

**Job Creation in California's Enterprise Zones:
A Comparison Utilizing a Propensity Score Matching Model**

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Abstract

In California, 39 Enterprise Zones strive to revitalize depressed areas through business tax incentives. The California legislature continues to debate Enterprise Zone policy, but little is known about the effectiveness of the program over the past 15 years. Estimating the impact of the program has been difficult because no measures for accountability were established with the program. This study examines the impact of Enterprise Zones on employment growth for both census tracts and establishments. To estimate the value of the Enterprise Zone designation, EZ census tracts are matched to non-EZ census tracts using 1990 census data and a propensity score matching model. Annual establishment level employment data from 1992 through 1999 are used to estimate the impact of the program on growth in employment and wages. Enterprise Zones experienced significantly more growth in employment than similar census tracts that did not receive business tax incentives. Estimates suggest that the Enterprise Zone designation raises employment 2 to 3 percent each year. The number of employees at each business in an Enterprise Zone also rises more than employment at businesses that do not have the same tax incentives.

I. Introduction

The Enterprise Zone program in California began in 1985. Since then, 39 Enterprise Zones (EZs) have been established in the state, providing tax breaks to businesses that locate in the zones. The program has received bipartisan support despite inconclusive evidence on the effectiveness of tax-based development incentives. Previous research has been hampered by the difficulty of obtaining employment data within the physical boundaries of Enterprise Zones. This analysis uses census tract data and confidential establishment level micro-data to compare employment growth in Enterprise Zones to growth in matched areas. Between 1992 and 1999, employment grew about 23 percent in Enterprise Zones in California and only 15 percent in areas matched to Enterprise Zones based on 1990 characteristics. Simultaneously, wages in Enterprise Zones grew more slowly than wages in the matched areas. Overall, the Enterprise Zone program has resulted in significant positive growth in employment in zones.

Several previous studies have attempted to analyze the success of the Enterprise Zone program in California. Each of these studies has been constrained by the lack of satisfactory data on Enterprise Zones and lack of an adequate control group. In 1995 the California State Auditor compared employment growth in Enterprise Zones to growth in each zone's surrounding county [3]. Their analysis did not consider that the zones were chosen specifically because they were at a disadvantage. By matching zones to similar areas, the present study creates a more comparable control group. In the absence of the Enterprise Zone program, we could expect growth in zones to have advanced in ways similar to the matched areas.

Dowall, Beyeler, and Wong [6] also compared employment growth in zones to growth in the surrounding counties, under the assumption that in the absence of the Enterprise Zone program, growth in each zone should progress at the same rate as growth in the remaining county. They use a shift-share analysis where the share of growth attributable to the EZ program

is the residual growth in the Enterprise Zone after controlling for the average growth rates of particular industries and growth in the county as a whole. They estimated growth in Enterprise Zones using zip code data. A single Enterprise Zone may cross multiple zip code boundaries or may be a small portion of a single zip code. Using data aggregated at the zip code level to approximate growth in Enterprise Zones can provide only estimates of the actual growth within the zones. They conclude that Enterprise Zones remain at a competitive disadvantage relative to surrounding areas, but they are unable to ascertain how much worse off these areas would have been in the absence of the program.

Two recent studies of economic development apply more valid methodologies. Dardia [5] analyzes redevelopment agencies (RDAs) in California by matching RDAs to similar areas, and comparing employment growth in the RDAs to growth in the matched areas. He uses a least squares algorithm based on two variables, vacancy rates and poverty rates, to conduct the matching process. Greenbaum and Engberg [9] consider the impact of Enterprise Zones on the housing market in six states by comparing changes in housing prices for zip codes that contain Enterprise Zones with those that do not. They create a control group by estimating the probability that each zip code becomes an Enterprise Zone. They then isolate their analysis to all zip codes that fall in the middle third of the probability distribution, assuming that these zip codes represent valid treatment and control groups. This procedure, which eliminates zones that fall in the upper and lower thirds of the probability distribution, could eliminate areas that responded to the development incentives in distinct ways. Focusing solely on housing market outcomes may also distort the observed impact of the program, since many factors influence housing prices.

Building on these recent studies, this analysis matches census tracts that did receive the Enterprise Zone designation to tracts that did not receive the designation using 1990 census data.

A propensity score matching model is used. The propensity score is derived from a logit regression, where the probability that each census tract in California is designated as an Enterprise Zone is modeled as a function of census tract characteristics. Each Enterprise Zone census tract is matched to the non-EZ census tract that has the closest propensity score within the same county. Growth in employment, average monthly earnings, and number of firms in Enterprise Zones is then compared with growth in the matched tracts. Under the assumption that growth in the zones would have been similar to growth in the matched areas, the difference in growth in the two areas represents the effectiveness of the Enterprise Zone program. Fixed effects for each matched pair are also used to isolate the impact of the Enterprise Zone designation.

A second analysis exploits the firm level data. Firms that are observed at least two consecutive years provide estimates of the impact of the Enterprise Zone designation on a firm's ability to increase its workforce under zone incentives. Regression analysis compares employment at firms in Enterprise Zone with employment in firms not in Enterprise Zones. All findings suggest that employment grows more quickly in areas that receive the Enterprise Zone designation, particularly when the sample is limited to census tracts most similar to Enterprise Zones.

This study makes three innovations over previous research. The first is the creation of a comparable control group for Enterprise Zones through the use of the propensity score matching model. Second, this study uses data on the geographic location of individual firms, making it possible to isolate changes in employment conditions in small geographic areas. Finally, the establishment level analysis allows estimation of the impact of tax incentives on employment at firms in Enterprise Zones.

II. California's Enterprise Zone Program

The primary goal of California's Enterprise Zone program is to “create jobs for disadvantaged Californians.” Secondary goals include the “attraction, expansion, retention, and creation of business, industry, and commerce” and the “revitalization of economically distressed communities” [4]. At the time of the program’s origination, communities could apply for the Enterprise Zone designation if they had a population of at least 2500, high levels of poverty, low income growth, and high unemployment [1]. The application had to include a plan for revitalization, and communities were selected based on the feasibility of their marketing plans. For this reason, the areas selected are not necessarily the most depressed areas of the state. Enterprise Zones had to demonstrate their potential for growth in order to receive the designation. Geographically, Enterprise Zones range in size from one square mile up to 70 square miles.

Businesses receive tax incentives if they locate within the boundaries of an Enterprise Zone and employ targeted workers. These incentives include carry-forward of net operating losses, state tax credits for qualified employees, tax credits for purchases of machinery, and net interest deductions for those who lend to businesses in Enterprise Zones. The hiring credit is 50 percent of wages, up to \$8.62 an hour during the first year of employment. This credit is reduced by 10 percentage points each year until it is phased out completely by the sixth year of employment, making the total potential credit for one employee \$26,894 spread over five years. The estimated total cost to the state in lost tax revenue from the credit, the net operating loss, and the net interest deduction was near \$30 million each year in 1995 and 1996 (Franchise Tax Board (FTB), as reported by the California Trade and Commerce Agency, [4]).

III. Study Design and Methodology

Analyzing the effectiveness of Enterprise Zones presents challenges. Though we can observe job growth within the Zones and project that some of that growth is attributable to the Enterprise Zone program, we do not know how many jobs would have been created without the program. To find an appropriate control group, this study expands on Dardia's [5] model and draws on the procedure used by Greenbaum & Engberg [9] by using a propensity score matching model. The propensity score is the conditional probability that any census tract is designated as an Enterprise Zone, given the observed characteristics of the tract in 1990 [12].¹ Using the U.S. Census STF3A demographic and economic data for census tracts, each Enterprise Zone census tract is matched to a similar census tract that did not receive the EZ designation. The probability that each census tract receives the Enterprise Zone designation is estimated as a function of demographic and economic characteristics using a logit regression. Propensity scores are calculated as the estimated probability of becoming part of an Enterprise Zone. Each EZ census tract is matched to the non-EZ census tract with the closest propensity score within the same county.

A logit model of the probability of each census tract being designated an Enterprise Zone takes the form:

$$\Pr(y = 1) = \frac{e^{\beta'x}}{1 + e^{\beta'x}}$$

where $y = 1$ if the census tract becomes part of an Enterprise Zone and is zero otherwise, and X is a matrix of census tract characteristics. The selection of an area as an Enterprise Zone depends directly on unemployment, vacancy, and poverty rates, but other factors could play a role in the

¹ Enterprise Zones were designated throughout the late 1980s and 1990s. 1990 census data are used for the matching process because analysis of employment growth will focus on 1991 through 1999. The EDD employment data are unavailable prior to 1991. Matching on 1990 characteristics will ensure that zones and matched areas are similar prior to the period of analysis.

community's plan for development and in the selection process. Race, educational attainment, sectors in which residents are employed, distance to work, median income, age, poverty rate, share of the population receiving public assistance, unemployment rate, vacancy rate, and percent urban are included in the regression. A dummy variable is included for the county in which the tract is located.

Census tracts in Enterprise Zones are matched to tracts outside of Enterprise Zones based on the estimated propensity scores. Matching based on a propensity score reduces the challenge of matching on multiple characteristics and creates a control group comparable to one created by matching on all observable characteristics [11, 10].

Enterprise Zone incentives are expected to encourage businesses to locate in the targeted areas and should also help existing businesses succeed and expand as their cost of hiring targeted workers falls and their after-tax profits rise. These savings may or may not be passed on to workers in the form of higher wages. The effectiveness of the tax incentives should be most evident in employment growth and growth in the total number of firms in each Enterprise Zone. Growth in employment is composed of the increase in the number of workers at existing firms and the number of workers at new firms, minus jobs lost at firms that leave the zone. Relative to areas that are similar in 1990, Enterprise Zones should experience greater growth in employment and number of firms. Depending on the types of jobs created and the degree of unemployment in the labor market, wages may or may not be affected by the program. Since the hiring credit is only fully applied to wages below \$8.62, it is reasonable to expect that most jobs created have relatively low salaries.

To analyze growth in employment, earnings, and number of firms, simple tabulations are presented which compare growth in all census tracts within an Enterprise Zone to growth in census tracts matched to Enterprise Zones. In addition, regressions with fixed effects for each

matched census tract pair provide estimates of the impact of the Enterprise Zone designation across all Zones, while controlling for the employment that could have been expected in the absence of the program. These regressions take the form:

$$\ln(\text{Employment}_{t,ij}) = \alpha_j + \beta_1' \text{EZ}_{ij} + \beta_2' \ln(\text{Employment}_{t-1,ij}) + \beta_3' \text{Firms}_{ij} + u_{ij}$$

where i indexes census tracts, and j indexes a matched pair composed of an Enterprise Zone census tract and a non-EZ census tract from the same county.

A second analysis considers the impact of the Enterprise Zone designation on employment at firms that are observed for two or more consecutive years. The log of employment at each firm is modeled as a function of lagged employment at the firm, census tract characteristics, and whether the firm is in an Enterprise Zone. This analysis is conducted separately for all observed firms, for all firms located in high poverty census tracts, and for firms located in Enterprise Zones and matched tracts.

IV. Description of the Data

The matching process uses data from the 1990 U.S. Census STF3A, which provides economic and demographic characteristics for each census tract. Descriptive statistics for Enterprise Zone census tracts, the matched census tracts, and all census tracts in California are presented in Table 1. The similarity of the matched census tracts to the Enterprise Zone census tracts is evidenced by the small differences in averages across the two groups. The final column of averages across all tracts in California demonstrates that tracts most similar to Enterprise Zones have been selected as matches. Maps presented in Figure 1 illustrate the location of Enterprise Zone census tracts and matched census tracts, derived from the within-county matching procedure, in the San Jose area and the Los Angeles area. These maps demonstrate

that many of the matched census tracts are located near Enterprise Zones, but some are located some distance from the zones.

Annual establishment level data for employment and total payroll at all firms in relevant zip codes were obtained from the Employment Development Department (EDD). The EDD ES 202 data are assembled from unemployment insurance administrative records and includes number of workers, total payroll, and the physical address of each employer for the first quarter of each year, 1992 through 1999. Business addresses are geocoded to their geographic locations within California using GIS software and a database of street addresses based on 1997 Tiger Census address data. Over 500,000 businesses are matched to their corresponding census tracts each year. Summing the total number of employees, number of firms, and average monthly earnings within the tract creates annual observations between 1992 and 1999, for each census tract. The geocoding process successfully matched between 85 and 89 percent of the firms to their exact geographic location each year. Unmatched firms have characteristics similar to those for which geographic locations were found. Employment, earnings, and number of firms are calculated for each Enterprise Zone census tract and each matched census tract each year.

For the firm-level analysis, annual files are merged across years, by the name of the business. Businesses that appear in the data file for two consecutive years demonstrate how employment changes at existing firms in Enterprise Zones, compared to firms outside Enterprise Zones. Characteristics of the census tracts in which firms are located are used as control variables in the model. Annual employment at each observed firm is modeled as a function of Enterprise Zone status, lagged employment at the firm, and census tract characteristics.

V. Results

A. Propensity Score Matching Model

The propensity score matching model uses actual census tract observations to estimate the influence of specific factors on the probability of becoming an Enterprise Zone. Though it is impossible to find two census tracts that are identical, we can estimate the likelihood that any tract is designated an EZ based on the characteristics of tracts that actually become Enterprise Zones. By matching census tracts based on the likelihood that they become Enterprise Zones, we control for the factors that predisposed particular areas for receiving the special designation.

Logit regression results are presented in Table 2. As expected, low median income, high unemployment, and high vacancy rates significantly contribute to the probability of becoming an Enterprise Zone. Other factors, including race, educational attainment, and concentration of particular industries have an impact on the probability of becoming an Enterprise Zone. The estimated probability for each tract is calculated from the logit coefficients, and each Enterprise Zone census tract is matched to the census tract in the same county with the nearest propensity score.

B. Comparison of Enterprise Zones and Matched Areas

Tables 3 presents growth in employment, earnings, and number of firms for Enterprise Zones and matched areas between 1992 and 1999. In 1999, there were 342,377 more jobs in Enterprise Zone census tracts than there had been in 1992. Employment grew 22.7 percent in Enterprise Zones, while growing only 14.6 percent in areas matched to the zones. Some Enterprise Zones were established prior to 1992, and others were established between 1992 and 1997. Employment growth between 1992 and 1999 does not differ much between zones established prior to 1992 and those established after 1992.

Monthly earnings rose on average \$273, or 21.3 percent, between 1992 and 1999 in Enterprise Zones. Matched areas experienced an increase of 26.3 percent, or \$439, in monthly earnings. Since the tax credit for qualified employees reaches its maximum when the wage is \$8.62, it is logical that average earnings in zones did not rise as quickly as earnings in the matched areas.

Enterprise Zone census tracts had 10,979 more businesses in 1999 than in 1992. This 16.1 percent increase in the number of firms can be compared to a 21.4 percent increase in number of firms in matched census tracts. This discrepancy suggests that Enterprise Zones have attracted larger firms than areas that have not received the designation because overall employment grew more quickly in Enterprise Zones.

C. Multivariate Analysis

Table 4 presents regressions of the log of annual employment, earnings, and number of firms in each census tract, modeled as functions of annual Enterprise Zone status, and other covariates. The Enterprise Zone designation is only significant in the employment regression. The coefficient suggests that zone designation increases employment 1.7 percent annually. Employment is also higher in census tracts with high population, high housing values, low levels of poverty, large shares of the population working in farming and support sectors, low percentages of blacks, and tracts where workers have shorter commutes. Lagged employment and number of firms are also significant control variables.

Table 5 presents an analysis of the impact of the Enterprise Zone designation over time. Since Enterprise Zones in California were designated between 1986 and 1997, and observations run from 1992 through 1999, the impact can be isolated based on the number of years since each zone was designated. Using a methodology similar to that presented in Papke, the Enterprise Zone dummy variable is expanded based on the number of years since the zone was designated.

[11]. Column 1 presents coefficients for employment one through nine years after the Enterprise Zone was designated. For most years, coefficients are insignificant, but the coefficients are always positive, and close to the estimate from Table 4. The coefficient is positive and significant seven years after the Enterprise Zone was designated, suggesting that employment was 3.2 percent higher than in matched tracts.

A fixed effect for each matched pair is included in regressions presented in the last two columns of Table 5. The data for these regressions are limited to Enterprise Zones and matches where the match is very good.² The coefficient on Enterprise Zone status suggests that employment in Zones was 2.9 percent higher each year than it would have been in the absence of the program. Again, when the time-dependent impact is considered, most coefficients are not significant, but all maintain their positive sign.

Table 6 presents results from the firm-level regressions. Only firms observed at least two consecutive years are included in the regressions, so that lagged employment can be included as a control variable. There are almost 2.9 million observations of firms that are observed two consecutive years. The first column presents a regression of the complete data set, which includes all observed firms. The second column limits the regression to firms in census tracts that have a poverty level above 15 percent. This restricts the observations to census tracts that could possibly obtain the Enterprise Zone designation based on program rules. The third column limits the regression to firms located in Enterprise Zones or census tracts matched to the Enterprise Zone census tracts. In each of the regressions, the coefficient on the Enterprise Zone designation is positive and significant. As the data set is restricted to a more comparable control group of firms located in areas that face economic challenges, the magnitude and significance of

² The difference between the propensity scores in the match and in the zone is less than or equal to 0.02.

the coefficient increases. For the most restrictive regression, where only firms in Enterprise Zones or matched tracts are included, Enterprise Zones increase employment by 1.1 percent.

VI. Conclusions

The Enterprise Zone program improved economic development in the most depressed areas of California throughout the 1990s. Results suggest that Enterprise Zones experienced enhanced employment. Each year, employment was 2 to 3 percent higher in zones compared with areas that were most similar to the zones in 1990. Earnings did not rise as quickly in Enterprise Zones as in matched areas, but this finding was not statistically significant. The propensity score matching model provides a valid control group for Enterprise Zones, and results demonstrate that Enterprise Zones appear most effective when compared with this control group. Previous research that compares employment in Enterprise Zones to employment in areas dissimilar to Enterprise Zones may underestimate the impact of the program. The census tract and establishment level analyses effectively isolate the impact of the Enterprise Zone program.

Table 1: Descriptive Statistics for Enterprise Zones, Matched Areas, and all census tracts in California.

Characteristic	Avg. in EZs (st. dev.)	Average in Matches (st. dev.)	Avg. for All Tracts in CA (st. dev.)
Employment	1824 (4491)	1693 (4042)	1472 (3607)
Number of Firms	81.0 (148.7)	80.7 (135.8)	71.1 (115.6)
Monthly Earnings	1772 (892)	1759 (1140)	2133 (3437)
Median Income	26,284 (10,471)	25,550 (7200)	38,671 (17,177)
Unemployment	0.111 (0.063)	0.098 (0.043)	0.069 (0.048)
Share of women out of the labor force	0.475 (0.110)	0.470 (0.100)	0.424 (0.105)
Share of men out of the labor force	0.288 (0.116)	0.260 (0.112)	0.237 (0.107)
Vacancy rate	0.063 (0.061)	0.076 (0.082)	0.058 (0.061)
Share receiving Public Assistance	0.181 (0.115)	0.148 (0.072)	0.098 (0.087)
Share Urban	0.965 (0.154)	0.956 (0.177)	0.938 (0.212)
Population	5191 (2497)	6222 (3448)	5371 (2876)
% American Indian	0.008 (0.009)	0.010 (0.023)	0.008 (0.011)
% Asian	0.106 (0.132)	0.091 (0.109)	0.098 (0.109)
% Black	0.200 (0.241)	0.124 (0.195)	0.081 (0.156)
% White	0.471 (0.271)	0.539 (0.242)	0.687 (0.240)
% Hispanic	0.375 (0.281)	0.418 (0.280)	0.245 (0.227)
% Less than High School Education	0.408 (0.204)	0.398 (0.189)	0.249 (0.183)
% High School Grads	0.214 (0.074)	0.217 (0.063)	0.219 (0.070)
% Some College	0.239 (0.094)	0.245 (0.094)	0.297 (0.085)
% College Grads	0.138 (0.128)	0.140 (0.118)	0.235 (0.164)
Share working in Craft Industry	0.115 (0.044)	0.124 (0.048)	0.109 (0.049)
Share working in Farming	0.039 (0.071)	0.035 (0.068)	0.030 (0.061)
Share working as Operators/Laborers	0.198 (0.106)	0.193 (0.101)	0.133 (0.089)
Share working in Managerial/Professional	0.192 (0.122)	0.188 (0.105)	0.281 (0.141)
Share working in Service Industries	0.166 (0.068)	0.166 (0.061)	0.127 (0.059)
Share working in Sales & Support	0.289 (0.083)	0.293 (0.086)	0.319 (0.070)
Number of Obs.	802	240	5125

Figure 1: Maps of Enterprise Zone census tracts and matched census tracts for Los Angeles and San Jose Enterprise Zones. Enterprise zones are shaded light, matches dark.

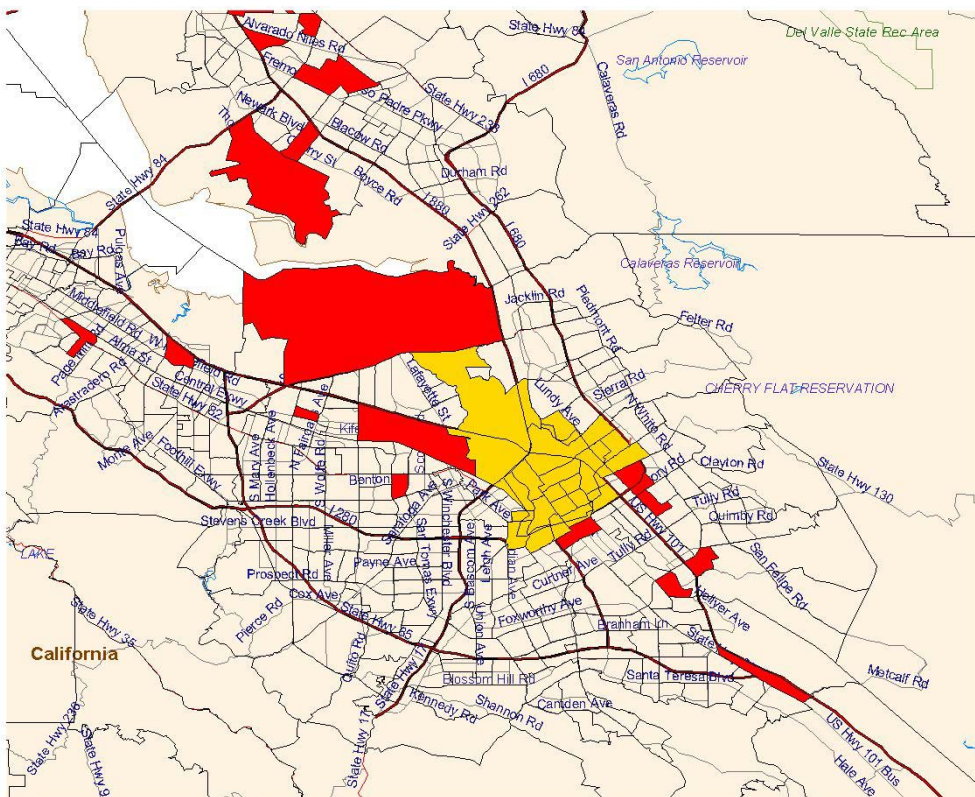
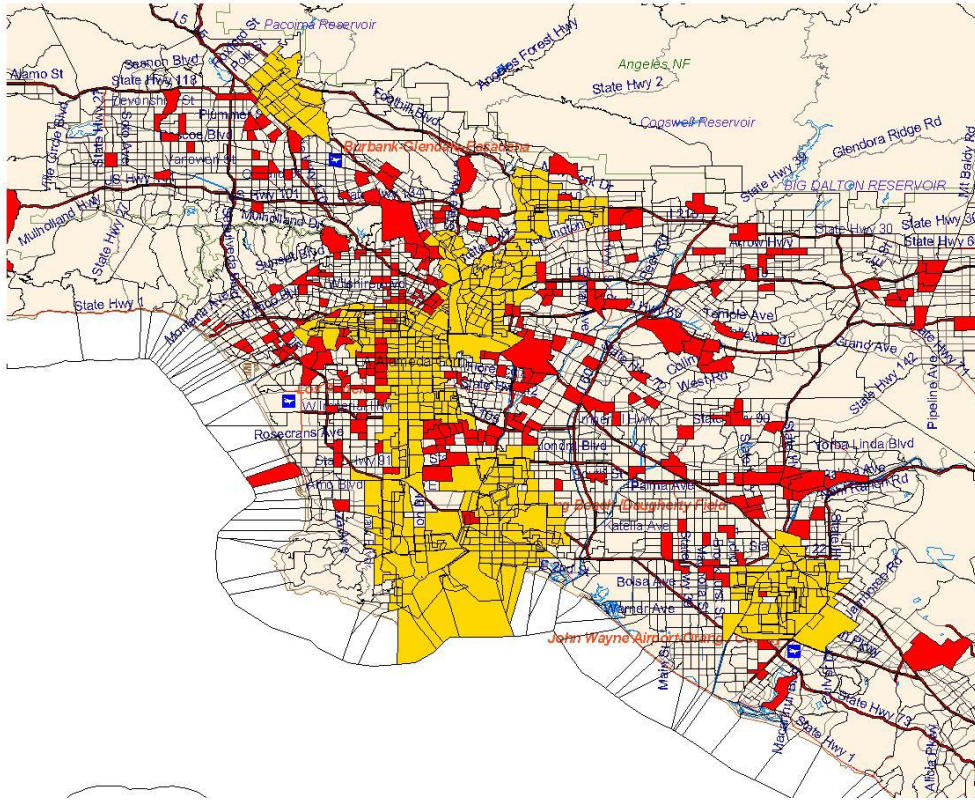


Table 2: Logit Regression Results of probability of receiving the Enterprise Zone designation, as a function of economic and demographic characteristics. Estimated probabilities, 'Propensity Scores,' from this regression are used to conduct the matching process.

Variable	Coefficient (standard error)
Median Income (1000's)	-0.143** (0.016)
Unemployment	3.633* (2.026)
Vacancy rate	2.138* (1.237)
Share receiving Public Assistance	1.660 (1.291)
Share Urban	-0.479 (0.501)
% American Indian	8.043 (5.647)
% Asian	-0.197 (0.678)
% Black	2.472** (0.525)
% Hispanic	2.499** (0.656)
% High School Grads	-6.523** (1.618)
% Some College	-5.518** (1.530)
% College Grads	-6.608** (1.490)
Share working in Farming	2.322 (2.194)
Share working as Operators/Laborers	0.697 (2.451)
Share working in Managerial/Professional	6.878** (2.226)
Share working in Service Industries	6.758** (2.374)
Share working in Sales & Support	9.451** (2.103)
Work Near Home	1.959** (0.299)
Log likelihood	-978.95
Pseudo R-Squared	0.509
Number of Obs.	4291

Dummy variables for each county are also included in the regression.

** Coefficient is significant at 5%

* Coefficient is significant at 10%

Table 3: Growth in employment, earnings, and number of firms between 1992 and 1999.

		1992-1999	Increase
Growth of Employment	EZ	22.7%	342,377
	Match	14.6%	58,268
	High Poverty	20.8%	432,623
	Statewide	12.5%	1,758,400
Growth of Monthly Earnings	EZ	21.3%	\$273
	Match	26.3%	\$439
Growth of Number of Firms	EZ	16.1%	10,979
	Match	21.4%	3801

Table 4: Effect of Enterprise Zone designation on employment, earnings, and number of firms by census tract.

Dependent Variable	Employment	Earnings	Number of Firms
Enterprise Zone	0.017* (0.008)	-0.002 (0.004)	0.048 (0.513)
Lagged Dependent Variable	0.903* (0.002)	0.739* (0.003)	0.964* (0.002)
Number of Firms (100's)	0.090* (0.003)	0.018* (0.001)	
Population	0.034* (0.007)	-0.010 (0.004)	-1.928* (0.474)
% High School Graduates	0.031 (0.070)	-0.168* (0.039)	1.502 (4.762)
% Some College	-0.032 (0.058)	-0.209* (0.033)	-4.555 (3.965)
% College Graduates	-0.037 (0.058)	-0.133* (0.033)	-1.575 (3.945)
Median Income (10,000's)	0.006 (0.003)	0.014* (0.002)	0.344 (0.226)
Median Rent (100's)	0.003 (0.002)	0.002 (0.001)	0.252 (0.155)
Median Value of Owner Occupied Housing (100,000's)	0.075* (0.039)	0.024* (0.002)	0.282 (0.263)
% Owner Occupied	-0.032 (0.017)	-0.065* (0.010)	-2.943 (1.172)
% in Poverty	-0.091* (0.047)	-0.048 (0.027)	-2.692 (3.216)
% Public Assistance	-0.004 (0.061)	-0.005 (0.035)	3.818 (4.187)
% Urban	0.047 (0.016)	0.021* (0.009)	2.091 (1.080)
% Vacant	-0.045 (0.047)	0.059* (0.027)	7.449 (3.210)
% Unemployed	0.0002 (0.094)	0.156* (0.053)	-1.440 (6.428)
% Farming	0.172* (0.074)	-0.223* (0.042)	3.168 (5.055)
% Service Sector	-0.019 (0.069)	-0.198* (0.039)	-3.456 (4.683)
% Support	0.136* (0.065)	-0.109* (0.037)	-1.740 (4.427)
% Long Commute	-0.236* (0.036)	-0.064* (0.020)	-8.854* (2.444)
% American Indian	-0.293 (0.234)	-0.095 (0.132)	-24.426 (15.962)
% Hispanic	0.034 (0.028)	-0.028 (0.016)	-3.946* (1.894)
% Asian	-0.032 (0.025)	-0.076* (0.014)	0.624 (1.705)
% Black	-0.068* (0.021)	-0.013 (0.012)	-4.789* (1.445)
Year Dummies	Yes	Yes	Yes
Observations	40,708	40,798	40,798
R-squared	0.91	0.68	0.92

Data from the EDD for Eureka and Fresno were incomplete, so these Zones are omitted.

Table 5. Time Dependent Impact of Enterprise Zone designation on employment growth in census tracts using within-county matches. Fixed effects for each matched pair (EZ & matched area) are included in the last two regressions.

	Year Since Designation	Fixed Effects	Fixed Effects
Enterprise Zone		0.029** (0.009)	
1 Year Since Designation	0.032 (0.021)		0.035 (0.025)
2 Years Since Designation	0.026 (0.020)		0.014 (0.579)
3 Years Since Designation	0.015 (0.020)		0.012 (0.025)
4 Years Since Designation	0.031 (0.019)		0.019 (0.024)
5 Years Since Designation	0.024 (0.018)		0.027 (0.022)
6 Years Since Designation	0.001 (0.018)		0.002 (0.022)
7 Years Since Designation	0.032** (0.016)		0.025 (0.019)
8 Years Since Designation	0.015 (0.019)		0.038* (0.021)
9 Years Since Designation	0.032 (0.024)		0.049* (0.028)
Employment Last Year (ln)	0.906** (0.002)	0.830** (0.005)	0.831** (0.005)
Number of Firms (100's)	0.060** (0.002)	0.121** (0.005)	0.120** (0.005)
Year Observed Dummies	Yes	Yes	Yes
Matched Pair Dummies	No	Yes	Yes
R-squared	0.91	0.92	0.92
Observations	44,275	11,698	11,698

The regression presented in column 1 includes the same control variables as Table 4.

* Significant at 10%, ** Significant at 5%.

Table 6: Effect of Enterprise Zone designation on log of number of employees at each firm, for firms observed at least two consecutive years.

	All Census Tracts	High Poverty Census Tracts (Poverty > 15%)	Enterprise Zones and Matched Tracts
Enterprise Zone	0.003* (0.001)	0.007* (0.002)	0.011* (0.002)
Employment Last Year (ln)	0.856* (0.0003)	0.863* (0.0004)	0.862* (0.002)
Population (ln)	-0.026* (0.001)	-0.021* (0.001)	-0.021* (0.003)
% High School Graduates	0.008 (0.013)	0.124* (0.018)	0.129* (0.027)
% High School Dropout	-0.051* (0.010)	0.059* (0.014)	0.036 (0.024)
% College Graduates	-0.016 (0.010)	0.127* (0.015)	-0.073* (0.024)
Median Income (10,000's)	0.017* (0.007)	0.005* (0.002)	0.024 (0.027)
Median Rent (100's)	0.004* (0.0004)	0.006* (0.0008)	0.015 (0.001)
Median Value of Owner Occupied Housing (100,000's)	0.006* (0.0005)	0.002* (0.0008)	0.004* (0.001)
% Owner Occupied	0.010 (0.003)	0.029* (0.004)	0.011 (0.007)
% in Poverty	-0.047* (0.008)	-0.018 (0.009)	0.019 (0.014)
% Public Assistance	-0.027* (0.009)	-0.003 (0.011)	0.032 (0.018)
% Urban	0.010* (0.003)	0.019* (0.005)	-0.060* (0.011)
% Vacant	0.001 (0.009)	0.008* (0.013)	0.020 (0.019)
% Unemployed	0.081 (0.015)	0.004 (0.017)	0.224* (0.029)
% Farming	-0.016 (0.016)	-0.033 (0.019)	-0.055 (0.033)
% Service Sector	-0.134* (0.016)	-0.115* (0.020)	-0.019 (0.031)
% Support	0.006 (0.015)	-0.073* (0.020)	0.098 (0.031)
% Long Commute	-0.107* (0.008)	-0.135* (0.012)	-0.060* (0.020)
% American Indian	-0.318* (0.053)	-0.412* (0.060)	-0.492* (0.091)
% White	0.042 (0.007)	0.028* (0.007)	-0.035* (0.010)
% Asian	0.108 (0.008)	-0.040* (0.009)	-0.002 (0.014)
% Black	0.105* (0.008)	0.069 (0.009)	-0.036* (0.014)
Year Dummies	Yes	Yes	Yes
Observations	2,896,671	1,403,491	524,067
R-squared	0.73	0.74	0.74

References

1. R. Bostic, Enterprise Zones and the Attraction of Businesses and Investment: The Importance of Implementation Strategies and Program Incentives, *Federal Reserve Board*, Washington DC (1996).
2. California Employment Development Department, ES 202 data, Sacramento (1991-1999).
3. California State Auditor, Trade and Commerce Agency: The Effectiveness of the Employment and Economic Incentive and Enterprise Zone Programs Cannot Be Determined, *Bureau of State Audits* (1995).
4. California Trade and Commerce Agency, California Enterprise Zones: 1998 Annual Report, Lon Hatamiya, Secretary (1999).
5. M. Dardia, 1998, Subsidizing Redevelopment in California, *Public Policy Institute of California* (1998).
6. D. Dowall, M. Beyeler, and S. Wong, Evaluation of California's Enterprise Zone and Employment and Economic Incentive Programs, *California Policy Seminar Report*, University of California (1994).
7. D. E. Dowall, An Evaluation of California's Enterprise Zone Programs, *Economic Development Quarterly*, Vol. 10, No. 4 (1996).
8. J. Engberg and R. Greenbaum, State Enterprise Zones and Local Housing Markets, *Journal of Housing Research*, Vol. 10, Issue 2 (1999).
9. R. Greenbaum and J. Engberg, An Evaluation of State Enterprise Zone Policies, *Policy Studies Review*, Vol.17:2/3 (2000).
10. D. I. Levine and G. Painter, The Costs of Teenage Out-of-Wedlock Childbearing: Analysis with a Within-School Propensity Score Matching Estimator, Working Paper (2000).
11. L.E. Papke, Tax Policy and Urban Development: Evidence from the Indiana Enterprise Zone Program, *Journal of Public Economics*, Vol. 54, (1994).
12. P. R. Rosenbaum and D. B. Rubin, The Central Role of the Propensity Score in Observational Studies for Causal Effects, *Biometrika*, Vol. 70, Issue 1 (1983).
13. U.S. Dept. of Commerce, Bureau of the Census. CENSUS OF POPULATION AND HOUSING, 1990 [UNITED STATES]: SUMMARY TAPE FILE 3A [Computer file]. Washington, DC: U.S. Dept. of Commerce, Bureau of the Census [producer], 1992. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor] (1993).