

# State Targeting of Business Investment: Does Targeting Increase Corporate Tax Revenue?

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**Abstract.** State governments increasingly use financial incentives to target and attract firms. The literature on state supported development reports mixed results at best as to whether there are net economic benefits to the state economy. Little has been done, however, to investigate the benefits that politicians may receive by offering incentives. We hypothesize that state governments benefit from offering financial incentives. Specifically, we use pooled cross sectional data from 1981 and 1989 to develop a model to test whether a state government offering financial incentives increases state corporate tax revenue. We argue that increases in state corporate tax revenue may explain why it is in the government's interest to target firms regardless of net economic benefit of financial incentives.

## 1. Introduction

It has been argued that competition by states to target firms provides no net gain to the economy. "From the states' point of view each may appear better off competing for particular businesses, but the overall economy ends up with less of both private and public goods than if such competition was prohibited" (Burstein and Rolnick 1995, p 7). Competition of this sort among states leads one to ask several interesting questions. For instance, what effects do these financial incentives have on a state's economic growth? Can state economic conditions benefit from this type of development policy, or is this a means for state government officials to maximize their own benefit?

What has led to this apparent increase in the use of financial incentives in this "economic war" between the states? Several of the Federal Reserve District Banks have published articles investigating the role of tax incentives on state economic growth.<sup>1</sup> In particu-

lar, the Minneapolis Federal Reserve Bank published the proceedings from a conference in Washington D.C. in May 1996 entitled "The Economic War Among the States." The conference addressed policy proposals to eliminate or refine the competition that is occurring between states for investment.

The subject of state governments targeting industries by offering financial incentives raises important questions regarding growth and development as well as benefits versus costs. Whether or not state development incentives lead to real job creation and economic growth is still open for debate.<sup>2</sup> Esinger (1989) argues that the efficacy of using state inducements to attract mobile firms has been long been doubted by economists. Buss (1999a, 1999b, 2001) argues that the studies that investigate the question of whether tax incentives and other development incentives generate economic growth are unconvincing. Ladd (1994) finds that enterprise zones in the U.S tend to fail on a cost-

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<sup>1</sup>Articles from regional Federal Reserve Bank publications include: Matthey and Spiegel (1995) "Is State and Local Competition for Firms Harmful?" *FRBSF Weekly Letter*. Burstein and Rolnick (1995) "Congress Should End the Economic War Among the States" *The Region*. Cunningham (1995) "Development Incentives Good or Bad?" *Re-*

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*gional Update*. Becsi (1996) "Have State and Local Taxes Contributed to the South's Economic Rise?" *Regional Update*.

<sup>2</sup>Bartik (1994) argues that development incentives provide the most benefit in high unemployment areas, but that state governments often attract firms to areas that have low unemployment, which limits the benefits that state's may receive from these types of incentives.

benefit analysis. DiLorenzo and Bennett (1983), Esinger (1989), Buss (1999a, 2001), and Saiz (2001) all point out that there are political benefits for using financial incentives. "Governors, mayors, legislators, and council members justify these public investments on the grounds that private-sector decisions to invest in a community result in jobs, income, and tax revenues that are essential to the economic and social well-being of a community or state" (Poole et al. 1999, p. 1). Ellis and Rogers (2000) using a game theoretic approach demonstrate that there are political motivations that can have a negative impact on local economic development.

Barkley (2005) suggests that the process of state governments offering incentives is a "black box." Very rarely do economists or citizens understand the political process of targeting business. According to Poole et al. (1999), the actual impact of development strategies is unknown because these economic developers lack the skill to identify the appropriate methodology and have limited data for analysis. As a result, many practitioners fear the implementation of formal systems to evaluate their programs since it may lead to their budgets being cut. Hinkley et al. (2000) claim that legislators and the public are not provided with enough information about economic development programs and call for increased audits. While numerous authors concur that targeting has a political component to it, many fail to realize that targeting may well be an inefficient allocation of resources (Dewar, 1998; Buss, 1999a, 1999b; Wiewel, 1999; Finkle, 1999).

Given that the empirical evidence regarding governments targeting firms is mixed we propose to turn our attention to another dimension of this issue. In this study we explore the largely ignored political benefits of financial incentives using a public choice framework. We present a simple model that suggests that offering financial incentives by state governments can have political benefits in the form of potential tax revenue, regardless of whether they generate real economic growth. We test this theoretical proposition by examining whether the introduction of financial incentives from state governments does in fact increase state corporate tax revenue. A larger tax base and additional tax revenue can bring political benefit to state level officials by providing them a larger source of revenue to spend and redistribute. If tax revenues are increased as a result of targeting firms it might explain why politicians continue to offer such programs in the face of such mixed evidence. In the next section we provide a background on state targeting, we then present an empirical model that tests the effects of financial incentives on tax revenues, then in the fourth

section we present the results from the model, and we close with some concluding remarks.

## 2. Previous Studies and Background

The literature on targeting and financial incentives has developed in several directions over the last several decades. Buss (2001) in a review of tax incentives divides this work into three areas: 1) the effects of tax incentives on economic growth in states 2) location decisions, and 3) identifying which incentives have an economic impact. Esinger (1989) provides a detailed history of state development policies that focus on their use and effectiveness during the 1980s and offers a political framework to justify incentives.

One of the first state and local governments to formally offer firms direct financial incentives (DFI) was Mississippi during the 1930s when they created an industrial development agency, which allowed the issuance of tax-exempt industrial development bonds (Bennett and DiLorenzo, 1983). By 1982, all fifty states were offering industrial development bonds as part of their state economic development programs. Several legislative changes enacted by Congress, which occurred from the late 1960s to the early 1980s, sought to limit states' use of industrial development bonds.<sup>3</sup>

In spite of these legislative changes, industrial development bonds remained the leading source of DFI during the 1980s. Efforts to avoid federal regulations and state constitutional constraints have led to the proliferation of new types of DFI (Taylor, 1994; Bennett and DiLorenzo, 1983). The widespread use of financial incentives at the state and local levels has grown extremely competitive, resulting in an "environment in which cities and states attempt to outbid each other to attract large industrial plants" (Taylor, 1994, p. 677). The increased use of targeting in recent years stems from changes in technology and fiscal variables. Lee and McKenzie (1991) and Tannenwald and Kendrick (1995) explain that changes in technology, allowing for greater firm mobility, place pressure on state governments to lower tax rates to retain and attract firms. McClure (1986), Wildasin (1986), and Break (1986) all suggest that changes in fiscal policy at the federal level during the 1980s caused states to compete for firms by adjusting their corporate tax

<sup>3</sup> The Revenue Expenditure and Control Act of 1968 (RECA), the Tax Equity and Fiscal Responsibility Act of 1982 (TERA), and the Deficit Reduction Act of 1984 all sought to put limits on the use of industrial development bonds by state governments. However, tax exemption status remained in place for air and water pollution control equipment, airports, docks, wharves, electricity, gas and water services, industrial parks, parking, mass transportation, housing, sewage, sports facilities, trade shows and convention centers.

rates. It was this combination of technological change and fiscal changes that lead to the developing of DFI in the 1980s and their increased use in the 1990s.<sup>4</sup>

In order to provide services to their constituents, governments need sources of revenue, which necessitates the implementation of a variety of revenue methods including corporate taxes. However, state governments, yielding to competitive pressure from other states, may find it necessary to reduce their corporate tax rates while maintaining some minimum revenue level.<sup>5</sup> It follows logically that as a state's corporate tax rates decline, the competition to retain and attract firms (revenue) emerges at a new margin, namely DFI.

Buss (1999a, 1999b, 2001) argues that many of the studies on tax and development incentives are done for local governments and never see the light of day. Again, suggesting that this political process is a "black box," he further claims that there is no accurate measure for these types of incentives. The tools and data are not sophisticated enough to generate convincing results as to whether the state or local government has given away too much or if there is true economic benefit. Furthermore, Esinger (1991) notes that "[e]valuative techniques are rudimentary, data are hard to come by and those that exist are often suspect, and cause and effect are extremely difficult to establish" (p. 71).

Gabe and Kraybill (1998) find that the number of new jobs promised by the targeted business is the major factor in deciding who receives the incentive. Saiz (2001) finds no evidence of growth in state GDP as a result of using financial incentives and finds negative impacts in certain industries. Calcagno and Thompson (2004) find evidence that incentives lead to a reallocation of resources rather than real economic growth.

Based on this brief literature review, it is not clear then that DFI provides positive economic benefits such as increased GDP, higher income, or increased employment. To address this issue, we think the focus needs to turn away from attempting to measure the

economic benefit and focus on a potential political benefit. Therefore, the issue to address is whether it is rational for politicians to target firms with DFI regardless of the economic benefit.

Esinger (1989) in his analysis of state and local economic development policy breaks it down into two broad categories: supply-side and demand-side policy. Supply-side policy constitutes the use of development bonds, tax abatements, grants, and the other incentive packages (i.e. DFI). The demand-side policy is what Esinger refers to as the entrepreneurial state. The entrepreneurial state is the use of venture capital by the state government to fill a gap in the development of new enterprises left by the private sector. Esinger argues that this type of policy is an improvement over the supply-side policy, which he argues puts too much of an emphasis on attracting capital and may simply be reallocating existing capital. The supply-side approach is more pragmatic and carries with it a political benefit if the state can attract or retain a firm. According to Esinger (1989), the entrepreneurial state was on the rise by the end of the 1980s with states realizing that it was a more effective way to administer development policy.

Our focus is on the use of DFI or supply-side policy and its potential political benefits. Esinger (1989) represents the public interest view and argues that a role exists for the state to play in developing new businesses through the venture capital approach. It should be noted, however, that in Esinger's (1991, 1993) follow up analysis he reports many of the same problems with the demand-side policy as with supply-side policy. Specifically, the lack of an effective measure to determine whether there exist any net economic benefits to these development policies.

It has become a stylized fact in the public choice literature that government officials like private decision makers are rationally self-interested. The result of this public choice view is that politicians are often shortsighted in their policy judgments not looking beyond the next election cycle. Building on this framework Buchanan and Lee (1982) and Calcagno and Adams (2005), assume that government officials want to maximize tax revenue.<sup>6</sup> We argue that by using a public choice lens to examine DFI we can provide some empirical evidence as to the political benefits and continued support of these policies. As noted above, there is some evidence in the literature that these policies are driven by the self-interested motivation of public officials. Even Esinger (1993) points out that the use of state venture capital funds, which he argues is the

<sup>4</sup> Several dramatic cases in the 1990s attracted media attention. South Carolina gave BMW \$100 million, Alabama gave Mercedes Benz \$250 million and Hyundai half that amount, Indiana gave United Airlines \$300 million, and Kentucky gave Toyota \$125 million. Mississippi gave Nissan cash payments for 10 years, equal to 4% of gross payroll, along with a 50% corporate income tax credit for job training.

<sup>5</sup> Buchanan and Lee (1982) argue that shortsighted politicians may move beyond the optimal point on the Laffer curve in the short-run and thereby may fail to maximize tax revenue in the short-run. For simplicity we argue that if politicians are competing with other states for tax revenue and are revenue maximizers that state politicians would want to keep the state corporate tax rate within the increasing portion of the curve between zero revenue and max revenue.

<sup>6</sup> For a more detailed theoretical analysis see Calcagno and Adams (2005).

more effective policy for generating capital, is no different than other policy choices with state politicians deciding the fate of the entrepreneurial state on the lack of apparent and immediate political benefit. Couch and Barrett (2004) find empirical evidence that the selection process for enterprise zones is not based upon where the greatest number of jobs can be created i.e. where unemployment is the highest, but rather in favor of political concerns.

Providing DFI reduces resource prices to targeted firms relative to existing firms, which potentially increases the after-tax profit for targeted firms. These firms may then choose to locate into states that provide DFI, thus increasing the tax base for the state. Examining the issue from this perspective implies that the motivation for offering DFI is enhanced tax revenues, even if other economic variables associated with growth are not increased. Thus, it is reasonable to theorize that political officials offer DFI, because they benefit politically even if the region does not experience economic growth.

### 3. Data and Empirical Model

We construct a model using a cross section of data from the forty-eight contiguous states for the years 1981 and 1989. These years were chosen based on the availability of the DFI data, which is the focus of this study.<sup>7</sup> Newman (1983), Plaut and Pluta (1983), Helms (1985), Wasylenko and McGuire (1985), Papke (1987), Blair and Premus (1987) Bartik (1985, 1989, 1991, 1992, 1994, 1996), Carroll and Wasylenko (1994), and De Bartolome and Spiegel (1995) identify several general factors as part of the state business climate. This literature along with the previous discussion leads us to consider an econometric model which tests whether offering DFI positively impact state corporate tax revenues. State corporate tax revenue is modeled as a function of a vector of state economic characteristics, state policy variables, and regional characteristics:

State corporate tax revenues =  $f$  (State economic characteristics, Policy variables, Regional characteristics).

The dependent variable is real corporate tax revenue per capita. The corporate tax revenue is chosen as opposed to total state revenue as this is the most prominent business tax, and the analysis attempts to measure whether the attraction of firms raises this form of revenue. State specific economic characteristics consist of seven variables: the unemployment rate, wage rate, unionization, college education, population density, price of electricity, and real per capita income.

Four of the seven state characteristic variables describe the labor force. The unemployment rate provides information on the economic condition of the state and the availability of labor in a particular state. The wage rate is the real average hourly wage rate of production workers in manufacturing, and reflects both the skills and costs of the labor force. Skilled labor generally commands a higher wage rate, but is also a cost to the manufacturer of producing output. Assuming firms are profit maximizers, they demand the highest possible skilled labor at the lowest possible wage. It is unclear which of these factors, skill or cost, dominates in determining the sign. Unionization is the percentage of the state labor force that is unionized. Unions are generally thought to be a deterrence to firms since union workers generally require higher wages, but Freeman and Medoff (1984) suggest it can also represent a signal to firms of a stable and skilled labor force. The years of education serve as a measure of human capital and productivity of the labor force within a state. A state with a high education level implies more skilled labor is available relative to unskilled labor. Thus, we include the percentage of the labor force age 25 or older with a college degree.

Previous studies such as, Wasylenko and McGuire (1985), and Bartik (1985) include population density to represent influences on market demand or the labor force. Helms (1985) uses it as an agglomeration effect. In other words, when more individuals are provided with a public good it allows for economies of scale in the production process. Both of these aspects reflect business climate issues that may affect corporate tax revenue. Variables representing energy costs have traditionally been considered important characteristics in firm growth and location decisions. The price of electricity represents the cost of inputs in the production process. The energy variable is the average price per kilowatt hour of electricity paid by manufacturing industries. It is the average price of electricity per kwh for state  $i$  at time  $t$  estimated by dividing the total cost of electricity for manufacturing firms by the total kwh

<sup>7</sup> The source for direct financial incentives (DFI) is the *Directory of Incentives for Business Investment and Development in the United States* (National Association of State Development Agencies [NASDA] 1983, 1991). The data available on DFI are inconsistently reported, with each edition of the *Directory* reporting expenditures for a range of years. For any one state, the *Directory* reports expenditures for the different DFI ranging over a 4-year period. The first and third editions of the *Directory* (1983, 1991) are the focus of the present study because this allows for a longer time span between periods to observe changes in DFI. The first edition of the *Directory* ranges over the years 1980 to 1983, whereas the third edition ranges over the period from 1987 to 1990. Even though the *Directory* reports the data over a 4-year range, the data from these two periods are primarily from the years 1981 and 1989, respectively.

they consume.<sup>8</sup> The last state characteristic variable is real per capita income. This variable reflects the economic condition of the state and controls for changes in economic growth that may occur between the two periods.

The policy variables consist of the effective corporate tax rate, the effective property tax rate and the real per capita value of direct financial incentives. The measure of state corporate income tax is based on Wheaton's (1983) effective tax level.<sup>9</sup> Wheaton's effective tax level is an effective measure of all state business taxes; however, the tax measures in this study use only corporate and property taxes. Newman (1983) uses changes in corporate tax rates; however, he uses nominal rather than effective tax rates; and Wasylenko and McGuire (1985) show in their analysis that only effective tax rates are of importance. The property tax rate for states is an effective property tax level measured in a manner similar to the corporate rate. Effective property tax is the average property tax rate in state  $i$  at time  $t$  calculated by dividing the total property tax revenue by the total assessed property value. This is the measure used by Plaut and Pluta (1983), and both measures have been used in Calcagno and Thompson (2004).

Direct financial incentives consists of the expenditures in millions of dollars for five aggregate categories (loans, grants, bonds, special incentives, and other incentives) in which states and local governments can provide assistance to firms. De Bartolome and Spiegel (1995) use an aggregate value of state development spending relative to the labor force in their analysis. Our analysis of DFI is measured in real per capita dollars. Detailed lists of the DFI programs that are used in this study to create the DFI variables are contained in Table 1. In Table 2 we provide data on the real expenditures in these programs by state and demonstrates which programs were favored by which states during the two periods of evaluation.

Regional characteristics are accounted for by categorical variables representing the North Central, Southern, and Western states. To avoid problems with

multicollinearity only three regions are included. These regions are evaluated relative to the Northeast. The Northeast is chosen as the base since it is considered to be highly industrialized relative to the other regions. These regions are adapted from the U.S. Bureau of the Census' nine classifications of regions. The Northeast consists of the New England and Mid Atlantic regions. The North Central is made up of the East and West North Central. The Southern states include the South Atlantic, East South Central and the West South Central. Finally, the Western states are a combination of the Mountain and Pacific regions. A state receives a one if it is in that region or a zero otherwise.

**Table 1.** List of Direct Financial Incentives Offered by States in Periods 1 and 2

<i>Direct Financial Incentives (DFI)</i>
Customized Industrial Training
Direct State Loans
Enterprise Zones
General Obligation Bonds/Locally Issued
General Obligation Bonds/State Issued
Industrial Revenue Bonds/Local Issued
Industrial Revenue Bonds/State Issued
Industrial Revenue Bond Guarantees
Loan Guarantees
Privately Sponsored Development Credit Corporations
State Grants
State Funded or State Chartered Equity /Venture Capital Corps.
State-Funded Interest Subsidies
Umbrella Bonds

Source: *Directory of Incentives for Business Investment and Development in the United States* 1991. A detailed description of each of these categories is available from the authors upon request. The *Directory* (1991) notes that the category "other financing programs" grew tenfold during the years 1983-1989 with twenty-seven states listing at least one type of "other financing programs."

Finally, a time trend dummy is utilized to investigate any structural changes that take place between the two time periods. The time dummy equals one in 1981 (period 1) and zero in 1989 (period 2). In addition, dummy interaction terms are used in the model where the D in front of the variable represents the dummy interaction term for that variable which can be expressed in the form  $Dx_i$  where  $x_i$  denotes the  $i$ th independent variable. The complete descriptions of the variables are presented in Table 3.

<sup>8</sup>The apparent focus on the manufacturing sector of the economy is for two reasons: first many of the more widely publicized cases of states using DFI have involved major manufacturing companies such as BMW in South Carolina and Mercedes Benz in Alabama. Second, and more importantly the data on DFI from the *Directory of Incentives for Business Investment and Development in the United States* is primarily for manufacturing firms. We think that our hypothesis and conclusions are completely general and could just as easily be made for the service industry.

<sup>9</sup>Although Papke (1987) compares her AFTAX measure to Wheaton's effective tax level and finds her measure to produce better estimates, these measures are comparable. Given the limited access to the program used in Papke's measure of AFTAX allows the effective tax level to be an adequate measure.

**Table 2** Real Per Capita Spending on Direct Financial Incentives by State (Thousands)

Period 1: 1981						Period 2: 1989					
State	Loans	Grants	Bonds	Special	Other	State	Loans	Grants	Bonds	Special	Other
Alabama	0.00	654.72	393207.58	349.95	0.00	Alabama	928.68	795.02	4958.67	0.00	0.00
Arizona	0.00	0.00	283208.28	0.00	0.00	Arizona	0.00	0.00	0.00	0.00	0.00
Arkansas	0.00	0.00	111109.42	1236.08	0.00	Arkansas	0.00	260.30	22996.58	1412.96	282.70
California	152.62	0.00	22980.64	1479.61	0.00	California	118.93	0.00	33230.95	1416.93	0.00
Colorado	0.00	0.00	0.00	103.26	0.00	Colorado	351.61	0.00	6023.71	138.85	151.57
Connecticut	536.32	0.00	201224.36	859.52	0.00	Connecticut	1368.73	0.00	83407.18	710.52	0.00
Delaware	0.00	0.00	548333.25	669.10	0.00	Delaware	1745.72	171.99	48204.89	7883.92	4248.68
Florida	195.50	0.00	64197.70	219.93	0.00	Florida	167.75	366.72	0.00	219.26	337.16
Georgia	0.00	0.00	32406.19	773.25	0.00	Georgia	0.00	0.00	41961.26	816.34	0.00
Idaho	0.00	0.00	0.00	3226.32	0.00	Idaho	0.00	0.00	0.00	208.79	0.00
Illinois	109.96	0.00	54962.46	200.75	0.00	Illinois	5178.87	5146.89	24376.19	1461.78	0.00
Indiana	149.40	259.44	131843.62	680.50	0.00	Indiana	183.95	1235.31	0.00	11151.45	0.00
Iowa	0.00	0.00	68423.56	431.12	0.00	Iowa	2018.14	0.00	22599.29	9286.77	0.00
Kansas	0.00	0.00	244556.76	1584.67	0.00	Kansas	6948.72	0.00	383450.39	4284.13	0.00
Kentucky	2128.90	0.00	169134.85	206.97	0.00	Kentucky	0.00	0.00	21208.64	666.12	0.00
Louisiana	368.37	0.00	64266.36	293.64	0.00	Louisiana	1245.25	0.00	573.42	233.96	102.94
Maine	0.00	0.00	121763.90	52.19	0.00	Maine	0.00	122.18	27668.98	0.00	0.00
Maryland	443.40	0.00	140666.62	729.37	0.00	Maryland	3504.08	0.00	34309.17	304.06	3226.57
Massachusetts	0.00	0.00	108819.68	6673.00	0.00	Massachusetts	2787.89	0.00	2060.61	13085.40	614206.34
Michigan	0.00	0.00	151934.86	99.83	0.00	Michigan	1747.72	47.26	26645.29	27010.26	6073.34
Minnesota	188.85	0.00	459672.57	0.00	0.00	Minnesota	1219.57	13994.32	7468.49	0.00	917.29
Mississippi	0.00	0.00	0.00	263.07	30624.62	Mississippi	51796.94	0.00	38857.77	0.00	56200.64
Missouri	0.00	0.00	3038.87	348.02	747.26	Missouri	560.85	0.00	60626.87	0.00	119239.65
Montana	2009.80	0.00	184580.33	0.00	0.00	Montana	14077.33	0.00	6351.24	98909.01	20732.41
Nebraska	0.00	0.00	42618.07	120.07	0.00	Nebraska	0.00	0.00	14477.02	1533.17	0.00

**Table 2** Real Per Capita Spending on Direct Financial Incentives by State (Continued)

State	Period 1: 1981					Period 2: 1989					
	Loans	Grants	Bonds	Special	Other	State	Loans	Grants	Bonds	Special	Other
Nevada	0.00	0.00	72944.46	0.00	0.00	Nevada	737.08	0.00	4613.56	442.86	0.00
New Hampshire	0.00	0.00	89237.90	811.94	0.00	New Hampshire	0.00	0.00	59711.70	0.00	0.00
New Jersey	276.60	0.00	110028.39	78.30	0.00	New Jersey	5049.53	519.43	20424.38	70.27	1363.92
New Mexico	0.00	0.00	313519.36	280.07	0.00	New Mexico	165.97	0.00	12206.00	564.01	19282.33
New York	39.57	0.00	33685.61	1166.93	0.00	New York	4726.10	964.27	4827.82	1223.32	32.05
North Carolina	0.00	0.00	0.00	499.43	0.00	North Carolina	0.00	695.83	0.00	1629.34	138.79
North Dakota	0.00	0.00	463657.19	2684.64	0.00	North Dakota	13404.63	0.00	169889.13	0.00	0.00
Ohio	20316.07	0.00	169031.28	756.59	0.00	Ohio	2808.65	2805.68	14797.76	512.63	2615.00
Oklahoma	843.48	0.00	16540.19	410.30	0.00	Oklahoma	10487.63	0.00	0.00	0.00	0.00
Oregon	1192.40	0.00	18602.29	0.00	0.00	Oregon	60827.16	0.00	5416.80	0.00	0.00
Pennsylvania	8665.96	0.00	197025.91	103.70	0.00	Pennsylvania	21696.24	4797.85	682.80	894.87	17.51
Rhode Island	0.00	0.00	171708.42	6556.56	0.00	Rhode Island	767.49	0.00	70381.47	1579.19	0.00
South Carolina	0.00	0.00	106600.06	660.83	0.00	South Carolina	5687.96	0.00	111505.63	66.70	0.00
South Dakota	0.00	0.00	84440.33	0.00	0.00	South Dakota	9097.22	0.00	5813.74	0.00	0.00
Tennessee	0.00	0.00	787.59	270.64	0.00	Tennessee	0.00	2271.10	31009.07	411.05	0.00
Texas	49.40	0.00	74338.11	69.63	0.00	Texas	0.00	0.00	2443.16	70.70	0.00
Utah	0.00	0.00	512441.37	0.00	0.00	Utah	0.00	0.00	84734.28	1353.63	0.00
Vermont	929.29	0.00	79992.81	1959.03	0.00	Vermont	3917.12	0.00	16327.09	2072.02	0.00
Virginia	0.00	0.00	164804.91	254.92	0.00	Virginia	379.38	1621.49	7663.81	437.88	0.00
Washington	0.00	0.00	0.00	0.00	0.00	Washington	0.00	1037.40	27617.07	186.56	0.00
West Virginia	1500.35	0.00	73534.36	92.07	0.00	West Virginia	30030.78	0.00	158693.84	14450.25	0.00
Wisconsin	0.00	0.00	69093.21	0.00	0.00	Wisconsin	346.54	192.27	16767.80	0.00	444.79
Wyoming	0.00	0.00	33300.33	0.00	0.00	Wyoming	7920.97	0.00	0.00	2304.00	223488.40

**Table 3:** Variable Definitions.

Variable Name	Definition	Data Source
<i>Dependent Variable</i>		
CTAXREV	Real Corporate Tax Revenue Per Capita	<i>Statistical Abstract of the United States</i>
<i>Independent Variables</i>		
UNEMP	State Unemployment Rate	<i>Employment and Earnings</i>
POPDEN	Population density	<i>Current Population Reports</i>
WAGE	Average Hourly Wage Rate of Production Workers	<i>Employment and Earnings</i>
ENERGY	Average Price of Electricity for Manufacturing	<i>Annual Survey of Manufacturers</i>
UNION	Percentage of State Labor Force Unionized	<i>Statistical Abstract of the United States</i>
INCOME	Real Per Capita Income	<i>Statistical Abstract of the United States</i>
COLLEGE	Percentage of the labor force age 25 or older with college degree	<i>Statistical Abstract of the United States</i>
CTAX	Effective Corporate Tax Rate	<i>Economic Report of the President and Book of the States</i>
PTAX	Effective Property Tax Rate	<i>Taxable Property Values and Assessment Sales Price Ratios</i>
DFI	Real Per Capita Value of Direct Financial Incentives	<i>Directory of incentives for business investment and development in the United States.</i>
NC	North Central States	<i>U.S. Bureau of Census</i>
SOUTH	Southern States	<i>U.S. Bureau of Census</i>
WEST	Western States	<i>U.S. Bureau of Census</i>
TIMEDUM	Dummy variable 1981 = 1; 1989 = 0	
LOANS	Real Per Capita Value of Direct State Loans	<i>Directory of incentives for business investment and development in the United States.</i>
GRANTS	Real Per Capita Value of State Grants	<i>Directory of incentives for business investment and development in the United States.</i>
BONDS	Real Per Capita Value of Industrial Development Bonds, Loan Guarantees, Umbrella Bonds, Industrial Development Bond Guarantees, and General Obligation Bonds	<i>Directory of incentives for business investment and development in the United States.</i>
SPECIAL	Real Per Capita Value of Customized Industrial Training, State Funded Venture Capital Corporations, and Privately Sponsored Development Corporations	<i>Directory of incentives for business investment and development in the United States.</i>
OTHER	Real Per Capita Value of Incentives whose Introduction is Recent or not Widespread	<i>Directory of incentives for business investment and development in the United States.</i>

To test our hypothesis we estimate the following equations:

$$\begin{aligned} \text{CTAXREV}_{it} = & \beta_0 + \beta_1 \text{UNEMP}_{it} + \beta_2 \text{POPDEN}_{it} + \\ & \beta_3 \text{WAGE}_{it} + \beta_4 \text{ENERGY}_{it} + \beta_5 \text{UNION}_{it} + \beta_6 \text{INCOME}_{it} \\ & + \beta_7 \text{COLLEGE}_{it} + \beta_8 \text{CTAX}_{it} + \beta_9 \text{PTAX}_{it} + \beta_{10} \text{DFI}_{it} + \\ & \beta_{11} \text{NC}_{it} + \beta_{12} \text{SOUTH}_{it} + \beta_{13} \text{WEST}_{it} + \beta_{14} \text{TIMEDUM}_{it} + \\ & \beta_{15} \text{DCTAX}_{it} + \beta_{16} \text{DDFI}_{it} + \varepsilon_{it} \end{aligned} \quad (1)$$

The DFI were also disaggregated into the five types noted above: loans, grants, bonds, special incentives, and other.

$$\begin{aligned} \text{CTAXREV}_{it} = & \gamma_0 + \gamma_1 \text{UNEMP}_{it} + \gamma_2 \text{POPDEN}_{it} + \\ & \gamma_3 \text{WAGE}_{it} + \gamma_4 \text{ENERGY}_{it} + \gamma_5 \text{UNION}_{it} + \gamma_6 \text{INCOME}_{it} + \\ & \gamma_7 \text{COLLEGE}_{it} + \gamma_8 \text{CTAX}_{it} + \gamma_9 \text{PTAX}_{it} + \gamma_{10} \text{LOANS}_{it} + \\ & \gamma_{11} \text{GRANTS}_{it} + \gamma_{12} \text{BONDS}_{it} + \gamma_{13} \text{SPECIAL}_{it} + \\ & \gamma_{14} \text{OTHER}_{it} + \gamma_{15} \text{NC}_{it} + \gamma_{16} \text{SOUTH}_{it} + \gamma_{17} \text{WEST}_{it} + \\ & \gamma_{18} \text{TIMEDUM}_{it} + \gamma_{19} \text{DCTAX}_{it} + \gamma_{20} \text{DLOANS}_{it} + \\ & \gamma_{21} \text{DGRANTS}_{it} + \gamma_{22} \text{DBONDS}_{it} + \gamma_{23} \text{DSPECIAL}_{it} + \\ & \gamma_{24} \text{DOTHER}_{it} + \varepsilon_{it} \end{aligned} \quad (2)$$

where  $i$  represents the state and  $t$  the year. Helms (1985) suggests that a pooled cross section and time series approach is necessary to test a theory of state development. Following Helms the models were estimated for the 48 contiguous states over two time periods, 1981 and 1989. Potentially a simultaneous relationship exists between the corporate tax rate and corporate tax revenues. While possible that this relationship could be determined either way we think that the idea of tax rates being exogenous and determining tax revenues is the more plausible direction of determination. A Hausman omitted variable test was performed and as suspected indicated no endogeneity.<sup>10</sup>

#### 4. Results

The OLS results for equations 1 and 2 are presented in Table 4. Of all of the state characteristics, unionization and per capita income were both significant at 1% level. Further, unionization negatively impacts state corporate tax revenues, which is the more traditional view of the effects of unions. This result suggests that states with heavily unionized labor forces are likely to have lower state corporate tax revenues. Income has the expected positive relationship with

state corporate tax revenue. Income is often viewed as a measure of economic well being for a state so it follows that states with higher income levels would have higher corporate tax revenues. The corporate tax rate was also positive and significant at the 1% level. As noted above, the corporate tax rates obviously determine the level of revenue generated, and higher tax rates generate higher tax revenue. More interestingly, the dummy interaction term indicates that corporate tax rates had less of an effect on tax revenues in the second period. In other words, tax competition matters in earlier periods (McClure, 1986; Wildasin, 1986; Break, 1986), when there is less proliferation of the use of DFI (see Table 2). We argue that greater use of DFI over time explains why tax rates matter more in the earlier period. Since the sign is negative, tax rates in the earlier period have a smaller impact on revenues than in the later period we argue this is because of the tax competition to have lower rates, but once DFI could more readily be used rates no longer had to be adjusted. In other words, taxes matter early in the game, but as states offer DFI they matter less over time. Location also matters; states in the North Central, South and West have lower corporate tax revenues relative to the Northeast states. Only the South and West are statistically significant. This is consistent with the idea that many southern states were able to attract firms with lower operating cost and by using land and capital subsidies (Esinger, 1989). Finally, DFI were positive and significant at the 5% level. The positive sign on DFI is consistent with our hypothesis that there may be political benefit in the form of higher tax revenue. The interaction term for DFI is also positive, but not significant suggesting that there is no significantly different effect of DFI on revenue in the latter period despite the increased use.

We also considered a disaggregated model to investigate which incentives matter. The disaggregated model included the five types of DFI and a dummy interaction term for each one of them. The remaining state characteristic, policy, and regional variables that were statistically significant in the first model maintain their sign and significance in the second model. Most of the individual DFI variables are positive, but none are statistically significant. The interaction terms for bonds and direct grants were both significant, which implies that direct grants had a smaller effect on tax revenues in the first period, while the provision of bonds exerted a greater effect. This result could be due to the tax changes that occurred over the period of time. This observation also leads one to hypothesize that states offering direct grants are attracting less than profitable firms. Firms that require bond financing, as opposed to direct grants (subsidies) on the other hand

<sup>10</sup> To test for the endogeneity of corporate taxes we include the following variables as instruments: percentage of the labor force in the manufacturing sector, real per capita spending on public assistance, education, healthcare, highways, and intergovernmental transfers, and the median temperature of the state. The F-statistic for the Hausman test to indicate endogeneity between the corporate tax rate and corporate tax revenue is 1.346 the critical value is 1.70.

**Table 4** Results from Equations 1 and 2.

Variable	Model 1 Aggregate DFI Coefficient	Model 2 Individual DFI Coefficient
Constant	-123.9597*** (-6.173)	-138.7727*** (-6.294)
WAGE	5.1623 (1.558)	5.7657 (1.615)
COLLEGE	-.4184 (-.418)	-.6596 (-.610)
UNION	-.8262*** (-2.773)	-1.1260*** (-2.520)
UNEMP	1.885 (1.326)	2.5899** (1.945)
ENERGY	20.4471 (.515)	-47.2016 (-.845)
PTAX	.2934 (.164)	.1122 (.053)
POPDEN	0.0173* (1.714)	0.01300 (1.117)
NC	-12.5628 (-1.487)	-12.5687 (-1.499)
SOUTH	-13.0758*** (-3.398)	-15.4323*** (-3.281)
WEST	-19.6266*** (-3.197)	-22.3367*** (-3.091)
D1	68.3962*** (5.252)	75.2672*** (6.155)
INCOME	.0051*** (4.996)	0.0059*** (5.388)
CTAX	551.2103*** (9.410)	554.2245*** (10.146)
DCTAX	-468.9276*** (-7.403)	-470.3568*** (-7.630)
DFI	0.0003** (1.930)	-
DDFI	0.0005 (1.486)	-
LOANS	-	.1407 (.985)
GRANTS	-	1.3649 (.856)
BONDS	-	-0.0309 (-1.270)
SPECIAL	-	.2656 (1.550)
OTHER	-	-0.0189 (-.576)

**Table 4** Results from Equations 1 and 2 (Continued)

DLOANS	-	-.5277 (-1.499)
DGRANTS	-	-29.2713*** (-2.487)
DBONDS	-	0.0678*** (2.454)
DSPECIAL	-	1.0353 (.730)
DOTHER	-	.2742 (1.518)
R <sup>2</sup>	.91	.92
Adj.R <sup>2</sup>	.89	.89
F	53.56	34.81

Note: t-statistic in parenthesis \* Significant at the 10% level \*\* Significant at the 5% level \*\*\* Significant at the 1% level

increases the tax revenues. This may be a signaling device that reveals which firms are more desirable for targeting.

## 5. Conclusion

A review of the previous research of state development policies indicates that examining the standard measures of growth: GDP, state income, and employment have generated at best mixed results. Since economic growth is the stated objective of these policies one can question the effectiveness of state governments' continuing use of direct financial incentives to promote economic growth. Rather than continue to muddy the waters as to whether these policies generate economic growth, we attempt to offer another motivation for state governments to provide direct financial incentives. We argue that politicians are focusing on the political rather than economic benefits of these policies. We consider that the goal of state policy is to improve corporate tax revenues without changing corporate tax rates. By targeting individual firms, state governments can increase their revenues and still attract firms. Providing direct financial incentives to locating firms appears to meet that goal. Whether or not higher corporate tax revenue results in economic growth is uncertain, and perhaps deserves further research. Our findings provide some empirical evidence to explain why state governments continue to offer DFI without any obvious economic benefit to the state.

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