Research report on Gender pay gap and Equal pay of a Firm in the UK

Dataset: Pay Dataset of a Firm

Outcome variable: Salary

Word count: 1594.

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Executive Summary

This report examines the gender pay gap and equal pay of a firm in the UK. The report contributes to ongoing efforts to monitor the Gender Pay Gap (GPG) to approach parity in pay for men and women. The research uses statistical methods to identify how much of the gender pay gap is associated with factors. The dataset analysed is the pay dataset of a firm in the UK.

Broadly, the research findings are; the firm has gender pay gap. There is difference in the average gender pay gap for salary between male and female, with male being paid higher salary than female in the firm. The median gender pay gap for salary between male and female showed a slight difference. The proportion of gender pay gap for salary based on contractual working hours for male and female showed no significant difference. These indicated that there is gender imbalance in recruitment, male are recruited more than female in the firm, Also women work more on part-time contract while men work more on full-time contract hours in the firm.

Secondly, there is a huge difference in the average and median gender pay gap for bonus between male and female in the firm respectively. Bonus pays are in favour of the men. Women are paid lower bonus in the firm. Men who work the same contract hour with women are paid higher bonus.

The result of the statistical analysis for equal pay on salary of employees in the firm, considering other factors that affect gender pay showed a significant difference in the equal pay between male and female in the firm. The average salary of male is more than female in the firm. Employees who work full time are paid higher salary irrespective of their tenure and position in the firm.

Considering the results of the gender pay gap and equal pay, these recommendations were made.

The firm should include multiple women in shortlists for recruitment and promotions. The firm should review their people policies and recruitment practices to remove any barriers to prevent a more evenly balanced workforce, ensuring everyone feel welcome.

The firm should introduce transparency to pay, promotion and reward processes. This means employees are clear what is involved and that mangers understand that decisions need to be objective, and evidence based. These processes can reduce pay inequalities.

The firm should do all they can to support part-time employees. This can be done by encouraging remote working, this will give women the opportunity to maintain their income and career.

The firm should encourage career progression by providing trainings and giving educational leave, this will enable employees not to get stuck at certain levels within the organisation.

More female should be recruited or promoted to the position of assistant manager. This is because employees in this position are paid highly in the firm and is mostly occupied by male with just one female.

1. Introduction

The gender pay gap and equal pay both deal with pay disparity at work, but they are not the same. Gender pay gap is the difference between the average pay of men and women in an organisation. It does not take into account people's roles and seniority. Equal pay means that women and men performing equal work, or work of equal value must receive equal pay. Equal pay has been a legal requirement for decades and is currently covered by the Equality Act 2010. It applies to salary all contractual terms and conditions of employment. This is a crucial social issue, especially now that more and more women are entering the workforce. UK law requires that employers pay women and men doing substantially similar work the same wage rate. To comply, organisations may want to evaluate the jobs their employees do and compare wages by gender.

This report aims to uncover the ongoing of the gender pay gap (GPG) and equal pay, which, despite considerable legislative change, remains a feature of the UK labour market. The research uses statistical methods to identify how much of the gender pay gap is associated with different factors. An employer with an effective equal pay can still have a gender pay gap. For example, this can happen if most women are in lower paid jobs.

As with other gender pay gap studies, we aim to reveal the predictors of the gender pay gap. This involves modelling the determinants of the salary of all employees and identifying differences in the remuneration structure for men and women.

2. Data Preparation

The data used in this report is a pay dataset of a firm in the UK, which consist of 9 variables and 995 observations. There were 13 missing values and 9 outliers in the dataset.

2.1 Data Restrictions

The missing value in Tenure was replaced with 0. The 9 outliers which are 6 employees without position and 3 employees without qualification were filtered out, this was stored as (.) in the dataset. The missing values in bonus which matches with employees who have not worked up to 5 months in the firm were replaced with 0. Tenure was transformed from months to years. FTE (weekly working hours) was transformed from decimal to percentage. Two new variables were created from FTE, contract and contract hour.10 employees stored as Female were recoded to female. The 4-character variables were transformed to factor variables. The variable and observation for the analysis after data cleaning and transformation were 11 and 986.

2.2 Variable Definition

The outcome variable in this analysis is salary. Salary is the monthly base salary of each employee in £. Bonus is the annual bonus of each employee in £.

See appendices for variable definition table and descriptive statistics table.

3. Analysis and visualisation.

The report used statistical methods. The choice of model used in the statistical analysis is the ordinary least squared (OLS), regression model which was used to explain the linear relationship between the outcome variable salary and other explanatory variables.

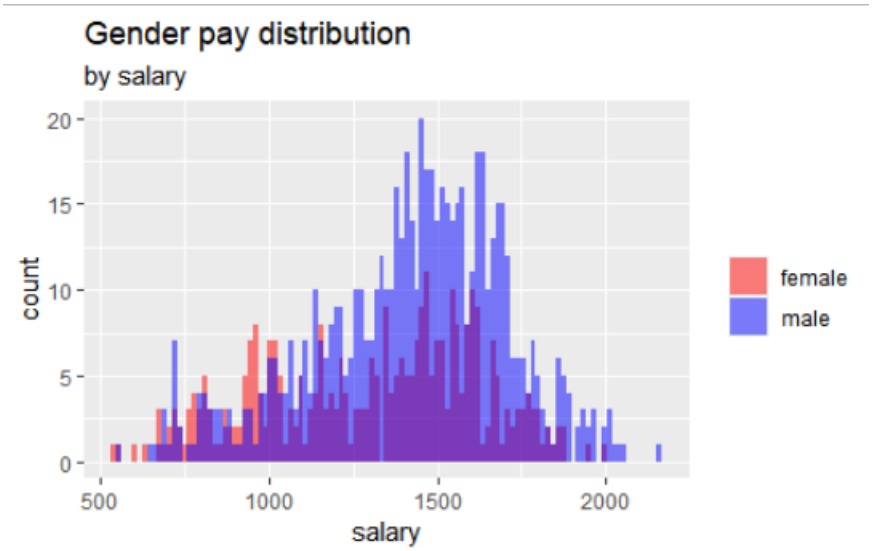

Figure 1: Male and Female Salary Distribution.

Figure1 shows there are more male than female employees in the firm with more female earning less than £1,000. Invariably, there are significantly more male earning more than £1,500. The gender pay distribution is nearly normal, there were a small number of values that skewed the data.

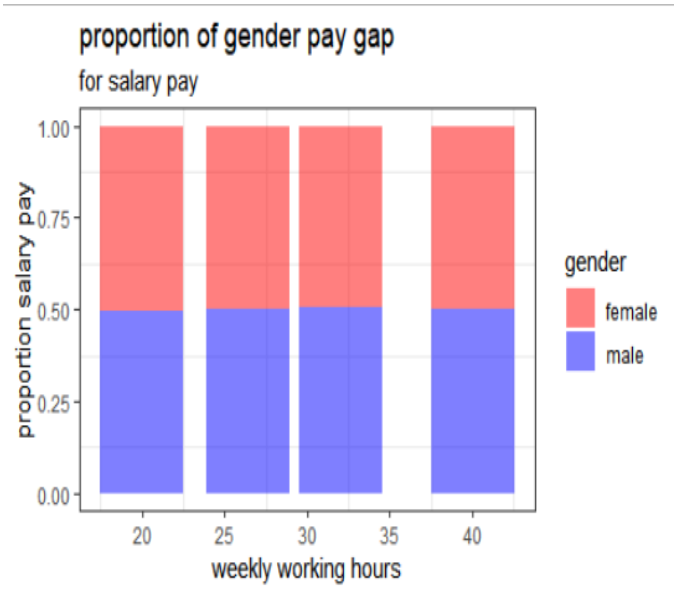

Figure 2: Proportion of gender pay gap based on contractual working hours.

Figure 2 shows that both male and female receive equal percentage of salary pay based on their weekly working hours.

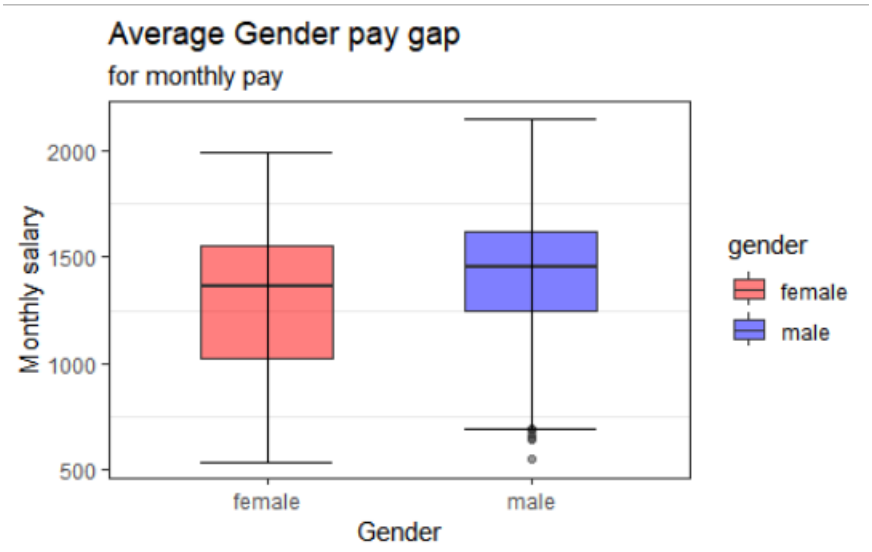

Figure 3: Mean (average) gender pay gap for monthly salary pay.

In figure 3 above, we see that the interquartile range for women is lower than men, in addition to the lower mean. Women are making slightly less, on average, than men in the firm.

Figure 4: Median gender pay gap for monthly pay.

From figure 4 above we can see that female work lesser than their male counterpart in the firm, hence male earn slightly higher than female. Men and women who work full time have the same median pay.

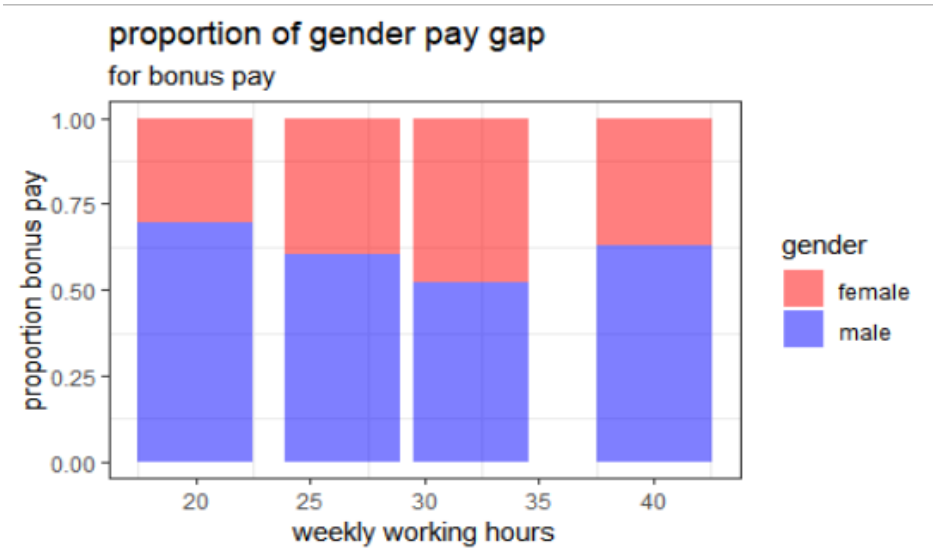

Figure 5: Percentage of men and women receiving bonus pay based on contract hour.

From the figure 5 above there is a significant difference between male and female bonus pay. Male that worked the same contracted hours with their female counterpart received her higher bonus pay than female in the firm.

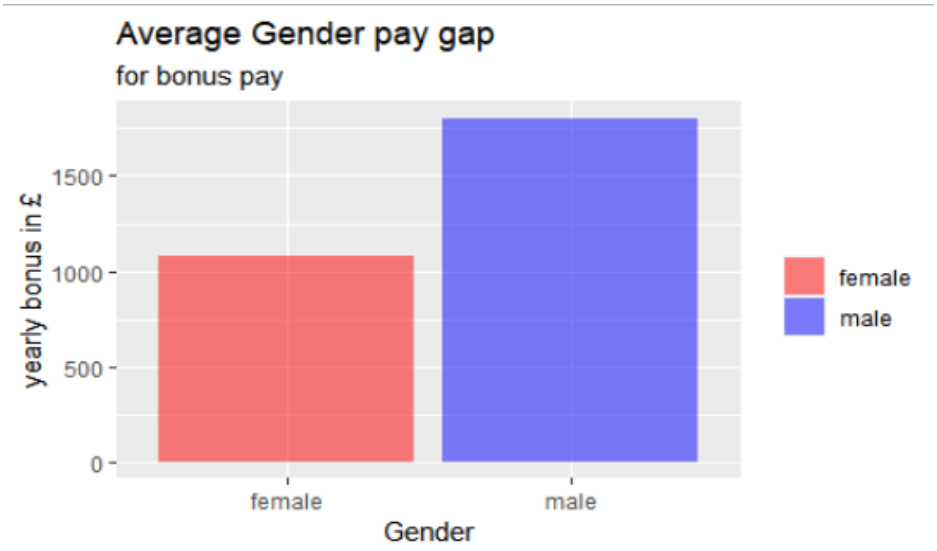

Figure 6: Mean (average) gender pay gap for bonus.

Figure 6 indicates that the average bonus pay of female is about 1100 while the average bonus pay of male is above 1700. Men received higher bonus than women in the firm.

Figure: 7 Median gender pay gap for bonus pay.

In figure 7, we can see that male received higher bonus than female each category of contractual work hour. There is a huge disparity in the median gender pay gap of the firm.

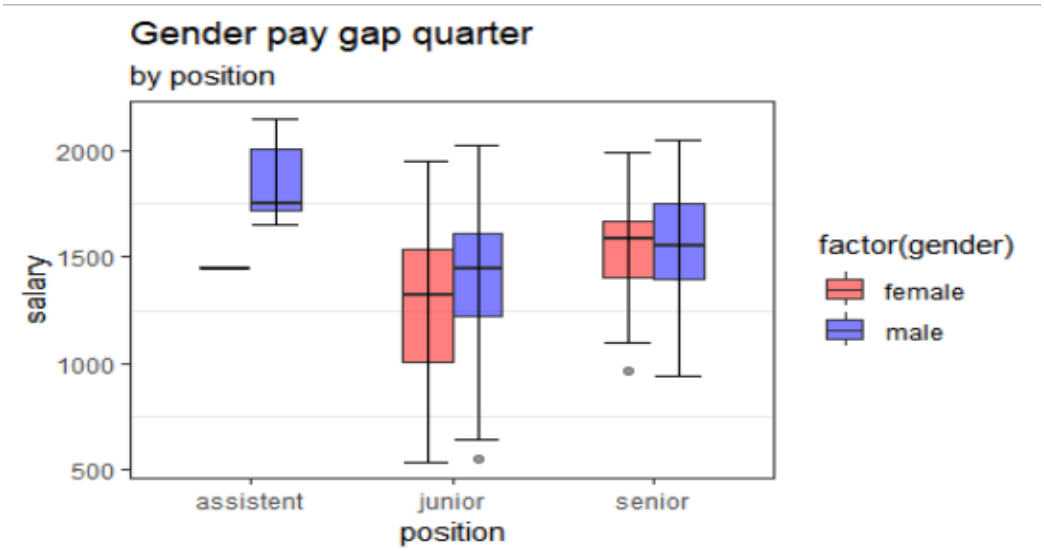

Figure 8: Gender pay gap by position.

Figure 8 shows that the assistant manager's position is mostly occupied by male employees the position received the highest salary pay. The interquartile range of female who occupied the same junior position with male is lower, this indicates that men in junior position received higher salary than women in the same position. There are more Men in the senior position than women who are in the same position. Figure 8 also indicated that more women worked in the junior position than men.

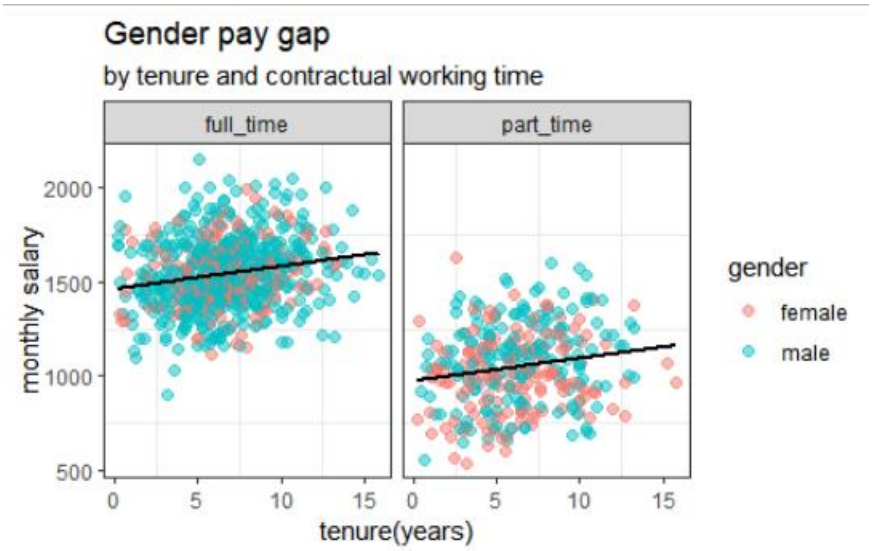

Figure 9: Gender pay gap by tenure and contractual working time.

Figure 9 shows that more female work part time than male hence, female are paid lower salary irrespective of their years of experience. Invariably more male work full time hence, are paid higher salary irrespective of their years of experience. This shows that increase in salary in the firm is dependent on the number of hours you have worked.

Regression Results Table

Table 3: Linear Regression of Gender Pay Gap

Variable	**Model 1**	**Model 2**
	Co-efficient (P-Value)	**Co-efficient (P-Value)**
Intercept	1304.77 (2e-16)***	1648.402 (2e-16)***
Gender	113.90 (1.72e-08)***	33.712 (0.00729) **
Contract		-476.000 (2e-16)***
Tenure		10.896 (4.43e-08) ***
position(junior)		-252.945 (0.00011) ***
position(senior)		-123.386 (0.06802).
qualification BA/ BSc		60.779 (7.77e-07) ***
qualification MA/MSc		114.774 (2.99e-07) ***
N	984	978
Rsq	0.0318	0.6392
Adjusted Rsq	0.0308	0.6366

Method: OLS; dependent variable: salary.

From table 3 above model 2 is the best option with the highest R-square (goodness of fit) of 64% in explaining the dependent variable salary. All the p-values for the variables are significant except position for senior roles. From model 2 in table 3, holding other variables constant the average

salary for a female is estimated to be £1,648 whereas male is estimated a total of 1648.402 + 33.712 = £1682. The p-value for gender is significant, suggesting that there is statistical evidence of a difference in average salary between male and female. The average salary of employees on part time holding other variables constant is estimated to be 1648.402-476.000 = £1,172. The average salary of employees who are assistants to managers is 1648.402 whereas employees in junior position holding other variables constant is estimated to be 1648.402-252.945 = £1,395. The average salary of employee with BA/BSc will increase to £61. The average salary of employee with MA/MSc will increase to £115.

Figure 10: Regression model 2 visualisation.

Figure 10 shows that male is paid higher salary than female in the firm. Males are also predicted to receive higher salary than female in the future.

4. Conclusion and Recommendations

The OLS (multiple regression) model used in the analysis is a much fuller model in the sense of including most of the variables that explained gender equal pay gap. It is frequently thought that the more factors that are included in a model, the less variance in salary will remain to be associated with gender and with discrimination. Indeed, we have captured within this model factors that affect equal pay gap. The firm is working hard to close the gender pay gap on salary pay based on the median gender pay gap but still has a significant difference on the mean gender pay gap as a result of the imbalance in gender recruitment. The firm has a significant disparity in the gender bonus pay gap with mean and median's female bonus pay lower than male pay respectively.

Based on the results of the analysis the following recommendations were made.

The firm should encourage remote working; flexible working gives women the opportunity to handle caring or childcare responsibilities, as well as maintaining a career and income.

The firm should reassess promotions, bonuses and benefits. The firm is biased towards male employees when receiving a bonus or enjoying a salary uplift.

The firm should re-evaluate hiring and promotions. 66% of the employees are male hence, more female should be hired in the firm and more female employees should also be promoted to assistant managers.

The firm should encourage educational attainment. This can be done by giving educational leave to employees as very few employees have higher qualification in the firm.

5. Limitations

There were some constraints encountered during the research; firstly the firm did not provide the hourly base pay of their employees only the monthly salary was available. Some contractual terms and conditions of employment, such as holiday entitlement, entry pay and reward schemes and pension payments were not available for thorough analysis of the gender equal pay results.

Secondly, the researcher made use of only salary as outcome variable for the gender equal pay using multiple linear regression analysis which excluded bonus pay.

Appendices

Variable definition table

Table 1: variable definition

Variable	**Definition**
Gender	Dummy variable with value 1 if male employee and 0 if female
qualification	Factor variable. An indicator of the employee's highest educational credential with levels 1 – 3.
Position	Factor variable. An indicator of the position of the employee with levels 1 – 3.
Tenure	The duration that the employee works in the firm in years between 0 and 15
FTE	The full-time equivalent of an employee's contractual working hours measured in percentage.
Salary	Continuous variable. monthly base salary of each employee in £
Bonus	Continuous variable. Annual bonus in £ based on appraisal and team performance.
Contract hour	Discrete Continuous. Working hours per week between 20 and 40.
contract	Dummy variable with 1 if part-time and 0 if full-time.

N = 986

Descriptive Statistics Table

Table 2: Descriptive statistics.

Variable	**Mean**	**Standard Deviation**	**Min**	**Max**
Gender			337	649
qualification			79	497
Position			8	888
Tenure	6.53	2.96	0.16	15.8
FTE	89.8	16.0	50	100
Salary	1380	303	538	2153
bonus	1555	978	0	5660
Contract hour	35.95	6.42	20	40
contract			326	660

N = 986