

# The puzzling lag in southern earnings

*Business booms but average earnings remain relatively low in the South; contributory factors include interregional differences in urbanization, and in the racial composition, training, and union status of the work force*

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During the 1970's, the South experienced rapid economic growth and a sharp increase in population.<sup>1</sup> While the region attracted workers from other parts of the country, the reversal of the longstanding pattern of migration to the North accelerated.<sup>2</sup> More Southerners found employment at home, as the boom created thousands of jobs. Nevertheless, average wages remained considerably lower than in the rest of the country.

This study takes another look at this phenomenon, finding that a wage differential of about 17 percent existed between May 1973 and May 1978. In order to examine the differential, a number of variables (industry, occupation, education, age, race, sex, city size, and union status) were chosen for their potential contribution to the observed gross differential in regional earnings. These labor market variables were used in regression analysis to estimate, sequentially, alternative specifications of a wage equation. This procedure permits estimates of the interregional wage differential net of the influence of various combinations of the explanatory variables. Accordingly, we were able to explain approximately 60 percent of the gross differential between wages in the South and those in the rest of the Nation

by controlling for worker characteristics.

The study is based on data from the Current Population Survey (CPS) from May 1973 to May 1978 with emphasis on 1978. The CPS not only provides household-derived information on weekly earnings and hours used to compute an average hourly wage, but also a wealth of information on the personal characteristics of workers.<sup>3</sup>

## An overview

Assuming perfect competition and free flow of resources, regional differences in the costs of doing business should vanish in the long run. These costs include outlays for equipment and raw materials (capital) and workers (labor). A change in output resulting from a 1-unit change in either the capital or the labor input is a function of the relative amounts of each input used in the production process. In the region with the most labor relative to capital, an additional unit of capital is more productive, and so would receive a higher return. Similarly, an additional unit of labor is more productive—and receives a higher wage—in the region where labor is least plentiful relative to capital. Thus, capital should migrate to low-wage areas while labor migrates from low-wage areas, until each factor cost is the same in all regions.<sup>4</sup> In reality, however, the gross differential

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in earnings between the low-wage South and the rest of the Nation has demonstrated a stubborn persistence.<sup>5</sup>

According to data from the May 1978 CPS, median earnings of all workers were about 17 percent lower in the South than in the rest of the country. (See table 1.) Averaged across all industries, workers in the South had median hourly earnings of \$4.26, compared to \$5.13 in other regions and \$4.86 for the Nation as a whole. Between 1973 and 1978, earnings increased 41 percent in the South and 39 percent elsewhere, resulting in a small reduction in the interregional wage differential. In manufacturing industries, however, southern earnings remained about 25 percent below those outside the South over the 1973-78 period.

Economists have tried to identify barriers to the free movement of capital or labor which might explain the observed wage differences. Theoretically, a regional differential could develop and be perpetuated if production functions or outputs differ, or if there are unusual transportation costs. Under some circumstances capital is attracted to high-wage areas.<sup>6</sup> And some economists have cited institutional factors such as low union penetration or domination of the labor market by large employers as evidence that employers in the South may have an advantage over other employers in their relationships to employees, thus creating a regional wage differential.

Alternately, wage differentials across regions may be compensating for differences in worker skill levels, living costs, and other factors. For instance, because skilled labor is more productive, and often incurs costs in acquiring its skill, it receives a higher wage than unskilled labor. And, differences in area living costs could persuade workers in the South to accept a smaller nominal wage than other workers. Thus, a regional wage differential need not be inconsistent with profit maximization by the firm or utility maximization by workers.

## Industry forces

Wages differ by industry for a variety of reasons including differences in capital intensity, unionization, skill requirements, working conditions, and sensitivity of industry employment to the business cycle. Accordingly, wage differentials could result in part from regional differences in industry composition. Using Census of Manufactures data for 1952 to standardize wages for industry composition, Victor Fuchs and Richard Perlman explained about half of the regional differential in earnings of manufacturing workers.<sup>7</sup>

An examination of the distribution of wage and salary employment by industry in the South and other regions in 1978 shows that the service-producing sector accounted for about two-thirds, and the goods-producing sector, one-third of the total in both. Within the service sector, the distribution by major industry group was very similar. But within the goods-producing sector, the proportions of employees in the relatively high-wage construction and mining industries and in the lower-paying nondurable goods industries were a little higher in the South.

The estimating procedure for the present study included controls to standardize wages for industry composition. Regression results indicate that standardization at the level of aggregation used does not change the net differential.

At the industry level as well, earnings were lower in the South. In both durable and nondurable manufacturing, the earnings ratios of the South to other regions were about 79 percent. The ratio for all manufacturing was even lower—about 75 percent—because of the higher concentration of southern employment in low-wage nondurable industries, especially in labor-intensive textile and apparel firms.

The regional earnings ratio for workers in construc-

**Table 1. Median hourly earnings of wage and salary workers in and out of the South, by industry, May 1973 and May 1978**

Industry	Number employed (in thousands)				Median hourly earnings					
	May 1973		May 1978		May 1973			May 1978		
	South	Rest of U.S.	South	Rest of U.S.	South	Rest of U.S.	South as a percent of rest of U.S.	South	Rest of U.S.	South as a percent of rest of U.S.
Total .....	23,285	52,281	26,772	58,196	\$3.03	\$3.69	82	\$4.26	\$5.13	83
Agriculture, forestry, and fisheries ..	563	774	575	986	1.76	2.11	83	2.66	3.14	85
Mining .....	319	308	418	333	4.76	4.78	100	7.24	7.79	93
Construction .....	1,791	2,873	1,960	3,025	3.81	5.32	72	5.24	6.78	77
Manufacturing .....	5,627	14,631	6,016	14,772	3.07	4.04	76	4.48	5.94	75
Durable .....	2,646	9,433	2,921	9,566	3.39	4.20	81	4.94	6.23	79
Nondurable .....	2,981	5,198	3,095	5,207	2.74	3.66	75	4.15	5.31	78
Transportation and utilities .....	1,616	3,525	1,873	3,936	3.97	4.99	80	6.09	6.92	88
Wholesale and retail trade .....	4,520	10,276	5,360	11,870	2.28	2.70	84	3.28	3.60	91
Wholesale .....	896	2,031	1,047	2,418	3.28	4.13	79	4.87	5.56	88
Retail .....	3,625	8,245	4,313	9,453	2.13	2.44	87	3.10	3.24	96
Finance, insurance, and real estate ..	1,201	2,906	1,321	3,436	3.15	3.55	89	4.34	4.93	88
Other services .....	6,115	14,064	7,493	16,676	2.69	3.20	84	3.86	4.46	87
Public administration .....	1,533	2,923	1,757	3,162	4.43	4.72	94	5.98	6.58	91

NOTE: Due to rounding, sums of individual items may not equal totals.

tion was about the same as in manufacturing, 77 percent. This lower wage of construction workers in the South may have been partly the result of a compensating differential awarded northern construction workers for the seasonality in their employment. However, differences in union penetration and other factors may have played a role. For example, 20 percent of the construction workers in the South were unionized compared to 44 percent of those in the rest of the Nation.

The earnings differential was not as large in most of the other major industry groups. In transportation and utilities, trade, finance, insurance and real estate, and public administration, southern workers earned about 10 percent less than workers elsewhere. In mining, where many of the southern workers were employed in highly paid oil extraction jobs, the differential appeared to be even less. Nationwide union agreements in the mining industry would also tend to make wages more uniform throughout the country.

Market and institutional factors could interact to produce the variation in the regional earnings differential across industries. An excess of unskilled laborers in the South would bid wages of these workers down, increasing the regional differential in industries using unskilled labor. Similarly, differences in industry unionization across regions could contribute to variation in the differential. Industries characterized by national markets, small numbers of large firms, or multiplant and geographically dispersed firms would tend to have more nationally uniform wages, especially if they are unionized.<sup>8</sup> Regions producing a large share of industry output could be expected to have industry wages as high or higher than in other regions. Finally, because capital in the South is more modern and possibly more efficient, southern workers in capital intensive industries may be more productive and so receive relatively higher wages than their counterparts elsewhere.<sup>9</sup>

Table 2 provides some examples. The petroleum, chemical, and significant portions of the paper products industries are relatively capital intensive. In addition, more than half of the workers in paper products in each region are unionized, and chemicals workers are more unionized in the South (34 percent) than elsewhere (26 percent). In these industries, southern workers earn as much or only slightly less than other workers.

While CPS estimates of the earnings differential for workers in automobile manufacturing are volatile, the ratio for other transportation equipment was consistently well over 90 percent during the May 1973–1978 period. Transportation equipment industries are highly concentrated and unionized.

Other industries demonstrate earnings ratios well below average. In food processing, an industry with regional markets and low union penetration in the South (22 versus 49 percent elsewhere), southern workers earn less than 80 percent of the wage in other regions. The

**Table 2. Median hourly earnings in the South as a percent of those outside the South, selected manufacturing industries, May 1973–78**

Industry	Number employed, May 1978 (in thousands)		Percent					
	South	Rest of U.S.	1973	1974	1975	1976	1977	1978
Durables:								
Lumber .....	257	379	65	65	64	60	62	60
Furniture .....	279	282	79	78	77	72	79	84
Automobiles .....	155	1,079	77	77	73	94	85	82
Aircraft .....	81	437	101	95	94	93	106	100
Other transport equipment .....	165	254	97	93	94	94	101	94
Nondurables:								
Food .....	504	1,304	71	71	69	74	71	78
Textiles .....	610	198	92	84	75	86	82	91
Apparel .....	582	672	80	84	80	83	81	82
Paper and paper products .....	206	472	90	88	94	92	101	95
Chemicals .....	464	762	94	88	101	99	99	102
Petroleum .....	106	131	101	95	99	95	111	108

lumber products industries provide an extreme example of a low earnings ratio; southern workers earn 65 percent or less of the levels elsewhere. Their earnings are about as much as those in the northern region, but only about half the level in the West.<sup>10</sup> Small, often family-run, establishments still produce much of the lumber milled in the South, and employment is less unionized than in the West.

In general, the interregional wage differential is smaller between workers covered by union contracts than it is for workers not covered. Persons with jobs covered by union contracts earned \$6.12 in the South compared with a median of \$6.42 elsewhere, an earnings ratio of 95 percent. Southern workers not covered by union agreements earned \$3.90 compared to \$4.35 in other regions, for an earnings ratio of 90 percent. In manufacturing, southern workers with no union ties earned about 75 percent as much as others in this group. The wage ratio for manufacturing workers covered by union contracts was much higher—90 percent. As already shown, regional differences in union coverage vary widely across manufacturing industries. However, the rate of coverage is about 60 percent as extensive in the South as elsewhere, both in manufacturing and overall.

### Labor market characteristics

Given the lower wages in the South, labor theory predicts that workers would migrate from the South to a higher-wage region. This is just what occurred until the early 1960's. Subsequently, the South experienced net immigration, even if one excludes retirees moving to the region. A net out-migration of the poor continued until 1968, yet the South remained with a high proportion of unskilled labor.<sup>11</sup>

This relative surplus of unskilled labor could have served to depress the wages of these workers below the

**Table 3. Median hourly earnings of wage and salary workers in and out of the South, by occupation, May 1973 and May 1978**

Occupation	Number employed, May 1978 (in thousands)		Median hourly earnings					
			1973			1978		
	South	Rest of U.S.	South	Rest of U.S.	South as a percent of rest of U.S.	South	Rest of U.S.	South as a percent of rest of U.S.
Total	26,772	58,196	\$3.03	\$3.69	82	\$4.26	\$5.13	83
White-collar	12,839	29,739	3.46	3.95	88	5.01	5.44	92
Professional and technical	3,929	9,341	4.43	5.06	88	6.12	6.86	89
Managerial and administrative	2,558	5,586	4.49	5.36	84	6.31	7.03	90
Sales	1,502	3,542	2.55	2.79	91	3.62	4.00	91
Clerical	4,805	11,270	2.80	3.17	88	3.84	4.28	90
Blue-collar	9,877	19,428	3.07	3.94	78	4.42	5.57	79
Craft	3,744	7,247	3.90	4.90	80	5.64	6.81	83
Operatives, except transport	3,418	6,912	2.59	3.34	78	3.81	4.91	78
Transport operatives	1,110	2,168	3.10	4.04	77	4.53	5.68	80
Nonfarm laborers	1,604	3,101	2.56	3.31	77	3.44	4.56	75
Service	3,629	8,391	1.85	2.31	80	2.84	3.19	89
Private household	446	665	1.16	1.27	91	2.16	1.80	120
Service, except private household	3,183	7,727	2.03	2.48	82	2.93	3.25	90
Farmworkers	427	638	1.53	2.02	76	2.53	2.84	89

NOTE: Due to rounding, sums of individual items may not equal totals.

level outside the South. In contrast, the relative shortage of skilled labor in the South would have exerted upward pressure on the wage levels of such workers. And, persons with more education are more likely than others to migrate, thus tending to equalize wages nationally among the better-educated.

*Occupation.* For the white-collar occupations, the regional ratio of wages exceeded the 83-percent level for all wage and salary workers. (See table 3.) The higher earnings ratios for white-collar workers may relate to the aforementioned propensity of these workers to migrate and their relatively limited numbers in the South. Many white-collar skills are traded in a national labor market. These higher earnings ratios may also be partly due to the concentration of the highest-paid Federal workers and of Federally dependent white-collar workers in the Washington, D.C., area, which is part of the southern region. Federal white-collar workers of similar grade are paid the same regardless of where they are located in the country.

The differential for each major blue-collar group is near or below the overall regional differential in median earnings. This includes workers in crafts usually considered skilled, indicating that these workers are less inclined to migrate and so equalize wages, or that they are usually in lower-paying trades than craftworkers elsewhere. Bureau of Labor Statistics Industry Wage Surveys do show that wage differentials for higher-paying jobs are smaller than those for lower-paying jobs, and that there is greater uniformity of wages among skilled workers than among unskilled workers.<sup>12</sup> The gap for nonfarm laborers is by far the greatest; CPS data show that southern laborers earn 75 percent of the median outside the South. In general, blue-collar and service labor is exchanged in local markets.

According to table 3, the earnings ratios were about the same in 1978 as in May 1973 except among managers and administrators, service workers, and farmworkers. The increase in the ratios for service and farm occupations could be due to the extended coverage of the minimum wage provisions of the Fair Labor Standards Act.<sup>13</sup>

*Education, age, race, and sex.* Two basic determinants of one's occupation and earnings are education and work experience. Although the total amount of work experience is not measured in the CPS, a reasonable proxy for experience can be obtained by subtracting years of schooling from an individual's age minus six. Both "human capital" and "dual labor market" theorists recognize the importance of these factors in determining levels of earnings though they do not agree on the exact roles they play. Whether they function as an investment in earnings capacity by the worker (supply side) or as an employment screening device for the firm (demand side), the empirical relation between these factors and earnings is well documented.<sup>14</sup> It is clearly feasible that the differences in the distribution of education and work experience across the work force in each region could explain, in part, the magnitude of the gross differential in earnings. And, in fact, education and age did explain about 60 percent of the regional wage differential in a 1974 study of men age 25 to 64.<sup>15</sup>

When education is measured as the highest grade completed, CPS data for May 1978 show that the relative differences in median earnings between the South and the rest of the Nation diminished as years of schooling increased. (See table 4.) While median years of education were about the same in each region, the South had a higher proportion of its population at lower education levels; 30 percent of the workers in the

South had not graduated from high school, compared with 23 percent elsewhere. This supports the notion that a surplus of lower-skilled workers is depressing the general wage level in the South. A smaller proportion of workers in the South have 5 or more years of college (6 compared to 8 percent elsewhere), but because jobs requiring these levels of education are likely to have a national labor market this is probably more a function of where the jobs are located, rather than any shortage of labor supply.

The size of the regional differential increases with age. This pattern in the differential could be a life cycle phenomenon and the differential might widen for the cohorts as they age. Alternatively, within younger cohorts, a narrowing could result from "vintage" improvement. Differences in educational attainment, measured in both quantity and quality, are becoming smaller with time. James P. Smith and Finis Welch note this trend among black workers (more than half of whom reside in the South, making up 17 percent of the wage and salary workers in the region). They suggest that the narrowing of the earnings gap between blacks and whites is the result of a relative improvement in the human capital stock of blacks and should persist as cohorts age.<sup>16</sup>

Nationwide, blacks earn, on average, 82 percent as much as whites. This gap may be the result of different levels and quality of education, on-the-job training, and work experience, but it may also reflect the effect of discriminatory practices. Years of education are lower for blacks than whites, and both Owen and Welch, as well as many others, have documented that, on average, the quality of education received by blacks, though improving, has been inferior to that received by whites.<sup>17</sup> In addition, on average, blacks tend to experience higher unemployment and may lack the opportunity for on-the-job training, either by nature of the jobs they hold or because of discrimination on the job. These factors

inhibit accumulation of work experience. Thus, the concentration of black workers in the South may partly explain the gross regional differential in hourly earnings.

The following tabulation shows that the interregional differential in median earnings is also much larger for blacks than for whites:

	South	Elsewhere	Ratio
Race:			
Black .....	\$3.50	\$5.11	68
White .....	4.46	5.14	87
Ratio .....	78	99	—
Sex:			
Women .....	\$3.46	\$3.93	88
Men .....	5.23	6.25	84
Ratio .....	66	63	—

Blacks in the South earned 68 percent as much as those elsewhere, while whites earned 87 percent as much as other whites. Differences in skill may partly explain these results. In contrast, the ratio of women's earnings to those of men is about the same in each region. And because women account for about the same proportion of workers in each region (42 percent), the male-female gap in earnings, although very wide, does not appear to play much of a role in the overall wage gap between the South and the balance of the Nation.

Differences in the average quality of education indicate that there will be error in measuring education with years of schooling. This error will be associated with race to the extent the quality of schooling differs by race. Similarly, differences in labor force participation, unemployment, and actual on-the-job training will lead to errors in measurement of experience when experience is measured as the difference between an individual's age and education. These errors will correlate with race and sex. Therefore, a standardization of wages using the measures of education and work experience employed in this analysis should control for race and sex composition of the population, as well.<sup>18</sup>

*An urban-rural differential.* Economists have observed that workers in larger cities, on average, receive higher wages than those in smaller cities. As David Segal has shown, firms in cities may benefit from agglomerative economies which increase the value of the marginal product of the labor they employ. In addition, the higher wage in a larger city could be the result of compensating differentials for higher cost of living, congestion, pollution, and so on.<sup>19</sup>

A larger proportion of the southern population resides outside of metropolitan areas. Of persons living in metropolitan areas, the proportion living in central cities is lower in the South than elsewhere. A smaller share live in metropolitan areas of 1 million or more inhabitants as well.<sup>20</sup> Thus, the regional wage differential may be partly the result of an urban-rural or metropolitan-nonmetropolitan wage differential. Victor Fuchs

**Table 4. Median hourly earnings of wage and salary workers in and out of the South, by education and age, May 1978**

Education and age	Median hourly earnings		
	South	Rest of U.S.	South as percent of rest of U.S.
Education:			
No school .....	\$2.78	\$2.74	101
1-8 years .....	3.24	4.18	78
9-11 years .....	3.27	3.58	91
12 years .....	4.23	4.94	86
13-15 years .....	4.68	5.36	87
16 years .....	6.00	6.53	92
17 years or more .....	7.39	7.92	93
Age:			
16-24 years .....	3.24	3.47	93
25-34 years .....	4.93	5.62	88
35-44 years .....	5.14	6.15	84
45-54 years .....	4.91	6.02	82
55-64 years .....	4.28	5.48	78
65 years and over .....	2.77	3.24	85

found that demographic characteristics explained one-third and city size, another one-third of the regional gap in earnings.<sup>21</sup> In the following regression analysis, observations are controlled for residency in large Standard Metropolitan Statistical Areas (SMSA's), including 12 SMSA's in the South.

### Regression results

Regression analysis is often used to estimate the impact of wage-determining variables on wages and to isolate net differentials existing between groups which cannot be explained by any of the variables. In this section, May 1978 CPS data on earnings and personal characteristics of 43,826 wage and salary workers are used to estimate alternative specifications of a standard wage equation. Usual hourly earnings are the wage measure. Regression results pertain to the differential in *mean* earnings, as opposed to the differentials in *median* earnings examined above.

The dependent variable in the wage equation, the natural log of wage, is a linear function of race, sex, education, experience, experience squared, city size, union status, occupation, and industry. In addition to these explanatory variables, the equation has a regional variable, with residence in the South embodied in the regression coefficient. In the log-linear formulation, estimated coefficients approximate proportionate impacts of the associated variables on wages; thus, the coefficient of the regional variable is an estimate of the proportionate difference between wages of workers in the South and those elsewhere.<sup>22</sup> All data pertain only to the worker's primary job. The appendix to this article presents definitions of the variables as well as their sample means and standard deviations.

To investigate the gross differential between the South and the rest of the Nation and the differential net of the effects of the explanatory variables, the variables were entered sequentially in eight regression equations. The first equation, which determined the log of wage using only the regional variable, provided an estimate of the gross differential. Each subsequent equation incorporated all the variables of the equation preceding it and additional explanatory variables. The coefficient of the regional variable in each equation provided an estimate of the regional differential net of the other explanatory variables included in that equation. Estimates underlying the following discussion are presented in appendix table A-1.

The initial regression, the log of wage regressed on the regional variable, shows that when other factors influencing wages were not controlled, the wages of workers in the South were an average 11 percent less than those elsewhere. In regression 2, race is added as an explanatory variable in the model and the estimated differential falls to 9 percent. The introduction of the sex variable in the third regression does not alter the esti-

mated differential significantly. However, including the human capital variables education, experience, and experience squared reduces the regional differential to 7 percent. Thus, controlling for systematic regional differences in race, sex, and human capital reduces the estimated wage differential by about one-third.<sup>23</sup>

Entering the city-size variable into the equation leaves unexplained an estimated differential of about 5 percent. Allowing union workers to earn a different average wage by including the union variable in the model reduces the estimate to 2 percent, about one-fifth of the gross regional differential estimated initially.

Thus far, the results have been expected. Blacks, on average, earn less than whites and they make up a larger proportion of the population in the South than elsewhere. And because women earn about two-thirds as much as men regardless of regional location and are represented in equal proportions between regions, sex would not have a significant influence on the regional differential. Workers living in larger cities receive a higher wage, and given the relatively greater concentration of the population in larger cities outside the South, these higher earnings would produce higher average earnings in these regions unless calculations controlled for city size. Similarly, the concentration of union workers, with their higher wages, outside the South has an impact on the size of the gross differential.

However, when the series of occupational variables is introduced, the estimated regional differential does not decrease. In fact, when both occupational and industry variables are included in the regression, the estimated relative distance between wage levels actually increases to 4 percent. Replacing the occupational and industry variables with a more detailed list of 25 occupational and 31 industry-group variables in the wage equation does not change this estimate significantly. In both cases, the occupational and industry variables do not make a significant contribution to explaining the total variation in wages. Regressing log wage against the regional variable and the occupational variables or the industry variables alone, or even the regional variable and the occupational and industry variables combined, will not yield an estimated net differential smaller than the 11-percent gross differential.<sup>24</sup>

Much of the information conveyed by the occupational and industry distribution of workers is related to human capital. Occupation and industry may actually provide the estimating process with information on human capital in addition to that provided by race, sex, and the human capital variables. Industry and occupational variables also provide additional information about unions as some unions influence wages more than others. Apparently at this level of aggregation, employment in the South is composed of occupational and industry groups with wages, on average, as high as or higher than these workers could command elsewhere.

Controlling for all of the aforementioned variables, this wage equation estimates the net differential in regional earnings at 4 percent, about two-fifths of the gross differential estimated initially. The coefficients of the variables in the same regression equation provide information in addition to estimates of the regional differential. The coefficient of the city-size variable, for example, indicates an 11-percent additional compensation to a worker living in a large SMSA, while the coefficient of the union variable estimates that wages of workers covered by union contracts are on average 22 percent above those of nonunion workers with similar characteristics. Regression coefficients also show the well-known wage disparities between blacks and whites and men and women. The results suggest that blacks, on average, receive a wage 5 percent less than whites, and that women receive 26 percent less than men, if other characteristics, including occupation and industry, are similar.

As previously indicated, economic conditions of employment and the ability of some of these proxy variables, especially the human capital variables, to represent what they are intended to represent may differ between blacks and whites. Past and current discrimination probably results in differences in the stock and rate of formation of human capital between the two races. As already mentioned, these conditions produce errors in measurement of the education and experience variables, as well as potential structural differences in the wage equation. To allow for these different conditions, the same regression equation was estimated separately for the black and white populations.

Bivariate regressions of the log of wage on the regional variable estimate the mean wage of blacks in the South at 71 percent of the level earned by other blacks, while mean earnings of whites in the South are 93 percent of those of whites elsewhere. After introduction of the other explanatory variables to the regression equation, the estimated net regional differential between the two black groups is 10 percent while for the white populations the estimate is 4 percent. Human capital, union status, and city size account for most of the regional differential in earnings within each racial group. Again, the industry and occupational variables add nominally to that differential.<sup>25</sup>

Both the South and the rest of the country can be divided into smaller, more homogeneous regions. With a wage regression, a range of regional wage levels can be estimated. Using Census divisions, dummy variables designating each division, with the exception of the East North Central division, were added to the final regression equation. The coefficients of these regional variables are estimates of the net wage differences between these divisions and the East North Central. Regression estimates indicate the following range for gross and net differentials.

<i>Division</i>	<i>Percent differential</i>	
	<i>Gross</i>	<i>Net</i>
Northeast:		
New England . . . . .	-10.9	-6.7
Mid-Atlantic . . . . .	2.5	-2.5
North Central:		
East North Central . . . . .	0.0	0.0
West North Central . . . . .	-14.8	-7.1
South:		
South Atlantic . . . . .	-11.2	-4.7
East South Central . . . . .	-14.9	-7.7
West South Central . . . . .	-13.7	-5.6
West:		
Mountain . . . . .	-8.3	-1.4
Pacific . . . . .	9.8	7.0

After adjustment for the explanatory factors in this analysis, wage levels in the South do not differ as much from the geographic majority of the country as do those in the West. New England and the West North Central area rank along with the East South Central as the divisions with the lowest adjusted wage levels. Workers in the South Atlantic States earned higher wages, but not as high as in the Mid-Atlantic, the East North Central division, or the West. Even after adjustment, mean earnings of workers in the Pacific States are 7 percent higher than in the East North Central area and well above those in all other divisions. The addition of these regional variables does little to the estimates of the other coefficients in the equation.

### Explaining the remaining differential

Estimates of the net differentials presented here are subject to the limitations of the method employed to produce them. Some of the possible errors in measurement of the variables have already been discussed. Some relevant variables may have been excluded from the equation. In addition, this method assumes that the structure of the wage equation is correct and the same in each region. An alternative approach would be to fit the wage equation to data for each region and compare the average wage a worker earns in his or her home region with the wage he or she could expect in another region.

Taking the method as a good approximation, compensating differentials, not considered in the regression standardization process, may partly explain the remaining 4 percent differential between the South and other regions. A major factor may be regional differences in price levels and living costs that go beyond those associated with the simple city-size variable. The worker makes most purchases locally and so his or her standard of living is directly affected by local price levels. There is no index for comparing price levels in the South overall with those elsewhere, nor is there any general index for comparison of living costs between these two regions. In any case, various pieces of evidence indicate that living costs, including price levels, are lower in the South.

To adjust earnings for differences in regional living costs and so to compare real wages, some economists have used the Bureau of Labor Statistics' hypothetical family budget for a family of four at an intermediate level of living in specific SMSA's. In an inter-industry regression analysis of data for five northern cities and five southern cities, Philip Coelho and Moheb Ghali found that when wages were deflated by an index of the family budgets, the regional wage differential vanished.<sup>26</sup> Comparing weighted averages after deflating wages by the index of family budgets, Donald Bellante also found no differential in regional real wages.<sup>27</sup> These economists believe that, although nominal earnings have not converged in recent years, real earnings have.

Between 1973 and 1977, the Consumer Price Index rose 38.6 percent in the South compared to 36.4 percent for the Nation.<sup>28</sup> The increase was especially large in three components—housing, food, and apparel. Apparently, over this brief period, the gap in price levels of the South and the United States narrowed. Still, results similar to those of Coelho and Ghali, and Bellante could be attained with the CPS usual hourly earnings data for 1978. The soundness of estimates of the regional differential in real earnings, however, rests in the reliability of the family budgets as a measure of regional cost of living. Other variables, such as fringe benefits or environmental factors, could also affect the level of the gross differential.

Even if regional differences in the cost of living play no role, and if all other compensating differentials have

been considered, the remaining differential between standardized nominal wages in the South and those elsewhere could persist because neither individuals nor firms find the difference in wages sufficient to warrant a move—that the differential is perceived as being equivalent to adjustment costs. A firm must not only compare labor costs with the cost of relocating, but must also take into account the proximity of any new location to the resources it needs for production. Similarly, individuals do not look only at the wage they could receive in another region, but also at the tangible costs of moving a household, job search (including travel expenses and a spell of unemployment), and the psychic cost of leaving family and friends. With returns of relocation to the average wage earner of only about \$500 a year, the mover would have to work many years just to break even.<sup>29</sup>

But people and businesses still move between regions, possibly because the differential in earnings varies by type of labor. The size of the differential each business confronts may depend upon the labor needs of that firm if, as we have estimated, the differential is larger for unskilled labor. Also, firms move to take advantage of things other than lower labor costs, such as State and local tax concessions. And finally, the individual worker may not even be aware of the magnitude of the regional wage differential. He or she probably migrates to take a different job, for career advancement, or to change from nonunion to union status. He or she is not moving to a higher paying region, but rather to a higher paying job. □

— FOOTNOTES —

<sup>1</sup> See Philip L. Rones, "Moving to the sun: regional job growth, 1968 to 1978," *Monthly Labor Review*, March 1980, pp. 12–19.

<sup>2</sup> The regions discussed in this paper are census regions. The South includes the South Atlantic (Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, and West Virginia), the East South Central (Alabama, Kentucky, Mississippi, and Tennessee), and the West South Central (Arkansas, Louisiana, Oklahoma, and Texas) divisions. The rest of the United States consists of the Northeast, the West, and the North Central regions. New England (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont) and the Mid-Atlantic division (New Jersey, New York, and Pennsylvania) make up the Northeast region. The West is composed of the Mountain States (Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming) and the Pacific States (Alaska, California, Hawaii, Oregon, and Washington). And, the East North Central (Illinois, Indiana, Michigan, Ohio, and Wisconsin) and the West North Central (Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota) divisions make up the North Central region.

<sup>3</sup> The Current Population Survey is a household survey conducted by the Bureau of the Census for the Bureau of Labor Statistics. Weekly earnings information was collected in each May between 1967 and 1978, with the exception of 1968. In May 1978 the sample size was about 56,000 households. Usual hourly earnings are usual weekly earnings divided by usual hours worked. Data refer only to the primary jobs of wage and salary workers. As with all sample data, these have sampling errors associated with them. In addition, nonsampling errors due to erroneous response and non-response may be present. For discussions of these data and their reliability, see *Weekly and Hourly Earnings Data from the Current Population Survey*, Special La-

bor Force Report 195 (Bureau of Labor Statistics, 1977); and, *Technical Description of the Quarterly Data on Weekly Earnings from the Current Population Survey*, Report 601 (Bureau of Labor Statistics, 1980).

<sup>4</sup> For an exposition of the neoclassical theory, see George H. Borts, "The Equalization of Returns and Regional Economic Growth," *The American Economic Review*, June 1960, pp. 319–47.

<sup>5</sup> An explanation of why southern wages lag behind those in the rest of the country has long interested American economists. Joseph Bloch, in one of the earliest studies, showed that in manufacturing industries the wage differential was no narrower in 1945 and 1946 than in 1919, although it was substantially less than during the Depression years 1931 and 1932.

Victor Fuchs and Richard Perlman, who detected a contraction of the earnings gap from 1929 to 1947, claim that from 1947 to 1954 the low position of the South relative to the rest of the Nation was stable or may even have deteriorated, after considering industry mix. Martin Segal presented conflicting evidence for the 1947–54 period, showing that after adjusting for institutional factors wage rates converged, at least for the majority of industries. See Joseph W. Bloch, "Regional Wage Differentials, 1907–1946," *Monthly Labor Review*, April 1948, pp. 371–77; Victor Fuchs and Richard Perlman, "Recent Trends in Southern Wage Differentials," *Review of Economic Statistics*, August 1960, pp. 292–300; and Martin Segal, "Regional Wage Differences in Manufacturing in the Postwar Period," *Review of Economic Statistics*, May 1961, pp. 248–55.

<sup>6</sup> Borts, "The Equalization of Returns," pp. 322–26.

<sup>7</sup> Fuchs and Perlman, "Recent Trends."

<sup>8</sup> Segal, "Regional Wage Differences."

<sup>9</sup> Harry M. Douty, "Wage differentials: forces and counterforces,"



*Monthly Labor Review*, March 1968, pp. 74-81.

<sup>10</sup> Although the standard errors associated with all these earnings ratios are rather large, they are generally in agreement with those that can be calculated from a sample of social security records. See *Annual Earnings and Employment Patterns of Private Nonagricultural Employees, 1973-75*, Bulletin 2031 (Bureau of Labor Statistics, 1979), table C-8.

<sup>11</sup> Larry H. Long, *Interregional Migration of the Poor. Current Population Reports, Special Studies*, Series P-23, No. 73 (Bureau of the Census, 1978).

<sup>12</sup> For a listing of reports from the Industry Wage Survey program, see *Directory of Occupational Wage Surveys, 1974-79*, Report 606 (Bureau of Labor Statistics, 1980).

<sup>13</sup> *Minimum Wage and Maximum Hours Standards Under the Fair Labor Standards Act* (U.S. Department of Labor, Employment Standards Administration, 1978), p. 12.

<sup>14</sup> For a survey of this literature, see Mark Blaug, "The Empirical Status of Human Capital Theory: A Slightly Jaundiced Survey," *Journal of Economic Literature*, September 1976, pp. 827-55.

<sup>15</sup> Barry R. Chiswick, *Income Inequality, Regional Analysis Within a Human Capital Framework* (New York, National Bureau of Economic Research, 1974), p. 132.

<sup>16</sup> James P. Smith and Finis Welch, "Race differences in earnings: a survey and new evidence," in Peter Mieszkowski and Mahlon Straszheim, eds., *Current Issues in Urban Economics* (Baltimore, Md., Johns Hopkins University Press, 1979), pp. 40-73.

<sup>17</sup> See John D. Owens, *School Inequality and the Welfare State* (Baltimore, Md., Johns Hopkins University Press, 1974), pp. 135-48; Finis Welch, "Black-White Differences in Returns to Schooling," *The American Economic Review*, December 1973, pp. 893-907; and Smith and Welch, "Race differences in earnings."

<sup>18</sup> Other errors in these variables, not necessarily related to race or sex, include vintage effects in education (changes in quality of education over time), and the greater incidence of on-the-job training during the early years of work experience which thus distorts the measure of work experience.

<sup>19</sup> On the agglomeration effect, see David Segal, "Are There Returns to Scale in City Size?" *Review of Economics and Statistics*, August 1976, pp. 339-50. John E. Buckley found evidence that wages are related to area living costs as measured by the Bureau of Labor Statistics Family Budgets. See "Do wages reflect area living costs?" *Monthly Labor Review*, November 1979, pp. 24-29.

<sup>20</sup> See *Current Population Reports*, Series P-60, No. 123 (Bureau of the Census, 1980), table 44.

<sup>21</sup> Victor R. Fuchs, *Differentials in Hourly Earnings by Region and City Size, 1959*, Occasional Paper 101 (New York, National Bureau of Economic Research, 1967), pp. 32-35.

<sup>22</sup> This approximation is closer the smaller the impact. The estimated proportionate impact is actually 1 minus the exponentiated value of this coefficient. All variables in the analysis with the exception of education, experience, experience squared, and the log wage are dummy variables, with workers' records assigned a 1 if the attribute is present and a zero otherwise.

<sup>23</sup> This estimated reduction agrees with the estimates of Victor Fuchs for a sample of the 1960 Census and estimates by Don Bellante for a sample of the 1970 Census. See Donald Bellante, "The North-South Differential and the Migration of Heterogeneous Labor," *The American Economic Review*, March 1979, pp. 166-75; and Fuchs, *Differentials in Hourly Earnings*.

<sup>24</sup> Regressing log wage on the region variable and the less detailed list of occupations or industries results in an estimate larger than 11 percent, though not significantly so.

<sup>25</sup> The equation estimated for the black population is:  $\ln W = .3994 - .0958 \text{ SOUTH} - .1776 \text{ FEMALE} + .0466 \text{ ED} + .0139 \text{ EXP} - .0002 \text{ EXPSQ} + .0970 \text{ SMSA} + .2394 \text{ UNION} + .3502 \text{ PROF} + .3525 \text{ MANG} + .1408 \text{ SALES} + .1937 \text{ CRAFT} + .1031 \text{ OPER} + .0294 \text{ LABOR} + .1142 \text{ CONSTR} + .2853 \text{ MFGDUR} + .2286 \text{ MFGNON} + .3521 \text{ TRANS} + .1042 \text{ TRADE} + .1846 \text{ FIRE} + .1366 \text{ SERV} + .3422 \text{ PA}$ . With the exception of LABOR and TRADE, the coefficients of all variables are significantly different from zero with 99-percent confidence. Confidence in the estimated coefficient of TRADE is above the 95-percent level.

The white population included some persons who were neither white nor black. The estimated equation for this white population is:  $\ln W = .4628 - .0396 \text{ SOUTH} - .2680 \text{ FEMALE} + .0518 \text{ ED} + .0260 \text{ EXP} - .0004 \text{ EXPSQ} + .1140 \text{ SMSA} + .2137 \text{ UNION} + .3725 \text{ PROF} + .3751 \text{ MANG} + .1626 \text{ SALES} + .2426 \text{ CRAFT} + .0950 \text{ OPER} - .0004 \text{ LABOR} + .1160 \text{ CONSTR} + .1347 \text{ MFGDUR} + .0982 \text{ MFGNON} + .1972 \text{ TRANS} - .0433 \text{ TRADE} + .1068 \text{ FIRE} - .0588 \text{ SERV} + .1398 \text{ PA}$ . All coefficients are significantly different from zero with 99-percent confidence, with the exception of that for LABOR.

<sup>26</sup> Philip R. P. Coelho and Moheb A. Ghali, "The End of the North-South Wage Differential," *The American Economic Review*, December 1971, pp. 932-37.

<sup>27</sup> Bellante, "The North-South Differential."

<sup>28</sup> *Handbook of Labor Statistics 1978*, Bulletin 2000 (Bureau of Labor Statistics, 1979), tables 117 and 123.

<sup>29</sup> In the South, the average wage and salary worker who usually worked full time had mean usual hourly earnings of \$5.34. Assuming this worker would work 40 hours per week, 52 weeks per year regardless of regional location, and given that wages are 4 percent lower in the South, a worker's annual earnings would increase \$463 if he or she moved to a similar job in the non-South.

## APPENDIX: Elements of the regression analysis

The following tabulation presents the definitions, means, and standard deviations of the variables used in the regression analysis:

Variable	Definition	Mean	Standard deviation
InW	The natural logarithm of usual hourly earnings.	1.547	.578
SOUTH	1 if residence is in the South; zero otherwise.	.292	.455
BLACK	1 if race is black; zero otherwise.	.083	.276
FEMALE	1 if sex is female; zero if male.	.443	.497
ED	Education as measured by highest grade completed.	13.249	2.885
EXP	Proxy for work experience; age less education less six.	16.443	14.469
EXPSQ	EXP × EXP, experience squared.	479.744	659.383
SMSA	1 if residence in one of the large SMSA's coded on Census public use tapes; zero otherwise.	.366	.482

UNION	1 if a member of a union or if job is covered by union contract; zero otherwise.	.266	.442
Occupation dummy variables (1 if true; zero otherwise):			
PROF	Professional or technical worker.	.155	.362
MANG	Managerial or administrative worker.	.087	.282
SALES	Sales or clerical worker.	.245	.430
CRAFT	Craftworker.	.127	.333
OPER	Operative.	.158	.365
LABOR	Laborer, either farm or nonfarm.	.071	.257
PHSV	Private household and other service workers.	.155	.362
Industry dummy variables (1 if true; zero otherwise):			
CONSTR	Construction.	.070	.255
MFGDUR	Durable goods manufacturing.	.193	.394
MFGNON	Nondurable goods manufacturing.	.095	.293
TRANS	Transportation and utilities.	.067	.250
TRADE	Wholesale and retail trade.	.204	.403
FIRE	Finance, insurance, or real estate.	.051	.219
SERV	Other services.	.298	.457
PA	Public administration.	.059	.236
AG	Agriculture, forestry, and fisheries.	.022	.146

Table A-1 details the results of the stepwise regression of the wage equation as sets of variables were added. As previously indicated, an entry may be interpreted as the approximate percentage effect on earnings of the

associated variable. For example, equation 8 predicts that workers in larger cities (SMSA's) might expect to average earnings 11.4 percent greater than workers with similar characteristics in less populous areas.

**Table A-1. Results of a stepwise regression of the natural log of usual hourly earnings on personal characteristics**

[Standard errors in parentheses]

Variable	Equation number							
	1	2	3	4	5	6	7	8
Intercept .....	1.5775 (.0033)	1.5836 (.0033)	1.7555 (.0039)	.4659 (.0123)	.4431 (.0123)	.3853 (.0120)	.4639 (.0140)	.4623 (.0182)
SOUTH .....	-.1059 (.0060)	-.0920 (.0061)	-.0976 (.0058)	-.0726 (.0050)	-.0534 (.0050)	-.0207 (.0049)	-.0369 (.0047)	-.0415 (.0046)
BLACK .....		-.1216 (.0101)	-.0899 (.0095)	-.0417 (.0082)	-.0687 (.0082)	-.0989 (.0080)	-.0526 (.0078)	-.0536 (.0076)
FEMALE .....			-.3905 (.0052)	-.3798 (.0045)	-.3785 (.0044)	-.3453 (.0044)	-.2967 (.0048)	-.2806 (.0048)
ED .....				.0742 (.0008)	.0723 (.0008)	.0722 (.0008)	.0504 (.0010)	.0515 (.0009)
EXP .....				.0355 (.0005)	.0353 (.0005)	.0317 (.0005)	.0271 (.0005)	.0250 (.0004)
EXPSQ .....				-.0006 (.00001)	-.0006 (.00001)	-.0005 (.00001)	-.0005 (.00001)	-.0004 (.00001)
SMSA .....					.1280 (.0047)	.1220 (.0045)	.1163 (.0044)	.1136 (.0043)
UNION .....						.2470 (.0050)	.2479 (.0050)	.2165 (.0050)
PROF .....							.3892 (.0086)	.3696 (.0085)
MANG .....							.4255 (.0095)	.3751 (.0095)
SALES .....							.2152 (.0069)	.1595 (.0071)
CRAFT .....							.3567 (.0085)	.2382 (.0090)
OPER .....							.1930 (.0077)	.0923 (.0085)
LABOR .....							.0592 (.0097)	-.0034 (.0102)
CONSTR .....								.1173 (.0095)
MFGDUR .....								.1445 (.0127)
MFGNON .....								.1061 (.0139)
TRANS .....								.2076 (.0146)
TRADE .....								-.0356 (.0131)
FIRE .....								.1118 (.0156)
SERV .....								-.0456 (.0132)
PA .....								.1539 (.0151)
Coefficient of determination (R <sup>2</sup> ) <sup>1</sup> .....	.007	.010	.123	.353	.364	.397	.441	.464

<sup>1</sup>An estimate of the proportion of the total variation in earnings which appears to be explained by the inclusion of the associated variables in the wage equation. For example, after all explanatory variables under consideration had been included, the R<sup>2</sup> value for equation 8 in-

icates that only 46 percent of the overall earnings variation had been accounted for, or conversely, that 54 percent of the variation must be attributable to factors outside the scope of this analysis.