DO WORKERS EARN LESS ALONG THE U.S.-MEXICO BORDER?

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Introduction

The United States-Mexico border has been characterized as having low wages relative to the U.S. interior. Standard Metropolitan Statistical Areas (SMSAs) along the border consistently rank among the poorest in the country. Some assert that the underlying cause is the inexhaustible inflow of Mexican labor. The border is the port of entry of many illegal immigrants seeking employment. Some employers along the border have the attitude that "pay should be based on what the last man who crossed the river received" (El Paso Herald-Post). Moreover, many Mexicans work in the U.S. border region legally as residents or commuters (Ericson). The persistence of low border wages, and the recent shocks which the border economy has received from peso devaluations, have prompted many to seek remedies to improve the welfare of border residents. These low wages have also figured in debate concerning proposals to tighten up border security and to penalize firms which employ illegal immigrants.

In addition to these important policy issues, there has been a general interest among social scientists in regional wage differentials. In a competitive economy, there are several forces which should eliminate regional wage differentials in the long run. First, labor may be expected to migrate from low-wage areas to high-wage areas (as obviously occurs from Mexico to the U.S.). This will decrease the supply of labor and raise wage rates in the low-wage area. Second, firms may be expected to relocate in the low-cost region in order to seize a profit advantage. This will gradually increase labor demand and raise wages in the low-wage area. A third and related effect concerns consumer purchases. So long as labor costs are low, correspondingly low product prices will stimulate consumer purchases and further increase labor demand and wage rates.

The existence and persistence of regional wage differentials raises a number of questions. Is this a result of labor and capital immobility (or at least sluggish mobility)? Is it associated with continuous shifts of supply (such as an inflow from Mexico) which perpetually keep the market out of long-run equilibrium? Or does the perceived wage differential disappear when other important factors are accounted for?

One such factor may be differences in the cost of living between areas.1/ In particular, several studies of the "North-South" wage differential have focused on price levels. Earlier studies attributed the lower wages in the South to inefficient market mechanisms (Scully; Segal; Fuchs and Perlman). More recent studies have concluded that Southern wages were lower only in money terms. Once the cost of living (or Consumer Price Index) is controlled for, similar workers in the South appear to earn as much as workers in the North (Coelho and Ghali; Bellante; Shelby and Weirick).

Perceived regional wage differentials may become smaller or even disappear when we control for certain socio-economic characteristics of the population. Workers in the low-wage region may have less education and human capital. There is overwhelming evidence that the more highly educated earn more. Low-wage regions may have unusually high concentrations of minorities, who because of discrimination tend to earn less. For our purposes, it is important to note that on average border residents have low levels of educational attainment and are heavily of Hispanic descent (Davila).

We are aware of only two previous studies which have directly attempted to measure the border wage differential.2/ Both focused only on the Texas border, and both relied on data from the 1970 Census of Population. Smith and Newman limited their study to a comparison of workers in one non-border city (Houston) and three Texas border cities (Brownsville, Laredo, and Corpus Christi). They concluded that earnings in 1969 were lower along the border, although the wage differential was smaller than previously believed. In particular, they found that it fell substantially when differences in cost of living were taken into account.

Davila improved on their study by using data on workers in many Texas cities, although he was still restricted to the 1970 Census. For that year, he found that a large and statistically significant nominal border wage differential disappeared once differences in cost of living were included in the statistical analysis.

Our paper goes beyond previous research in several ways. First, we provided estimates using the recently available 1980 Census of Population. In addition to more current data, we provide some comparisons between 1970 and 1980. Second, we include California in our sample. This adds a major metropolitan area (San Diego) to the set of otherwise smaller border cities and reduces the likelihood that we are actually measuring a wage differential because of city size rather than location. Third, we feel that we do a more thorough job of controlling for other socio-economic characteristics which influence earnings. While the focus of this paper is on the border earnings differential, these control variables also yield interesting results.

In the next section we analyze the 1980 Census of Population. In the following sections, comparisons are drawn between the 1980 and 1970 Census estimates. A short summary concludes the paper.

1980 Border Wage Differential

The Public Use Sample of the 1980 Census of Population is the major data source of this study. These data contain an array of information which is used to estimate an earnings equation via multiple regression analysis. This sample is restricted to male household heads who tend to be more permanently attached to the labor force than are females and young males who do not head households. Annual earnings in 1979 are used as the dependent variables because this is the only measure available from the 1980 Census. Annual earnings for workers in a region may be low simply because they work fewer hours per year. Hence, controls for number of weeks worked per year and hours worked per week are included as discussed below. Earnings were transformed into logarithms so that the estimate coefficients may be interpreted as percentage changes.3/ A total of 14,732 observations were utilized.

Any difference between border and non-border earnings is measured with a dummy variable. "Border" takes on the value 1 if the individual lived in a city which was within 20 miles of the U.S.-Mexico border and the value 0 otherwise. The metropolitan areas included in the border region are San Diego, El Paso, Laredo, McAllen, and Brownsville. Although one could make a case for including cities such as Corpus Christi and San Antonio, these cities do not employ Mexican commuters that legally work in

the U.S. Mexican commuter workers have been cited as a source of lower wages along the border (Ericson). In addition, our more narrow definition places the emphasis exactly on the border. It is expected that the "border" coefficient should be negative.

The first step was to simply regress earnings on an intercept and on the border dummy variable. The results are:

$$\text{Earnings} = \underset{(12.30)}{9.59} - \underset{(11.63)}{.254}\ \text{Border}, \qquad R^2 = .009$$

Without including any other control variables earnings are 22 percent lower along the border.

The next step was to control for the major variables which economists have found to influence earnings. The results are shown in column 1 of Table 1. The impact of education is accounted for by using five dummy variables. Persons with four years of college (16 years of school) earn 3.5 percent less than the omitted group (those with more than four years of college). Those with less education progressively earn less. For instance, high school graduates (12 years of school) earn 30 percent less than the omitted group.

Increasing work experience (computed as age minus years of schooling minus five) raises earnings by 5.8 percent a year at first, although the negative sign on the "experience squared" variable indicates a diminishing rate of increase. Blacks earn 21 percent less and Mexican-Americans earn 16 percent less than do non-Hispanic whites. Because our sample includes persons who work a variety of hours and weeks

Table 1

	(1)	(2)	(3)	(4)	(5)
	1980			1970	
	Nominal		Real	Nominal	Real
Intercept	7.19	7.15	7.09	1.87	1.81
	(212.0)	(163.0)	(162.0)	(17.7)	(17.3)
Border	-.148	-.134	-.122	-.098	-.027
	(8.96)	(8.08)	(7.40)	(2.98)	(0.83)
Education (Years)	-.734	-.654	-.636	-.547	-.525
Less than 7	(23.12)	(20.08)	(19.57)	(15.39)	(14.87)
7-11	-.487	-.496	-.481	-.481	-.466
	(22.61)	(22.42)	(21.78)	(15.25)	(14.87)
12	-.352	-.388	-.382	-.339	-.347
	(19.86)	(20.85)	(20.61)	(12.46)	(12.81)
13-15	-.255	-.287	-.283	-.244	-.257
	(14.27)	(15.50)	(15.33)	(8.10)	(8.58)
16	-.035	-.061	-.057	-.112	-.117
	(1.68)	(2.93)	(2.75)	(2.20)	(2.31)
Experience	.058	.053	.052	.046	.046
	(42.38)	(37.57)	(37.12)	(22.34)	(22.13)
$(\text{Experience})^2$	-.001	-.001	-.001	-.001	-.001
	(35.41)	(32.88)	(32.59)	(20.62)	(20.39)
Black	-.238	-.240	-.247	-.373	-.363
	(11.45)	(11.72)	(12.11)	(10.37)	(10.17)
Mexican-American	-.176	-.166	-.151	-.233	-.222
	(10.26)	(9.61)	(8.74)	(7.12)	(6.84)
Weeks Worked	-.036	.033	.033	.035	.036
	(65.76)	(56.35)	(56.56)	(34.12)	(34.56)
Hours Worked	.008	.004	.004	.003	.004
	(16.17)	(11.56)	(12.02)	(5.78)	(6.46)
Years Since		.075	.077	.061	.062
Immigration		(9.16)	(9.51)	(3.88)	(4.00)
Foreign Born		.085	.062	.241	.220
		(3.03)	(2.23)	(2.82)	(2.59)
Industries		Incl.	Incl.	Incl.	Incl.
City Size		-.050	-.057	.065	.042
		(1.85)	(2.13)	(3.51)	(2.32)
Disabled		-.153	-.146	-.118	-.118
		(5.90)	(5.66)	(3.40)	(3.44)
Married w/ Spouse		.208	.233	.164	.171
		(16.28)	(17.47)	(6.14)	(6.45)
R^2	.440	.463	.465	.461	.462

[1]The critical value of the t-statistic is 1.65 at the 5% level and 2.33 at the 1% level.

[2]Values for the industry coefficients are not shown in order to conserve space but will be supplied upon request.

each year, we felt it would be best to control for such variation. As expected, men who work longer hours and more weeks have higher annual earnings.

In addition to having the correct signs all of these control variables are statistically significant at the 1 percent level. It is also worth emphasizing that this relatively small set of variables explains 44 percent of the variation in the dependent variable, which is quite good for cross-section data.

Of greatest interest to us, the nominal earnings differential is 13.8 percent (and statistically significant) along the border. Although still substantial, this is 8.6 percentage points lower than the 22.4 percent differential reported above. Our interpretation is that a major portion of the gross border differential is associated with the lower levels of education and experience and higher proportions of Mexican-Americans along the border. Once these factors are controlled for, the border differential shrinks by approximately forty percent.

There may be other variables which explain some of the remaining earning differential. Some recent research by Chiswick (1978) indicates that foreign immigrants earn less when they first enter the U.S. (because of language barriers and nontransferable skills) but that their earnings return towards normal the longer that they are in the U.S.. This may make an important contribution to the border differential if a larger proportion of border residents are recent immigrants. In addition, we test for any impact of differences in the mix of industries by including a set of ten two-digit SIC code industry dummy variables. City size is included to

control for any nonpecuniary disutilities such as crime or congestion (or utilities such as entertainment) which alter willingness to work in a large city. Finally we control for disability and marital status.

These additional variables are incorporated in the regression equation reported in column 2 of Table 1. The border differential declines in magnitude by about ten percent, although it is still large, [12.5 percent], and statistically significant. Immigrants who have been in the U.S. for several years earn more than do recent arrivals, as expected. More surprising is the positive sign on the "foreign born" variable. This coefficient reverses sign when the "years since immigration" variable is deleted. Our interpretation is that once "years" is controlled for, the "foreign born" variable picks up the frequently observed effect that immigrants are highly motivated and able individuals.

Although not shown in Table 1 the industry dummy variables had the expected effects. Earnings were lowest in agriculture, trade, and services. Workers, who report that a disability limits their ability to work earn 14 percent less.4/ City size did not have the expected positive effect. We do not have an explanation for this, although we do note that its t-ratio of 1.85 is not very large.

The next step in our analysis was to control for the level of living costs. An intercity cost of living index was constructed by the U.S. Bureau of Labor Statistics in 1979. Unfortunately, this index is only available for three cities in California (Los Angeles, San Diego, San Francisco) and two in Texas (Dallas-Fort Worth, Houston). A similar B.L.S. survey done in 1977 allows us to add two additional cities (Austin and

Bakersfield). This two-year gap should not be a problem because relative living costs change only slowly over time.

How might we estimate a cost of living index for other smaller cities, including several key border cities in Texas? The approach which we adopted was to rely upon indices estimated by the American Chamber of Commerce. These data have the desirable feature that they were based on a fixed basket of goods and services which was priced individually in each of 24 small, medium and large cities in California and Texas which were not surveyed by the B.L.S. One shortcoming of the Chamber of Commerce data is that the raw data was accumulated locally, probably without the standardization and quality control that goes into the B.L.S. collection procedures.5/ Although not ideal, we feel that the Chamber of Commerce data are superior to the alternative of basing the index on the closest large city for which the B.L.S. publishes data. The latter is the approach adopted by Gerking and Weirick and in part by Liu.

Real earnings are computed by dividing money earnings by the cost of living index (base = 1.00). Real earnings were then regressed on exactly the same set of control variables as in column 2 of Table 1. The results are presented in column 3.

The border differential declines by one percentage point to 11.5 percent. The coefficients of the control variables show little change between columns 2 and 3 and the R^2 rises only slightly. This small impact of the cost of living index is inconsistent with the "North-South" wage differential studies. That literature found that controlling for price effects eliminated the differential. We find only a 9 percent reduction in

magnitude. Before commenting further on this, let us look at the 1970 data.

1970 Border Wage Differential

Given the limitations on data, we attempted to run identical regressions using data from the 1970 Census of Population. These results are reported in columns 4-5 of Table 1. The most important change in the data set is the cost of living index, as discussed below. The Census definitions of variables are very similar in 1970 and 1980. One minor difference is that the 1970 "hours worked" variables refers to hours worked during the survey week rather than the more desirable "usual hours worked per week in 1979" of the 1980 Census.

Without any control variables, the 1970 border differential was as large as 16 percent. As in 1980, inclusion of the control variables (especially the human capital measures) greatly reduces the magnitude of the border differential. The nominal differential was only 9.3 percent in 1970 as compared to 12.5 percent in 1980. This would suggest that there has been some widening of the differential during the decade of the 1970's.

The magnitudes of the control variable coefficients are reasonably consistent between 1970 and 1980. The racial and foreign-born variables are slightly stronger in 1970, while the work experience, disabled, and marital status variables are stronger in 1980. Only one variable switches sign. City size was positive in 1970 but negative in 1980.

The 1970 real earnings regression is reported in column 5 of Table 1. Because the Chamber of Commerce data were not available for 1970, we used

the cost of living index compiled by Liu. The latter was primarily based on the index for the closest city for which B.L.S. data were available.

Comparing columns 4 and 5, we see that the border differential largely disappears in 1970 when the cost of living is included. The coefficient declines from 6.3 percent to 2.7 percent and loses statistical significance. This is consistent with the North-South wage differential literature which was discussed in the introduction. The control variable coefficients are remarkably stable between columns 4 and 5.

Comparing the 1970 and 1980 Results

It is clear that the size of the border coefficient is sensitive to the choice of proxy variable for the cost of living. In this section we report some further comparisons of the two indices.

The first thing we did was to rerun the 1970 regression of column 5 substituting the 1980 Chamber of Commerce index for the Liu index. The result was a border coefficient of 7.0 which was statistically significant (t-ratio of 2.23). This confirmed that the choice of index does make a difference.

The simple correlation between the two measures is high (.68) but not as high as one might expect. A city-by-city comparison revealed that the Chamber of Commerce index was lower for cities such as Corpus Christi, San Antonio, San Jose, and San Bernadino but higher for cities such as Fresno, Galveston, Midland and Odessa.

One clear pattern was identified. Three of the border cities had higher cost of living indices in 1980 as compared to 1970. Of these, the index for San Diego increased from 1.004 to 1.048. But because this comes directly from the B.L.S. survey, there is less reason to doubt its reliability. The increases in McAllen (.887 to .945) and in Brownsville (.891 to .954), however, might be more suspicious because the 1970 estimate comes from Liu, while the Chamber supplies the 1980 figure.

(1) We replaced the 1980 index for San Diego with the 1970 San Diego index. As a result, the border coefficient fell from 11.5 percent to 9.9 percent.

(2) We replaced the 1980 indices for the Texas border cities with their 1970 values (while retaining San Diego at its 1980 value). The border coefficient did not change significantly from 11.5 percent.

(3) We replaced the 1980 indices for San Diego and for the Texas border cities with their respective 1970 values. As a result, the border coefficient declined from 11.5 percent to 9.2 percent.

We conclude that our results are sensitive to the cost of living index applied to San Diego but are <u>not</u> sensitive to the values for the Texas border cities. Because the San Diego index is taken directly from the B.L.S. survey, the increase in living costs is likely to be a real phenomenon rather than a statistical artifact.

This finding supports the hypothesis that the real wage differential widened during the 1970s. On the other hand, we feel sufficiently uncomfortable with all of the cost of living indices that we prefer to remain agnostic on this issue.

Concluding Remarks

We do find clear evidence that there is a nominal border wage differential even after we account for many important control variables. Border wage rates were about 9.3 percent lower in 1970 and about 12.5 percent lower in 1980. This suggests some widening of the differential over that decade, although this must be a tentative conclusion because of changes in definitions and data quality in the two censuses.

It is clear that lower levels of human capital (education; experience) and greater concentrations of Mexican-Americans contribute to low average earnings along the border. But even after these are controlled for a border differential of 9-13 percent still exists. Such a differential could induce firms to expand and to locate along the border provided that any cost savings are not offset by lower levels of labor productivity. But measuring employment productivity is beyond the scope of our data and paper.

It is less clear whether there is a real border wage differential after the cost of living is included. We find a 3 percent (or zero) real differential in 1970 but a 11.5 percent real differential in 1980. More reliable cost-of-living data will be necessary before a definitive answer can be given.

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