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Mexican Enclaves and the Price of Culture

Arturo Gonzalez[1]

Mexican American Studies and Research Center, University of Arizona, Tuscon, AZ 84721

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Studies of Mexican immigrant earnings consistently find a negative relationship between concentration of Mexicans and earnings. Smith and Newman [*Economic Inquiry*, **15**, 51–66 (1977)] and Yuengert [*Journal of Human Resources*, **30**, 194–204 (1995)], among others, attribute this enclave effect as the compensating differential for culture. However, the existence of a land market suggests that the ''price'' of culture may also depend on culture's effect on the price of land. Adopting a model developed by Roback [*Economic Inquiry*, **26**, 23–41 (1988)], I first show that the price of Mexican culture is a function of culture's effect on both earnings and rents. Second, using data for California and Texas from the 1990 Census, I estimate the price for Mexican culture. Consistent with the model, culture lowers earnings and increases rents in enclaves with larger concentration of Mexicans. In fact, land's share of the price of culture is as much as 42%. Therefore, studies that attribute the lower earnings in enclaves as the compensating differential for enclave externalities underestimate the value of culture. This paper also tests several predictions implied by the theoretical model. Satisfying the general equilibrium conditions, the earnings of other workers are higher in enclaves. Furthermore, except for Mexican-Americans, the assumption that culture is not an amenity to other workers is supported by the data.

I. INTRODUCTION

Approximately 75% of all Mexican immigrants in the United States live in Texas and California. But within these states, Mexican immigrants are concentrated in the enclaves established by previous immigrants. Studies of immigrant earnings that incorporate this ethnic concentration in their analysis consistently find a negative relationship between Mexican enclaves and Mexican earnings. A common explanation for this finding is that Mexican enclaves offer cultural amenities which attract Mexican im-

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migrants and Mexican immigrants are willing to pay a compensating differential for these benefits. Several studies conclude that the negative relationship between Hispanic concentration and immigrant earnings is the price of enclave culture [2, 9, 20, 21, 23].

Previous calculations of the price of culture implicity assume that culture does not affect land rents in the enclave. In this paper, I add to these studies by applying a model developed by Roback [19] to demonstrate how the migration decisions of workers and firms are constrained by also including the price of land in their optimization problem. Formulating the migration decision in this manner yields a ''price'' for Mexican culture that is a function of culture's impact on both earnings and land rents. Since workers and firms must make land payments to live and produce in the enclave, the compensating differential for culture may also include higher rents. This possibility is theoretically attractive because it explains why firms in enclaves do not earn positive profits.

Under plausible assumptions, the Roback model predicts that enclaves with higher cultural amenities have both lower earnings and higher rents. Using data for California and Texas from the 1990 Census, I demonstrate that not only are rents higher and earnings lower in enclaves, but the share of the price of culture attributable to rents is as much as 42%. Therefore, studies that calculate the compensating differential for culture from only earnings regressions underestimate the value of culture.

This paper also test several predictions made by the model regarding the effect of Mexican culture on the earnings and preferences of other workers. First, the general equilibrium framework of the model predicts that if enclave land rents are higher, then workers without preference for enclave culture must be compensated with higher earnings in order to keep them from moving. This is found to hold for Asians, Blacks, and Whites, but not for Mexican-Americans. Second, I also test the assumption that Mexican culture does not add to the utility of other ethnic groups. The hypothesis that the price of Mexican culture equals zero is not rejected for Asians, Whites, and Blacks, but for Mexican-Americans the price of culture is statistically significant (yet still lower in magnitude than for Mexican immigrants). While many studies apply the Roback model to empirical studies of local amenities,[2] this is the first to test the general equilibrium implications and the assumptions often made to derive predictions from the model.

[2]Studies that have used this model to calculate prices for local amenities include [19], [8], [22], and [17].

II. IMMIGRANTS LIVE IN ENCLAVES

Using data from the 1980s, several analyses of the settlement patterns of immigrants [1, 2, 10, 16] find that Mexican immigrants choose to live in areas with large numbers of Mexicans.[3] Data from the 1990 5% Public Use Microdata Sample (PUMS) files reveal that same pattern of geographic concentration among Mexican immigrants in Texas and California.[4]

Recognizing the extent of Hispanic concentration in certain labor markets, many previous studies include variables of concentration in log wage regressions. Table 1 presents a list of studies finding a negative relationship between ethnic concentration and Mexican immigrant wages. The table groups these studies by the relative impact of ethnic concentration on wages, ranging from small, to medium, to large. A subset of these studies [2, 9, 20, 21, 23] along with Funkhouser and Ramos [7] argue that the lower earnings in enclaves is directly attributable to culture. In general, such studies can be broken down into two types.

The first type are comparative analyses of the earnings of immigrants living in different areas. Examples of this type of studies are Smith and Newman [20] and Funkhouser and Ramos [7]. Smith and Newman compare the wages of workers in Houston to those working along the Texas–Mexico border where the number of Mexican immigrants is greater. After controlling for cost-of-living differences, Smith and Newman find that wages along the border are 8–10% lower. They attribute this result to the amount Mexican-Americans give up to live with others of the same culture. Funkhouser and Ramos compare the earnings of Cubans and Dominicans living in enclaves in Puerto Rico, in New York or Miami, and in areas outside of the enclaves. In most instances mean earnings outside the enclave are higher than inside the enclave, and this is attributed to a trade-off between culture and work income.

The most common type of study found in the literature, however, controls for differences in enclave population in regressions of individual earnings. Usually relying on individual data from the Census, these regressions generally yield a statistically negative enclave coefficient.[5] Some [2, 3, 21] include dummy variables for various levels of Hispanic concentration in SMSAs to measure enclave effects. An approach used by others [5, 9, 18, 23] uses percent Hispanic or Mexican in an SMSA as the enclave variable.

[3] Funkhouser [6] investigates the geographic concentration of all immigrant groups using the 5% sample of the 1980 Census and 1990 Census.

[4] For example, 47% of Mexican immigrants live in enclaves with more than 20,000 Mexican immigrants. In contrast, only 14% of other ethnic groups live in such areas. See Section IV for description of the data and sample.

[5] Bartel and Koch [2] find no change in the wages of immigrants that move to SMSAs with higher percentages of fellow countrymen.

TABLE 1

Studies of the Effect of Ethnic Concentration on Mexican Work Income

Author	Magnitude	Data	Empirical framework	Result
Bartel and Koch [2]	Small	1980 Census data	Log wage regression with dummy variables for individuals that changed SMSAs	Immigrants moving to SMSAs whose percent foreign population was smaller increased their wages
Koch [9]	Small	1980 Census data	Regression of log median family income includes the log of percent of ethnic group located in SMSA	1% increase in the number of immigrants in SMSA leads to a 2.3% decrease in median annual income of Mexican families
Bean and Tienda [3]	Medium	1980 Census data	Log earnings regression with categories for various levels of Hispanic concentration in SMSA labor markets	Mexicans living in areas with 10% or more Hispanics in labor market earn 7% less other Mexicans
Reimers [18]	Medium	1976 Survey of Income and Education	Log wage regression with state's percent Hispanic population	Mexican-Americans sacrifice 5.8% in wages for 1 1% increase in a state's Hispanic population
Smith and Newman [20]	Medium	1970 Census data	The real earnings of workers in Houston are compared to workers in three border cities, controlling for worker and area characteristics	Mexican-Americans living along the border sacrifice 8 to 10%of real income relative to those in Houston
Tienda and Wilson [21]	Large	1980 Census data	Log annual earnings regression with dummy variable for SMSAs who had greater than average percent Mexican workers in the labor force	Mexican men earn 10% less if they work in SMSA with high concentrations of fellow Mexican workers
Borjas [5]	Large	1980 Census data	Log annual earnings regressed on the supply of various labor force groups	A 10% increase in the supply of Mexican immigrants reduces own wages by 13%
Yuengert [23]	Large	1980 Census data for 150 largest SMSAs	Log earning regression of Mexican immigrants with percent Mexican immigrants in SMSA included in specification	1% increase in percent Mexican immigrant leads to a 11% reduction in the earnings of Mexican immigrants

The empirical framework of this paper follows the second set of studies by controlling for the Mexican population in the regressions below. However, rather than limiting the analysis to culture's effect on earnings, this study adds to the existing literature by analyzing culture's effect on rents. The empirical justification for analyzing both earnings and land rents comes from the model developed by Roback [19].

III. THEORETICAL FRAMEWORK

One explanation for the geographic concentration of Mexican immigrants argues that enclaves provide benefits valued by immigrants. Pecuniary benefits include self-employment opportunities [23] and increased opportunity for occupational achievement. Non-pecuniary neighborhood amenities found inside enclaves include information networks, social networks [16], and the ability to speak Spanish with others [7, 13]. Using Roback's [19] model, I incorporate such non-pecuniary cultural amenities into an individual's utility maximization problem.

Roback's model balances the trade-off between the cost of housing (land rents), earnings, and non-pecuniary benefits—enclave culture in this case. Although the quality of culture is not rooted to a specific geographic area by nature, the quality nonetheless results from the persistence of enclaves over time in a geographic area.[6]

Each location contains an amount c of cultural quality which enters the utility function of workers, immigrants (I) and natives (N). For any given location, immigrants and natives provide one unit of work and spend their work income W to consume an amount z of the numeraire commodity Z and R units of housing at price r per unit. Workers choose to reside in the location that maximizes utility U^*. The indirect utility in equilibrium is

$$V^j(W^j, r; c) = U^{*j}(Z^{*j}, R^{*j}; c) = v^j \tag{1}$$

for each type of workers $j = \{I, N\}$, where v^j is the maximum utility of each type of worker. In the case of immigrants, culture increases utility, and therefore $V_c^I > 0$.

The conditions that describe firms in equilibrium are derived from profit-maximizing behavior. At any given location, firms use immigrants, natives, and land (B) in a constant-returns-to-scale production function to produce the numeraire good.[7] Letting W^I and W^N be the price for the

[6]As LaLonde and Topel [11] point out, the geographic distribution of immigrants replicates itself over time, and thus the locational decisions of immigrants is exogeneous.

[7]Since the average Mexican workers has English skills and education levels much lower than the average native of any ethnic group, it is not unreasonable to assume that immigrants and natives are imperfect substitutes in production.

labor inputs, the firm's unit cost function C must equal the price of the output

$$C(W^I, W^N, r; c) = 1. \tag{2}$$

In equilibriums firms—just like workers—have no incentives to move.

The trade-off between earnings, rents, and culture is found by totally differentiating the indirect utility function and the cost function and solving for dW^I/dc and dr/dc. Under the working assumptions that culture is a neutral good for natives and firms,[8]

$$V_c^N = 0 \quad \text{and} \quad C_c = 0, \tag{3}$$

the reduced-form effects of culture on area rents and immigrant earnings are

$$\frac{dr}{dc} = \alpha\left[\frac{V_c^I}{V_W^I}C_{W^I}\right] > 0 \quad \text{and} \quad \frac{dW^I}{dc} = \alpha\left[-\frac{V_c^I}{V_W^I}\left(C_r + C_{W^N}R^N\right)\right] < 0, \tag{4}$$

where $\alpha = (R^I C_W^I + R^N C_W^N + C_r)^{-1} > 0$, $R^j = -V_r^j/V_W^j$ is the amount of residential land consumed by each type of worker, and C_X is the marginal increase in unit costs of hiring an additional unit of input X. Finally, the reduced-form effect of culture on the earnings of native workers is

$$\frac{dW^N}{dc} = \alpha\left[R^N\frac{V_c^I}{V_W^I}C_{W^I}\right] > 0. \tag{5}$$

Thus, the two equations in (4) demonstrate the earnings of immigrants fall in enclaves with greater levels of culture. Furthermore, the value of the enclave culture for immigrants can be derived from these results. The implicit price of culture for immigrants is

$$p_c^I = \frac{V_c^I}{V_W^I} = \frac{R^I r}{c}\frac{d\log r}{d\log c} - \frac{W^1}{c}\frac{d\log W^I}{d\log c}. \tag{6}$$

The important result from the Roback model is that the price of any local amenity must include the amount that is capitalized into rents.

[8] It is possible that large enclaves improve the information about the local labor market and thus improve the employer–employee match. This makes the firm more productive. However, since no general statement of the effect of culture on the firm's productivity can be made, the working assumption (with qualifications) is that culture is a neutral good.

It should be noted that this model does not attempt to explain how or where enclaves are formed. Nor does it guarantee the existence of enclaves. *Given the existence of enclave*, however, the model describes the equilibrium conditions. Since this paper is interested only in the comparative statistics, and not the dynamics, of enclave culture, the price of culture in (6) is well suited for this purpose.

IV. EMPIRICAL FRAMEWORK AND DATA

A. *Empirical Model*

Allowing for individual characteristics, the empirical specification implied by the reduced-form results is

$$\begin{aligned} \log \text{Income}_{ik} &= X_i \beta_W + A_k \gamma_W + \lambda_W \log c_k + P_k^M + \varepsilon_{ik}, \\ \log \text{Rent}_{hk} &= Y_h \beta_R + A_k \gamma_R + \lambda_R \log c_k + P_k^R + \nu_{hk}, \end{aligned} \tag{7}$$

where X is a set of human capital variables for immigrant i, Y consists of housing quality for household h, and A is a set of amenity variables common to all households and workers of area k; log Income is the log of annual immigrant work income and log Rent is the log of monthly housing costs for Mexican householders in town k. Lastly, $\log c$ is a measure of enclave size, defined as the log of the number of Mexicans immigrants. β_W, β_R, γ_R, γ_W, λ_R, and λ_W are variables to be estimated. ε and ν are individual-specific errors, and P_k^M and P_k^R are unobservable area characteristics, each distributed normally, $P_k \sim N(0, \sigma_P^2)$.[9] The random-effects procedure captures individual town heterogeneity that affects rents and earnings.

The coefficients of $\log c$ from the log rents and from the log earnings regressions are substituted into (6) to calculate the price of culture. Under the assumptions made in Section II, the sign of the culture coefficient in the earnings regression is theorized to be negative, and positive in the rents regression. Two further tests are implied by the Roback model. First, because other workers must be used in production, it is possible to test if these workers receive higher earnings in Mexican enclaves. Second, the assumption that other workers derive no utility ($V_c^N = 0$) implies that the price of culture calculated from Eq. (6) is zero for other workers.

[9] Moulton [14] demonstrates that estimating the earnings and rent equations by OLS results in biased standard errors due to intra-enclave error correlation. A random errors model is applied by including the location-specific error term, P_k. If $\sigma_P^2 = 0$, then (7) reduces to an OLS specification. This model reduces the danger of spurious regression and also improves the precision of the estimated coefficients.

B. *The Data*

Because approximately 75% of Mexican immigrants live in California and Texas, I use the 1990 5% Public Use Microdata Sample files for California and Texas to derive individual and household data. The dependent variable in the log earnings regression is the log of 1989 self-reported work income. The independent variables for this regression are a constant, age, age-squared, dummy variables for education level, English ability dummies, marital status, rural, citizenship status, and years in the United States dummy variables.

Years in the United States is included to control for the fact that information about U.S. labor markets increases with time in the United States, and for other aspects of the immigrant's life-cycle correlated with earnings. Since migrant networks steer immigrants to certain enclaves, it is unlikely the first job of immigrants will pay the wage appropriate for their skills. Over time, however, information about the labor market will increase opportunities and, therefore, reliance on these migration networks will decrease. Furthermore, increased levels of U.S.-specific skills, such as English, improve the labor market opportunities. As a consequence, Funkhouser [6] finds that after 15 to 20 years in the United States, immigrants move to less ethnically concentrated areas. Hence, more time in the United States reduces any compensating differential that new arrivals are willing to pay for information about labor markets in the United States.

To provide the purest test of the effect of culture on earnings, I concentrate on male Mexican immigrants between the ages of 18 and 64 meeting the following criteria. Mexican immigrants are those non-citizen males that state their Hispanic origin as Mexican and were born in Mexico. Furthermore, to minimize self-selection issues, self-employed persons and those in school are dropped from the sample. To estimate the effect of Mexican culture on other ethnic groups, similar sample selection criteria are applied separately to Mexican-Americans, non-Hispanic Asians and Whites (natives and immigrants), and native-born Blacks.

The dependent variable of the rents regression is the capitalized value of owner-occupied homes, or the reported gross rent (depending on renter status) of Mexican immigrant householders.[10] To control for housing quality, the regression includes a constant, year-built dummy variables, number of bedrooms dummies, whether there are more than two units in

[10] Linneman and Voith [12] find that the mean annual capitalization rate of owner-occupied homes is approximately 10%. The monthly amount (0.0083) is applied to the owner-reported house value. Since house values are reported in brackets, the midpoint of each bracket is used as the value of the house.

the structure, condominium status, rural dummy variable, and renter status.

I define an enclave based on the geographic structure of the Census, which assigns each person in the PUMS file to a Public Use Microdata Area (PUMA).[11] This census-defined area is a county-based region of approximately 200,000 persons. The measure of enclave size used in the regressions below is the log of the number of Mexican immigrants in the PUMA (log MI).

In addition to the immigrant and household-specific variables, several community variables that serve as controls for area amenities are included in each specification. The first two are calculated from the 5% PUMS file: the log of the area's population minus Mexican immigrants, and the percent of persons 25 years and older with a high school diploma. The remaining amenity variables are taken from the 1994 edition of the *County and City Data Book* (C & C). They are climate variables (mean January temperature and mean inches of rain), health measures (infant mortality per 1000 live births and the number of hospital beds per 100,000), and socio-economic status variables (serious crimes per 100,000, persons 16–19 years old not in school, and population density).

Location-specific variables from C & C are included in the specification to capture characteristics that affect rents and wages as suggested by the studies that use the Roback model. However, one drawback of using this data is that information is available only for incorporated cities with 25,000 persons or more. Due to this restriction, 283 out of 332 PUMAs are used in this study. However, the majority of deleted PUMAs are located where there are not many pockets of Mexican immigrants. Some large Mexican communities, however, such as East Los Angeles (unincorporated) and Delano (total population below 25,000), were dropped.[12]

C. *Summary Statistics*

The summary statistics for Mexican immigrants and California households are shown in Table 2. The unstandardized effects of enclave size can be seen by dividing the same into ''High'' and ''Low'' concentrations of Mexicans immigrants, where Low enclave areas are PUMAs with less than 15,000 Mexican immigrants and High enclave areas are PUMAs with more than 15,000 Mexican immigrants. The average work income of immigrants

[11] In deriving the enclave measure, it must be pointed out that these enclaves do not necessarily correspond to any one particular municipality. Because a PUMA corresponds to an area within a county consisting of about 200,000 persons, the same city may be located across different PUMAs, or more than one city may be located within one PUMA. Therefore, in order to incorporate the *County and City Data Book* (C & C) information into the analysis, all C & C variables are weighted by each city's population in the PUMA.

[12] The results are similar when all PUMAs are included. See footnote 13.

TABLE 2

Summary Statistics for Selected Variables: Mexican Immigrants and Householders[a]

Mexican Immigrants				Mexican Householders			
	All	Low	High		All	Low	High
Variable	Mean (std. dev.)	Mean (std. dev.)	Mean (std. dev.)	Variable	Mean (std.dev.)	Mean (std.dev.)	Mean (std.dev.)
Log rent	9.289	9.327	9.265	Log rent	6.245	6.262	6.235
	(0.839)	(0.844)	(0.835)		(0.761)	(0.789)	(0.744)
Income	14,315	14,998	13,875	Rent	675	705	656
	(11,440)	(12,645)	(10,570)		(535)	(602)	(491)
Mexican Immigrants	10,700	9,873	29.959	Mexican Immigrants	10,700	9,873	29,959
	(12,678)	(12,326)	(29,361)		(12,678)	(12,326)	(29,361)
Age	33.107	32.650	33.401	Renter	0.589	0.580	0.595
	(10.494)	(10.288)	(10.614)		(0.492)	(0.494)	(0.491)
Marital	0.645	0.647	0.643	Two units	0.375	0.383	0.370
	(0.479)	(0.478)	(0.479)		(0.484)	(0.486)	(0.483)
Rural	0.081	0.087	0.062	Rural	0.081	0.087	0.062
	(0.274)	(0.283)	(0.242)		(0.274)	(0.283)	(0.242)
Citizen	0.200	0.219	0.188	0 bedrooms	0.107	0.084	0.121
	(0.400)	(0.414)	(0.391)		(0.310)	(0.277)	(0.327)
No school	0.125	0.113	0.133	1 bedroom	0.296	0.286	0.302
	(0.331)	(0.317)	(0.339)		(0.456)	(0.452)	(0.459)
Grades 1–4	0.141	0.137	0.143	2 bedrooms	0.307	0.327	0.295
	(0.348)	(0.344)	(0.350)		(0.461)	(0.469)	(0.456)
Grades 5–8	0.298	0.302	0.296	3 bedrooms	0.224	0.231	0.220
	(0.458)	(0.459)	(0.457)		(0.417)	(0.421)	(0.414)
Grades 9–11	0.224	0.220	0.227	4 bedrooms	0.056	0.061	0.053
	(0.417)	(0.414)	(0.419)		(0.229)	(0.239)	(0.223)
High school graduate	0.121	0.127	0.117	5 bedrooms	0.010	0.012	0.009
	(0.326)	(0.333)	(0.321)		(0.101)	(0.110)	(0.095)
Some college	0.054	0.061	0.050	1989–90	0.023	0.017	0.026
	(0.227)	(0.239)	(0.219)		(0.148)	(0.129)	(0.159)

College degree	0.036	0.040	0.034	1985–88	0.081	0.074	0.085
	(0.186)	(0.195)	(0.180)		(0.272)	(0.261)	(0.278)
English only	0.033	0.031	0.034	1980–84	0.096	0.097	0.096
	(0.178)	(0.174)	(0.180)		(0.295)	(0.296)	(0.294)
Engl. very well	0.204	0.227	0.190	1970–79	0.189	0.208	0.178
	(0.403)	(0.419)	(0.392)		(0.392)	(0.406)	(0.382)
Eng. well	0.238	0.253	0.228	1960–69	0.194	0.203	0.188
	(0.426)	(0.434)	(0.420)		(0.395)	(0.402)	(0.391)
Eng. not well	0.341	0.345	0.339	1950–59	0.195	0.197	0.193
	(0.474)	(0.475)	(0.473)		(0.396)	(0.398)	(0.395)
Engl. not at all	0.184	0.145	0.209	1940–49	0.117	0.113	0.120
	(0.388)	(0.352)	(0.407)		(0.322)	(0.317)	(0.325)
Years in U.S. 0–3	0.133	0.135	0.132	Before 1940	0.106	0.091	0.115
	(0.340)	(0.342)	(0.338)		(0.308)	(0.287)	(0.319)
Years in U.S. 4–5	0.120	0.125	0.117	Condo	0.041	0.042	0.041
	(0.325)	(0.331)	(0.322)		(0.199)	(0.200)	(0.198)
Years in U.S. 6–8	0.101	0.110	0.096				
	(0.302)	(0.313)	(0.294)				
Years in U.S. 9–10	0.121	0.126	0.117				
	(0.326)	(0.332)	(0.321)				
Years in U.S. 11–15	0.199	0.193	0.203				
	(0.399)	(0.394)	(0.402)				
Years in U.S. 16–20	0.161	0.148	0.169				
	(0.367)	(0.355)	(0.375)				
Years in U.S. 21–25	0.074	0.071	0.075				
	(0.261)	(0.258)	(0.263)				
Years in U.S. 26–30	0.044	0.044	0.044				
	(0.206)	(0.206)	(0.206)				
Years in U.S. 31–40	0.037	0.039	0.037				
	(0.190)	(0.192)	(0.188)				
Years in U.S. 41 +	0.010	0.009	0.010				
	(0.099)	(0.095)	(0.101)				
Sample size	43,947	17,211	26,736	Sample size	47,079	17,521	29,588

Source: 5% 1990 PUMS file of California and Texas.

[a] Low enclave size is defined as PUMAs with fewer than 15,000 Mexican immigrants, and high enclave size is defined as areas with more than 15,000 Mexican immigrants.

is $14,315. However, in low areas the mean income is $14,998 and in High areas, $13,875. Overall, the plurality of immigrants have only 5–8 years of education. However, 20% of persons in High areas have at least a high school diploma, compared to 23% in Low areas. Also, about 53% of all immigrants do not speak English well or at all, but 21% of immigrants in High areas do not speak English at all, compared to 15% in Low areas. Lastly, around 48% of current immigrants have 10 years or less U.S. experience.

The mean rent is slightly higher in Low enclave areas and lower in High enclave areas, but the mean characteristics of housing quality differ across enclaves to some extent. Differences in housing quality that are not captured in average rents include the fact that homes have more rooms (and thus are larger) in Low enclave towns: 18% of homes in Low enclaves areas have four or more bedrooms, compared to 9% in High enclave areas. Similarly, only 12% of High enclave homes have no bedrooms, compared to 8% in Low enclave areas. Lastly, 9% of the homes in Low areas are rural areas, compared to 6% in High enclaves areas. As shown below, the apparent negative relationship between enclave size and rents is accounted for by differences in housing quality and other location-specific qualities.

V. RESULTS: THE EFFECT OF CULTURE ON MEXICAN EARNINGS AND RENTS

The results of estimating the equations in (7) are shown in Table 3. The two columns show the coefficients of the PUMA-level variables from random effects regressions log annual earnings and log monthly rents on quality characteristics of individuals and places. Consistent with the theory and with other studies shown in Table 1, an increase in enclave size reduces the earnings of Mexican immigrants. Of greater significance, however, is that increases in enclave size increases rents, holding other factors constant.

The estimates of the full specification in the first column imply that a 10% increase in the Mexican immigrant population of an enclave results in a 0.56% decrease in annual earnings and a 0.73% increase in monthly rent.[13] The price of culture reported at the bottom of Table 3 is the price of culture taken at the mean of enclave size (10,700), income (14,315), and rent (675).[14] The cost of moving from the averaged-sized enclave with an

[13] The rent and earnings equations were also estimated using the full PUMA sample. These regressions included the two PUMS community variables, plus a dummy variable for 283 PUMAs included in the original specification. The coefficient of log Mexican immigrants in the log earnings is -0.039 and in the log rents regression it is 0.105. Rents and earnings are higher in the 283 PUMAs of the original sample, but only rents are statistically higher.

[14] From Eq. (6), $12*(675/10,700)*(0.0725) - (14,315/10,700)*(-0.0560) = 0.1298$. The standard error of this estimate treats enclave size, income, and rent as constants.

TABLE 3

Regression Results: Mexican Immigrants and Households[a]

Variable	Log income regression Estimate (std. err.)	Log rent regression Estimate (std. err.)
Persons/sq. mile	0.1000	0.3750
	(0.038)	(0.049)
Crime/100,000	−0.0135	−0.0619
	(0.037)	(0.051)
Hospital beds/100,000	−0.6270	−3.707
	(0.547)	(0.708)
Infant mortality/1000	−0.0127	−0.0158
	(0.005)	(0.006)
January mean temperature	0.0014	0.0055
	(0.001)	(0.001)
Rainfall, average number of inches	0.0065	0.0091
	(0.001)	(0.002)
Log PUMA population excluding Mexicans immigrants	−0.0384	−0.2156
	(0.027)	(0.039)
Percent high school graduates	0.0013	2.0013
	(0.001)	(0.154)
Log Mexican immigrants	−0.0560	0.0725
	(0.013)	(0.016)
Price of Culture[b]	$0.1298	
(Std. err.)	(0.022)	

[a] The log income regressions also include a constant, plus the corresponding variables from Table 2. The log rents regressions also include the variables from Table 2, plus a constant term. The parameter estimates of Crime/100,000, Persons/square mile, and Hospital beds/100,000 are multiplied by 10,000.

[b] The price of culture refers to the increase in rents and decrease in earnings resulting from an additional Mexican immigrant, holding other populations constant.

additional 5,000 Mexican immigrants implies a compensating differential of $649 per year, or about $0.13 per immigrant. Given that most studies attribute the negative relationship between earnings and ethnic concentration as the compensating differential for enclave culture, it is important to note that excluding the impact on rents reduces the estimate of the compensating differential by 42%.[15]

However, since Eq. (6) is a function of the number of Mexican immigrants, I also estimate the price of culture at various enclave sizes. I divide the enclave population of Mexican immigrants into different sizes and then

[15] Using other measures of cultures yields statistically similar results. These alternative measures are the log of Spanish-speaking persons of Mexican descent and the log of persons of Mexican descent.

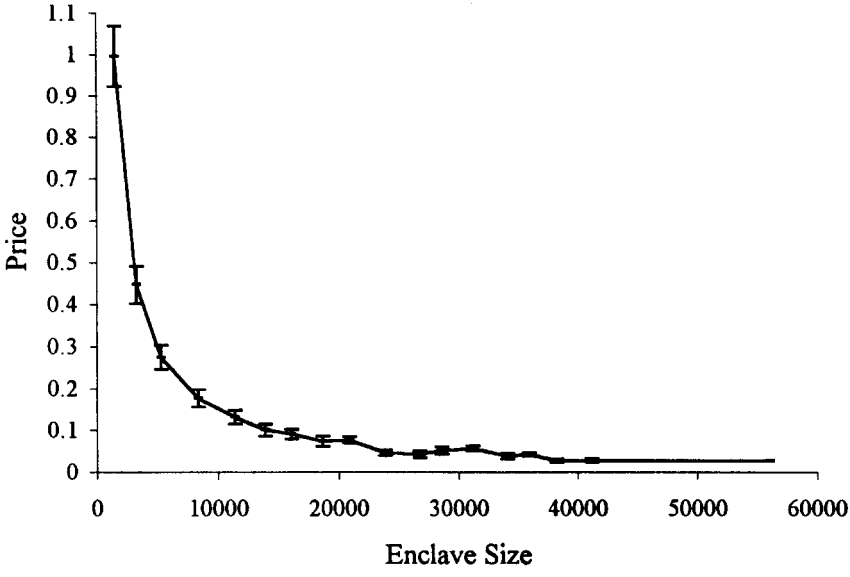

FIG. 1. Price of culture at various enclave sizes.

use the corresponding means in these areas to derive prices for Mexican culture. Figure 1 graphs the relationship between the level of culture and the price of culture at various enclave sizes, with the estimated standard error around each point. As shown there, the price decreases with higher levels of culture, from a high of $1 to a low of $0.03.[16] That is, immigrants living in enclaves with low levels of culture are willing to pay more for a 1% increase in culture than immigrants with high levels of culture. Since the price of culture is a marginal measure of the value of culture, moving from an enclave with 11,384 to one with 13,906 Mexican immigrants, implies a cost of culture of $328; then a move from the enclave with 13,906 to 16,085 Mexican immigrants implies a cost of $218. Therefore, a movement from the enclave with 11,384 immigrants to the enclave with 16,085 immigrants (or an increase of about 4,700 more immigrants) implies a cost of culture of $546 per year, for a per-immigrant price of $0.116.

The negative relationship between enclave size and rents described in Table 2 is reversed in the rents regression. The variable causing this reversal is the area's high school graduation rate. When the variable "percent high school graduates" is dropped from both specifications, the enclave coefficient in the earnings regression is slightly decreased to

[16]Specific estimates for all enclave sizes are available upon request.

−0.067, but in the rents regression this coefficient switches sign to −0.087. Since Mexicans, in general, have lower than average education levels, their concentration results in a negative relationship between high school graduation sizes and enclave size. These additional regressions imply that once differences in high school graduation rates across PUMAs are controlled for, Mexican culture is associated with higher rental prices. Thus, lower rents in the housing market is associated with lower education achievement, not Mexican culture per se.[17]

Although the model assumes that each PUMA is an individual labor market, I investigated the possibility that workers could avoid lower earnings by working outside the PUMA in which they live. One way of controlling for this possibility is to examine the effect of culture on the earnings of commuters. Empirically, I re-estimated the log earnings regression using only those with commutes of 30 minutes or less, and then again using those with commutes of 15 minutes or less. Approximately 81% and 40% of all Mexican immigrants have commute times that are less than or equal to 30 and 15 minutes, respectively. The enclave coefficient estimate for these commute times are −0.0519 and −0.0459, respectively. These coefficients are not statistically different from the original estimate of −0.056.[18]

The key point of the paper, however, remains that immigrants choose to rent houses in enclaves and, therefore, limit their job opportunities. Since an unrestricted set of job opportunities is always better than a restricted set, this implies that immigrants sacrifice earnings for culture by the virtue of living in enclaves. Evidence for this is provided by O'Regan and Quigley [15], who find that employment opportunities decrease with higher levels of minority concentration. Commuting, however, is one way of increasing job opportunities. This implies that immigrants in larger enclaves will have to travel farther than immigrants in smaller enclaves in order to attain the same set of job opportunities. Because those with long commutes reveal that they are willing to incur large commuting costs, this implies that the adverse employment opportunities in the enclave impacts them the most.[19] Therefore, it is not surprising to see a larger negative enclave coefficient among those with long commute times.[20] Conversely, those that do not

[17] The positive relationship between land rents and education could arise if the housing market places a premium on neighborhoods with educated residents, presumably because residents of this type embody "desirable" elements.

[18] The mean incomes of these immigrants ($14,709 and $14,572, respectively) imply that the prices of culture are $0.1263 and $0.1182, respectively.

[19] Immigrants with lower unobservable characteristics will be less successful than other immigrants in the enclave.

[20] The estimated coefficient among those with commute times of 31 (16) minutes or more is −0.705 (−0.795).

face adverse employment conditions in the enclave do not need to commute. Those with shorter commute times should have smaller negative enclave coefficient. The direction of the coefficients above are consistent with this hypothesis. At the margin, commuters and non-commuters accept lower earnings and pay higher rents for the enclave culture.

VI. CONSISTENCY WITH THE ROBACK MODEL

In the previous section, it was assumed that enclave culture is not an amenity for other workers or for producers. Under these assumptions, the model predicts that the earnings of native workers must be higher in enclaves because enclaves have higher land costs, all else equal. The model also predicts that the price of culture is zero for non-Mexican immigrant workers.[21] While these assumptions seem reasonable, it is possible to test for evidence against them.

The results of the test of the first hypothesis are shown in the first column of Table 4. The first column of Table 4 shows the coefficient estimate of the enclave variable Log MI($\hat{\lambda}_W^N$) from an earnings regression for Mexican-Americans, non-Hispanic Asians, native Blacks, and Whites, controlling for the same variables as in the earnings regression for Mexi-

TABLE 4

Tests of the Roback Model for Asians, Blacks, Mexican-Americans, and Whites[a]

	Test 1				Test 2
Ethnicity	Log MI ($\hat{\lambda}_W^N$) (std. err.)	Average income	Average rent	Log MI ($\hat{\lambda}_R^N$) (std. err.)	Price of culture[b] (std. err.)
Asians	0.037*	25,616	1364	0.101*	\$0.066
	(0.016)			(0.018)	(0.046)
Blacks	0.307*	18,895	663	0.112*	\$0.018
	(0.015)			(0.016)	(0.029)
Mexican-Americans	0.001	17,654	704	0.097*	\$0.075*
	(0.013)			(0.015)	(0.012)
Whites	0.045*	31,690	1158	0.138*	\$0.046
	(0.007)			(0.012)	(0.026)

[a] All variables used to estimate Eq. (7) are also included in each of these regressions. The sample size for the log earnings and log rent regressions are 20,080 and 37,335, respectively, for Asians; 20,643 and 53,934 for Blacks; 33,113 and 54,243 for Mexican-Americans; and 198,838 and 450,208 for Whites.

[b] The price of culture refers to the increase in rents and decrease in earnings resulting from an additional Mexican immigrant, estimated at the mean values of enclave size, income, and rent.

* Significant at the 1% level.

[21] It can be seen from Eq. (6) that since $p_c = V_c/V_W$, then $V_c = 0$ implies that $p_c = 0$.

cans. The coefficient of Log MI($\hat{\lambda}_W^N$) is positive for all four groups and is statistically significant at the 1% level for all groups except for Mexican-Americans. Thus, the general equilibrium prediction of the Roback model cannot be rejected. Since Mexican-Americans share a similar cultural heritage as Mexican immigrants, it is not surprising that they do not require compensation for higher rents.

The second hypothesis is that the price of culture for natives is zero. In other words, $p^N = [(rR^N)\hat{\lambda}_R^N - W^N\hat{\lambda}_W^N]c^{-1} = 0$, where rR^n is mean *annual* rent and W^N is mean annual income of natives. To estimate p^N, separate rent regressions for these ethnic groups are carried out using the same specification as for Mexican immigrants. In the second-to-last column of Table 4, the coefficient estimate of log MI($\hat{\lambda}_R^N$) is shown. And in the last column, the price of culture is estimated at the mean values of enclave size, rents, and incomes for each ethnic group; the standard error is reported in parantheses.

The *t*-statistic of they hypothesis that the price of culture is different from zero is 1.43 for Asians, 0.62 for Blacks, and 1.77 for Whites. For Mexican-Americans, however, the *t*-statistic is 6.25. Since the price of culture is not significantly different from zero at the 1 or 5% level for all of these ethnic groups save for Mexican-Americans, the hypothesis that Mexican culture provides no value for these groups cannot be rejected. Again, since Mexican-American share a similar cultural heritage as Mexican immigrants, the results of this test support the notion that Mexican-Americans derive some benefit from the culture in enclaves. It is interesting to note that the Mexican immigrants value enclave culture by about 43% more than Mexican-Americans.

VII. CONCLUSION

The empirical results of this paper indicate that studies of the compensating differential of enclave culture must include culture's impact on rents. The share of the compensating differential for enclave attributable to rents is 42%. Studies that examine only the effects of culture on work income underestimate the full cost of enclave culture.

The model presented here demonstrates how earnings and rents respond to non-pecuniary enclave amenities which encourage in-migration. Enclaves consisting of Mexican immigrants provide cultural amenities that attract immigrants, but the majority of immigrants fails to concentrate in only a few enclaves (despite economies of scale to enclave culture) because increases in land rents and decreases in work income sort immigrants across enclaves of various sizes. The price for the cultural quality in the average-sized enclave provided by an additional 5000 Mexican immigrants

is $649. This value represents approximately 4.5% of the average immigrant's income.

This paper also presented several ways of testing the assumptions employed to yield predictions from the model. The model is complicated by the presence of the utility of other groups and by the costs of firms, and it is, therefore, often necessary to make simplifying assumptions. Tests support the assumption that Mexican culture provides no value for Whites, Asians, and native Blacks. Interestingly, however, there is evidence that Mexican-Americans value enclave culture, although not as much as Mexican immigrants. Lastly, controlling for the correlation between Mexican concentration and low high school graduation rates reveals that Mexican culture has a positive effect on rents.

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