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Some Economic Effects of Tax Increment Financing in Indiana

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Executive Summary

This study evaluates the impact of tax increment financing (TIF) in Indiana counties from 2003-2012. Using a spatial panel model as part of a two-stage research strategy into the economic effects of TIFs, we find that larger TIF districts are associated with higher effective tax rate of non-TIF areas within a county. This motivates the second stage analysis, which estimates the net effect of TIF districts on TIF and non-TIF regions within a county. Here we find that TIFs are associated with small but positive growth in assessed value. However, we find uniform negative impacts of TIFs on traditional measures of economic development such as employment, the number of business establishments, and sales tax revenue. This leads us to conclude that the Indiana TIF is not an economic development tool, but a county budget management tool. We offer the following policy recommendations.

- The use of TIFs in Indiana should be **reviewed by the legislature**. The nature of these results implies that while the average TIF has no meaningful impact, there are undoubtedly some with positive and some with negative effects on their counties.
- County leaders considering TIFs should **evaluate the potential tax shifting to non-TIF regions** when considering a TIF. This is especially critical in light of the effects of property tax caps, and the need to make local quality of place improvements in many places in Indiana.
- TIF reporting could be improved to **include a criterion for evaluating the potential impact**—one that counts tax rates, employment, and capital investment both before and after the TIF project. This should be done for both the TIF district and the non-TIF area of a county. These findings should be continuously made available (with at least annual updates) for all TIF districts.
- The legislature should **limit the use of TIFs** to those counties that exhibit at least minimally effective fiscal management. Specifically, we recommend precluding the use of TIFs in counties with unfunded pension liabilities (less than 80 percent actuarially funded), in school districts that have requested transportation waivers within the past five years and in counties or municipalities lacking an adequate Rainy Day Fund.

Introduction

Tax increment financing (TIF) is a form of economic development incentive—the property tax revenues associated with the growth of assessed value or ‘increment’ on a designated piece of property can be captured for redevelopment. In Indiana, a TIF may be formed by a county or municipal government through the creation of a redevelopment commission. These redevelopment commissions may then identify a geography, which will act as a TIF district and capture any growth in property taxes from new construction in that area for other uses.^[1]

The geography of a redevelopment commission is colloquially referred to as a ‘TIF District.’ The property tax revenues from new construction within a TIF district are designed to be for areas “needing redevelopment” under the language of the Indiana Code. The legislative language is broad, and by the permitting of bonding repayment, effectively allows any project which might otherwise not be clearly within the scope of traditional redevelopment. Thus, the use of TIFs offers some of the most flexible financing tools available for local governments in Indiana. Debt within Indiana’s TIF districts comprises some 20 percent of Indiana’s \$12 billion local debt outstanding as of 2013.

There is not a comprehensive analysis of all TIF uses in Indiana, a product which may not be possible given the data limitations. Still, the use of TIF monies by redevelopment commissions appears to target activities designed to improve the economy of the region in which they are spent. However, there is legitimate concern that the intent of TIF-related expenditures does not in fact generate better economic outcomes for counties. It is that issue upon which this study will focus. To do so, we construct and test a series of models that measure the impact tax increment financing plays in affecting economic development measures, such as employment and assessed value. We also test the impact TIF plays on the effective tax rates in counties. We then offer routes to additional research and policy recommendations germane to our findings. We begin with a review of the existing research on these issues.

Other Research on Tax Increment Financing

A number of authors have previously examined TIFs to evaluate their impact and efficacy. Several authors have examined economic activity within a TIF district. They have examined questions such as why and where TIF districts are located, the effect on residential industrial and commercial property value, and the effect on public services, wages, employment, and tax rates.

The intent of most TIFs are to redevelop or refurbish a region, but the stated legislative intent, and the actual practice of location has seen some scrutiny. Diane Gibson (2003) examined Chicago TIFs in the 1990s, finding that distressed but not very poor regions were more likely to use TIFs, which were often connected to

empowerment zones in the city. Felix and Hines (2013) found that areas of lower income, those proximal to state borders, and those with poor measures of political performance tend to offer incentives in general. However, very poor and very troubled regions tend to offer TIFs less frequently than others. Man (1999) found no evidence that growing cities were more likely to adopt TIFs than those not growing in her examination of Indiana cities over a decade. Mason and Thomas (2010) studied TIF use in Missouri, finding that there was geographic competition related to TIF adoption (cities were more likely to adopt a TIF district if their neighbors had done so), and that high levels of economic inequality between municipalities may be caused by TIF adoption. Byrne (2002) found that such strategic interaction with regard to TIF adoption also was evident in the Chicago metropolitan area. Together these studies suggest that TIFs locate in communities focusing on revitalization, but not in terribly poor places. Also, there is a strong suggestion of inter-regional competition in TIF location.

Several studies have identified property value growth in TIF districts and in counties overall using TIFs. These include a study of Michigan cities in the mid 1980s and in Wisconsin from 1990 to 2003 (see Anderson 1990; Merriman, Skidmore, and Kashian 2011). A follow-up study of Wisconsin by Kashian and Skidmore (2012) found that TIF and non-TIF regions experienced differential effects within the same county. They report that the presence of a TIF district did not affect the tax rates within the municipality in which it was located, but did in the surrounding taxing jurisdiction. A third study of these Wisconsin TIF districts determined that about half of the annexations in Wisconsin at the time were of recent TIF districts. A study of Milwaukee TIF districts found that the value growth of property within the TIF district is attributable to the capitalization of higher quality public services offered in these districts. Brent (2009) reports the same effects in Chicago, with the quality of local public services influencing the magnitude of the impacts. Anderson (1990) found that property values grew faster in areas with TIF districts. This led him to suggest that TIF may be a budget manipulation, not an economic development tool. When studying Indiana, Man and Rosentraub (1998) found that residential property values were higher in TIF adopting cities than in those without TIF districts. These studies focus primarily on residential property.

Studies of commercial and industrial property are more mixed. Weber, Bhatta, and Merriman (2003) found that industrial TIF parcels in Chicago were of lower value than those outside the TIF district, but the opposite was true in mixed-use TIF districts. Byrne (2006) concludes otherwise, finding when controls for regional economic conditions are included, the industrial TIFs are the only types that experience property value growth within Chicago. Smith (2004) examined the same geography and found that property value growth among multifamily housing units occurred in TIF districts.

1. Indiana Code 36-7-14 39(a) outlines this process, with definitions of the base and minimum taxes due to taxing units.

These two separate sets of studies focusing on residential and non-residential property growth tell one clear story, and an unclear one. It appears relatively clearly across several studies in several regions that residential property growth within TIF regions occurs, and that differences between TIF and non-TIF regions occur. In contrast, the differences in findings and the lack of diversity in geography provide no clear conclusion on property values for industrial and commercial property within or outside of TIF districts.

In an examination of TIF district effects on Illinois tax rates and revenue, Weber, Hendrick, and Thompson (2008) found very little effect on revenues of surrounding school districts in suburban areas. In urban school districts, TIFs reduced available revenue, while in rural school districts, the presence of a TIF district boosted tax revenues.

Studies of the impact of TIF on economic activity yield mixed results. Man (1999) reports that cities with TIFs saw greater employment growth than those without. This finding was echoed by Bynre (2010), who found industrial TIFs were accompanied by employment growth, while retail TIFs in Illinois saw negative growth of employment. Dye and Merriman (2000) offer some the clearest exposition on TIF and economic development. These authors found that locations that adopted TIFs grew more slowly than those that did not. This appears counterintuitive, and they were able to reject empirically sample selection bias in their data (slower growing places did not adopt TIF more heavily than faster growing places). They also offered a clear theoretical explanation that echoed the findings of Johnson (1990). While TIFs may boost investment and employment within a region, they also affect tax rates in non-TIF areas, which in turn may reduce net economic growth within a municipality or county.

TIFs have been in use for decades, and there is evidence that places with TIFs see some new investment, some higher residential property value, and some increased growth within the TIF borders (in income and employment). These are fairly intuitive results, but they do not address the net effect within municipalities or counties who adopt TIFs. The more sophisticated analyses reviewed here (and this is the bulk of research the matter), tell a more nuanced story about TIF adoptions and economic development. Since TIFs potentially shift tax burden, the net effect of a region's economic performance will not likely mimic that of the TIF district. Any proper analysis of TIF impacts will have to evaluate the net effects of TIF and non-TIF areas within a county or municipality. We next turn our attention to that issue.

Tax Increment Financing in Indiana

Table 1 shows basic statistics for TIFs in Indiana from 2003-2012 for 91 of Indiana's counties. The typical county had about \$215 million of net assessed value within TIFs in 2012. The aggregate net assessed value in TIFs increased from just over \$10 billion in 2003, to more than \$19 billion in 2012.

Figure 1 shows snapshots of TIF usage from 2003 and 2012. These maps indicate that TIF usage has increased over time and urban counties use TIFs more intensively.

Table 1. Net Assessed Value in TIFs (\$ Million, Inflation-Adjusted)

Year	Mean	Median	Std Dev	Min	Max	Sum	Obs
2003	111	23	296	0	2,430	10,056	91
2004	113	21	330	0	2,829	10,239	91
2005	113	21	310	0	2,609	10,290	91
2006	113	24	267	0	2,018	10,274	91
2007	155	33	364	0	2,447	14,082	91
2008	181	35	437	0	3,063	16,489	91
2009	199	43	480	0	3,316	18,099	91
2010	216	46	515	0	3,493	19,654	91
2011	228	45	554	0	3,573	20,718	91
2012	215	51	495	0	3,364	19,599	91

Note: LaPorte County is not included due to missing data for some years.

Source: Author calculations from DGLF data.

Figure 1. TIF Net Assessed Value by County, 2003 & 2012 (Inflation-Adjusted)

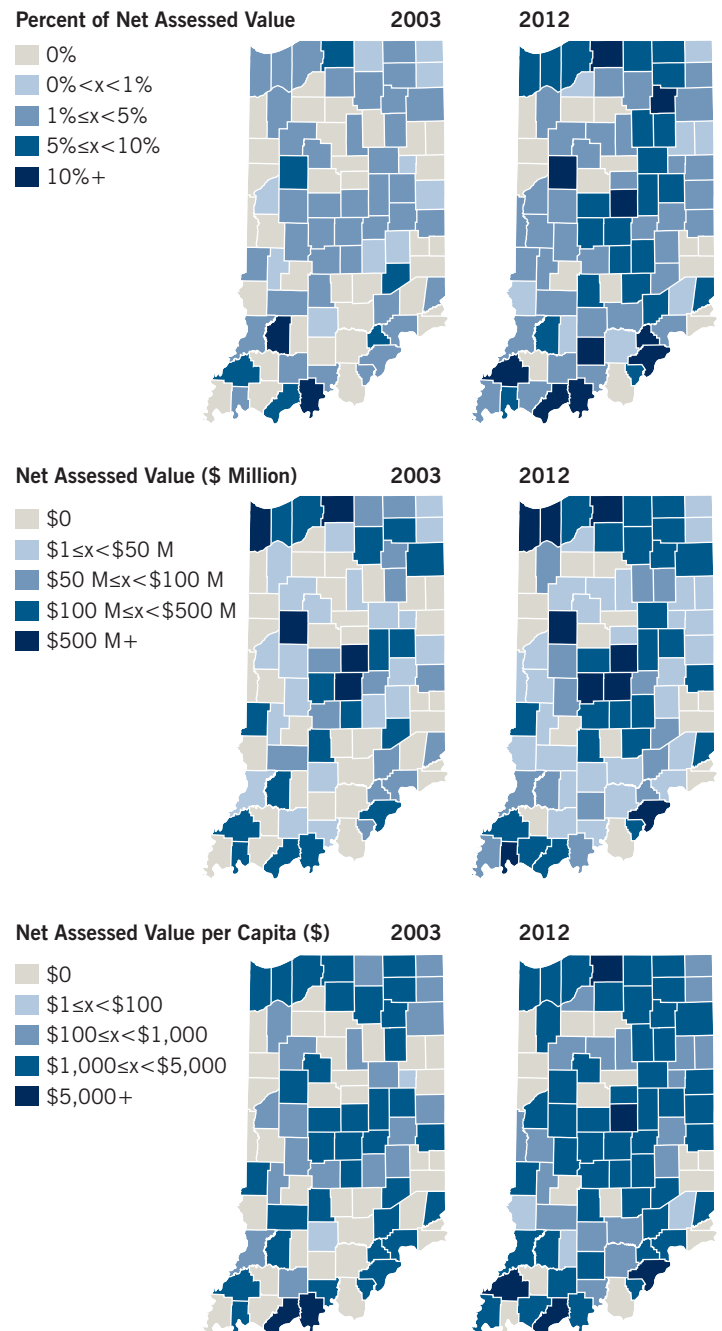


Table 2. Descriptive Statistics

Statistic	Mean	Median	Std Dev	Maximum	Minimum	Obs.	Source
Value of TIF (% net assessed value)	3.01	2.00	3.49	22.00	0	920	DLGF
Net assessed value in TIF (\$ million)	165	34	416	3,573	0	915	Author's calculation using DLGF data
Net assessed value in TIF per capita (\$)	1,476	928	1,856	8,213	0	915	Author's calculation using DLGF data
Non TIF net assessed value (\$ million)	3,377	1,580	5,794	52,789	266	915	Author's calculations
Non TIF net assessed value per capita	48,638	46,713	13,730	103,734	24,740	915	Author's calculations
Effective property tax rate (%)	1.866	1.828	0.473	3.697	0.667	915	DLGF
Net assessed value (\$ million)	3,542	1,615	6,163	55,219	266	915	DLGF
Net assessed value per capita (\$)	50,114	48,016	13,894	104,150	25,637	915	DLGF
Total employment	39,257	16,937	78,743	677,569	2,299	920	BEA, REIS
Manufacturing employment	5,914	2,813	9,831	73,286	78	897	BEA, REIS
Retail employment	4,285	1,868	7,723	66,127	119	920	BEA, REIS
Business establishments	1,606	743	2,940	24,566	79	920	County Business Patterns
Sales tax due (\$ million)	34.85	11.55	87.54	827.82	0.94	920	Stats Indiana

Note: All dollar values were adjusted for inflation using the CPI.

TIF Impact Modeling for Economic and Fiscal Measures

We propose to measure the impact of TIFs on activity in Indiana counties from 2003 to 2012.^[2] This approach is motivated for two reasons. First, available data on TIFs and potential economic variables are limited to these years. From a geographic standpoint, the county is the unit of interest for several reasons. Economic activity within a redevelopment region and surrounding areas will be primarily captured within the county. So, such variables as employment and assessed value within a county will capture much of the net impact of TIFs across the boundaries of the redevelopment commission. In this respect, we take seriously the analyses of Dye and Merriman (2000) and Johnson (1990), who report that there are impacts of TIF districts within and outside their geographic boundaries.

To better understand the impact of TIFs, we compose a model where economic activity within a county is a function of economic activity in both TIF and non-TIF regions within the county. This total economic activity is in turn a function of total capital, total labor, and government services. The *Appendix* contains a brief theoretical treatment of the issue.

Not surprisingly, each of those variables is affected by taxes and other variables including regional spillovers, recessions, and a host of county-specific issues like the presence of an interstate, large manufacturing firms, or a university.

At the heart of the empirical issue is the combined effects of a TIF across both TIF and non-TIF regions. The reason for this is that with tax rates comprising an element of capital and labor formation, the effects of a TIF are not isolated to the TIF district if there are resulting changes to non-TIF areas. In particular, changes to tax rates in non-TIF areas effect capital accumulation and labor that in turn effect total production. So, our interest is the net observed effect of a TIF in these counties.

Unfortunately, we do not have data on TIF and non-TIF areas, and very limited sub-county data. We do have a decade of information on the size of the TIF, and measures of capital accumulation, tax rates, and employment. To examine the overall effect of TIF, we perform two separate tests. First, we construct a simple statistical test of the effect of the TIF on taxes and capital accumulation in a county.

We use a modelling approach similar to that of Greenstone and Moretti (2003) and Faulk and Hicks (2013), in which we offer a treatment model of the TIF in each county and year. In the first set of estimates, we seek to evaluate the impact of TIF on the effective property tax rate in each county. This is followed by an analysis of the relationship between TIFs and capital formation and employment.

In each stage, we employ a model in which the affected variable (effective tax rate, capital, employment) is affected by TIFs within a county, the mean value of adjacent county TIFs, statistical controls for unrelated correlation across time and geography, a time trend, a random error term, and an error term controlling for those factors that do not change within each county over the observed period. The *Appendix* contains a brief technical explanation of these models. Summary statistics for variables used in the models are listed in *Table 2*.

In our test of the effect of TIF on effective tax rates, we estimate five different model variations to test the role TIF plays in county-level tax rates. In most of the models, we use the share of county-wide assessed value in TIFs as the TIF measure. In the first two models, we employ ordinary least squares and vary fixed or autoregressive terms. The third model removes the spatial autocorrelation term. In the fourth model, we use an alternative TIF measure—the assessed value of property in the TIF. The final model examines the growth of the effective tax rate as an alternative measure.

As shown in *Table 3*, these models provide clear insight into the county-wide tax impact of TIF districts. In models that explain

2. Data on the net assessed value in TIFs are available from the DLGF for 2003-2013, and most economic variables of interest are not yet available for 2013. Data on the number of TIF districts in a county or the land area covered by TIF districts in a county are not available.

Table 3. Effect of Tax Increment Financing on County Effective Property Tax Rates

Variable	Panel Least Squares	Panel Least Squares	Panel Least Squares	Panel GLS, Lagged	Growth of ETR, Panel Least Squares
C	0.484516*** [0.0000]	1.037055*** [0.0087]	1.788927*** [0.0000]	2.098207*** [0.0000]	-0.827356*** [0.0000]
TIF percent of county assessed value	0.012793* [0.0774]	0.009914* [0.0845]	0.012763* [0.0757]	–	0.013172** [0.0320]
TIF assessed value (\$ million)	–	–	–	0.000156** [0.0234]	–
Average TIF assessed value in adjacent county (\$ million)	0.000191 [0.1723]	0.000198* [0.0731]	-4.33E-05 [0.7402]	-7.82E-05 [0.3981]	9.36E-05 [0.3776]
Spatial autocorrelation	0.754467*** [0.0000]	0.379711* [0.0000]	–	-0.138957*** [0.0064]	0.498111*** [0.0000]
Time trend	-0.000603 [0.8933]	0.022771 [0.7861]	0.015037*** [0.0003]	0.010331*** [0.0006]	-0.016766*** [0.0000]
Temporal autocorrelation	0.257077*** [0.0000]	–	0.155984*** [0.0014]	0.170534*** [0.0001]	-0.359907*** [0.0000]
County fixed effects	Yes	Yes	Yes	Yes	Yes
Period fixed effects	No	Yes	No	No	No
Adjusted R-squared	0.879979	0.879960	0.833459	0.869968	0.145105
F-statistic	63.77902 [0.0000]	65.42415 [0.0000]	44.30247 [0.0000]	51.87487 [0.0000]	2.290690 [0.0000]
Durbin-Watson stat	2.084993	1.433549	2.121852	2.095399	2.434341

Note: Parentheses indicate standard deviation.

Significance: * at 0.10 level, ** at 0.05 level, *** at 0.01 level. This model uses White's (1980) corrected t-statistic, asymptotically efficient p-values or F-statistic.

Table 4. Effect of TIF on Capital Accumulation (Assessed Value)

Variable	Net Assessed Value per Capita	Net Assessed Value per Capita	Non TIF Net Assessed Value per Capita	Non TIF Net Assessed Value per Capita
C	0.057517*** [0.0000]	0.064203*** [0.0000]	0.057504*** [0.0000]	0.064171*** [0.0000]
TIF assessed value (\$ million)	5.258912*** [0.0000]	4.426118*** [0.0000]	4.269278*** [0.0000]	3.443044*** [0.0000]
Average TIF assessed value in adjacent county (\$ million)	3.11E-06 [0.1543]	1.01E-06 [0.5358]	6.88E-06 [0.0038]	2.44E-06 [0.1754]
Spatial autocorrelation	3.77E-06 [0.0000]	1.44E-06 [0.0001]	3.77E-06 [0.0000]	1.44E-06 [0.0001]
Population	-1.50E-07 [0.0001]	-1.20E-07 [0.0002]	-1.50E-07 [0.0001]	-1.20E-07 [0.0002]
ETR	-0.005334*** [0.0000]	-0.006332*** [0.0000]	-0.005331*** [0.0000]	-0.006331*** [0.0000]
TIF percent of county assessed value	-0.002369*** [0.0000]	-0.001845*** [0.0000]	-0.002374*** [0.0000]	-0.001853*** [0.0000]
Time trend	-0.000396*** [0.0000]	–	-0.000397*** [0.0000]	–
Temporal autocorrelation	0.469771*** [0.0000]	–	0.469755*** [0.0000]	–
County fixed effects	Yes	Yes	Yes	Yes
Period fixed effects	No	Yes	No	Yes
Adjusted R-squared	0.97	0.96	0.97	0.96
F-statistic	279.7803 [0.0000]	252.4830 [0.0000]	273.6880 [0.0000]	248.0735 [0.0000]
Durbin-Watson stat	1.95	1.01	1.95	1.01

Note: Parentheses indicate standard deviation.

Significance: * at 0.10 level, ** at 0.05 level, *** at 0.01 level. This model uses White's (1980) corrected t-statistic, asymptotically efficient p-values or F-statistic.

the bulk of tax rate variation, the presence of a TIF demonstrates an across-the-board, statistically meaningful impact under different measures of TIF and different model specifications.

Using the value of estimated coefficients, an increase of TIF share of assessed value of 1.0 percentage point is associated with an effective tax rate increase of around 0.01 percentage point in the county. The fourth model suggests that each \$10 million increase in assessed value within a TIF increases effective tax rates by 0.01 percentage points.

This result has two possible explanations. First, it may be that the use of TIFs increases the cost of public services for adjacent taxpayers. Second, it may be that communities with higher effective tax rates use TIFs more intensively than communities with lower effective tax rates. Existing research allows for both possibilities, and in this setting we cannot clearly isolate the extent to which either of these two effects dominates. The strongest conclusion that we can draw is that higher effective tax rates are associated with TIFs.

These results lead to the second analytical step, which is the county-wide effect of a TIF on capital accumulation. We know that increases in assessed value within TIF districts occur as new facilities are constructed in these districts. Here we examine a broader impact—the impact of assessed value in TIF districts on the overall assessed value in a county, and on assessed value outside of TIF districts in a county. We use a more fully parameterized model and estimate two specifications that provide similar results. The results show that a \$1 million increase in TIF assessed value is associated with an increase of \$4.43 to \$5.26 per capita in assessed value in the county. This is a small but positive relationship. In the typical county, the increase in assessed value associated with TIFs would be in the range of \$306,000 to \$365,000. Again, we are unable to draw a causal link between TIFs and overall assessed value growth. It may be that counties that have higher growth in assessed value use more TIFs or that TIFs cause overall assessed value growth. The results of the models showing the relationship between TIF assessed value and non-TIF assessed value suggest that most of the assessed value growth is occurring in non-TIF areas. A \$1 million increase in TIF assessed value is associated with non-TIF assessed value growth of \$3.44 to \$4.27 per capita. Again, this is a small but positive effect. See *Table 4*.

Next, we examine the impact of TIFs on employment, the number of business establishments and sales tax revenue in a county. For brevity, we report only the influence of TIF on each of these variables in *Table 5*. While TIFs are associated with a small but positive increase in assessed value, the same is not true for their impact on employment and other economic indicators. A 1.0 percent increase in TIF assessed value in a county is associated with lower employment levels and a lower number of business establishments.

Due to statistical issues, we are not able to conclude that TIFs cause lower employment, only that they are associated with lower employment. It may be that counties experiencing employment/establishment decreases are more likely to use TIFs. Alternately, it could be that TIFs do lead to employment/establishment declines as competing businesses in non-TIF districts reduce employees or close

Table 5. Effect of Tax Increment Financing on County-wide Economy (Dependent Variable)

Variable	Coefficient [p-value]	Effect of a 1.0% increase of assessed value in TIF
Total employment	-78.99643* [0.0504]	A 1.0% increase in TIF assessed value is associated with 78 fewer jobs in the county.
Manufacturing employment	-32.70521** [0.0169]	A 1.0% increase in TIF assessed value is associated with 32 fewer manufacturing jobs in the county.
Retail employment	-15.66258** [0.0137]	A 1.0% increase in TIF assessed value is associated with 15 fewer retail jobs in the county.
Business establishments	-2.817684* [0.0602]	A 1.0% increase in TIF assessed value is associated with 2 fewer business establishments in the county.
Sales tax due	-2.266806 [0.1277]	Negative, but not statistically significant

Note: Parentheses indicate standard deviation.

Significance: * at 0.10 level, ** at 0.05 level, *** at 0.01 level. This model uses White's (1980) corrected t-statistic, asymptotically efficient p-values or F-statistic.

Source: Author calculations.

While TIFs are associated with a small but positive increase in assessed value, there is a negative association with employment and other economic indicators.

in response to new businesses opening within TIF districts. Or, some combination of these factors could be at work.

TIFs have no discernible statistical impact on sales tax revenues in a county. This later result would occur if retail activity shifts from non-TIF to TIF areas as new retail establishments are developed in TIF districts so that retail sales in TIF locations are substituting for retail sales in non-TIF locations.

Our set of models assessed the effect of TIF on total capital growth, total employment, manufacturing employment, retail employment, the number of business establishments and sales tax revenue. In all cases, the effects of TIFs were negative, but in the case of sales tax revenue the impacts were not statistically meaningful due to a high variability of effects across counties.



County leaders considering TIFs should evaluate the potential tax shifting to non-TIF regions. This is especially critical in light of the effects of property tax caps and the need to make local quality of place improvements in many towns.

Summary and Recommendations

The use of TIFs in Indiana has increased substantially over the period examined in this analysis. To better understand this, we examined TIF districts in Indiana 2003–2012 in an effort to evaluate the impact of TIF on capital growth, employment, and tax rates in counties. This approach is designed to test the efficacy of TIFs as an economic development tool designed to boost employment and capital investment in communities. Our findings are very clear and echo those of many other researchers.

First, we find that the size of a TIF within a county is associated with higher effective tax rates within the county. This is not surprising given that Indiana's local property tax system would necessarily shift burdens of taxation from TIF to non-TIF taxpayers to maintain constant levels of public services. We find that TIFs increase tax rates by about 0.01 percent on average, which is large enough to influence the tax variation across Indiana counties over the past decade. While we cannot conclusively report that TIFs are the cause of higher tax rates on existing taxpayers, that is a very likely effect.

Second, this finding establishes the need to examine TIF impacts in both TIF and non-TIF regions, since higher tax rates levied on non-TIF businesses and households will necessarily alter the net effect of any new capital accumulation or employment within a TIF district. We conducted this analysis asking whether the size of TIFs within a county influenced net county capital accumulation or employment. There was evidence that, on average, there was a small, positive correlation between the size of a TIF district and capital accumulation (measured as assessed value).

TIFs were negatively correlated with other measures of economic development such as employment, business establishments and sales tax revenue. However, in no case was the statistical certainty or size of the lost employment sufficient to conclude that TIFs caused these negative impacts in Indiana counties. The strongest conclusion that we can draw is that TIFs are associated with these negative outcomes, which is a finding that is consistent with our first result—that TIFs are associated with higher effective tax rates in the counties in which they are used.

This study offers a very robust and critical finding regarding the efficacy of TIFs in Indiana: The presence and size of a TIF district within a county is associated with higher overall tax burdens, which likely is due to a shift of the costs of public services to other taxpayers. This finding holds across multiple variations in our statistical models

and measures of TIF presence. The result of this tax shifting is that an examination of the economic effects within TIF and non-TIF areas is necessary to evaluate the net impact of TIFs on economic development. In so doing, we found that the net impact of TIFs on a county economy is modest, but on average negative in measures of economic development other than assessed value. This suggests that the Indiana TIF is not an effective economic development tool, but is instead a budget management tool for local governments.

Policy Considerations

Our findings point to some specific policy considerations for Indiana:

- TIF usage should be reviewed by the state legislature. The nature of these results implies that, while the average TIF has no meaningful impact, there are undoubtedly some with positive effects and some with negative effects on their counties.
- County leaders considering TIFs should evaluate the potential tax shifting to non-TIF regions. This is especially critical in light of the effects of property tax caps, and the need to make local quality of place improvements in many places in Indiana.
- TIF reporting could be improved to include a criterion for evaluating the potential impact—one that counts tax rates, employment, and capital investment *before and after* the TIF project. This should be done for both the TIF district and the non-TIF area of a county. These findings should be continuously made available (with at least annual updates) for all TIF districts.
- The legislature should limit the use of TIFs to those counties exhibiting, at the very least, minimally effective fiscal management. Specifically, we recommend precluding the use of TIFs...
 - in counties with unfunded pension liabilities (less than 80 percent actuarially funded),
 - in school districts that have requested transportation waivers within the past five years, and
 - in counties or municipalities lacking an adequate 'rainy day fund.'
- Tax increment financing itself is a budget management tool, which when used prudently may boost the economic prospects of a region. On average, its use does not improve economic conditions, but instead is associated with higher effective tax rates, and less employment and income. Therefore, its use should be limited to communities with effective local fiscal policies.

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Appendices

Appendix A. Methodology

Appendix B. Literature Review

Appendix A. Methodology

Specimen A1. Brief Theoretical Outline

$$Y_i = Y_{TIF} + Y_{NTIF} = f \left[K(N,T), N(K,w), GS(N,K) \right]$$

where output, Y in county i , is a function of output in both TIF and non-TIF regions within the county. Output, or total economic activity, is a function of capital, K , labor, N and government services, GS . Each of those variables are affected by taxes, T , and wages w . We focus on the net effects of the TIF on capital formation, labor and taxes between the two locations (TIF and non-TIF). Here we assume that the interest rate is independent of local conditions. We also assume that labor and capital are gross complements, so that an increase in capital will lead to increased employment. Both of these assumptions have a great deal of empirical backing we simply do not test them in this model and that makes them assumptions.

$$dY_i = f' \left[K' \left(\frac{\partial K}{\partial N} K + \frac{\partial K}{\partial T} T \right), N' \left(\frac{\partial N}{\partial K} K + \frac{\partial N}{\partial w} w + \frac{\partial N}{\partial T} T \right), GS' \left(\frac{\partial GS}{\partial K} K + \frac{\partial GS}{\partial N} N \right) \right]$$

Assumptions explicitly involve only the elements of:

$$\frac{\partial K}{\partial N}, \frac{\partial N}{\partial K}, \frac{\partial N}{\partial w}, \frac{\partial GS}{\partial K} > 0 \quad \text{and} \quad \frac{\partial K}{\partial T}, \frac{\partial N}{\partial T}, \frac{\partial GS}{\partial N} < 0$$

for which only $\frac{\partial GS}{\partial K}$ and $\frac{\partial N}{\partial w} > 0$ offers a plausible challenge, but in assuming higher levels of private capital lead to higher levels of government services we make a conservative assumption regarding output. In assuming that higher wages leads to more employment we are assuming the supply effect dominates in a region.

Specimen A2. Brief Empirical Specification

Effective Tax Rate Estimate

$$ETR_{i,t} = c_i + c + \beta_1 TIF_{i,t} + \beta_1 \hat{W} TIF_{j,t} + \gamma_1 \hat{W} Y_{j,t} + T + \theta ETR_{i,t-1} + e_{i,t}$$

Economic Impact Estimates Estimate

$$Y_{i,t} = c_i + c + \beta_1 TIF_{i,t} + \beta_1 \hat{W} TIF_{j,t} + \gamma_1 \hat{W} Y_{j,t} + T + \theta Y_{i,t-1} + e_{i,t}$$

where impacts on effective tax rates (ETR) or economic impacts (Y) in county i , in year t , are a function of fixed c_i and common c , intercepts, TIF, adjacent county TIF, weighted by \hat{W} , the first order contiguity matrix for each county, a spatial and time auto-correlation measure and a white noise error term, e .

Appendix B. Literature Review

Table B1. Articles 1990–2006

Year	Article Author	Geographic Area	Research Question	TIF Measure	Statistical Technique	Major Finding
1990	Anderson, John E.	Michigan cities, 1985-1986	Are property value growth and TIF adoption related?	Dummy variable for TIF	Structural probit model	Cities using TIF had greater property value growth, all other things being equal.
1998	Man, Joyce Y. & Mark S. Rosentraub	Indiana cities	How does TIF affect property value growth?	Series of dummy variables corresponding to the various years of TIF implementation.	First-difference model	Owner-occupied housing values were 11% greater in TIF adopting cities than in non-TIF cities.
1999	Man, Joyce Y.	Indiana cities, 1985-1992	Do TIF districts create an increase in local employment/jobs?	TIF as a dummy variable	Cross-section time series regression	Cities with TIF created an average of 4% more jobs than those without.
1999	Man, Joyce Y.	Indiana cities	Are growing cities more likely to adopt TIF?	Dummy variable for TIF	Structural probit model	No empirical evidence found to suggest that growing cities are more likely to adopt TIF.
2000	Dye, Richard F. & David F. Merriman	Chicago metropolitan area	How does TIF affect the property value growth rates of municipalities?	Dummy variable for TIF adoption, TIF district share of total equalized assessed property value of 1992	Regression	Municipalities that adopt TIF grow more slowly than those that do not.
2002	Byrne, Paul F.	Chicago metropolitan area (256 municipalities, excluding Chicago)	Do municipalities engage in strategic interaction when engaging in TIF adoption decisions?	TIF as a latent variable	Linear probability model	"A municipality that adopts TIF when its neighbors do not makes itself a preferred location for businesses looking to expand or relocate in the general area, which in turn puts pressure on nearby municipalities to also adopt TIF."
2003	Gibson, Diane	Chicago, IL census tracts, 1990-2000	Why are TIFs located where they are within the city?	Was tract included in TIF district designation between 1990-2000?	Weibull duration model	TIFs in Chicago tend to be located in economically distressed tracts but not the most severely disadvantaged. Chicago has used TIF to complement empowerment zones.
2003	Smith, Brent C. (Presentation)	Chicago, IL	Does proximity to TIF districts have a positive impact on commercial property value?	Within TIF boundary, within 250 yards of TIF (control group), or not proximate to TIF	Hedonic index	Adjacent properties appreciated at a higher rate than both other groups. Findings did not fully support or fully contradict the hypothesis.
2003	Weber, Rachel, Saurav Dev Bhatta, & David Merriman	Chicago, IL	Does TIF raise urban industrial property values?	TIF as a dummy variable	Regression using a two-stage procedure to correct selection bias. 1.) Multinomial logit model 2.) Adds selectivity correction factors derived for the logit model	In industrial TIF districts, parcels sell for less than identical parcels outside of district. Industrial parcels in mixed-use TIF districts sell for no less, sometimes significantly more than those outside the district.
2004	Smith, Brent C.	Chicago, IL	Do properties within a TIF district exhibit higher rates of appreciation after the TIF is designated compared to properties outside the TIF and compared to properties sold in the district before designation?	Dichotomous variables representing whether or not a property sale occurred within a designated TIF district, or in a TIF project designation	Hedonic models	"Appreciation rates within TIF districts exceeded those of properties outside TIF boundaries, and the designation of TIF districts stimulates market value increases in areas that are ultimately designated as TIF districts."
2006	Byrne, Paul F.	Chicago metropolitan area	Which district characteristics are important in influencing the success of TIF as measured by the growth rate of property values in the TIF district?	Dummy variables for TIF classification	OLS regression model	Industrial TIF designation is the only classification having an impact on success. TIF area/location, population density, race/ethnicity, and recency of creation all influence growth. Results also suggest a positive relationship between blight and property value growth in TIF districts.

Table B2. Articles 2008–2013

Year	Article Author	Geographic Area	Research Question	TIF Measure	Statistical Technique	Major Finding
2008	Carroll, Deborah A.	Milwaukee, WI, 1980-1999	What effect does TIF have on business property value over time?	Dichotomous variables for within TIF, young TIFs (created after 1989), and statutory-changed TIFs (created after 1995); TIF age in years.	Semilog econometric model with fixed effects regression, Heckman selection model to correct for selection bias	The provision of public services offered within TIF districts is capitalized into business property values over time. Positive and statistically significant relationships found between placement of a parcel within a TIF district and its assessed value.
2008	Weber, Rachel, Rebecca, Hendrick, & Jeremy Thompson	Illinois school districts (782 of 896 total)	How does TIF affect the property tax rates and revenues for school districts?	TIF intensity: The proportion of the school district's tax base tied up in 1 or more TIF districts	Three-stage least squares and ordinary least squares regression	Urban school districts outside Chicago were most negatively affected by TIF. Rural school districts were positively affected. Little effect on Chicago metropolitan area and other suburban areas upstate.
2009	Skidmore, Mark, David, Merriman, & Russ Kashian	Wisconsin municipalities, 1990-2003	Does TIF encourage annexation?	TIF variable as running tally or districts created since 1990	Regression	TIF use is closely linked with annexation; a new TIF leads to a 3% increase on average. Over the studied time period, TIF is responsible for more than half of the annexed land.
2009	Smith, Brent C.	Chicago, IL	1.) Do properties located inside a TIF district have a higher rate of appreciation than those outside? 2.) Is the rate of change in prices is higher once area is designated as TIF?	TIF as a dummy variable	Hedonic model with two-stage regression approach to address selection bias. 1.) Probit regression 2.) Linear regression	1.) Properties inside TIF appreciate at a higher average rate than those outside. 2.) Influence of TIF is dependent on the economic state of the neighborhood as compared to others without TIF.
2010	Bryne, Paul F.	Illinois municipalities, 1981-1999	Do TIF districts increase employment in municipalities?	TIF as a dummy variable in general and per classification: Mall, industrial, housing, CBD, mixed-use, other	Fixed-effect regression, fixed-effect estimation	Industrial TIFs have a positive effect on employment; retail TIFs have a negative effect on employment
2010	Farris, Sherri & John Horbas	Chicago, IL, & Cook County	Does TIF cause growth?	Looks at TIF implementation and value	No real statistical analysis performed	Cannot be sufficiently addressed by simply looking at property values and money spent, more sophisticated statistical research techniques must be applied.
2010	Mason, Susan & Kenneth P. Thomas	Missouri	1.) Do cities use TIF to compete with other cities for investment? 2.) Does the pattern of TIF use in MO ameliorate of exacerbate inequality between municipalities? 3.) Is TIF use path dependent in MO?	TIF amount, value, and type used as dependent variables. Proximity to other cities TIF used as an independent variable.	Four binomial logistic regressions, ten ordinary least square regression analyses	1.) Adoption of TIF made neighboring city 2.5 times more likely to adopt one. 2.) Some evidence found that TIF adoption patterns contribute to inter-municipal inequality. 3.) Early adopters of TIF adopted 3.62 times more TIFs and 3.81 times more retail TIFs.
2010	Skidmore, Mark & Russ Kashian	Wisconsin municipalities, 1990-2003	What is the long term relationship between the use of TIF and property taxation in the municipality and overlying jurisdiction?	Number of districts created	Regression	The addition of a TIF district will not affect the tax rates of those within the municipality, but will increase the rates of those just outside the municipality, within the jurisdiction.
2011	Merriman, David, Mark Skimore, & Russ Kashian	Wisconsin municipalities, 1990-2003	Has TIF increased the total property value in Wisconsin municipalities?	TIF as an independent variable, value of all real estate within TIF districts in municipality, # of TIF districts per 10,000 people in municipality	Regression	Property value grew more rapidly in cities/villages with TIF than those without. Non-TIF areas of cities/towns with TIF grew slightly more slowly than the area in the TIFs, but more rapidly than cities/towns without TIFs.
2013	Felix, R. Alison & James R. Hines	U.S. municipalities and counties	Why do cities and counties offer the tax-based incentives they do?	TIF and other tax incentives as dummy variables	Regression	Areas near state borders, of low income, or with troubled political cultures are most likely to provide incentive in general. Those with very poor residents or with troubled political cultures are less likely to offer TIFs specifically.