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Analysis of Internal and External Wage gaps between Blacks and White Workers in the UK

Eze, Emeka[1]
Ogbonna, Chukwuma[2*]
Nwachukwu Edwin Udochukwu[3]
Chukwuma-Ogbonna, Joyce[4]
Department of Economics, Michael Okpara University of Agriculture, Umudike, Abia State[1,2,4]
Department of Economics, Nnamdi Azikiwe University Awka.[3]
[*]Corresponding Author: ***chuksgabriel40@yahoo.com***

Abstract

Both the internal wage gap within the Black ethnic minority and the impact of the intersection of gender and ethnicity on the external pay gap were investigated in this study. According to the study's findings, black men make between 7% and 5% more money than black women, indicating a substantial wage disparity within the black ethnic group. Additionally, we discover that Black workers, both male and female, have significant external wage gaps.

Keywords: ethnicity, gender, job satisfaction, minority class, wage gaps.

1.0 Introduction

Over the years, there have been a growing body of evidence documenting the gender and ethnic wage gaps in many parts of the world (Breach and Li, 2017; Brynin, Longhi and Zwysen , 2019; Blau and Kahn, 2017). Research into the wage differentials along ethnic and gender lines were borne out of certain arguments. While studies like Cuberes and Teignier (2016), Hsieh et al. (2019) argue that discrimination in the labour market disrupt efficiency and can impede economic growth. Others have pointed out the unfairness and injustice in paying people differently for doing similar job. Heath and Brinbaum (2014) and Li (2018) point out, the persisting inequalities experienced by ethnic min-orities run counter to the principle of equality of opportunity as enshrined in the law,

Recent evidence have pointed out that despite increased educational enrollment and attainment of women, there is still large internal wage gaps within ethnic groups (Bertrand, 2020) and the speed of convergence of this gaps have slowed down over the years (Blau and Kahn, 2017). Furthermore, given that several studies have reported evidence of wage gaps along ethnic and gender lines, the effect of the intersection of ethnicity and gender on wages have opened up new questions regarding the differential effect of the interaction of gender and ethnicity (Brynin, Longhi and Zwysen, 2019). For instance, what will be the impact of being a Black and being a female on the pay gap relative to a white man?

This study seeks to evaluate the internal wage gaps within the Black minority ethnic group in the UK as well to determine the effect of the intersection of gender and ethnicity on the external wage gap relative to white men in the UK. The decision to select the black ethnic

group is borne out of several reasons. Evidence from the LFS survey 2013 to 2023 indicate that black workers receive the least mean hourly wage in the UK as shown in Table 1.

Table 1.Means of gross hourly pay

	Sex of worker		
Ethnic Group	Male	Female	Total
White Britian	18.18491	14.00685	15.77716
Other White	17.47332	14.65964	15.86908
Asian	18.08933	15.0703	16.66494
Black	14.68126	13.45236	13.93863
Mixed/Oth	17.7085	15.1174	16.34522
Total	18.03319	14.10213	15.79195

Authors computation using data from LFS 2013 -2023

Evidence from Table 1 shows that while White British male workers receive a mean annual hourly pay of over 18 pounds per hour, Black male workers receive about 14.6 Pounds. This represents about 19.29% less than what a white male worker earn per hour on the average. The difference is also statistically significant. When we compare the wages of female workers, we observe that Black female workers earn less compared to Black males and females from other ethnic groups. The difference is also significant.

Discrimination of blacks is not limited to earnings alone. In terms of occupation, we find that blacks are less likely to occupy the post of Managers, director and senior officials in the UK relative to white British workers. While 11.7% of white males are managers, directors and Senior officials, for Blacks only 5.8% of workers where in this category. Furthermore, while over 7.7% of whites were found to work in STEM related occupations, among the black ethnic group the percentage of workers in this occupation is lower and stands at about 5.7%. Also, while 8.4% of whites operates in the skilled trade occupation, for Blacks the number stands at 4.6%.

While there are no shortage of works describing the extent of ethnic and gender pay gaps in the UK, many of these studies have produced varied results (Breach and Li, 2017; Brynin, Longhi and Zwysen , 2019). Again, in the light of new data on the Labour force there is need to reexamine the ethnic gender wage gap issue in order to establish its current state.

As a result of the above discussion, the following objectives will guide this study. They are to:

i. Determine the internal wage gap within the Black ethnic group in the UK

ii. Determine the effect of the intersection of gender and ethnicity on the external pay gap.

The study utilizes a relatively updated UK Labour Force Survey (LFS). The data ranges from 1st quarter of 2013 to the 2nd quarter of 2023. Empirically, the study employed the method of ordinary least squares (OLS) to evaluate the hypothesis of the study.

2. Literature review

There is no shortage of studies analyzing the gender and ethnic pay gaps. These studies, which have employed different models and estimation technique provides us with findings confirming the existence of gender and ethnic pay gaps. This paper examined some these studies in other to further highlight wage disparities across gender and ethnic groups

Brynin, Longhi and Zwysen (2019) analysed whether women from ethnic minorities suffer a double wage penalty on the basis of both their ethnicity and their gender. The study employed LFS data ranging from 1993 to 2014 for the purpose of the study. The study found that White British men are paid the most on average, followed by the Indians and Chinese, blacks Pakistanis and Bangladeshis workers. White British women were also found to earn significantly more than Pakistanis and Bangladeshis, both men and women. The study found that after controlling for age, education and tenure, the internal wage gap reduces significantly. In terms of intersectionality between ethnicity and gender, the study found that between (1993–2000) there is indeed some intersectionality relative to white workers, but this largely disappears in the second period (2001–14). The study concludes that while it is possible that this is a temporary improvement it does seem that gender and ethnic inequalities are increasingly divergent.

In a different study, Breach and Li(2017) examined the racial pay gap in the Britain using LFS data of 1992 to 2015. Sample size was restricted to full time working men between the ages of 16-65 and women within the ages of 16-63. Using ordinary least square estimation technique, the study found Women from almost every minority ethnic group experience a pay gap with White British men. Also, the study found that for full time workers, Black African women experience the highest pay gap at about 19.6% relative to white British men. On the contrary, Chinese women experience reversed pay gap of -5.6% relative to white British men indicating that Chinese women earn more than white British men. The study also found that there is variability in pay gap within same ethnic group. Women of most ethnic minority groups experience a gender pay gap when compared with men of the same ethnicity.

Longhi and Brynin(2017) used historical data from the LFS covering the period 1993-2014 to measure pay gaps for the largest ethnic groups in the UK (Indian, Pakistani, Bangladeshi, Black African, Black Caribbean and Chinese people) compared with White British people. The aim was to identify if ethnicity influences women pay differently from men's. Evidence from the study showed that White British group tended to outperform ethnic minorities in terms of pay – but with a few exceptions. All Indian and Chinese men (that is, both foreign-born and British) and British-born Black African men had similar earnings to White British men. However, all other groups earned noticeably less. Pakistani and Bangladeshi males had particularly severe pay gaps, especially those born outside the UK. Ethnic minority women generally earned more than White British women, with all Indian, all Chinese, British-born Black Caribbean and British-born Black African women experiencing notable pay advantages. Only two groups had a clear pay disadvantage: these were Pakistani and Bangladeshi immigrant women. However, British-born Pakistani and Bangladeshi women experienced no such disadvantage. Along with female immigrants in the Black African and Black Caribbean group, their pay was found to be fairly similar to White British women's

3. Methodology

The study employed a combination of Ordinary Least Square (multiple linear regression) estimation technique and critical analysis of past literature to answer the research questions posed by this study. Under the assumptions of the Gaussian classical linear regression model, OLS estimates are considered to be a best linear unbiased estimator (BLUE) (Gujarati, 2004, pp. 79) Specifically, the objectives of the study are to:

a. Investigate the internal pay gap within black workers
b. Investigate the effect of the intersection/interaction of ethnicity and gender on the wage gap

To capture objective one of the study which is to determine the internal pay gaps amongst black, the following models were estimated.

$$\log(wage_i^b) = \beta_1 + \beta_2 female_i^b + \mu_i^b \quad \text{.....1}$$

$$\log(wage_i^b) = \beta_1 + \beta_2 female_i^b + \beta_3 havedegree_i^b + \beta_4 citizen_i^b + \beta_5 agegroup_i^b + \beta_6 occup_i^b + \beta_7 marr\_stat_i^b + \beta_8 year_i^b + \beta_8 havechild19_i^b + \beta_9 female * havedegree_i^b + \beta_{10} female * citizen_i^b + \mu_i^b \quad \text{.....2}$$

Model 1 is a simple regression of log wage on a dummy variable for gender. The sample is restricted to only black workers. The subscript i is the individual identifier and the superscript

b is the ethnic identifier for blacks. The abridged model 1 is used to capture the impact of gender on wages among black workers in the UK. To measure how the wage gap changes when we control for certain demographics, we estimate model 2. In model 2, we control for education, citizenship status, agegroup, occupational group, marital status and the years. Furthermore we interact the dummy variables female and havedegree as well as female and citizen.

Equation 3 and 4 produces a direct test of intersectionality through the use of interaction terms between gender and ethnicity, showing their joint effects on the dependent variable. It is unclear in the literature whether there should be a reinforcement effect for ethnic-minority women for intersectionality to hold, or rather that the intersection is simply represented by the presence of the two main effects separately (Browne and Misra, 2003: 498)

$$\log(wage) = \beta_1 + \beta_2 eth\_gen_i + \mu_i \ldots\ldots\ldots\ldots 3$$

$$\log(wage) = \beta_1 + \beta_2 eth\_gen_i + \beta_3 havedegree_i + \beta_4 citizen_i + \beta_5 agegroup_i + \beta_6 occupgrou_i + \beta_7 havechild19_i + \beta_8 year_i + \beta_9 eth\_gen_i * havedegree_i + \beta_{10} eth\_gen_i * citizen_i + \mu_i \ldots\ldots\ldots\ldots 4$$

In equation 3 we regress the interaction of gender and ethnicity on wages. In equation 4, we control for other variables that are likely to affect wages. The idea is to examine how the wage gap changes as we control for more demographics.

The coefficient on the dummy variables are referred to as the differential intercept coefficient. They measure by how much the average wage changes when the dummy variable takes a value of 1. The interaction term on the other hand allows us test to effects across different groups generated by more than one factor (Woodridge, 2016, pp. 227)

Furthermore, to shed more light on our findings, we Critically analyze past literature. Different authors have adopted different methods, different contexts to analyze the ethnic gender pay gap. We reviewed some of the findings to see how it differs or aligns with our findings.

3.2 Data

The study made use of the UK Labour Force Survey (LFS). The LSF is a quarterly survey undertaken by the Office for National Statistics to collect information about the UK labour market. The LFS is intended to be representative of individuals living in private households in the UK, with approximately 60,000 households and their members interviewed each quarter. A household is followed for five quarters and the LFS is a rotating panel so in each wave a fifth are responding to their first survey, a fifth to their second etc., hence there is

around an 80% overlap between quarters. The dataset is a combined extract from the 1st quarter of 2013 to the 2nd quarter of 2023.
Because the study focuses on a subset of the sample (White and Black employees of both gender) the sample size is quite lower than the 288,666 observations in the data set. In particular, the study employed a sample of about 4270 for the first analysis of internal wage gap within Blacks and a sample size of about 147,124 comprising of both black and white workers to evaluate the second hypothesis of no external wag gap between Blacks and white.
The data is suitable for the present analysis of ethnic and gender pay gaps because it has information on respondents ethnicity, gender, occupational type, marital status, hourly wages, citizenship status, number of kids, age of respondents, educational qualifications and other variables that are crucial in estimating the ethnic gender pay gaps of workers in the UK.

3.3 Description of variables

Log(wage)	Log of hourly wage
Ethn_gen	A nominal variable that takes the value 1 if the respondent is a white male, 2 if the respondent is white female, 3 if the respondent is a black male and 4 if the respondent is black woman (Base group= whitemen)
female	A dummy variable that takes the value 1if the respondent is a female and 0 otherwise (Base group=male)
havedegree	A dummy variable that takes the value 1 if the respondent has a degree or higher qualification and 0 otherwise (Base group=less than a degree (0))
Citizen	A dummy variable that takes the value 1 if the respondent is a British citizen and 0 otherwise (Base group= non bristish citizen)
Haveachild19.	A dummy variable that takes the value 1 when the respondent has a child under 19 years and 0 otherwise (Base group= have no child under 19 years)
Age_group	A nominal variable that groups all the observation into 4 groups beginning from 16 to 65 years of age (Base group = age 16-24)
Occup_group	A nominal variable used to classify different occupation. Ranges from 1 to 10 (Base group=profesionals, directors and senior official)
Year	A dummy variable that takes on the value 1 for a certain year and zero otherwise. (Base year=2013)

4.0 Empirical results and discussion

4.1 summary statistics

Evidence from the descriptive statistics indicate that in the estimated sample, 60% were black females while 40% were black men. 65% of the sample had no degree or higher qualifications while 35% had a degree or higher qualifications. Again, 70% of the blacks

were British citizens while 30% were not. The average log hourly wages was 2.4. 5% of the population aged between 16-24, 20% are between 25-34 years of age, 45% are of the age bracket 35-49 years and the remaining 28% are withing the ages of 50-64.

4.2. Results: Estimates for Models 1 and 2.

Table 4.1. Internal pay gaps within Black Minority group

VARIABLES	(1) logwage	(2) logwage
female	-0.074***	-0.058**
	(0.017)	(0.027)
havedegree		0.118***
		(0.027)
female#havedegree		0.017
		(0.031)
citizen		0.111***
		(0.024)
citizen#female		-0.014
		(0.029)
marr_status		0.069***
		(0.015)
25-34		0.195***
		(0.033)
35-49		0.257***
		(0.033)
50-64		0.284***
		(0.032)
havechild19		-0.020
		(0.016)
Year Dummy		YES
Occupational group		YES
Constant	2.524***	2.325***
	(0.014)	(0.060)
Observations	4,270	4,257
R-squared	0.005	0.360

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4.1 shows the regression output of regressing log wage on gender and other demographic variables for black workers in the UK. The base category for model 1 is a black man. For model 2, the base category is an unmarried non-British black man who has no

degree, has no child, and is less than 25 years of age.

Evidence from models 1 and 2 indicate the presence of internal wage gaps among black workers in the United Kingdom. The disparity did not disappear even after controlling several demographic indicators. Regression output of model 1 in table 4.1 indicates that female black workers earn significantly less than their male colleagues. The difference is estimated to be about 7.4 % less than the average wage of a black male worker. To check the robustness of the result we controlled for several demographic variables such as educational status, marital status, citizenship status, age group, occupational type, year dummies and interaction terms in model 2. After controlling for all the selected demographics, we find that the average log hourly wages for female blacks is about 5.8% lower than that of a comparable black male. Similar findings of internal wage gap within the Black ethnic have been reported by Brynin, Longhi and Zwysen (2019); Breach and Li(2017); Blau and Kahn (2017). Studies such as Bertrand (2020) points out that differences in wages between men and women can be attributed to educational choices and the motherhood penalty factor. This study posits that women are more likely to study courses which generally attract low wages. Data from LFS show that compared to 70% of black men that are engaged in the STEM base occupation only 30% of black women are engaged in similar. A study by Fluchtmann et al (2021) using Danish data found that gender differences in job applications can explain more than 70 percent of the residual gender wage gap.

On the other hand, we find that the level of education increases the average hourly wages of blacks in the UK. A black man with a degree or other higher qualifications earns about 11% more than a comparable black man with less than a high degree. The coefficient is also statistically significant, indicating that education is a major determinant of earnings. For women the impact of having a degree is 0.188 or 18%. The interaction term is not statistically significant, indicating that there is no heterogenous effect of having a degree across gender. In other words, the impact of having a degree on wages is similar across gender. Studies like Altonji and Blank (1999) found similar impact of education on wages.

Again, we see that a black male citizen earns about 11% significantly more wages compared to a comparable black who is not a citizen of the UK. This implies that even amongst black males, there is significant wage disparity. Black Citizens may have more opportunities for better paying jobs compared to black non-citizen and tend to be more educated. For instance,

a cross tabulation of the level of education between black UK citizens and black non-citizens shows that while over 32% British blacks have a degree or more, only 16% of blacks non citizens have a degree or more. For females the citizenship premium is relatively less 9.3%. When we interact the citizens dummy with the female dummy, we find no significant interaction effect. Female black citizens earn same as their male equivalent.

Furthermore, we find that compared to a non-married black man, married black men earn higher. The marriage premium is estimated to be about 6.9%. Again, we find that the higher the age group the greater the hourly wage. For instance, those in age groups 25-34, 35-49, 50-64 earn about 19.5%, 25.7% and 28.4% higher than those in the 16-24 age groups. One way to interpret this is that as workers grow older they acquire experience which in turn increases their marginal productivity and therefor their wages. The coefficients were also statistically significant indicating that experience matters for wage.

The study also included year dummies to capture changes in hourly wages that is due solely to passage of time. We observe that over time, the hourly wage rate has increased significantly.

4.3 Estimates for Model 3 and 4

summary statistics

The sample comprises of 43% male and 57% females. Over 69% percent had less than a degree, with remaining 21% having a degree or more. 10% were found to be non-British citizen white 90% were British citizens. In terms of ethnic grouping, the sample comprised of around 95% whites and less than 5% blacks. This is because black worker make up less than of the total sample in the survey.

Discussion of result

Table 4.2 External pay gap and intersection effect of gender and ethnicity

VARIABLES	(1) logwage	(2) logwage
Whitefemale	-0.230***	-0.150***
	(0.003)	(0.008)
Black male	-0.178***	-0.128***
	(0.014)	(0.021)
Blackfemale	-0.251***	-0.213***
	(0.010)	(0.016)
Havedegree		0.195***

		(0.005)
Citizen		0.009
		(0.007)
White female#.havedegree		0.036***
		(0.006)
Black male#havedegree		-0.094***
		(0.025)
Black female#havedegree		-0.066***
		(0.018)
White female#citizen		-0.050***
		(0.008)
Black male#citizen		0.092***
		(0.024)
Blackfemale#citizen		0.077***
		(0.019)
havechild19		0.031***
		(0.003)
25-34 years		0.218***
		(0.005)
35-49years		0.360***
		(0.005)
50-65years		0.372***
		(0.005)
Year dummies		YES
Occupational grouping		YES
Constant	2.702***	2.478***
	(0.002)	(0.010)
Observations	147,124	146,830
R-squared	0.040	0.410

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4.2 shows the estimated wage model for both whites and black workers in the UK. To capture the impact of the intersection of gender and ethnicity on wages, we interact the ethnic dummy and gender dummy to create 3 distinct variables (White woman, black man and Black woman). Model 1 is abridged version of model 2.

In model 1, the base category is white man. We find that a white female earns about 23% less than the average hourly wage of white males. This implies the existence of internal pay gaps within white workers in the UK. For black men, the differential intercept coefficient is slightly less, amounting to about 17.8% less than the average wage for white males. Black females earn about 25% less than the average hourly wage for white male. Given that the

wage differentials across the 2 ethnic groups are statistically significant, the hypothesis of external gaps in wage earnings cannot be rejected. Similar findings was also reported by Breach and Li (2017);Brynin et al. (2017). In particular, Brynin et al. (2017) in a study of the ethnic pay gaps in the Britain, found that Black African women earn about 10% less than white male.

Theoretically, Altonji and Blank (1999) points out that differences in labor market outcome across gender and ethnicity are as a result of differences in preferences and skills, Differences in human capital investment and differences in comparative advantage. Psychological theory of gender discrimination points to the evidence that gender pay gap can be attributed to traits like conscientiousness and high level of agreeableness among women (Carter, 2014; Eswaran, 2014). Others like Wood et al (2009) consider ethnic inequality as a result Employer bias and discrimination against members of ethnic minority origins.

Further analysis of model 1 shows that Black female workers were found to be the most effected by the pay ethnic gender gap . They earn less than white females as well as black men. They earn about 2% less than white females. When compared to black men, we see that black women still earn 7.2% less wages (-0.25 -(-0.178)) and quite surprisingly, we see that white women also earn less than black men by about 5.2% (-0.23-(-0.178)). This implies that on the average, men earn in more than women irrespective of ethnic group further reinforcing the gender pay gap theory. Again, the significant differences between wages for white men and black workers indicate the presence of external pay gaps. This finding was also corroborated by Brynin et al. (2017). Furthermore, a study by Breach and Li in (2017) also found significant pay inequality between blacks and whites' male workers in Britain.

Similar result was found when we estimated the full model with additional control variables. We see that despite slight drop in the values of the ethnic gender variable, the ethnic gender pay gap remained statistically significant. After controlling for the additional variables, the differential intercept coefficient dropped to about 12% and 21% for black men and black women respectively, further highlighting the fact that external gender pay gap persist in Britain even after controlling for several demographics. Studies have highlighted several factors that could have led to these differences. According to Lang and Lehman (2012), these differences could be attributable to differences in skills between blacks and white.

Having a degree significantly increases wages. The estimated degree premium in Model 2 is about 19.5%. Holding all variables constant, a male white worker who has a degree or higher

qualification earns 19.5% more than a comparable white male who did not have a degree. This finding indicates that education is a major determinant of wage earning. Findings by Longhi and Brynin (2017) in a study of ethnic pay gaps in the UK is also consistent with the positive impact of education on average wages across ethic groups.

When we interact education with the ethnic gender variable, we observe that education has a heterogenous effect across ethnicity and gender. The effect is also statistically significant, indicating that the interaction effect is present in the model. The effect of having a degree on wages is higher for white females compared with white males. For a white female, the degree premium is 0.231 (0.195+0.036) or 23%. Compared to a white male without a degree, a white female with a degree earns about 0.08 (-0.150-(-0.23)) or 8% higher wages. for Black workers, the degree premium is significantly lower than its predicted value for white male workers. For instance, the degree premium for male blacks is 0.101 (0.195-0.094) or 10%. In terms of wages, a black male worker with a degree or above earn (-0.128+0.101) -0.027 or -2.7% less than a white male without a degree. He also earns -0.222 (-0.094 +(-0.128)) or -22% less than the average wage of a comparable white male who has a degree or higher qualification. For black females, the degree premium is about 12.9% (0.19-0.066). Relative to a white non-degree holder they earn about 8% (0.21-0.129) less. This analysis shows that although education reduces the pay gap across gender and ethnicity, its effect is heterogenous across gender and ethnicity.

On the average, being a British citizen has no effect on the wage earnings as the variable was found to be statistically insignificant. However, when we interact it with the gender and ethnic variable we found some significant interaction effect. For instance, the citizenship premium for white females is about 5% less than white male citizens, black male citizens of the UK enjoy a 9% premium while female blacks British citizens enjoy a premium of about 7% more than their white male counterpart. This implies that being a British citizen is crucial in enhancing wages for blacks in the UK. One reason could be that being a citizen gives you some rights or access to certain jobs that a black non-British citizen cannot access or probably because black Brits are more educated than non-British blacks in the workforce. Empirically, the finding that there is a citizenship premium is consistent with results established by Platt (2009) and Longhi et al. (2013). These studies compared wages of different ethnic groups, disaggregated by different metrics such as being born in Britain or being a British citizen. Particularly, Longhi et al. (2013) apart from the aforementioned also

controlled for religious affiliation in the model. They confirmed that pay gaps of UK-born ethnic minorities are much smaller than pay gaps of ethnic minorities born abroad.

Finally, we find that having children is positively related to wages. This is contrary to the motherhood penalty theory advanced by Betrand (2020). Also, wages increase as we move up the age groupings indicating significant positive effect of experience on wages. Again, we see that Managers, directors and senior civil servants earn significantly more than other occupations as can be seen from the coefficient of the occupation variable and lastly, we find that over time wages have increased as can be seen from the year dummies (see appendix) .

5.0 Conclusion

The study examined the internal wage gap within the black ethnic minority as well as the effect of the intersection of gender and ethnicity on the external wage gap. Data used was made of quarterly labour force survey data running from 2013 quarter 1 to 2023 quarter 2. The method of Ordinary Least Square was used to analyze the data. Evidence from the study indicates that there is a significant wage gap within the black ethic group with black males earning between 7% and 5% more wages than black females (from model 1 and 2). Factors that were found to reduce the internal wage gap include having a degree, being a British citizen, age and marital status. Having children was found to reduce the average wage rates of female blacks. Furthermore, we found that there is a negative and significant interaction effect between gender and ethnicity. There is a considerable external wage gaps between while males and Black workers both male and female. Black females earn less than both black men and white women. However, black men were found to earn more than the average wage of white women all things being equal. Again, the study found that having a degree, being a British citizen and age reduces the external wage gap significantly.

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