

**Racial differences in availability of fringe benefits as an explanation for the
unexplained black-white wage gap for males in US¹**

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Abstract

The US black-white wage gap is an issue that has attracted thorough investigation, but so far the corresponding gap for fringe benefits has not received sufficient attention. Although ethnic differences in fringe benefits could affect wage differences, previous analysis of ethnic wage gaps in the vast majority of cases has not taken fringe benefits into account. In order to fill that gap in the existing literature, this article estimates the black-white gap for both wages and fringe benefits on the basis of US data. Data from the 2004 section of the National Longitudinal Survey of Youth 1979 has been used in this analysis. Our results indicate that when controlling for various individual and job characteristics, there remains a wage gap in favour of whites, and for several fringe benefits, there is an unexplained gap in favour of blacks. This result means that the ethnic wage gap overestimates the ethnic compensation gap. We also argue that fringe benefits are used to compensate blacks for their lower wages.

JEL classification: J15, J31, J33

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1. Introduction

Ethnic minorities in the vast majority of cases have lower wages than ethnic majorities. The US black-white wage gap is probably the most investigated ethnic wage gap and does not represent an exception to the rule as blacks earn considerably less than whites. Even when controlling for schooling, family background and job characteristics there still remains an unexplained gap in favour of whites. This kind of unexplained wage gap has persisted for decades and has not shown any signs of decline during the last decade (for a review, see Altonji and Blank 1999). Although the differences between blacks and whites in terms of educational attainment have narrowed, the wage differences have not decreased. There are several possible explanations for the unexplained black-white wage gap. One possible cause of such a gap is the omitted variable bias, which may result from unobserved ability or lack of information on the quality of education. Another possible explanation is discrimination in the form of taste discrimination (Becker, 1971) or statistical discrimination (Phelps, 1972). Empirically these theoretical considerations have found only partial support (Oettinger, 1996).

The third potential explanation for the unexplained black-white wage gap could be differences in the provision of fringe benefits between blacks and whites. Employees are compensated for their effort not only with wages, but they also receive fringe benefits. According to the US Department of Labour, fringe benefits represent almost one third of total labour compensation, which means that the ethnic gap in fringe

benefits will have an important effect on ethnic gaps in total labour compensation. Inequality in terms of access to fringe benefits has been analysed for gender wage gaps (Solberg and Laughlin, 1995) and union/non-union wage gaps (Budd, 2004), but there has been little research conducted in the field of ethnic fringe benefit gaps. If the ethnic fringe benefit gap is smaller than the wage gap, then the total compensation gap will be lower than the wage gap and vice versa. The importance of fringe benefits has increased in recent decades (Fossum and McCall, 1997). If there has been a shift in compensation from wages to fringe benefits, and if whites are paid more wages than fringe benefits and if it is vice versa for blacks, then it could explain the increasing unexplained racial wage gap.

The fact that employees accept lower wages in favour of a higher level of fringe benefits has been theoretically argued using the compensating wage theory (Eberts and Stone, 1985). Empirically this theory has found support, for example, in the case of health insurance benefits as Olson (2002) has shown that wives with their own employer health insurance accept a wage about 20% lower than what they would have received working in a job without benefits. Other authors have found that fringe benefits and wages are complementary. Duncan (1976) found that human capital investments are rewarded both with higher wages and fringe benefits. Fringe benefits and wages are both part of the compensation package offered to employees, but it has to be kept in mind that the reasons for offering fringe benefits could be to some extent different. Fringe benefits could be offered with the aim of encouraging certain types of behaviour in employees – to support investments in human capital. They may also be used to reduce worker turnover or make the employer more attractive

(Collard *et al*, 2005). Fringe benefits may also be offered as compensation for bad or risky working conditions (van Ommeren *et al*, 2002).

Discriminating employees on the bases of the provision of fringe benefits instead of wages might be easier as offering fringe benefits is not as tractable by the legal authorities as wages. But if the labour markets are competitive then there will be no room for employers with discriminatory behaviour. If whites receive higher wages then it could be argued that in competitive labour markets blacks should receive more fringe benefits in compensation for lower wages. One of the few studies addressing this issue is Levy (2006), who analyses gaps in employer provided health insurance. She finds the black-white health insurance gap is smaller than the corresponding wage gap. So she argues that the black-white wage gap overestimates the gap in total compensation. Rhine (1987) investigated several determinants of fringe benefits, including ethnicity, but an analysis of ethnic fringe benefit gaps was not the aim of that article and so the topic receives very little attention. She investigates the determinants of pension contributions, sick leave and the total monetary cost of fringe benefits. Her results do not indicate that ethnicity has an effect on fringe benefits.

Fringe benefits are not only limited to health insurance; although in the US it is probably one of the most important. In order to estimate the racial gaps in total compensation, we should take other fringe benefits besides health insurance into account. This issue has been dealt with in the case of gender wage gaps by Solberg and Laughlin (1995), who find that the gender gap in total compensation is smaller than the wage gap, but there is a lack of such analyses for ethnic wage gaps. The aim

of this paper is to fill that gap by analysing black-white gaps both for wages and nine different fringe benefits (medical, life and dental insurance, maternity/paternity leave, retirement plans, flexible hours, profit sharing, company provided training and childcare) and showing that the wage gap is substantially larger than the total compensation gap. Although it is clear that fringe benefits are not even limited to these nine, they probably cover the majority of fringe benefits.

Our analysis also differs from Levy (2006) by using a different dataset. Instead of the Current Population Survey, we use data from the National Longitudinal Survey of Youth 1979 (NLSY79). Although it is a smaller dataset, it contains information about the Armed Forces Qualification Test (AFQT) scores. This variable could be used as a proxy for ability or school quality. As previous analyses of the racial wage gap (for example, Neal and Johnson (1996)) have indicated that these test scores explain a lot of the ethnic wage gap; therefore, the AFQT should also be included in the analysis of fringe benefit gaps as it could be similarly related to fringe benefits as to wages.

We use data from NLSY79 2004 survey and limit our sample to males with reported wages. We implement the Oaxaca decomposition method and estimate different specifications of decomposition models. Our results indicate that when controlling for various individual and job characteristics, there remains an unexplained wage gap in favour of whites, and for several fringe benefits there is an unexplained gap in favour of blacks. This result means that the ethnic wage gap is larger than the ethnic compensation gap. We also argue that blacks are compensated for lower wages with fringe benefits.

The article is organised as follows. First, there will be a short description of the decomposition methods used in this article. Next, the dataset is described. Following that, the descriptive statistics are analysed. Then wage and fringe benefit decompositions are conducted and the results are discussed. Following that, the compensation gap as a weight averaged wage and fringe benefit gap is calculated and analysed. In the last sections, more detailed analysis of the wage and fringe benefit gap is conducted. This includes discussion of the effects of industrial and occupational segregation as well as birthplace on wage and fringe benefit gaps. Finally, the compensation gap is analysed.

2. Method and Data

2.1. Method

We apply an Oaxaca (1973) decomposition method to analyse wage and fringe benefits gaps. As we use data about males aged between 40 and 47 then we ignore selection by employment. We argue that this is not likely to bias our results to a great extent, as the share of respondents with positive wages is high in both groups – 90% of whites and 82% of blacks have positive wages.

For the Oaxaca decomposition, we assume that the dependent variable (log wage of binary variable for availability of fringe benefit) for individual i could be written as

$$Y_i = \beta X_i + \varepsilon_i,$$

where X is the vector of explanatory variables and ε_i is the error term. For the Oaxaca decomposition, these kinds of regressions are separately estimated for two samples, in this case whites and blacks. So we get

$$Y_i^W = \beta^W X_i^W + \varepsilon_i^W$$

$$Y_i^B = \beta^B X_i^B + \varepsilon_i^B,$$

where W stands for whites and B for blacks. Let the upper bar denote the sample average for the corresponding variable and the hat, the parameter estimate. Then the difference of the sample average for the dependent variable could be decomposed in the following way:

$$\bar{Y}^B - \bar{Y}^W = \left[(\bar{X}^B - \bar{X}^W) \hat{\beta}^W \right] + \left[\bar{X}^B (\hat{\beta}^B - \hat{\beta}^W) \right]$$

The first term on the right hand side of the equation indicates the part of the difference in the average value of the dependent variable, which is caused by the differences in the explanatory variables between whites and blacks (explained gap). The second term indicates the part of the difference in the average value of the dependent variable caused by the differences in the values of regression coefficients between whites and blacks (unexplained gap). In this specification the unexplained gap answers the question – what would the average wage and availability of fringe benefits for blacks be, given the values for their explanatory variables, if these were valued in the same way as for whites.

2.2. Data

We use data from the National Longitudinal Survey of Youth 1979 (NLSY79). This is a panel data set of 12,686 individuals born between 1957 and 1964. Until 1993 the respondents were interviewed annually, in the latter periods bi-annually. The size of

the sample has decreased over the years of the survey, in 2004 there were 7,661 respondents interviewed.

We use a sample of males from the 2004 round of NLSY79. Women are left out of the sample in order to avoid sample selection problems resulting from the relatively low female labour force participation in comparison to men. While that kind of problem may be present for men too, it is likely to be less important for the male sample. We include only men for whom we have wage data and who have taken the AFQT test. For ethnicity, we use the variable 'Racial/Ethnic Cohort from Screener' from the NLSY79 dataset. This variable divides the sample into three different ethnicities: non-black/non-Hispanics, blacks and Hispanics. We compare whites (non-black/non-Hispanics) and blacks. We have 1266 whites and 629 blacks in the sample with positive wages.

2.3. Descriptive statistics

The dependent variables in our decomposition analysis are wages and fringe benefits. For wages we use the logarithm of hourly wages from the main job and for fringe benefits we use binary variables, which indicate the availability of these benefits. The NLSY79 provides the hourly rate of pay, excluding any additional compensation in the form of commissions, bonuses, stock options or tips. The descriptions of the fringe benefits are listed in table 1. The data about fringe benefits refers to whether fringe benefits are offered to employees not taking into account whether the respondent takes up the offer of fringe benefits or not.

Table 1. Description of fringe benefits analysed

Fringe benefit	Description
Medical insurance	Medical, surgical, or hospital insurance that covers injuries or major illnesses off the job
Life insurance	Life insurance that would cover an employee's death for reasons not connected with his/her job
Dental insurance	Dental benefits
Maternity/paternity leave	Maternity/paternity leave that will allow the employee to go back to his/her old job or one that pays the same as his/her old one
Retirement	Retirement plan other than social security
Flexible hours	Flexible hours or work schedule
Profit sharing	Profit sharing
Training or education	Training or educational opportunities including tuition reimbursement
Childcare	Company provided or subsidized childcare

Table 2. Average wages and fringe benefits for whites and blacks

Variable	Black	White	Difference
	mean	mean	
wage	16.98	24.42	-7.44
medical	0.693	0.772	-0.079
life	0.600	0.667	-0.067
dental	0.634	0.656	-0.022
maternity	0.498	0.508	-0.010
retirement	0.594	0.686	-0.092
flexible	0.468	0.461	0.007
profit	0.237	0.221	0.016
training	0.419	0.495	-0.076
childcare	0.091	0.052	0.039

The average values for the dependent variables are presented in table 2. Whites have substantially higher hourly wages in comparison to blacks, but in the case of fringe benefits the differences are not so clear. Whites have slightly higher coverage of medical and life insurance, firm-sponsored training and retirement plans, but for several fringe benefits there is virtually no difference. Company provided childcare is offered to blacks almost twice as often than to whites, although this benefit is available to only a small number of employees.

Table 3. Average values for the explanatory variables for whites and blacks

Variable	Black	White	Variable	Black	White
	mean	mean		mean	mean
age	42.59	42.48	manserv	0.113	0.039
schooling	12.81	13.70	education	0.044	0.043
afqt	23.87	55.52	health	0.059	0.043
tenure	337.54	452.91	arts	0.010	0.016
married	0.452	0.707	accomodation	0.053	0.021
kids	0.884	1.276	otherserv	0.054	0.036
maxparentschooling	11.359	12.951	publadm	0.072	0.057
immigrant	0.021	0.028	publsect	0.170	0.128
northeast	0.135	0.172	firmsize	1513.31	867.49
northcentral	0.171	0.345	selfemployed	0.104	0.142
south	0.615	0.317	union	0.178	0.161
urban	0.837	0.649	manager	0.088	0.219
mining	0.002	0.008	technician	0.038	0.083
utilities	0.003	0.005	comlegal	0.020	0.018
construction	0.117	0.151	teacher	0.016	0.023
manufacturing	0.164	0.199	entertainer	0.009	0.015
wholesale	0.041	0.040	healthworker	0.063	0.059
retail	0.072	0.090	serviceworker	0.140	0.049
transport	0.099	0.064	sales	0.044	0.082
information	0.023	0.030	clerk	0.068	0.052
finance	0.015	0.050	farmworker	0.004	0.008
realestate	0.013	0.012	productionworker	0.505	0.388
profserv	0.026	0.059			

It can be seen from table 3 that in the case of education and ability, whites have approximately one more year of formal schooling, but the differences in the AFQT results are more striking, as average scores for whites are more than twice as large as the average results for blacks. There have been quite a number of explanations for these kinds of differences. It could be argued that the low AFQT scores are the result of low school quality for blacks. Blacks are more likely to attend schools with higher student-teacher ratios, disadvantaged student ratios and student drop out ratios (Neal and Johnson, 1996). In addition, comparatively low parental education and income may be an obstacle for developing skills among young blacks. Unfavourable family background and neighbourhood could explain the racial gaps in the AFQT scores. When using AFQT scores to explain the present wage and fringe benefit gaps then we have to keep in mind that these tests were taken more than 20 years ago. On the

one hand, this could be a good thing as these tests were taken before the attainment of college education so they do not reflect the differences in college level education, which may be good if we suspect that blacks may be discriminated against at the college level. On the other hand, ability may change over such a long period, and in this case the test results reflect past ability rather than present ability. It could also be argued that AFQT test scores are racially biased, as there could be racial differences in their test taking ability (Rodgers III and Spriggs, 1996). Still these test results are widely used in racial wage gap analyses.

Among the average values for other explanatory variables, it is worth mentioning that whites tend to be married and have more kids in their household. Blacks more often live in urban areas and in Southern states. There is some racial segregation at the industry level as whites are more likely to be employed in construction, manufacturing, finance and professional services, whereas blacks are more likely to be employed in transportation, manual services and accommodation. Blacks are employed more in the public sector and whites are more often self-employed. Besides industrial segregation, the descriptive statistics provide evidence of occupational segregation, as whites are also more likely to be managers or technicians than blacks

3. Results

3.1. Wage and fringe benefit gap

We estimate six different models for wage and fringe benefit decomposition using the Oaxaca decomposition method. The first model estimates the raw gap in wages

and fringe benefits. In model 2, schooling is inserted and in model 3, AFQT results are inserted as explanatory variables. Model 4 takes into account the effect of tenure and several family background variables (number of kids, marital status, parental education level, immigrant status). In model 5, regional variables and in model 6, several job characteristics are added.

Table 4. Specification of wage and fringe benefit decomposition models

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	X	X	X	X	X	X
Age		X	X	X	X	X
Schooling		X	X	X	X	X
AFQT			X	X	X	X
Tenure				X	X	X
Family				X	X	X
Immigrant				X	X	X
Region					X	X
Job						X

Table 5. Unexplained wage and fringe benefit gaps with standard errors from the decomposition models

	Wage	Medical	Life	Dental	Maternity	Retirement	Flexible	Profit	Training	Childcare
Model 1	-0.389	-0.079	-0.067	-0.022	-0.010	-0.092	0,007	0,016	-0,076	0,039
se	0.037	0.018	0.020	0.020	0.021	0.019	0,021	0,017	0,02	0,01
Model 2	-0.338	-0.059	-0.041	0.000	0.016	-0.058	0,041	0,026	-0,035	0,049
se	0.037	0.019	0.020	0.020	0.021	0.020	0,021	0,018	0,02	0,011
Model 3	-0.168	-0.003	0.020	0.053	0.062	-0.004	0,087	0,05	0,036	0,051
se	0.046	0.023	0.025	0.025	0.026	0.024	0,026	0,022	0,025	0,013
Model 4	-0.090	0.017	0.050	0.083	0.097	0.030	0,083	0,067	0,056	0,055
se	0.048	0.024	0.026	0.026	0.027	0.025	0,028	0,023	0,027	0,014
Model 5	-0.120	0.011	0.029	0.064	0.095	0.019	0,077	0,086	0,057	0,051
se	0.052	0.026	0.028	0.028	0.030	0.027	0,03	0,025	0,029	0,015
Model 6	-0.083	-0.012	0.006	0.035	0.081	0.000	0,081	0,115	0,035	0,05
se	0.041	0.024	0.029	0.029	0.034	0.028	0,035	0,031	0,033	0,018

Note: Bold text indicates statistical significance at the 95% level

As can be seen from table 5, there is a significant racial gap in wages. The raw gap is about 39 percent in favour of whites, and even if we include all the control variables then the unexplained wage gap is still 8 percent and it remains statistically

significant. The AFQT score explains the biggest share of the wage gap; years of schooling and tenure also explain a substantial part. Differences in education and ability together explain more than half of the wage gap. These results are similar to previous analysis of the racial wage gap in the US; for example, Neal and Johnson (1996) also found that the AFQT explains the largest portion of the racial wage gap. Adding regional variables increases the unexplained wage gap slightly, meaning that blacks live in regions with higher average wage levels, but they do not benefit from living in these locations as much as whites. Differences in job characteristics explain a relatively small part of the wage gap as better job characteristics for whites explain about 4 percentage points in the remaining gap.

There is a significant raw gap in favour of whites in the case of four fringe benefits (medical insurance, life insurance, retirement and firm-sponsored training) and a significant raw gap in favour of blacks for company provided childcare. As for wages, schooling and AFQT scores explain a large share of the white advantage. In model 3, which takes education and ability into account, the white advantage is not evident for any of the fringe benefits, but for five of the fringe benefits there is a significant unexplained gap in favour of blacks. The remaining wage gap from the same model is 17 percent in favour of whites. So it could be concluded that if we account for differences in education and ability then whites have higher wages, but blacks have access to more fringe benefits. For several fringe benefits, tenure and family background characteristics also play an important role. Model 4 illustrates the black advantage in fringe benefits even more because in that case there is an unexplained gap in favour of blacks for six fringe benefits. Adding regional characteristics does not affect the results to a great extent. If we control for all

explanatory variables, it can be seen that for none of the fringe benefits is there a significant white advantage, but for maternity leave, flexible working hours, profit sharing and company provided childcare there is a significant black advantage. Company provided childcare is a somewhat different benefit from others as explanatory variables do not explain the gap in availability at all. Blacks have the largest advantage in profit sharing, where the unexplained gap in availability is more than 11 percentage points. In general, adding job characteristics slightly reduces the black advantage for some fringe benefits. Still there is no statistically significant remaining gap in favour of whites in any of the fringe benefits, but there exists such a gap in the case of wages.

Our results are in line with the findings of Levy (2006). She finds a 4% raw gap and a 1.7% unexplained advantage for whites in the case of medical insurance. Although she uses a different dataset, does not control for AFQT and decomposes the coverage of medical insurance instead of its availability, her results do not differ from ours remarkably.

According to these results it could be argued that blacks may be compensated for lower wages through higher access to fringe benefits. Although the raw wage and fringe benefit differences tend to be both in favour of whites, accounting for explanatory variables creates an unexplained wage gap in favour of whites, but corresponding gaps for fringe benefits are in favour of blacks in the case of several fringe benefits.

3.2. Compensation gap

So far we have viewed wages and fringe benefits as separate issues. In this section we will analyse the ethnic gap in compensation and take both wages and fringe benefits into account. Our results from the decomposition of gaps in fringe benefits would predict that the black-white gap in total compensation should be lower than the corresponding wage gap. Probably the most straightforward way to estimate the gap in compensation is to assign a monetary value to fringe benefits. One way of doing this could be to use data about employment costs as Brooks (2001) used for estimating compensation inequality. He has used average employment cost at the job level and therefore his analysis misses the possible within-job variation in employment costs. If we want to estimate the gaps in employment costs more accurately then employee-level data about employment costs is needed, which is difficult to obtain in practise. We must also take into account that some fringe benefits, like flexible working hours, do not have clear monetary value and therefore employment cost data could not be used to analyse them. Even if a majority of fringe benefits have clearly measurable costs for employers, there are still arguments for not treating them as monetary benefits. First, employees do not usually know the monetary cost of fringe benefits and they may over or underestimate their value. Second, different employees have different preferences for money and fringe benefits and therefore they may experience the value of fringe benefits differently from their monetary value. Some employees may value flexible working hours more; others may want to earn higher monetary wages. The value of fringe benefits could also be affected by employee endowments (Kahneman *et al* 1990). If we want to estimate

the compensation gaps in the sense of how they reflect differences in employee utility from employment rather than gaps in employment costs, then using the monetary value of these costs could be misleading and therefore we will not do so in the following analysis.

Employees are compensated for their labour both by wages and fringe benefits.

Compensation for worker i consisting of wage income W_i and fringe benefits F_i

could be written as:

$$C_i = (1 - \lambda)W_i + \lambda F_i,$$

where λ is the share of fringe benefits in total compensation. If we assume that the share of fringe benefits λ is equal for both groups, then the average compensation for blacks and whites is

$$\bar{C}^B = (1 - \lambda)\bar{W}^B + \lambda\bar{F}^B$$

$$\bar{C}^W = (1 - \lambda)\bar{W}^W + \lambda\bar{F}^W$$

The racial compensation gap is

$$\bar{C}^B - \bar{C}^W = (1 - \lambda)(\bar{W}^B - \bar{W}^W) + \lambda(\bar{F}^B - \bar{F}^W)$$

So the compensation gap is the average of wage and fringe benefit gaps weighted by λ .

In our analysis we have used a number of fringe benefits and it is difficult and even not favourable to assign them a monetary value as discussed previously. Still it is plausible to assume that individual utility is increasing in both wages and the number of fringe benefits available. If we do not know the value of different fringe benefits, then we assume that all the fringe benefits are equal in the sense that they affect an employee's utility. Therefore, we use the weighted average of log hourly wages and

log of the total number of fringe benefits offered as the measure of compensation. If there were no fringe benefits available for a worker then the logarithm of fringe benefits was set equal to -1. We assume that wages account for two thirds of the total compensation and fringe benefits for one third, so $\lambda = \frac{1}{3}$. To estimate the racial compensation gap we use the Oaxaca decomposition and estimate six different models as previously.

Table 6. Unexplained compensation gap with standard errors from decomposition models

	Wage	Fringe	Compensation
Model 1	-0.389	-0.167	-0.315
se	0.037	0.046	0.033
Model 2	-0.338	-0.097	-0.258
se	0.037	0.047	0.033
Model 3	-0.168	0.072	-0.088
se	0.046	0.058	0.040
Model 4	-0.090	0.140	-0.013
se	0.048	0.060	0.041
Model 5	-0.120	0.117	-0.041
se	0.052	0.065	0.045
Model 6	-0.083	0.066	-0.033
se	0.041	0.053	0.035

Note: Bold text indicates statistical significance at the 95% level

The raw fringe benefit gap is more than one half smaller than the corresponding wage gap (17% vs 39% in favour of whites). As with the wage gap, the racial fringe benefit gap is explained mainly by schooling and the AFQT score. The results from model 3 indicate that if we control for the AFQT score then blacks will have a slight advantage in terms of access to fringe benefits. If we add tenure and family background variables then the unexplained wage gap in favour of whites decreases and the corresponding fringe benefit gap in favour of blacks increases. Regional

effects on wage and fringe benefit gaps are relatively modest. If we add job characteristics into the decomposition model, then both wage and fringe benefits gaps decrease, but the direction of the job characteristics effect is different. Adding job characteristics to the model makes blacks better off in terms of wages, but reduces their advantage in fringe benefits. This means that blacks are employed in occupations and industries with relatively low wages, but high access to fringe benefits. If controlling for everything then whites have an 8% advantage in wages and blacks have a 7% advantage in fringe benefits; although, the unexplained gap in fringe benefits is statistically insignificant. These kinds of results give additional support to our previous findings that blacks are compensated with higher access to fringe benefits for lower wages.

The compensation gap is the weighted average of the wage and fringe benefit gaps. As in the case of wages and fringe benefits separately, the compensation gap is mainly explained by ethnic differences in education and ability. When controlling for all explanatory variables then the compensation gap is slightly in favour of whites, but it is statistically insignificant. Taking fringe benefits into account results in a reduction of the 8% wage gap to a 3% compensation gap. Our results confirm that accounting only for wages overestimates the black-white compensation gap.

4. Detailed analysis

4.1. Segregation

Blacks and whites tend to be employed in different industries and occupations. Could industrial and occupational segregation be the cause of gaps in wages and fringe

benefits? There are several theoretical considerations why industrial segregation may cause differences in wages and fringe benefits. First, firms may have different capacities for providing wages and fringe benefits as profit margins, intensity of competition and firm size are different across industries. In the case of wages, studies have documented a positive firm-size effect (Brown and Medoff, 1989). Similar factors may cause positive size-effects for fringe benefits too as offering fringe benefits creates costs in the same way as paying wages. Second, there may exist positive returns to scale in offering fringe benefits (Collard *et al*, 2005). For example, large firms may obtain discounts from insurance companies if they buy life insurance for their employees. Still the empirical evidence on the firm-size effect on fringe benefits is controversial, as only some studies have found empirical support for that argument (Bernstein, 2002), while other studies document that for a majority of fringe benefits, employer size does not matter (Variyam and Kraybill, 1998). Third, union coverage and the bargaining power of unions vary across industries. A stronger union position results in higher wages and more fringe benefits as the union fights for both better wages and fringe benefits for their members. Furthermore, unions typically serve more the interests of older members, who usually have a stronger desire for certain fringe benefits like health insurance and pension plans (Freeman, 1981).

If we look at the average values of industry dummies for blacks and whites in table 3 then it could be said that industrial segregation exists to some extent. For example, whites are more likely to be employed in manufacturing, construction, finance and professional services, whereas blacks are more likely to be employed in transport, manual services and accommodation. In figures 1 and 2, we plot the relationship

between the average wage and the average number of fringe benefits available at the industry level with the share of blacks in that industry.

These figures indicate that blacks are more likely to be employed in industries with relatively low levels of both wages and fringe benefits. That relationship is stronger for wages than fringe benefits. Therefore, industrial segregation is one explanation for the white advantage in wages and fringe benefits.

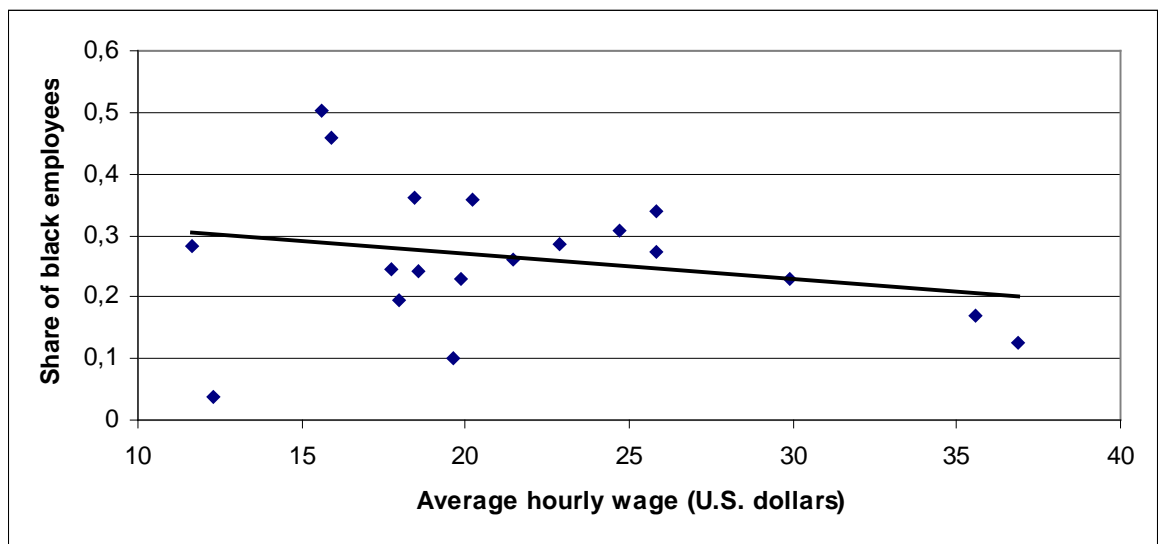


Figure 1. Relationship between average wage and share of black employees at the industry level

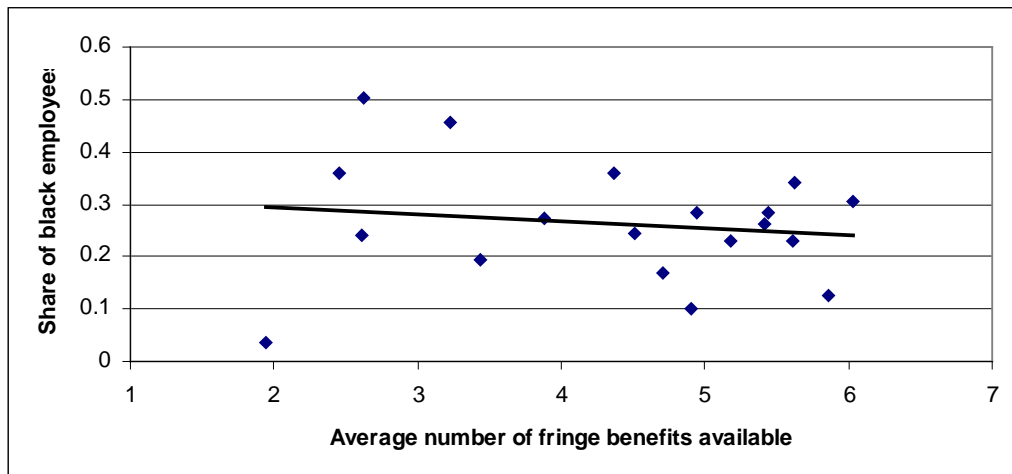


Figure 2. Relationship between average number of fringe benefits available and share of black employees at the industry level

Occupational segregation could be a more important determinant of racial gaps in wages and fringe benefits than industrial segregation. This will be true if the availability of fringe benefits is attached to occupations rather than single to workers. Firms could offer the same package of fringe benefits to all their employees of the same occupation.

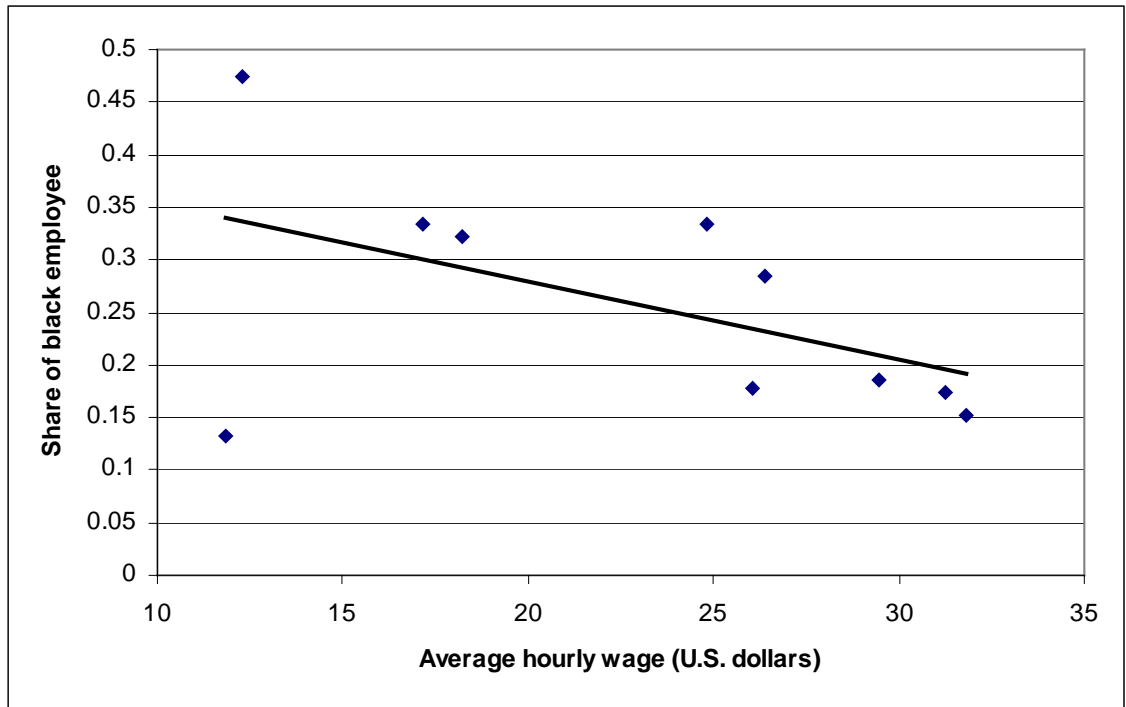


Figure 3. Relationship between average wage and share of black employees at the occupation level

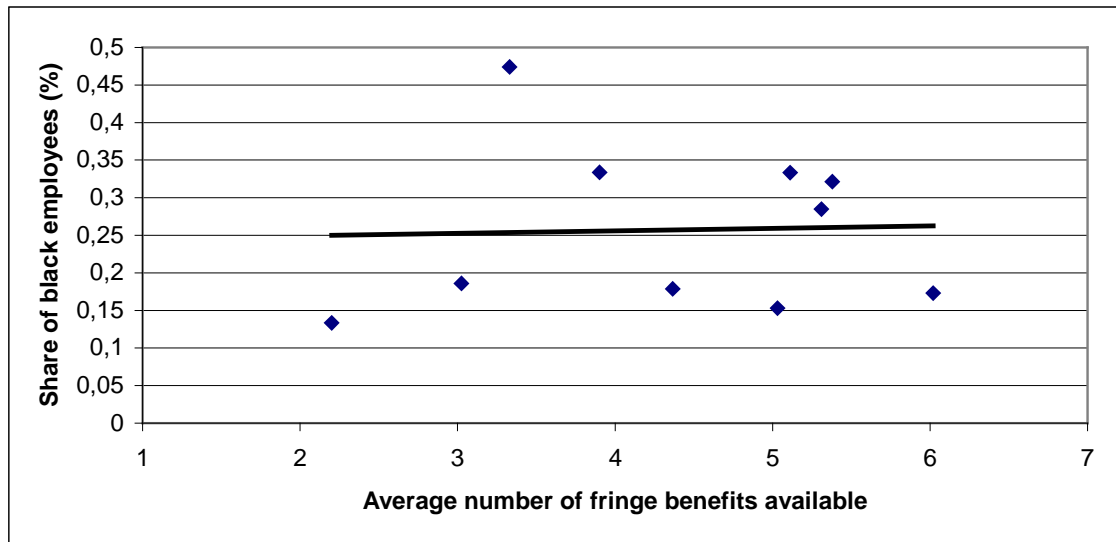


Figure 4. Relationship between average number of fringe benefits available and share of black employees at the occupation level

Whites are much more likely to be managers, technicians or employed in sales; blacks are more likely to be service or production workers. If we look at the effects of occupational segregation on wages and fringe benefits (figures 3 and 4) then it could be concluded that occupational segregation is an important determinant of the black-white wage gap, but it does not affect the corresponding fringe benefit gap. Blacks are more likely to be employed in occupations with lower wages, but this is not true for the fringe benefits.

In conclusion, both occupational and industrial segregation explain the black-white wage gap to some extent, but for the fringe benefit gap, only industrial segregation seems to matter. Still it has to be kept in mind that due to the small sample, the number of industries and occupations used in our analysis is relatively low and therefore the level of aggregation is high.

4.2. Do blacks have preferences for fringe benefits?

In this section we investigate whether the result, that blacks are compensated for lower wages by greater access to fringe benefits, could be explained by differences in preferences between blacks and whites. As wages are the most important form of labour compensation, we assume that when choosing jobs individuals make this decision on the basis of wages and not fringe benefits. Therefore, the industrial and occupational segregation will not reflect black and white preferences for fringe benefits. But we assume that managerial employees have at least some power to choose their form of compensation, which is not so likely for the other occupations.

We estimate an Oaxaca decomposition model for the sub samples of managers and other employees. We argue that among all occupations managers have the greatest power to decide about their own wages and fringe benefits. Therefore, the balance between the racial gaps in wage and fringe benefits among managers will reflect the preferences among blacks for wages and fringe benefits.

The estimation results indicate that for both sub samples there is a significant raw gap in favour of whites in wages (tables 7 and 8). In the case of fringe benefits for managers the raw gap is in favour of blacks for a number of fringe benefits, in the case of non-managers the raw gap is in favour of whites for the majority of fringe benefits. If we control for all explanatory variables then for managerial workers the wage gap reduces to zero, but there are positive unexplained fringe benefit gaps in favour of blacks. Still we have to remember that the unexplained fringe benefit gaps

for managers are statistically insignificant, which is likely to be due to the small sample.

Table 7. Racial gaps in wages and fringe benefits for managerial occupations

	Wage	Medical	Life	Dental	Maternity	Retirement	Flexible	Profit	Training	Childcare
Model 1	-0,264	0,018	0,107	0,124	0,177	0,086	0,168	-0,003	0,060	0,115
se	0,092	0,050	0,055	0,056	0,061	0,056	0,060	0,057	0,061	0,036
Model 2	-0,267	0,015	0,105	0,123	0,180	0,084	0,168	-0,003	0,059	0,114
se	0,076	0,048	0,049	0,051	0,058	0,053	0,057	0,059	0,060	0,047
Model 3	-0,191	0,066	0,112	0,159	0,197	0,119	0,241	0,064	0,159	0,078
se	0,095	0,058	0,061	0,063	0,071	0,064	0,069	0,071	0,071	0,053
Model 4	-0,172	0,059	0,113	0,140	0,193	0,116	0,220	0,043	0,149	0,088
se	0,102	0,062	0,065	0,067	0,075	0,067	0,075	0,074	0,075	0,057
Model 5	-0,166	0,063	0,090	0,127	0,174	0,084	0,269	0,087	0,134	0,075
se	0,113	0,067	0,071	0,073	0,083	0,074	0,082	0,081	0,083	0,061
Model 6	0,021	0,034	0,058	0,101	0,086	0,079	0,221	0,090	0,124	0,036
se	0,130	0,055	0,068	0,074	0,101	0,081	0,100	0,111	0,106	0,093

Note: Bold text indicates statistical significance at the 95% level

Table 8. Racial gaps in wages and fringe benefits for other occupations

	Wage	Medical	Life	Dental	Maternity	Retirement	Flexible	Profit	Training	Childcare
Model 1	-0.333	-0.084	-0.077	-0.033	-0.027	-0.108	0.010	0.033	-0.077	0.036
se	0.041	0.020	0.021	0.021	0.022	0.021	0.022	0.018	0.022	0.010
Model 2	-0.315	-0.070	-0.059	-0.020	-0.008	-0.085	0.035	0.036	-0.045	0.042
se	0.041	0.020	0.022	0.022	0.022	0.021	0.022	0.019	0.022	0.011
Model 3	-0.156	-0.013	0.013	0.038	0.047	-0.022	0.070	0.046	0.019	0.051
se	0.051	0.025	0.027	0.027	0.028	0.026	0.028	0.023	0.027	0.013
Model 4	-0.077	0.014	0.048	0.083	0.094	0.024	0.069	0.066	0.048	0.052
se	0.054	0.026	0.028	0.028	0.029	0.027	0.030	0.025	0.029	0.014
Model 5	-0.116	0.011	0.032	0.068	0.101	0.023	0.051	0.084	0.054	0.049
se	0.058	0.028	0.031	0.031	0.032	0.030	0.033	0.027	0.032	0.015
Model 6	-0.108	-0.018	0.000	0.031	0.093	0.004	0.055	0.112	0.035	0.047
se	0.045	0.027	0.032	0.032	0.037	0.030	0.039	0.032	0.036	0.019

Note: Bold text indicates statistical significance at the 95% level

For other occupations, the unexplained wage gap is in favour of whites. This result confirms that occupational segregation is a determinant of the unexplained wage gap, as those blacks that have succeeded in getting a managerial position do not have unexplained wage disadvantages. The story is quite similar for fringe benefits. For managers, the black advantage in terms of fringe benefits is larger than for non-managers. This difference is especially large for flexible working hours. Black

managers are 22 percentage points more likely to have flexible working hours than their white counterparts, whereas among other occupations the difference is 5 percentage points. The fact that black managers have access to more fringe benefits than white managers allows us to argue that blacks prefer to receive more fringe benefits. At least some of the managerial workers have the power to decide about their wages and the fringe benefits available to them, whereas it is not likely to be the case for other occupations.

4.3. Is AFQT a determinant of industry and occupation?

Previous analysis has shown that the difference in AFQT scores is the most important cause of the black-white wage and fringe benefit gap. The relationship between AFQT scores and wages is discussed extensively in the literature (for example, Neal and Johnson (1996)), but the linkages between test scores and fringe benefits have not been investigated. If we consider fringe benefits as the part of total compensation, which is not paid as wages, then that kind of relationship could be similar.

In this section we test whether the AFQT score is only a determinant of the choice of industry and occupation or whether it affects wages and fringe benefits even if we control for all job characteristics, including industry and occupation. In order to do that, we estimate model 6 of the Oaxaca decomposition, but drop the AFQT score variable and compare the estimation results with the previous results including the AFQT score variable. If AFQT were only the determinant of industry and occupation then dropping the AFQT variable will not affect the unexplained wage gap.

Table 9. Unexplained wage and fringe benefits gaps with standard errors with and without the AFQT variable

	Wage	Medical	Life	Dental	Maternity	Retirement	Flexible	Profit	Training	Childcare
With AFQT	-0.083	-0.012	0.006	0.035	0.081	0.000	0.081	0.115	0.035	0.050
se	0.041	0.024	0.029	0.029	0.034	0.028	0.035	0.031	0.033	0.018
Without AFQT	-0.136	-0.031	-0.020	0.015	0.059	-0.019	0.073	0.120	-0.005	0.055
se	0.036	0.021	0.025	0.025	0.029	0.024	0.030	0.027	0.029	0.017
Without AFQT with nonmissing AFQT	-0.126	-0.026	-0.017	0.018	0.061	-0.017	0.067	0.117	0.007	0.063
se	0.037	0.022	0.026	0.026	0.030	0.025	0.031	0.027	0.029	0.017

Note: Bold text indicates statistical significance at the 95% level

The results from table 9 indicate that when controlling for job characteristics the AFQT score affects wages more than fringe benefits. Dropping the AFQT variable increases the unexplained wage gap by about 5 percentage points. This means the AFQT score affects wages within occupations and industries. As blacks have considerably lower test scores, these scores are converted into lower wages for blacks in similar jobs. The story is different for fringe benefits as leaving the AFQT variable out does not alter the result remarkably. That leads us to the conclusion that the availability of fringe benefits does not depend on ability or schooling or quality of education. Although more able workers tend to be paid higher wages in similar jobs, this does not seem to be true for fringe benefits, and therefore, lower abilities among blacks do not reduce the availability of fringe benefits within occupations and industries.

Not all the respondents of the NLSY79 sample have taken the AFQT. Among the respondents of the 2004 survey about 6% had not taken the test. In order to test, if this affects the effect of AFQT on the wage and fringe benefit gap, we estimated decomposition model 6 without the AFQT variable, but limited the sample to those who had taken the test. The decomposition results for the full sample and test takers

are virtually the same. This means that the effect of dropping the AFQT variable is not affected by the fact that some respondents had not taken the AFQT.

These results allow us to argue that the AFQT score tends to be a determinant of industry and occupation and affects fringe benefits in an indirect way, but it has also direct wage effects. The fact that ability has no direct effect on fringe benefits could be one reason why blacks that receive relatively low wages in comparison to whites have relatively high access to fringe benefits.

4.4. Birthplace effect

Human capital is considered to be one of the most important determinants of labour compensation. Although we have included years of schooling, AFQT scores and tenure in our analysis so far, these variables may not capture the entire human capital. Years of schooling express only the quantitative aspect of formal schooling and AFQT scores are frequently used to control for differences in school quality and also to account for ability. Tenure is frequently considered as a measure of working experience and it could be interpreted as a proxy for the amount of on-the-job training if it is assumed that workers over the years continuously receive training at the work place. Still, there are some arguments for why these variables, including the AFQT score, do not fully capture human capital. First, human capital is definitely not limited to formal schooling. Second, AFQT tests do not measure all kinds of skills. It is naïve to think that the result of a relatively short test could give complete and thorough information about all of an individual's skills. As Black *et al* (2006) point out, this test surely misses other valued traits that one might learn in school (e.g.

specific domain knowledge, computer skills, persistence in completing tasks, or the ability to work with others). Third, the test results do not reflect human capital acquired after the completion of the test. As the importance of life-long learning and on the job training have increased sharply during the last decade, then it is quite clear that the results of the test taken more than 20 years ago do not fully capture human capital.

A recent article by Black *et al* (2006) estimates the black-white wage gaps separately for employees born in Southern states and in other states. They find that blacks born in non-Southern states receive a similar conditional wage to whites, whereas blacks born in the South show much lower wages in comparison to whites born in the South. However, their sample is limited to highly educated employees. In this section, we extend their analysis by investigating the birthplace effect not only on highly educated workers, and do not limit our analysis only to wages but consider fringe benefits too.

Birthplace could be used as a proxy for unobserved human and also cultural capital for several reasons. First, school quality in Southern states has been comparatively low and this is true both for high school and college level. Traditionally, blacks have attended low quality schools with large classroom sizes. As Card and Kruger (1992) note, the Southern states were the last to abolish a racially segregated school system, where segregated schools operated even in the mid-1960s. Second, the socio-economic status of blacks has been traditionally different in Southern states. During 1960s, a college education among blacks led to an upper middle class occupation far more frequently in the North than in the South (Black *et al*, 2006). Therefore, even

when controlling for parental education we do not fully take into account the effect of the parents' socio-economic status. The lower class-position of the parents of Southern born blacks could result in lower quality pre-school education. Third, there have been and still are remarkable cultural differences between Southern and other states including different attitudes towards blacks. Southern-born blacks may have experienced more hostile attitudes towards them, which may have negatively affected both their socialisation and labour market performance. Blacks born in the South may also have become less culturally integrated into society – their customs, habits and behaviour could be more different from whites than the cultural differences between blacks and whites born elsewhere.

In order to analyse the birthplace effect on wages and fringe benefits we estimate the Oaxaca decomposition models separately depending on birthplace. We use an identical set of control variables as in the previous analysis.

Table 10. Unexplained wage and fringe benefit gaps with standard errors from the decomposition models for employees born in the South

	Wage	Medical	Life	Dental	Maternity	Retirement	Flexible	Profit	Training	Childcare
Model 1	-0.267	-0.035	-0.044	-0.008	0.056	-0.055	0.086	0.052	-0.010	0.022
se	0.060	0.029	0.031	0.031	0.032	0.031	0.032	0.026	0.031	0.015
Model 2	-0.238	-0.023	-0.030	0.006	0.069	-0.036	0.101	0.053	0.011	0.028
se	0.061	0.029	0.031	0.031	0.032	0.031	0.032	0.026	0.031	0.015
Model 3	-0.007	0.015	0.035	0.064	0.100	0.026	0.162	0.071	0.097	0.034
se	0.086	0.041	0.043	0.044	0.045	0.043	0.044	0.036	0.044	0.020
Model 4	0.067	0.050	0.099	0.137	0.155	0.084	0.178	0.077	0.136	0.040
se	0.094	0.044	0.046	0.046	0.048	0.046	0.048	0.040	0.047	0.022
Model 5	0.033	0.042	0.096	0.118	0.153	0.079	0.151	0.089	0.133	0.044
se	0.102	0.048	0.050	0.051	0.053	0.050	0.053	0.044	0.051	0.024
Model 6	-0.149	-0.070	-0.026	-0.055	0.060	-0.077	0.130	0.048	0.022	-0.014
se	0.109	0.068	0.081	0.087	0.101	0.084	0.090	0.078	0.090	0.048

Note: Bold text indicates statistical significance at the 95% level

Table 11. Unexplained wage and fringe benefit gaps with standard errors from the decomposition models for employees not born in the South

	Wage	Medical	Life	Dental	Maternity	Retirement	Flexible	Profit	Training	Childcare
Model 1	-0.391	-0.115	-0.111	-0.033	-0.055	-0.124	-0.021	0.003	-0.085	0.070
se	0.055	0.027	0.030	0.030	0.031	0.029	0.031	0.026	0.031	0.016
Model 2	-0.343	-0.096	-0.084	-0.010	-0.030	-0.090	0.012	0.013	-0.041	0.079
se	0.052	0.029	0.031	0.030	0.031	0.030	0.031	0.027	0.031	0.019
Model 3	-0.216	-0.040	-0.024	0.047	0.025	-0.040	0.053	0.033	0.013	0.087
se	0.059	0.032	0.035	0.034	0.036	0.034	0.036	0.031	0.035	0.021
Model 4	-0.150	-0.027	-0.005	0.058	0.048	-0.016	0.030	0.041	0.024	0.085
se	0.062	0.033	0.036	0.036	0.038	0.035	0.038	0.032	0.037	0.022
Model 5	-0.210	-0.043	-0.030	0.038	0.033	-0.041	0.019	0.065	0.013	0.080
se	0.066	0.035	0.038	0.038	0.040	0.037	0.041	0.034	0.039	0.023
Model 6	-0.064	-0.016	-0.029	0.053	0.024	-0.036	0.042	0.118	0.014	0.095
se	0.062	0.035	0.042	0.040	0.049	0.040	0.050	0.044	0.047	0.032

Note: Bold text indicates statistical significance at the 95% level

The raw wage gap for employees born in the South³ is actually smaller than for employees born elsewhere, but if we control for all explanatory variables then the result is the opposite. If we compare models 2 and 3 then we see that the effect of the AFQT score on wage gap is larger for those born in the South (23% vs 13%). This means that the direct effect of ability on the wage gap is larger for workers born in the South. Comparing the results from models 5 and 6 leads us also to an interesting conclusion. Taking the job characteristics into account, the wage gap grows in favour of blacks for the non-Southern-born sample and in favour of whites for the Southern-born sample. This means that blacks born in the South have relatively low wages in comparison to whites in similar jobs, but the situation is the other way round for non-Southern-born blacks. So it seems to be that for the non-Southern-born sample, the ethnic wage gap is largely explained by job characteristics, but for the Southern-born sample it seems to be that in the case of similar job characteristics there are

³ South region includes the following states: Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia and West Virginia

considerable racial differences. If we view ethnic wage discrimination as blacks receiving lower wages in comparison to whites in similar jobs, then it could be argued that this kind of discrimination is more likely to be present for blacks born in the South. If we compare the unexplained wage gaps after controlling for all explanatory variables then it also suggests that wage gaps favour whites for employees born in the South (15% vs 6%). However, these results do not necessarily indicate greater wage discrimination against blacks born in the South because, as discussed earlier, birthplace may act as a proxy for unobserved human capital and these wage gaps could be caused by differences in human capital as well.

If we look at the raw fringe benefit gaps then we document a statistically significant gap in favour of whites not born in the South for a number of benefits, with the exception of company provided childcare, which is more available for blacks. For the Southern-born sample there is no clear pattern of ethnic advantage in term of fringe benefits. Blacks have higher access to flexible working hours and profit sharing, but for the majority of fringe benefits the raw gap is not statistically significant. If we control for all explanatory variables then it could be said that in general the unexplained wage gaps are somewhat larger than the corresponding gaps in fringe benefits for both sub-samples. For medical and dental insurance, the remaining gap is in favour of Southern-born whites, whereas for the non-Southern-born sample there are virtually no differences in the availability of medical insurance, but there is a slightly higher availability of dental insurance for whites. Southern-born blacks get some compensation for low wages in the form of flexible hours and maternity leave, but non-Southern-born blacks get compensated more for their lower wages. To sum up, Southern-born blacks are in a worse position in comparison to blacks born in

other regions both in terms of wages and fringe benefits. Therefore, it could be concluded that the birthplace effect explains the ethnic gaps in wages and fringe benefits to some extent.

5. Conclusions

The aim of this article was to estimate black-white wage and fringe benefit gaps based on US data. The results indicate that for wages, there is a raw gap of about 39% in favour of whites, but if we take differences in observable characteristics into account, this gap reduces to 8%, but it still remains statistically significant. Most of the wage gap is explained by differences in schooling and AFQT scores. In the case of fringe benefits there is a significant raw gap in favour of whites for some benefits, but the unexplained fringe benefit gaps tend to be in favour of blacks. If we estimate the compensation gap as the weighted average of wage and fringe benefit gaps then we find that the unexplained compensation gap is more than twice lower than the corresponding wage gap. Therefore, it could be argued that if the racial compensation gap is estimated without taking fringe benefits into account, this overstates the compensation gap. We recommend that when analysing ethnic discrimination in the labour market then not only wages but also fringe benefits should be investigated.

According to the result that blacks in many cases have better access to fringe benefits, it could be said that this is how blacks are compensated for lower wages. If we analyse the effect of industrial segregation on the ethnic wage and fringe benefit gaps, then we find that industrial and occupational segregation is an important

determinant of black-white gaps in wages, but for the fringe benefit gap, only industrial segregation seems to matter. Next we investigated whether black preferences for fringe benefits could explain the fact that blacks receive relatively low wages, but have relatively high access to fringe benefits. We estimate the decomposition models separately on the sub samples of managerial occupations and other occupations. As we find that blacks, who are employed as managers have more fringe benefits available than whites in similar occupations, we argue that it could be the result of black preferences for fringe benefits. Additionally, we take a more detailed look into the AFQT test score's effect on the wage and fringe benefit gap. We find that the AFQT score tends to be a determinant of industry and occupation and affects fringe benefits in an indirect way, but it also has direct wage effects. The fact that AFQT has no direct effect on fringe benefits could be one reason why blacks that have considerably lower test scores, receive relatively low wages in comparison to whites but have relatively high access to fringe benefits.

Similarly to Black *et al* (2006), we find that wage and fringe benefit gaps differ according to the employee's birthplace. The unexplained racial wage gap is smaller for the non-Southern-born sample. In the case of fringe benefits, we find that blacks regardless of their birthplace receive some compensation for lower wages in the form of fringe benefits, but non-Southern-born blacks get compensated more. According to this, it could be concluded that Southern-born blacks are worse off both in terms of wages and fringe benefits. That kind of result could be interpreted as birthplace being a proxy for unobserved human capital as blacks born in the South could be argued to have a lower attainment of unobserved human capital than blacks born in other regions.

This study has a number of limitations, which could be the target of future research. First, although we cover a number of fringe benefits, we do not have information about the entire set. For example, we do not have data about company provided cars, phones, subsidised transportation, etc. Although it could be argued that in this article the most important fringe benefits are taken into account, there could be bias in the compensation gap resulting from the fringe benefits that have been omitted. Second, more detailed characteristics of the fringe benefits offered should be taken into account. That does not necessarily mean accounting for the monetary value of the fringe benefits as we argued that using this approach is unfavourable. For example, if we consider employer offered maternity leave, then there could be differences in its duration across firms and employees; or, if we take on-the-job training then there is heterogeneity in training programs. Third, a more sophisticated method for accounting for the relative importance of fringe benefits should be developed. Considering all fringe benefits equally important would not be plausible. If we want to interpret the compensation gap from the viewpoint of employees' utility then it could be favourable to address the issue of the relative importance of fringe benefits by taking the employees' preferences about fringe benefits into account.

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