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Dickie, M.; Gerking, S.D.

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INTERREGIONAL WAGE DIFFERENTIALS: AN EQUILIBRIUM PERSPECTIVE*

Mark Dickie and Shelby Gerking†

ABSTRACT. This paper empirically analyzes two competing explanations for observed interregional wage differentials among full-time U.S. workers: (1) differences in the average levels of market valued labor characteristics, and (2) differences in rates of return to the characteristics. Hedonic wage equations are estimated for broad U.S. regions using detailed measures of human capital, work environment, and personal attributes collected by a national random sample mail survey. Statistical tests reveal little tendency for interregional structural shifts in the wage equations estimated, an outcome which rests on the inclusion of important, but seldom measured, wage determining variables.

1. INTRODUCTION

Wage differentials across geographic regions in the United States may be attributed to two factors: (1) differences in the average levels of market valued labor characteristics, such as education and work experience, and (2) differences in the rates of return to those characteristics. Most previous empirical studies of interregional wage differentials have concluded that the latter factor is dominant [Gallaway (1963); Goldfarb and Yezer (1976); Hanushek (1973); Sahling and Smith (1983); and Krumm (1984)], while other studies [Coelho and Ghali (1971); Bellante (1979); and Gerking and Weirick (1983)] have found that the former factor is primarily responsible. The validity of each of these perspectives is, therefore, unsettled; yet the outcome of this debate bears on important theoretical and policy questions. For example, in modeling labor migration, what are the relative merits of equilibrium, amenity oriented approaches [Graves (1980, 1983)] as compared with more traditional disequilibrium, wage differential approaches [Schlottman and Herzog (1982)]? Is the assumption of interregional wage differentials warranted in general equilibrium modeling [Yu (1979); and Ingene and Yu (1982)]? Should government policy makers be more concerned with removing impediments to geographic mobility or with augmenting the human capital of low-wage workers?

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†Assistant Professor of Economics, University of Texas, Dallas; and Professor of Economics, University of Wyoming, respectively.

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This paper provides additional empirical evidence concerning factors contributing to interregional wage differentials among full-time workers. This evidence is based on new and highly detailed data collected in 1984 by a national random sample mail survey. The main conclusion drawn is that interregional differences in rates of return to market valued characteristics are unimportant even among workers with low amounts of human capital. This outcome rests on including important, but seldom measured, wage determining variables. Thus, using an independent data set, the analysis presented replicates the major finding in the Gerking and Weirick paper and supports the equilibrium view that the labor market clears nationally. Replication of this earlier study is important because related studies generally have found significant interregional differences in rates of return to labor market characteristics.

The remainder of this paper is organized into four sections. Section 2 describes the mail survey data and Section 3 presents empirical results. Section 4 relates results of Section 3 to those of other interregional wage studies. Conclusions are drawn in Section 5.

2. THE MAIL SURVEY DATA

Data used in this study were collected during the summer of 1984 by national mail survey. The survey was conducted using the total design method proposed by Dillman (1978). Key aspects of this approach include: (1) care taken in preparing cover letters, questionnaires, and other materials sent to respondents, (2) postcard reminders sent approximately one week after the initial mailing, and (3) mailing replacement questionnaires and cover letters three weeks after the initial mailing to everyone who had not yet responded. A more complete description of all survey materials and methods, including questionnaire pretesting, may be found in Gegax et al. (1984). The group of prospective respondents consisted of a national random sample of 6,000 households. From the questionnaires mailed, 749 (12.5 percent) were returned as undeliverable and 2,103 were returned in completed form, yielding a response rate of about 40 percent of the initial mailing.

Four types of information, obtained from the head of each household, are used in this study. First, annual labor earnings, exclusive of overtime pay, from the head's main job in 1983 together with data on hours worked during the same year were combined to yield an hourly wage figure. This nominal wage variable, *NWAGE*, then was divided by a regional price index to form its real counterpart, *RWAGE*.[1] Because high quality data on interarea cost of living differences do not exist, both *NWAGE* and *RWAGE* are used in the empirical work, even though

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[1]In order to construct a set of 1983 regional price indices, two separate consumer price index tables were used (U.S. Department of Commerce). These tables showed: (1) four 1983 regional indices for the Northeast, North Central, South, and West (base = 100 = 1977); and (2) eight 1977 regional price indices for urban and rural areas within each of these four regions (base = 100 = 1977 U.S. urban average). Table (1) revealed price changes since 1977 in each of the four regions but assumed equal price levels for each region in that year. Table (2) revealed cross-regional price differences in 1977. By multiplying each index in (2) with its appropriate regional index in (1), eight regional price indices were constructed. These indices then were adjusted so that the lowest index was the base; i.e., 1977 rural-south = 100.

RWAGE is more appropriate from a theoretical standpoint. Second, measures of respondents' human capital (*H*) were: (1) years of schooling, (2) years of full-time work experience since age 18, and (3) years worked for present employer. Third, work environment variables (*W*) collected were: (1) whether work experience or special training is required for head's 1983 primary job, (2) number of years required to become fully trained and qualified on that job, (3) whether head is a union member, (4) number of weeks worked in 1983, (5) whether head moved in the past three years, (6) whether primary job site is in a central city, suburban, or rural area, (7) head's occupation, and (8) head's industry of employment. Fourth, personal characteristic variables (*P*) measured were: (1) race, (2) sex, (3) whether head is a veteran, and (4) whether head lives in a central city, suburban, or rural area. Thus, these data provide a rich source of information regarding the determinants of wages. More precise definitions of each of the variables used in the empirical work are presented in Table 1.[2]

Table 1 also shows sample means by region of each variable used in the analysis.[3] The Northeast had the highest sample mean of nominal wages ($13.54) followed by the West ($12.74), the South ($12.36) and the North Central ($11.60). Of the six possible pairwise comparisons among these four nominal wage figures, two of the differences between the means are significantly different from zero at the 10 percent level: average nominal wages in the northcentral are significantly lower than in the Northeast and the West. After adjusting nominal wages by the regional price index, the South had the highest sample mean of real wages ($12.14), followed by the West ($11.04), the Northeast ($10.92), and the North Central ($10.00). Again, two of the differences in the sample means of real wages are significant at the 5 percent level: average real wages in the North Central are significantly lower than in the South and West.

Among the other three categories of variables, there are both interregional differences and similarities between sample means. The North Central sample has a larger representation of respondents whose schooling ended with completion of high school. The West sample has the largest percentage of respondents who completed some college (*SCHL5*), and the Northeast and West samples have larger percentages of college graduates than the other two regions. The relatively higher educational attainment of individuals in the West and Northeast may be reflected in the higher percentage of managers and professionals in these two regions:

[2]Note that amenity variables and other local characteristics are missing in this specification. In a previous study [Gerking and Weirick (1983)], these variables did not contribute greatly to the explanatory power of a wage equation in which a relatively full list of components of *H* and *W* is measured. As a consequence, no effort was made to merge such variables into the present data set.

[3]South includes the states of Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia. The West is composed of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming, Alaska, Hawaii. The following constitute the Northeast: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont. The remaining states define the North Central region: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin. There are the same regional definitions used in the Gerking and Weirick Study.

TABLE 1: Variable Definitions and Sample Means by Region

Explanatory Variable	Definition	Sample Means North-east	North Central	South	West
A. Wage Variables					
NWAGE	Nominal wages	13.54	11.60	12.36	12.74
RWAGE	Real wage	10.92	10.00	12.14	11.04
B. Human Capital Variables					
SCHL1	1 if schooling ended in grades 1–8	0.02	0.03	0.03	0.02
SCHL2	1 if schooling ended in grades 9–11	0.04	0.05	0.06	0.04
SCHL3	1 if schooling ended in grade 12	0.21	0.27	0.21	0.16
SCHL4	1 if schooling ended with trade school	0.10	0.07	0.07	0.04
SCHL5	1 if schooling ended with some college	0.20	0.25	0.26	0.31
SCHL6	1 if shooling ended with BS or BA	0.29	0.21	0.22	0.29
SCHL7	1 if schooling ended with graduate or professional degree	0.13	0.12	0.15	0.13
YRSFT	Years worked full-time since age 18	21.30	20.49	20.24	19.54
YRSPE	Years worked for present employer	11.63	12.81	11.65	11.09
YRSP2	YRSPE squared	227.09	256.74	237.06	206.33
C. Work Environment Variables					
WKEXP	1 if work experience or special training required for present job	0.86	0.80	0.82	0.88
UNION	1 if union member	0.31	0.47	0.31	0.42
YRSQL	Years required to become fully trained and/or qualified on primary job	3.26	3.01	2.96	3.70
WEEKS	Weeks worked in 1983	48.85	48.54	48.43	48.45
MOVED	1 if moved in the last three years	0.20	0.21	0.25	0.25
AGFOR	1 if employed in agriculture, forestry, or fishing	0.02	0.01	0.01	0.02
MINCO	1 if employed in mining or construction	0.07	0.11	0.10	0.09
MANUF	1 if employed in manufacturing	0.35	0.35	0.28	0.30
TRANS	1 if employed in transportation or public utility	0.09	0.07	0.11	0.11
TRADE	1 if employed in wholesale or retail trade	0.09	0.12	0.12	0.09
FININ	1 if employed in finance, insurance, or real estate	0.11	0.04	0.05	0.04
SERVI	1 is employed in services	0.27	0.30	0.34	0.36
CENTJ	1 if primary job site is a central city	0.33	0.38	0.41	0.32
SUBJ	1 if primary job site is in suburban area	0.50	0.38	0.39	0.34
RURLJ	1 if primary job site is in rural area	0.17	0.24	0.22	0.34
SERVO	1 if service worker	0.06	0.09	0.09	0.11
LABOR	1 if laborer	0.06	0.08	0.10	0.09
TRANO	1 if transportation operator	0.03	0.04	0.02	0.05
EQUIP	1 if equipment operator	0.06	0.07	0.07	0.03
CRAFT	1 if craft worker	0.14	0.21	0.14	0.13
CLERC	1 if clerical worker	0.05	0.07	0.04	0.04
SALES	1 if sales worker	0.07	0.05	0.08	0.03
MANAG	1 if manager of administrator	0.20	0.10	0.15	0.19
PROF	1 if professional or technical worker	0.32	0.28	0.31	0.32

TABLE 1: Continued

Explanatory Variable	Definition	Sample Means North-east	North Central	South	West
D. Personal Characteristic Variables					
RACE	1 if white	0.95	0.96	0.88	0.94
SEX	1 if male	0.85	0.86	0.78	0.83
VET	1 if veteran	0.42	0.37	0.34	0.40
CENTR	1 if lives in a central city	0.14	0.19	0.15	0.14
SUBR	1 if lives in a suburban area	0.60	0.56	0.57	0.48
RURLR	1 if lives in a rural area	0.26	0.25	0.28	0.38
Sample Size		188	215	176	189

roughly 52 percent as compared to 46 percent in the South and 38 percent in the North Central. Also, the North Central sample has the largest percentage of union members and the West sample has the largest percentage of both rural residents and respondents with jobs in rural areas. The sample means of *YRSFT, YRSPE, WKEXP, RACE,* and *SEX* show relatively smaller interregional variations.

3. EMPIRICAL RESULTS

The mail survey data are used to estimate the hedonic wage equation shown in (1)

$$RWAGE = f(H, W, P) \tag{1}$$

Under the assumptions of perfect information, free geographic and intersectoral labor mobility, and homogeneous consumer tastes, this equation is a reduced form double envelope which shows how both employers and employees have implicitly agreed to value the components of *H*, *P*, and *W*. If these assumptions are at least approximately correct and if the market for labor clears nationally, then structural shifts in Equation (1) between regions of the U.S. should not be observed and the real wage of an individual should be invariant with respect to the region in which he works. Additionally, interregional commodity trade which embodies labor inputs represents an independent influence which tends to drive the wages of similar workers to equality across regions. A test for structural shifts in Equation (1) between regions of the U.S. is presented following a brief explanation of how the data set was constructed.

Completed questionnaires were returned by 2,103 household head respondents. However, not all of these responses could be used in the empirical analysis. Responses from 872 unemployed or retired individuals were excluded. Also excluded were responses from: (1) 254 individuals not reporting their labor earnings, (2) 64 individuals who worked fewer than 1,250 hours on their main job in 1983, (3) 117 self-employed individuals, (4) 13 individuals who received 30 percent or more of their total household income from transfer payments, and (5) 15 individuals for miscellaneous reasons. Part-time or casual workers may not have a strong labor force attachment and/or may be tied to a geographic region for noneconomic reasons. Moreover, self-employed individuals may not be able to estimate accurately their total annual working hours. Without an accurate measure of that variable, computed hourly wage rates are of doubtful quality. Finally, persons receiving large fractions of income from transfer payments may be facing nonconvex budget contraints. These restrictions reduced the original number of respondents to a sample size of 768 observations. In this sample, the number of missing values per variable ranged from none to 20. For continuous variables, missing values were replaced by sample means while for discrete variables, missing values were replaced by sample modes.

Tests for interregional shifts in the hedonic wage equation were conducted on a semilogarithmic version of (1). This function form was suggested by Mincer (1974) to treat skewness inherent in the wage variable and is commonly used in hedonic wage analyses. Table 2 presents ordinary-least-squares estimates (coefficients and t-statistics) for the full sample regression and for four regional regressions. In the full sample regression, the estimated coefficients generally have the expected signs, are significantly different from zero at conventional levels, and are roughly consistent with prior empirical work. The education variables are significant predictors of real wages, as are the detailed work experience variables

TABLE 2: Hedonic Wage Equation Estimates*

Independent Variable	Full Sample	Northeast	North Central	West	South
SCHL1	−.504	−.629	−.531	−.472	−.550
	(−5.071)	(−2.432)	(−3.189)	(−1.989)	(−2.394)
SCHL2	−.403	−.605	−.478	−0.526	−.371
	(−5.118)	(−3.176)	(−3.500)	(−.317)	(−2.028)
SCHL3	−.294	−.231	−.372	−.117	−.418
	(−5.290)	(−1.900)	(−3.549)	(−.990)	(−3.220)
SCHL4	−.228	−.148	−.322	−.0698	−.221
	(−3.433)	(−1.076)	(−2.581)	(−.440)	(−1.516)
SCHL5	−.217	−.252	−.322	−.0868	−.227
	(−4.298)	(−2.211)	(−3.385)	(−.855)	(−1.977)
SCHL6	−.0861	−.0901	−.122	−.0381	−.0642
	(−1.889)	(−.913)	(−1.447)	(−.392)	(−.604)
SCHL7	—	—	—	—	—
YRSFT	.00383	.00156	.00135	.00606	.0105
	(2.232)	(.405)	(.458)	(1.622)	(2.528)
YRSPE	.0175	.0146	.167	.00734	.00764
	(3.722)	(1.373)	(1.97)	(.675)	(.713)
YRSP2	−.000312	−.000158	−.000298	−.0000774	−.000205
	(−2.513)	(−.577)	(−1.369)	(−.248)	(−.739)
WKEXP	.102	.170	.145	−.0319	.136
	(2.734)	(1.883)	(2.383)	(−.344)	(1.600)
UNION	.0610	.0124	.0542	.0294	.110
	(2.003)	(.161)	(.997)	(.478)	(1.481)
YRSQL	.0241	.0223	.0982	.0298	.0278
	(5.468)	(2.190)	(1.149)	(3.839)	(2.303)
WEEKS	−.00911	−.0134	−.00862	−.0175	−.0073
	(−2.820)	(−1.388)	(−1.579)	(−2.589)	(−1.016)
MOVED	−.103	−.116	−.851	−.0987	−.184
	(−3.06)	(−1.306)	(−1.411)	(−1.512)	(−2.428)

TABLE 2: Continued

Independent Variable	Full Sample	Northeast	North Central	West	South
AGFOR	−.353	−.0213	−.356	−.325	−1.052
	(−3.038)	(−.0843)	(−1.910)	(−1.501)	(−2.475)
MINCO	.581	.186	.126	−.00899	.281
	(1.442)	(1.686)	(1.350)	(−.0116)	(2.999)
MANUF	.156	.0373	.0287	.116	.252
	(3.675)	(.440)	(.458)	(1.174)	(2.081)
TRANO	.221	.175	.127	.301	.403
	(4.490)	(.666)	(1.352)	(2.994)	(3.560)
TRADE	−.428	.0684	−.128	−.209	.132
	(−.8476)	(.585)	(−1.523)	(−1.928)	(1.133)
FININ	.960	.151	.102	.131	.188
	(1.596)	(1.382)	(.838)	(.897)	(1.216)
SERVI	—	—	—	—	—
CENTJ	.0935	−.0165	.112	.168	.0703
	(2.450)	(−.153)	(1.835)	(2.211)	(.804)
SUBJ	.0449	.00111	.0692	.161	−.110
	(1.204)	(.0107)	(1.106)	(2.147)	(−.126)
RURLJ	—	—	—	—	—
SERVO	−.237	−.146	−.226	−.288	−.347
	(−3.908)	(−.986)	(−1.988)	(−2.443)	(−2.530)
LABOR	−.0769	−.287	−.000952	−.0212	−.0385
	(−1.188)	(−1.886)	(−.00744)	(−.157)	(−.259)
TRANO	−.136	−.197	−.0648	−.201	−.0433
	(−1.648)	(−1.024)	(−.452)	(−1.339)	(−.169)
EQUIP	−.101	0.122	0.0790	.00590	.00643
	(−1.459)	(−.826)	(−.622)	(.0341)	(.0403)
CRAFT	−.140	−.205	−0.433	−.138	−.240
	(−2.670)	(−1.74)	(−.446)	(−1.278)	(−1.855)
CLERC	−.216	−.118	−.305	−.184	.0108
	(−3.123)	(−.759)	(−2.539)	(−1.222)	(.0621)
SALES	−.116	−.235	−.125	.0318	−.136
	(−1.733)	(−1.694)	(−.982)	(.191)	(−.986)
MANAG	—	—	—	—	—
PROF	−.0256	.574	−.0812	−.134	.127
	(−.609)	(.666)	(−.948)	(−1.615)	(1.310)
RACE	.0191	.0449	.00956	.124	.0318
	(.357)	(.322)	(.0785)	(1.007)	(.323)
SEX	.211	.264	.159	.235	.316
	(5.228)	(2.619)	(2.208)	(2.891)	(3.585)
VET	.0516	.0224	.0542	.0205	.00634
	(1.611)	(.301)	(.997)	(.319)	(.0820)
CENTR	−.184	−.217	−.189	−.179	.0141
	(−4.171)	(−1.882)	(−2.633)	(−1.945)	(.129)
SUBR	.827	.143	.0132	−.0106	.212
	(2.477)	(1.567)	(.224)	(−.161)	(2.612)
RURLR	—	—	—	—	—
CONSTANT	2.289	2.397	2.434	2.662	1.966
	(12.789)	(4.648)	(7.731)	(7.100)	(4.984)
R^2	.473	.535	.547	.531	.613
Error sum of squares	90.948	21.273	16.814	18.400	18.693
Degrees of freedom	732152	179153	140		

**t*-statistics in parentheses.

—denotes excluded dummy variable.

used in this study. Industry variables perform less well, but the occupational regressors tend to be significant. Moreover, there is consistency in the signs, magnitudes, and significance levels of the estimated coefficients in the four regional regressions.

Possible interregional structural shifts in Equation (1) were examined by comparing the full sample regression to four separate regional regressions using a Chow (1960) test. This joint F-test is preferable to sequential independent t-tests from both conceptual and practical perspectives. Farber and Newman (1986) argue that the joint test is the best choice because interregional invariance of wage equation structure implies equality of the entire coefficient vector. Moreover, Savin (1984) demonstrates that: (1) sequential t-tests and joint F-tests can produce conflicting results depending on the extent of multicollinearity in the variables analyzed and (2) joint F-tests generally are more powerful than sequential t-tests. The resulting Chow test F-statistic, $F(108{,}624) = 1.21$, which can be derived from the information presented in Table 2, is not signficantly different from unity at the 5 percent level, but is significantly different from unity at the 10 percent level. In other words, there does not appear to be a strong tendency for shifts in the hedonic wage equation between the four broad regions considered. Observed differences in average real wages appear to be due mainly to differences in the average level of the H, W, and P input characteristics, rather than to their market determined rates of return.

4. FURTHER DISCUSSION

This section considers the robustness of results just presented to four changes in the empirical analysis. These are: (1) substituting *NWAGE* for *RWAGE,* (2) including respondents with less than 1,250 annual hours of work, (3) using alternative sets of explanatory variables, and (4) removing workers with relatively large amounts of human capital from the sample.

Cost of Living Adjustments

Because the cost of living data used to create *RWAGE* are weak, the five regressions reported in Table 2 are reestimated using the natural logarithm of *NWAGE* as the dependent variable (results are available from the authors on request). The resulting Chow test statistic of $F(108{,}624) = 1.03$ is not significantly different from unity at either the 5 or 10 percent level. Thus, the use of *NWAGE* results in a stronger conclusion concerning interregional variation of returns to market valued worker characteristics than does the use of *RWAGE.*

Inclusion of Part-Time Workers

A second alteration lies in the treatment of part-time workers. Other investigators, such as Sahling and Smith (1983), use a smaller number of annual hours worked (520) for including workers in the sample as compared to the 1,250 annual hours used here. Krumm (1984) apparently makes no exclusion of part-time workers. When the Table 2 regressions are reestimated (results available from the authors on request) with no exclusion restrictions on hours worked, the Chow test statistic $F(108{,}669) = 1.30$ is significantly different from unity at the 5 percent level, but not at the 1 percent level. The inclusion of part-time workers in the sample, therefore, weakens the conclusion of interregional invariance of wage equation structure.

Selecting Explanatory Variables

A key difference between the present study and most previous analyses of interregional wage differentials is that the mail survey measured a more fully specified set of human capital and work environment variables. For example, Krumm (1984) used 1976–78 data from the Panel Study in Income Dynamics (PSID) in order to examine wage differentials by region and race. In addition to dummy variables measuring the geographic location of the respondent's residence, explanatory variables adjusted for: (1) age, (2) years of work experience, (3) years of schooling, (4) educational degrees, (5) union membership, and (6) veteran and marital status. Separate equations were estimated for racial groups. This relatively sparse specification probably resulted from using a panel of PSID data, rather than data only from one year. Krumm's results indicate significant interregional wage differences both for urban and rural residents. When the Table 2 equations were reestimated with the mail survey data using the natural logarithm of *RWAGE* as the dependent variable and a right-hand side specification similar to Krumm's, the resulting Chow test statistic of $F(36,720) = 2.10$ is significantly different from unity at the 1 percent level.[4] Estimated equations underlying this test are presented in Table 3.

As a second example, Sahling and Smith (1983) used 1973 and 1978 Current Population Survey (CPS) data to examine wage variation between five broad U.S. regions. In their analysis, the real wage was regressed on the following: (1) years of schooling and its square, (2) the square of years of work experience (measured as years of age minus years of schooling minus six), (3) schooling times experience, (4) marital and veteran (for males) status, (5) race, (6) Spanish origin, (7) regular part-time worker, (8) dual job holder, (9) union membership, and (10) occupation and industry of employment. Significant interregional differences in returns to market valued characteristics were found. The Table 2 regressions again were reestimated with the mail survey data (results presented in Table 4) using the natural logarithm of *RWAGE* as the dependent variable and a close approximation to Sahling and Smith's explanatory variables.[5] The resulting Chow test statistic of $F(69,676) = 1.49$ is significantly different from unity at the 5 percent level, but not at the 1 percent level.

The results obtained from estimating equations similar to those used by Krumm and Sahling and Smith point to the importance of explaining wages with a detailed set of human capital and work environment characteristics. A strength of the mail survey data is that important variables not found in nearly all other data sets could be measured. These variables include: (1) years worked for present employer (*YRSPE*), (2) years needed to become fully trained or qualified on

[4]Krumm's specification included a marital status dummy which the data set employed here did not include.

[5]The Sahling and Smith specification included a dummy variable for dual job holders which the data set employed here did not include.

TABLE 3: Hedonic Real Wage Equations Using a Specification Similar to Krumm's*

Independent Variable	Full Sample	Northeast	North Central	West	South
SCHL	.0320	.0511	.0270	.0360	.0204
	(4.114)	(3.074)	(2.238)	(2.037)	(1.191)
DEGREE	.1867	.2013	.2599	.0011	.2770
	(3.958)	(2.166)	(3.400)	(.011)	(2.489)
YRSFT	.0370	.0704	.0407	.0260	.0210
	(3.768)	(3.040)	(2.928)	(1.313)	(.821)
$(YRSFT)^2$	−4.4649	−9.0837	−5.6188	−4.9269	−5.4271
	(−2.381)	(−2.222)	(−2.097)	(−.120)	(−1.101)
AGE	.0087	−.0119	−.0205	.0219	.0155
	(.486)	(−.301)	(−.764)	(.579)	(.331)
$(AGE)^2$	−1.4374	−3.7558	1.5808	−3.5425	6.3355
	(−.732)	(−.092)	(.523)	(−.814)	(.120)
UNION	.0742	.0307	.1804	.0405	.1683
	(2.468)	(.471)	(3.814)	(.647)	(2.264)
VET	.0658	−.0171	.0908	.0607	.0600
	(1.949)	(−.236)	(1.694)	(.901)	(.728)
CENTR	−.1752	−.1530	−.2365	−.1352	−.1200
	(−3.871)	(−1.619)	(−3.336)	(−1.413)	(−1.150)
SUBR	.1045	.2129	−.0053	.0376	.1451
	(3.142)	(2.996)	(−.095)	(.576)	(1.892)
RACE	.1142	.1244	.2149	.0993	.2720
	(1.957)	(.913)	(1.742)	(.773)	(2.662)
CONSTANT	5.5616	5.4184	6.1111	5.5091	5.3078
	(16.749)	(7.391)	(12.177)	(7.880)	(6.331)
R^2	.316	.430	.381	.260	.406
Error sum of squares	118.04905	26.06731	22.95879	29.05451	28.74706
Degrees of freedom	756	176	203	177	164

**t*-statistics in parentheses.

present job (*YRSQL*), and (3) whether work experience or special training is required on present job (*WKEXP*). Additionally, years of full-time work experience (*YRSFT*) is measured directly, rather than by using a proxy variable computed from years of age and schooling. In the full sample Table 2 regression, the coefficients of each of these four variables are significant at the 1 percent level. These variables also perform well in selected region regressions.

Sample Selection[6]

A fourth factor that could have influenced the results is the mail survey itself. Better educated individuals tend to respond with greater frequency to mail surveys. Additionally, well educated individuals in high status occupations, such as *MANAG* and *PROF*, often have better information (through professional societies, for example) about jobs in other areas than do persons with lower levels of

[6]We are particularly indebted to Anthony Yezer for his numerous constructive suggestions concerning this section.

TABLE 4: Hedonic Real Wage Equations Using Sahling-Smith Specification*

Independent Variable	Full Sample	Northeast	North Central	West	South
SCHL	−.103	−.148	−.101	−.0482	−.0528
	(−3.152)	(−2.005)	(−1.997)	(−.686)	(−.667)
$(SCHL)^2$	.00461	.00630	.00451	.00230	.00365
	(4.266)	(2.582)	(2.653)	(1.003)	(1.415)
SCHL × *EXPER*	.00127	.00144	.00125	.00119	.00105
	(5.494)	(2.876)	(3.118)	(2.348)	(2.063)
$(EXPER)^2$	−.000199	−.000361	−.000231	−.000102	.0000625
	(−2.863)	(−2.454)	(−1.977)	(−.662)	(.377)
UNION	.0763	.0340	.102	.0469	.111
	(2.337)	(.430)	(1.886)	(.701)	(1.451)
VET	.104	.105	.0450	.111	.101
	(3.174)	(1.371)	(.850)	(1.716)	(1.281)
RACE	.152	.133	−.0561	.162	.348
	(2.231)	(.662)	(−.331)	(2.092)	(1.526)
HISPANIC	.0452	−.138	−.350	.358	.296
	(.374)	(−.471)	(−1.501)	(1.489)	(.934)
AGFOR	−.281	−.121	−.313	−.197	−.733
	(−2.211)	(−.460)	(−1.574)	(−.848)	(−1.646)
MINCO	.112	.128	.0835	.127	.192
	(2.618)	(1.459)	(1.385)	(1.206)	(1.528)
MANUF	.178	.268	.0697	.0813	.254
	(3.896)	(2.392)	(.735)	(.974)	(2.685)
TRANS	.257	.159	.0916	.346	.460
	(4.802)	(1.303)	(.958)	(3.234)	(4.103)
TRADE	−.0177	.0836	−.183	−.0807	.125
	(−.321)	(.665)	(−2.164)	(−.657)	(1.011)
FININ	.0968	.198	.0394	.0295	−.00692
	(1.467)	(1.725)	(.316)	(.185)	(−.0427)
SERVO	−.338	−.180	−.315	−.345	−.444
	(−5.132)	(−1.130)	(−2.809)	(−2.781)	(−3.105)
LABOR	−.116	−.230	−.101	−.00601	−.164
	(−1.682)	(−1.458)	(−.809)	(−.0429)	(−1.110)
TRANO	−.195	−.207	−.0615	−.147	−.330
	(−2.191)	(−1.014)	(−.424)	(−.907)	(−1.309)
EQUIP	−.206	−.328	−.145	−.0112	−.240
	(−2.772)	(−2.083)	(−1.136)	(−.0607)	(−1.533)
CRAFT	−.140	−.153	−.0475	−.304	−.122
	(−2.512)	(−1.257)	(−.492)	(−1.052)	(−2.410)
CLERC	−.429	−.243	−.493	−.453	−.374
	(−5.907)	(−1.563)	(−4.331)	(−2.881)	(−2.092)
SALES	−.163	−.244	−.214	.0892	−.254
	(−2.246)	(−1.698)	(−1.680)	(.487)	(−1.743)
PROF	−.0323	.0803	−.117	−.0971	.00833
	(−.707)	(.870)	(−1.314)	(−1.081)	(.0832)
CONSTANT	2.357	2.623	2.602	1.873	1.815
	(9.418)	(4.434)	(6.190)	(3.515)	(3.054)
R^2	.344	.363	.464	.498	.365
Error sum of squares	113.19158	29.12998	19.89793	24.27727	24.93861
Degrees of freedom	745	165	192	153	166

*t-statistics in parentheses.

educational attainment. Because better job information may lead to greater mobility and thus a narrowing of interregional wage differences, use of a mail survey could have biased the results in favor of those that were obtained. Moreover, several empirical investigations of migration [Falaris (1982); Farber (1983); and Schlottman and Herzog (1982)] have found that less educated persons are less likely to migrate in response to interregional wage differentials than are more highly educated persons.

As can be determined from Table 1, 6.8 percent of the workers in the present sample did not complete high school, as compared with 16.5 percent of employed civilians aged 25 or older in the U.S. Also, 14.5 percent of the workers in the present sample are employed in *MANAG* and 29.4 percent in *PROF*, as compared with corresponding employment percentages of 10.7 and 15.7 in the general U.S. population. Therefore, a cost of collecting the detailed human capital and work environment data by mail survey is the undersampling of low human capital and low-skill workers. The Table 2 regressions were reestimated using both *RWAGE* and *NWAGE* as dependent variables and excluding all respondents whose occupation was *MANAG* or *PROF* or whose educational attainment went beyond trade school programs. Results for the *RWAGE* regression are shown in Table 5 and results for the *NWAGE* regression are available from the authors on request. Remaining respondents were not truly unskilled; nevertheless it is of interest that the resulting Chow-test F-statistics, where $F(96,230) = 1.14$ when using *NWAGE*

TABLE 5: Hedonic Real Wage Equations Excluding Highly Educated, Managers, and Professionals*

Independent Variable	Full Sample	Northeast	North Central	West	South
SCHL1	−.197	−.243	−.182	−.493	−.0807
	(−2.189)	(−.698)	(−1.204)	(−1.982)	(−.299)
SCHL2	−.0507	−.171	−.0382	.0445	−.0487
	(−.719)	(−.726)	(−.321)	(.250)	(−.312)
SCHL3	−.0254	.158	−.00975	−.145	−.0889
	(−.593)	(1.208)	(−.131)	(−1.331)	(−.750)
SCHL4	.0358	.199	.0497	−.0789	.144
	(.605)	(1.364)	(.475)	(−.457)	(.940)
SCHL5	—	—	—	—	—
SCHL6	—	—	—	—	—
YRSFT	.00137	.00715	−.00259	.00625	.00625
	(.643)	(1.111)	(−.718)	(1.227)	(1.177)
YRSPE	.0127	.00194	.0253	.00522	−.00691
	(2.024)	(.114)	(1.937)	(.334)	(−.465)
YRSP2	−.000293	−.0000997	−.000616	−.000192	−.0000978
	(−1.742)	(−.240)	(−1.682)	(−.428)	(.261)
WKEXP	.0583	.158	.155	−.00568	.0923
	(1.267)	(1.212)	(1.906)	(−.0439)	(.834)
UNION	.187	.0916	.288	.0999	.291
	(4.641)	(.855)	(3.845)	(1.083)	(2.630)
YRSQL	.0197	.0263	.00452	.0167	.0101
	(2.797)	(1.483)	(.277)	(1.410)	(.537)
WEEKS	−.00588	−.0142	.00574	−.0185	−.0109
	(−1.297)	(−.662)	(.732)	(−1.926)	(−.997)

TABLE 5: Continued

Independent Variable	Full Sample	Northeast	North Central	West	South
MOVED	−.0641	−.0504	−.0355	−.0476	−.307
	(−1.327)	(−.294)	(−.458)	(−.383)	(−2.445)
AGFOR	−.308	−.0764	−.290	.0569	−1.146
	(−2.203)	(−.174)	(−1.431)	(.162)	(−2.508)
MINCO	−.0179	.00264	−.145	.0652	.167
	(−.334)	(.0196)	(−1.752)	(.358)	(1.102)
MANUF	.0961	.276	−.0659	−.0665	.171
	(1.683)	(1.708)	(−.449)	(−.589)	(1.213)
TRANS	.143	.191	.0907	.324	.217
	(2.245)	(1.233)	(.670)	(2.100)	(1.467)
TRADE	−.118	.0265	−.308	−.162	.313
	(−1.919)	(.170)	(−3.011)	(−1.080)	(1.731)
FININ	.00130	.312	.0319	.0293	−.0657
	(.0101)	(1.118)	(.149)	(.264)	(−.175)
CENTJ	.0373	−.0372	.00350	.127	.0100
	(.762)	(−.241)	(.0439)	(1.059)	(.0847)
SUBJ	.0150	−.0333	.0942	.125	−.0414
	(.321)	(−.205)	(1.160)	(1.103)	(−.361)
SERVO	−.198	−.00142	−.294	−.317	−.215
	(−2.539)	(−.00686)	(−2.183)	(−1.625)	(−1.087)
LABOR	−.0667	−.0691	−.141	−.00840	.171
	(−.807)	(−.357)	(−.926)	(−.0329)	(.904)
TRANO	−.0971	.0763	−.119	−.409	.00975
	(−1.016)	(.338)	(−.689)	(−1.794)	(.0323)
EQUIP	−.0531	.0209	−.0850	−.0583	.287
	(−.622)	(.106)	(−.530)	(−.225)	(1.473)
CRAFT	−.0523	.0800	−.0473	−.169	.0320
	(−.725)	(.415)	(−.361)	(−.823)	(.182)
CLERC	−.119	.0215	−.278	−.201	.425
	(1.372)	(.111)	(−1.974)	(−.929)	(1.610)
SALES	—	—	—	—	—
PROF	—	—	—	—	—
RACE	.0466	−.0195	.155	.160	−.0344
	(.614)	(−.0765)	(1.012)	(.661)	(−.221)
SEX	.218	.0960	.172	.364	.439
	(3.520)	(.586)	(1.654)	(2.605)	(2.721)
VET	.0172	−.0504	−.0183	.00888	.0630
	(.409)	(−.294)	(−.261)	(.944)	(.588)
CENTR	−.214	−.332	−.204	−.110	.128
	(−3.890)	(−2.225)	(−2.254)	(−.743)	(.868)
SUBR	.0680	.123	−.0172	−.0218	.286
	(1.608)	(.845)	(−.225)	(−.237)	(2.419)
CONSTANT	1.963	2.176	1.378	2.666	1.178
	(8.121)	(2.150)	(3.365)	(4.628)	(2.994)
R^2	.432	.523	.603	.619	.661
Error sum of squares	33.58493	4.77748	7.75579	3.71943	6.13664
Degrees of freedom	326	45	89	44	53

**t*-statistics in parentheses.
—denotes excluded dummy variable.

and $F(96,230) = 1.19$ when using *RWAGE*. These values imply that no differences in the regional wage structure are detectable at the 5 percent level although differences are detectable using *RWAGE* at the 10 percent level. Notice that this finding is roughly consistent with those obtained by Gerking and Weirick. In their sample, average education of respondents was 12.1 years and fully 33.6 percent had not completed high school, reflecting the efforts made in the PSID to *oversample* from low-income, low-education, and minority households.

5. CONCLUSION

This paper has analyzed empirically two competing explanations for observed interregional wage differentials among full-time U.S. workers: (1) differences in the average levels of market valued labor characteristics, such as education and work experience and (2) differences in rates of return to those characteristics. Hedonic wage equations were estimated for four broad U.S. regions using detailed measures of human capital, work environment, and personal attributes collected by a national random sample mail survey conducted in 1984. Statistical tests do not reveal strong tendencies for interregional structural shifts in the wage equations estimated. This result holds even when the sample is partitioned to include only respondents whose occupation is other than manager and professional worker and who have no college education. Thus, the relatively detailed market valued characteristics in this data set, rather than the composition of the sample, appears to be crucial to the finding of interregionally invariant wage equation structure. This finding implies that interregional factor and commodity movements tend to equalize rates of pay of similar full-time workers between broadly defined U.S. regions and that the labor market can usefully be viewed from an equilibrium perspective.

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