Do Location-Based Tax Incentives Attract New Business Establishments?

Andrew Hanson  
Department of Economics, Georgia State University  
P.O. Box 3992  
Atlanta, GA 30302  
ahanson@gsu.edu

Shawn Rohlin  
Department of Economics and  
Center for Policy Research, Syracuse University  
426 Eggers Hall  
Syracuse University  
Syracuse, NY 13244  
smrohlin@maxwell.syr.edu

Abstract:

This paper examines how offering employment based tax incentives in a local area affect the entry of new establishments in the area. We use the federal Empowerment Zone (EZ) tax incentive, the largest employer-based wage tax credit in the federal tax code, as a natural experiment to test this relationship. Our results show that offering a tax credit that is tied to local geography reduces the number of new establishments in the targeted area by almost 74 percent in the short-term. The negative result is persistent across industry types, and is driven by the substantial negative effect on small establishments (between one and four employees). We also find that the negative effect of the tax incentives persists in the longer term. The sign of our primary results is robust to an alternative instrumental variables specification, however the statistical significance is not. We show evidence that the negative result for new businesses is driven by the expansion of establishments that were in the targeted area prior to the tax incentives being offered, and is consistent with the capitalization of the incentives into property values. We do find some evidence that the tax incentives worked to attract new establishments in industries for areas that had some existing agglomeration of establishments, however these results are quite imprecise.
I. Introduction

Countless state and local governments offer a myriad of tax incentives in an attempt to lure business establishments into establishing their jurisdiction. These incentives include a range of tax credits for investment in capital, job creation, research and development, and rehabilitation of structures.1 Often, these incentives are predicated on hope that new establishments will become a catalyst for future economic growth.2

There are two primary challenges that arise in any attempt to determine the effect these policies have on the location decisions of new establishments.3 The first is that they are often created for a single city or state, making it difficult to find a proper comparison group to construct a counterfactual for what would have happened to the area in the absence of the policy. The second is that the policies are crafted by law-makers in an attempt to either strengthen the local economy or change historic economic fortunes. Because these incentives are often predicated on the current local economic situation, the policies are endogenous to outcome measures of interest.

These challenges often leave researchers with limited ability to identify the effects of offering tax incentives on new establishment location, as standard methods do not separate trends in the local economy from the policy effects or may give biased results due to policy endogeneity. In this paper, we use the Empowerment Zone (EZ) program, a set of incentives offered to establishments that operate in well-defined local areas, but funded by the federal government, as a natural experiment to identify the effect of offering tax incentives in a local

1 See Black and Hoyt (1989) for a formal model of local jurisdictions bidding for establishments.
2 See Glaeser (2001) for a discussion and review of theories on why governments offer location-based tax incentives.
3 See Holmes (1998), Bartik (1989), and Bartik (1985) for a discussion and method of identification for how state policies, including taxes, influence the location decision of establishments.
area on the location decision of new establishments. The EZ program is the largest employer-based wage tax credit in the federal tax code with an estimated cost of $1.7 billion in the President’s 2009 budget.⁴

The EZ tax incentives offer a unique way to identify the effect of offering tax incentives on local areas because the designated areas were chosen from a group of qualified applicants. We use the group of areas that applied, but did not receive EZ designation to build a counterfactual for what would have happened to areas that did receive the benefits. In addition, because selection of the designated areas may be endogenous, we also use an instrumental variables estimation procedure, where we instrument for the tax incentives using the political characteristics of the applicant’s federal representatives. Using these methods, we can determine how offering an employment-based tax credit in a well defined area of a city affects the location decision of new establishments.

Our primary finding is that the Empowerment Zone wage tax credit was responsible for reducing the number of new establishments that entered targeted areas by almost 74 percent. We also show that the negative effect on new establishment location remains into the longer term (five years after the start of the program). This negative finding is strongest for small establishments (between one and four employees), and declines for larger establishments (more than one hundred employees). This finding is consistent with the previous evidence in the literature that the tax incentives become capitalized into local property values and therefore make it more costly for new establishments to enter the targeted area. The sign of this relationship is

⁴ This is an estimate of tax revenue that would have been collected in the absence of the program and includes the Empowerment Zone program and a smaller, less generous, but similar program called the Renewal Communities tax credit. To put this amount into context, consider that the estimated forgone revenue from the Earned Income Tax Credit (EITC) in the 2009 budget is $5.4 billion, and that the EITC is available regardless of geographic location.
robust to the alternative instrumental variable specification; however the IV results are statistically imprecise.

The remainder of the paper begins with a discussion of the incentives offered by the Empowerment Zone program. We follow this with a description of our identification strategy and a statistical summary of the comparison and treatment groups. In the next section we describe the data used for estimating the effect of tax incentives on new establishment location. In the following section we provide our estimation results. After describing our main results we offer some robustness checks and discuss potential criticisms of our research design and offer an alternative method of identification. The final section concludes and discusses policy implications.

II. Incentives offered by the EZ Program

The federal government began to explicitly offer tax incentives to employers located in parts of economically distressed areas with the creation of the Empowerment Zone program, which was passed as part of the 1993 Omnibus Budget Reconciliation Act (OBRA 1993, P.L. 103-66). The EZ program is primarily a set of tax incentives claimed by employers that operate inside of small urban areas defined by groupings of census tracts. Awards for EZs were made to both urban and rural areas, the Department of Housing and Urban Development (HUD) was responsible for designating EZs in urban areas; the Department of Agriculture was responsible for choosing rural EZs. Designations of EZs were made from applications of state and local governments.

Each department considered applications for areas where at least 20 percent of the population was living in poverty and 6.3 percent were unemployed (GAO, 2004). From 78 applications,
parts of six cities (Atlanta, Baltimore, Chicago, Detroit, Philadelphia/Camden, and New York) and three rural areas (Kentucky Highlands, Mississippi Delta, and the Rio Grande Valley in Texas) were awarded EZ status (Wallace, 2004). The original designation provided tax-preferred status for ten years ending in 2005, however, Congress extended the sunset to the end of 2009 with the Community Renewal Tax Relief Act of 2000 (P.L 106-554).

The main component of the tax incentive package is a 20 percent tax credit on wages paid to employees who live and work within the zone boundary. The wage tax credit applies to the first $15,000 in wages paid to employees for a maximum value of $3,000 per employee. There is no requirement that the employee be a new hire or on the type of individual hired as long as they reside in the designated area. The EZ program also provides smaller incentives for capital investment and allows localities to issue bonds on behalf of business locating within the zone to finance the purchase of capital. 5

Empowerment Zone areas were also awarded $100 million for urban and $40 million for rural areas in the form of Social Service Block Grant funds. 6 The tax incentives and grants are exclusively tied to the land that is designated an Empowerment Zone. Establishments can only use the incentives if they operate in and hire employees who live within an EZ boundary.

Areas that applied for an Empowerment Zone, but were denied, almost all received a designation of “Enterprise Community” (EC). EC areas were given a Social Service Block Grant allotment of $3 million and were allowed to claim some of the capital incentives, but were

---

5 Establishments that locate within the EZ can expense (rather than deduct) a wider range of capital investment and a larger amount than the federal tax code allows for establishments not in an EZ. They are also allowed to postpone the reporting of capital gains made on zone assets.

6 Social Service Block Grants can be used for a variety of services including: day care for children, employment services, counseling, legal services, transportation, education, and substance abuse recovery. Grant funds for each EZ are funded through the department of Health and Human Services and administered by states.
not allowed to use the wage tax credit.\textsuperscript{7} Because the EC areas met the qualifications to be E\(Z\)s, and a record of their boundaries exists, we use them as a control group to study the effect of the E\(Z\) tax incentives on new establishment location.\textsuperscript{8}

As shown in table 1, the EC and E\(Z\) areas are, on average, quite similar before zone designation took place. Table 1 reports summary statistics from the 1990 census using tract level data aggregated up to the zone and city level for all E\(Z\) areas and for the average of the EC areas. Although, on average the EC areas were in smaller cities, they still include some of the largest cities in the country, and are still on average larger than the smallest E\(Z\) city. Importantly, the areas do not differ greatly along economic dimensions as the average unemployment rate, per-capita income, and poverty rate for EC areas are all within the range of E\(Z\) areas or within a percentage point or two.

E\(Z\) incentives are tied to location of the establishment, but not tied to the establishment being a new entity for tax purposes. This is important, because we are interested in measuring the decision of establishments to physically locate in an area, rather than how they change their tax filing behavior. Some state programs try to target new businesses by explicitly requiring that any incentives are only available to businesses that are newly incorporated. This poses a problem for determining if new businesses are physically re-locating to the area because many existing businesses can simply change names or business types and then reap the benefits offered by the

\textsuperscript{7}Some areas that were denied an E\(Z\) were designated as “Supplemental Empowerment Zones” and “Enhanced Enterprise Communities” these areas were given a larger allotment of grants. In future years some of these areas were allowed to claim the wage tax credit, but not until after 2001.
\textsuperscript{8}Our sample includes EC areas in the following cities: Akron, OH, Albany, GA, Albany, NY, Albuquerque, NM, Birmingham, AL, Boston, MA, Bridgeport, CT, Buffalo, NY, Burlington, VT, Charleston, SC, Charlotte, NC, Cleveland, OH, Columbus, OH, Dallas, TX, Denver, CO, Des Moines, IA, East St. Louis, IL, El Paso, TX, Flint, MI, Harrisburg, PA, Houston, TX, Huntington, WV, Indianapolis, IA, Ironton, OH, Jackson, MS, Kansas City, KS, Kansas City, MO, Las Vegas, NV, Little Rock, AR, Los Angeles, CA, Louisville, KY, Lowell, MA, Manchester, NY, Memphis, TN, Miami, FL, Milwaukee, WI, Minneapolis, MN, Muskegon, MI, Nashville, TN, New Haven, CT, Newark, NJ, Newburgh, NY, Norfolk, VA, Oakland, CA, Ogden, UT, Oklahoma City, OK, Omaha, NE, Phoenix, AZ, Pittsburgh, PA, Portland, OR, Providence, RI, Rochester, NY, San Antonio, TX, San Diego, CA, San Francisco, CA, Seattle, WA, Springfield, IL, Springfield, MA, St. Louis, MO, St. Paul, MN, Tampa, FL, Waco, TX, Washington, DC, and Wilmington, DE.
program. Because the EZ program does not require that the establishment is a new entity for tax purposes, it should not evoke any response that is not a physical relocation.

III. Method of Identification

To identify the effect of the EZ tax incentives on new establishment location we use a differencing methodology to build a counterfactual for what would have happened in the absence of the program.\(^9\) Our strategy is to compare outcomes between EZ areas and their surrounding city with EC areas and their surrounding city to see how this difference changes before and after the program. This design isolates the effect of the EZ from city fixed effects because it makes an across-time comparison. It also isolates the effect of the EZ from time-variant, city-wide effects because it makes an intra-city comparison. It is important to note that we are not assuming that the EZ and EC areas would have grown the same; we are assuming that the difference between these areas and their surrounding cities would have grown the same in the absence of the tax incentives.

The EC comparison group is similar to the EZ areas, but because they are located in different cities, the areas are not likely to be subject to negative effects from the policy. This may be the case if we were to choose a comparison group based an inter-city matching technique if establishments make a location choice based on a set of areas that are similar within a city. Also, because both the comparison and treatment groups applied for EZ designation and met the criteria for unemployment and poverty, there will be no unobservable differences caused from

\(^9\) Other researchers have designed methods to identify and tested the effect of zone based tax incentives on various outcomes, including Busso and Kline (2006), Papke (1994), Boarnet and Bogart (1996), Bondonio (2003), Bondonio and Engberg (2000) and Greenbaum and Engberg (2004). The primary differences between the identification strategy presented here and these papers is the manner in which we build a counterfactual and our treatment of zone designation as an endogenous variable.
going through the application process or being qualified. The variables used in each regression are of the following form, to reflect the differencing methodology:

\[ Y_i = (Y_{\text{tract1996}} - Y_{\text{city1996}}) - (Y_{\text{tract1994}} - Y_{\text{city1994}}) \]  

(1)

Besides creating a counterfactual for what would have happened in the absence of offering the tax incentives, the differencing methodology helps control for unobserved factors that may otherwise be driving correlation between zone status and the location of new establishments. The first difference in this method (the first bracketed term in equation 1) eliminates any city-wide time variant variables that could be in the error term. Taking this difference eliminates any difference in new establishment location that happen because of city-specific shocks that happen between our years of data. For example, if EZ cities implement a city-wide policy that attempts to purge establishments from other cities, taking this difference will separate the effect of this policy on new establishment location decisions from the effect of offering EZ, as long as the event did not affect EZ areas differentially from the larger city.

The second difference in this method (the difference between the two bracketed terms in equation 1) eliminates any census-tract fixed or city-wide fixed effects that could be responsible for changes in new establishment location. For example, if all census-tracts chosen for EZs have high state tax rates (that remain constant between our years of data), then taking this difference will eliminate the possibility that the EZ variable is also picking up the effects of the tax rates on new establishment location decisions.

A potential weakness of this differencing method is that the larger city may be subject to general equilibrium effects of the EZ incentives. Although, this problem may be more serious when using comparison areas that are similar and geographically close, this may still be a concern if economic activity shifts across these areas. It could also affect our results if there are
externalities (positive or negative) on comparison areas, making the effect of the program look larger or smaller than it actually is. \(^{10}\) By differencing with the entire city surrounding the EZ, the potential for general equilibrium effects are muted. The differencing method limits the error term to being only census tract level variables that change over the decade. If there are variables that are census tract specific that change over the decade and are correlated with designation of the EZ, they can still cause a biased estimate of the EZ program effects.

The estimating equation used to determine the effect of the tax incentives on new establishment location, as measured by the number of new establishments, is:

\[
Y_{i,n} = \alpha + \beta EZ_{i,n} + X'_{i,n}\delta + u
\]  

(2)

where \(i\) indexes a census tracts, \(n\) indexes the industry at the two digit SIC level, \(X\) is a vector of industry dummy variables, and \(EZ\) is a dummy variable for availability of the EZ wage tax credit. The outcome variable, \(Y\), is expressed in counts of establishments by industry in a given census tract, and is differenced as shown in equation one.

IV. Data Description

Our data source for the number of new establishments that enter a local area comes from the Dun and Bradstreet (D&B) Marketplace database. \(^{11}\) The data come from the fourth quarter survey from the years 1994, 1996, and 2000. These data contain a wealth of establishment information, including employment, sales, years of service, the location at the zip code level, and the two digit Standard Industrial Classification (SIC) code of the establishments.

\(^{10}\) If EZs improved other areas of the city because of a positive externality, then comparing to the EZ area to the surrounding city would understate the true effect. If the EZs shifted resources away from other areas of the city, then comparing the EZ area to the surrounding city would overstate the true effect.

\(^{11}\) Although the D&B does not contain all business activity in the U. S., the omissions from the data is sufficiently random that the data is considered representative of the spatial distribution of the business activity in the U. S.
The D&B data are aggregated to the zip code level. We map the zip code level data to census tracts using a zip code to census tract correspondence to match the EZ and EC geography. This correspondence determines what percent of each zip code lies in a given census tract and assigns that percent of zip code employment to the census tract. Our list of EZ and EC census tracts was obtained through personal correspondence with the Department of Housing and Urban Development, and is also partially available through the department’s webpage.

From the D&B data we create our dependent variable, then number of new establishments, and a measure of industry agglomeration, a count of existing business. We classify an establishment as new if it has been in service for one year or less at the time of the survey. Our measure of agglomeration is the number of establishments in the same SIC that have been in service for more than four years. We use this measure of existing agglomeration to test if the EZ tax incentives have a differential impact on areas with an existing number of inter-industry establishments.

V. Results

Our primary regression results for equation 2 using the D&B data, with the number of new establishments that locate in an area as the dependent variable are shown in table 2. Table 2 presents short term results (the 1994 to 1996 difference) of estimating equation 2 using OLS with SIC two digit industry fixed effects, and clustering the standard errors at the city level. We run separate regressions using all industries as well as for select industries at the one digit SIC level. We cluster standard errors at the city level because we expect that the number of new establishments in a census tract is correlated within a city and therefore the error term is likely to be correlated within a city.

---

12 To use this correspondence, we assume that the amount of business activity in a zip code is distributed uniformly across the zip code. This is a standard assumption in the literature.
The regression results in column 1 of table 2 show that the location based tax incentives offered by the EZ program had a negative short term impact on the number of new establishments that chose to locate in designated areas. The coefficient on the tax incentive (EZ) variable shows that on average, areas designated with tax incentive status had about .03 less new establishments locate there. Recall, that because of our identification strategy, this coefficient is the change in the number of new establishments relative to what happened in the larger city. Although, the coefficient appears quite small in terms of economic significance it is actually quite large relative to what happened in control areas, as shown by the constant term. The constant term can be interpreted as the change in the number of new establishments that chose to locate in control areas (relative to the larger city). Our estimate is that the constant is effectively zero (0.005), thus the fact that the EZ areas had, on average .03 fewer new establishments locate there than the previous period is a large effect. This effect is precisely estimated, and is statistically different from zero at the one percent level.

The negative effect of tax incentives on new establishment location remains quite strong across industries, as shown in columns 2-6 of table 2. These results show that the overall effect on new businesses is not caused by a heterogeneous policy impact of location based tax incentives across industries. This is somewhat surprising; given the findings in Hanson and Rohlin (2008) that the EZ tax incentives are responsible for a heterogenous effect across industry types for all establishments. The negative impact of location-targeted tax incentives on new establishment location also remains statistically significant across industries in all cases, and in most cases is significant at the one percent level. Our results across industries show that although the tax incentives may be more valuable to some industries (because they are based on wages paid), they tend to keep new establishments of all types from entering the designated area.
The negative effect is strongest in the Wholesale industry and is also quite strong in the Retail and Service industries.

For ease of interpretation, we also run the model using the natural log of the number of new establishments as the dependent variable. The results for all industries, displayed in column 1 table 3, show that adding Empowerment Zone tax incentives to an area reduces the number of new establishments locating in the area by almost 74 percent, statistically significant at the one percent level. Table 3 also shows the results across industries using the natural log of the number of new establishments as the dependent variable in columns 2-6. These results show that although there is a negative effect on new establishment location across industries, it is largest in the manufacturing sector where the number of new establishments is reduced by almost 150 percent (significant at the one percent level).

There is also a large negative effect on new establishment location in the wholesale trade industry; we show that the number of new establishments in this industry is reduced by 50 percent as a result of the policy (statistically significant at the two percent level). The other major negative industry level impact is in the finance, insurance and real estate sector (FIRE), where the policy reduced the number of new establishments entering tax-incentive designated areas by about 48 percent, statistically significant at the one percent level.

There has been a recent interest by state and local policy makers to attract or encourage the birth and growth of small establishments known as “economic gardening”. Since location-based tax incentives may be seen as one tool for meeting this policy goal, we are interested in testing to see if the EZ tax incentives have a differential effect on new establishments across

---

13 Because we take the natural log transformation, we lose observations where there was no change or a negative change. Therefore, the literal interpretation of this result is conditional on having an increase in the number of new establishments; the tax incentives cause a 74 percent smaller increase.
14 The economic gardening approach to growth was pioneered in Littleton, Colorado in the late 1980’s a complete description of the approach is available on the cities webpage at: www.littletongov.org/bia/economicgardening/.
different sizes, where size is measured by the number of employees. The Dun and Bradstreet data allow for this flexibility, as they include information on the number of establishments sorted by number of employees. To test the effect of the EZ tax incentives on new establishment location across different sizes of establishments, we break the dependent variable used in tables 2 and 3 down by counts of establishments based on the number of employees. We run separate regressions as in equation two for establishments that are between one and four employees, five to nine employees, ten to 49 employees, 50 to 99 employees, and 100 or more employees. The regression results for equation two using establishments of different size as the dependent variable are shown in table 4.

The first column of table 4 shows that the EZ tax incentives reduced the number of new establishments with between one and four employees by .02. Again, considering that the constant is essentially zero (0.0049), this is a large change, statistically significant at the one percent level. Results using the natural log specification (not shown) suggest that the tax incentives were responsible for reducing the number of new establishments with between one and four employees by about 118 percent (statistically significant at the one percent level). Columns 2-5 of table 4 show that the effect on new, larger establishments was much smaller, although still statistically different from zero. The results for larger establishments also show a negative relationship between the tax incentives and new establishment location in the targeted areas.15

At first glance, our results may appear counter-intuitive; we show that a policy designed to strengthen local economies causes a decline in the number of new establishments that enter a

---

15 The results presented in table 4 are not heterogeneous across industries. We have run regressions at the one digit industry level (as in table 2 and 3) by establishment size and consistently find a negative effect of the tax incentives on new establishment location. This effect is largest for establishments of between one and four employees regardless of the industry, and remains so across the spectrum of establishment sizes as shown in table 4. These results are available from the authors upon request.
market. This finding, however, seems to fit with the finding in Hanson (2007) that the EZ tax incentives became capitalized into local property values. If the tax incentives become immediately capitalized into property values, new establishments considering the targeted area may not be able to afford the increased rents. This may be especially true for new establishments as they are likely to have greater degree of uncertainty about profitability, and therefore tax liability, and may deem tax credits as less valuable than established establishments. Not surprisingly, this is especially true for small establishments, as the employee tax credit is less valuable for establishments that have fewer employees.

Because property values increase as a result of the tax credits, we would expect there to be some effect on existing establishments in the targeted area. The Dun and Bradstreet data provide counts of establishments and employees by age of the establishment, allowing us to test the effect on establishments that were in the area prior to the start of the tax incentives. We use the same econometric specification presented in equation two, but change our dependent variable to be the number of employees at existing establishments. This allows us to see if established establishments react to the tax incentives by expanding employment.

Our results, shown in table 5, provide weak evidence that existing establishments in certain industries expanded employment as a result of the tax incentives. The point estimate for the regression using all industries suggests that employment at existing establishments is declining slightly, although this effect is quite small and not statistically different from zero. Regression results at the industry level show that the manufacturing, wholesale, retail, and FIRE sectors all expanded employment. These positive results, however, are quite imprecise, as only the effect in

---

16 Existing establishments are establishments that have been in service in that location for four years or more.
17 Note that this is employment at establishments within the EZ boundary, not necessarily employment of residents. Employment changes of residents are found to zero in Hanson (2007), although research using other specifications by Busso and Kline (2006) has found positive effects.
the wholesale industry is marginally statistically significant. We take the evidence that employment at existing establishments in some industries expanded as being somewhat supportive of the finding that the tax incentives became capitalized into local property values.

VI. Robustness Checks

Our results show that tax incentives tied to location decrease the number of new establishments that choose to locate in the designated area. This effect is consistent across industries and is particularly strong for small establishments. In this section we present evidence that supports our primary findings by examining several reasons why our findings may be questioned, including: measuring only a short term program effect, endogeneity in our econometric design, and existing agglomeration economies in treatment areas creating a heterogeneous program effect.

The results presented in tables 2 and 3, showed the effect of tax incentives on new establishment location by measuring the change in the number of new establishments over a relatively short period of time (1994 to 1996). A potential problem with measuring the effect of the tax incentives using a short time window is that establishments may not have knowledge of the incentives, and thus my not react accordingly. Establishments may be more likely to have knowledge of the credit after a longer period of time, thus the long-term effect may be different than the short term effect. To test whether the long term effect of the tax incentives is different we use the same econometric specification in equation two, but with year 2000 data as the treatment period. It should be noted that if the tax incentives truly are capitalized into property values, we would expect the same (or possibly stronger) negative effect in the longer term.
Results using year 2000 data as the treatment period are shown in table 6. These results suggest that the long term effect of the tax incentives is also negative, with a magnitude larger than the short term effect, statistically significant at the one percent level. Column one of table 6 shows that the EZ tax incentives were responsible for reducing the number of new establishments that locate in targeted areas by .01, statistically significant at the one percent level, considering that the change in the comparison areas was essentially zero (the constant term), this is a large change. The negative long-term result holds across industries, and is statistically significant at conventional levels in most industries.

Again, for ease of interpretation we also present the results using a natural log transformation of our dependant variable in table 7. The results in table 7 show that the tax incentives reduced the number of new establishments locating in the designated area by 136 percent, statistically significant at the one percent level. The across industry results also show a large negative long-term effect of the tax incentives, reducing the number of establishments locating in the area by as much as 200 percent in the FIRE industries, and by at least 65 percent in the Service industries. All results using the natural log transformation are statistically significant at the one percent level.

The results using year 2000 data as the treatment year and 1994 as the pre-treatment show that the short term findings displayed in table 2 and 3 are not likely to be driven by the speed at which establishments learned about the tax incentives. The longer term results repeat the same negative effect of the tax incentives that was shown in the short term results. Although, it is still possible that establishments have not learned about the tax incentives and have not reacted to them by the year 2000 direct survey evidence suggests that this is not a concern, as
about 60 percent of establishments located in Empowerment Zone designated areas are aware of the tax incentives (GAO, 1999).

Another possible reason that our primary results may be subject to criticism is endogeneity of the EZ tax incentives with respect to our outcome measure. Although our identification strategy gets around many of the typical stories that could result in endogeneity bias, ultimately EZ areas were likely chosen over the EC areas for a reason.\textsuperscript{18} If the selection of EZ areas was based on some notion of what was going to happen to future economic outcomes (either negative or positive) then our primary results could be biased. For instance, if EZ areas were selected over other applicants because they were less likely to be able to attract new establishments than other applicants, then the results in table 2 and 3 would be biased toward finding a negative effect of the tax incentives.

To eliminate the possibility that our primary findings are being driven by endogeneity caused by selection of EZ areas, we use an instrumental variables estimation procedure and re-estimate equation two. A plausible instrument for EZ designation is one that reflects the political influence of the Representative associated with the census tract of the area. We use a measure of political influence based on federal Congressional districts, as opposed to Senate districts that encompass an entire state, because they are closer to the level of geography by which EZs were assigned. Our measures of political influence are if the area had a representative on the House of Representatives Ways and Means Committee and the number of years that representative was in office at the time the EZ areas were designated. There is existing evidence of the relationship between political favoritism and EZ designation. Both Wallace (2004) and Hanson (2007) find that a location represented by a member serving on the House Ways and Means committee is

\textsuperscript{18} See Hanson (2007) for a discussion of EZ selection process and a discussion of the likely bias in estimation caused by this process.
correlated with being designated an EZ. Wallace (2004) finds that no other committee membership is a significant determinant after controlling for other area characteristics.

Table 8 shows the first stage results using both Ways and Means committee membership and the number of years that the congressman was on that committee. As shown by the instrument F test, the instruments show a strong correlation with EZ designation. They are both individually significant as shown by the p-values, as well as jointly significant as shown by the instrument F-test and corresponding p-value. These results are essentially the same whether or not we use the two digit SIC effects in the model.

The second stage regression results from the IV estimation using both instruments shown in table 9 confirm the negative relationship between the EZ tax incentives and new establishment location from our primary findings reported in table 2 and 3. These results show approximately the same negative relationship with new establishment location as the non-IV results in terms of magnitude; however the IV results are statistically imprecise. The IV results presented in table 9 are consistent with our findings that the tax incentives were responsible for a large decrease in the number of new establishments that entered the targeted area. As shown in columns 2-6 of table 9, the IV results hold across various industry types and are similar in magnitude to the results in table 2.

Another possible criticism of the results presented in table 2 and 3 is that the tax incentives could have a heterogeneous effect across areas with different amounts of existing agglomeration. There is a well-established literature that examines the importance of
agglomeration economies to productivity, (for recent examples see Greenstone et. al. (2007),
Rosenthal and Strange (2004), and Ellison and Glaeser (1999)) so it would be natural for new
establishments to react to a policy differently in areas with this characteristic. Previous work by
Devereux, et. al. (2007) finds that government grants are less effective at inducing
establishments to locate in an area that has fewer establishments in the same industry. To
capture the differential effect that agglomeration economies may induce on new establishment
location decisions, we use a simple model that allows us to test if the tax incentives had more of
an impact in these areas. Our model for testing this effect is shown in equation three:

\[ Y_{i,n} = \alpha + \beta_1 EZ_{i,n} + \beta_2 AG_{i,n} + \beta_3 AG_{i,n} * EZ_{i,n} + X'_{i,n} \delta + u \]  

(3)

The parameter of interest in this regression is \( \beta_3 \), which tells us if the effect of the EZ tax
incentives was different in areas with a different degree of agglomeration. We measure
agglomeration as the number of existing establishments in a given industry prior to the start of
the policy (1994), often referred to as a localization effect. The regression results for equation
three are displayed in table 10, and show that the tax incentives actually increased the number of
new establishments in areas that had existing agglomeration in the same industry. The parameter
of interest, \( \beta_3 \), shows that this effect is about half as large as the negative effects found without
considering agglomeration. This result is driven by a positive effect in the retail and service
industries as shown in columns 4 and 6 of table 10.

Although, the magnitude of existing agglomeration economies is quite large, this effect is
not precisely estimated as shown by the large standard errors and p-values in table 10. It is hard
to draw a definitive conclusion from these results because of the large standard errors; however
the point estimates shed some light on the effect of existing agglomeration. It seems that from a
policy perspective, it may be that offering tax incentives for relocation is more likely to be
successful if the incentives are offered in an area with existing establishments in an industry which policy makers intend to target.

VII. Conclusion

Tax incentives have been used as an economic (re)development tool by a wide range of state and local governments. Presumably, part of the hope of policy makers using this tool is that it will attract new establishments to the local economy and work as a catalyst for future economic growth. The evidence presented here suggests that a prominent policy administered at the federal level, but tied to local geography, actually discourages new establishments from entering the targeted area. We find strong evidence that the federal Empowerment Zone wage tax credit reduces the number of new establishments that enter a local market. This effect is particularly strong for small establishments, and is persistent across a wide range of industry classifications. We also present evidence that this finding is driven by the expansion of existing establishments in the targeted area, and is consistent with capitalization of the tax incentives into local property values.

We used the federal Empowerment Zone wage tax incentive to design an identification strategy to confront the primary challenges that arise in any attempt to determine the effect of tax incentives on location decision of establishments. Our identification strategy relied on a differencing methodology that allowed us to separate the effect of the tax incentives from trends in the local economy as well as build a plausible counterfactual for what would have happened to the targeted areas in the absence of offering tax incentives. In addition, our findings proved robust to an alternative instrumental variables specification that dealt with the possibility that selection of the designated areas may be endogenous. We also showed the negative effect on new
establishment location persists into the longer term, but that the program may have a differential impact across areas with existing agglomeration economies.

These results do not allow us to conclude that offering tax incentives cannot benefit local economies, but they do suggest that allocating these incentives based on geography is likely to work against the goal of attracting new business establishments. Our results suggest that if a tax incentive policy is going to work to attract new establishments to an area, it likely hinges on the area having some existing degree of agglomeration in a particular industry. Although we do find strong evidence that the overall number of new establishments entering local markets declines as a result of the tax incentives, we do not have evidence as to what types of establishments choose not to enter. It could be that the policy encourages only more successful establishments to enter the market because it requires some positive tax liability to be useful and prevents those that are likely to fail from entering. More research is needed to determine if tax incentive policies attract more successful establishments to the area, and ultimately if these policies are able to improve local economies. However, given the strong negative relationship between EZs and new establishment location shown here, caution should be used when crafting tax incentive policy if the intended effect is to attract new establishments to a local area.
References


Table 1: Pre-Treatment Characteristics of Sample: Zone and Surrounding City

<table>
<thead>
<tr>
<th></th>
<th>Atlanta, GA</th>
<th>Baltimore, MD</th>
<th>Chicago, IL</th>
<th>Detroit, MI</th>
<th>New York, NY</th>
<th>Philadelphia, PA*</th>
<th>EC Area</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Area (sq.mi.)</td>
<td>10</td>
<td>6</td>
<td>16</td>
<td>25</td>
<td>7</td>
<td>3</td>
<td>11</td>
<td>132</td>
</tr>
<tr>
<td>Population Density</td>
<td>54514</td>
<td>394017</td>
<td>77173</td>
<td>124737</td>
<td>221178</td>
<td>44541</td>
<td>1585577</td>
<td>61835</td>
</tr>
<tr>
<td>% White</td>
<td>5%</td>
<td>21%</td>
<td>12%</td>
<td>26%</td>
<td>15%</td>
<td>12%</td>
<td>12%</td>
<td>36%</td>
</tr>
<tr>
<td>% Black</td>
<td>92%</td>
<td>87%</td>
<td>77%</td>
<td>66%</td>
<td>57%</td>
<td>39%</td>
<td>36%</td>
<td>61%</td>
</tr>
<tr>
<td>% Other</td>
<td>2%</td>
<td>2%</td>
<td>1%</td>
<td>8%</td>
<td>27%</td>
<td>27%</td>
<td>13%</td>
<td>8%</td>
</tr>
<tr>
<td>Unemployment Rate</td>
<td>18%</td>
<td>15%</td>
<td>24%</td>
<td>28%</td>
<td>17%</td>
<td>24%</td>
<td>16%</td>
<td>16%</td>
</tr>
<tr>
<td>Employment Rate</td>
<td>28%</td>
<td>32%</td>
<td>25%</td>
<td>24%</td>
<td>31%</td>
<td>24%</td>
<td>34%</td>
<td>45%</td>
</tr>
<tr>
<td>Labor Force Participation</td>
<td>34%</td>
<td>37%</td>
<td>33%</td>
<td>33%</td>
<td>37%</td>
<td>31%</td>
<td>40%</td>
<td>49%</td>
</tr>
<tr>
<td>Income per Capita (1999 dollars)</td>
<td>$7,057</td>
<td>$20,474</td>
<td>$10,426</td>
<td>$7,527</td>
<td>$9,333</td>
<td>$7,446</td>
<td>$9,819</td>
<td>$17,339</td>
</tr>
<tr>
<td>Income below poverty line</td>
<td>56%</td>
<td>42%</td>
<td>49%</td>
<td>47%</td>
<td>43%</td>
<td>53%</td>
<td>40%</td>
<td>20%</td>
</tr>
<tr>
<td>Vacant Housing Units</td>
<td>21%</td>
<td>15%</td>
<td>18%</td>
<td>18%</td>
<td>18%</td>
<td>21%</td>
<td>14%</td>
<td>9%</td>
</tr>
<tr>
<td>% Graduating from High school</td>
<td>41%</td>
<td>43%</td>
<td>42%</td>
<td>46%</td>
<td>45%</td>
<td>39%</td>
<td>52%</td>
<td>72%</td>
</tr>
<tr>
<td>% Graduating from College</td>
<td>5%</td>
<td>8%</td>
<td>7%</td>
<td>8%</td>
<td>9%</td>
<td>5%</td>
<td>10%</td>
<td>21%</td>
</tr>
</tbody>
</table>

* The Philadelphia EZ also includes parts of Camden, NJ which are excluded from this analysis.

Data are from 1990 census tract level and are aggregated to either the city or zone.
### Table 2: Effect of Tax Incentives on New Establishment Location, standard errors clustered at the city level shown in parenthesis

<table>
<thead>
<tr>
<th>EZ</th>
<th>All Industries</th>
<th>Manufacturing (20)</th>
<th>Wholesale (50)</th>
<th>Retail (52)</th>
<th>FIRE (60)</th>
<th>Service (70)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-0.0298***</td>
<td>-0.0103***</td>
<td>-0.1567***</td>
<td>-0.0575***</td>
<td>-0.0236**</td>
<td>-0.0707***</td>
</tr>
<tr>
<td></td>
<td>(0.0084)</td>
<td>(0.0021)</td>
<td>(0.0475)</td>
<td>(0.0197)</td>
<td>(0.0100)</td>
<td>(0.0258)</td>
</tr>
<tr>
<td></td>
<td>0.0055</td>
<td>0.0110</td>
<td>0.1028</td>
<td>0.0073</td>
<td>0.0052</td>
<td>0.0147</td>
</tr>
<tr>
<td></td>
<td>(0.0032)</td>
<td>(0.0063)</td>
<td>(0.0502)</td>
<td>(0.0361)</td>
<td>(0.0052)</td>
<td>(0.0088)</td>
</tr>
</tbody>
</table>

| N        | 105149         | 26620              | 2662           | 10648       | 9317      | 18634        |
| R²       | 0.0050         | 0.0020             | 0.0050         | 0.0070      | 0.0030    | 0.0060       |

*** indicates statistically significant at 1% level, ** at 5% level, * at 10% level.

Notes:
(a) The pre-treatment year is 1994, the treatment year is 1996.
(b) Unit of observation is the two digit SIC industry at the census tract level of geography.
(c) Data on number of establishments is from the Dunn & Bradstreet survey and is differenced as shown in equation 1 to reflect our identification strategy.
(d) The EZ variable represents designation of the federal Empowerment Zone wage tax credit at the census tract level, the coefficient on this variable reflects the effect of this tax incentive on the number of new establishments that locate in an area relative to the surrounding city compared to areas that applied for the EZ designation but were denied relative to their respective surrounding city.

### Table 3: Effect of Tax Incentives on Natural Log of New Establishment Location, standard errors clustered at the city level shown in parenthesis

<table>
<thead>
<tr>
<th>EZ</th>
<th>All</th>
<th>Manufacturing (20)</th>
<th>Wholesale (50)</th>
<th>Retail (52)</th>
<th>FIRE (60)</th>
<th>Service (70)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-0.7359***</td>
<td>-1.4769***</td>
<td>-0.5112**</td>
<td>-0.1785</td>
<td>-0.4738***</td>
<td>-0.3051</td>
</tr>
<tr>
<td></td>
<td>(0.1631)</td>
<td>(0.2953)</td>
<td>(0.2102)</td>
<td>(0.1572)</td>
<td>(0.1788)</td>
<td>(0.1917)</td>
</tr>
<tr>
<td></td>
<td>(2.5353)</td>
<td>(0.3038)</td>
<td>(0.2080)</td>
<td>(0.1682)</td>
<td>(0.3682)</td>
<td>(0.6660)</td>
</tr>
</tbody>
</table>

| N        | 24626        | 21598             | 855           | 3467        | 1805      | 4919         |
| R²       | 0.2050       | 0.3500            | 0.0280        | 0.1750      | 0.1090    | 0.2350       |

*** indicates statistically significant at 1% level, ** at 5% level, * at 10% level.

Notes:
(a) The pre-treatment year is 1994, the treatment year is 1996.
(b) Unit of observation is the two digit SIC industry at the census tract level of geography.
(c) Data on number of establishments is from the Dunn & Bradstreet survey and is differenced as shown in equation 1 to reflect our identification strategy.
(d) The EZ variable represents designation of the federal Empowerment Zone wage tax credit at the census tract level, the coefficient on this variable reflects the effect of this tax incentive on the percentage change in new establishments that locate in an area relative to the surrounding city compared to areas that applied for the EZ designation but were denied relative to their respective surrounding city.
Table 4: Effect of Tax Incentives on New Establishment Location by Establishment Size, standard errors clustered at the city level shown in parenthesis

<table>
<thead>
<tr>
<th>EZ</th>
<th>1 to 4</th>
<th>5 to 9</th>
<th>10 to 49</th>
<th>50 to 99</th>
<th>100 or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>EZ</td>
<td>-0.0243***</td>
<td>-0.0026***</td>
<td>-0.0017***</td>
<td>-0.0004***</td>
<td>-0.0002**</td>
</tr>
<tr>
<td></td>
<td>(0.0073)</td>
<td>(0.0007)</td>
<td>(0.0006)</td>
<td>(0.0001)</td>
<td>(0.0001)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.0049</td>
<td>0.0006</td>
<td>0.003</td>
<td>0.0001</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

| N           | 105149     | 105149     | 105149      | 105149      | 105149      |
| R²          | 0.0100     | 0.0000     | 0.0000      | 0.0000      | 0.0000      |

*** indicates statistically significant at 1% level, ** at 5% level, * at 10% level.

Notes:
(a) The pre-treatment year is 1994, the treatment year is 1996.
(b) Unit of observation is the two digit SIC industry at the census tract level of geography.
(c) Data on number of establishments is from the Dunn & Bradstreet survey and is differenced as shown in equation 1 to reflect our identification strategy.
(d) The EZ variable represents designation of the federal Empowerment Zone wage tax credit at the census tract level, the coefficient on this variable reflects the effect of this tax incentive on the number in new establishments by number of employees that locate in an area relative to the surrounding city compared to areas that applied for the EZ designation but were denied relative to their respective surrounding city.

Table 5: Effect of Tax Incentives on Employment at Existing Establishments, standard errors clustered at the city level shown in parenthesis

<table>
<thead>
<tr>
<th>EZ</th>
<th>All</th>
<th>Manufacturing (20)</th>
<th>Wholesale (50)</th>
<th>Retail (52)</th>
<th>FIRE (60)</th>
<th>Service (70)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EZ</td>
<td>-0.9612</td>
<td>1.4794</td>
<td>15.6661*</td>
<td>2.0977</td>
<td>9.5676</td>
<td>-9.2222**</td>
</tr>
<tr>
<td></td>
<td>(1.3467)</td>
<td>(1.2104)</td>
<td>(9.2312)</td>
<td>(2.4910)</td>
<td>(6.2774)</td>
<td>(4.2497)</td>
</tr>
<tr>
<td>Constant</td>
<td>11.0316</td>
<td>-0.7039</td>
<td>1.5901</td>
<td>-8.5624</td>
<td>-2.2728</td>
<td>2.0289</td>
</tr>
<tr>
<td></td>
<td>(18.3071)</td>
<td>(0.7730)</td>
<td>(4.4115)</td>
<td>(6.4415)</td>
<td>(2.9820)</td>
<td>(1.1450)</td>
</tr>
</tbody>
</table>

| N           | 105149    | 26620             | 2662           | 10648       | 9317      | 18634        |
| R²          | 0.0010    | 0.0010            | 0.0040         | 0.0010      | 0.0010    | 0.0020       |

*** indicates statistically significant at 1% level, ** at 5% level, * at 10% level.

Notes:
(a) The pre-treatment year is 1994, the treatment year is 1996.
(b) Unit of observation is the two digit SIC industry at the census tract level of geography.
(c) Data on number of employees is from the Dunn & Bradstreet survey and is differenced as shown in equation 1 to reflect our identification strategy.
(d) The EZ variable represents designation of the federal Empowerment Zone wage tax credit at the census tract level, the coefficient on this variable reflects the effect of this tax incentive on the percentage change in employment at establishments that were existing prior to the start of the program in an area relative to the surrounding city compared to areas that applied for the EZ designation but were denied relative to their respective surrounding city.
Table 6: Long Term Effect of Tax Incentives on New Establishment Location, standard errors clustered at the city level shown in parenthesis

<table>
<thead>
<tr>
<th>EZ</th>
<th>All</th>
<th>Manufacturing (20)</th>
<th>Wholesale (50)</th>
<th>Retail (52)</th>
<th>FIRE (60)</th>
<th>Service (70)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EZ</td>
<td>-0.0108***</td>
<td>-0.0041**</td>
<td>-0.0339</td>
<td>-0.0100*</td>
<td>-0.0121**</td>
<td>-0.0270**</td>
</tr>
<tr>
<td>Constant</td>
<td>0.0025</td>
<td>0.0059</td>
<td>0.0248</td>
<td>0.0042</td>
<td>0.0102</td>
<td>-0.0024</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>N</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>105149</td>
<td>0.0020</td>
</tr>
</tbody>
</table>

*** indicates statistically significant at 1% level, ** at 5% level, * at 10% level.

Notes:
(a) The pre-treatment year is 1994, the treatment year is 2000.
(b) Unit of observation is the two digit SIC industry at the census tract level of geography.
(c) Data on number of establishments is from the Dunn & Bradstreet survey and is differenced as shown in equation 1 to reflect our identification strategy.
(d) The EZ variable represents designation of the federal Empowerment Zone wage tax credit at the census tract level, the coefficient on this variable reflects the effect of this tax incentive on the number of new establishments that locate in an area relative to the surrounding city compared to areas that applied for the EZ designation but were denied relative to their respective surrounding city.

Table 7: Long Term Effect of Tax Incentives on Natural Log of New Establishment Location, standard errors clustered at the city level shown in parenthesis

<table>
<thead>
<tr>
<th>EZ</th>
<th>All</th>
<th>Manufacturing (20)</th>
<th>Wholesale (50)</th>
<th>Retail (52)</th>
<th>FIRE (60)</th>
<th>Service (70)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EZ</td>
<td>-1.3627***</td>
<td>-1.6769***</td>
<td>-0.8196***</td>
<td>-0.7562***</td>
<td>-2.0494***</td>
<td>-0.6595***</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>N</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>24955</td>
<td>0.3260</td>
</tr>
</tbody>
</table>

*** indicates statistically significant at 1% level, ** at 5% level, * at 10% level.

Notes:
(a) The pre-treatment year is 1994, the treatment year is 2000.
(b) Unit of observation is the two digit SIC industry at the census tract level of geography.
(c) Data on number of establishments is from the Dunn & Bradstreet survey and is differenced as shown in equation 1 to reflect our identification strategy.
(d) The EZ variable represents designation of the federal Empowerment Zone wage tax credit at the census tract level, the coefficient on this variable reflects the effect of this tax incentive on the percentage change in new establishments that locate in an area relative to the surrounding city compared to areas that applied for the EZ designation but were denied relative to their respective surrounding city.
Table 8: 1st stage IV: Dependent variable is EZ designation, standard errors shown in parenthesis

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ways and Means Member</td>
<td>0.1416***</td>
<td>-0.2589***</td>
<td>-0.2589***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0033)</td>
<td>(.0061)</td>
<td>(.0061)</td>
<td></td>
</tr>
<tr>
<td>Number of Terms on</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Committee</td>
<td></td>
<td>0.0224***</td>
<td>0.0445***</td>
<td>0.0445***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.0004)</td>
<td>(.0006)</td>
<td>(.0006)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.1826</td>
<td>0.1727</td>
<td>0.1826</td>
<td>0.1826</td>
</tr>
<tr>
<td></td>
<td>(0.0013)</td>
<td>(0.0013)</td>
<td>(0.0013)</td>
<td>(0.0109)</td>
</tr>
<tr>
<td>Industry fixed effects</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>N</td>
<td>105149</td>
<td>105149</td>
<td>105149</td>
<td>105149</td>
</tr>
<tr>
<td>R²</td>
<td>0.0169</td>
<td>0.0443</td>
<td>0.0573</td>
<td>0.0573</td>
</tr>
<tr>
<td>Instrument F-test (1,105147)</td>
<td>1804.36</td>
<td>4870.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Value</td>
<td>0.0000</td>
<td>0.0000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instrument F-test</td>
<td></td>
<td></td>
<td>3115.81</td>
<td>3113.5</td>
</tr>
<tr>
<td>(2,105146)/(2,105068)</td>
<td></td>
<td></td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>P-Value</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*** indicates statistically significant at 1% level, ** at 5% level, * at 10% level.

Notes:
(a) Information about congressional committee assignment and years of service comes from http://clerk.house.gov. We match this to census tract geography using the Mable/Geocorr database online at http://mcdc2.missouri.edu/websas/geocorr90.shtml
(b) Unit of observation is the two digit SIC industry at the census tract level of geography.
(c) We also run the first stage by clustering standard errors at the SIC 2 digit level; this decreases our standard errors on the instrument parameters and does not change the fact that they pass the instrument F test.
Table 9: 2nd stage IV for Effect of Tax Incentives on New Establishment Location, standard errors clustered at the city level shown in parenthesis

<table>
<thead>
<tr>
<th>EZ (fitted)</th>
<th>Industry Level (1 digit SIC)</th>
<th>( t ) values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All</td>
<td>Manufacturing (20)</td>
</tr>
<tr>
<td>EZ (fitted)</td>
<td>-0.0390</td>
<td>-0.0085</td>
</tr>
<tr>
<td></td>
<td>(0.0429)</td>
<td>(0.0145)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.0145</td>
<td>0.0106</td>
</tr>
<tr>
<td></td>
<td>(0.0136)</td>
<td>(0.0073)</td>
</tr>
</tbody>
</table>

N | 105149 | 26620 | 2662 | 10648 | 9317 | 18634

*** indicates statistically significant at 1% level, ** at 5% level, * at 10% level.

Notes:
(a) The pre-treatment year is 1994, the treatment year is 1996.
(b) Unit of observation is the two digit SIC industry at the census tract level of geography.
(c) Data on number of establishments is from the Dunn & Bradstreet survey and is differenced as shown in equation 1 to reflect our identification strategy.
(d) The EZ variable represents designation of the federal Empowerment Zone wage tax credit at the census tract level, the coefficient on this variable reflects the effect of this tax incentive on the number of new establishments that locate in an area relative to the surrounding city compared to areas that applied for the EZ designation but were denied relative to their respective surrounding city.
(e) Second stage results are reported using both instruments. The sign of these results is not sensitive to using only one instrument; however the magnitude of the EZ variable is decreased substantially when only using the membership variable. The second stage standard errors in each case are also too large to attach statistical significance. We take these results as evidence that our OLS results are not biased in any meaningful way.
<table>
<thead>
<tr>
<th></th>
<th>All (0)</th>
<th>Manufacturing (20)</th>
<th>Wholesale (50)</th>
<th>Retail (52)</th>
<th>FIRE (60)</th>
<th>Service (70)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EZ*AG</td>
<td>0.0142</td>
<td>-0.0206</td>
<td>-0.0125</td>
<td>0.0115</td>
<td>-0.0092</td>
<td>0.0105</td>
</tr>
<tr>
<td>EZ</td>
<td>-0.0058</td>
<td>-0.0005</td>
<td>-0.0719**</td>
<td>0.0014</td>
<td>-0.0101*</td>
<td>-0.0039</td>
</tr>
<tr>
<td>AG</td>
<td>0.0365***</td>
<td>0.0409***</td>
<td>0.0246**</td>
<td>0.0634***</td>
<td>0.0281***</td>
<td>0.0618***</td>
</tr>
<tr>
<td>Constant</td>
<td>0.0006</td>
<td>-0.0029</td>
<td>0.0430</td>
<td>-0.0290</td>
<td>-0.0022</td>
<td>0.0012</td>
</tr>
</tbody>
</table>

*** indicates statistically significant at 1% level, ** at 5% level, * at 10% level.

Notes:
(a) The pre-treatment year is 1994, the treatment year is 1996.
(b) Unit of observation is the two digit SIC industry at the census tract level of geography.
(c) Data on number of establishments is from the Dunn & Bradstreet survey and is differenced as shown in equation 1 to reflect our identification strategy.
(d) The EZ*AG variable represents the interaction of our agglomeration measure and an area designated with the federal Empowerment Zone wage tax credit at the census tract level. The coefficient on this variable reflects how existing agglomeration in an area changes the effect of this tax incentive on the number of new establishments that locate in an area relative to the surrounding city compared to areas that applied for the EZ designation but were denied relative to their respective surrounding city.