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Articles

The EFFECTS of STATE and LOCAL TAX-BASED INCENTIVES on U.S. LABOR MARKETS, 1990–2015: BOON or BOONDOGGLE?

Hakyeon Lee [a], J.S. Butler [b]

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Clear evidence about the effectiveness of economic development incentives is limited. To bridge this research gap, this study uses the Upjohn Institute Panel Database on Incentives and Taxes (PDIT). Unemployment and employment rates are used to analyze the effectiveness of tax-based incentives. Statistical results indicate that tax incentives have a marginal impact on employment status and limited benefits to states. Only the R&D tax credit statistically significantly increases employment rates. This result supports the interpretation of economic development policies as a zero-sum game.

Introduction

Confronted with a high unemployment rate, state and local governments have experienced double torture (Wu, 2012), with the resulting crisis locking local governments in a vicious cycle. Specifically, high unemployment leads to significant reductions in local government revenues and requires government to spend more resources and operate more programs. Statistical indicators support this serious situation. Not only have 27 metropolitan areas among 45 in the Northeast already faced "chronic distress, but also 33 Midwest metropolitan areas have experienced a similar fate since the 1970s (Porter, 2018). Thus, state governments are actively operating local development policies that are aimed at increasing local tax bases and jobs. The extent and type of economic development policies varies depending on each state (Wang, 2018).

Substantial attention and interest have existed in the academic field due to the dramatic spread of economic development policies, with the majority of studies analyzing the effect of such policies at the local level (Betz et al., 2012). As more studies are conducted, academic disputes continue about the effect of economic development policies. A few studies suggest that there is a positive relationship between economic outcomes and economic development policies (Hollenbeck, 2008; Holzer et al., 1993; Hoyt et al., 2008; Peters & Fisher, 2002; Rodríguez-Pose & Arbix, 2001). Many previous studies have made counterarguments concerning the positive effects of economic development policies. Some argue that a possibility exists that incentive policies could have a negative impact on local areas because of the evils of competition (Ellis & Rogers, 2000; Patrick, 2014). Others argue that this severe competition could lead to the under-provision of public goods because economic development policies simply relocate businesses (Bartik, 1991; Fisher & Peters, 1997; Gorin, 2008; Wang, 2016). Furthermore, Burstein and Rolnick (1995) suggest that targeting incentives for a specific industry could cause losses in the national economy. We can confirm that the results of economic development policies are mixed. Therefore, previous studies only partially addressed the question whether economic development incentives are effective. In other words, although many studies have analyzed the effectiveness of incentives, they do not actually report clear results about how effective they are. The situation provides us with two questions about this field. The first question is why governments use incentives without clear evidence about their effectiveness. Some studies have analyzed why local governments use tax incentives (Basolo & Huang, 2001; Dewees et al., 2003; Lobao & Kraybill, 2005). According to one recent study, the ideology of a state government is a major factor (H. Lee & Butler, 2022).

The second question pertains to the effects of tax incentives on local areas. Earlier studies were conducted with limited data (H. Lee & Butler, 2022) and, again, do not give us clear answers. Yet the effectiveness of these incentives is an emerging issue (Bartik & Erickcek, 2014). In this regard, the analysis is based on two underlying reasons. First, each state needs to increase the number of jobs available to overcome the Great Recession (Bartik, 2012). Second, billions of dollars have been spent on incentives across the nation (Peters & Fisher, 2004). Despite the importance of this issue, we do not have clear information about the effectiveness of economic development incentives because the literature shows opposing results. Accordingly, this research aims to contribute to the field of business incentives by posing the following research questions: (1) How important are tax-based incentives to the overall unemployment

a Department of Local Governance, Gyeonggi Research Institute, cauhak1983@gmail.com

b Martin School of Public Policy and Administration, University of Kentucky, jsbutl3@email.uky.edu

rate and employment rate by state? (2) What is the impact of tax-based incentives on the unemployment rate and employment rate of states?

Literature Review

The Characteristics of Economic Development Policy

When state and local governments adopt economic development policies, they expect to create something new, such as increasing investments and jobs. However, many studies do not draw conclusions about the effectiveness of economic development policies (Bartik & Erickcek, 2014; Patrick, 2014; Swann, 2017). Thus, a few studies on economic development have recognized policy effects as a zero-sum game (Chirinko & Wilson, 2008; Goolsbee & Maydew, 2000; Wilson, 2009).

We can easily understand the characteristics of economic development policy if we review the process of policy adoption. At the start of the process, as one state adopts a new economic development policy, the probability of other states adopting the same policy is increased because other state residents hear of the expected benefits (Leiser, 2017). These states also start to experience the loss of wealth, that is, the zero-sum nature of damage because of the new policy. As time goes on, the comparative benefits of the economic development policy decrease because several other states adopted the same policy. In other words, early adopters can no longer enjoy their once unique benefits. Additionally, states that do not adopt the new policy try to differentiate themselves from other states that have already adopted the policy by using other policies to attract new investors; indeed, the probability of adoption begins to decrease after a short peak time, with economic development policies tending to show an inverted U-shaped adoption probability. This repeating process indicates that state and local governments recognize the use of economic development policies as a zero-sum game (Leiser, 2017).

Tax-based Incentives

Business or economic-development incentives are "tax breaks, cash, or services that are at least somewhat customized to the need(s) of an individual business and are awarded with some discretion" (Bartik & Erickcek, 2014, p. 315). For example, state and local governments may designate a specific area as an enterprise zone to induce private investment. If a firm moves to the targeted area, it receives benefits, including tax abatements. In return, governments expect to boost the local economy by attracting more investment and increasing employment and consumption. In other words, the purpose of tax-based incentive is to impact business expansion, openings, and location.

State and local governments need to devote more money to unemployed people while facing a decline in revenue brought on by economic downturns. In addition, increasing demand exists for state and local governments "to do something about jobs" (Bartik, 2012, p. 545). In such situations, local and state governments try nearly everything to increase private investment and job creation. Rubin described this effort as "shooting anything that flies and claiming anything that falls" (Rubin, 1988, p. 236). However, raising taxes may affect the local government negatively and delay the pace of economic recovery in the current situation (Wu, 2012). For instance, higher taxes on firms may add to the cost of business.

To overcome this situation, state and local governments actively have engaged in tax-based incentives, the rationale behind which is that they lead to business investment and new jobs, stimulating local demand for goods and services, and giving rise to further rounds of economic growth. However, differences of opinion exist on this point. Furthermore, policymakers who favor this approach argue that economic growth increases public revenue, allowing for improved public services or a decrease in tax rates (Peters & Fisher, 2004; Sung et al., 2017). However, certain studies criticize economic-incentive policies for often being wasteful and having, at best, a minor impact on growth in employment or investment (Hanson, 2009; Neumark & Kolko, 2010).

Most states have several types of tax-based incentives, such as tax credits, tax exemptions, and infrastructure investments (Pew Center Report, 2012). Tax-based incentives have grown substantially over the past 25 years, but they vary from state to state. Figure 1 shows this variation. The darker the color, the more tax-based incentives offered by the state.

The first map shows the status of tax-based incentives in 1990, when few state governments used them. Those that made extensive use of them include Nebraska, Michigan, and New York. Specifically, these maps show each state's average percentage of value added. Bartik (2017) explained this concept as follows: "This is the present discounted value of incentives provided/promised over a 20-year period for new facility opened in 2015, divided by the present value of value added, with present value calculated using a 12 percent discount rate and with industries and state averaged together based on their relative share of value-added' (pp. 46). The first map is a snapshot of each state's average percentage of value added. The areas colored in light blue indicate little use of incentives, whereas those in dark blue mean a considerable use of incentives. The second map shows the variation in tax-based incentives from 1990 to 2000. The shade of color used indicates the difference between tax incentives from 1990 to 2000. The second map depicts growth in the average percentage of value added. In this map, the areas colored in the lightest blue indicate decreased tax incentives (−0.23%), whereas those presented in the darkest blue point to increased tax incentives (2.56%) between 1990 and 2000. Thus, the range illustrated in the second map is between −0.23% and 2.56%.

State governments actively increased the use of tax-based incentives during this time. Kentucky is one example. The third map reveals the differences in tax-based incentives between 2000 and 2007. Although tax-incentive use continued to increase, the pace slowed down. The range depicted in the third map falls between −0.36% and 3.69%, and that shown in the last map is between −1.68% and 2.69%.

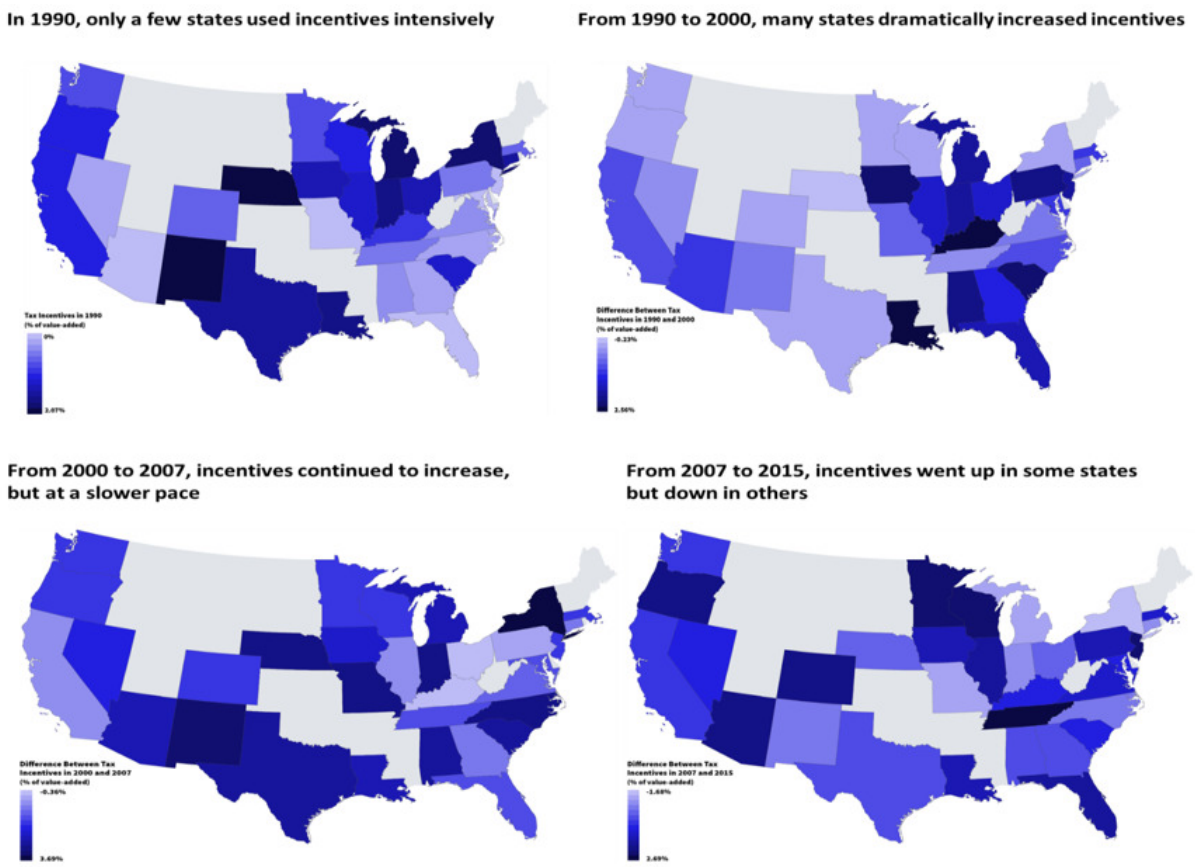

Figure 1. State variations in tax-based incentives

(Source: Upjohn Institute).

The last map depicts the variation from 2007 to 2015. Overall, some states cut back on tax-based incentives while others increased their use. The figures demonstrate that state governments favored tax-based incentive policies from the late 1990s to the early 2000s. Now, it seems that the situation dictates whether a state will utilize such policies.

Economic Effects of Tax-based Incentives

Many studies have argued that tax-based incentives fail to achieve their intended policy outcomes. They have attributed the problem with current policies to the local decision-making process, as local policymakers often overestimate the benefits of incentives. Moreover, this debate is dominated by business interests (Bartik, 2005). For example, state and local governments often provide tax-based incentives where job creation is too expensive or is unlikely to improve the employment opportunities of residents (Bartik, 2005). In addition, many tax incentives target firms or industries rather than people in need. Peters and Fisher (2004) examined both tax-based incentives—such as property tax abatements, tax-increment financing, sales tax exemptions, and credits for investment or jobs—as well as non-tax incentives, such as business grants, loans, and loan guarantees. They found that, in all cases, the firm was the initial recipient of the incentive.

Since the 1980s, researchers have conducted studies to determine the factors that are important for determining a firm's location. According to the previous literature, state and local taxes did not significantly affect a firm's location (Buss, 2001). Some studies have found that incentives have a negligible impact on a firm's location and investment decisions because state and local taxes constitute a small fraction—approximately 1.8%—of an average company's costs of doing business (Bartik, 2003; Betz et al., 2012; Davis, 2013; Felix & Hines, 2013). Peters and Fisher (2004) found that, in as many as nine times out of ten, firms would hire or invest even absent the incentive.

Until the 1990s, few attempts were made to distinguish general tax policy and public service (Bartik & Erickcek, 2014). By the late 2000s, many studies had examined the effects of tax-based incentives. Several have analyzed the overall business or several incentives (Calcagno & Thompson, 2004; Gabe & Kraybill, 2002; Y. Lee, 2008). A few studies have focused on specific cases, such as new factories that received business incentives (Edmiston, 2004; Fox & Murray, 2004). Others have analyzed one type of business incentive, such as enterprise zones, customized job training, manufacturing extension services, tax-increment financing districts, or tax credits tied to job creation (Bartik & Erickcek, 2014). Table 1 briefly summarizes the key literature on the economic effects of incentives.

According to previous studies, incentive literature is classified into three types (Zheng & Warner, 2010). A busi-

Table 1. Summary of the Key Literature on the Economic Effects of Tax-based Incentives

Author (year)	Study subject	Time period	Unit of analysis	Analytic method	Are economic development incentives effective?
Holzer et al. (1993)	State-financed training grant program	1987–1989	Michigan	Difference in differences	Yes, the grant program achieved the goal.
Wassmer (1994)	TIF projects	1947–1992	Detroit	Regression analysis	Yes, they had a positive impact on retail employment and retail sales.
Peters and Fisher (2004)	Business incentives	1961–2002	Previous studies	Comprehensive reviews	No, it is necessary to radically change incentive policies
Bartik (2005)	Economic development policies	1986–2004	Research literature	Comprehensive reviews	No, they are too expensive.
Goetz et al. (2011)	State economic performance	2000–2007	State	Benchmark regressions	No, they are more likely to harm growth.
Bartik and Erickcek (2014)	MEGA tax credit program	1996–2007	Michigan	Regional economic model	No, there was no positive effect on employment growth.
Lester (2014)	TIF	1990–2008	Chicago	Difference in differences	No, there was no evidence of economic benefits.

ness attraction method is the first category. The purpose of this category is to target or pursue a specific business to relocate or expand in a state (Zheng & Warner, 2010). For example, subsidized loans, tax exemptions, and direct payments are typical examples of the first category (Koven & Lyons, 2006; Olberding, 2002). The second incentive category is business retention, which is slightly different from the first. The purpose of this method is to retain firms and businesses by renewing infrastructure and providing businesses with marketing support (Christopherson & Clark, 2007). Accordingly, the purpose of this method is to improve the competitive edge of the government (Fosler, 1992). Revolving loans, technical support, and marketing are classic examples of the second category of incentives (Olberding, 2002).

The two previous categories of incentives have received much academic attention, but the evaluation of these two categories has not been favorable. The reason is that the benefits of these two methods are usually concentrated on particular groups, such as businesses with highly skilled workers (Koven & Lyons, 2006).

The third category of incentives aims to broaden the policy target to overcome problems with the previous methods. For instance, this category of incentives has more diverse goals than the earlier methods: (1) improving social justice for a specific area and (2) attracting investment to improve people's quality of life (Warner, 2001). In other words, this method focuses more on overall community interests than the previous methods. For example, economic development policies for small business owners and devastated areas are examples of this category (Bennett & Giloth, 2008). The adoption of this category of policy has become common across the country since 2000 (Bennett & Giloth, 2008). To sum up the review so far, tax incentives are classified into the first and second methods.

Some studies have revealed that business incentives are not only inefficient: They also have no positive effect on employment growth (Bartik & Erickcek, 2014). Goetz, Partridge, Rickman, and Majumdar (2011) examined the extent to which economic development policies promote growth and produce economic gains across the population. They found no evidence of the effectiveness of lower taxes on a state's economic performance, suggesting that targeted tax incentives and financial assistance are more likely to harm growth and income inequality. The likely reason is that lower taxes may reduce government revenue—which could be used to provide services such as education and infrastructure—without expanding or increasing employment. If this is the case, such a policy not only fails to bring promised economic benefits to a community but also wastes money states could otherwise use to build a solid foundation for economic development (Williams, 2017). On the other hand, several studies have indicated that customized job training has a positive impact on the local area (Hollenbeck, 2008; Holzer et al., 1993; Hoyt et al., 2008). Although recent trends have shifted toward building a firm's capacity, developing human capital, and enhancing quality of life, economic-development policy historically has focused on attracting new businesses or preventing companies from leaving by offering financial incentives, usually in the form of tax abatements. Given that research on tax-based incentives has offered mixed results, it is necessary to analyze the overall effect of tax-based incentives and determine why state and local governments still actively use tax-based incentives. Generally, there are two justifications for why local governments have adopted economic incentives. Eisinger (1988) provided two reasons: (1) Economic incentives are expected to increase business investment, thereby creating new jobs, which will facilitate economic growth; (2) This economic growth will increase local government revenue, which will improve the quality of public services. A tax-based incentive is also a place-based incentive and addresses both justifications as a policy tool.

The Purpose of Applying the Theory of Zero-Sum Games to Economic Development Policies

Economic development policy is considered a powerful tool for local development. Private or public investments in underprivileged areas that are less likely to attract new investment or businesses without policy intervention require economic development policies to achieve their goals. Most previous studies have focused on the output or outcomes of economic development policies in certain municipalities. However, there have been varied results. Therefore, it is reasonable to theoretically test the characteristics of economic development policy.

Theoretical Model for a Zero-Sum Dilemma

The present study is based on a theoretical model of public infrastructure (Boarnet, 1998) but with slight modifications applied to economic development policy. It includes a model of economic development policy in two cities: A and B. Each city has a public authority, and both public authorities produce identical local outputs, such as public services, with identical technologies. The local output of each public authority is evaluated by the national market at price p. We also assume that the supplies of capital and labor are perfectly inelastic in each city in the short run. In the long run, both factors of local outputs can move freely between cities. Finally, total economic activities, such as jobs and businesses, are in fixed supply because nothing is created that does not already exist. To focus on the effect of economic development policy, this study also assumes that there is no cost for providing public capital, and F is a neoclassical production function.[1]

Based on previous assumptions, each city produces public local outputs to residents according to

$Q = (G)F(L, K)$,

where

Q = city or local output,

G = public capital,

L = labor force, and

K = physical capital.

In this situation, assume that City A increases public capital due to the local economic development project. The increased public capital with economic development policy will provide benefits for the owners of physical capital and workers in the short run. During this process, City A generally issues debt, such as revenue bonds, to cover the cost of increasing public capital. Thus, the increase in the amount of public capital is equal to the debt (D).

In the long run, the increased public capital with the local development project will be attractive to labor and physical capital in City B. As a result, factors L and K will migrate from City B to City A in the long run to obtain benefits. After the shift of factors is complete, the two cities' local output is as follows:

$$Q_A = (G_A + \Delta G - D)F(L_A + \Delta L, K_A + \Delta K) \quad \Delta G = D$$
$$Q_B = (G_B)F(L_B - \Delta L, K_A - \Delta K)$$

Given that the local development project in City A leads to local output increases in City A and decreases in City B, the above model demonstrates the basic logic of a zero-sum dilemma in an economic development project. Figure 2 shows that the economic development policy program is necessarily located in the zero-sum line, which is a non-positive and non-negative sum area. Accordingly, this study proposes the following hypothesis:

> **Hypothesis** 1: Economic development policy is a zero-sum game among states

Research Design

The aim of this study is to examine the effects of state tax-based incentives on economic performance measured by the unemployment and employment rates of U.S. states over time. Additionally, this research empirically tests the proposition that economic development policies have the nature of a zero-sum game. This section discusses data, key variables, and a model that will be used for analysis.

Data

The study period is from 1990 to 2015. We used US Decennial Census and American Community Survey data for dependent variables; these are the most reliable data. We used the Upjohn Institute Panel Database on Incentives and Taxes (PDIT) as the primary data source. This database includes incentives and taxes for 45 industries and 32 states. These 32 states account for 92% of U.S. GDP, and the 45 industries account for 91% of U.S. compensation (W.E. Upjohn Institute, 2019). Specially, the PDIT includes 30 major cities and the 30 largest metropolitan areas in the US. The data do not cover all cities in the country, indicating that this resource is susceptible to the overrepresentation of large cities and populated states (Wang et al., 2020). Appendix 1 lists the cities and states covered by the PDIT. Although this database does not include all tax-based incentives, the PDIT consists of the five most commonly used tax-based incentives: investment tax credits, research and development (R&D) tax credits, job creation tax credits, property tax abatements, and customized grants (W.E. Upjohn Institute, 2019). We used the Decennial Census and American Community Survey as a secondary source of data for control variables related to socioeconomic status. The use of this data source is validated by earlier studies (Dewees et al., 2003; Fellix & Hines, 2013; Reese, 2006). We used data on state government expenditures from the Government Finance Database to control for government capacity. Researchers also confirm the accuracy and adequacy of this data (H. Lee et al., 2021; H. Lee & Butler, 2022; Park et al., 2021). The details are presented in Table 2.

1 The neoclassical production F(L,K) has the following properties: (1) both factors are necessary; (2) both factors contribute to output; and (3) the production exhibits constant returns to scale.

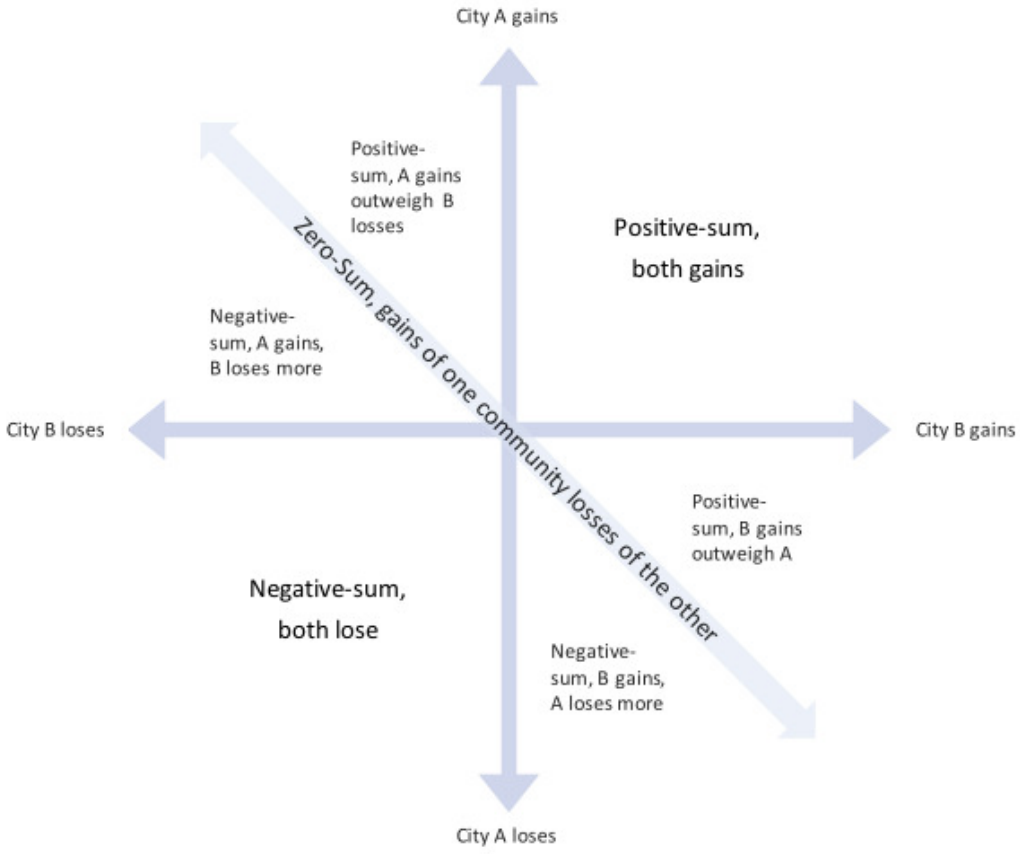

Figure 2. Zero-sum dilemma in economic development policy

Dependent Variable

Many studies use employment indicators to evaluate the effect of incentives (Ham et al., 2011; Hanson & Rohlin, 2013; Reynolds & Rohlin, 2015). Wasylenko and McGuire (1985) use percentage change in employment as a dependent variable to determine the effect of the business climate on the state economy. De Bartolome and Spiegel (1997) rely on the level of employment to evaluate the effects of economic development agency spending. Gabe and Kraybill (2002) use unemployment rates to analyze the effect of state tax-based incentives. Accordingly, this study also uses employment indicators as outcome variables. The primary purpose of using two dependent variables is to conduct a robustness check. To measure the effects of state tax-based incentives on the state's economy, we used unemployment and employment rates as the dependent variables because those indicators represent the effect of the incentives overall. As shown in Table 3, states in this sample average a 7.14% unemployment rate. The range of unemployment rate is between 2.46% and 12.70%.

Independent Variables

This study uses five incentives: customized job training grants, property tax abatements, investment tax credits, job creation tax credits, and R&D tax credits—as independent variables. The percentage of tax incentives for state business taxes is the unit of incentive measure in this research. It measures the extent to which a state government uses incentives, with a high value indicating a high use of incentives. Specifically, "The measure shows present value of incentives divided by present value of gross taxes" (Bartik, 2017, p. 47). The formula for unit of incentive is present value of incentive divided by the present value of gross taxes. A key strength of this database is that it is exceptionally comprehensive because it covers the majority of business activities from 1990 to 2015, which is a relatively long period.

Control Variables

Many studies that examine the employment effects of tax incentives include several control variables that measure socioeconomic characteristics and government expenditures, including public education, infrastructure, and welfare. Wasylenko and McGuire (1985) separate their control variables into three categories: labor, fiscal, and market. The labor category includes prime working age population (age 25 to 55); the fiscal category includes a set of variables that indicate state and local governments' expenditure on education and welfare; and the market category includes state population density and per capita state income. Freedman (2012) similarly categorizes control variables: demographic characteristics, housing characteristics, and change in neighborhood characteristics. The demographic characteristics include the population, the number of persons under age 5, the number over age 65, median in-

Table 2. Variable Definitions and Data Sources

	Variable	Definition	Data Source
Dependent variable	Unemployment Rate Employment Rate	The percentage of unemployment within a state The percentage of employment within a state	US Decennial Census (1990, 2000 & 2010) and ACS (2005-2009, 2011-2015)
Independent Variables	Total Incentives (sum of the following five variables)	The percentage of Tax incentives of State-local Business taxes	Panel Database on Incentives and Taxes, PDIT (1990, 2000, & 2005-2015)
	Job Creation Tax Credit	The Percentage of Tax incentives of State-local Business Taxes by Job Creation tax credit	
	Investment Tax Credit	The Percentage of Tax incentives of State-local Business Taxes by Investment Tax credit	
	Research and Development (R&D) Credit	The Percentage of Tax incentives of State-local Business Taxes by R&D tax credit	
	Property Tax Abatement	The Percentage of Tax incentives of State-local Business Taxes by Property Tax Abatement	
	Customized Job Training Subsidy	The Percentage of Tax incentives of State-local Business Taxes by Customized Job Training Subsidy	
Control Variables	Poverty rate	Poverty rate is the percent below poverty level as per the definition of the Census.	US Decennial Census (1990, 2000 & 2010) and ACS (1990, 2005-2009, 2011-2015)
	% of owner occupied housing	The percentage of households in owner occupied housing	
	Housing value (log)	Median housing value in dollars	
	Population (log)	Total population	
	% Under 5	Under 5 year (%)	
	% Over 65	65 years and over (%)	
	Median Income (log)	Median income in dollars	
	% BA Degree or higher	Percent bachelor's degree or higher	
	Percentage of Manufacturing Employment	Manufacturing as a share of employment	
	% Edu Expenditure	The percentage of education expenditure in total revenue	Annual Survey of State, Local Finance (2000-2015) Government Finance Database (Pierson et al., 2015)
	% Infrastructure Expenditure	The percentage of transportation and highways expenditure in total revenue	
	% Welfare Expenditure	The percentage of social service and public welfare expenditure in total revenue	

come, and poverty rate. Housing characteristics include the share of owner-occupied housing, and median household income and median housing value are included to measure neighborhood characteristics.

As many other previous studies also follow this pattern (Goss & Phillips, 1999; Ham et al., 2011; Hanson, 2009; Hanson & Rohlin, 2013; Reynolds & Rohlin, 2015), this study includes a set of variables that measure each state's socioeconomic characteristics and government expenditures on public services. Over the study period, the average poverty rate is 13.54% across 32 states. Population, age structure, education, and median household income, are also used as socioeconomic characteristics. This study also includes variables related to housing, such as the percentage of owner-occupied housing and median housing values, because the quality of the neighborhood is capitalized in housing if the housing market works efficiently. As Table 2 shows, the average percentage of owner-occupied housing was 67.25% over the study period. Three variables that measure state government spending on public education, infrastructure, and welfare are included because the level of government expenditure is closely related to the local economy (Wasylenko & McGuire, 1985). Finally, the percentage of manufacturing employment was also used as a control for the industrial composition of each state. Previous studies used labor categories and industrial composition as control variables when analyzing the employment effects of tax incentives (Freedman, 2012; Reynolds & Rohlin, 2015; Wasylenko & McGuire, 1985). The details are presented in Table 3.

Table 3. Descriptive Statistics

Variables	Obs	Mean	Std. Dev	Min	Max
Employment rate	416	59.94	3.60	52.50	68.20
Unemployment Rate	416	7.14	2.19	2.46	12.70
Total Incentives	416	26.80	20.88	0.00	99.44
Job Creation Tax Credit	416	9.59	11.49	0.00	57.44
Investment Tax Credit	416	6.42	12.84	0.00	72.04
Research and Development Credit	416	2.08	2.46	0.00	12.35
Property Tax Abatement	416	7.16	9.63	0.00	43.69
Customized Job Training Subsidy	416	1.55	1.81	0.00	6.89
Poverty rate	416	13.54	3.57	5.00	21.90
% Owner Occupied Housing	416	67.25	4.46	52.20	76.30
Housing Value (log)	416	12.02	0.45	10.73	13.19
Population	416	15.69	0.68	13.99	17.46
% Under Age 5	416	6.66	0.57	5.30	8.40
% Over Age 65	416	12.99	1.56	9.20	18.60
Median Income (log)	416	10.83	0.25	9.99	11.45
% BA Degree or higher	416	26.97	5.30	13.63	40.50
% Edu Expenditure	416	28.72	7.66	6.73	44.22
% Infrastructure Expenditure	416	6.29	2.12	1.80	17.77
% Welfare Expenditure	416	22.93	4.18	7.48	38.78
% of Manufacturing Employment	416	12.01	4.52	3.60	26.69

Model

We used fixed-effects panel estimates for 32 states in each year between 1990 and 2015 to examine the effects of incentives on unemployment rate and employment rate. The first model presented below applies to unemployment rates, and the second model applies to employment rates. Each model estimates the effects of total tax incentives and five subcategories of tax incentives, respectively. One way to evaluate the effects of tax incentives on the unemployment rate and employment rate is to consider all control variables in the model in the same year as the dependent variable. However, a potential endogeneity problem may exist, because state government officials may decide the types and amount of tax incentives to use in year *t* based on employment status in year *t-1*. Thus, we used lagged values for the control and independent variables to address possible endogeneity issues. The following models are estimated:

$$\begin{aligned} Unemployment\ rate_{i,t} = {} & \beta_0 + \beta_1 \text{Tax } Incentive_{i,t-1} \\ & + \beta_2 Socioeco_{i,t-1} \\ & + \beta_3 Gov't Spending_{i,t-1} \\ & + \beta_4 Housing_{i,t-1} + \beta_5 X_{i,t-1} \\ & + \alpha_i + d_t + \varepsilon_{i,t} \end{aligned}$$

$$\begin{aligned} Employment\ rate_{i,t} = {} & \beta_0 + \beta_1 \text{Tax } Incentive_{i,t-1} \\ & + \beta_2 Socioeco_{i,t-1} \\ & + \beta_3 Gov't Spending_{i,t-1} \\ & + \beta_4 Housing_{i,t-1} + \beta_5 X_{i,t-1} \\ & + \alpha_i + d_t + \varepsilon_{i,t} \end{aligned}$$

where i indexes states, t indexes time, and $Incentive$ measures the percentage of tax incentives of state business taxes. The parameter β_1 measures the effect of tax incentives on the unemployment rate and employment rate. Vector $X_{i,t-1}$ means all other covariates that include a state's socioeconomic conditions, which likely affect employment. Lastly, ε means the error term, α_i indicates a set of state fixed effects, and d_t denotes a set of year fixed effects.

Results

Table 4 shows the results of a regression analysis on the relationship between tax-based incentives and the unemployment rate in 32 states from 1990 to 2015. Column 1 in Table 4 is the results of the OLS analysis, and Column 2 reveals the results of panel fixed-effects estimates on the use of tax incentives and a series of control variables. The panel fixed-effect model is preferable to the OLS model, controlling for unmeasured, fixed characteristics of states.

OLS shows that—holding all other variables constant—a 1% increase in total tax incentives reduces the average unemployment rate by 0.01%. When fixed effects by state and year are included, the negative correlation between tax incentives and the unemployment rate disappears. In other words, the sign of the coefficient on total incentives is positive and statistically insignificant. There is significant variation between states and over time.

Table 5 shows the results of five regression analyses on state unemployment rate using five tax-based incentives as key independent variables. Column 1, the unemployment effects of job-creation tax credits, does not support findings in previous studies that the incentive has a statistically significant effect on the unemployment rate (Bartik & Erick-

cek, 2014). Considering that the average use of job-creation tax credits in U.S. states has more than doubled between 2000 and 2015, this finding is especially surprising. Less effective applications might have increased with the large increase in use.

Column 2 of Table 5 shows the unemployment effects of investment tax credits and a positive coefficient on tax credits. Moreover, this study does not find statistically significant evidence that an increase in investment tax credits would reduce unemployment rates, as standard economic theory suggests. Conversely, the results show that investment tax credits statistically increase unemployment. These results suggest that investment tax credits do not influence employment because it is usually related to a specific asset, such as equipment. On the other hand, column 3 indicates the relationship between R&D tax credits and the unemployment rate, which shows a significant negative relationship.

As shown in columns 4 and 5, this study also finds no significant correlation between providing grants for abatement of property taxes and customized job training subsidies and the unemployment rate.

These findings suggest that untargeted incentives based on whether an industry provides jobs and wages do not significantly affect employment. Targeted incentives, such as customized job training, fail to achieve the intended policy outcome. Note that state governments have invested heavily in this field. However, targeted incentives on a specific industry, such as R&D tax credits, demonstrate a different result.

Across all models, this study finds consistent evidence of the effects of socioeconomic characteristics on the unemployment rates of U.S. states. Briefly, the results indicate that the poverty rate and population size increase the unemployment rate. On the other hand, the percentage of owner occupied housing and percentage of manufacturing employment decrease the unemployment rate.

This study includes three variables that measure state government expenditures on education, infrastructure, and welfare, as many previous studies argue that the level of government expenditure is closely related to employment status in the local labor market. While the findings vary depending on the types of expenditure examined, most found that higher spending on education tends to have a positive impact on employment factors such as job growth (Wasylenko & McGuire, 1985). However, across all models, this study demonstrates that level of state expenditure on education has no statistically significant correlation with the unemployment rate. Additionally, the findings illustrate that there is no relationship between welfare spending and the unemployment rate. Our results also indicate that increasing state spending on infrastructure has a positive and statistically significant correlation with the unemployment rate.

Table 6 shows the results of six regression analyses on state employment rate using total incentives and the five tax-based incentives as key independent variables. The results are similar to the previous results on the unemployment rate. The finding shows that a 1% increase in R&D tax credit increases the average employment rate by 0.1%. This study suggests that tax incentives are only marginally associated with the employment rate and that investment tax credits are negatively correlated with the employment rate. Similar to the case of unemployment, this result could support the interpretation of economic policies as a zero-sum game because the total sum of the effect of tax-based incentives on employment status is close to zero. In the theoretical model section, we theoretically explained that economic development policies are inevitably characterized as a zero-sum game on the basis of an unrealistic assumption. The results of this research empirically showed that tax-based incentives, which are a core element of economic development policies, are zero-sum measures. In this sense, the hypothesis is supported by the theoretical model and empirical results.

Based on the previous results, socioeconomic characteristics statistically influence the employment rate. Briefly, the results indicate that median housing value, poverty rate, and share of population over 65 have negative relationships with the employment rate. In contrast, the share of the population under age 5 and owner-occupied housing are positively associated with the employment rate.

Conclusion

While many studies argue that tax-based incentives have a negligible impact on local economies, tax-based incentives have been recognized as an important policy tool in the United States. The recent case of Amazon's second headquarters means that tax-based incentives are still acting as powerful policy tools to attract investment. Although tax-based incentives were widely used in the states examined, this study theoretically showed that economic development policies have been confronted with the inevitable consequence of a zero-sum situation. To the best of our knowledge, it is difficult to find a research trial in previous studies on this question.

Using new data on nationwide tax incentives, this study examined the employment effects of tax incentives across the United States over time, providing more nuanced understandings on the effects of tax incentives overall. The results of this study show that tax incentives in general have no impact on employment, contradicting the theory that offering tax incentives to firms will lead to job growth. However, the findings support tax-based incentives as one of the popular economic development policies being a zero-sum game. Results of this study could explain the opposing ideas of previous studies on the effectiveness of tax-based incentives. It is likely that the previous studies have analyzed only the zero-sum nature of costs and benefits. Therefore, this study contributes to understanding the characteristics of different economic development policies.

Lastly, this study holds further significance because it provides valuable evidence of the effectiveness of policy in this field by using comprehensive data. Although we theoretically anticipate the characteristics of development policies, there is no clear empirical evidence supporting the zero-sum mechanism of such policies. Based on the employment and unemployment rates of most states, we con-

Table 4. OLS and Panel Regression Results: The Effects of Total Incentives on Unemployment Rates

	Unemployment rates	
VARIABLES	(1) (OLS)	(2) (Panel fixed effect)
Total Incentives $_{t-1}$	-0.0088**	0.0047
	(0.0036)	(0.0035)
Poverty rate $_{t-1}$	0.3561***	0.3570***
	(0.0242)	(0.0545)
% of Owner Occupied Housing $_{t-1}$	-0.0015	-0.0961**
	(0.0207)	(0.0522)
Housing Value (log) $_{t-1}$	0.4284	-0.4013
	(0.3328)	(0.3995)
Population (log) $_{t-1}$	0.3378***	2.4940***
	(0.1051)	(0.6995)
% Under 5 $_{t-1}$	-1.7395***	-1.0669***
	(0.1991)	(0.1933)
% Over 65 $_{t-1}$	-0.1458**	0.1046
	(0.0708)	(0.1202)
Median Income (log) $_{t-1}$	1.3878***	0.1749
	(0.4654)	(1.6641)
% BA or higher $_{t-1}$	-0.0654***	0.0396
	(0.0247)	(0.0663)
% Edu Expenditure $_{t-1}$	0.0319**	0.0142
	(0.0128)	(0.0159)
% Infrastructure Expenditure $_{t-1}$	-0.1664***	0.0537**
	(0.0416)	(0.0267)
% Welfare Expenditure $_{t-1}$	-0.0293	0.0261
	(0.0183)	(0.0184)
% of Manufacturing Employment	-0.0253	-0.0927***
	(0.0219)	(0.03536)
State Fixed Effects	No	Yes
Year Fixed Effects	No	Yes
Constant	-6.1553	-23.7346
	(5.1563)	(17.6847)
Observations	384	384
R-squared	0.68	0.93

Note: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

firm that the effect of tax-based incentives is negligible. This result may persuade policy makers to reconsider overall economic development policies and could become a strong empirical counterargument to supporters of economic development policies. This study is limited in that it was not based on a strict causal inference in spite of our use of several empirical strategies, such as the employment of lagged variables in analyzing the relationship. Thus, findings should be interpreted as correlations rather than causal inferences, and further research should be carried out with a stringent causal strategy as a foundation of analysis.

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Table 5. Panel Regression Results: The Effects of Each Tax Incentives on Unemployment Rate

	Unemployment Rate				
VARIABLES	(1)	(2)	(3)	(4)	(5)
Job Creation Tax Credit $_{t-1}$	0.0059				
	(0.0050)				
Investment Tax Credit $_{t-1}$		0.0145**			
		(0.0063)			
Research and Development Credit $_{t-1}$			-0.0457*		
			(0.0274)		
Property Tax Abatement $_{t-1}$				-0.0042	
				(0.0057)	
Customized Job Training Subsidy $_{t-1}$					-0.0473
					(0.0460)
Poverty rate $_{t-1}$	0.3557***	0.3548***	0.3440***	0.3531***	0.3472***
	(0.0545)	(0.0542)	(0.0546)	(0.0546)	(0.0548)
% of Owner Occupied Housing $_{t-1}$	-0.1066*	-0.0819	-0.0918*	-0.1068**	-0.0994*
	(0.0521)	(0.0525)	(0.0523)	(0.0523)	(0.0521)
Housing Value (log) $_{t-1}$	-0.3606	-0.3733	-0.4180	-0.3399	-0.3753
	(0.3996)	(0.3970)	(0.3992)	(0.4032)	(0.3995)
Population (log) $_{t-1}$	2.4093***	2.5124***	2.2963***	2.2696***	2.2403***
	(0.6910)	(0.6867)	(0.6828)	(0.6862)	(0.6869)
% Under 5 $_{t-1}$	-1.0434***	-1.0773***	-1.0207**	-1.0168***	-1.0309***
	(0.1915)	(0.1911)	(0.1905)	(0.1916)	(0.1911)
% Over 65 $_{t-1}$	0.1112	0.1094	0.1288	0.1263	0.1053
	(0.1199)	(0.1190)	(0.1194)	(0.1199)	(0.1206)
Median Income (log) $_{t-1}$	0.2120	-0.0462	0.0788	0.1899	-0.0164
	(1.6651)	(1.6587)	(1.6630)	(1.6671)	(1.6790)
% BA or higher $_{t-1}$	0.0345	0.0401	0.0314	0.03061	0.0224
	(0.0661)	(0.0658)	(0.0660)	(0.0662)	(0.0668)
% Edu Expenditure $_{t-1}$	0.0158	0.0133	0.0143	0.0163	0.0138
	(0.0159)	(0.0158)	(0.0159)	(0.0160)	(0.0160)
% Infrastructure Expenditure $_{t-1}$	0.0549**	0.0479*	0.0579**	0.0543**	0.0542**
	(0.0267)	(0.0267)	(0.0267)	(0.0268)	(0.0267)
% Welfare Expenditure $_{t-1}$	0.0297	0.0229	0.0291	0.0300	0.0300
	(0.0183)	(0.0184)	(0.0182)	(0.0184)	(0.0183)
% of Manufacturing Employment $_{t-1}$	-0.0951***	-0.0989***	-0.1014***	-0.0993***	-0.0949***
	(0.0352)	(0.0350)	(0.0353)	(0.0355)	(0.03553)
State Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Constant	-22.7631	-22.6894	-19.9989	-20.7929	-17.6788
	(17.6432)	(17.4953)	(17.5592)	(17.6112)	(17.9033)
Observations	384	384	384	384	384
R-squared	0.93	0.93	0.93	0.93	0.93

Note: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 6. Panel Regression Results: The Effects of Each Tax Incentives on Employment Rate

	Employment Rate					
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Total Incentives $_{t-1}$	-0.0005					
	(0.0036)					
Job Creation Tax Credit $_{t-1}$		0.0083				
		(0.0052)				
Investment Tax Credit $_{t-1}$			-0.0170**			
			(0.0065)			
R&D Credit $_{t-1}$				0.0983***		
				(0.0280)		
Property Tax Abatement $_{t-1}$					-0.0018	
					(0.0059)	
Customized Job Training Subsidy $_{t-1}$						-0.0454
						(0.0476)
Poverty rate $_{t-1}$	-0.5329***	-0.5284***	-0.5347***	-0.5133***	-0.5323***	-0.5378***
	(0.0567)	(0.0564)	(0.0560)	(0.0558)	(0.0566)	(0.0568)
% of Owner Occupied Housing $_{t-1}$	0.2969***	0.2925***	0.2731***	0.2739***	0.2960***	0.3010***
	(0.0542)	(0.0539)	(0.0542)	(0.0534)	(0.0542)	(0.0540)
Housing Value (log) $_{t-1}$	-1.5299***	-1.5085***	-1.5382***	-1.4466***	-1.5163***	-1.5303***
	(0.4149)	(0.4133)	(0.4103)	(0.4077)	(0.4180)	(0.4140)
Population (log) $_{t-1}$	-0.0291	0.1516	-0.2571	-0.0014	-0.0172	-0.06030
	(0.7266)	(0.7145)	(0.7097)	(0.6974)	(0.7113)	(0.7117)
% Under 5 $_{t-1}$	0.4249**	0.3952**	0.4802**	0.4085**	0.4238**	0.4150**
	(0.2007)	(0.1981)	(0.1975)	(0.1946)	(0.1986)	(0.1980)
% Over 65 $_{t-1}$	-0.7095***	-0.7257***	-0.6976***	-0.7278***	-0.7094***	-0.7268***
	(0.1248)	(0.1240)	(0.1230)	(0.1220)	(0.1243)	(0.1250)
Median Income (log) $_{t-1}$	0.4314	0.4452	0.7179	0.6890	0.4239	0.2204
	(1.7284)	(1.7218)	(1.7143)	(1.6985)	(1.7281)	(1.7397)
% BA or higher $_{t-1}$	-0.0995	-0.0956	-0.1078	-0.0966	-0.0994	-0.1081
	(0.0689)	(0.0684)	(0.0680)	(0.0674)	(0.0687)	(0.0693)
% Edu Expenditure $_{t-1}$	-0.0042	-0.0037	-0.0020	-0.0021	-0.0039	-0.0058
	(0.0165)	(0.0165)	(0.0164)	(0.0162)	(0.0166)	(0.0166)
% Infrastructure Expenditure $_{t-1}$	0.0285	0.0276	0.0372	0.0230	0.0278	0.0271
	(0.0277)	(0.0276)	(0.0276)	(0.0272)	(0.0278)	(0.0277)
% Welfare Expenditure $_{t-1}$	-0.0228	-0.0218	-0.0162	-0.0238	-0.0226	-0.0219
	(0.0191)	(0.0189)	(0.0190)	(0.01867)	(0.0191)	(0.0190)
% of Manufacturing Employment $_{t-1}$	0.0549	0.0573	0.0583	0.0662*	0.0542	0.0569
	(0.0367)	(0.0364)	(0.0362)	(0.0360)	(0.0368)	(0.0366)
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Constant	66.8068***	64.1350***	68.3568***	64.1251***	66.6121***	69.7603***
	(18.3684)	(18.2449)	(18.0815)	(17.9333)	(18.2557)	(18.5501)
Observations	384	384	384	384	384	384
R-squared	0.88	0.88	0.89	0.89	0.88	0.88

Note: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

References

Bartik, T. J. (1991). *Who Benefits from State and Local Economic Development Policies?* W.E. Upjohn Institute for Employment Research. https://doi.org/10.17848/9780585223940

Bartik, T. J. (2003). *Local economic development policies*. W.E. Upjohn Institute for Employment Research. https://doi.org/10.17848/wp03-91

Bartik, T. J. (2005). Solving the problems of economic development incentives. *Growth and Change*, *36*(2), 139–166. https://doi.org/10.1111/j.1468-2257.2005.00272.x

Bartik, T. J. (2012). The future of state and local economic development policy. *Growth & Change*, *43*(4), 545–562. https://doi.org/10.1111/j.1468-2257.2012.00597.x

Bartik, T. J. (2017). *A new panel database on business incentives for economic development offered by state and local governments in the United States* (pp. 1–131). W.E. Upjohn Institute for Employment Research Report.

Bartik, T. J., & Erickcek, G. (2014). Simulating the effects of the tax credit program of the Michigan economic growth authority on job creation and fiscal benefits. *Economic Development Quarterly*, *28*(4), 314–327. https://doi.org/10.1177/0891242414548893

Basolo, V., & Huang, C. (2001). Cities and economic development: Does the city limits story still apply? *Economic Development Quarterly*, *15*(4), 327–339. https://doi.org/10.1177/089124240101500407

Bennett, M., & Giloth, R. (2008). *Economic development in American cities: The pursuit of an equity agenda*. SUNY Press.

Betz, M. R., Partridge, M. D., Kraybill, D. S., & Lobao, L. (2012). Why do localities provide economic development incentives? Geographic competition, political constituencies, and government capacity. *Growth and Change*, *43*(3), 361–391. https://doi.org/10.1111/j.1468-2257.2012.00590.x

Boarnet, M. G. (1998). Spillovers and the locational effects of public infrastructure. *Journal of Regional Science*, *38*(3), 381–400. https://doi.org/10.1111/0022-4146.00099

Burstein, M., & Rolnick, A. J. (1995). *Congress should end the economic war between the states* (pp. 2–20) [Annual Report].

Buss, T. F. (2001). The effect of state tax incentives on economic growth and firm location decisions: An overview of the literature. *Economic Development Quarterly*, *15*(1), 90–105. https://doi.org/10.1177/089124240101500108

Calcagno, P. T., & Thompson, H. (2004). State economic incentives: Stimulus or reallocation? *Public Finance Review*, *32*(6), 651–665. https://doi.org/10.1177/1091142104267207

Chirinko, R. S., & Wilson, D. J. (2008). State investment tax incentives: A zero-sum game? *Journal of Public Economics*, *92*(12), 2362–2384. https://doi.org/10.1016/j.jpubeco.2008.07.005

Christopherson, S., & Clark, J. (2007). *Remaking regional economies: Power, labor, and firm strategies*. Routledge. https://doi.org/10.4324/9780203003480

Davis, C. (2013). Tax Incentives: Costly for states, drag on the nation. *Institute on Taxation and Economic Policy*.

De Bartolome, C. A. M., & Spiegel, M. M. (1997). Does state economic development spending increase manufacturing employment? *Journal of Urban Economics*, *41*(2), 153–175. https://doi.org/10.1006/juec.1996.1090

Dewees, S., Lobao, L., & Swanson, L. E. (2003). Local economic development in an age of devolution: The question of rural localities. *Rural Sociology*, *68*(2), 182–206. https://doi.org/10.1111/j.1549-0831.2003.tb00134.x

Edmiston, K. D. (2004). The net effects of large plant locations and expansions on county employment. *Journal of Regional Science*, *44*(2), 289–320. https://doi.org/10.1111/j.0022-4146.2004.00338.x

Eisinger, P. K. (1988). *The rise of the entrepreneurial state: State and local economic development policy in the United States*. Univ of Wisconsin Press.

Ellis, S., & Rogers, C. (2000). Local economic development as a prisoners' dilemma: The role of business climate. *Review of Regional Studies*, *30*(3), 315–330. https://doi.org/10.52324/001c.8650

Felix, R. A., & Hines, J. R., Jr. (2013). Who offers tax-based business development incentives? *Journal of Urban Economics*, *75*(1), 80–91. https://doi.org/10.1016/j.jue.2012.12.003

Fisher, P. S., & Peters, A. H. (1997). Tax and spending incentives and enterprise zones. *New England Economic Review*, *109*.

Fosler, R. S. (1992). State economic policy: The emerging paradigm. *Economic Development Quarterly*, *6*(1), 3–13. https://doi.org/10.1177/089124249200600101

Fox, W. F., & Murray, M. N. (2004). Do economic effects justify the use of fiscal incentives? *Southern Economic Journal*, *71*(1), 78–92.

Freedman, M. (2012). Teaching new markets old tricks: The effects of subsidized investment on low-income neighborhoods. *Journal of Public Economics*, *96*(11–12), 1000–1014. https://doi.org/10.1016/j.jpubeco.2012.07.006

Gabe, T. M., & Kraybill, D. S. (2002). The Effect of State Economic Development Incentives on Employment Growth of Establishments. *Journal of Regional Science*, *42*(4), 703–730. https://doi.org/10.1111/1467-9787.00278

Goetz, S. J., Partridge, M. D., Rickman, D. S., & Majumdar, S. (2011). Sharing the gains of local economic growth: Race-to-the-top versus race-to-the-bottom economic development. *Environment and Planning C: Government and Policy*, *29*(3), 428–456. https://doi.org/10.1068/c1077r

Goolsbee, A., & Maydew, E. L. (2000). Coveting thy neighbor's manufacturing: The dilemma of state income apportionment. *Journal of Public Economics*, *75*(1), 125–143. https://doi.org/10.1016/s0047-2727(99)00036-5

Gorin, D. (2008). Economic development incentives: Research approaches and current views. *Federal Reserve Bulletin*, *94*(10), A61. https://doi.org/10.17016/bulletin.2008.94-10-1

Goss, E. P., & Phillips, J. M. (1999). Do business tax incentives contribute to a divergence in economic growth? *Economic Development Quarterly*, *13*(3), 217–228. https://doi.org/10.1177/089124249901300302

Ham, J. C., Swenson, C., İmrohoroğlu, A., & Song, H. (2011). Government programs can improve local labor markets: Evidence from state enterprise zones, federal empowerment zones and federal enterprise community. *Journal of Public Economics*, *95*(7–8), 779–797. https://doi.org/10.1016/j.jpubeco.2010.11.027

Hanson, A. (2009). Local employment, poverty, and property value effects of geographically-targeted tax incentives: An instrumental variables approach. *Regional Science and Urban Economics*, *39*(6), 721–731. https://doi.org/10.1016/j.regsciurbeco.2009.07.002

Hanson, A., & Rohlin, S. (2013). Do spatially targeted redevelopment programs spillover? *Regional Science and Urban Economics*, *43*(1), 86–100. https://doi.org/10.1016/j.regsciurbeco.2012.05.002

Hollenbeck, K. (2008). *Is there a role for public support of incumbent worker on-the-job training?* Available at SSRN 1105365.

Holzer, H. J., Block, R. N., Cheatham, M., & Knott, J. H. (1993). Are training subsidies for firms effective? The Michigan experience. *ILR Review*, *46*(4), 625–636. https://doi.org/10.1177/001979399304600403

Hoyt, W. H., Jepsen, C., & Troske, K. R. (2008). *Business incentives and employment: What incentives work and where?* (Working Paper 2009-02). Institute for Federalism & Intergovernmental Relations.

Koven, S. G., & Lyons, T. S. (2006). *Economic development : Strategies for state and local practice*. International City/County Management Association.

Lee, H., & Butler, J. S. (2022). The Determinants of Tax-Based Incentives: An Empirical Analysis of State Governments. *Public Performance & Management Review*, *45*(6), 1431–1460. https://doi.org/10.1080/15309576.2022.2115089

Lee, H., Park, J., & Butler, J. S. (2021). Forms of government and municipal financial performance. *Public Money & Management*, 1–10. https://doi.org/10.1080/09540962.2021.1923168

Lee, Y. (2008). Geographic redistribution of US manufacturing and the role of state development policy. *Journal of Urban Economics*, *64*(2), 436–450. https://doi.org/10.1016/j.jue.2008.04.001

Leiser, S. (2017). The diffusion of state tax incentives for business. *Public Finance Review*, *45*(3), 334–363. https://doi.org/10.1177/1091142115611741

Lester, T. W. (2014). Does Chicago's tax increment financing (TIF) programme pass the "But-for" test? Job creation and economic development impacts using time-series Data. *Urban Studies*, *51*(4), 655–674. https://doi.org/10.1177/0042098013492228

Lobao, L., & Kraybill, D. S. (2005). The emerging roles of county governments in metropolitan and nonmetropolitan areas: Findings from a national survey. *Economic Development Quarterly*, *19*(3), 245–259. https://doi.org/10.1177/0891242405276514

Neumark, D., & Kolko, J. (2010). Do enterprise zones create jobs? Evidence from California's enterprise zone program. *Journal of Urban Economics*, *68*(1), 1–19. https://doi.org/10.1016/j.jue.2010.01.002

Olberding, J. C. (2002). Diving into the "Third Waves" of regional governance and economic development strategies: A study of regional partnerships for economic development in U.S. metropolitan Areas. *Economic Development Quarterly*, *16*(3), 251–272. https://doi.org/10.1177/089124240201600305

Park, J., Lee, H., Butler, J. S., & Denison, D. (2021). The effects of high-quality financial reporting on municipal bond ratings: Evidence from US local governments. *Local Government Studies*, *47*(5), 836–858. https://doi.org/10.1080/03003930.2020.1825385

Patrick, C. (2014). Does increasing available non-tax economic development incentives result in more jobs? *National Tax Journal*, *67*(2), 351–386. https://doi.org/10.17310/ntj.2014.2.03

Peters, A. H., & Fisher, P. S. (2002). State enterprise zone programs: Have they worked? *Choice Reviews Online*, *40*.

Peters, A. H., & Fisher, P. S. (2004). The failures of economic development incentives. *Journal of the American Planning Association*, *70*(1), 27–37. https://doi.org/10.1080/01944360408976336

Pew Center Report. (2012). *Evidence counts: Evaluating State tax incentives for jobs and growth*. The Pew Charitable Trusts.

Pierson, K., Hand, M. L., & Thompson, F. (2015). The government finance database: A common resource for quantitative research in public financial analysis. *PLOS ONE*, *10*(6), e0130119. https://doi.org/10.1371/journal.pone.0130119

Porter, E. (2018). *When all else fails, tax incentives probably will, too*. https://www.nytimes.com/2018/05/08/business/tax-breaks-jobs.html

Reese, L. A. (2006). Not just another determinants piece: Path dependency and local tax abatements. *Review of Policy Research*, *23*(2), 491–504. https://doi.org/10.1111/j.1541-1338.2006.00212.x

Reynolds, C. L., & Rohlin, S. M. (2015). The effects of location-based tax policies on the distribution of household income: Evidence from the federal empowerment zone program. *Journal of Urban Economics*, *88*, 1–15. https://doi.org/10.1016/j.jue.2015.04.003

Rodríguez-Pose, A., & Arbix, G. (2001). Strategies of waste: Bidding wars in the Brazilian automobile sector. *International Journal of Urban and Regional Research*, *25*(1), 134–154. https://doi.org/10.1111/1468-2427.00302

Rubin, H. J. (1988). Shoot anything that flies; claim anything that falls: Conversations with economic development practitioners. *Economic Development Quarterly*, *2*(3), 236–251. https://doi.org/10.1177/089124248800200304

Sung, M. J., Awasthi, R., & Lee, H. C. (2017). Can tax Incentives for electronic payments curtail the shadow economy? Koreas attempt to reduce underreporting in retail businesses. *Journal of Policy Studies*, *32*(2), 85–134.

Swann, W. L. (2017). Examining the impact of local collaborative tools on urban sustainability efforts: Does the managerial environment matter? *American Review of Public Administration*, *47*(4), 455–468. https://doi.org/10.1177/0275074015598576

Wang, J. (2016). Do economic development incentives crowd out public expenditures in U.S. States? *The B.E. Journal of Economic Analysis & Policy*, *16*(1), 513–538. https://doi.org/10.1515/bejeap-2015-0042

Wang, J. (2018). Strategic interaction and economic development incentives policy: Evidence from U.S. States. *Regional Science and Urban Economics*, *68*, 249–259. https://doi.org/10.1016/j.regsciurbeco.2017.11.007

Wang, J., Yuan, W., & Rogers, C. (2020). Economic development incentives: What can we learn from policy regime changes? *Economic Development Quarterly*, *34*(2), 116–125. https://doi.org/10.1177/0891242420909899

Warner, M. E. (2001). Local government support for community-based economic development. In *The Municipal Yearbook* (pp. 21–27). International City/Councty Management Association.

Wassmer, R. W. (1994). Can local incentives alter a metropolitan city's economic development? *Urban Studies*, *31*(8), 1251–1278. https://doi.org/10.1080/00420989420081151

Wasylenko, M., & McGuire, T. (1985). Jobs and taxes: The effect of business climate on States'employment growth rates. *National Tax Journal*, *38*(4), 497–511. https://doi.org/10.1086/ntj41792110

W.E. Upjohn Institute. (2019). *Panel database on incentives and taxes*. https://www.upjohn.org/bied/home.php

Williams, B. E. (2017). *A four-point fiscal policy blueprint for building thriving State Economies* (pp. 1–12).

Wilson, D. J. (2009). Beggar thy neighbor? The in-state, out-of-state, and aggregate effects of R&D tax credits. *Review of Economics and Statistics*, *91*(2), 431–436. https://doi.org/10.1162/rest.91.2.431

Wu, Y. (2012). How major local taxes affect private employment: An empirical analysis of northeastern Illinois municipalities. *Economic Development Quarterly*, *26*(4), 351–360. https://doi.org/10.1177/0891242412465109

Zheng, L., & Warner, M. (2010). Business incentive use among U.S. local governments: A story of accountability and policy learning. *Economic Development Quarterly*, *24*(4), 325–336. https://doi.org/10.1177/0891242410376237

Appendix 1. States and Cities included

City	State	City	State	City	State
Albuquerque	NM	Detroit	MI	Orlando	FL
Atlanta	GA	Houston	TX	Philadelphia	PA
Aurora	IL	Indianapolis	IN	Phoenix	AZ
Baltimore	MD	Kalamazoo	MI	Pittsburgh	PA
Birmingham	AL	Kansas City	MO	Portland	OR
Boston	MA	Las Vegas	NV	Riverside	CA
Bridgeport	CT	Los Angeles	CA	Sacramento	CA
Buffalo	NY	Louisville	KY	San Antonio	TX
Charlotte	NC	Memphis	TN	San Diego	CA
Chicago	IL	Miami	FL	San Francisco	CA
Cincinnati	OH	Milwaukee	WI	Seattle	WA
Cleveland	OH	Minneapolis	MN	St Louis	MO
Columbia	SC	New Orleans	LA	Tampa	FL
Dallas	TX	New York City	NY	Virgina Beach	VA
Denver	CO	Newark	NJ	Washington	DC
Des Moines	IA	Omaha	NE		