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Do Enterprise Zones Work? An Analysis at the Borders

Stephen Billings  
*University of Colorado*

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Center for Economic Analysis  
Department of Economics



University of Colorado at Boulder  
Boulder, Colorado 80309

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## Abstract

This paper analyzes Enterprise Zones in Colorado in order to study the relationship between geographically targeted tax credits and the location of new businesses and jobs. Enterprise Zone (EZ) programs provide tax incentives for investment and job creation in economically lagging regions. While most states have EZ programs, past program evaluations have found a mixture of effectiveness. This research improves upon existing literature by utilizing both establishment-level data and a border effects methodology to: 1) control for unobservables that influence the self-selection of EZ regions and 2) highlight EZ impacts across different industries. Results find that while EZ fiscal incentives have no impact on where new establishments locate in Colorado, they do increase the number of employees hired. Industry results highlight the heterogeneity of tax credit impacts within the EZ Program. Results are robust to a variety of specifications for land use controls and in comparison to a propensity score matching model.

**JEL Classification: H25, H71, and R12**

**Keywords: Enterprise Zones, State and Local Economic Development, Taxes and Location of Economic Activity**

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\*Department of Economics, University of Colorado, 256 UCB, Boulder, CO 80309. Phone: (720) 837-4017, Email: [stephen.billings@colorado.edu](mailto:stephen.billings@colorado.edu)

# 1 Introduction

State and local governments' economic development strategies commonly include tax incentives to attract mobile capital and workers (Bartik (1996)). Since the early 1980s, a majority of U.S. states have implemented Enterprise Zone programs that provide tax credits for investment and job creation in targeted geographic areas within a state.<sup>1</sup> These programs are costly, with Peters and Fischer (2002) finding that Enterprise Zone tax credits were valued around \$5,000 per job for the twenty most industrialized states during the 1990s. Existing empirical studies indicate that the impacts of Enterprise Zone (EZ) programs range from positive to even negative on a variety of outcome measures, including employment, wages, investment, and housing prices (Wilder and Rubin (1996) and Boarnet (2001)).<sup>2</sup>

One significant problem in estimating the effects of EZ programs is that EZ areas are often economically different than non-EZ areas. Since these economic differences likely influence which regions are designated Enterprise Zones, the problem of self-selection of EZ areas will bias resulting program evaluation. Self-selection occurs in two stages of the EZ designation process.

First, eligibility criteria typically require above-average unemployment and/or low income levels to become a qualifying region.<sup>3</sup> These eligibility criteria are correlated with unfavorable economic conditions, which can influence the entry of businesses and the hiring of workers. Separating out EZ tax credit effects from local economic conditions requires the creation of adequate control and treatment groups.

Second, these areas must apply at a state level to receive EZ designation. Some states further complicate the process by requiring applicants to create an economic development plan (including Colorado). an eligible EZ area must apply to the state in order to receive EZ designation. The self-selection that occurs at this stage of EZ designation is due to the role of local institutions or community leaders that organize and complete the applications. Also, these institutions and the

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<sup>1</sup>According to Peters and Fischer (2002), approximately forty states as well as the District of Columbia have implemented an EZ program in one form or another. While these programs vary in specifics they are all aimed at stimulating economic development in depressed areas.

<sup>2</sup> Given that tax credits should only benefit businesses, the finding of negative impacts highlight the difficulty in controlling for other factors that influence business location and hiring decisions.

<sup>3</sup>High unemployment, low income, and high poverty rates relative to a state's average are used as part of eligibility criteria for most states (Peters and Fischer (2002)).

community leaders themselves influence local economic conditions and subsequent growth rates of EZ areas. This community effect likely varies over time as the application process is completed, designation is determined, and businesses obtain information about the availability of tax credits. This type of self-selection lacks quantifiable measures, which limits most empirical analysis.

This paper introduces a new methodology of program evaluation that will control for unobservables that may influence the self-selection of EZ regions. In particular, this paper uses establishment-level microdata and digitally coded EZ boundaries to match a sample of establishments in close proximity but on opposite sides of the EZ policy border.<sup>4</sup> Matched establishments are then measured with respect to employment and business location outcomes in EZ areas. These outcome measures are based on Colorado’s EZ tax credits, which “provide incentives for private enterprise to expand, for new businesses to locate in economically depressed areas and to provide more job opportunities for residents of such areas (EZ Annual Report [Colorado \(1998\)](#)).”

Border matching, along with controls for land use, isolates the difference between the EZ and non-EZ areas by the availability of tax credits; Corresponding differences in establishment and employment outcomes therefore indicate the effectiveness of Colorado’s EZ program. Several more specifications, including a comparison of results to a propensity score matching model, highlight the robustness of results for employment and establishment location results.

Results find that EZ tax credits in Colorado insignificantly impact an establishment’s location decision; They do however, generate between 1.5 and 1.8 more employees for new establishments locating within an EZ and 0.0 to 0.3 more employees for existing establishments located within an EZ. When delineating new establishments by industry, results find mixed impacts across industries, accentuating the limited role that EZ tax credits have on location decisions. Yet, manufacturing, which receives additional tax credits, consistently generated positive impacts for new establishments. Results also pinpoint the presence of factor specific impacts with a few 1 digit Standard Industrial Classification (SIC) industries (Agriculture, Construction, and Retail) experiencing different impacts for employment and location trends in response to EZ tax credits.

This study provides two significant contributions beyond previous research. First, a border

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<sup>4</sup>Of note is the terminology used throughout this paper, establishments are single, physical locations, while a firm is the legal entity through which an establishment is formed. Establishments are subsets of firms.

matching estimation strategy controls for observable and unobservable factors that influence the self-selection of EZ regions. Second, specific industry results provide a disaggregated assessment of EZs across all industries, which allows an analysis of industry-targeted incentives within Colorado's EZ program. This paper will begin with a discussion of relevant literature in Section 2 and provide details of Colorado's EZ program in Section 3. Section 4 will provide a discussion of the data and empirical methodology. Sections 5 and 6 will provide impacts for Colorado's EZ program and Section 7 breaks down analysis for specific industry effects.

## 2 Related Literature

One of the first econometric studies that controls for the endogeneity of EZ designation is [Papke \(1994\)](#)'s analysis of the state of Indiana's EZ program. Using a panel of local taxing jurisdictions with similar industrial employment in both Enterprise Zones and non-Enterprise Zones, Papke concluded that EZ designation resulted in an 8% increase in the value of inventories and that there was a 19% reduction in unemployment claims.<sup>5</sup> [Boarnet and Bogart \(1996\)](#) analyzed the effects of EZ designation on employment and property value in the state of New Jersey. They found that EZ designation had no significant effect on employment or property values by using an experimental approach in which the municipalities designated EZs were the treatment group and those municipalities that qualified, but were not designated EZs served as the control group.

[Engberg and Greenbaum \(1999\)](#) estimate the capitalization of EZ tax credits in the local housing market, and find that Enterprise Zones have no impact of housing prices. This indirect measure of EZ impacts is useful for measuring overall residential impacts of EZs, but it is unclear whether new jobs that may go to residents outside the EZ or if proximity to certain types of businesses would have positive or negative impacts on local residents. In an examination of five different state EZ programs, [Bondonio and Engberg \(2000\)](#) find no impact on employment and results are robust to variations in the characteristics of the programs in terms of monetary amounts or program

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<sup>5</sup>This methodology represents propensity score matching based on industrial composition. For Enterprise Zones, this technique involves creating a control and treatment set of EZ regions based on characteristics such as industrial composition, income, population, and matching similar regions which only differ in EZ status. The matched border technique used in this paper represents a form of Propensity Score Matching based on location relative to the EZ border.

characteristics.

O’Keefe (2004) ’s study of the California EZ program addresses aggregation biases in past studies and allows for propensity score matching by census tract through the use of establishment-level data. She finds that Enterprise Zones raise employment by three percent each year during the first six years after designation. The amount given for EZ tax credits as well as the estimated impacts on employment decrease after the sixth year.

Greenbaum and Engberg (2004) further contribute to the literature with an analysis of urban Enterprise Zones in six states. This paper uses longitudinally linked manufacturing data which allows more detailed information on EZ programs than previous studies. Propensity score matching and difference-in-difference estimation was used to base comparisons between non-EZ and EZ zip codes and found that EZ programs had a positive effect on the birth of new establishments, but a negative effect on retaining establishments. The absence of consensus among these studies of EZ programs can be attributed to variations in methodologies and EZ program characteristics.

A few papers provide examples of incorporating a border effects methodology for policy and program evaluation. Holmes (1998) study of state right to work laws incorporates the idea that any unobservable characteristic is unlikely to vary between businesses in a small geographical area. Using the configuration of states with right to work laws, he then examined the differences in employment growth between bordering counties that differ in state right to work laws. Bronars and Lott (1998) examined concealed weapon laws using differences across state borders and found that “shall issue” concealed gun laws create geographic spillovers in crime to neighboring counties without such laws. Finally, Holcombe and Lacombe (2004) use a “matched” border technique to find that AFDC and food stamp programs have a positive impact on the number of female-headed households and a negative effect on female labor force participation. In these border methodology studies, the data used are at a larger scale than this study of Colorado’s EZ program. Black (1999) provides a comparable methodological approach to value school quality. Her analysis at the border of school attendance zones finds a positive impact of primary school test scores on housing prices.

### 3 Colorado's Enterprise Zone Program

Colorado's Enterprise Zone Program began in 1986 and currently limits the number of distinct enterprise zones to 16.<sup>6</sup> Fourteen of the 16 zones were formed by 1990, the Jefferson County EZ formed in 1991, and the Larimer County EZ formed in 1993.<sup>7</sup> The sixteen EZs vary in size from urban EZs of less than a square mile to rural, multi-county EZs containing over a thousand square miles. Results from analyzing EZs in Colorado are overwhelmingly driven by urban EZs and the border matching methodology limits conducting a separate analysis of sparsely developed rural EZs. Overall, 22.8% of establishments that existed between 1990 and 2000 were located within an EZ.<sup>8</sup> Eligibility for EZ designation requires the area to have a population of less than 80,000 and meet at least one of the following criteria:

- 1) Unemployment rate at least 25 percent above state average.
- 2) Population growth rate less than 25 percent of the state average.
- 3) Per capita income less than 75 percent of the state average.<sup>9</sup>

An eligible jurisdiction must then create an economic development plan and apply for EZ designation with the state. EZ boundaries include some combination of census or political geographies (e.g. census tracts, zip codes, etc.) in order to demonstrate eligibility using readily available census or state data.<sup>10</sup> An establishment can locate or increase employment within an EZ to receive a number of different tax credits, most of which are for investment and job creation.<sup>11</sup> Some tax credits are linked to specific industries and/or activities including agriculture, manufacturing, mining, and research and development. A three percent investment tax credit is offered to businesses

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<sup>6</sup>This is based on existing legislation in 2000.

<sup>7</sup>Given that the data in this analysis is limited to 1990 through 2000, the Jefferson and Larimer County EZs were examined separately with pre and post EZ designation observations and the number of observations were too limited for any conclusions.

<sup>8</sup>Based on author's calculations

<sup>9</sup>These eligibility requirements are based on Colorado State Statute: Urban and Rural Enterprise Zone Act (Title 39, Article 30)

<sup>10</sup>In a few cases, EZ boundaries are designated at a subcensus or political geography. In these cases, EZ boundaries are created around only commercial land use and designation is based on the larger geographies' characteristics. These cases are almost all excluded from border analysis because of the lack of observations outside the EZ. Results are unchanged when these specific EZs are excluded.

<sup>11</sup>See Appendix for details on Colorado Enterprise Zone Tax Credits.

making investment in equipment used exclusively in an EZ. This investment tax credit accounted for nearly 70 percent of all EZ tax credits (EZ Annual Report [Colorado \(1996\)](#)). The second most commonly used tax credit is that of the \$500 per job created, given to new establishment jobs or for employment expansion by existing establishments (EZ Annual Report [Colorado \(1996\)](#)). The total amount of tax credits used is substantial, as Colorado averaged \$30 million a year in foregone tax revenue due to the EZ program between 1986 and 1996. The amount has increased to over \$60 million annually between 2000 and 2005 (EZ Annual Report [Colorado \(2005\)](#)).

A previous analysis of the Colorado EZ program was done by [Alm and Hart \(1998\)](#). Using 1980 and 1990 Census data, they concluded that the program has positive and significant impacts on both employment growth and per capita income. [Lynch and Zax \(2004\)](#)'s study of Colorado's EZ program finds EZ status had a positive impact of 9.8 employees for each establishment that existed in 1990 and survived until 2000 using a Tobit model. The incorporation of a Heckman selection model produced reverse results, by showing a negative impact of 19.7 employees.

## 4 Methodology

To properly measure Colorado's EZ tax credits targeted for investment and job creation, one has to model how different tax credits will influence an establishment's profit maximizing choices of location, investment, and employment. Since EZ tax credits are primarily targeted to new establishments in Colorado, modeling their behavior is based on two decisions. An establishment chooses a location for its business and its corresponding level of capital and labor. The availability of tax credits should encourage businesses to locate in EZ regions and also lower the costs of expanding existing businesses. The effects on entry are a result of business owners recognizing the value of EZ tax credits, and new businesses forming that would not expect profitability to outside the EZ. The amount of job creation due to new businesses will depend on industry characteristics, as well as EZ incentives for employment. The effects of EZ tax credits on entry and employment will provide a measurement of the overall effectiveness of the EZ program in Colorado.<sup>12</sup>

As discussed, a number of methods have been employed in past research to control for the self-

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<sup>12</sup>The unavailability of data on capital limits directly measuring impacts on capital intensity.



selection of EZ regions. The use of propensity score matching models and difference-in-difference techniques controls for observable factors and existing EZ region trends that can influence EZ designation. One issue not controlled for in these techniques is the presence of unobservable factors, which may vary over time and are correlated with EZ designation and the entry and/or employment decisions of an establishment. A difference in difference methodology may control for some unobservable confounding variables, but this technique has an underlying assumption that unobservable factors are time invariant (Cameron and Trivedi (2005)). Intuitively, factors that influence EZ designation affect the growth rates of outcome variables in an EZ area versus non-EZ area. Greenbaum and Engberg (2004) discuss the potential problem that EZs may have fundamentally different growth trends, which requires a time-variant technique to control for self-selection factors. Since the change in growth rates results in different time trends of outcome measures, this makes difference in difference estimation dependent on time trends that are correlated with EZ designation. Resulting estimates will therefore depend on which time intervals are used for differencing.

A border matching methodology that matches only EZ and non-EZ areas in close geographical proximity will control for time-varying unobservables by limiting comparisons between EZ and non-EZ outcomes to neighboring commercial areas. The idea that locations close together are more alike is well established in the geography literature as Tobler's Law and forms the basis for spatial econometric models. Extrapolating this idea to EZ regions is straightforward because factors such as crime, access to markets, and agglomeration economies are likely to be the same within a small area. Therefore, a policy border allows a segmentation of commercial areas into control and treatment groups. The control group is represented by the area just outside the EZ policy border and the treatment group is the area just inside the EZ policy border. Since EZ tax credits focus on new businesses and jobs, an establishment's location decision will take existing economic conditions and the EZ policy border as exogenous. Therefore, the estimated impacts of EZ tax credits is represented by the differences in business location trends or employment between the non-EZ and EZ areas.

## 4.1 Econometric Methodology

The above discussion on different econometric methodologies is formalized here. Let outcome measure of establishment  $i$  in region  $j$  at time  $t$  be represented by:

$$Y_{i,j,t} = \alpha D_{j,t} + \beta Z_{j,t-1} + \theta X_i + \gamma_t + \varepsilon_{j,t} \quad (1)$$

In Equation 1,  $Y_{i,j,t}$  is the outcome measure of interest,  $D_{j,t}$  is an EZ status indicator variable,  $Z_{j,t-1}$  represent existing region characteristics,  $X_i$  represent establishment characteristics and  $\gamma_t$  is a time-fixed effect. Of note is that  $\varepsilon_{j,t}$  has a region and time component, which highlights that unobservable factors may vary by region and over time. Of concern in any program evaluation is that  $D_{j,t}$  and  $Z_{j,t-1}$  are correlated with  $\varepsilon_{j,t}$ . A propensity score model allows only comparisons of regions with similar values of  $Z_{j,t-1}$ , thereby eliminating any correlation of  $Z_{j,t-1}$  with  $\varepsilon_{j,t}$ . The presence of a correlation between  $D_{j,t}$  and  $\varepsilon_{j,t}$  may still exist due to unobservable factors captured in  $\varepsilon_{j,t}$ . Differencing out the lagged dependent variable eliminates time invariant unobservables in  $\varepsilon_{j,t}$ , and removes  $\theta X_i$  from equation 1, resulting in Equation 2.

$$\Delta Y_{i,j,t} = Y_{i,j,t} - Y_{i,j,t-1} = \alpha \Delta D_{j,t} + \beta \Delta Z_{j,t-1} + \Delta \gamma_t + \Delta \varepsilon_{j,t} \quad (2)$$

The idea that unobservables, which are correlated with EZ designation, change over time and that this changes growth trends in EZ areas are not removed by difference in difference estimation because the time component of  $\Delta \varepsilon_{j,t}$  may be correlated with  $\Delta Y_{i,j,t}$ . Border matching accounts for the correlation between  $D_{j,t}$  and  $\varepsilon_{j,t}$ , thereby eliminating any factors that influence EZ designation and outcome variable,  $Y_{i,j,t}$  as well as only comparing regions with similar growth trends. Resulting estimates of  $\alpha$  in Equation 1 can be measured as the difference between levels of outcome variables between the border area inside the EZ versus the border area outside the EZ area for a given year.

## 4.2 Exogeneity of Border Location

Border matching assumes an exogenously determined policy border. If factors that influence the border of the EZ also influence outcome measures, then this assumption is invalid. The EZ desig-

nation process limits the location of the EZ border in two manners. First, state legislation limits the population contained within an EZ, which limits the size and expansion of an EZ area. Second, EZ boundaries are limited to census or political geographies in determining eligibility based on unemployment, income, or population growth measures. Other factors related to neighborhood characteristics that may influence EZ designation are unlikely to vary significantly in such a small geographic area. The main factor that is endogenous to an EZ's border location is commercial land use and zoning limitations. The incorporation of zoning data is problematic due to the small geography of interest and the dynamic nature of zoning and land use. A reasonable proxy for land use is the location of existing establishments. Empirical analysis incorporates two measures of commercial land use to control for zoning limitations. Results report the impacts of EZ tax credits for only border areas with similar existing 1990 number of establishments within and outside the EZ. The second measure of land use only includes border areas with similar numbers of previous year deaths of existing establishments. Since the death of an establishment in the previous year is exogenous to tax credits (which are based only on new establishments and jobs), this measure represents the number of available commercial properties for new establishments to the border area.

### **4.3 Data Source and Information**

Specific information on Colorado's EZ program is from the State of Colorado's Department of Local Affairs. The information on the geography of the EZs and the date of designation for each individual zone is from the State of Colorado's Department of Local Affairs. The geographic information obtained from the individual zone coordinators were used to create digital maps of each EZ.<sup>13</sup>

Data on establishments and employment is from the ES-202 database, which contains quarterly data on employment, by industry, at the establishment level.<sup>14</sup> The physical addresses of the establishments obtained from the ES-202 database were geocoded to their geographical locations based on the 2000 Tiger Census Address Database. ESRI ArcGIS 9.0 software was used to determine

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<sup>13</sup>Digital maps were created by Devon Lynch (University of Denver) based on paper maps from each individual EZ. During the 1990-2000 time period of study, EZ status was not removed even if economic conditions improved.

<sup>14</sup>This database is compiled as a cooperative endeavor of the Bureau of Labor Statistics (BLS) and the employment security agency of the State of Colorado.

an establishment's location relative to the digitized map of EZ boundaries. Outcome variables for ES-202 data are monthly establishment employment, monthly payroll, four-digit SIC, and indication of an establishment's existence on a quarterly basis. This research aggregated the ES-202 data to a panel of annual averages for 1990 through 2000. The use of annual averages matches the process used by the EZ program to determine employment tax credits.

From the state ES202 database, 282,988 establishments that existed for at least one year in Colorado between 1990 and 2000 were geocoded in ArcGIS 9.0. Approximately 20 percent of the establishments given in the ES202 records were unable to be geocoded due to incomplete addresses, missing addresses, or lack of a street address. A concern with losing a portion of the data is if establishments located just inside the border of the Enterprise Zone are systematically different from those just outside the Enterprise Zone in their likelihood of providing a physical, geocodable address. This is highly unlikely given that the EZ Program and ES202 records are compiled separately and for different purposes by the state. Non-geocodable establishments were found to have similar measures for all ES202 variables as geocodable establishments. <sup>15</sup>

#### 4.4 Empirical Methodology

The nature of the border effects methodology as applied to EZs is highlighted in Figure 1. The border area between the dotted lines represents the region where the sample of border establishments is taken and is based on a 1/4 mile buffer around the EZ border.<sup>16</sup> The points represent establishments and each establishment in this sample is given an indicator to represent location within or outside the EZ benefit area. The segmented regions of 1/2 mile along the EZ border represent neighborhoods and are in essence a local fixed effect and are used to maintain comparisons between border establishments in close proximity. The sample of border establishments incorporated in

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<sup>15</sup>One plausible case that could result in problems is if multi-establishment firms are more likely to give a non-physical location address or a corporate headquarter address for their ES202 records, and are less likely to respond to EZ incentives. In this case, estimates of EZ effects will be biased because of the under-representation of certain types of establishments which may have experienced higher or lower economic growth over this time period. In order to control for this potential problem, estimation accounts for multi-establishment firms and SIC industries.

<sup>16</sup>The choice of the 1/4 mile buffer is based on the need to limit the distances between matched establishments and the spatial configuration of EZ boundaries. The presence of differences in agglomeration benefits, market area, or natural resource advantages is unlikely to differ at this scale (see [Rosenthal and Strange \(2001\)](#) for a discussion on the scale of agglomeration benefits). Overall results are robust to 1/2 mile border buffers and are available upon request from the author.

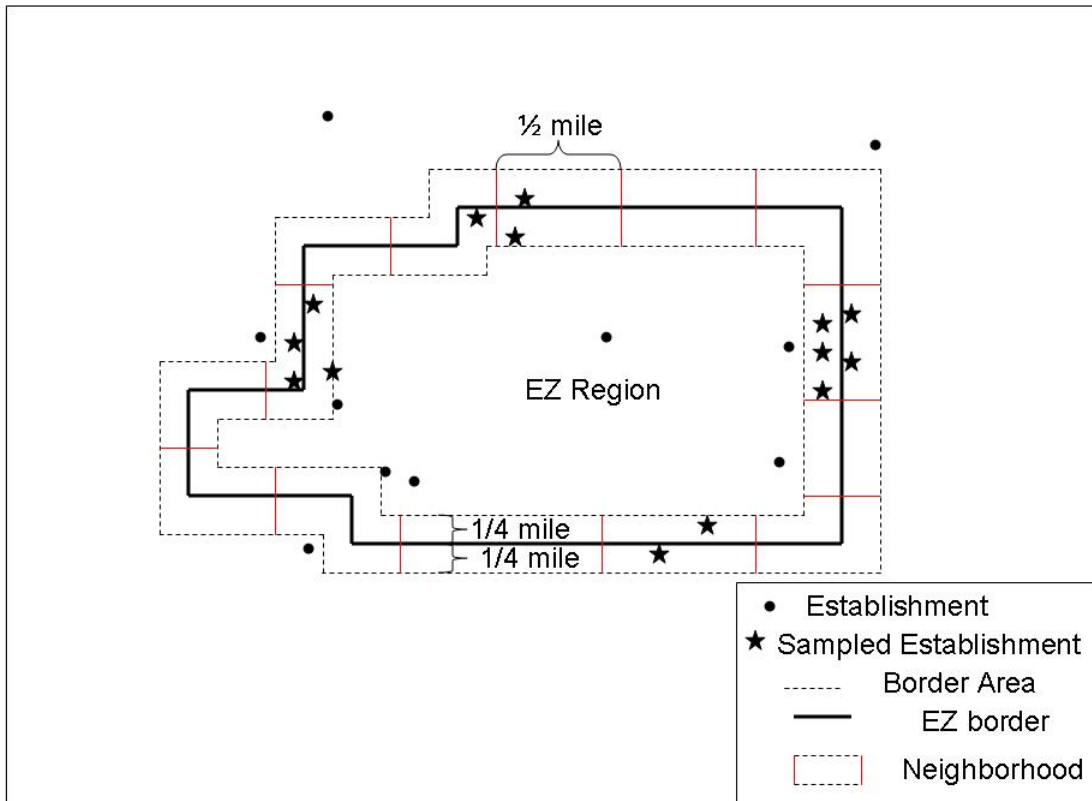


Figure 1: EZ Border Methodology

later analysis is represented by the stars in Figure 1.

In order to create neighborhoods around the EZ border, this research constructed a square lattice of points 1/2 mile apart across the entire state of Colorado using Geographical Information Systems (GIS).<sup>17</sup> Connecting these points created 1/2 mile-wide squares, which were then overlaid onto digitized EZ boundaries. The lines representing the borders of the squares partitioned the EZ border into segments whose length was within the 1/2 mile square. A total of 38,523 establishments that existed for at least one quarter during 1990 through 2000 and were within a 1/4 mile of the EZ border were assigned to the closest border segment. This methodology created a total of 3,216 neighborhoods. Of which, 812 neighborhoods contained at least one establishment for at least one year between 1990 and 2000.<sup>18</sup> A total of 481 neighborhoods contained establishments on both

<sup>17</sup>The initial point of the lattice is based on the NW corner of the state.

<sup>18</sup>The large number of neighborhoods not assigned any establishments is due to a number of neighborhoods created

sides of the EZ border.

Two metrics will control for land use in later estimation results. Both metrics involve matching EZ and non-EZ areas within a border neighborhood based on existing 1990 establishments or previous year establishments lost. The land use matching criteria includes neighborhoods ( $j$ ) that satisfy a 20% difference in land use measure ( $Z$ ) between EZ and non-EZ areas as shown in Equation 3.

$$\frac{|Z_j(EZ = 1) - Z_j(EZ = 0)|}{1/2(Z_j(EZ = 1) + Z_j(EZ = 0))} \leq 0.2 \quad (3)$$

Matching based on 1990 establishments resulted in 74 border neighborhood observations over 11 years. Matching on previous year deaths included 174 different neighborhoods and a total of 614 observations. Land use matching excluded neighborhoods with  $Z_j(EZ = 1)$  or  $Z_j(EZ = 0)$  equal to zero.

Table 1 provides summary data for ES202 data for census tracts, border neighborhoods, and neighborhoods matched on 1990 existing establishments.<sup>19</sup> The summary data provided in Table 1 allows an examination of how well border matching controls for differences between EZ and non-EZ areas. The progression from all data at the census tract level to border neighborhoods to land use matched neighborhoods demonstrate that this methodology is controlling for differences between the EZ and non-EZ area.

The number of employees (full and part time) per establishment is greater in EZ areas than non-EZ areas. In general, EZ areas contain more commercial activity than non-EZ areas as shown by the average annual number of establishments in border neighborhoods. The difference between average annual number of new establishments and establishments lost among border neighborhoods is 0.48 establishments for EZ areas and 0.5 for non-EZ areas. Land use controls remove any differences in commercial activity and overall trends for establishment location are similar between the EZ and non-EZ areas. The fraction of establishments that are part of a multi-establishment firm is larger in border EZ areas and estimation will control for this attribute. The fraction of establishments along rural EZ borders and residential areas that contain no commercial or limited commercial land use.

<sup>19</sup>Given that the border effects methodology does not follow census geographies, census based summary data cannot be included in Table 1.

that are part of a multi-establishment firm provide a measure of an establishment's organizational structure and may proxy for any informational differences between single and multi-establishment firms on the availability of EZ tax credits.

Table 1 reveals some differences in industrial composition between the EZ and non-EZ border areas. There is a larger representation of Manufacturing, Wholesale Trade, and Retail and a smaller representation of Construction and Services in EZ areas. The results for Agriculture and Manufacturing could be due to the presence of additional EZ tax credits targeted to these industries.

Annual Means (1990-2000) (Standard Deviation)	All Ests - Census Tracts		All Border Ests		Land Use Matched Border Establishments (1)	
	In EZ	Not in EZ	In EZ	Not in EZ	In EZ	Not in EZ
<i>Census Tract/Border Neighborhoods</i>						
Employees (full and part-time) per Establishment	15.66 (51.9)	13.50 (43.4)	13.86 (21.1)	9.70 (11.06)	23.1 (48.2)	21.2 (52.1)
Fraction of Establishments that are part of a Multi-establishment Firm	0.15 (0.18)	0.15 (0.19)	0.107 (0.163)	0.081 (0.143)	0.148 (0.146)	0.117 (0.111)
No. of Establishments in a Neighborhood	79.8 (183.0)	20.1 (126.7)	32.4 (89.1)	21.2 (82.2)	44.2 (123.2)	41.1 (133.2)
No. of New Establishments in a Neighborhood	11.8 (25.5)	4.0 (23.1)	4.34 (11.7)	3.26 (12.5)	6.80 (18.8)	6.82 (22.1)
No. of Establishments Lost in a Neighborhood	10.4 (23.2)	3.1 (19.0)	3.86 (10.8)	2.76 (10.8)	5.88 (17.6)	5.78 (20.0)
<i>Industry Composition for 1 digit SIC by Neighborhood</i>						
Agriculture	4.8%	3.7%	7.5%	5.0%	5.4%	5.6%
Mining	1.9%	1.3%	2.1%	2.1%	1.6%	1.4%
Construction	14.2%	8.6%	21.9%	26.5%	16.2%	18.3%
Manufacturing	11.7%	8.5%	6.4%	4.0%	7.3%	4.9%
Transportation, Communication, and Utilities	4.1%	3.4%	6.4%	6.4%	6.5%	5.9%
Wholesale Trade	3.2%	3.5%	7.3%	5.9%	8.4%	6.8%
Retail Trade	19.1%	28.8%	16.9%	12.6%	19.7%	16.9%
Finance, Insurance, and Real Estate	10.4%	8.7%	4.6%	5.5%	6.6%	6.9%
Services	31.0%	34.3%	26.4%	31.0%	24.3%	28.4%
Government	1.6%	1.5%	1.1%	0.9%	0.7%	0.5%
Number of Observations	1,122	3,707	4,810	4,810	814	814

Descriptive statistics are only based on neighborhoods with positive establishment counts.  
Land use matched neighborhoods are based on 1990 existing establishments.

Table 1: Summary Statistics - Border Neighborhoods



## 5 Results for Entry Decision

This section considers the impacts of EZ tax credits on an establishment's entry decision. Examining the entry of establishments provides an impact of both job creation and investment tax credits. Corresponding measures of exit or establishments lost will reveal the longer term impacts of tax-credit induced entry. New establishment location choices and the corresponding choices of labor and capital can result in different impacts between the entry and factor of production decisions. Measurement of establishment location trends and later analysis of employees per establishments will highlight respective impacts on entry and the subsequent tax-credit induced use of labor. If an establishment benefits from investment or job creation tax credits then this should positively influence entry, and labor and capital usage in EZ regions. The additional impact on relative factor prices results in factor substitution between capital and labor. If the cross price elasticity between capital and labor is positive, then EZ tax credits encourage factor substitution and decreases EZ impacts on employment or investment relative to non-EZ areas.

Table 2 provides analysis of impacts of EZ status on the number of new establishments and number of establishments lost between 1990 and 2000. The basis for this analysis is that an establishment first decides to locate in a given commercial area based on the set of location characteristics available. For those establishments locating in a border neighborhood, the establishment then must choose between sites with an EZ tax credit and ones without EZ tax credits. Significant differences in establishments choosing EZ locations will highlight the impact of the tax credits. The scale of analysis for the location of establishments is based on border neighborhoods, which allows for a comparison of similar square mileage of land on each side of the EZ border. Mean values of number of new establishments and number of establishments lost are compared between EZ and non-EZ border areas. The reported results give the difference in means between the EZ and non-EZ area. The total number of observations are given in Table 2 and bootstrapped standard errors are incorporated for all hypothesis tests on differences in means and are reported in parentheses.

Table 2 adopts a number of non-parametric specifications to highlight the robustness of results and compare to other identification strategies adopted in the EZ literature. A propensity score matching model based on census tracts is provided to compare results with previous EZ studies

**Border Establishment Location Trends (1990-2000)**

Difference in Annual Means Y(InEZ=1) - Y(InEZ=0)	No of New Ests		No of Ests Lost	
	1990-1995	1996-2000	1990-1995	1996-2000
<b>Census Tracts</b>				
<i>All Census Tracts (n=4,829)</i>	-0.243 (1.19)	-2.11* ( 1.28)	0.96 ( 1.11)	-0.609 (1.176)
<i>Propensity Score Matched (n=1,082)</i>	4.31 (3.1)	4.18 (3.04)	4.84** (2.31)	3.82 ( 3.01)
<b>Border Neighborhoods</b>				
<i>All Border Neighborhoods (n=4,810)</i>	0.90*** ( 0.295)	1.08*** (0.410)	0.898*** (0.257)	1.11*** (0.35)
<i>Matched on 1990 Ests (1) (n=814)</i>	1.50 (2.60)	2.46 (3.42)	0.68 (2.30)	2.11 (3.16)
<i>Matched on Death(t-1)(1) (n=614)</i>	-0.43 (4.04)	0.612 (3.84)	-0.155 (3.54)	1.09 (3.43)

(1) Includes only neighborhoods where EZ and non EZ areas have less than 20% difference in the matched variable for land use.

n represents the number of observations for the entire panel 1990-2000.

Standard errors are bootstrapped and in parentheses.

Significant at \*0.10 \*\*0.05 \*\*\*0.01. Ests = Establishments; Employ = full or part time employment

Table 2: Border Establishment Location Trends

and as a proxy for the impact of unobservables on estimates of EZ impacts. A nearest neighbor matching based on the propensity score logit regression provided in Appendix Table 1 determines matched census tracts. Only matched census tracts with propensity score differences of less than 10% are included in results. O’Keefe (2004) provides a good explanation of this methodology in the context on EZs.<sup>20</sup>

Results indicate that border areas matched on land use have an insignificant impact of EZ status on the number of new establishments and establishments lost annually. The robustness of this result across specifications that control for land use highlights that EZ tax credits have limited or no influence on establishment location trends. Results were consistent between the first half (1990-1995) and the second half of the panel (1996-2000). This highlights that the initial time period after which most EZs were formed (late 1980s) did not create differential impacts. This is consistent with the tax credits in Colorado’s EZ program, which are available to new investment and job creation and have not changed in magnitude over the 1990s. Results are robust to the use

<sup>20</sup>See Black and Smith (2004) for a discussion of propensity score matching models and the problems of self-selection in estimating treatment effects.

of 0.1, 0.3, and 0.4 for land use matching thresholds in Equation 3. Also, results did not change when examining only multi-establishment firms.

The propensity score model provides significant results for establishments lost in 1990-1995. Tax credits should not influence establishment exit because they are given only for entry and job creation. One explanation is that tax credits may induce entry for less competitive establishments. Tax credit induced entry is only plausible if new establishments do not anticipate current and future benefits due to tax credits, and that tax credits influence the formation of new establishments. The formation of an establishment because of a tax credit is a strong and unlikely assumption. This research adopts the weaker assumption that tax credits only influence the location decisions of an establishment at the neighborhood level.

## 6 Results for Job Creation

Multivariate analysis tests the impact of EZ status on job creation at the establishment level.<sup>21</sup> This impact is due to a variety of elements of the EZ tax credit program. The job creation tax credit and the employment training tax credit both directly benefit establishments that employ more workers. Also, job creation occurs when larger establishments benefit from investment and/or job creation tax credits and therefore create more jobs within the EZ. Since employment levels likely vary by industries and ownership structure, regression analysis will allow controls for these factors. Fixed effects for border neighborhoods will limit border comparisons to small geographic areas. Table 3 highlights impacts on existing establishments and impacts on new establishments in separate regressions.

The regressions in Table 3 are sparse in explanatory variables because the border methodology controls for other factors.<sup>22</sup> A number of specifications including a comparison to a Propensity Score (PS) matching model provide EZ impacts. The coefficient on the Enterprise Zone indicator variable represents the percentage difference in employment growth for establishments within an

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<sup>21</sup>The unavailability of establishment level data for measures of capital, prevents directly testing the impact of investment tax credits.

<sup>22</sup>Due to concerns of heteroscedasticity and that this is a panel dataset, all regressions on existing employment incorporate clustered standard errors at the establishment level within a robust variance correction. This clustered variance correction is based on [White \(1980\)](#) and [Woodbridge \(2002\)](#).

<b>Employment Growth for Existing Establishments</b>				
<b>Dep Var = Emp(t) - Emp(t-1)</b> (for establishments with prior year employment)	<b>Census Tracts</b> (Propensity Score)	<b>Border Neighs</b> (No Matching)	<b>Border Neighs</b> (Match on 1990 No. of Ests.)	<b>Border Neighs</b> (Match on death (t-1))
Enterprise Zone	0.331*** (0.117)	0.2766*** (0.103)	0.286 (0.208)	0.179 (0.183)
Multi-establishment Dummy	1.471*** (0.194)	1.504*** (0.203)	2.07*** (0.515)	1.88*** (0.430)
Neighborhood or Census Tract Fixed Effects	Yes	Yes	Yes	Yes
Two Digit SIC Dummy Variables	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
R Squared	0.03	0.14	0.17	0.17
Observations	285,317	160,354	42,393	51,721

Absolute value of standard deviation in parentheses  
All regressions include clustered standard errors by establishments  
\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

<b>Employment Growth for New Establishments</b>				
<b>Dep Var = Emp(t) - Emp(t-1)</b> (for new establishments with no prior year employment)	<b>Census Tracts</b> (Propensity Score)	<b>Border Neighs</b> (No Matching)	<b>Border Neighs</b> (Match on 1990 No. of Ests.)	<b>Border Neighs</b> (Match on deaths(t-1))
Enterprise Zone	1.80** (0.901)	1.75** (0.827)	1.51** (0.711)	1.56** (0.744)
Multi-establishment Dummy	20.25*** (1.63)	23.54*** (2.08)	30.11*** (3.84)	32.53*** (4.99)
Neighborhood/Census Tract Fixed Effects	Yes	Yes	Yes	Yes
Two Digit SIC Dummy Variables	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
R Squared	0.19	0.14	0.26	0.26
Observations	76,927	31,894	7,770	9,187

Absolute value of standard deviation in parentheses  
\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Table 3: EZ impacts on employment

EZ versus those just outside the EZ. Similar interpretation holds for the multi-establishment firm indicator variable.

All specifications except for existing establishments with land use controls provide positive results. The coefficient on the indicator variable for EZ status ranges from 0.0 to 0.3 more employment for existing establishments and from 1.5 to 1.8 greater employment for new establishments. The differences between the border matching and propensity score results highlight that PS matching produces larger estimates than border matching. This is consistent with a concern that unobservables, which are likely positively correlated with EZ designation and establishment outcomes variables, may positively bias the estimated impacts of EZ tax credits.

Overall the smaller impacts for existing establishments is not surprising because EZ tax credits only apply to establishments that expand employment by at least 10% or investment by at least \$1 million. The larger impacts for new establishments is consistent with the nature of the EZ tax credits, which are available to all new establishments. Also, the ability of a new establishment to initially determine levels of employment provides greater flexibility in modifying factor inputs in response to the tax credit. The multi-establishment dummy has a significant positive impact on the number of employees an establishment hires and represents an increase of between 20 and 33 employees over single establishment firms.<sup>23</sup> Fixed effects for year and SIC two-digit composition provide controls for industry or temporal variation.

## 7 Industry Results

Often local economic development programs target specific industries that have desirable characteristics for job creation and wages. This has led to the focus of a number of regional development efforts on large manufacturing facilities (see [Greenstone and Moretti \(2004\)](#) for a paper on how local policy is used to attract large manufacturing companies) or high technology industries to foster the development of industry-based clusters (based on the model of industry clusters popularized by [Porter \(1990\)](#)). Targeted industry incentives in Colorado's EZ program are represented

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<sup>23</sup>Unreported regressions with an interaction term between the EZ dummy and Multi-establishment dummy were insignificant for border matching specifications in Table 3.

by additional tax credits for Manufacturing, Mining, and research and development activities. The presence of industry level impacts, even when overall impacts are insignificant, may signify the need to better focus EZ tax credits on the industries that have demonstrated response to specific incentives.

## 7.1 Entry Decision

Industry results for new establishments emphasize the respective impacts of job creation and investment tax credits. Table 4 provides border location trends for new establishments by one digit SIC industry. Analysis for establishments lost was not possible given the low amount of border neighborhoods with existing establishments for a given one digit SIC on both sides of the EZ border. Three different specifications are provided in Table 4 for the difference in annual number of new establishments between the EZ and non-EZ border neighborhoods over the 1990 through 2000 time period.

In general, results represent positive impacts of EZ tax credits on the location decisions of new establishments in some industries even though overall location trends for new establishments are insignificant. Positive results are found for Manufacturing and Retail and negative results occur for Mining and Construction. The additional sales tax credit for manufacturing investment is consistent with greater entry by new establishments in Manufacturing. The presence of insignificant and negative results for some industries is attributed to two factors. First, tax credit benefits may be capitalized in land rents, which limits the benefits for new establishments. Second, some industries may lack a set of acceptable locations on both sides of the EZ border due to site/parcel requirements, and/or natural resource access, which may result in negative impacts inside the EZ. Mining likely has a restricted set of acceptable locations due to zoning, infrastructure, and/or natural resource access and Construction is largely influenced by residential development trends.

**Border Establishment Location Trends (1990-2000)**  
**Number of New Establishment by SIC**

Difference in Annual Means (1990 to 2000) Y(InEZ=1) - Y(InEZ=0)	No of New Establishments		
	<i>No Land Use Matching</i>	<i>Land Use Matching</i> (1990 Ests)	<i>Land Use Matching</i> (Death(t-1))
Agriculture	0.0003 (0.005)	-0.027 (0.025)	0.036 (0.035)
Mining	-0.17 (0.12)	-0.26* (0.14)	-0.34* (0.19)
Construction	-0.039** (0.02)	-0.393** (0.105)	-0.41*** (0.141)
Manufacturing	0.158*** (0.013)	0.16*** (0.059)	0.296*** (0.077)
Transportation, Communications, Utilities	0.049*** (0.012)	-0.149 (0.092)	-0.34 (0.13)
Wholesale	0.156*** (0.02)	-0.21* (0.118)	-0.013 (0.157)
Retail	0.32*** (0.043)	-0.027 (0.251)	0.772** (0.318)
Finance, Insurance, Real Estate	0.009 (0.039)	-0.71* (0.43)	-0.82 (0.546)
Services	0.319*** (0.108)	-0.24 (1.07)	0.254 (1.49)
Public Administration	0.0002 (0.077)	-0.064 (0.074)	-0.052 (0.107)
n	4,810	814	614

Land use matching based on ez, non ez areas containing less than 20% difference in the matched variable for land use  
Standard errors are bootstrapped and in parentheses. n represents the number of observations for the entire panel 1990-2000.  
Significant at \*0.10%; \*\*0.05%; \*\*\*0.01%

Table 4: New Establishment Location Trends by SIC

## 7.2 Job Creation Analysis

Table 5 extends earlier regressions to include interaction terms between the EZ indicator variable and a dummy variable for an establishment's one digit SIC. As before, analysis is broken down into existing and new employment. Agriculture, Construction, Manufacturing, Wholesale, and Service industries report positive impacts for EZ status. The results for Manufacturing are consistent with the entry of new Manufacturing establishments in EZ areas. An additional tax credit for Agriculture job creation supports the positive results for the Agriculture sector.

The results for Agriculture, Construction, and Retail employment impacts differ from new establishment location results for these industries. Agriculture industries had insignificant results for new location trends and Construction had negative results. Retail had positive impacts on entry and has insignificant employment growth. These results for Agriculture, Construction, and Retail could be a result of factor substitutability between labor and capital intensive production in response to factor specific EZ tax credits. The possibility of factor substitutability is a concern for the type of tax credits offered in an EZ program. Overall conclusions on the presence of factor substitutability in Colorado's EZ program is limited by the unavailability of data on an establishment's capital intensity.



**EZ Impacts on Employment by 1 digit SIC  
Border Establishments**

Dep Var = Employment(t) - Employment(t-1)	Existing Establishments		New Establishments	
	No Land Use Match	Land Use Match	No Land Use Match	Land Use Match
Multi-establishment Dummy	1.51** (0.203)	1.87*** (0.430)	23.60** (2.09)	30.08*** (3.84)
Agriculture Dummy*Inez	0.637** (0.238)	0.581* (0.328)	1.24* (0.645)	1.08* (0.585)
Mining Dummy*Inez	0.636* (0.376)	0.686* (0.391)	2.90 (3.13)	1.55 (3.92)
Construction Dummy*Inez	1.15*** (0.232)	0.713* (0.402)	2.31*** (0.697)	4.24 (6.40)
Manufacturing Dummy*Inez	0.470 (0.384)	0.504* (0.278)	11.54*** (4.39)	14.70** (7.35)
TCU Dummy*Inez	-0.527 (0.801)	-0.984 (1.84)	-13.40 (10.48)	-9.83 (17.60)
Wholesale Dummy*Inez	0.024 (0.144)	0.054 (0.228)	2.33** (1.01)	1.67** (0.803)
Retail Dummy*Inez	-0.102 (0.114)	-0.161 (0.13)	-1.61 (1.31)	-0.98 (1.23)
FIRE Dummy*Inez	0.164 (0.163)	0.402 (0.308)	0.361 (0.945)	-0.08 (1.96)
Service Dummy*Inez	0.365** (0.181)	0.264 (0.340)	1.61 (1.31)	4.99* (2.97)
Government Dummy*Inez	1.45 (0.837)	-0.539 (0.826)	8.95 (6.11)	10.02 (13.74)
1/2 Mile Border Segments Fixed Effects	Yes	Yes	Yes	Yes
Two Digit SIC Dummy Variables	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
R Squared	0.14	0.17	0.14	0.26
Observations	160,354	42,393	31,894	7,770

Absolute value of standard deviation in parentheses

All regressions for existing establishments include clustered standard errors

Land use matching done based on 1990 establishments

Table 5: Major Industry Results - Job Creation

## 8 Conclusions

The limited influence of EZ tax credits on location decisions may be explained by the fact that landowners are able to capitalize these tax credits into rents, negating the net benefit to businesses.<sup>24</sup> The capitalization of EZ tax credits should not impact job creation because greater labor intensity positions establishments to incur more land rent than lower labor intensity establishments. The benefit of the tax credit will be realized by the landowner, but job creation will still occur. The insignificant impacts of establishment location could also signify the small impact of EZ tax credits compared to other site or parcel characteristics. The literature highlights the possibility of both explanations, where [McDonald \(1993\)](#), [Man \(1995\)](#), and [Wheaton \(1984\)](#) find partial capitalization of commercial property taxes into commercial rents. The hypothesis that parcel/site characteristics are more important than tax credits is supported by the industry results, which vary across industries.

Establishments may also perceive the value of the job creation tax credits in Colorado as too small to impact overall employment decisions. [Bondonio and Engberg \(2000\)](#) find that the amount of the fiscal incentive does not influence results for five different state EZ programs, while [O’Keefe \(2004\)](#)’s results find that a decrease in the magnitude of EZ tax credits over time corresponds with a decrease in estimated impacts on employment growth. These inconclusive results from the literature preclude reasonably predicting the effects of changing the magnitude of job creation tax credits in Colorado. Given controls for other factors that may influence labor intensity, even a small tax credit should influence the marginal employment decision. Results from this paper weakly support the idea that larger job creation tax credits positively influence labor intensity and job creation.<sup>25</sup> Agricultural industries are eligible for a double job creation tax credit and agricultural industries experienced positive impacts of EZ status on job creation. Manufacturing establishments experience positive impacts on entry and are eligible for larger investment tax credits.

The influence of policy on the location of economic activity is just beginning to be understood in the literature and a number of place-based government programs have been the focus of past

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<sup>24</sup>[Lynch and Zax \(2004\)](#) discuss the potential capitalization on EZ tax credits into land rents.

<sup>25</sup>This idea is also consistent with [de Bartolome and Spiegel \(1997\)](#)’s finding that higher economic development spending at the state level is positively correlated with manufacturing employment.

analysis. This research provides a new empirical methodology for examining the impact of tax incentives on the location of jobs and businesses and tests it on a commonly used tax incentive program in the U.S., the Enterprise Zone program. The problems of spatial mismatch between EZ and data geography and the presence of unobservables have been problematic in a number of earlier works in this area. The use of border effects and establishment level data takes advantage of the spatial nature of these programs to overcome these problems, which provides cleaner estimates of EZ impacts in Colorado. Overall, results find insignificant impacts from the EZ program on the location decision of establishments, but positive impacts for job creation. Industry results highlight the importance of taking specific tax credits into consideration in examining factor specific outcomes.

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## 9 Appendix

### Colorado's Enterprise Zone Tax Credits

These tax credits are published on the state of Colorado's Office of Economic Development and International Trade website, <http://www.state.co.us/oed/enterprise-zone/EZ-Tax-Credits.cfm>

1) **Three percent investment tax credit.** Businesses making investments in equipment used exclusively in an enterprise zone may claim a credit against their Colorado income taxes equal to 3 percent of the amount of the investment, subject to limitations on the amount that can be claimed in any one year. Investment that results from an in-state relocation is not eligible for the credit unless the new location qualifies as an expansion. Excess credits may be carried back three years and forward twelve.

2) **500 dollar job tax credit.** Businesses hiring new employees in connection with a "new business facility" located in an enterprise zone may claim a tax credit against state income taxes of 500 dollar for each such employee. An expansion of an existing facility may be considered a "new business facility" if the expansion adds at least 10 employees or a 10 percent increase over the previous annual average, if it is at least 1 million dollars in investment, or, if less, at least doubles the original investment in the facility. The credit may be taken in subsequent years of the enterprise zone for each additional employee above the maximum number employed in any prior tax year. Excess credits may be carried forward five years (applies to 3 and 4 below).

The Colorado EZ Program formula for the job creation tax credits is given by, EZ Job Creation = (Average Annual Employment in year t) - (Average Annual Employment in base year). The base year of employment is determined by the highest employment level from any prior annual employment level. The base year is set equal to zero for any new establishment.

3) **Double job tax credit for agricultural processing.** An additional credit of 500 dollars per new business facility employee may be claimed by businesses that add value to agricultural commodities through manufacturing or processing.

4) **200 dollar job tax credit for employer health insurance.** In order to encourage employer sponsored health insurance plans, a taxpayer with a qualifying new business facility is allowed a two-year 200 dollar tax credit for each new business facility employee who is insured under a qualifying employer-sponsored health insurance program.

5) **Research and Development tax credit.** Taxpayers who make private expenditures on research and experimental activities (as defined in federal tax law) conducted in an enterprise zone qualify for an income tax credit. This credit equals 3 percent of the amount of the increase in the taxpayer's Research and Development expenditures within the zone for the current tax year above the average of Research and Development expenditures within the zone area in the previous two years. No more than one fourth of the allowable credit may be taken in any one tax year.

6) **Credit to rehabilitate vacant buildings.** Owners or tenants of commercial buildings in an enterprise zone which are at least 20 years old and which have been vacant for at least 2 years may claim a credit of 25 percent of the cost of rehabilitating each building. The credit is limited to 50,000 dollars.

7) **Credit for contributions to zones.** A taxpayer who makes a contribution to certain eligible enterprise zone development projects including business assistance, job training, economic development marketing, community development and homeless organizations in zones may claim a tax credit. To be eligible, a proposed project must be approved by the local enterprise zone administrator and by the Colorado Economic Development Commission. The amount of the credit

is 25 percent of the value of the contribution, up to 100,000 dollars (12.5 percent for in-kind contributions).

8) **Ten Percent Job Training Credit.** Beginning with 1997 tax years, employers who carry out a qualified job training program for their enterprise zone employees may claim an income tax credit of 10 percent of their eligible training costs.

9) **Exemption from state sales and use tax for manufacturing and mining equipment** - Manufacturing Machinery and Machine Tools and Parts are exempt from the 3 percent state sales and use tax state-wide, regardless of where within the state the equipment is used. When used solely within an enterprise zone this exemption may also be claimed for purchases of: Mining Equipment or Materials Used to Make Eligible Machinery

Eligible purchases used in an enterprise zone are exempt whether the purchases are capitalized or expensed for accounting purposes.

10) **Local government tax incentives.** Any city or county within an enterprise zone is authorized to negotiate with individual taxpayers who have qualifying new business facilities (a) an incentive payment equal to not more than the amount of the increase in property tax liability over pre-enterprise zone levels; and (b) a refund of local sales taxes on purchases of equipment, machinery, machine tools, or supplies used in the taxpayer's enterprise zone.

**Propensity Score Logit for Census Tracts**

Dep Variable	InEZ
PopDensity(000s per sqmi)	-0.06450* (0.03)
White(%)	-4.52* (2.36)
Black(%)	-3.36 (2.45)
Hispanic(%)	-2.71* (1.49)
OutofCountyCommute(%)	-0.44 (0.83)
MultiEstablishmentFirm(%)	1.03 (1.08)
NumberFirms(00s)	0.13 (0.15)
TotalEmployment(000s)	0.19 (0.19)
TotalWages(000s)	-0.00917* (0.01)
HighSchoolEduc(%)	5.79** (2.43)
LessHighSchoolEduc(%)	6.75*** (2.43)
CollegeEduc(%)	-0.08 (2.26)
ManufacturingEmployment(%)	-0.19 (1.43)
ServicesEmployment(%)	2.01 (1.73)
SalesEmployment(%)	-0.73 (3.14)
ManagersAdminEmployment(%)	3.05 (3.04)
PovertyRate	4.35* (2.30)
UnEmploymentRate	3.59 (2.93)
AvgHHIncome(000s)	-0.01 (0.05)
HHIncomeless10k(%)	-2.79 (2.30)
HHIncomemore50k(%)	3.53 (3.99)
PercentRenters	0.27 (0.71)
PercentSFHomes	-1.27** (0.62)
MedianHomeYr	-0.0265*** (0.01)
R-squared	0.42
N	872

Based on 1980 Census Tract Data and 1990 ES202 Data.

\* p<0.1, \*\* p<0.05, \*\*\* p<0.001

Table 6: Appendix Table 1