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Family Ties, Labor Mobility and Interregional Wage Differentials*

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Abstract. The applied research reported here examines the impact of household structures on interregional wage disparities. While migration studies generally suggest that family ties deter labor mobility, there is no clear evidence whether the reduced mobility is reflected in interregional wage differentials. Using a two-step procedure, we examine the conjecture that diminished labor mobility from greater family ties increase inter-regional wage differentials. Results indicate that spatial wage dispersion is greater because of the presence of children, but wage disparities are not enhanced by marriage. Findings consequently suggest that decreased labor mobility from children is reflected in interregional wage differentials, but any restrictive effect on mobility from marriage is not observed in wage variation.

1. Introduction

Neoclassical theory predicts that interregional wages should converge. But such wage disparities continue to persist. The divergence of wages has been documented in the United States (Montgomery, 1992), Canada (Dickie and Gerking 1998), and the United Kingdom (Blackby and Manning 1990). Possible explanations of interregional wage differentials include regional variation in worker attributes, industry mix and environmental amenities (Roback 1988; Blomquist et. al 1988). Additional work suggests that immobility of labor also contributes to interregional wage disparities (Topel 1986). Two main factors that inhibit

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labor mobility are employment and family considerations. Accumulated job specific capital, for instance, can cause older more experienced workers to be less mobile than younger less experienced workers—consequently, research finds that older workers display greater interregional wage differentials than younger workers (Dickie and Gerking 1998; Helwege 1992).

The impact of family considerations on labor mobility and interregional wage disparities has received less attention in the literature. Intuitively, the impact of family ties arises because the household structure partially determines the returns from migration for household members. Specifically, the presence of a spouse and children likely diminishes the net benefits of an individual's potential move. In order to compensate for spouses, married workers are more likely to require a greater incentive to move as compared to single workers. And married couples with children may require even greater compensation for the additional costs associated with moving children.

While previous migration studies have indicated that family ties deter labor mobility (Shields and Shields 1993; Krumm 1983; Mincer 1978), there is no convincing evidence that the reduced mobility is reflected in interregional wage variation. Dickie and Gerking (1998) provide the limited conditional evidence by examining wage disparities across Canadian provinces. While they find the presence of children contributes to greater spatial wage dispersion, results are not supportive of a similar impact from marriage.

In an attempt to clarify the issue, we undertake a similar conditional analysis on wage disparities across U.S. regions. Using Current Population Survey data, we measure the interregional wage disparity by household structure while conditioning the estimates on important factors such as worker attributes and industry mix. As the family ties conjecture suggests, we find that children enhance spatial wage dispersion among married workers—indicating the deterrent effect of children on labor mobility is reflected in interregional wage differentials. But surprisingly, results are robust in revealing the largest regional wage disparities exist among single workers.

2. Methodology

The effect of family ties on labor mobility and regional wage disparities is examined by comparing the magnitude of differences in wages across regions under alternative family structures. Following Dickie and Gerking (1998) and Krueger and Summers (1988), we employ a two-step procedure to obtain a conditional measure of spatial wage dispersion. The method is preferred because the estimated variation (i.e., standard deviation) holds constant the levels of and returns to labor market char-

acteristics. Consequently, this procedure provides superior measures of spatial wage dispersion relative to unconditional methods (Dickie and Gerking 1998).

The initial step delivers the conditional estimates for the regional effects on wages. This is accomplished by estimating the following log-wage model:

$$W_i = a + b' R_i + j'C_i + y'D_i + g'E_i + e_i \qquad i = 1,2,\ldots,N \qquad (1)$$

where W_i is the natural logarithm of wage for the i^{th} worker; R_i is a vector of $J-1$ regional indicator variables; C_i is a vector of human capital measures such as education, tenure and age; D_i is a vector of demographic attributes including race and urban residency; E_i is a vector of employment condition measures which range from industry category to firm size; and a is the constant term. A complete listing of all exogenous variables is provided in Table 1. The disturbance terms follow a normal distribution with a zero mean and constant variance.

Our main interest from equation (1) is the estimates of R_i since they provide the information for the subsequent estimation of regional wage dispersion. Two aspects of equation (1) warrant further discussion. First, as Kennedy (1986) suggests, the regional dummy variables are weighted according to the proportion of individuals found in the respective categories. And second, the set of regional dummies are restricted to be zero so that estimated coefficients are relative to the weighted average. Results for the human capital measures are expected to follow the intuitive results documented in the literature, while the remaining labor market variables control for known occupational and industry effects (Gera and Greneir 1994; Edin and Zetterberg 1992).

Estimation of equation (1) uses individual level data recorded in the 1988 United States Current Population Survey and the Employee Benefits Supplement Record Layout.[1] From these surveys, we obtain detailed information about individuals and their employers. We restrict our sample to include male employees because migration decisions are typically based on the dominant wage earner within the household, and men generally fill this role among married households in the U.S. We also follow previous work (e.g., Dickie and Gerking) by restricting the sample to only include full-time and part-time private non-agriculture employees 16 years and older. The resulting final sample consists of 7,467 observations.

[1] Individuals that participated in the Employee Benefits Supplement represent a randomly selected subset of the larger Current Population Survey. We therefore reduce our sample size by including those that participated in both surveys. But we gain valuable information on wage determinates such as tenure, fringe benefits, and the size of the firm and plant that the person works.

Table 1. Definition of Variables used in lnWage Model

Variable	Definition
Dependent Variable	
lnWage (W)	Natural logarithm of the ratio of weekly earnings to weekly hours
Regional Location:	
Mid Atlantic	Employed in Mid Atlantic region
New England	Employed in New England region
Southeast Central	Employed in Southeast Central region
Northeast Central	Employed in Northeast Central region
Northwest Central	Employed in Northwest Central region
South Atlantic	Employed in South Atlantic region
Southwest Central	Employed in Southwest Central region
Mountain	Employed in Western Mountain region
Pacific	Employed in Pacific Coast region
Human Capital and Demographic:	
Education	The highest year of completed education
Age	Age in years
Tenure	Years employed by current employer
White	Race is white
City	Metropolitan residence status
Veteran	Veteran status
Union	Member of a union
Pension	Benefits include a pension
Occupation:	
Machine	Occupation is machine operator, laborers and inspectors
Production & Repair	Occupation is precision production, craft and repair
Professional	Occupation is executive, professional and managerial
Farming, Forest & Fishing	Occupation is farming forest, fishing
Technician & Support	Occupation is technicians and related support
Service	Occupation is service
Industry:	
Construction	Industry is construction industry
Manufacturing	Industry is manufacturing industry
Transport & Public Utility	Industry is transport and public utility industry
Wholesale & Retail	Industry is wholesale and retail industry
Services	Industry is services industry
Mining	Industry is mining industry
Firm Size:	
24 or fewer	Firm has 24 or fewer employees
25 to 99	Firm has 25 to 99 employees
100 to 499	Firm has 100 to 499 employees
500 or more	Firm has 500 or more employees
Establishment Size:	
24 or fewer	Establishment has 24 or fewer employees
25 to 99	Establishment has 25 to 99 employees
100 to 249	Establishment has 100 to 249 employees
250 or more	Establishment has 250 or more employees

The subsequent step in the analysis uses the conditional estimates of the regional log-wage differentials to calculate a measure of interregional wage dispersion. The measure of dispersion is computed as the root-mean-square deviation of a typical worker's wage in each region from the common mean.[2] Recovering the employment-weighted, log-wage differential for the j^{th} region ($\hat{b}_j$), we calculate the dispersion measure as the square root of the following weighted and adjusted variance

$$V = m - \left(\frac{1}{j}\right)\sum \hat{s}_{jj}^2 + \left(\frac{1}{j}\right)^2 \sum\sum \hat{s}_{jh}^2 \qquad (2)$$

where μ denotes the variance of the mean of the J differentials; s_{jj} is the estimated variance of $\hat{b}_j$; and s_{jh} is the estimated covariance between $\hat{b}_j$ and $\hat{b}_h$. The square root of equation (2) provides the weighted and adjusted standard deviation of the regional log-wage differentials. Calculating this measure of spatial wage dispersion for different household categories, we can compare the magnitude of interregional wage dispersion across those groupings.

Three household groupings are examined: single males, married males without children, and married males with children—in which children are defined as being under the age of 18 years. If family ties are important in determining interregional wage differentials, the interregional wage dispersion is expected to increase from *single* to *married* and from *married* to *married with children*.

3. Results

Mean and standard deviation of wages across family categories are summarized in Table 2. As expected, single men have a much lower average wage than their married counterparts. This finding likely illustrates the different age distributions within each category—with the single category capturing substantially more younger and inexperienced workers. Standard deviations indicate that single men display the least variation in wage, while married men with children display a greater variation in wage than married men with no children. Note that the relative variation in wage across family categories does not imply relative interregional wage variations.

Turning to interregional wage differentials the results from the initial step of our analysis—the OLS results from equation (1)—are reported in Table 3. The model on the whole is highly significant in explaining

[2] Calculation incorporates adjustments for sampling error and assumes the return to labor-market characteristics are equal across regions.

wage variation, with the estimated coefficients indicating the expected relationships between wages and explanatory variables. For instance, demographic findings imply that education, tenure and union membership significantly increase the worker's wage ($p<0.01$). Estimated coefficients of the occupation and industry dummies are generally significantly, and accordingly the null hypotheses that occupation and industry effects are jointly zero are rejected ($p<0.01$).

Table 2. Descriptive Statistics for Hourly Wage Across Household Categories

Household Category	Mean	Standard Deviation
Single	7.87	4.05
Married	12.39	5.66
Married with Children	12.44	5.36

Such evidence of interoccupation and interindustry wage differences is consistent with the literature (Gera and Greneir 1994; Edin and Zetterberg 1992). While the general findings indicate reliable data, the estimated regional effects provide the principal estimates for our analysis. If the regional variables failed to indicate a significant impact on wage variation, no regional wage disparities would be present in the data. But indeed, contrary to theory, the results suggest that wages vary significantly across regions. For example, relative to the Mid-Atlantic region (omitted), estimates indicate that wages in the Southeast Central region are 16.8 percent lower while those in the Pacific region are 9.75 percent higher. An F-test confirms that the regional effects are highly significant in determining wages ($F=17.58$).[3]

Given interregional wage differentials exist, we move to step two of our analysis and examine the relationship between family ties and spatial wage dispersion. Wage dispersion across the nine regions by household category—as measured by the weighted and adjusted standard deviation of interregional *W* differentials—is reported in Table 4. Findings contradict expectations with the magnitude of spatial wage dispersion decreasing as family ties grow stronger. This surprising result, however, may arise from the small numbers of observations within some regions for single men. For example, there are less than 30 observations of single men in the Southeast Central and Southwest Central regions.

[3] The presented estimates are not substantially different than the biased estimates that do not control regional effects. Also, estimated regional effects are similar across subgroupings of the data (i.e., single, married, or married with children).

Table 3. Results from lnWage Model

	Parameter Estimates	t-statistics
Constant	1.655	51.523
Regional Location:		
New England	-0.022	-1.134
Southeast Central	-0.168***	-7.133
Northeast Central	-0.038**	-2.312
Northwest Central	-0.103***	-5.342
South Atlantic	-0.098***	-5.973
Southwest Central	-0.057***	-2.826
Mountain	-0.076***	-3.878
Pacific	0.092***	4.611
Human Capital and Demographic:		
Education	0.014***	14.650
Age	0.004***	7.973
Tenure	0.007***	9.886
White	0.083***	4.769
City	0.011	0.916
Veteran	0.024***	2.083
Union	0.096***	7.044
Pension	0.112***	9.268
Occupation:		
Production & Repair	0.203***	15.112
Professional	0.441***	29.646
Farming, Forest and Fishing	-0.054**	-2.013
Technician & Support	0.259***	11.173
Service	-0.171***	-7.629
Industry:		
Manufacturing	-0.140***	-7.613
Transport & Public Utility	-0.047**	-2.177
Wholesale & Retail	-0.265***	-13.155
Services	-0.225***	-4.338
Mining	0.052	1.332
Firm Size:		
25 to 99 employees	0.114***	5.519
100 to 499 employees	0.093***	4.570
500 or more employees	0.131***	6.800
Establishment Size:		
25 to 99 employees	0.024	1.389
100 to 249 employees	0.040**	2.055
250 or more employees	0.100***	5.665
F	158.63	
(p-value)	(0.0000)	
Adj. R-squared	.403	
N	7467	

*, ** and *** indicate significance at the 10, 5 and 1 percent levels

We therefore reexamine the issue by aggregating the nine regions to four—northeast, midwest, south and west. The resulting wage dispersion estimates across household categories are presented in the second column of Table 4. The additional results only confirm our previous finding that single men exhibit the largest spatial wage dispersion. The new results do follow the documented effect of family ties on labor mobility among married men, with the estimated wage dispersion of married men with children being larger than those of married men without children. The persistent result that single males exhibited the largest interregional wage dispersion is unexpected, but the result does have precedent in the literature (Dickie and Gerking 1998). As such, one may question whether the data is failing to capture a significant aspect of the migration issue.

Table 4. Wage Dispersion by Household Categories*

Household Category	9 Regions	4 Regions
Single	2.0200	0.0745
Married	1.0757	0.0265
Married with Children	0.5177	0.0451

*weighted and adjusted standard deviation of conditional *W* differentials

4. Reconciling the Results

We address this question by extending the analysis to reconcile our unexpected result for single workers with previous work.[4] Topel (1986), Dickie and Gerking (1998), and Helwege (1992) present evidence that suggest single workers face the largest regional wage dispersion because of the age distribution. The argument centers on the belief that different aged workers respond to unanticipated and anticipated demand shocks differently. Facing unanticipated shocks, older workers are less likely to migrate to another sector with higher demand and higher wages than younger workers since older workers generally have accumulated a greater amount of firm and industry specific human capital relative to younger workers. Unless the wage increase is high enough to compensate for the loss of specific human capital and the cost of moving to another region, the worker may not choose to move. For younger workers, the loss of specific human capital may be very small and migration decisions are more easily justified. The common argument follows that interregional wage differentials are expected to increase with age.

[4] We thank an anonymous reviewer for suggesting this extension.

Wage differentials, however, may not strictly increase with age if demand shocks are anticipated. Helwege (1992) argues that anticipated demand shocks will generate large variation in wages for young workers. The argument follows that anticipated demand shocks are arbitraged into starting wages, which causes declining industries or regions to offer higher starting wages and growing industries or regions to offer lower wages. Consequently, the interregional wage disparities may be relatively large for young workers. Combining the effects of anticipated and unanticipated demand shocks, wage variation should be U-shaped. That is, wage variation should be large for the youngest workers, and variation should decrease then increase as the age of workers increases.

Dealing with such unobserved demand shocks, which are specific to industry and region, in the estimation process is not straightforward; thus controlling for any related impact from age and skill is problematic as well. For our unexpected result, the potential impact of unobserved effects from anticipated demand shocks may be substantial because approximately half of the workers in the single category are 18 to 25 years old. If the conjecture proposed by Helwege (1992) is correct, anticipated demand shocks and its impact on wage disparities among young workers may explain why the diminished labor mobility from marriage is not reflected in interregional wage differentials. To explore whether interregional wage variation is U-shaped across age categories, we estimate wage dispersion across the four regions by age groupings rather than family groupings. As presented in Table 5, the pattern of interregional wage disparity is indeed U-shaped with the 18 to 25 age category displaying the second highest variation of any wage group. Therefore, in our sample, the relatively large interregional wage differences for single workers may be related to unobserved age effects related to industry and region specific anticipated demand shocks.

Table 5. Wage Dispersion by Age Categories*

Age Category	
18 – 25	0.0506
26 – 35	0.0443
36 – 45	0.0447
46 – 55	0.0478
56 – 65	0.0579

*weighted and adjusted standard deviation of conditional *W* differentials using the 4 region specification; the 9 region specification yielded similar results.

5. Conclusions

While traditional neoclassical growth theory suggests wages will converge across regions, we provide additional evidence against convergence. Results reveal that wages significantly varied across U.S. regions. Many conjectures have been proposed to explain the persistent interregional wage disparity and herein we explore one possible explanation—family ties. While migration studies generally support the deterrent effect that family ties have on labor mobility, little attention has been paid to examine whether this effect translates into interregional wage disparities. Using a two-step conditional procedure, we provide mixed evidence regarding the impact of family ties on spatial wage dispersion. Across every specification, single males displayed the largest magnitude of wage variation of any family category. Among married men, however, the presence of children does appear to increase interregional wage dispersion. Our results suggest that decreased labor mobility due to having children is partially reflected in interregional wage differentials, but any restrictive effect on mobility from marriage is not observed in wage variation. An extension of the analysis reveals the relatively large wage dispersion among single males may result from the unobserved age and skill effects arising from region and industry specific demand shocks proposed by Helwege (1992).

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