

Labor Market Equilibrium and Sun-Belt-Frostbelt Earnings Gaps*

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INTRODUCTION

The magnitude and interpretation of regional earnings gaps has been a topic of considerable dispute in the literature on U.S. labor markets. Many early studies found that the South was a low wage region and concluded that worker mobility generally failed to equalize earnings (Fuchs, 1967, Scully, 1969). This view has been challenged (Coelho and Ghali (1971) Bellante, 1979, Gerking and Weirick, 1983) on the basis of earnings adjustments for differences in human capital and local living costs, that contradict earlier evidence of disequilibrium across regions. More recently, (Sahling and Smith, 1983) turn conventional wisdom on its head with their argument that, by the late 1970's, a regional gap had reemerged in which the South has become a high wage region!

This study uses a unique supplement to the Current Population Survey which permits correction of several potential biases that may have plagued earlier studies. Employer-specific job tenure and establishment size are included in this analysis, as both factors are widely recognized as influencing workers' earnings. Since both tenure and establishment size are significantly higher in Northcentral and Northeast states, their exclusion from earlier studies may have biased estimates of regional earnings gaps. These variables are typically not available in the Current Population Survey, or in the decennial Census, the two data sources whose large size makes them most suitable for this type of study.

Nonmetropolitan price indexes have been used to deflate nonmetropolitan earnings. Failure to do this produces a serious underestimate of real nonmetropolitan earnings, since the cost-of-living is much lower outside of major metropolitan areas. Moreover, since the share of the population living in major metropolitan areas varies across regions, estimates of interregional wage gaps are also biased.¹ Some researchers have avoided this problem by excluding workers not living in a major SMSA. This approach is costly, however, for it implies dropping over eighty percent of the Southern labor force from the sample.

After correcting for these potential sources of bias, it is found that regional *real* earnings gaps are significant and considerably larger than corresponding nominal gaps for metropolitan and nonmetropolitan workers. In particular, it is found that in the late 1970's an average worker in the "sunbelt" South and West enjoyed a significant real earnings premium over workers in "frostbelt" Northcentral and Northeast states. Furthermore, these earnings gaps are smaller for more mobile groups of workers. It is concluded that, by the late 1970's, a disequilibrium real earnings gap had developed between "frostbelt" and "sunbelt" labor markets.

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Model and Data

In order to examine the structure of real and nominal earnings across regions, we estimate the following reduced-form earnings equation:

$$(1) \quad \ln(E_i/P_i) = B_0 + B_1 X_i + e_i$$

for the *i*-th worker in the *j*-th region (i.e., *j* = South(S), Northeast(NE), Northcentral(NC), and West(W)). *E_i* represents average hourly earnings, *P_i* an area price deflator, and *X_i* is a vector of 54 variables designed to capture variation in supply and demand-side labor market factors. Finally, it is assumed that uncaptured variation in remunerative worker and job characteristics is uncorrelated with *X_i* and included in independent and identically distributed mean-zero residuals, *e_i*.

The proportionate differential in real wages across any two regions, say NE and S, for a worker with a given set of background characteristics *X** will be:

$$(2) \quad \text{Diff} = \exp [(B_0^{NE} - B_0^S) + (B_1^{NE} - B_1^S)X^*] - 1$$

Thus, significant regional earnings differentials would be implied if $B_0^{NE} \neq B_0^S$ and the differential will vary with worker and job characteristics if $B_1^{NE} \neq B_1^S$.

The data file used to estimate the regional earnings equations in (1) is a sample of 9679 nonfarm wage and salary workers from the May-June matched 1979 Current Population Survey (CPS). Along with the usual extensive economic and demographic data contained in the monthly CPS, the May 1979 survey contained a special supplement on pensions and health insurance in which workers were asked the size of their work establishment and job tenure with their current employer, two questions not regularly part of the CPS survey.

Three versions of equation (1) are estimated. First, nominal earnings differentials are estimated by setting $P_i = 1$, for all *i* and *j*. Next, real earnings differentials were analyzed using two different sets of price deflators. Most studies use a price index constructed from BLS budget data for "intermediate" income families. However, a study by Gerking and Weirick (1983) that finds no significant regional earnings gap uses the BLS "lower" income deflator. While we believe that the "intermediate" index is a better gauge of living costs for most of our sample, the "lower" index is also used to test the robustness of our estimates.

Estimates

Ordinary least squares estimates of selected coefficients are reported in Table 1 for the real earnings equation using the intermediate income deflator, along with sample means for the independent variables.² Employer-specific tenure is a highly significant determinant of earnings in all regions. The mean level of tenure also varies from 5.5 years in the West to 7.9 years in the Northeast. Workers in large establishments generally earn significantly more than workers in small establishments. The establishment size differential is most pronounced in the Northeast and Northcentral regions, and smallest in the South and West. Workers in the Northeast and Northcentral states are also much more likely to work in large establishments: 15% of workers in Northeastern and Northcentral states are employed in establishments with over 1000 workers, as compared to 12% in the South and just 10% in the West.

Is there a significant real earnings gap across the regions? We tested two nested hypotheses. First, we assumed that the "slopes" in the vector *B₁* from equation (1) were the same in all regions, and tested whether the intercepts (*B₀*) differed across regions (this

TABLE 1
Ordinary Least Squares Estimates of Selected Earnings Equation Coefficients for Nonagricultural Wage and Salary Workers by Region* (t-statistics in parenthesis)

Variable	Dependent Variables = Natural Log of Real Hourly Earnings			
	South	Northeast	North Central	West
	Mean	Mean	Mean	Mean
Tenure	6.6	7.9	7.2	5.5
(Tenure) ² /100	.018** (7.41)	.021** (7.98)	.014** (5.56)	.024** (7.24)
Establishment Size (employees):				
1-25	-.025** (-3.48)	-.041** (-5.23)	-.026** (-3.53)	-.052** (-4.44)
26-99	.007 (.37)	.061** (3.00)	.045* (2.44)	.004 (.18)
100-499	.073** (3.59)	.058* (2.53)	.083** (3.94)	.087** (3.70)
500-999	.092** (3.10)	.074 (2.45)	.128** (4.04)	.064 (1.63)
1000+	.081** (3.14)	.149 (5.31)	.127** (5.03)	.083* (2.53)
SMSA	.021 (1.15)	.021 (1.35)	.029* (2.02)	-.006 (-.33)
R ²	.514	.571	.555	.510
N	2726	2101	2576	2173

*Independent variables not shown are: Education; Labor Market Experience; (Labor Market Experience)²; Sex; Race; Family Head; In Family, Not Head; Veteran; Part-Time; Multiple Plant Employers; Union Contract Coverage; 8 Occupation and 30 Industry dummies.
**Significant at 5% level (two-tailed).
***Significant at 1% level (two-tailed).

TABLE 2

Homogeneity Tests for Regional Earnings Equations: F-Statistics

Null Hypothesis (given)	Nominal	Real Income Deflator	
		Intermediate	Lower
Identical B_0 (identical B_1)	51.02**	144.13**	20.42**
Identical B_1 (different B_0)	1.85**	1.69**	1.46**

**Null hypothesis rejected at a 1% level of significance.

difference corresponds to the first term in equation (2)). The F-statistics in the first row of Table 2 show that we can readily reject equality of intercepts across regions at a 1% significance level. We then tested whether the slopes in B_1 differed, allowing B_0 to differ as well. Again, we can reject the null hypothesis that the coefficients are equal across regions at a 1% significance level. These tests lead us to conclude that there are differences in real and nominal earnings across regions, and that these gaps vary with worker and job characteristics. These findings also hold when the lower income deflator is used to calculate real earnings.

The structure of real and nominal earnings differentials across regions for an average worker in the sample is presented in Table 3. Nominal earnings in metropolitan labor markets range from 97.3% of the U.S. average in the Northeast to 103.9% in the West—producing a gap of 6.6% and a standard deviation of 2.7%. The nominal gap is approximately twice as large in nonmetropolitan labor markets.

The real earnings differentials reported in Panel B of Table 3, are however much larger—particularly in metropolitan labor markets.³ Real metropolitan earnings range from 89.4% in the Northeast to 106.3% in the West, implying a substantial 16.9% real earnings gap. A similar gap prevails in nonmetropolitan areas. These findings reinforce and extend those of Sahling and Smith (1983) who find a real earnings premium for Southern workers in major metropolitan areas. A similar premium is identifiable for the remaining eighty percent of

TABLE 3

The Regional Structure of Real and Nominal Earnings in Metropolitan and Nonmetropolitan Labor Markets (U.S. Average = 100)

	South	North East	North Central	West	Range	Std. Dev.
A. Nominal						
Metro.	101.2	97.3	97.8	103.9	6.6	2.7
Non-Metro.	96.2	97.6	97.5	110.6	14.4	5.9
B. Real (Intermediate Income Deflator)						
Metro.	104.7	89.4	99.2	106.3	16.9	6.6
Non-Metro.	104.3	89.1	98.0	108.7	19.6	7.4
C. Real (Lower Income Deflator)						
Metro.	104.5	96.1	99.8	98.6	8.4	3.0
Non-Metro.	104.7	96.8	99.6	97.9	7.9	3.0

Southern workers who do not live in metropolitan areas, and indeed for Sunbelt workers generally.

The finding of large real earnings gaps is robust. For example, the interregional gaps implied by a generalization of our earnings equation, in which the returns to education, labor market experience, and tenure are allowed to vary with sex, race, and union status, are very similar.⁴ Estimating separate earnings equations for metropolitan and nonmetropolitan workers in each region also has little impact.⁵ While we believe that the intermediate income deflator is more appropriate for computing real earnings for an average worker in our sample, our basic findings also hold when the lower income deflator is used. As is shown in Panel C of Table 3, using the lower income deflator to compute real earnings reduces, but by no means eliminates, interregional earnings gaps.⁶

What explains these interregional real earnings gaps? Two alternative interpretations are possible. First, the earnings structure in Table 3 may, in fact, reflect long-run competitive equilibrium and the “gaps” which we measure are simply compensating differentials for factors omitted from our analysis. Since we utilized an extensive set of controls for worker and job characteristics, the likely focus for such an explanation would be regional differences in what have been termed “nonmarketed amenities” such as climate and crime rates. Labor mobility should increase the supply of labor in “good” metropolitan areas or regions until the resulting earnings differentials are sufficient to discourage further migration.

Geographic differentials in the “quality of life” no doubt play a role in individual location decisions. However, there is doubt that the interregional earnings differentials estimated above can be attributed to the regional distribution of nonmarketed amenities. Indeed, a recent study by Henderson (1982) that attempts the difficult task of measuring the quality of life across regions ranks cities in the West higher than those in other regions.⁷ Since real earnings are also highest in the West, our estimated interregional earnings differentials, substantial though they are, may well *understate* the full welfare gap for workers between the West and the rest of the country.

An alternative explanation is that these real earnings differentials reflect significant disequilibrium in U.S. labor markets. Recent strong growth in labor demand relative to labor supply in the South and West has resulted in premium earnings in these regions. Many Northern workers have migrated, but substantial barriers to mobility exist and a protracted period of adjustment has resulted, during which significant earnings differentials persist.⁸

The relative earnings levels reported in Table 3 are for an average worker. If these real earnings differentials reflect disequilibrium between regions, this gap would be expected to be narrower for more mobile workers. Since the statistical tests carried out above indicate that this gap varies significantly with worker and job characteristics, the real earnings differentials of workers expected *a priori* to be more or less mobile than the sample average worker can be compared.

The standard deviation of real earnings across regions for metropolitan and nonmetropolitan workers is 7.1%. Other things being equal, if this differential reflects disequilibrium across regional labor markets it should be smaller for more mobile workers. For example, it is expected that mobility will decline with age and seniority. The sample average age is 36.7 years, and average employer-specific job tenure is 6.6 years. For workers aged 50, with average seniority of 13.4 years, the standard deviation of real earnings across regions rises to 7.9%. For mobile professionals with above-average education (16.6 versus 13.6 years) the deviation is below average (6.1%), while for unskilled laborers (mean education 11.9 years) it is considerably above average (10.6%).⁹ Finally, blacks, who may face various discriminatory barriers to

mobility, have a much higher average standard deviation than whites (9.9% versus 6.8%). The fact that greater mobility seems to be associated with smaller real earnings gaps favors a disequilibrium interpretation.

Data on migration by region are also consistent with the disequilibrium thesis. The high real wage South and West had much higher rates of gross and net in-migration than did the Northeast and Northcentral regions between 1975–1980 and 1980–1983 (Greenwood, 1985, p. 523). Indeed, net in-migration was negative in the low real wage regions, and positive in the high real wage regions during both of these periods.

CONCLUSION

In this paper we have reestimated nominal and real earnings differentials across regions using a unique supplement to the May, 1979 Current Population Survey, which made it possible to correct several omitted variable and measurement biases that may have affected earlier studies. Both metropolitan and nonmetropolitan workers in the rapidly growing "sunbelt" regions have been found to enjoy a sizeable real earnings premium over workers in the rest of the nation. Since the size of the gap tends to be smaller for more mobile workers, we believe it indicates disequilibrium between regional labor markets.

NOTES

1. Bellante (1979) averaged "intermediate" budget metropolitan price indexes within each region to form a single cost-of-living index that was applied to all workers in a region. Gerking and Weirick (1983) assign nonmetropolitan workers a "lower" budget deflator for the nearest metropolitan area. Since the cost of living is lower in nonmetropolitan areas, both of these approaches will underestimate real nonmetropolitan earnings. Further, since the percent of workers living in major metropolitan areas is much lower in the South, relative Southern earnings will be underestimated.
2. A full set of regression coefficients and related statistics are in a separate appendix available on request from the authors.
3. Real earnings gaps exceed nominal earnings gaps because the above-average nominal earnings in the Sunbelt are associated with below-average living costs. Once differences in the cost of living are accounted for, metropolitan and nonmetropolitan workers receive very similar earnings in each region.
4. Eighteen additional independent variables were created by interacting sex, race, and union contract coverage with each other, years of schooling, labor market experience, labor market experience squared, tenure, and tenure squared. The resulting real interregional earnings structure for an average metropolitan (nonmetropolitan) worker has a range of 17.9 (20.5) percentage points and a standard deviation of 7.3 (8.0).
5. The resulting real interregional earnings structure for an average metropolitan (nonmetropolitan) worker has a range of 14.2 (14.7) percentage points and a standard deviation of 5.8 (6.9).
6. Using a lower income deflator reduces real earnings gaps because this deflator shows less interregional variation than the intermediate income deflator and high nominal wages are no longer strongly correlated with low living costs.
7. Henderson (1982) derives "quality of life" rankings for metropolitan areas in the four regions from imputed worker valuations of variation in crime rates, population density, amount of sunshine, recreational opportunities, and local unemployment rates. He ranks the Northcentral states lowest and the Western states highest. The Northeast and the South received nearly equal intermediate rankings. Thus, adjusting for nonmarketed amenities would seem to widen, rather than narrow, interregional real earnings differentials.
8. The earnings gaps reported in Table 3 will overstate the returns to migration if workers tend to locate in areas where they receive premium earnings (i.e., a positive residual in an earnings equation). Nakosteen and Zimmer (1980) report some evidence of self-selection in their study of the economic returns to migration, but we incorporate a far more extensive list of control variables in our earnings

equations and concentrate on long-distance moves where good information on employment prospects and living costs may be unavailable or prohibitively expensive to obtain.

9. Landinsky (1967) finds that migration rates for professional and technical workers are twice that of other workers. Other characteristics associated with mobility are age, education, and race. For a comprehensive survey of research on mobility see Greenwood (1985).

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