

Economic Development Incentives, Reported Job Creation, and Local Employment

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Abstract

State and local policymakers continue to utilize and place an important emphasis on economic development incentives as a means of attracting and retaining employers, with tax increment financing (TIF) being one of the more popular incentives. Recently, a number of states have increased reporting requirements for local economic development agencies in an attempt to ensure that targeted incentives are achieving their stated objectives. However, the economic validity of these reported jobs depends heavily on the extent to which the incentives draw new economic activity into an area. This paper examines the credibility of the number of jobs reported by local economic development agencies in Missouri as having been created or retained by TIF. The paper examines the impact of these reported jobs on county employment, as measured by the Bureau of Labor Statistics. Results suggest the number of jobs reportedly created by TIF districts do not significantly impact county employment.

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1. Introduction

State and local policymakers continue to utilize and place an important emphasis on targeted economic development incentives, such as industrial development bonds, tax abatements, job creation tax credits, and tax increment financing (TIF), as a means of fostering job creation within their local jurisdictions. Greenbaum and Landers (2014) report that 55 percent of all local governments that responded to the International City/County Management Association economic development survey used TIF. The general public also appears to share the view that economic development programs are a necessary part of maintaining a vital local economy. Seventy percent of respondents to an American Planning Association (APA) poll identified job creation as a high priority for policymakers, and 63 percent identified a preference for economic development funding receiving a high priority for scarce local government resources (APA 2012). Although a large proportion of the population and policymakers support, in general, governments' role in implementing and operating economic development programs, there have been increased calls on economic development agencies to provide evidence on their effectiveness in fulfilling their objective of job creation, and a greater emphasis has been placed on assessing incentive programs (Luger and Bae 2005). In 2008, the Kansas Legislature asked the Legislative Division of Post Audit, the audit arm of Kansas government, to report on the effectiveness of the state's economic development programs (Legislative Division of Post Audit 2008). The state of Washington made a similar request to its State Auditor (Washington State Auditor's Office 2014). Missouri, the state that is the subject of this paper, has also

attempted to document the economic impact of TIF by requiring all jurisdictions sponsoring TIF districts to file a TIF report with the State Auditor of Missouri reporting, among other things, the number of jobs created by the TIF project.

This paper examines whether the job numbers reported by local economic development agencies in Missouri represent actual improvements in local employment. This paper does not attempt to directly measure the impact of TIF on jobs but instead examines the extent to which the number of jobs reportedly created by TIF districts within a county positively influences employment in a county as measured by the Bureau of Labor Statistics (BLS). Missouri is just one of many states searching to quantify the benefits of economic development incentives. Even when not required by state laws, the number of jobs supported by economic development projects often takes center stage when incentive packages are announced.

Although Missouri's increased reporting requirements represent progress in terms of greater disclosure and transparency, supporters of economic development incentives have a clear motivation to convince policymakers and the public that incentives are having a large, positive impact on local employment. Therefore, they have little reason to examine critically the question of whether these reported job numbers represent an actual employment increase in the local economy. If the number of jobs created by TIF, as reported by TIF administrators, is a true economic impact, then the number of reported jobs should have a positive impact on county employment as measured by the BLS. On the other hand, the absence of a significant effect of reported jobs by TIF administrators on employment as measured by the BLS would be consistent with TIF not having a true economic effect on county employment.

The next section provides a basic overview of the history of TIF along with an overview of how TIF is structured, as well as some of the difficulties in assessing its effectiveness as an

economic development tool. Section 3 reviews the previous literature on TIF, which has primarily focused on TIF's efficacy as an economic development tool meant to increase property values. This section also addresses the drawbacks, due to data limitations, of the two previous studies that examined TIF's impact on employment and how the data in the current study allows us to avoid some of these issues. Section 4 describes the data sources and provides the descriptive analysis of the data. Section 5 presents the empirical model, estimated using both panel data and instrumental variable approaches. This section also presents and discusses the results. Section 6 reiterates the main conclusions and discusses this study's contribution to policymakers' understanding of TIF's efficacy at furthering economic development objectives.

2. Overview of TIF

First implemented in California in 1952, the use of TIF grew from eight states in 1970 to 49 states by 2010 (Greenbaum and Landers 2014). As state statutes empower local jurisdictions to enact TIF, certain details vary by state. Nonetheless, the fundamental structure of TIF is common across states. A local jurisdiction, typically a municipality, creates a TIF district by designating a group of properties as part of the district. Although most TIF districts consist of contiguous properties, some states allow noncontiguous properties in close proximity to be part of a single TIF district. Figure 1 gives an example of a legally defined TIF district. It shows the College Hill TIF in Topeka, Kansas, consisting of approximately 35 parcels located in Topeka's central city that developers had acquired rights to purchase and planned on turning into a mixed-use retail and residential development.

Figure 1. College Hill TIF District, Topeka, Kansas



Source: City of Topeka Geographic Information Systems (GIS) presentation (2011).

TIF supporters argue that TIF encourages development by allowing a municipal-controlled TIF commission to use tax revenues generated through tax base growth within the TIF district to finance development costs necessary to encourage economic development. When a TIF district is created, the tax base accessible to overlapping jurisdictions, such as the school district and county and municipal governments, is effectively frozen at its value in the year of creation. If the tax base grows, whether from investment or some external factors, any tax revenue collected on the additional tax base (referred to as the tax increment) is diverted to the TIF administrators to pay for development costs, such as bonds used to finance infrastructure improvements, land acquisition costs, demolition of existing structures, or other reimbursable development costs. The initial infrastructure improvement and development costs can be financed by TIF bonds issued by the TIF commission or by the developer, who is reimbursed by the TIF administrator as the tax increment begins to generate revenue. If the TIF district's tax base fails to grow, the TIF district can be either dissolved or allowed to expire with the

developer, bondholders, or municipality having to cover the incurred costs of improvements, depending on the specifics of the TIF plan at the time of the district's adoption.

One should note that the extent to which TIF-financed improvements are necessary for the development to take place is not always clear-cut and is addressed in this section. While municipalities allow some TIF districts to dissolve after the initial improvements are paid off, some states allow TIF to finance development on a pay-as-you-go basis, with the TIF commission financing additional infrastructure or development costs as the tax increment grows. The number of years in which a TIF commission may divert the tax increment can vary by district, although state law sets a maximum time period for which the TIF may exist, typically between 20 and 30 years.¹ Although TIF financing usually applies only to property taxes, Missouri and a number of other states have allowed taxes on a broader range of economic activities to be included in a district's tax increment, such as local sales and income taxes. The basic model of TIF is more or less unchanged when applied to these other taxes.

Although policymakers initially discovered TIF as a useful means to fund public infrastructure improvements in blighted areas with the hope that the overlapping jurisdictions would eventually benefit from a larger tax base once TIF expired, TIF has evolved into mostly an economic development tool. As such, its primary appeal to economic development practitioners is in its ability to attract jobs. Missouri's reporting requirements highlight the preeminence of TIF's role in job creation over blight reduction. TIF administrators are required to report the estimated new and retained jobs at TIF creation and the actual new and retained jobs each year. On the other hand, there is no requirement for documenting TIF's success at blight reduction. As an example of reporting estimated job creation, when St. Louis County's Lambert

¹ Missouri's limit is 23 years. Some state legislatures have also extended the life of individual TIF districts that have reached their normal statutory limit.

Airport Perimeter TIF was formed, the county's TIF commissions overwhelmingly supported the project, emphasizing the estimated 12,000 jobs the TIF would create over its lifetime (Harris 2004). TIF's role as a job creator extends well beyond the Midwest, however. In North Carolina, where a 2004 constitutional amendment allowed the legislature to implement TIF, economic development officials touted TIF as a necessary tool for creating jobs and growth (Elkins 2005). In Washington State, then governor Locke undertook a long campaign to adopt a TIF statute that was permissible under its constitution to eliminate his state's perceived disadvantage at attracting firms resulting from its failure to adopt TIF (Erb 2002).

The ultimate objective of economic development incentives such as TIF is to attract economic activity to a particular area that would otherwise occur elsewhere. That many TIF districts experience incredible growth within their boundaries is undeniable. A more difficult and important task is determining whether such growth is both attributable to TIF and beneficial to the area as a whole. A number of often obscure issues have considerable impacts on assessing the success of TIF. First, although Missouri requires annual TIF reports, job numbers are self-reported by local TIF administrators without consistent rules on determining whether a job should be attributed to a TIF district. Second, proponents of TIF frequently overlook the extent to which TIF shifts economic activity from areas outside the TIF district. Third, fairly attributing increased economic activity to TIF requires that the economic activity would not occur but for the presence of TIF. For all these reasons, the State Auditor of Washington, when charged with assessing the efficacy of economic development agencies in Washington, stated that the Department of Commerce "could not carry out statutory intent to identify impacts, because doing so with certainty is virtually impossible" (Washington State Auditor's Office 2014). In fact, the

state of California eliminated its use of TIF in 2012 because of policymakers' concerns that its effectiveness as a generator of true economic development was overstated (Svorny 2014).

The shifting of economic activity diminishes the benefits of TIF when growth in jobs or taxes within the TIF district comes at the expense of non-TIF areas of a jurisdiction. For example, in Kansas City, Missouri, the Pershing Road TIF is credited with creating 6,268 new jobs (State Auditor of Missouri 2011). The development incentive involved consolidating the IRS's operations in the Kansas City area. While the IRS had no previous presence within the TIF district, most of the jobs existed at its Bannister Road office complex already located within Kansas City, Missouri, with only approximately 1,800 jobs being relocated from the IRS center in Overland Park, Kansas (Collinson 2003). So while the TIF district itself clearly experienced a significant growth in economic activity, jobs, and related taxes, when considering the impact on the entire municipality, the decrease in economic activity, jobs, and related taxes from the Bannister Road location offsets a large portion of these gains. Even when TIF does not finance relocation, it can facilitate a subtler shifting of economic activity. If TIF adoption increases economic activity within the district by attracting spending that had previously occurred with firms located outside the TIF district, the decrease in economic activity outside the district tempers the increase in economic activity within the TIF district. Since many Missouri TIF districts support retail establishments, failing to consider the shifting of economic activity from existing firms within a county can result in a significant overstatement of TIF's impact on job creation.

Even in cases where no economic shifting within a county occurs, the but-for condition is another caveat that must be considered when assessing TIF. The but-for provision refers to the statutory requirement that an incentive cannot be awarded unless the supported economic activity

would not occur but for the incentive being offered. This legal provision has economic importance. If a relocating firm would locate in a particular jurisdiction with or without receiving the economic incentive, then the economic impact of offering the incentive is nonexistent, even when the firm does not divert spending from other local firms. Although the but-for provision represents the legislature's attempt to prevent local jurisdictions from awarding more than the minimum incentive necessary to attract a firm, it also has an important impact on empirical estimates of TIF's efficacy at job creation.

3. Previous Literature

Since the primary means by which TIF finances economic development is through the property value increment, it is not surprising that empirical studies of TIF have focused on TIF's impact on property values. Smith (2006, 2009), Byrne (2006), Weber, Bhatta, and Merriman (2003 and 2007), and Carroll (2008) examine the impact of TIF on property values at the parcel or TIF district level, finding mixed results in terms of TIF success. Anderson (1990), Dye and Merriman (2000, 2003), and Merriman, Skidmore, and Kashian (2011) look at the effect of TIF on property values at the municipal level. Anderson (1990) examines municipal property values in Michigan and finds that municipalities that adopt TIF experience higher property value growth. Dye and Merriman (2000) study municipalities in the metropolitan Chicago area and find that TIF adoption has a negative impact on a municipality's aggregate property value growth. Although Dye and Merriman find significant property value growth within TIF districts, the growth was more than offset by decreased growth in the non-TIF areas of municipalities. This finding highlights the importance of considering the shifting of economic activity by examining TIF impact at a jurisdictional level and is confirmed by Dye and Merriman (2003), who find that commercial activity within TIF districts substitutes for such

activity outside of districts. Weber (2003) also highlights the importance of the potential broader impact of TIF on overlapping jurisdictions, as she finds that more intensive use of TIF, measured as the amount of the property tax base included in TIF, negatively affects the property tax revenue of school districts.

Byrne (2010) and Lester (2014) are the only studies that examine the impact of TIF on employment. Byrne (2010) finds that Illinois TIF districts supporting industrial development have a positive impact on employment growth, whereas those supporting retail development have a negative impact on municipal employment. Byrne's finding of a positive impact for industrial TIF on employment is consistent with these firms being less reliant on local spending and thereby less likely to shift economic activity from within the jurisdiction. Byrne hypothesizes that the finding of a negative employment effect from TIFs supporting retail development is consistent with these developments shifting local spending to more labor-efficient national chains. Lester (2014) examines employment at the block group level in Chicago between 1990 and 2008 and does not find a significant impact of TIF designation on employment. Although Byrne (2010) and Lester (2014) are the only previous studies to examine the employment impact of TIF, many studies have examined the employment impact of other economic development incentives, finding mixed results (Faulk 2002; Billings 2009; Hanson 2009; Bartik 2012).

A shortcoming of Byrne and Lester's studies is that because Illinois lacked any type of detailed reporting requirements, both studies examine whether localities experienced an increase in employment in the years following the adoption of a TIF district. One drawback of this approach is that there is often a lag between the creation of the TIF district and the beginning of development, something that could not be taken into account in those studies. The data limitation

also meant that the studies could not account for the variation in the size of the development occurring within the TIF district or whether the primary benefit was employment or expansion of the property or sales tax base. This paper has the benefit of utilizing the annual number of actual jobs that the TIF incentive supports as reported by the TIF administrator. As such, it does not suffer from the problem of potentially misidentifying the treatment period and can control for the magnitude of each TIF district's purported employment impact from year to year.

4. Data

This paper utilizes three measures of TIF-supported employment reported by TIF administrators in the TIF annual reports filed with the State of Missouri Auditor between 2007 and 2010: *Total Jobs*, *New Jobs*, and *Retained Jobs*. Each report is required to state the number of jobs attributed to TIF, categorizing such jobs as either retained or new. *Retained Jobs* are the number of jobs "saved" by TIF support. These jobs are attributed to TIF under the assumption that the firm or firms within the district would have shut down or relocated without TIF support. *New Jobs* are jobs that did not exist before TIF designation. These jobs are attributed to TIF under the assumption that the firm or firms within the district either expanded operations or relocated into the district as a result of TIF. *Total Jobs* is simply the sum of *Retained Jobs* and *New Jobs*. It should be noted that the baseline from which a job is designated as new or retained is the year in which the TIF is created, as such a new job remains categorized as such throughout the life of the TIF district.

Table 1. Reported TIF Jobs for Kansas City’s 13th and Washington TIF District

Year	Reported New Jobs Supported	Reported Retained Jobs Supported
2007	410	0
2008	355	0
2009	423	0
2010	374	0

Source: Author’s calculations using data provided by TIF annual reports.

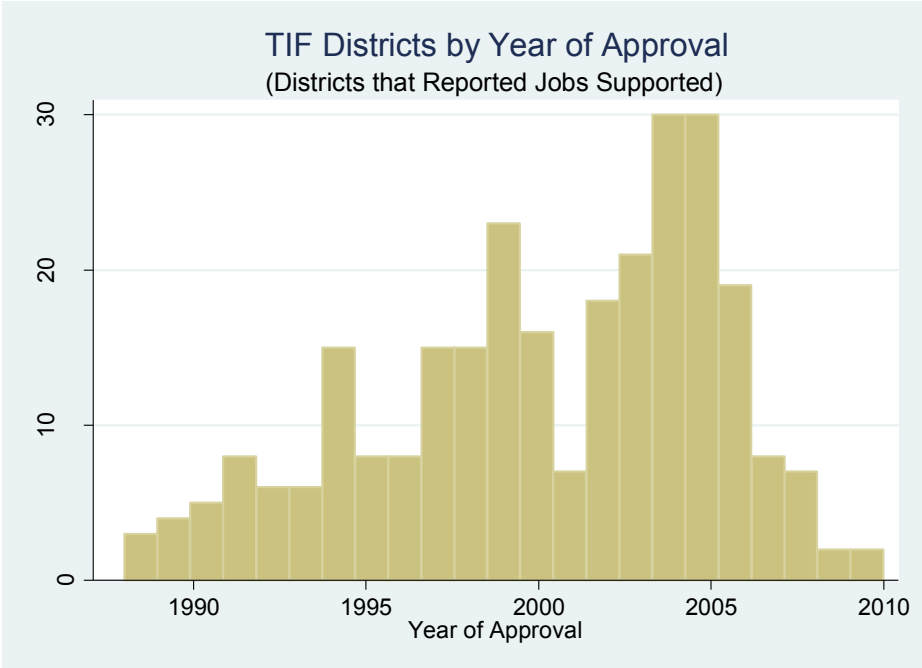
Table 1 shows an example of how TIF-supported jobs are reported. It shows the number of new and retained jobs for Kansas City’s 13th and Washington TIF District. The TIF plan was approved in 1996 to convince the company Unitog to keep its headquarters in Kansas City, Missouri, instead of moving across the state line into Kansas. The company moved into the TIF district, which had previously been a vacant surface parking lot. At the time of the 2007 to 2010 TIF reports, the building was home to Argus Health Systems (Kansas City Economic Development Corporation 2007). Since there was no existing business located within the TIF district at the time of adoption in 1996, all the employment reported between 2007 and 2010 are categorized as new jobs. These jobs, reported by the TIF administrator, vary from year to year with the change in employment at the company located within the district.

Since we are assessing the impact of TIF on county-wide employment, TIF-supported employment data are aggregated for all the TIF districts located within each county. The reporting requirements for TIF-supported employment are left to the discretion of the sponsoring jurisdiction, and TIF reports are based on the sponsoring jurisdiction’s fiscal year. The year in which this paper categorized TIF-supported employment was based on the end of the reporting period.² In total, there were 513 TIF districts in the years under examination, with 276 of these

² For example, TIF reports with reporting years of 7/1/2007 to 6/30/2008, 10/1/2007 to 9/30/2008, and 5/1/2007 to 4/30/2008 were all assigned as 2008 TIF-supported employment.

TIF districts reporting a positive number of jobs supported. It is not uncommon for a TIF district to be approved, only to have a long period of inactivity at the site. Figure 2 is a histogram of the TIF districts that reported jobs supported by the year in which they were created. Two hundred fifty-seven of the 276 TIF districts (93 percent) were approved before 2007. Three TIF districts expired during the years this paper examines.

Figure 2. TIF Districts by Year of Approval (Districts that Reported Supported Jobs)



Source: Author-generated graph using Stata software and author’s own data.

Data on county-wide employment, which would include employment both inside and outside TIF districts, come from the BLS’s Quarterly Census of Employment and Wages (QCEW). The QCEW was chosen as the source for the dependent variable for a number of reasons that are relevant to the current empirical study. First, the QCEW measures employment at the county level, whereas the BLS’s Local Area Unemployment Statistics (LAUS) measures

employment at the municipal level. The geographical area used is important since TIF has the potential to shift economic activity within a local economy. A TIF district that shifts economic activity from one municipality in a county to another could have a positive impact on municipal employment but no impact on county employment.³ A second key characteristic is that the QCEW is a census of establishments as opposed to a household survey. In large metropolitan areas with multiple municipalities, such as Saint Louis and Kansas City, there is a higher probability that workers may not live in the same municipality or county as their employer.

Third, since TIF reports document the employment impact at the establishment level, the QCEW is more comparable to TIF reports. The final benefit of QCEW is that it includes employment estimates for all 115 Missouri counties, whereas LAUS does not report data for municipalities with populations below 25,000, resulting in employment being reported for only twenty-six Missouri municipalities. The QCEW used is the average county employment over the calendar year.

Information on sales and property tax rates come from the Missouri Department of Revenue. Wasylenko (1997) and Bartik (2012) summarize the literature on taxes and economic development and report tax elasticity estimates in the range of -0.1 to -0.6 , implying that a 10 percent increase in taxes would result in a 1 to 6 percent decrease in economic activity. The share of establishments in the manufacturing (*%Manufacturing*), retail (*%Retail*), and finance and real estate (*%FIRE*) industries come from the Census Bureau's County Business Patterns.

Funderburg et al. (2013) and Garrett, Wagner, and Wheelock (2007) find that industry mix has a significant impact on economic growth.

³ For example, in 2007 a sales tax TIF was approved in support of a redevelopment project in Mission, Kansas, which included the relocation and expansion of a Walmart Supercenter located just 0.75 miles up the road in neighboring Roeland Park. While the relocation likely would have increased employment in Mission, Kansas, both Roeland Park and Mission are located in Johnson County. Therefore, the relocation would be unlikely to increase county employment.

A number of demographic variables come from the American Community Survey (ACS).⁴ The percentage of the population with a bachelor's degree or higher (*%Bach*) is included to control for local human capital levels and is expected to have a positive impact on employment. Population density (*PopDens*) is included to control for positive effects of agglomeration economies on local employment. Additional demographic variables from the ACS, such as the percentage of the population between the ages of 18 and 65 (*%18to65*), sex (*%Male*), race (*%White*, *%Black*, *%Asian*, *%Other*), and ethnicity (*%Hispanic*), are included to control for differences in labor force participation between groups (Edmiston 2006; Partridge and Rickman 1997). Finally, the variable *Interstate* takes a value of 1 if an interstate runs through the county. This is used as a proxy for both infrastructure and lower transportation costs and is expected to have a positive impact on employment.

In addition to estimating the model using panel data, the model is estimated using a cross-sectional instrumental variable approach to account for the potential endogeneity of TIF-supported jobs. Three instruments are used. The first instrument is the variable *HHI*, a Herfindahl-Hirschman-type index calculated as the sum of the squares of each municipality's share of county population. For example, St. Charles County has a population of 360,485 spread out among fourteen municipalities, the largest being O'Fallon, which makes up 22 percent of the county's population, followed by St. Charles city (18 percent) and St. Peters (15 percent). The least populated municipality is Foristell, with a population of 245 (0.07 percent of the county population). Summing the squared shares of all fourteen municipalities in St. Charles County results in an *HHI* of 1,125. The concentration of population share could influence TIF adoption, because although the decision to create a new TIF district is made by municipalities, TIF's

⁴ Since the one-year ACS only provides estimates for areas with populations over 65,000, estimates would be available for only 17 of the state's 115 counties. For this reason, demographic data are taken from the 2006–2010 5-year ACS, which provides estimates for all 115 counties (US Census Bureau 2017).

unique structure could negatively affect overlapping jurisdictions (e.g., county governments and school districts). Since TIF diverts tax revenue from all overlapping jurisdictions, municipalities are sometimes accused of using TIF to capture tax revenue from county governments and school districts. In counties with high *HHI*, municipal leaders would have less of an incentive to use TIF as a means to capture revenue, as a greater portion of the overlapping jurisdictions' residents are municipal residents as well. On the other hand, when a municipality with a small share of the county population uses TIF to capture revenue from the county, most of the harm is falling on residents outside of the municipality adopting the TIF.

A second instrument is the percentage of the vote share for the Democratic candidate in the 2008 Missouri gubernatorial election (*DEM2008*). Betz et al. (2012) find that political ideology influences a county's propensity to offer economic development incentives. A dummy variable for border counties (*Border*) is used as a final instrument. Since TIF is often just one part of an economic development package that may also include incentives from state government, jurisdictions near the state border face increased competition. Whereas the state of Missouri should be reluctant to provide incentives to induce a firm to locate in one Missouri county versus another, border counties face a competitive environment in which both Missouri and neighboring states are focused on capturing each other's firms. As such, we would expect TIF districts to be more likely to be created in these counties.

Table 2 presents the summary statistics. County employment (*Employ*) and each measure of TIF-supported employment (*Total Jobs*, *New Jobs*, and *Retained Jobs*) are measured as natural logs to improve the normality of the error terms.⁵ The sample includes 115 counties measured across four years, 2007 to 2010. The average county had an employment of 22,508,

⁵ Since *Total Jobs*, *New Jobs*, and *Retained Jobs* take the value of zero for some counties, the log-transformations for these three variables are $\ln(\text{Jobs} + 1)$.

with the mean value of $\ln(\text{Employ})$ being 8.771. As mentioned previously, TIF reports require TIF administrators to report new and retained jobs separately. The mean number of reported *Total Jobs* ($\text{New Jobs} + \text{Retained Jobs}$) supported by TIF in a county is 802.5 jobs (the mean value of $\ln(\text{Total Jobs})$ is 1.725) with 548.1 of those being categorized as new jobs (the mean value of $\ln(\text{New Jobs})$ is 1.60). Employment within TIF districts represents a large portion of Missouri's labor markets; as such, if the reported TIF-supported jobs are credible, we should expect to find a significant impact on county employment.

Table 2. Summary Statistics

Variable	Mean	Standard Deviation
$\ln(\text{county employment})$ (<i>Employ</i>)	8.77	1.32
$\ln(\text{total jobs attributed to TIF} + 1)$ (<i>Total Jobs</i>)	1.72	2.93
$\ln(\text{new jobs attributed to TIF} + 1)$ (<i>New Jobs</i>)	1.60	2.81
$\ln(\text{retained jobs attributed to TIF} + 1)$ (<i>Retained Jobs</i>)	0.93	2.11
Sales tax rate (<i>Sales Tax</i>)	0.059	0.006
Property tax rate (<i>Property Tax</i>)	0.049	0.012
Population per sq. mile (<i>PopDens</i>)	130.67	520.15
% of firms in manufacturing sector (% <i>Manufacturing</i>)	5.35	2.52
% of firms in retail sector (% <i>Retail</i>)	17.37	3.20
% of firms in finance and real estate sector (% <i>FIRE</i>)	6.77	1.66
County with an interstate highway (<i>Interstate</i>)	0.33	0.47
% of population with bachelor's degree or higher (% <i>Bach</i>)	15.85	6.65
% of population between ages 18 and 65 (% <i>18to65</i>)	59.62	3.48
% of population between ages 18 and 65, male (% <i>Male</i>)	50.26	3.05

(continued on next page)

Variable	Mean	Standard Deviation
% of population white, non-Hispanic (<i>%White</i>)	91.85	8.03
% of population black, non-Hispanic (<i>%Black</i>)	3.30	6.60
% of population Hispanic (<i>%Hispanic</i>)	1.43	1.47
% of population Asian, non-Hispanic (<i>%Asian</i>)	0.54	0.72
% of population, other (<i>%Other</i>)	2.88	2.03
HHI for municipal shares of county population (<i>HHI</i>)	1,286.63	1,429.55
% of Democrat vote in 2008 governor's race (<i>DEM2008</i>)	50.55	8.00
Border county (<i>Border</i>)	0.41	0.49

Source: Author's calculations using data provided by TIF annual reports.

Table 3. TIF Attributed Employment in Missouri

Year	New and Retained Jobs Attributed to TIF	Percentage of State Employment
2007	80,043	2.9
2008	86,460	3.2
2009	109,786	4.2
2010	91,096	3.5

Source: Author's calculations using data provided by TIF annual reports.

Table 3 shows the number of new and retained jobs attributed to Missouri TIF districts between 2007 and 2010. Between approximately 80,000 and 110,000 jobs in Missouri were attributable to TIF districts, representing 2.9 percent to 4.2 percent of total employment in the state. TIF can have an even more pronounced impact on the labor markets at the local level. Table 4 shows the ten counties with the largest numbers of reported jobs attributed to TIF districts within the county, along with the percentage these jobs represent of the county's employment level as measured by the BLS. In Jackson County, the largest county in the Kansas

City metropolitan area, TIF reports attributed 43,528 jobs created or retained by TIF districts, 13 percent of the county’s total employment. In Buchanan County, located just north of Kansas City, the 6,998 jobs reportedly created or retained by its TIF districts represent 15 percent of its employment.

Table 4. Ten Counties with the Most Reported TIF Jobs in 2010

County	Reported TIF Jobs (2010)	Reported TIF Jobs as a Percentage of BLS-Measured Jobs (2010)
Jackson County	43,528	13
St. Louis County	15,652	3
St. Louis City	7,328	3
Buchanan County	6,998	15
Clay County	6,171	1
Taney County	3,411	12
St. Charles County	2,063	2
Jefferson County	1,145	2
St. Francois County	1,045	5
Jasper County	972	2

Source: Author’s calculations using data provided by TIF annual reports.

5. Empirical Model and Results

This paper estimates the impact of TIF-reported jobs on county employment using two approaches: panel data and instrumental variables. Since TIF administrators report the number of TIF-supported jobs supported annually, this allows for estimation of the model using panel data estimation approaches, which incorporate the variation within counties into its estimates.

The panel data model estimated is as follows:

$$Employ_{it} = \alpha + \beta TIFJOBS_{it} + X_{it}\lambda + J_i\theta + YEAR_t\eta + u_{it}. \quad (1)$$

$Employ_{it}$ is the natural log of employment in county i in period t ; $TIFJOBS_{it}$ is the natural log of the number of reported jobs supported by TIF, which enters into the model either as a

single variable (*Total Jobs*) or as two separate variables for *New Jobs* and *Retained Jobs*, depending on the specification. X_{it} are time-varying covariates: *Sales Tax*, *Property Tax*, *%Manufacturing*, *%Retail*, and *%FIRE*. J_i are observed time-invariant county effects. Since population and demographic variables are taken from the 5-year ACS, *%Bach*, *%18to65*, *%Male*, *PopDens*, and race and ethnicity variables are treated as time-invariant variables in the regressions. Z_i are unobserved time-invariant county effects, $YEAR_t$ are dummy variables for year, and u_{it} are idiosyncratic errors. If TIF is indeed successful at drawing new or retaining jobs for the county, we would expect a positive relationship between TIF-supported jobs and BLS county employment estimates. Since the variable of interest, the reported number of jobs supported by TIF, is reported annually, the model can be estimated with either a random-effects (RE) or fixed-effects (FE) model.

The appropriateness of the models depends on the underlying assumptions, as the FE estimation of the model yields unbiased estimates even in the presence of unobserved county effects (Z_i) that are correlated with other explanatory variables. Endogeneity, discussed more later, could still potentially bias the estimates. However, as mentioned previously, 93 percent of the TIF districts (257 of 276) were created before 2007. Panel data have the benefit of incorporating within-panel variation into its estimates. Therefore, panel data have the benefit of incorporating whether within-panel county employment increases or decreases with within-panel reported TIF jobs.

A weakness of this simple panel data approach comes from the fact that the creation of TIF districts is not random. Although FE estimates can be consistent in the case where an omitted variable is constant across the panels, as shown in figure 2, 19 of the 276 TIF districts that reported jobs at some point in the sample were created between 2007 and 2010. These

nineteen TIF districts were distributed in 11 of the 115 Missouri counties. In order to test the robustness of the estimates to this potential endogeneity, an instrumental variable (IV) approach is also used on the 2010 cross section. The IV model is estimated as follows:

$$Employ_i = \alpha + \beta TIFJOBS_i + X_i\lambda + J_i\theta + u_i. \quad (2)$$

The IV model treats the *TIFJOBS* variables (*Total Jobs*, *New Jobs*, and *Retained Jobs*) as endogenous, using *HHI*, *DEM2008*, and *Border* as instruments in the first-stage regressions and the predicted values of the endogenous variables in the second-stage regression in order to yield consistent estimates of the impact of reported TIF jobs on county employment.⁶ As mentioned previously, each of the instruments is expected to have an impact on the propensity for TIF districts to be adopted within a county and therefore on the number of TIF-supported jobs reported within the county.

Although at the means TIF-supported jobs make up only 3.6 percent of county employment, simple pooled ordinary least squares (OLS), using the full set of covariates and year dummy variables, result in TIF-supported jobs having a statistically significant impact on county employment. Table A1 of the appendix shows the pooled OLS regressions. Whether TIF-supported employment enters as a single variable (*Total Jobs*) or splits between *New Jobs* and *Retained Jobs*, the coefficients are positive and statistically significant at the 1 percent level. So it is plausible that the impact of TIF-supported jobs, if economically valid, would be measurable at the county level. Of course, the pooled OLS assumes that each county has a common intercept. This assumption is violated when unobserved county effects are present, necessitating the use of RE estimates for the panel data model.

⁶ The model was estimated using Stata's *ivregress 2SLS* command.

Table 5. Regression Results

Variable	Panel Data: Random Effects	Panel Data: Random Effects	IV Model: 2SLS	IV Model: 2SLS
Ln (<i>Total Jobs</i>)	0.003 (0.003)		0.113 (0.083)	
Ln (<i>New Jobs</i>)		0.005 (0.005)		0.042 (0.118)
Ln (<i>Retained Jobs</i>)		0.001 (0.003)		0.131 (0.141)
<i>Sales Tax</i>	-4.416* (2.656)	-4.317 (2.655)	-17.705 (13.739)	-19.774 (14.802)
<i>Property Tax</i>	1.559 (1.677)	1.271 (1.703)	-7.872 (6.425)	-9.581 (6.848)
<i>%Manufacturing</i>	-0.007 (0.006)	-0.008 (0.006)	-0.018 (0.029)	-0.022 (0.034)
<i>%Retail</i>	-0.003 (0.004)	-0.003 (0.004)	-0.050** (0.022)	-0.043 (0.024)
<i>%FIRE</i>	-0.002 (0.009)	-0.002 (0.009)	0.077* (0.042)	0.069 (0.045)
<i>%Bach</i>	0.051*** (0.017)	0.051*** (0.017)	0.047*** (0.018)	0.050*** (0.019)
<i>PopDens</i>	0.0004** (0.0002)	0.0004** (0.0002)	0.0003 (0.0003)	0.0002 (0.0003)
<i>Interstate</i>	0.407*** (0.153)	0.405*** (0.154)	0.197 (0.222)	0.145 (0.229)
<i>%18to65</i>	0.136*** (0.031)	0.136*** (0.031)	0.117*** (0.032)	0.122*** (0.013)
<i>%Male</i>	-0.105*** (0.028)	-0.106*** (0.028)	-0.098*** (0.027)	-0.106*** (0.029)
<i>%Black</i>	0.013 (0.016)	0.013 (0.016)	0.018 (0.017)	0.012 (0.018)
<i>%Hispanic</i>	0.121** (0.051)	0.121** (0.052)	0.110* (0.056)	0.108* (0.057)
<i>%Asian</i>	0.013 (0.155)	0.011 (0.156)	-0.087 (0.148)	-0.115 (0.155)
<i>%Other</i>	0.063* (0.037)	0.063* (0.037)	0.048 (0.035)	0.047 (0.035)

(continued on next page)

Variable	Panel Data: Random Effects	Panel Data: Random Effects	IV Model: 2SLS	IV Model: 2SLS
<i>Year = 2008</i>	-0.013 (0.009)	-0.013 (0.009)		
<i>Year = 2009</i>	-0.043*** (0.010)	-0.043*** (0.010)		
<i>Year = 2010</i>	-0.055*** (0.011)	-0.055*** (0.011)		
Constant	4.862*** (1.404)	4.887*** (1.410)	7.135*** (1.600)	7.474*** (1.725)
Observations	460	460	115	115
R^2	0.712	0.713	0.785	0.775
Shapiro-Wilk Normality of Errors (p -value)	0.729	0.701	0.507	0.556

Note: Standard errors in parentheses; *** indicates significance at the 1 percent level; ** indicates significance at the 5 percent level; * indicates significance at the 10 percent level.

Source: Author's calculations using data provided by TIF annual reports.

Table 5 shows the regression results of the RE and IV estimates. The first two specifications show the panel data results, and the last two specifications show the IV results. For each set of regressions, the number of TIF-supported jobs is first entered as the single variable, *Total Jobs*, and then with *New Jobs* and *Retained Jobs* included as two separate variables. In each of the first two regressions, there is no evidence that the reported number of TIF-supported jobs has an impact on county employment, as the coefficients for *Total Jobs*, *New Jobs*, and *Retained Jobs* are all statistically insignificant. The lack of significance of these variables is consistent with TIF-supporting jobs that were simply shifted from other areas of the county or supporting jobs that would have located within the county with or without TIF's financial incentive. The coefficients of TIF-supported jobs are also insignificant in the FE estimates, not reported in this table, with p -values of 0.458, 0.442, and 0.882.⁷

⁷ As mentioned previously, three TIF districts dissolved between 2007 and 2010. For two of the districts, 2008 was the final year with reported job numbers, and for one, 2009 was the final year with reported job numbers. The model was also run with these three districts stripped from all years. This did not change the results.

The IV models treat *Total Jobs*, *New Jobs*, and *Retained Jobs* as endogenous, using *HHI*, *DEM2008*, and *Border* as instruments in the first-stage regressions and the predicted values of the endogenous variables in the second-stage regression. In the first IV regression, the instruments *HHI* and *Border* have *p*-values of 0.053 and 0.028, respectively, and are in the expected direction, with low *HHI* counties and border counties reporting more TIF-supported jobs. The joint F-statistic for the three instruments is 0.029. In the first stage of the IV model with *New Jobs* and *Retained Jobs* entered separately, the first-stage results for *New Jobs* is similar to that of *Total Jobs*, with *HHI* and *Border* having *p*-values of 0.044 and 0.032. In the first-stage result for *Retained Jobs*, *Border* remains significant with a *p*-value of 0.016. While the instrument *HHI* does not significantly impact *Retained Jobs*, *DEM2008* does, as counties with a larger share of Democratic voters reported more *Retained Jobs* with a *p*-value of 0.007. The joint *F*-test of the instruments in these two first-stage regressions are 0.029 and 0.010. The Sargan χ^2 tests for the two IV models have *p*-values of 0.465 and 0.416, suggesting that the instruments satisfy the IV assumption that they be uncorrelated with the structural error term.

Similar to the panel data results, the coefficients of *Total Jobs*, *New Jobs*, and *Retained Jobs* are all positive but insignificant in the IV models. These results again suggest that the number of TIF-supported jobs in a county, as reported by TIF administrators, does not significantly impact county employment, as measured by the BLS. While the increased reporting requirements for economic development incentives are important tools for furthering transparency, these results suggest that such reported job numbers may need to be looked at with a little skepticism by the public and policymakers. Both the panel data model, which incorporates the within-panel variation in reported jobs and county employment data, and the IV model, which accounts for the potential endogeneity of TIF-reported jobs, come to this same conclusion.

Of the other explanatory variables in the model, *%Bach*, *%18to65*, and *%Male* have statistically significant impacts across all the models. The coefficient for *%Bach* varies from 0.047 to 0.051 and is significant at the 1 percent level across all specifications. The coefficients indicate that at the mean, a one-standard-deviation change in *%Bach* from 15.9 percent to 22.5 percent would increase county employment from 0.31 percent to 0.34 percent, or 71 to 76 workers. The coefficients of *%18to65* and *%Male* are also significant at the 1 percent level in each specification, with a 1-percentage-point change in the population between 18 and 65 increasing county employment from 0.117 percent to 0.136 percent and a 1-percentage-point change in males decreasing employment from 0.098 percent to 0.106 percent.

PopDens and *Interstate* are both significant in the panel data model, with both density and the presence of an interstate having a positive effect on county employment, but are insignificant in the IV model. *%Hispanic* has a positive impact on employment that is significant at the 5 percent level in the panel data models but is only significant at the 10 percent level in the IV models. Although the impact of industry makeup does not have a statistically significant effect across all specifications, *%Retail* has a coefficient of -0.05 that is significant at the 5 percent level in the first IV specification, indicating that a 1-percentage-point change in the number of establishments in the retail sector decreases county employment by 0.05 percent, or eleven workers. In all the models, the Shapiro-Wilk test for the normality of errors does not reject the null hypothesis that the errors are normally distributed.

6. Conclusion

Economic development practitioners view TIF as an indispensable tool for promoting local job growth and retention. Not surprisingly, local policymakers in Missouri, like those in other states, have aggressively utilized TIF in an attempt to attract jobs into their jurisdictions. As a

result, TIF has come to cast a large shadow over local finances, as TIF can divert a large portion of overlapping jurisdictions' tax revenue. In 2012, California eliminated the use of TIF in the state because of the concerns over these diverted revenues. Proponents of TIF counter that the large number of jobs in businesses supported by TIF justifies the diversion of these revenues. The results in this paper, however, give credence to the State Auditor of Washington's concerns that simply requiring economic development administrators to report the number of jobs supported by economic development incentives provides little credible evidence of job creation. This paper's results indicate that the number of jobs supported by TIF, as reported by local economic development agencies in Missouri, does not have a significant positive effect on county employment as measured by the BLS. The lack of a positive impact of reported jobs on employment suggests that TIF-supported jobs either come at the expense of other areas in the county or would have located in the county regardless of the existence of Missouri's TIF districts.

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Appendix: Data Table

Table A1. Pooled OLS Regression Results

Variable	Pooled OLS	Pooled OLS
Ln (<i>Total Jobs</i>)	0.111*** (0.013)	
Ln (<i>New Jobs</i>)		0.061*** (0.018)
Ln (<i>Retained Jobs</i>)		0.092*** (0.023)
<i>Sales Tax</i>	-26.955*** (6.077)	-27.741*** (6.071)
<i>Property Tax</i>	-9.546*** (3.067)	-10.681*** (3.087)
<i>%Manufacturing</i>	-0.027* (0.015)	-0.033** (0.0147)
<i>%Retail</i>	-0.051*** (0.011)	-0.049*** (0.011)
<i>%FIRE</i>	0.059*** (0.022)	0.058*** (0.022)
<i>%Bach</i>	0.042*** (0.009)	0.045*** (0.009)
<i>PopDens</i>	0.0004*** (0.0001)	0.0003*** (0.0001)
<i>Interstate</i>	0.243*** (0.077)	0.238*** (0.076)
<i>%18to65</i>	0.115*** (0.016)	0.120*** (0.031)
<i>%Male</i>	-0.098*** (0.014)	-0.103*** (0.014)
<i>%Black</i>	0.009 (0.008)	0.005 (0.008)
<i>%Hispanic</i>	0.119*** (0.025)	0.118*** (0.025)
<i>%Asian</i>	-0.067 (0.076)	-0.085 (0.076)
<i>%Other</i>	0.060*** (0.018)	0.056*** (0.037)
<i>Year = 2008</i>	-0.013 (0.084)	-0.011 (0.084)
<i>Year = 2009</i>	-0.115 (0.085)	-0.119 (0.085)
<i>Year = 2010</i>	-0.104 (0.086)	-0.107 (0.085)

(continued on next page)

Variable	Pooled OLS	Pooled OLS
Constant	8.253*** (0.867)	8.344*** (0.867)
Observations	460	460
R^2	0.775	0.777
Shapiro-Wilk Normality of Errors (p -value)	0.056	0.147

Note: Standard errors in parentheses; *** indicates significance at the 1 percent level; ** indicates significance at the 5 percent level; * indicates significance at the 10 percent level.

Source: Author's calculations using data provided by TIF annual reports.