Right-to-Work Laws and Geographic Differences in Living Costs: An Analysis of Effects of the "Union Shop" Ban for the Years 1974, 1976, and 1978

Cebula, Richard

Jacksonville University

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By RICHARD J. CEBULA*

ABSTRACT. The existence in a geographic area of *right-to-work laws* prohibiting the *union shop* tends to generate a *labor-market* environment with less union power and thus less labor-market pressure to elevate *labor costs.* To the extent that right-to-work legislation leads to lower labor costs and hence to lower *unit production costs,* there is a tendency for the overall *cost of living* in the area to be lower. Using ordinary least squares, this paper examines this hypothesis for the years 1974, 1976, and 1978 for some *38 metropolitan areas* in the *United States.* In a variety of different empirical models, this study generates very strong factual support for this right-to-work law/living-cost relationship.

Introduction

ENORMOUS GEOGRAPHIC COST-OF-LIVING DIFFERENTIALS exist in the United States. The existence of these large differentials has recently been found by investigations to influence markedly geographic mobility patterns within the United States. For example, Cebula finds that ". . . the cost of living is an important determinant of migration behavior and omission of this variable from the migration regression constitutes a specification error." [1] Essentially the same results have also been obtained by Renas and Kumar[2] and Werthwein. [3]

The impact of living-cost differentials on geographic mobility may be extremely important because, as West, Hamilton, and Loomis argue, given the stability of both birth and death rates, internal migration is likely to be the principal determinant of regional and interregional labor-market adjustments in the United States. [4]

The fundamental purpose of this paper is to investigate whether, and if so,

*{Richard J. Cebula, Ph.D., is professor of economics and senior member of the academic staff of the Law and Economics Center, Emory University, Atlanta, Ga. 30322.} The author acknowledges with thanks financial support from the Federal Reserve Bank of Atlanta during 1981.

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to what extent, geographic living-cost differentials can be attributed to right-to-work laws prohibiting the "union shop." Hopefully, the results from this study may be of use to policy makers and researchers by providing insights into the determinants of the geographic living-cost differentials which so significantly influence geographic mobility and regional labor markets in the United States.

The basic argument for expecting a relationship between right-to-work laws and living-cost differentials is summarized in Section II of this paper. In order to interpret the possible living-cost impact of right-to-work laws in a meaningful fashion, the analysis below will also allow for the possible living-cost effects of a variety of other factors. The analysis focuses upon living-cost determinants for the years 1974, 1976, and 1978 in those 38 Standard Metropolitan Statistical Areas (SMSAs) for which geographically comparable living-cost data are available.

II

RighMo-Work Laws and the Cost of Living

SECTION 14(b) of the Taft-Hartley Act states that the "union shop" is a legal form of union unless specifically prohibited by state legislation. Thus, each state has the option to adopt (or to reject) such legislation. In point of fact, several states have very recently considered the passage of right-to-work laws; however, there have been no recent additions to the list of states with such legislation. The end result is that the public choice proces involving voter preferences and state legislation has thus far resulted in a total of some 20 states which have legislated "right-to-work laws" to make compulsory union membership, and hence the union shop, illegal.

The existence in an area of right-to-work laws prohibiting the "union shop" tends to create, this writer believes, a labor-market environment with less union power (both actual and potential) and thus an environment with less labor-market pressure (on the supply side) to increase labor costs. In turn, to the degree that right-to-work legislation leads to lower labor costs and hence to lower production costs, there is likely to be a tendency for final commodity prices to be lower in those areas having right-to-work laws, *ceteris paribus.*

III

The Basic Model

GEOGRAPHIC LIVING-COST DIFFERENTIALS are likely to be a function of numerous factors besides right-to-work legislation. To allow for such factors, the following model is postulated:

$$COLi = COLi\ (Ri, Di, Pi, Yi) \qquad [1\}$$

where COLi the average annual cost of living for a four-person family living on an intermediate budget in SMSAi

Ri a dummy variable which indicates the existence of right-to-work legislation in the state where SMSAi is principally located (the variable assumes a value of "1" if there is right-to-work legislation and a value of "O" otherwise)

Di the population density in SMSAi in terms of the number of persons per square mile

Pi the total population in SMSAi

Yi the per capita income level in SMSAi

In accord with the hypothesis in section II above, it is argued that:

$$\frac{acoLi}{oRi} < 0 \qquad [2\}$$

Next, it is hypothesized here that the greater the population density in SMSAi, the greater the amount of congestion within the SMSA. With greater congestion, it is argued that, *ceteris paribtts,* transit costs, marketing costs, transfer diseconomies, and other such cost factors which influence the overall cost of living in an area will increase. Moreover, the greater the population density in an area, the greater the upward pressure on the cost of housing and land is likely to be, *ceteris paribtts.* Hence, it is argued that:

$$\frac{acoLi}{oDi} > 0 \qquad (3)$$

Next , it is hypothesized here that within a given SMSA there may be "agglomeration" (urbanization) economies associated with a larger population size. As Isard argues, areas subject to agglomeration (urbanization) economies have "access to a larger pool of skilled labor . . . and fuller use of specialized and auxiliary industrial and repair facilities. "[5] Thus, *ceteris paribtts,* we would expect areas with larger populations to be characterized by lower production costs and hence by a lower overall cost-of-living:

$$\frac{aCOLi}{iJPi} < 0 \qquad [4\}$$

Finally, this study contends that the income variable (per capita income) may be viewed as a proxy for an array of demand-side factors. It holds that the greater the per capita income level in an SMSA, the greater the average level of demand for goods and services in that area. In turn, a greater demand

Ordinary Least Squares Estimations of Equations (6) - (9), 1974

Equation #	Constant	Ri	Di	Yi	R2	F-ratio
(6) coefficient	+14623.84	-1464.28***			.32	15.204
(standard error)		(375.52)				
(7) coefficient	+14064.50	-1043.63***	+.48910***		.56	19.715
(standard error)		(324.17)	(.11953)			
(8) coefficient	+14226.98	-1073.29***	+.71831***	-.16414	.59	14.491
(standard error)		(317.97)	(.19012)	(.10730)		
(9) coefficient	+8711.49	-701.82***	+.61338***	-.26977***	+1.05714***	.79	27.716
(standard error)		(240.88)	(.13921)	(.08028)	(.19939)		

Statistically significant at .01 level, one-tailed test
Statistically significant at .05 level, one-tailed test
Statistically significant at the .10 level, one-tailed test

as the impact of variables Di, Pi, and Yi, this paper estimates the following four regressions for each of the three years studied:[6]

$$COLi \quad a_0 + a_1Ri + \mu_1 \qquad [6]$$

$$COLi \quad b_0 + b_1Ri + b_2Di + \mu 2 \qquad [7]$$

$$COLi \quad c_0 + c_1Ri + c_2Di + c_3Pi + \mu 3 \qquad [8]$$

$$COLi \quad d_0 + d_1Ri + d_2Di + d_3Pi + \qquad + \mu 4 \qquad [9]$$

where a_0, bo, Co, do constants

μ_1, μ_2, μ_3, μ_4 error terms

For the three years studied, 1976, and 1978, respectively, we observe that:

COLi as above, for 1974, 1976, and 1978, respectively
Ri as above
Di as above, for 1973, 1975, and 1977, respectively
Pi as above, for 1973, 1975, and 1977, respectively
Yi as above, for 1972, 1974, and 1975, respectively

The SMSAs studied were as follows:

Atlanta, GA; Austin, TX; Bakersfield, CA; Baltimore, MD; Baton Rouge, LA; Boston, MA; Buffalo, NY; Champaign-Urbana, IL; Cedar Rapids, IA; Chicago, IL-Northwestern IN; Cincinnati, OH-IN-KY; Cleveland, OH; Dallas, TX; Dayton, OH; Denver, CO; Detroit, MI; Green Bay, WI; Hartford, CT; Honolulu, HA; Ho 1ston, TX; Indi--anapolis, IN; Kansas City, MO-KS; Lancaster, PA; Los Angeles-Long Beach, CA; Milwaukee, WI; Minneapolis-St. Paul, MN; Nashville, TN; New York, NY-Northeastern NJ; Orlando, FL; Philadelphia, PA-NJ; Pittsburgh, PA; Portland, ME; St. Louis, MO; San Diego, CA; San Francisco-Oakland, CA; Seattle-Everett, WA; Washington, DC-MD-VA; Wichita, KS.

These 38 areas comprise the complete set of SMSAs for which geographically comparable living-cost data are available for the years and 1978. (Although such living-cost data were also available for Durham, NC, this area was omitted from the study due to a lack of other needed data.)

The data sources for this study are as follows:

Statistical Abstract of the United States, 1975 (Table 694 and Section 34); *City and County Data Book, 1977* (Table 3) and *Statistical Abstract of the United States, 1977* (Table 777); and *State and Metropolitan Area Data Book, 1979* (Table B).

Before examining the empirical results, an observation regarding the cost-of-living data is appropriate. In particular, the living-cost data examined in this study are geographically comparable to a reasonable degree in view of the general similarity of market baskets of consumer goods among areas.

Nevertheless, the data have several limitations which warrant attention. To begin with, the cost-of-living data compiled by the Bureau of Labor Statistics (BI.S) reflect differences in cost of established residents in a community.

Table 2
[illegible] Squares Estimations of [illegible]

Equation #	[illegible]	Ri	Di	[illegible]	[illegible]		
(6) coefficient	[illegible]	-1588.11***					
(standard error)		(406.01)					
(7) coefficient	[illegible]	[illegible]	+.49307***			48	16.092
(standard error)		[illegible]	(.14147)				
(8) coefficient	[illegible]	[illegible]	+.73489***			52	11.446
(standard error)		[illegible]	(.23711)				
(9) coefficient	[illegible]	[illegible]	+.82892***	[illegible]	+.83502***	65	11.851
(standard error)		[illegible]	(.22147)	[illegible]	(.31551)		

*** Statistically significant [illegible] one-tailed [illegible]
** Statistically significant [illegible] one-tailed [illegible]
* Statistically significant [illegible] [illegible]

Rental costs, for example, are based on the averages for occupied dwellings and are not an accurate measure of the costs of vacant units available to new residents. Furthermore, the costs of housing for an area are an *average,* and it is clear that this average is very crude since the price of housing, even within a given metropolitan area, varies enormously. Moreover, this housing-price variance is likely to differ a good bit from one metropolitan area to the next.

In addition, the living cost data allegedly reflect the cost of living for a four-person family, a family consisting of an employed husband (age 38), a wife not employed outside the home, a daughter (age 8) and a son (age 13). Clearly, to the extent that a family unit deviates from this "model," the living-cost data lose relevance.

Going further, it is not at all clear that the living-cost data control adequately for geographic differences in preferences. For example, there are considerable differences in regional preference patterns in the choice of food to meet nutritional needs. [7] Moreover, there are considerable differences, even within a given metropolitan area, in preference patterns in the choice of food. Thus, not only are interregional comparisons of food costs crude, but so also are the average food cost computations within a given metropolitan area.

Clearly, there are also enormous geographic differentials in the preference patterns for clothing (contrast Chicago, Illinois, with Orlando, Florida). Thus, in both the categories of food and clothing, it is clear that the BLS living-cost data are a bit crude.

On yet another level, it is clear that there inevitably will exist geographic differences in both the quality of goods and in the available mix of goods (some areas can provide snow skiing, others warm beaches). [8] It is not at all obvious that the BLS data control sufficiently for these differences in location-specific commodities.

Finally, the family budgets computed by the BLS have not been thoroughly updated over the years. Rather, for the most part they have simply been adjusted using the consumer pride index (CPI). In fact, according to the BLS *Handbook of Methodr,* "Since the spring of 1969, the (budget) figures (for the various metropolitan areas) have been derived by applying price changes reported in the CPI for these individual areas to the previous period's . . ."[9] budget figures.

The CPI itself has well-known, inherent biases. The CPI index heavily relies upon housing costs (44 percent) and transportation (18 percent), which do fluctuate by region for numerous reasons besides right-to-work legislation. In sum, although geographically comparable to some reasonable degree, the living-cost data are certainly too crude to be considered entirely comparable or completely dependable.

V

Empirical Results

THE OLS ESTIMATIONS of equations [6} through [9} for the years 1974, 1976, and 1978, are provided in Tables 1, 2, and 3, respectively. The zero-order correlation coefficients among the independent variables for 1974, 1976, and 1978 are provided in Table 4.

Consider first the results from 1974, as summarized in Table 1. In all of the regressions, the F-ratios are significant at the .01 level. Of the ten coefficients estimated, only one fails to be significant at the .01 level. In the last regression, where all four independent variables are included and found to be significant at the . 01 level, the R^2 has a value of .79, so that the model explains nearly four-fifths of the variation in the cost of living in 1974.

In Table 2, which shows the results for 1976, all of the F-ratios are significant at the .01 level. Of the ten coefficients estimated, nine are significant at the . 01 level. In the last regression, where all four exogenous variables are significant at the .01 level, the R^2 is .65, so that the model explains nearly two-thirds of the variation in the cost of living for 1976.

The general pattern of results shown in Tables 1 and 2 appears once again in Table 3. All of the F-ratios are significant at the .01 level. In addition, nine of the ten estimated coefficients are significant at the .01 level. Finally, the R^2 of .68 in the last regression, where-as in Tables 1 and 2-all the independent variables are significant at the .01 level, implies that the model explains nearly seven-tenths of the variation in the cost of living in 1978.

As Table 4 indicates, the only case where there is a high degree of **mul**ticollinearity in the model is that involving population size (Pi) and population density (Di). However, in view of the high significance levels for the coefficients on both Pi and Di in all three of the OLS estimates of equation [9], this degree of correlation should not be of concern.

The findings summarized in Tables 1, 2 , and 3 exhibit a remarkably consistent pattern. For example, the coefficient on variable Pi fails to be significant at even the . 10 level in the OLS estimate of equation [8] in all three tables; however, once the income variable is added to the regression (equation [9]), the coefficient on Pi becomes significant at the .01 level in all three cases.[10] Of greater importance is the fact that, as shown in the OLS estimate for equation [9} in all three Tables, all four independent variables-when in the same equation-are statistically significant at the .01 level with the expected sign. Thus, both higher population density and higher per capita income levels tend to elevate the cost of living, whereas both higher population size and the existence of right-to-work legislation act to lower the cost of living.

VI

Concluding Analysis

Tms WRITER HAS ARGUED that the existence in an area of right-to-work laws prohibiting the "union shop" tends to generate a labor-market environment with less union power and thus less labor-market pressure (on the supply side) to elevate labor costs. He then argues that to the extent that right-to-work legislation leads to lower labor costs and hence to lower production costs, there is a tendency for the overall cost of living in the area to be lower.

This has examined this hypothesis for the years 1974, 1976, and 1978. In all 12 of the regressions in Tables 1 through 3, the coefficient on the variable has the expected negative sign and is significant at the .01 level. Thus, this study has generated very strong support for the right-to-work law/living-cost hypothesis.

Naturally, the conclusion stated above is only tentative, the limitations of the data available and the possibility of structuring alternative models. One such model is described below:

$$COLi = COLi\ (Ri,\ Di,\ Pi,\ Yi,\ Ui) \qquad [10]$$

where Ri, Di, Pi, Yi as above
Ui average annual cost per household, in of household gas, oil, and electric-

Correlation 4 1974' 1976' 1978

1974

	Ri	Di	Pi	Yi
Ri	1.00			
Di	-.32	1.00		
Pi		.81		
Yi		.44		1.00

1976

	Ri	Di	Pi	Yi
Ri	1.00			
Di	-.27	1.00		
Pi	-.23	.82	1.	
Yi	17	.29		1.00

1978

	Ri	Di	Pi	Yi
Ri	1.00			
Di	-.28	1.		
Pi	-.23		1.00	
Yi	-.48	.24	.35	1.00

Including the variable Ui in the model may be viewed as an effort to control for the possibility that areas where laws exist *may* just happen to be areas where warmer climatic conditions act-on balance--to reduce the annual cost of the home.[12] Inclusion of this variable thus should a more accurate estimate of the effects of

The actual regression to be estimated is as follows:

$$COLi \quad + \quad + \quad + \quad + \qquad [11]$$

Table 5
Ordinary Least Squares Estimations of Equation (11), 1974, 1976, 1978

Equation	Constant		Di	Pi	Yi		i_	f-ratio
(1974) coefficient	+8270.10	-662.86***	+.63458***	-.29034***	+1.14743***	+.88594*	.81	21.887
(standard error)		(245.13)	(.14445)	(.08719)	(.24556)	(.56256)		
(1976) coefficient	+12056.38	-1088.96***	+.77857***	-.28801***	+.68600**	+.89747*	.67	9.850
(standard error)		(347.23)	(.22636)	(.12498)	(.34590)	(.54533)		
(1978) coefficient	+17032.11	-1408.15***	+.87784***	-.27490**	+.79384**	+.86348*	.70	9.967
(standard error)		92)	(.30005)	(.15616)	(.40202)	(.53604)		

Statistically significant at the .01 ______test
Statistically significant at the •05 test
Statistically significant at the .10 level, one-tailed test

respectively,

average annual gas, oil, and electricity costs, in SMSAi, per household for the years 1974, 1976, and 1978.

The OLS estimates of equation [11] for 1974, 1976, and 1978 are presented in Table 5. The coefficients for Ui are all marginally significant at the .10 level but exercise relatively little influence on the overall results. Of greatest relevance is the fact that, for all three years, right-to-work laws once again appear to exercise a highly significant impact on the cost of living.

We may summarize by observing that the various models examined in this paper all yield very strong empirical support for the right-to-work law/living-cost hypothesis. Judging from the results for regression equations [9] and [11], for all three of the years studied, it appears that the existence of right-to-work laws lowers the overall cost of living by between 7 and 8 percent.[13]

Notes

1. Richard J. Cebula, *The Determinants of Human Migration* (Lexington, Mass.: Lexington Books, 1979, p. 58).

2. See S. Renas and R. Kumar, "The Cost of Living, Labor Market Opportunities, and the Decision to Migrate: A Case of Misspecification?" *Annals of Regional Science,* July, 1978, pp. 95-104, and "Reply," *ibid.,* November, 1979, pp. 119-21.

3. See J. Werthwein, "A Note on Migration Determinants," *Review of Busines.r and Economic Research,* Winter, 1980, pp. 106-08.

4. See D. A. West, *].* R. Hamilton, and R. A. Loomis, "A Conceptual Framework for Guiding Policy-Related Research on Migration," *Land Economics,* February, 1976, pp. 66-76.

5. See W. Isard, *Location and Space Economy* (Cambridge, Mass.: The M.I.T. Press, 1956, p. 182).

6. The regressions are expressed in linear terms. A log-linear. specification would have precluded the use of the dummy variable (Ri). Moreover, there was no apparent *a priori* reason to adopt a log-linear equation in lieu of the linear form.

7. Related to this, see Jean Brackett, "Intercity Differences in Family Food Budget Costs," *Monthly Labor Review,* October, 1973, pp. 1189-94.

8. Related to this, see Mark Sherwood, "Family Budgets and Geographic Differences in Prices," *Monthly Labor Review,* April, 1975, pp. 8-15.

9. U.S. Department of Labor, Bureau of Labor Statistics, *Handbook of Methods* (Washington, D.C. 1980), p. 84.

10. This may be an indication that Yi is an "omitted variable."

11. These data do *not* include household purchases of automobile fuel.

12. The cost of household heating tends to be higher in colder climates than in warmer climates. On the other hand, household air conditioning costs tend to be higher in warmer climates than in colder climates. The net effect of these opposing forces on the overall annual cost of living is *a priori* unknown. To the extent that these forces are not precisely offsetting, it is appropriate to include variable Ui as a control factor.

13. In view of the consistency of the results obtained in the regressions, the conclusions appear to be compelling. Nonetheless, alternative specifications of the model might be considered. For example, one might consider replacing the variable "Ri" by "percent of the civilian labor force unionized." In addition, it may be appropriate at some point to examine whether there may be a bi-directional relationship between COLi and Yi or between COLi and Pi. Finally, the possibility of using path analysis might be considered.