putting in lockdowns to stop the spread of the virus which led to worldwide economic collapse and major unemployment numbers across the world. In the UK the pandemic led to a historical economic decline of 9,9% in 2020, the largest decline since the great frost of 1709 (ONS,2021). The labor market was hit hard by the pandemic which hit its peak in unemployment in December of 2020 with 5,1% (ONS,2021). However the unemployment rate has been decreasing since the end of covid-19 (ONS,2022)

Another effect of the pandemic on the labor market is the decrease in equality between employees with different skill sets, gender and education level. Highly skilled workers had the possibility to work from home whilst low skilled workers were overrepresented in sectors that were hit harder by the covid-19 pandemic. Which has led to increased inequality in opportunities and income for employees with different backgrounds and made the traditional work structure vulnerable (Daly et al., 2020).

2.3 The effect of Covid-19 pandemic on gender inequalities

The Covid-19 pandemic has had a significant impact on the global economy, but in contrast to the Global financial crisis (GFC) the Covid-19 crisis has had a disproportionate impact on the labor market for women. In almost all G20 nations, where there is data available, women have had a larger decrease in employment and total hours worked on average than men (OECD & ILO, 2020). A report by the ILO (2022) estimated that globally, the total working hours between the fourth quarter of 2019 and the second quarter of 2020 decreased by 14%. This comes down to almost 400 million full time jobs if you take into account a 48 hour work week. For the G20 economies this was also estimated to be 14% which is about 265 million full time jobs. For a lot of men and women this decrease in worked hours also came with increased unpaid care work because of the closure of a lot of schools and daycare centers, the decrease in public services for people with disabilities and elderly, the non-availability of household staff and the need to care of family members with Covid-19.

Women have disproportionately borne the brunt of the economic and social consequences of the COVID-19 crisis. They have been extensively employed in essential roles within the healthcare and caregiving sectors, experiencing a disproportionate amount of job losses and reduced working hours. (OECD & ILO, 2020)

Recent research conducted by Singh et al. (2022) shed light on the consequences of the pandemic on labor market outcomes, specifically highlighting the challenges faced in terms of gender disparities in employment and wages.

In a study conducted by Reichelt et al. (2020), significant gender disparities in the labor market were uncovered. The research revealed that women experience more pronounced challenges compared to men, including a higher likelihood of working from home, reducing working hours, and facing unemployment. Notably, the disparities in unemployment probabilities were largely attributed to women's pre-existing employment situations, such as their higher prevalence of working part-time. However, when controlling for individual and employment characteristics, the study found that the risks of unemployment between men and women were not substantially different, indicating potential underlying mechanisms contributing to emerging gender inequalities in the labor market.

Furthermore, the study highlighted that women faced a greater risk of transitioning to unemployment in Germany and Singapore, while they were more likely to reduce working hours or transition to remote work in the United States. These findings suggest that gender differences in labor market outcomes, such as transitioning to unemployment or adjusting working hours, are influenced by various factors, including specific occupations, industries, and national contexts, which they were not able to control for. The study emphasizes the importance of considering these nuanced aspects to comprehensively understand the complexities of gender disparities in the labor market.

Doorley et al. (2022) highlight findings from their study conducted in Ireland, which shed light on the nuanced impact of the pandemic on employment and wages, specifically with regards to gender disparities. According to their research, the overall market income experienced a similar relative decrease for both men and women, resulting in a stable gender gap of 40% in market incomes. However, an interesting shift was observed in the composition of this income gap, particularly related to occupational segregation.

The study reveals that prior to the pandemic, occupational segregation played a significant role in perpetuating the gender income gap, as men were disproportionately concentrated in higher-paying occupations and industries. This pattern reflected traditional gender stereotypes and limited opportunities for women in certain sectors. However, the dynamics changed during the pandemic, driven by the structure of job losses and earnings declines. (Doorley et al., 2022)

Notably, the current occupational and industry structure in Ireland appears to favor women in terms of earnings. This shift has led to women gaining an earnings advantage compared to men. While labor supply and wage gaps have remained relatively stable as contributors to the income gap, the reversal in the impact of occupational segregation has become a noteworthy factor in understanding the evolving landscape of gender income inequality.

The study conducted by Doorley et al. (2022) brings attention to the variations observed in labor markets and the consequences of economic lockdowns across different countries. Notably, Ireland stood out among the countries examined as one where men experienced a higher degree of employment loss compared to women during the pandemic. A careful analysis of the data revealed that this gender disparity in employment decline can be attributed to occupational sorting.

During the pandemic, women in Ireland were found to be overrepresented in sectors deemed essential, which resulted in comparatively smaller reductions in their employment levels as compared to men. This finding highlights the role of occupational sorting in shaping the differential impact of the pandemic on employment outcomes between genders.

These insights underscore the importance of considering country-specific contexts and factors such as occupational distribution when examining the effects of economic crises on labor markets.

While Covid-19 seems to have had a positive effect for women on the labor market opportunities in Ireland, research suggest that that women were more negatively affected in the UK. Dang and Nguyen (2021) found that in the context of the United Kingdom, women were more likely to experience temporary job loss compared to men. Furthermore, both in the United Kingdom and the United States, women faced greater decreases in their weekly expenses compared to men.

3. METHODOLOGY

3.1 Research questions

To achieve the research objective of understanding the impact of Covid-19 on the gender pay gap in the UK the research design will be exploratory data analysis as mentioned in the research design. This approach will enable a comprehensive examination and interpretation of the available data to identify patterns, trends, and relationships related to the gender pay gap during the pandemic. The following research questions will guide the data analysis:

- I. How has the gender pay gap in the UK changed over time and specifically before, during and after the pandemic?

By analyzing the historical data this question aims to identify any trends or significant shifts in the gender pay gap and determine whether the pandemic has influenced these patterns

- II. Are there any noticeable differences in the gender pay gap between industries predominantly employing women and industries predominantly employing men?

The analysis will focus on comparing the gender pay gap across different industries to identify noticeable variations and potential factors that are contributing to the differences in the gender pay gap

3.2 Research design & data analysis

The purpose of this research is to gain insight on how the Covid-19 pandemic has affected the gender pay gap in the UK. The overall research design of this thesis consists of exploratory data analysis. To address the research questions laid out in this thesis, various statistical and graphical techniques will be employed during the exploratory data analysis. The analysis will include summary statistics such as the mean difference in hourly pay across all industries and in a specific industry. Additionally, visualizations such as line graphs and histograms will be created to visualize the distribution and changes in the gender pay gap over time.

In this analysis, a specific threshold of 70% is incorporated to establish whether an industry can be classified as male or female dominated. This predetermined cut-off serves as a guiding principle to analyze gender representation within sectors. By utilizing the 70% threshold, the research aims to identify industries where one gender comprises a substantial majority of the workforce, thus uncovering potential gender imbalances and disparities inherent in specific fields.

The rationale behind employing a 70% cut-off is rooted in several factors. Firstly, it offers a clear and easily comprehensible criterion for industry classification. This standardized threshold allows for consistent and comparable categorization across

diverse sectors, facilitating efficient assessments of prevailing gender compositions.

Furthermore, the 70% cut-off aligns with statistical significance within binary contexts. It denotes a significant majority and signifies notable gender disparities within an industry. By employing this threshold, the study acknowledges the importance of addressing sectors where one gender overwhelmingly dominates, thus drawing attention to potential inequities and emphasizing the need for promoting enhanced gender diversity.

Additionally, the 70% cut-off acknowledges the presence of occupational segregation and gender biases, contributing to concentrated gender imbalances. Industries surpassing the 70% threshold for a particular gender often reflect historical, social, or cultural influences that have shaped occupational preferences and opportunities. By incorporating this cut-off, the analysis endeavors to shed light on such imbalances, fostering a deeper understanding of underlying factors and encouraging actions to foster greater gender equality.

It is imperative to note that the 70% cut-off does not seek to oversimplify or disregard the intricate nature of gender dynamics within industries. Rather, it serves as an initial reference point for identifying sectors exhibiting pronounced gender disparities. This paves the way for focused investigations into the drivers of gender representation and the formulation of targeted strategies to promote inclusivity and equality.

3.3 Data Collection

The data collection in this research involved obtaining and utilizing a dataset and various different reports. The primary source of data in this research is the mandatory gender pay gap data. This refers to the data that companies in the United Kingdom are legally required to provide regarding the gender pay gap. Under current legislation, companies with more than 250 employees are obligated to submit annual data that display the disparities in pay based on gender within their organization.

The reported data includes the percentages of men and women in each hourly earnings quartile, the average gender pay gap by hourly earnings, the median gender pay gap by hourly earnings, the percentage of men and women receiving bonus payments, the average gender pay gap based on bonus payments, and the median gender pay gap based on bonus payments. It also includes SIC which is used to classify industries.

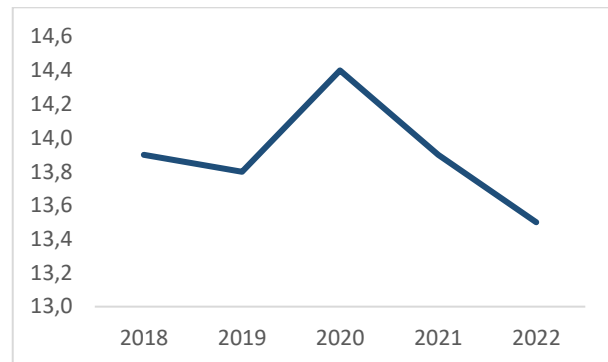
The use of mandatory reporting data in this study provides a valuable source of information to examine the impact of the Covid-19 pandemic on the gender pay gap. By analyzing this data and comparing it with other sources and reports, patterns and trends are identified, shedding light on how the pandemic has influenced gender-related wage disparities.

The decision to incorporate this specific dataset was driven by its credibility, relevance to the research topic, and availability. By analyzing the self-reported data this study aims to investigate the impact of the Covid-19 pandemic on the gender pay gap in the United Kingdom.

4. FINDINGS

4.1 Gender pay gap self-reported data

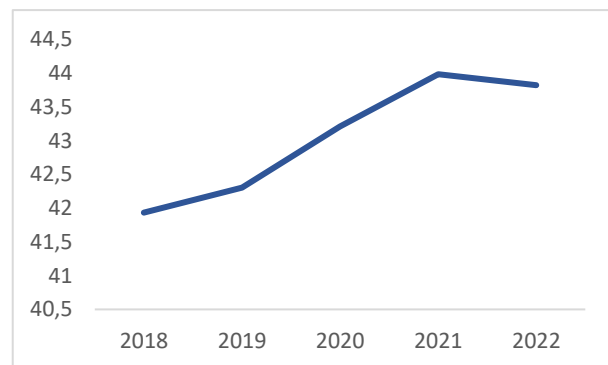
Figure 2. The mean gender pay gap from 2018-2022.



Note. . The mean gender pay gap for all industries for the self-reported 2018-2022 in percentages.

The chart presents the gender pay gap over a span of five years, from 2018 to 2022. The reported data reveals variations in the pay gap percentages between men and women. In 2018, men were found to make approximately 13.9% more than women. The following year, in 2019, the pay gap slightly decreased to 13.8%. However, in 2020, the gap increased to 14.4%, indicating a widening disparity. In 2021, the gap reverted to 13.9%, aligning with the figure from 2018. Finally, by 2022, the gap further decreased to 13.5%, indicating a slight improvement in pay equality between genders. It appears that there is no significant trend in the gender pay gap over the five-year period from 2018 to 2022. The variations observed in the reported data do not follow a consistent pattern of increase or decrease. While there are fluctuations in the percentages, they are relatively small and do not demonstrate a clear trajectory.

Figure 3. Percentage of female workers from 2018 -2022



Note. This chart represents the percentage of female workers through the years 2018 to 2022

The findings from Figure 3 depict the percentage of female workers in the years 2018 to 2022. The data shows a gradual increase in the representation of women in the workforce over the analyzed period.

In 2018, the percentage of female workers stood at 41.93%. This figure experienced a slight increase in 2019, reaching 42.30%. The upward trend continued in 2020, with the female percentage rising to 43.21%. The following year, 2021, witnessed a further increase to 43.98%. Lastly, in 2022, the female representation remained relatively stable at 43.82%.

4.2 Mean pay gap per Industry

Table 1. The mean gender pay gap per industry

<i>Industries</i>	2018	2019	2020	2021	2022	<i>Female Workforce</i>	<i>N</i>
A AGRICULTURE, FORESTRY AND FISHING	11,42	13,48	12,21	9,93	12,74	31,2	138
B MINING AND QUARRYING	22,34	22,6	21,35	23,26	19,11	16,9	150
C MANUFACTURING	13,02	12,47	11,89	12,38	10,57	25,1	4542
D ELECTRICITY, GAS, STEAM AND AIR CONDITIONING SUPPLY	14,09	13,35	13,74	13,4	13,6	23,8	196
E WATER SUPPLY; SEWERAGE, WASTE MANAGEMENT AND REMEDIATION ACTIVITIES	8,99	9,58	13,29	9,52	7,08	27,1	157
F CONSTRUCTION	21,91	21,7	19,53	20,73	18,42	19,4	800
G WHOLESALE AND RETAIL TRADE; REPAIR OF MOTOR VEHICLES AND MOTORCYCLES	13,88	13,79	13,99	13,44	12,88	43,4	2890
H TRANSPORTATION AND STORAGE	9,26	10,12	10,3	8,57	8,85	19,5	1337
I ACCOMMODATION AND FOOD SERVICE ACTIVITIES	7,68	6,71	7,06	8,98	7,98	49,6	1859
J INFORMATION AND COMMUNICATION	19,23	19,34	18,76	18,09	17,9	32,7	1569
K FINANCIAL AND INSURANCE ACTIVITIES	26,43	26,74	26,93	25,3	24,66	45,1	1648
L REAL ESTATE ACTIVITIES	15,42	16,08	16,86	14,15	15,36	46,3	450
M PROFESSIONAL, SCIENTIFIC AND TECHNICAL ACTIVITIES	18,89	19,21	20,08	18,8	18,65	44,2	2754
N ADMINISTRATIVE AND SUPPORT SERVICE ACTIVITIES	11,51	10,7	10,71	10,99	10,16	44,0	4723
O PUBLIC ADMINISTRATION AND DEFENCE; COMPULSORY SOCIAL SECURITY	9,85	10,63	11,08	8,46	10,26	46,1	164
P EDUCATION	11,22	11,75	15,76	16,77	16,92	72,5	1580
Q HUMAN HEALTH AND SOCIAL WORK ACTIVITIES	6,59	7,53	8,57	7,33	7,81	76,9	2338
R ARTS, ENTERTAINMENT AND RECREATION	22,89	22,84	17,45	22,33	25,83	43,6	903
S OTHER SERVICE ACTIVITIES	12,54	12,51	11,51	13,22	13,37	51,5	935
T ACTIVITIES OF HOUSEHOLDS AS EMPLOYERS; UNDIFFERENTIATED GOODS- AND SERVICES-PRODUCING ACTIVITIES OF HOUSEHOLDS FOR OWN USE	3,13	-0,38	-0,6	-1,7	-1,47	46,7	16
U ACTIVITIES OF EXTRATERRITORIAL ORGANISATIONS AND BODIES	9,48	6,44	12,7	13,89	4,43	38,1	32

Note. The mean gender pay gap per year per industry for 2018-2022 is shown here in percentages. *N*= Number of cases. Percentage of female workers between 2018-2022 is also included in the Table.

The analysis conducted in this study examines the gender pay gap trends across various industries based on the data provided in Table 1. Notably, a cut-off percentage of 70% is used to categorize industries as either male-dominated or female-dominated. Using this criterion, industries B (Mining and Quarrying), C (Manufacturing), D (Electricity, Gas, Steam and Air Conditioning Supply), E (Water Supply; Sewerage, Waste Management and Remediation Activities), F (Construction), and H (Transportation and Storage) are identified as male-dominated sectors, while industries P (Education) and Q (Human Health and Social Work Activities) are categorized as female-dominated sectors.

When examining the mean gender pay gap within these industries, distinct trends emerge over the analyzed years. In male-dominated sectors B and C, the gender pay gap consistently decreased from 22.34% and 13.02% in 2018 to 19.11% and 10.57% in 2022, respectively. This indicates a gradual reduction in the wage disparity between men and women within these industries.

Similarly, industries D, E, F, and H witnessed a decline in the gender pay gap. In sector D (Electricity, Gas, Steam and Air Conditioning Supply), the pay gap decreased from 14.09% in 2018 to 13.6% in 2022. In sector E (Water Supply; Sewerage, Waste Management and Remediation Activities), the pay gap decreased from 8.99% in 2018 to 7.08% in 2022. Sector F (Construction) saw a decrease from 21.91% in 2018 to 18.42% in 2022, while sector H (Transportation and Storage) experienced a decrease from 9.26% in 2018 to 8.85% in 2022.

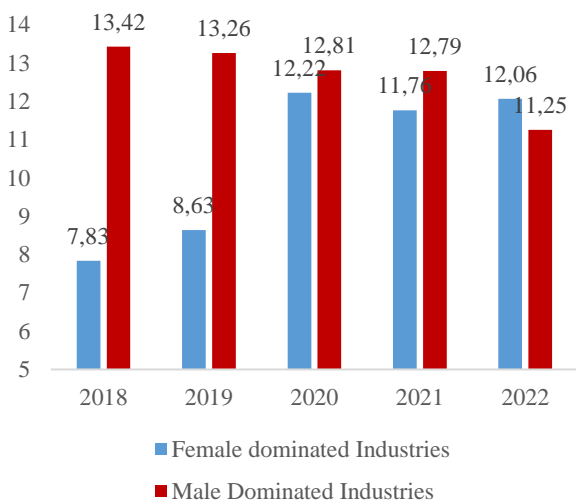
However, in the female-dominated sectors of P and Q, the mean gender pay gap demonstrated an opposite trend. In sector P (Education), the pay gap increased from 11.22% in 2018 to 16.92% in 2022, indicating a widening disparity in earnings between men and women within the education industry. Similarly, sector Q (Human Health and Social Work Activities) witnessed an increase in the gender pay gap from 6.59% in 2018 to 7.81% in 2022, reflecting a growing wage disparity within the healthcare and social work sector.

4.3 The Differences between male and Female dominated industries

In table I there is a noticeable difference in the fluctuations of the mean gender pay gap between industries that have a higher percentages of females versus industries that have a higher percentage of men. In industries with <70% women there is noticeably different variations than industries with <70% men.

The analysis identifies industries B (Mining and Quarrying), C (Manufacturing), D (Electricity, Gas, Steam and Air Conditioning Supply), E (Water Supply; Sewerage, Waste Management and Remediation Activities), F (Construction), H (Transportation and Storage), and J (Information and Communication) as male dominated, while industries P (Education) and Q (Human Health and Social Work Activities) are categorized as female dominated, using a cut-off threshold of 70% for gender representation.

Figure 4, Mean gender pay gap for Female-dominated industries versus Male-dominated industries between 2018-2022



Note. This histogram shows the changes during 2018-2022 for the mean gender pay gap for Female dominated industries and Male dominated-industries. A,B,C,D,E,F,H,J are male dominated and P and Q are female dominated.

In 2018, the gender pay gap in male-dominated industries was 13,42, significantly higher than the corresponding figure for female-dominated industries at 7.83. This indicates a substantial disparity in earnings, with male workers earning, on average, 13,42% more than female workers in male-dominated industries.

In 2019, the gender pay gap in male-dominated industries slightly decreased to 13.26, while the gap in female-dominated industries increased to 8.63. Although both gaps remained sizable, the difference between them narrowed slightly, with male-dominated industries still exhibiting a higher pay gap.

However, in the subsequent years, the gender pay gap in male-dominated industries continued to decline. By 2020, the gap dropped to 12.81, and in 2021 and 2022, it further decreased to 12.79 and 11,25 respectively. This indicates a gradual reduction

in the earnings disparity between male and female workers in male-dominated industries.

In contrast, the gender pay gap in female-dominated industries experienced a different trajectory. After the initial increase in 2019, the gap remained consistently higher compared to 2018. In 2020, it reached 12.22, and in 2021 and 2022, it remained elevated at 11.76 and 12.06, respectively.

4.3.1 Female dominated industries and earning quartiles

Table 2. Percentages of Females in earning quartiles

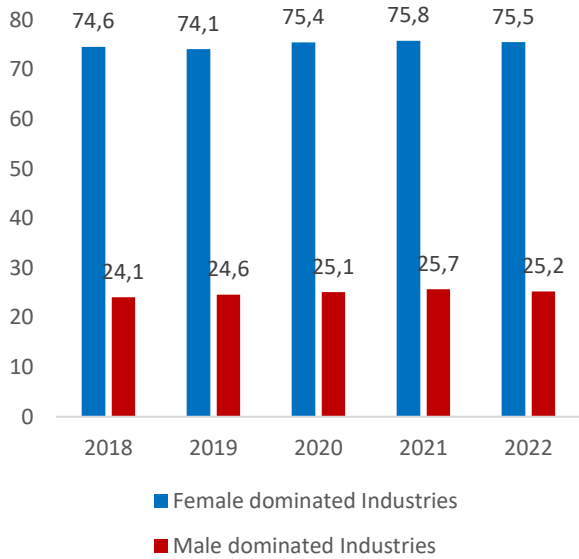
	Female dominated	Male dominated
FemaleLowerQuartile		
2018	76,82	31,55
2019	76,31	32,11
2020	79,56	32,65
2021	79,48	33,11
2022	79,68	32,04
FemaleLowerMiddleQuartile		
2018	76,17	23,43
2019	75,96	23,58
2020	78,02	23,83
2021	77,99	24,53
2022	77,72	23,33
FemaleUpperMiddleQuartile		
2018	74,87	18,78
2019	74,31	19,40
2020	74,76	19,72
2021	74,89	20,24
2022	74,59	19,76
FemaleTopQuartile		
2018	70,47	16,53
2019	69,76	17,06
2020	69,44	17,51
2021	70,67	18,19
2022	70,02	18,11

Note. The percentages of women in earning quartiles in male dominated industries and female dominated industries between 2018 -2022 divided into 4 quartiles.

From 2019 to 2020, there was an upward shift in the representation of women in earning quartiles within female-dominated industries. Specifically, there was an increase in the percentage of women in the lower quartile, rising from 76.31% in 2019 to 79.56% in 2020. This indicates a shift towards a higher concentration of women in the lower-earning bracket. Furthermore, this trend continued beyond 2020, with the percentage of women in the lower quartile remaining consistently high. The percentages for subsequent years (2021 and 2022) were 79.48% and 79.68%, respectively.

In contrast, the percentages of women in earning quartiles within male-dominated industries displayed relatively minor changes during the same period. The percentages in each quartile fluctuated within a narrow range, with an upward trend.

Figure 5. Percentage of women in the workforce for Female-dominated industries compared to Male-dominated industries between 2018-2022



Note. Data presented in the Figure represent the percentage of employees who are women in female-dominated and male-dominated industries over the years 2018 to 2022. The figures indicate the percentage of women in the respective industries.

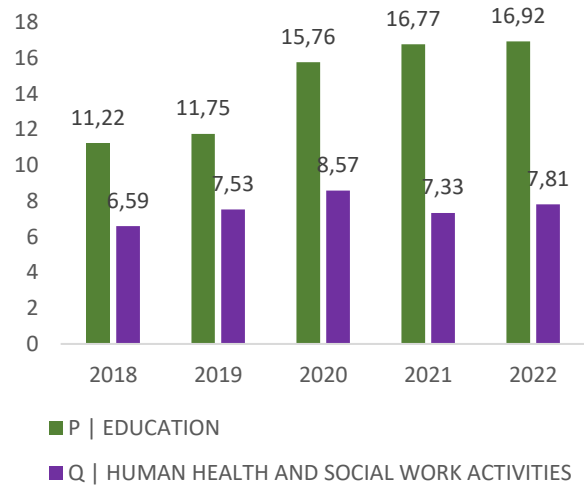
The data presented in Figure 5 sheds light on the changes in the percentage of women employees in both female-dominated and male-dominated industries from 2018 to 2022. In industries predominantly occupied by women, there was a gradual but consistent increase in the representation of women over the years. The percentage of women employees started at 74.6% in 2018 and experienced minor fluctuations, reaching a peak of 75.8% in 2021, before slightly declining to 75.5% in 2022.

Similarly, the data in the table shows that the percentage of women employees in male-dominated industries also witnessed a gradual but consistent increase during the period from 2018 to 2022. In these industries, where men traditionally occupy a larger proportion of the workforce, there was a positive trend towards greater gender diversity.

The percentage of women employees in male-dominated industries started at 24.1% in 2018 and steadily rose over the years. It increased to 24.6% in 2019, 25.1% in 2020, 25.7% in 2021, and reached 25.2% in 2022. These figures indicate a progressive shift towards a higher representation of women in industries traditionally dominated by men.

4.3.2 Differences within Female dominated industries.

Figure 6. Mean gender pay gap for P | EDUCATION compared to Q | HUMAN HEALTH AND SOCIAL WORK ACTIVITIES compared between 2018-2022.



Note. This figure represents the mean gender pay gap for the education industry compared to the Human health and social work industry between the years 2018-2022 in percentages.

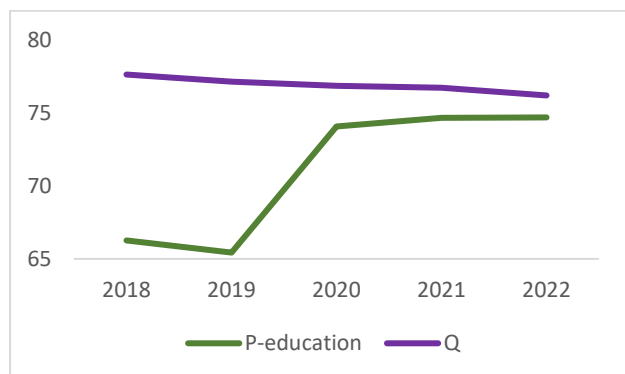
The gender pay gap in the Education industry (P) slightly increased from 11.22 to 11.75%, from 2018 to 2019. But a notable change occurred in 2020, as the gender pay gap in the Education industry experienced a significant jump to 15.76%. This marked a substantial increase compared to the previous years, indicating a more pronounced disparity in earnings between male and female workers within the industry.

The trend continued in 2021, with the gender pay gap reaching 16.77% in the Education industry. While the gap remained relatively stable compared to the previous year, it still indicated a significant difference in earnings based on gender.

By 2022, the gender pay gap in the Education industry (P) had further increased to 16.92%. This represented a continuation of the widening trend observed since 2020, indicating an ongoing and a more significant disparity in wages between male and female employees within the industry.

Industry Q (Human Health and Social Work Activities) has exhibited relatively consistent fluctuations in the gender pay gap over the years. From 2018 to 2022, the percentages have remained relatively stable, indicating a consistent level of gender pay disparity within this industry. While there are minor year-to-year variations, there is no significant upward or downward trend observed. This suggests that the gender pay gap in Industry Q has not experienced substantial changes during this period, indicating a relatively consistent pattern of earnings disparity between male and female workers.

Figure 7. Percentage of women in the workforce P | EDUCATION compared to Q | HUMAN HEALTH AND SOCIAL WORK ACTIVITIES compared between 2018-2022



Note: This chart presents a comparison of the percentage of women in the workforce in relation to the total number of workers and their representation in the industries education and the human health and social work activities industry from 2018 to 2022. The data included in this chart provides insights into the proportion of women workers relative to the overall workforce in these sectors over the specified period.

The provided table examines the representation of women in the workforce, specifically focusing on the education sector (variable P-education) and their engagement in human health and social work activities (variable Q) between 2018 and 2022. A careful analysis of the data reveals interesting patterns and significant shifts in the proportion of women in these domains.

A remarkable observation emerges concerning the percentage of women in education. There is a noteworthy surge from 65.43% in 2019 to 74.07% in 2020, indicating a substantial increase in the representation of women within the education sector. This finding implies a significant transformation in gender dynamics and suggests a growing presence of women in this field. Furthermore, this upward trend is sustained in subsequent years, with the percentages reaching 74.66% in 2021 and 74.70% in 2022, signifying a consistent and substantial level of female involvement in education.

In contrast, the data demonstrates a relatively stable representation of women in human health and social work activities throughout the study period. The percentage of women in this sector starts at 77.64% in 2018 and displays minor fluctuations over time, ultimately settling at 76.20% in 2022. This consistency suggests a persistent level of female participation within these domains.

Table 3. Percentages of Females in earning quartiles

		P	Q
FemaleLowerQuartile			
	2018	72,28	78,48
	2019	71,61	77,97
	2020	81,16	77,91
	2021	81,59	77,61
	2022	82,08	77,57
FemaleLowerMiddleQuartile			
	2018	68,10	79,13
	2019	68,07	78,76
	2020	77,42	78,65
	2021	77,78	78,17
	2022	77,67	77,76
FemaleUpperMiddleQuartile			
	2018	65,86	78,18
	2019	64,62	77,74
	2020	71,76	77,85
	2021	72,35	77,13
	2022	72,41	76,49
FemaleTopQuartile			
	2018	58,78	74,76
	2019	57,43	74,13
	2020	65,95	73,04
	2021	66,92	73,98
	2022	66,63	72,99

Note. Percentages of females in earning quartiles between 2018-2022 for the education industry compared to the Human health and social work industry.

Between 2019 and 2020, there was a noteworthy rise of 10 percentage points in the number of females occupying the lower earning quartile, accompanied by an impressive 11 percentage point increase in female workers in the lower middle quartile. The upward trend extended beyond 2020, with significant growth observed in the upper quartiles as well. This positive trajectory persisted throughout 2021 and 2022, with the proportion of women in all quartiles consistently surpassing the levels observed in preceding years prior to 2020. This indicates a sustained improvement in female representation across the board.

5. RESULTS & DISCUSSION

This section presents the results and discussion of the study, aiming to examine the gender pay gap in the UK and its specific changes before, during, and after the COVID-19 pandemic.

5.1 Gender Pay Gap Changes Over Time and During the Pandemic

The findings regarding the gender composition and gender pay gap in the UK workforce are presented in Figures 1 and 2. Figure 1 illustrates the mean gender pay gap over the years 2018 to 2022, while Figure 2 displays the percentage of female employees over the same period.

In Figure 2, it appears that there is no significant trend in the gender pay gap over the five-year period from 2018 to 2022. The variations observed in the reported data do not follow a consistent pattern of increase or decrease. While there are fluctuations in the percentages, they are relatively small and do not demonstrate a clear trajectory.

From 2018 to 2019, there was a minimal decrease of 0.1% in the pay gap. However, this progress was followed by a slight increase of 0.6% in 2020, indicating a temporary setback. The subsequent years, 2021 and 2022, witnessed the pay gap returning to levels similar to those seen in 2018, with a decrease of 0.4% in 2022 compared to 2021.

These findings suggest that the gender pay gap has remained relatively stable over the studied period, with no clear indication of a consistent positive or negative trend. While there may be some year-to-year variations, the overall pattern does not exhibit a significant change. Addressing and reducing the gender pay gap requires ongoing efforts and targeted initiatives to promote fairness and equality in the workforce.

The Covid-19 pandemic could have been the driving factor for this increase in the gender pay gap during 2020, with most of the research of today showing Women experienced a more pronounced negative impact during the pandemic.

These year to year variations and slight increase could also be attributed by the number of reported cases. For 2020 the number of reported cases was 4055, while the other years it was around 6000 cases every year.

Turning to Figure 2, the percentage of female employees is presented for the years 2018 to 2022. The data reveals a gradual increase in the percentage of female employees from 41.9% in 2018 to 43.8% in 2022.

These findings highlight a positive trend in the inclusion of women in the workforce. Over the five-year period, there has been a consistent and modest rise in the percentage of female workers. These results suggest that efforts to promote gender diversity and equal opportunities in the labor market may be yielding positive outcomes.

5.2 Gender Pay Gap Differences Between Industries

The analysis of the gender pay gap in the UK also investigated the variations in pay disparities between industries predominantly employing women and those predominantly employing men. This section presents the data regarding the gender pay gap within these industry groups, as illustrated in Figure 4 and Figure 5.

The data indicates that gender pay gaps exist within both female-dominated and male-dominated industries. Female-dominated industries generally exhibited lower gender pay gaps, whereas male-dominated industries showed higher gender pay gaps.

These findings suggest that industry-specific factors and occupational segregation contribute to the observed variations in gender pay gaps. Female-dominated industries, characterized by a higher percentage of female employees, tend to experience relatively smaller pay gaps, while male-dominated industries, with a lower percentage of female employees, exhibit higher pay gaps.

Male-dominated industries displayed a decreasing trend in the gender pay gap from 2018 to 2022, suggesting a slight improvement in pay equality within these sectors. On the contrary In Figure 3, there is a significant spike in the gender pay gap within female-dominated industries between 2018 and 2020. During this period, the gender pay gap increased from 7.8% in 2018 to 12.2% in 2020. the trend continued to persist in subsequent years, as depicted in Figure 3. This ongoing increase suggests that the impact of the COVID-19 pandemic on these industries and the gender pay gap was not a temporary phenomenon but had lasting effects. It is important to acknowledge that the link between the spike in the gender pay gap and the COVID-19 pandemic is speculative and would require further research and analysis to establish a definitive causal relationship. Nevertheless, considering the timing of the spike and the unique challenges posed by the pandemic, it is plausible that the pandemic played a role in exacerbating gender pay disparities within female-dominated industries.

5.3 Education Industry

The analysis revealed a significant increase in the gender pay gap within the education sector from 2018 to 2022. A notable spike occurred in 2019, coinciding with the reporting year 2019-2020, which witnessed the emergence of the COVID-19 pandemic. While it might be tempting to attribute this surge solely to the pandemic's impact, a closer examination of the data reveals another important factor: a rise in the number of reported cases.

The dataset demonstrated a substantial increase in reported cases from 2018 to 2022, particularly evident in 2020, when the pandemic had a more pronounced effect. This suggests that the 2019 spike in the gender pay gap may not be exclusively ascribed to the pandemic but could also be influenced by changing dynamics within the education sector, as indicated by the increased number of reported cases.

To understand the potential interplay between COVID-19 and changing workforce dynamics, it is essential to consider the specific impacts of the pandemic on the education sector. The COVID-19 crisis resulted in school closures, disruption of teaching methodologies, and a rapid shift to remote learning. These changes posed significant challenges for educators, including increased workloads, additional responsibilities, and heightened job insecurity (Robinson et al., 2022). Consequently, pre-existing gender disparities within the education workforce may have been exacerbated.

It is important to note that the gender pay gap is a multifaceted issue influenced by various factors beyond the scope of this study. Other potential contributors include systemic biases, occupational segregation, and discriminatory practices. However, this analysis highlights the potential interplay between COVID-19 and changing workforce dynamics as factors that may have influenced the observed spike in the gender pay gap within the education sector.

In conclusion, the analysis suggests that while the COVID-19 pandemic likely impacted the gender pay gap in the education sector, it should not be viewed in isolation. The increase in reported cases also underscores the changing dynamics within the sector, potentially contributing to the observed spike.

6. LIMITATIONS

While the use of a database that captures gender pay gap data for companies with over 250 employees offers valuable insights, it is important to acknowledge certain limitations associated with this research. The following limitations should be taken into consideration when interpreting the findings of this master's thesis

Firstly there is underrepresentation of small and medium-Sized enterprises (SMEs): The database exclusively focuses on companies with over 250 employees, which inherently excludes a significant portion of the business landscape composed of small and medium-sized enterprises. As a result, the findings may not fully capture the gender pay gap dynamics within this important segment of the economy. The exclusion of SMEs limits the generalizability of the results and may introduce bias in the overall analysis.

There is also a limited scope of variables in the dataset The database primarily captures information related to the gender pay gap, such as mean gender pay gap percentages and employment distribution. However, it lacks comprehensive data on other relevant variables that could contribute to a more nuanced understanding of the gender pay gap, such as hours worked, part-time or full time employees. The absence of such variables restricts the ability to examine and account for potential confounding factors. This study uses the unadjusted wage gap while most studies refer to the adjusted wage gap, which is adjusted to the total of hours worked. This mean gender pay gap is solely based on the hourly rate.

Moreover the data Availability and representativeness of this dataset also has its limitations. The data originally had 71.902 reported cases however, the data prov

Another limitation is that the database's focus on gender pay gap data alone makes it challenging to establish causal relationships between observed trends and specific external factors or interventions. The influence of broader societal, economic, and policy-related factors on the gender pay gap cannot be fully accounted for without a more comprehensive data set that captures a wider range of variables.

These limitations should be acknowledged to ensure a balanced interpretation of the findings and to guide future research endeavors in addressing these gaps in knowledge. Additionally, it is recommended to triangulate findings from the database with other sources of data and methodologies to enhance the validity and reliability of the conclusions drawn from this analysis.

7. REFERENCES

- Alon, T., Doepke, M., Olmstead-Rumsey, J., & Tertilt, M. (2020). *The Impact of COVID-19 on Gender Equality*. <https://doi.org/10.3386/w26947>
- Dang, H. H., & Nguyen, C. (2021). Gender inequality during the COVID-19 pandemic: Income, expenditure, savings, and job loss. *World Development*, *140*, 105296. <https://doi.org/10.1016/j.worlddev.2020.105296>
- Doorley, K., Sologon, D. M., & O'Donoghue, C. (2022). The Gender Gap in Income and the COVID-19 Pandemic in Ireland. *Social Sciences*, *11*(7), 311. <https://doi.org/10.3390/socsci11070311>

ILO. (2022, October 31). *ILO Monitor on the world of work. 10th edition*.

https://www.ilo.org/global/publications/books/WCMS_859255/lang--en/index.htm

OECD & ILO. (2020). The impact of the COVID-19 pandemic on jobs and incomes in G20 economies. In *OECD*. OECD-ILO. Retrieved May 30, 2023, from https://www.ilo.org/wcmsp5/groups/public/---dgreports/---cabinet/documents/publication/wcms_756331.pdf

Office for National Statistics (ONS), released 26 October 2022, *ONS website, statistical bulletin, Gender pay gap in the UK: 2022*. (n.d.).

ONS. (2008). *Economic & Labour Market Review / Vol 2 / No 4 / April 2008* (Vol 2). Office for National Statistics. <http://escoe-website.s3.amazonaws.com/wp-content/uploads/2020/09/04202706/Economic-Labour-Market-Review-April-2008.pdf#page=19>

Reichelt, M., Makovi, K., & Sargsyan, A. (2020). The impact of COVID-19 on gender inequality in the labor market and gender-role attitudes. *European Societies*, *23*(sup1), S228–S245. <https://doi.org/10.1080/14616696.2020.1823010>

Robinson, L. E., Valido, A., Drescher, A., Woolweaver, A. B., Espelage, D. L., LoMurray, S., Long, A. C. J., Wright, A. A., & Dailey, M. J. (2022). Teachers, Stress, and the COVID-19 Pandemic: A Qualitative Analysis. *School Mental Health*, *15*(1), 78–89. <https://doi.org/10.1007/s12310-022-09533-2>

Singh, V., Shirazi, H., & Turetken, J. (2022). COVID-19 and gender disparities: Labour market outcomes. *Research in Economics*, *76*(3), 206–217. <https://doi.org/10.1016/j.rie.2022.07.011>

White, N. J. (2022). Gender pay gap in the UK - Office for National Statistics. www.ons.gov.uk. <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/bulletins/genderpaygapintheuk/2022>