## Exploring the Impact of the Gender Pay Gap on Female Entrepreneurship

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## ABSTRACT,

This thesis offers insights into the influence of the gender pay gap on female entrepreneurship using regional evidence from England and Wales. Utilizing data of the gender pay gap from companies with over 250 employees, and regional shares of different types of female entrepreneurship, the research aims to analyze the significance and direction of the effect of gender pay gap on female entrepreneurship. The analysis is grounded in labor market theories, the human capital model, and occupational choice theory. By quantitative analysis, the research aims to recognise trends and patterns in the relationship. The findings indicate that the gender pay gap acts as a complex factor influencing female entrepreneurship. At lower levels of wage inequality, the gender pay gap appears to push women towards entrepreneurship, offering an alternative to wage-employment where wage discrimination is prevalent. However, when the gender pay gap increases further, the effect becomes negative, becoming a barrier for women to enter self-employment. Furthermore, the research reveals impacts on different types of female entrepreneurship. For female entrepreneurs without employees, the gender pay gap initially serves as a pushing factor, but later becomes a barrier as the gap reaches significant levels. For female entrepreneurs with employees the increasing gender pay gap initially has a negative effect, which later shifts to a positive, pushing effect when the threshold value is reached, suggesting that scaling up becomes a response to wage discrimination. Through the analysis this study contributes to the research aiming for gender equality.

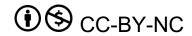
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## Keywords

Gender pay gap, Female entrepreneurship, Self-employment, Quantitative analysis, Occupational choice theory, England and Wales



#### 1. INTRODUCTION

The gender pay gap is a persistent issue that reflects systematic disparities in the wages of men and women worldwide, across different industries (Thébaud, 2015). Many countries have put regulations and laws into effect to influence the gap, but it has not been able to be fully eliminated (Schäfer & Gottschall, 2015). The gender pay gap is influenced by gender discrimination against women and gender inequalities. Over time this has led to the segregation of male- and femaledominated industries, from which the latter are commonly the secondary industries. Women also hold fewer executive positions in companies (Mroczek-Dabrowska & Gaweł, 2021). This further affects the inequality in the job market, creating entry barriers to women in the primary industries. Most STEM industries are male-dominated and examples of primary industries, where women face barriers already while looking for a job. (Hu, Tarafdar, Al-Ani, Rets, Hu, Denier, Hughes, Konnikov, Ding, 2022). An example of a secondary industry would be the education sector, where women hold 70% of the jobs (Francis-Devine & Hutton, 2024). Thus, the gender pay gap can tell important information about the economic empowerment and equality nationally, and regionally. Analyzing the gender pay gap gives important insights into the industries and organizations.

In the UK, the gender pay gap exists, but has been decreasing slightly over time. In April 2023, the gap was at 14.3%, including both full-time and part-time workers. In comparison, in 2017 the gap was 18.4%. Over the years the decrease has been slow. 2017 is the year when the additional regulations of the Equality Act 2010 came into effect in the UK, requiring all the organizations of over 250 employees to report on their gender pay gap information annually (ONS, 2023). The goal of this act is to decrease the inequality in the workforce (GOV.UK 2017).

The Equality Act 2010 has been in force, but still the gender pay gap is significant.

The gender pay gap is a widely discussed topic, but still exists in today's society. Even though work has been done to provide women with completely equal opportunities as men, it has not been successful to provide full equality, and the gap keeps affecting women's economic power and career choices.

One career choice people face is whether to choose wage-employment or become an entrepreneur. The gender gap in entrepreneurship is noticeable, women being underrepresented in the domain. Significantly more men are creating and starting their own businesses, and thus are more entrepreunially active. According to the Research Briefing of the House of Commons Library, at the end of 2023 in the UK, 89.6% of women in the workforce were in wage-employment, while 83.5% of men in workforce were in wage-employment. Women made up only 37% of all entrepreneurs, as around 10% of women were entrepreneurs compared with 16% of male entrepreneurs.

Within the previous years, the trend in female entrepreneurship has been growing globally (Bögenhold & Klinglmair, 2015). Factors such as flexibility and autonomy are driving women to entrepreneurship. Also, the inequality in wage-employment can be included as a pushing factor of women towards entrepreneurship (Mroczek-Dąbrowska & Gaweł, 2022).

The gender gap in entrepreneurship is important since increasing the number of female entrepreneurs would increase the value of the economy. In a review report published in 2019, it was concluded that if women started and scaled new businesses at the same rate as men do in the UK, £250 billion of increased new value could be added to the economy of the UK (Rose, 2019). This is a significant number, giving reason

for more extensive studying of the factors affecting women's entrepreneurial activity.

The research objective of this study focuses on the effect of the gender pay gap on female entrepreneurship in England and Wales, by looking at data from 300 Local Administrative Districts (LAD). This view is chosen as the UK Gender Pay Gap Service provides useful and reliable data for the research. The Office for National Statistics (ONS) data of female entrepreneurship is collected from the Census 2021 conducted in England and Wales. Combining these two datasets will give an insightful basis for quantitative research analysis. The perspective of the UK is interesting also as there is significant effort to reduce the gender pay gap. Using aerial data from the LADs gives comprehensive coverage over the different parts of England and Wales and allows for a more detailed analysis of the factors influencing the effect of the gender pay gap on female entrepreneurship. This study provides useful insights for further research on gender equality and women's decision-making, entrepreneurial offering a understanding of how economic disparities influence their career choices, and highlighting the critical factors that impact their participation in the business world. As there are various reasons for women to choose one employment type over another it is important to investigate the inequality factors, since there is a large gap in the numbers of male and female entrepreneurs. By studying the gender pay gap and the number of female entrepreneurs across various LADs in England and Wales, it can be seen whether there is correlation between these two factors. This study contributes to the goal to reach gender equality in different industries and positions and provides important insights into the effects of the gender pay gap by reviewing relevant and recent literature and analyzing data from the Gender Pay Gap Service and Office of National Statistics. The study concentrates of the following question:

How does the gender pay gap influence women's entrepreneurial activity in England and Wales?

## 2. LITERATURE REVIEW

## 2.1 The Gender Pay Gap

Equal pay for equal work is one of the signs of equality in modern societies. The existence of the gender pay gap highlights the inequality of the salaries earned by men and women. The gender pay gap is the difference in earnings between men and women in the workforce, as a percentage of men's earnings (ONS, 2023). The trend globally and in the UK has been declining over the years due to the efforts of governments to promote equality (ONS, 2023: Bögenhold & Klinglmair, 2015). It has been a relevant topic of research and discussion for years, but still has not been solved in practice (Blau & Kahn, 2017). The issue has been more discussed in politics than in the workforce, as it can create debates and people have strong opinions about it. The gender pay gap provides information about many societal factors, like economic empowerment and poverty levels. It can be used as a factor to measure the wellbeing of a country or region.

Many studies have been done that study the causes and effects of the gender pay gap. Different models and theories have tried to explain the existence of the gap, including the labor market segmentation and segregation, the human capital model, and the effect of family and marriage. Main theories relevant to this research, explaining the gender pay gap are the labor market segmentation and labor market segregation theory. According to the labor market segmentation theory, the labor market is

divided into two or more divisions (depending on how complex the model being used is), and according to the labor market segregation theory, in these divisions men and women are unevenly distributed in industrial, occupational, and hierarchical levels (Tonoyan, Strohmeyer & Jennings, 2019: Mroczek-Dąbrowska & Gaweł, 2021). These two divisions in the segmentation theory are called the primary and the secondary market, from which the first one is the one with the high paid jobs, and the latter consists of the low paid jobs. The sectors differ from each other not only by pay, but also by industries, jobs, task difficulty and variance, and opportunities for advancements. The jobs in the secondary market are commonly female dominated, with easier tasks and less opportunities for advancement (Mroczek-Dąbrowska & Gaweł, 2021). This is referred to as horizontal segregation. Within the primary and secondary markets, there is also hierarchical segregation, meaning that men dominate the higher-level and managerial positions within the occupations. Women remain underrepresented in managerial positions. This is referred to as vertical segregation (Tonoyan, Strohmeyer & Jennings, 2019). Women can also face pre-entry discrimination when trying to enter a male dominated primary sector, making it harder to break "the glass ceiling" and proceed in their careers, affecting the gender pay gap. Women's career choice is also affected by family and domestic responsibilities, creating disadvantages when compared to men.

Opposing the labor market segmentation and labor market segregation theory, is the human capital model. It is one of the most studied theories regarding the gender pay gap. According to the human capital model, the gap can be explained by the differences between the genders in factors like education, previous work experience, and typical personality traits assigned to each gender. The theory assumes that the level of education affects the wage level positively, and thus that men on average would be more highly educated than women (Mroczek-Dąbrowska & Gaweł, 2021: Adom K. & Asare-Yeboa, 2016). This was true in the past, but on average, women are currently more highly educated than men (Lehto & Sutela, 1999). Thus, only looking at this factor women should earn more than men based on their educational level. According to human capital theory, the fact that the level of women's education has increased, can be used to explain the narrowing of the gender pay gap (Mroczek-Dabrowska & Gaweł, 2021). This would then mean that the other factors create a large enough difference in the human capital offered by men and women, that the educational level could not eliminate it. Another factor the human capital model uses, is the previous work education obtained. The difference between men and women is created by the pauses women have to take in their careers due to for example pregnancy and taking care of the child(ren) and household issues (Mroczek-Dąbrowska & Gaweł, 2021: Adom & Asare-Yeboa, 2016). Childcaring and household jobs are commonly societally assigned as labor that the women have to take care of and can be considered as "unpaid labor". Thus, women might have to take a break from their job (maternity leave), continue as a part-time worker, or quit their job completely. These factors affect women's human capital factors, whereas for men, becoming a father does not show significant effects in their working careers (Blau & Kahn, 2017). To give an example, if a married couple decides together that they want to have a child, this will significantly affect the woman's career, but will have no effect on the man's career. Thus, even though both become parents, one now has a significant disadvantage career wise. The societal expectations and assumptions have a great effect on the gender pay gap. An employer is likely to consider this when deciding from male

and female job applicants, which will give men an advantage in the job market (Blau & Kahn, 2017). This gives men the advantage of getting higher positions and better opportunities for career advancement, making the higher paid occupational sector male dominated. The human capital model also considers personality traits linked to each gender (Mroczek-Dąbrowska & Gaweł, 2021). The fact that the gender pay gap exists everywhere thus must imply one of the two things: either labor markets are not perfectly competitive, or the two genders are not identical in labor markets (Abadía, Villa & Cárdenas, 2020).

## 2.2 Female Entrepreneurship

The number of women going into entrepreneurship and starting their own businesses has been increasing globally. There is more encouragement for women and examples from others who have started their own companies. In the UK, governments have introduced many policy initiatives to encourage women towards entrepreneurship. (Marlow, Carter & Shaw, 2008). This comes as they are still clearly underrepresented. Women starting their own businesses are often concentrated in specific fields, which are not as profitable as the ones men dominate in, resulting in poorer performance and financial resources. (Mroczek-Dąbrowska & Gaweł, 2020) This can be linked to the labor market segmentation discussed previously. In the UK the gender gap between men and women in entrepreneurship in 2023 was significant, as only 37% of entrepreneurs were women (Francis-Devine & Hutton, 2024). This indicates that there is also segmentation between wage-employment and entrepreneurship. Much of the talent and economic opportunities women offer is not utilized due to the gender barriers they are facing.

In the research done by Mroczek-Dąbrowska and Gaweł (2020) it is stated that "comparing costs and benefits from these two forms of occupation, the decision to enter into entrepreneurship is made when the net entrepreneurial benefits exceed the net employment benefits". Looking at the gender gap, this indicates that entrepreneurship is not as appealing to women as it is for men. Then again, referring back to the human capital model and women looking for more flexible career entrepreneurship should seem like a tempting option. The barriers women encounter in the process of starting their business must thus be significant, making wage-employment a more appealing choice. The possibility to start and manage a business from home offers flexibility for women who have domestic responsibilities (Thompson, Jones-Evans & Kwong, 2009). For such businesses the research indicates that the performance is often poor and they are operated only part-time. This increases the lack of performance and financial results from female entrepreneurs.

These different factors affecting the choice are the push and pull factors of the occupational choice theory. The occupational choice theory states that a person has two alternatives to choose from; either they choose to become an employee, or an entrepreneur. The choice is made by weighting the costs and benefits of the alternatives; is the risk to become an entrepreneur with no guaranteed income worth taking over a guaranteed salary as an employee (Tonoyan, Strohmeyer & Jennings, 2009: Mroczek-Dąbrowska & Gaweł, 2021). The push factors in this theory are the ones pushing women towards entrepreneurship due to necessity, whereas the pull factors are pulling women towards entrepreneurship as opportunities. An example of a push factor would be for example lack of development opportunities in wage-employment. A pull factor would be for example freedom and flexibility in

entrepreneurship. As gender pay gap is a negative factor for women in wage-employment, it could also be considered as a push factor. It needs to be considered that the gender pay gap exists also in entrepreneurship and is even bigger than in wageemployment. If the gender pay gap is a pushing factor for women to enter entrepreneurship, the decrease of the gender pay gap would have a negative effect on the number of female entrepreneurs. In the article by Saridakis, Marlow and Storey (2013), it was confirmed that the gender pay gap has more influence on female entrepreneurship than for males, but when adding the marriage variable into the equation, the effect was not significant anymore. On the other hand, the decrease of the gender pay gap would mean that women have more financial capital to start their own businesses, driving them towards entrepreneurship. The fact is, that it would at least give women the equal possibility to become entrepreneurs compared to men. The gender pay gap can also have an effect on the entry to entrepreneurship. As it is needed to have funds to start a business, gathering these from wage-employment is more difficult to women. As more men are in higher paying positions, it is easier for them to gather the needed funds, and to get external funding from banks and investors. Studies have found that men are more likely to get financial support from external entities. The managerial positions also help to gather the right contacts and information for starting as an entrepreneur, these networks being mainly male dominated (Leung, 2005: Thébaud, 2015). This would indicate that the discrimination of women in wage-employment also has an impact of female entrepreneurship, the gender pay gap being a crucial factor. To understand all the gender specific factors driving people into different occupations, many factors need to be studied, including family and marital status. Also consumer discrimination has an effect on the performance of female owned businesses, meaning that customers simply do not want to buy products from women (Leung, 2005). This would increase the gender pay gap in entrepreneurship, pushing women away from the occupation. This can be seen especially in male dominated industries, such as automotive and electronic industries (Grybaitė, 2006).

The discrimination in self-employment has not been investigated as closely as in wage-employment, making the causes more unclear (Mroczek-Dabrowska & Gaweł, 2021).

In this research, the assumption is that the gender pay gap is a pushing factor for women to enter entrepreneurship.

## 3. METHODOLOGY

### 3.1 Research Design & Data Collection

The aim of this research is to offer insights into the effect of the gender pay gap on female entrepreneurship. This is done by quantitative research, while utilizing relevant literature in the analysis. The quantitative research focuses on gender pay gap data and female entrepreneurship data from England and Wales. Due to the current legislation (The Equality Act 2010) in the UK, companies with over 250 employees are required to report annual data of the pay of their employees showing the disparities between men's and women's earnings. This data provides a source for this research. This data set gathered from The Gender Pay Gap Service consists of companies from various industries across England and Wales. The gender pay gap data covers the years from 2018 to 2023. The data on female entrepreneurship numbers is sourced from 300 Local Administrative Districts (LADs) and has been gathered from the Office for National Statistics (ONS). This dataset is derived from the 2021 Census conducted in England and Wales. The data offers numbers and shares of entrepreneurship of each

LAD, including shares of different types of female entrepreneurship. These data sources were chosen due to their credibility and relevance to the research. By combining these two data sources, a merged data set providing a comprehensive view of self-employment dynamics across the LADs can be created and used to complete the data analysis.

#### 3.2 Data Analysis

The gender pay gap data from The Gender Pay Gap Service and female entrepreneurship data from ONS are analyzed in RStudio. The relationship of the variables is investigated by completing a linear regression analysis for 10 shares of different types of female entrepreneurship and difference in the median hourly pay percentage. The independent variable in this study measures the gender pay gap by calculating the percentage difference between what men and women earn per hour on average. Specifically, it looks at the median hourly pay for men and compares it to the median hourly pay for women to see how much more or less women earn compared to men. This difference, expressed as a percentage, is used to analyze its impact on female entrepreneurship. The squared term of the independent variable is included in the regression to investigate non-linearity. The dependent variables include the share of fulltime female entrepreneurs in active employment, part-time female entrepreneurs in active employment, total female entrepreneurs in active employment, female entrepreneurs with employees in active employment, female entrepreneurs without employees in active employment, overall self-employed women, part-time self-employed women, full-time selfemployed women, self-employed women with employees, and self-employed women without employees. This allows the comparison of the effect of the gender pay gap on different shares of female entrepreneurship.

The linear model was chosen to investigate the relationship between the dependent variables and the independent variable. Including the square of the independent variable in the model provides a more detailed understanding of the effects. This approach helps to reveal potential complexities in how the gender pay gap influences female entrepreneurship. The regression model offers insights to the strength and direction of the relationship. A positive coefficient represents a positive relationship, which is the expectation based on the assumption of the occupational choice theory, that as the gender pay gap increases, it pushes women into self-employment. In addition, the model has seven control variables, which are population density, share of under 25-year-olds, share of women, unemployment rate, Brexit estimated position error, Asian population in the district, and Black population in the district. These variables were kept constant throughout the analysis. The complete model used in the analysis is the following:

Dependent\_Variable

 $= \beta_0 \\ + \beta_1 \times DiffMedianHourlyPercent \\ + \beta_2 \times DiffMedianHourlyPercent^2 \\ + \beta_3 \times PopDensity \\ + \beta_4 \times Share\_Under25 \\ + \beta_5 \times Share\_Female \\ + \beta_6 \times Unempl\_Rate \\ + \beta_7 \times Brexit\_EPE + \beta_8 \times Asian \\ + \beta_9 \times Black + \in$ 

The code for this model was run in RStudio ten times, to model the relationships for all the dependent variables.

Three dependent variables were chosen for closer analysis to understand the impact of the gender pay gap on female entrepreneurship. These are the share of female entrepreneurs in the entrepreneur population, the share of female entrepreneurs without employees, and the share of female entrepreneurs with employees.

Next, the threshold values for each case were calculated to find out the critical values of gender pay gap where the direction changes. To calculate these threshold values, the vertex of the models was calculated by using the following formula.

$$v_x = -\frac{\beta_1}{2\beta_2}$$

This tells the gender pay gap level at which the direction of the relationship changes.

#### 4. FINDINGS

Through the findings of the analysis of the effect of gender pay gap on female entrepreneurship, three core themes were found. This section is structured to cover the following core findings 1) gender pay gap on the share of female entrepreneurs, 2) gender pay gap on the share of female entrepreneurs without employees 3) gender pay gap on the share of female entrepreneurs with employees. This section presents the results from the quantitative analysis completed in RStudio, using the methods described in the previous section. The results are summarized in Table 1, Table 2, and Table 3, and visualized in Figure 1, Figure 2 and Figure 3.

# 4.1 Gender Pay Gap on the Share of Female Entrepreneurs

The first core finding of the quantitative analysis is the effect of the gender pay gap on the share of female entrepreneurs within the self-employed population. This represents the proportion of female entrepreneurs among all self-employed individuals. Investigating this relationship gives insights into the effects of the gender pay gap on the entrepreneurial environment and the level of equality of entering different employment opportunities between women and men. It helps to understand whether a widening gender pay gap pushes women to pursue entrepreneurship as an alternative for wage-employment, or if it creates a barrier for women to enter self-employment.

A summary of the findings of the analysis, showing the effect of the independent variable (gender pay gap) on this dependent variable (share of female entrepreneurs within the self-employed population) is presented below.

	Coefficient	p-value
DiffMedianHourlyPercent	2.856e-03	0.0090
DiffMedianHourlyPercent_Sq	-8.901e-05	0.0399
PopDensity	2.787e-06	0.0106
Share_Under25	-5.092e-01	3.01e-15
Share Female	8.689e-01	0.0003
Unempl_Rate	-1.389e+00	1.35e-12
Brexit_EPE	-2.680e-01	< 2e-16
Asian	-1.096e-03	1.75e-05
Black	2.233e-04	0.6751
Adjusted R-squared	0.6474	
Threshold value	16.04%	

Table 1: Results Summary for Share of Female Entrepreneurs Within the Self-Employed Population

Table 1 shows a summary of the effect of the difference in median hourly percentage of earnings (in this study referred to as the gender pay gap) to the share of female entrepreneurs in the self-employed population. A p-value < 0.05 indicates that there is a significant effect. The first observation is that the gender pay gap has a significant positive effect on the linear variable. This indicates that as the gender pay gap increases, the number of women entering self-employment increases. For the squared variable the effect is significantly negative, with a negative coefficient and a p-value of 0.0399. This indicates that there is a turning point where the share of female entrepreneurs begins to decrease slowly with the increasing gender pay gap. The negative coefficient for the squared term suggests that the relationship between the gender pay gap and female selfemployment is non-linear. The shape of the regression is a downwards opening parabola, which can be seen from Figure 1 below.

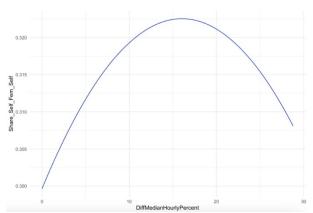


Figure 1: Relationship Between Gender Pay Gap and Share of Female Entrepreneurs

The model explains 64.74% of the variance in the dependent variable. The threshold value, calculated using the formula mentioned earlier, is 16.04%. This threshold represents the point where the "pushing" influence of the gender pay gap on female entrepreneurship peaks and changes direction. Beyond this threshold, the increasing gender pay gap starts to negatively impact the share of female entrepreneurs.

When the gender pay gap is zero percent, the share of female entrepreneurs is around 0.30. At the peak the share is around 0.32. The change can seem small numerically, but it represents a significant number of individuals.

# 4.2 Gender Pay Gap on the Share of Female Entrepreneurs Without Employees

The second focus of the analysis is the effect of the gender pay gap on the share of female entrepreneurs who do not have employees. This dependent variable represents the proportion of female entrepreneurs operating their business by themselves within the total self-employed population. Examining this relationship is beneficial for understanding how the gender pay gap affects the entrepreneurial landscape and the decision-making processes of female entrepreneurs.

Analyzing the relationship helps to determine whether an increasing gender pay gap encourages women to start and maintain solo businesses due to the flexibility and autonomy provided by this type of employment, or if it affects female entrepreneurship negatively because of financial and systemic barriers. This analysis aims to reveal how gender pay disparities

influence the scale and nature of female-owned businesses and their potential for growth.

The table below presents the results of the regression model highlighting the effect of the independent variable (gender pay gap) on the dependent variable (share of female entrepreneurs without employees).

	Coefficient	p-value
DiffMedianHourlyPercent	3.402e-03	0.0018
DiffMedianHourlyPercent_Sq	-1.064e-04	0.0138
PopDensity	4.037e-06	0.000219
Share_Under25	-4.161e-01	4.65e-11
Share Female	8.041e-01	0.000816
Unempl_Rate	-1.624e+00	2.35e-16
Brexit_EPE	-2.399e-01	< 2e-16
Asian	-9.801e-04	0.000109
Black	6.266e-04	0.238088
Adjusted R-squared	0.6330	
Threshold value	15.98%	

Table 2. Results Summary for Share of Female Entrepreneurs Without Employees

For the share of female entrepreneurs without employees, the relationship shows a similar trend as for the share of female entrepreneurs. Initially as the gender pay gap starts to increase, the share of female entrepreneurs without employees increases. The coefficient of the linear variable is positive, and the p-value is low, at 0.0018. Again, there is a turning point at which the share begins to decrease as the gender pay gap increases, as for the squared variable the coefficient is negative. The relationship is non-linear, and the shape is a downwards opening parabola, presented in Figure 2.

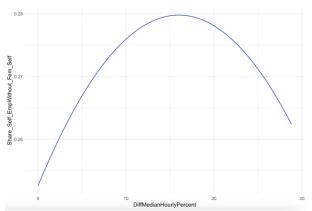


Figure 2: Relationship Between Gender Pay Gap and Share of Female Entrepreneurs Without Employees

The threshold at which the direction changes is at a gender pay gap of 15.98%. The share of female entrepreneurs without employees increases with the gender pay gap until this point, from which the share begins to decrease. The model explains 63.30% of the variance in the dependent variable. When the gender pay gap is zero percent, the share of female entrepreneurs without employees is around 0.25. At the peak the share is around 0.28.

## 4.3 Gender Pay Gap on the Share of Female Entrepreneurs With Employees

The third focus point is the effect of the gender pay gap on the share of female entrepreneurs with employees. This variable represents the proportion of female entrepreneurs with employees within the total self-employed population. Understanding this relationship is important, as it highlights the implications of the gender pay gap on business scaling and employment practices among female entrepreneurs. Specifically, analyzing this relationship considers whether an increasing gender pay gap motivates women to further expand their businesses by hiring employees, or whether it negatively affects their ability to do so because of financial and systemic barriers.

The results of the analysis, detailing the impact of the independent variable (gender pay gap) on this dependent variable (share of female entrepreneurs with employees), are presented in the following table.

	Coefficient	p-value
DiffMedianHourlyPercent	-5.752e-04	0.0313
DiffMedianHourlyPercent_Sq	1.844e-05	0.0817
PopDensity	-1.238e-06	4.55e-06
Share_Under25	-9.150e-02	3.04e-09
Share_Female	7.442e-02	0.20388
Unempl_Rate	2.342e-01	6.03e-07
Brexit_EPE	-2.768e-02	2.68e-07
Asian	-1.139e-04	0.06455
Black	-4.112e-04	0.00176
Adjusted R-squared	0.3236	
Threshold value	15.60%	

Table 3. Results Summary for Share of Female Entrepreneurs With Employees

For the share of female entrepreneurs with employees, the negative coefficient and p-value of 0.0313 of the linear variable indicate a significant negative relationship with the independent variable. Looking at the squared variable, the relationship is not significant (p-value > 0.05), but the direction is positive. This means that the relationship is non-linear. Initially when the gender pay gap increases, it has a negative effect on the share of female entrepreneurs with employees. There is a point when the direction changes, and the gender pay gap begins to positively affect the dependent variable. This turning point is at the gender pay gap level of 15.60%, at which the direction switches to positive and the share begins to slightly increase. The shape of this regression is an upwards opening parabola, presented in Figure 3 below.

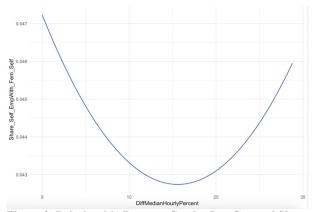


Figure 3: Relationship Between Gender Pay Gap and Share of Female Entrepreneurs With Employees

The model explains 32.36% of the variance in the dependent variable. When the gender pay gap is zero percent, the share of female entrepreneurs is around 0.047. At the threshold the share

is around 0.043. The change is significantly smaller than for the share of female entrepreneurs, and the share of female entrepreneurs without employees.

These results indicate that the two dependent variables of female entrepreneurs without and with employees are affected in completely opposite ways by the independent variable. The variable of the share without employees follows the same pattern as the share of female entrepreneurs discussed before, whereas the variable of the share with employees shows a different trend.

### 5. DISCUSSION

# 5.1 Gender Pay Gap on the Share of Female Entrepreneurs

The initial increase in female entrepreneurship as the gender pay gap increases indicates that the gap works as a pushing factor according to occupational choice theory. As the gap starts to increase, women start escaping the discrimination into self-employment, where they have more control over their profits and working conditions. At low and moderate gender pay gap levels, the gap is not significant enough to have a considerable negative impact on women, thus creating a more encouraging environment for starting a business. These conditions can build confidence in women, while making entrepreneurship a financially viable option. When the pay women get is close to what men are paid, but decreasing comparatively, the risk of choosing entrepreneurship attracts more to a certain point. This point is the threshold value calculated at 16.04%. The share of female entrepreneurs increases to this point. The threshold gender pay gap is slightly higher than the average gender pay gap in the UK in 2023.

The decrease after the threshold is opposite to the assumption that the gender pay gap pushes women into self-employment. When the gender pay gap gets significant, entrepreneurship starts to become unattractive for women. The decrease can be caused by various factors. While the gap is increasing, at the lower levels it is still viable for women to choose entrepreneurship over wage-employment, but when the difference in pay is growing too high women face a severe disadvantage in financial opportunities to become entrepreneurs compared to men. As the research done by Saridakis, Marlow and Storey (2013) concludes, women are significantly influenced by economic conditions when it comes to entrepreneurship decision making. The results of this study aligns with the research, as when the large gender pay gap affects women's economic capabilities, they are less likely to choose entrepreneurship. The industry specific study by Mroczek-Dabrowska and Gaweł (2022) also found that in industries where the gender pay gap is over the moderate levels, the share of female entrepreneurs decreases.

As found by the studies by Leung (2005) and Thébaud (2015) discussed in the literature review, it is harder for women to receive loans and investments needed for starting a business. With the pay gap over 16.04%, the ability to get credit, capital and other resources compared to men can affect women's ability to become entrepreneurs. If the gender pay gap level is high, women are even more dependent on external funding when starting a business. When the gap gets too significant, the opportunities for women and men get so disproportionate that the chances are not close to equal. The higher pay gap can also indicate that the networking opportunities important for starting a business are disproportionate. The high pay gap indicates labor market segregation and segmentation, where men are

holding the managerial positions and controlling the primary market. Women do not have the same opportunities to network and gain the important contacts as men, who are overrepresented in the higher positions (Leung 2005: Thébaud 2015). The significantly lower funds and smaller networks affects the share of female entrepreneurs negatively. There shows to be a critical level of inequality in the economic landscape at which it begins to negatively impact opportunities for women. An unequal economic landscape can impact the availability of training and education for women, further contributing to the gender pay gap as outlined by the human capital model. At a critical point the gap between the two genders is so wide that it starts to affect women negatively in multiple different areas, making it harder to escape the inequality of wage-employment by creating a barrier of entry to entrepreneurship.

If the gender pay gap level is very high, it indicates that there are deeper issues in the economy which are making entrepreneurship not viable for women. The unfair and poor economic conditions affect the growth potential for all. A high gender pay gap often is a sign of broad systematic disadvantages that are affecting women disproportionately (Toczek, Bosma & Peter, 2021). These could be for example lack of childcare support and gender biases in many levels of society. Psychological and social barriers start to build up more easily, making the disadvantaged position of women more severe. The finding that there is a critical point at which the gender pay gap is limiting instead of pushing women into self-employment is critical for a working and equal economy.

## 5.2 Gender Pay Gap on the Share of Female Entrepreneurs Without Employees

Similarly to the share of female entrepreneurs, there is also an initial increase in the share of female entrepreneurs without employees. Initially the gender pay gap seems to be a pushing factor for women to start their own businesses. The threshold gender pay gap is 15.98% for the variable with employees. Until this point, the increase of the gap is a pushing factor.

The reasons can be linked to the ones for the share of female entrepreneurs in self-employment. With the lower, still increasing pay gap levels it is still viable for women to start their own businesses as a response to the increasing gender pay gap. Starting a business without employees is less costly and more simple when it comes to dealing with payrolls and regulations. There is no necessity for employees and running the business alone is more attractive. The increase in the share of female entrepreneurs without employees can be a sign of horizontal segregation. According to the study by Mroczek-Dabrowska and Gaweł (2021), women are more likely to be in the secondary market, where there are less opportunities for advancement. As these are the sectors women have experience and knowledge from, this can reflect in their entrepreneurial careers and women being self-employed in the sectors with limited growth opportunities and no necessity for employees. This would be a factor explaining the initial increase in the share of female entrepreneurs without employees. Additionally, this highlights the systemic barriers that prevent women from entering more profitable and scalable industries, reinforcing the gender pay gap and limiting their economic potential. These barriers, such as limited access to capital, professional networks, and scalable opportunities, affect women's ability to expand their businesses and hire employees. The barriers do not only reinforce the gender pay gap, but also limit the economic impact and growth potential of female owned businesses.

As the trend of female entrepreneurs without employees is similar to the share of female entrepreneurs in general, it suggests that at the lower gender pay gap levels, women rather choose solo entrepreneurship. This can also be a sign that many women may choose this type of entrepreneurship without employees to gain more control and flexibility of their work lives in response to the inequality in wage-employment, which is in line with the study by Mroczek-Dąbrowska and Gawel (2022). This can be a sign of vertical segregation. These personal barriers include family and domestic responsibilities that limit the opportunities for women to focus on scaling their businesses. Due to these responsibilities, it is harder for women not only to gain the initial funds for starting a larger business, but also to achieve the right work-life balance.

The decrease after a certain point also follows the same trend as in the model for share of female entrepreneurs. When the gender pay gap gets larger than 15.98%, the share begins to decrease. Thus, when the pay gap gets to very high levels, less women participate in self-employment without employees. At very high gender pay gap levels, becoming an entrepreneur becomes less of an option for women. As the total share of female entrepreneurs falls, the same happens for the share of female entrepreneurs without employees, indicating that they represent the majority of female entrepreneurs. A high pay gap creates a serious financial disadvantage to enter entrepreneurship compared to men. Another reason can be that at higher pay gap levels, women start employing other people. This can happen out of necessity to create a larger scale business to fight the high pay gap levels and be more in control of the earnings.

## 5.3 Gender Pay Gap on the Share of Female Entrepreneurs With Employees

For the share of female entrepreneurs with employees, the results are very different. The negative coefficient of the linear variable tells that the share of women with employees decreases initially until the threshold value of 15.60%. After this point, the share starts to increase, indicating that the increasing gender pay gap in the high pay gap levels drives women into self-employment with employees.

The downwards sloping trend at lower pay gap levels indicates that the risk of taking employees is too high. There seems to be no necessity for women to have the scale of business that would require hiring people at the pay gap levels below 15.60%. As discussed previously, at these lower pay gap levels the share of women in self-employment without employees is increasing, indicating that it is more attractive to have a small business than owning a larger scale business. As Tonoyan, Strohmeyer and Jennings (2009) discussed occupational choice theory, the gender pay gap is a pushing factor due to the necessity, which women do not have at the lower gender pay gap levels. The initial decrease in the share of female entrepreneurs with employees at lower pay gap levels can be unattractive due to several factors. Firstly, hiring employees is costly and requires more administrative work, and thus can seem less attractive at the lower pay gap level. The gender pay gap level under the threshold is not worth taking the risk of becoming an entrepreneur with employees. This can also indicate that female owned businesses are not scaled up to the level in which hiring other people would be necessary, being a result of vertical segregation. Additionally, the smaller wage disparity may

mean that women do not feel as compelled to leave wage-employment for entrepreneurship, where they have to scale up quickly to compensate for lower starting capital and resources. When the gender pay gap gets larger than 15.60%, the share of female entrepreneurs with employees begins to increase. This indicates that scaling up the business and hiring employees becomes more attractive. According to the results, the increasing high gender pay gap pushes women towards large scale business ownership. At the gender pay gap levels of over 15.60% the benefits seem to outweigh the risks and costs created by scaling up the business, making the gender pay gap a pushing factor. Becoming an entrepreneur and scaling up the business is a way to escape unequal pay.

As the study by Lehto and Sutela (1999) found, women are on average more highly educated than men. The increase of female large scale business owners can thus be a result of women using their education and acquired skills to create opportunities and profit despite the systematic barriers they are facing. Women use their human capital to escape the severe inequalities in wage-employment. Scaling up their businesses allows women to potentially generate higher revenues, build stronger professional networks, and gain greater market influence in response to the negative impacts of the gender based economic disparities.

Looking at the decision making from the point of view of occupational theory, it seems that the risk of employing people when the gender pay gap level is low is not attractive for women. When the gender pay gap is high, the possible reward is comparatively higher and taking the risk of a larger scale business becomes attractive. The pay gap only becomes a pushing factor when the risk-reward relationship is more balanced, or making the reward very attractive. Before that the push from the gender pay gap is not necessary and not worth the possible economic consequences from taking the risk.

### 5.4 Theoretical Implications

By providing insights into the effects of gender pay gap on female entrepreneurship in England and Wales, this research contributes to the literature aiming to understand this market relationship, labor segregation, women's entrepreneurial decision-making, and societal barriers women are facing. Various studies have examined the gender pay gap and female entrepreneurship (Blau & Kahn, 2017: Grybaitė, 2006: Mroczek-Dabrowska & Gaweł, 2020: Thompson, Jones-Evans & Kwong, 2009), but have not explicitly related these two variables with each other. This study emphasizes the way the gender pay gap uniquely impacts women's business decisions and growth opportunities.

The study discusses different theories behind the gender pay gap and female entrepreneurship, including occupational choice theory and the human capital theory. The pushing effect of the gender pay gap is found not to be constant, but varies depending on the width of the gap. It was also found that the increase of the gender pay gap has a different impact on female entrepreneurship with employees, and female entrepreneurship without employees. These findings have important implications for understanding and researching the decision-making of women in choosing their employment type. This provides an interesting basis for further research.

The research done provides empirical evidence on how gender pay disparities can reinforce labor market segregation by pushing women into entrepreneurship, especially in contexts where traditional wage-employment opportunities are unequal. This contributes to theories on labor market segmentation and highlights the need for policies that address both wage equality and entrepreneurial support.

## 5.5 Practical Implications

The findings are beneficial for the development of an equal economic environment. It shows that women are facing various different barriers that limit their career choice. The threshold values can be further investigated to develop policies to reduce the effects of unequal pay on female entrepreneurship in England and Wales. Encouraging more women into entrepreneurship would boost the economy of the UK.

Policy makers should focus on creating supportive environments that address the unique challenges faced by women in wage-employment and female entrepreneurs. Such could be for example providing equal opportunities for inquiring funding, promoting and creating opportunities for networking, providing affordable childcare, and improving flexible working arrangements.

The results highlight the need for companies and financial institutions to provide equal opportunities and equal pay to ensure that both genders have equal opportunities. Lower interest rates, dedicated funds for female owned businesses could be the first step to overcome the financial barriers and promote an alternative for traditional wage-employment.

To help female entrepreneurs with scaling their businesses and to overcome barriers they face, creating and promoting networking opportunities is essential. Ensuring that business networks and associations are inclusive and provide mentorship for employees in all levels. This would help women to gain the necessary contacts and resources to scale their businesses. Different policy changes could be implemented to achieve this. To improve the economic environment for women, focusing on the further development of the Equal Pay Act would help to ensure that the conditions improve. To make sure that women have the opportunity to pursue the possibilities, child care support is crucial. Making child care affordable, accessable, and providing support for women in their maternity leaves can help to minimize the difference between the genders.

#### 5.6 Limitations and Further Research

The findings of this study are subject to limitations that are important to be acknowledged. The gender pay gap is a complex issue that is affected by various factors, including socio-economic, cultural, and institutional influences. This study was focused only on England and Wales. This makes the data very homogeneous. To further understand the concept of the gender pay gap, data from different countries with different influences should be completed. As all countries have different policies, cultural norms, attitudes towards gender equality, and changing economies, the results of this study may not be applicable somewhere else. Completing a comparative study of various countries will allow for a wider understanding of the different factors on the gender pay gap and its effect on female entrepreneurship. Such studies could help identify best practices and policies that are effective in reducing the gender pay gap and promoting female entrepreneurship. Studying other countries would increase the generalizability to the findings.

The data from the Gender Pay Gap Service includes information from companies that have over 250 employees.

This means that it excludes a significant sector of the business landscape of small and medium-sized companies. Thus, the effect of this sector on the gender pay gap is not considered in the study. Certain industries that commonly consist largely of smaller businesses may be underrepresented. Including the small and medium-sized companies into the study would remove the bias in the analysis. This could provide an interesting base for further research as small and medium-sized companies tend to operate in the secondary market, where many women are employed.

This study also does not account for industry-specific factors that could influence the gender pay gap and female entrepreneurship. Different industries have varying levels of gender disparity, which could affect the results. Future research should consider industry-specific focus to understand how the gender pay gap impacts female entrepreneurship within specific sectors.

Another limitation is that there are constantly different policy changes that can affect the gender pay gap or female entrepreneurship in England and Wales. The effect of these policies cannot be predicted and the observed relations can be affected. Also changes in economic conditions and attitudes towards gender equality can affect the relationship. Thus the results might not reflect future trends.

Additionally, the data used in this study is cross-sectional, capturing a snapshot of the relationship between the gender pay gap and female entrepreneurship at a specific point in time, between different LADs. Longitudinal data would provide a more comprehensive understanding of how this relationship evolves over time and under different economic and political conditions. Future research should consider using longitudinal data to capture these dynamics and provide insights into the long-term effects of the gender pay gap on female entrepreneurship.

The analysis of this study has been completed within the limits of the data set compiled from The Gender Pay Gap Service and ONS. It does not include all the variables that affect the gender pay gap and female entrepreneurship, and it is important to note that there can be unaccounted variables. There are many other external factors influencing female entrepreneurship, such as cultural attitudes, societal norms, industry-specific dynamics, and access to childcare, which have not been fully accounted for in this study. These factors can significantly impact women's entrepreneurial decisions and success rates.

It is important to note, that the threshold values calculated are specific to this study, and might not be applicable in different contexts or with different analysis of the relationship.

By addressing these limitations, future research can build on the findings of this study to provide a more detailed and comprehensive understanding of the impact of the gender pay gap on female entrepreneurship.

## 6. CONCLUSION

This study aimed to explore the research question: How does the gender pay gap influence women's entrepreneurial activity in England and Wales? This was done by conducting a regression analysis that focused on ten different dependent variables, the difference in the median hourly pay percentage as the independent variable with the squared term included, and seven control variables. Three dependent variables were chosen for a closer analysis. These variables were the share of female

entrepreneurs in the self-employed population, the share of female entrepreneurs without employees in the self-employed female population, and the share of female entrepreneurs with employees in the self-employed female population. The initial assumption according to the occupational theory discussed in the literature review was that the gender pay gap is a pushing factor that pushes women from wage-employment into entrepreneurship.

From the quantitative analysis it was concluded that the effect of the gender pay gap on female entrepreneurship is not constant, but changes at different levels of the gap, and with different types of self-employment. For the share of female entrepreneurs in self-employment and the share of female entrepreneurs without employees, the initial effect of the increase in the gender pay gap is positive, meaning that the pay gap is a pushing factor. The threshold value of gender pay gap for the share of female entrepreneurs is 16.04%, from which point the effect of the increasing pay gap becomes negative. For the share of female entrepreneurs without employees this value is 15.98%. For the share of female entrepreneurs with employees the trend is the opposite, initially being negative and at the threshold value of 15.60% becoming positive. This indicates that for this variable the gender pay gap becomes a pushing factor only when the gap is significant. In conclusion, this research offers insights into the variability of the influence of the gender pay gap on female entrepreneurship in England and Wales.

### 7. REFERENCES

- Abadía, L.K., Villa, E., Cárdenas. (2020). A theory of the gender pay gap. Evidence from Colombia and the United States. *Universidad Nacional de Colombia*. ISSN: 0121-4772 E-ISSN: 2248-4337
- Adom, K., Asare-Yeboa, I.T. (2016). An evaluation of human capital theory and female entrepreneurship in sub-Sahara Africa: Some evidence from Ghana. *International Journal of Gender and Entrepreneurship*. ISSN: 1756-6266
- Blau, F.D., Kahn, L.M. (2017). The Gender Wage Gap: Extent, Trends, and Explanations. *Journal of Economic Literature* 2017, 55(3), 789–865. https://doi.org/10.1257/jel.20160995
- Bögenhold, D., Klinglmair, A. (2015). Female Solo Self-Employment – Features of Gendered Entrepreneurship. International Review of Entrepreneurship, Article #1504, 13(1): pp. 47-58. Senate Hall Academic Publishing.
- Carranza, E., Das, S., & Kotikula, A. (2018). Gender-based employment segregation: Understanding causes and policy interventions. *World Bank*. https://doi.org/10.1596/31042
- Francis-Devine, B., Hutton, G. (2024). Women and the UK economy. *House of Commons Library*. https://researchbriefings.files.parliament.uk/documents/SN06838/SN06838.pdf
- Gaweł, A., & Mroczek-Dąbrowska, K. (2022). Gender pay gap in explaining female entrepreneurship-Industry

- perspective of selected European countries. *International Journal of Manpower*, 43(9), 42-59.
- GOV.UK (2017). The Equality Act 2010 (Gender Pay Gap Information) Regulations 2017. *The International Archives*. https://www.legislation.gov.uk/ukdsi/2017/9780111 152010#:~:text=Citation%2C%20commencement% 20and%20interpretation,force%20on%206th%20Ap ril%202017.
- Grybaitė, V. (2006). Analysis of theoretical approaches to gender pay gap, *Journal of Business Economics and Management*, 7:2, 85-91. https://doi.org/10.3846/16111699.2006.9636127
- Hu Y., Tarafdar M., Al-Ani J. A., Rets I., Hu S., Denier D., Hughes K. D., Konnikov A., Ding L. (2022). Gendered STEM workforce in the United Kingdom: The role of gender bias in job advertising. BIAS project evidence submission to the 'Diversity in STEM' inquiry. Science and Technology Committee, House of Commons, UK Parliament. https://committees.parliament.uk/writtenevidence/43 175/pdf/#:~:text=Occupations%20such%20as%20c onstruction%20and,formed%20almost%20exclusive ly%20of%20men.
- Lehto, A., Sutela, H. (1999). Gender Equality in Working Life.

  Tilastokeskus. ISSN 0785-0107

  = Labour M arket ISBN 951-727-696-6
- Leung, D. (2005). The male/female earnings gap and female self-employment. *The journal of Socio-Economics, Volume 35, Issue 5, Pages 759-779*. https://doi.org/10.1016/j.socec.2005.11.034
- Marlow, S., Carter, S., Shaw, E. (2008). Constructing female entrepreneurship policy in the UK: is the US a relevant benchmark? *Environment and Planning C: Government and Policy 2008, volume 26, p. 335-351.* https://doi.org/10.1068/c0732r
- Mroczek-Dąbrowska, K., Gaweł, A. (2020). Determinants of female entrepreneurship in male- and femaledominated sectors in selected European counrties. *International Entrepreneurship Review 2020, Vol. 6,* No. 2. https://doi.org/10.15678/IER.2020.0602.04
- ONS. (2023). Gender pay gap in the UK: 2023. Office for National Statistics. https://www.ons.gov.uk/employmentandlabourmark et/peopleinwork/earningsandworkinghours/bulletins/genderpaygapintheuk/2023
- Rose, A. (2019). The Alison Rose Review of Female Entrepreneurship.

  https://assets.publishing.service.gov.uk/government/
  uploads/system/uploads/attachment data/file/78432
  4/RoseReview\_Digital\_FINAL.PDF
- Saridakis, G., Marlow, S., Storey, D.J. (2013). Do different factors explain male and female self-employment rates? *Journal of Business Venturing, Volume 29*,

- *Issue* 3, *Pages* 345-362. https://doi.org/10.1016/j.jbusvent.2013.04.004
- Schäfer, A., Gotschall, K. (2015). From wage regulation to wage gap: how wage-setting institutions and structures shape the gender wage gap across three industries in 24 European countries and Germany.

  \*Cambridge Journal of Economics, Volume 39, Issue 2, March 2015, Pages 467–496. https://doi.org/10.1093/cje/bev005
- Thébaud, S. (2015). Business as Plan B: Institutional Foundations of Gender Inequality in Entrepreneurship across 24 Industrialized Countries. Administrative Science Quarterly. https://doi.org/10.1177/0001839215591627
- Thompson, P., Jones-Evans, D., Kwong, C. (2009). Women and Home-based Entrepreneurship, Evidence from the United Kingdom. *International Small Business Journal*. https://doi.org/10.1177/0266242608100492
- Toczek, L., Bosma, H., Peter, R. (2021). The Gender Pay Gap: Income Inequality Over Life Course – A Multilevel Analysis. *Front. Sociol.* 6:815376. https://doi.org/10.3389/fsoc.2021.815376
- Tonoyan, V., Strohmeyer, R., Jennings, J.E. (2019). Gender Gaps in Perceived Start-up Ease: Implications of Sex-based Labor Market Segregation for Entrepreneurship across 22 European Countries.

  \*\*Administrative Science Quarterly, Volume 65, Issue 1, Pages 181-225.\*\* https://doi.org/10.1177/0001839219835867

## 8. APPENDIX

8.1 Appendix A – Regression Results for All 10 Dependent Variables

Dependent variable	Linear independent variable	Linear variable (p- value)	Squared variable (coefficient)	Squared variable (p- value)	Adjusted R- squared
Share_Self_Ft_Fem_Act	(coefficient) 2.026e-04	0.5408	3.010e-06	0.8190	0.5082
Share_Self_Pt_Fem_Act	-3.535e-04	0.0559	1.588e-05	0.0307	0.5449
Share_Self_Fem_Act	-1.509e-04	0.7578	1.889e-05	0.3313	0.5348
Share_Self_EmpWith_Fem_Act	-1.793e-04	0.0055	7.483e-06	0.0035	0.4840
Share_Self_EmpWithout_Fem_Act	2.372e-05	0.9575	1.157e-05	0.5128	0.5282
Share_Self_Fem_Self	2.856e-03	0.0090	-8.901e-05	0.0399	0.6474
Share_Self_Pt_Fem_Self	3.516e-03	6.49e-05	-1.074e-04	0.0020	0.5676
Share_Self_Ft_Fem_Self	-6.596e-04	0.214	1.840e-05	0.382	0.5845

Share_Self_EmpWith_Fem_Self	-5.752e-04	0.0313	1.844e-05	0.0817	0.3236
Share_Self_EmpWithout_Fem_Self	3.402e-03	0.0018	-1.064e-04	0.0138	0.6330

Note: Linear variable: DiffMedianHourlyPercent; Squared variable: DiffMedianHourlyPercent<sup>2</sup>