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**Local Government Responses to Property Tax Caps:
An Analysis of Indiana Municipal Governments**

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ABSTRACT

This article investigates local government responses to fiscal stress resulting from property tax rate caps. Using data on 28 municipal governments in Indiana, we examine two policy options available for managing declining revenues: (1) reducing spending and employment (2) raising additional revenue through annexation. We find that revenue losses from property tax caps are a significant determinant of decreases in municipal budgets and local government employment. Functions including fire, police, highways, and parks & recreation are negatively affected while financial administration and land area are positively impacted.

INTRODUCTION

The opening decades of the 21st century have been a turbulent time for local governments in Indiana. A court-ordered reassessment exposed fundamental problems with Indiana's property tax system which ultimately led to calls for numerous property tax reforms and included an organized effort for total property tax repeal. In 2008 the Indiana General Assembly imposed property tax rate caps. These caps dramatically reduced some local government revenue while having little impact on others. The imposition and implementation of the tax caps coincided with the Great Recession and the subsequent slow recovery. In response to declining revenue, local governments can cut spending, including personnel spending, find new revenue sources, or both. We find evidence that Indiana municipalities engaged in strategies to reduce budgets and employment and also increase revenue to some degree over the 2007-2014 period.

This study provides an analysis of municipalities within the same state and during the same time period. Of the 28 municipalities examined, 27 are part of metropolitan areas, while one is located within a nonmetropolitan county. This geographic and temporal focus provides a set of municipalities existing in the same overarching legal and economic environment, but experiencing a wide variety of impacts from the imposition of tax caps. We examine total local government employment changes and changes in the functional areas of fire services, police services, administration, highways, and parks and recreation. These government functions were chosen because they are commonly provided by municipal governments. We also examine changes in municipal budgets and municipalities' reliance on annexation as a means to increase revenue.

In the next sections, we provide a brief review of the literature on local government responses to fiscal changes followed by an overview of Indiana's property tax system and the

changes since 2000. Then using data on municipal employment and local government financial data, we examine the impact of tax caps on budgets, local government employment, and alternative revenue sources for 28 of Indiana's municipalities. The final section provides conclusions.

LITERATURE

During economic downturns, while the federal government frequently engages in Keynesian spending through deficit financing, state and local governments are often constitutionally compelled to balance their budgets by cutting spending (Levine, 1978). Once considered anomalous in public organizations, cuts in spending due to a lack of growth have become more permanent in the current political landscape.

The literature on measuring local fiscal conditions can be divided into two branches (Skidmore and Scorsone 2011, Chernick and Reschovsky 2007) – fiscal stress caused by local government decisions focusing on local financial management (micro level) and fiscal stress due to underlying fiscal and economic conditions not mismanagement as typified by social theorists (macro level). We examine both types of fiscal stress.

Focusing on the micro level, the first branch of literature examines the fiscal stress precipitated by local financial management decisions. Under pressure to reduce spending, managers cutback or manage “organizational change toward lower levels of resource consumption and organizational activity” which requires “making hard decisions about who will be let go, what programs will be scaled down or terminated, and what clients will be asked to make sacrifices” (Levine 1979, 180). The organizational response to cutback demands are driven by a variety of motives, some directed at serving public purposes, some intended to serve organizational goals, and others intended to serve organization subunits (Levine 1978).

The cutback strategy chosen by an organization might be driven by technical rationality or internal or external political competition for resources. According to rational or political theories, managers will tend to first utilize approaches that are less disruptive or less likely to attract political resistance, such as broadening tax bases, drawing down reserves, or using nonrecurring revenues. If the fiscal stress becomes more severe or of a longer duration, public officials will attempt to defer or contain expenses by postponing capital improvements or by instituting hiring freezes. Under the most austere conditions, they will eventually resort to employee layoffs and service cuts (Nelson 2012, Wolman 1980, Forrester and Spindler 1990). Although these theories differ in predicting which changes will be adopted first, they agree that layoffs and service cuts tend to be the strategies of last resort.

Once an organization has decided to make cuts, there are multiple approaches for doing so. Across-the-board cuts attempt to spread the pain by imposing equal or similar cuts across all functions. Alternatively, budget reductions may be targeted to certain departments or functions either rationally by taking resources from less essential or low priority services or politically by directing resources away from departments or beneficiaries with little political power and toward those with greater influence (Levine 1978, Jick and Murray 1982, Skidmore and Scorsone 2011, Bartle 1996). Other scholars argue that strategies may be less structured or predictable, having the appearance of a garbage can approach (Downs and Rocke 1984, Jick and Murray 1982, Pammer 1990, Bartle 1996). Due to the wide variety of differences in state and local political and economic environments, cutback strategies lack a discernible pattern (Nelson 2012). This approach predicts variation among municipalities in their response to fiscal stress.

Underlying fiscal and economic conditions impact local government budgets and employment levels. Few studies have examined local government fiscal stabilization strategies

(Wang and Hou 2012). Ross, Yan and Johnson (2015) examined fiscal responses to the Great Recession of America's 35 largest cities and found that these cities increased property taxes and engaged in deficit spending to stabilize revenue. Kopelman and Rosen (2016) estimated that the probability of job loss during the Great Recession was lowest for local government workers compared to federal and state government workers and private-sector workers.

Finally, the literature on tax and expenditure limits (TELs) that states impose on local governments is particularly relevant here. Property tax limits are one source of fiscal stress. A variety of studies have examined the fiscal effects of property tax limits on local governments. Dye and McGuire (1997) find evidence that TELs reduce local government revenue and spending. Mahler and Deller (2012) find that TELs weaken municipal financial conditions. Similarly, McCubbins and Moule (2010) showed that tax and expenditure limits had extreme cyclical effects on state and local revenues. For example, TELs reduced reliance on local property taxes and increased reliance on income-elastic revenue sources such as sales and income taxes so that revenue declines were more extreme during recessions. St. Clair (2012) shows that Colorado TELs increased local government revenue and expenditure volatility. Sexton, Sheffrin and O'Sullivan (1999) found that local governments increased reliance on other sources of revenue such as fees, special assessment-districts, tax increment financing and lease purchase plans. Mullins (2004) showed that TELs had differential effects among general purpose governments where communities with disadvantaged populations experienced the largest decreases in revenue and expenditures after the limits were imposed. Joyce and Mullins (1991) and Sharp and Elkins (1987) find that local TELs result in greater reliance on non-tax revenue sources, such as user fees. Results of these studies suggest that property tax limits will have differential effects on local governments with the largest impacts occurring in communities with

disadvantaged populations (typically older, urban areas) and that local government will turn to other, more volatile revenue sources to close budget gaps.

OVERVIEW OF PROPERTY TAX REFORM IN INDIANA

The 2008 property tax restructuring is the latest in a long line of both legislated and court-ordered property tax changes implemented in the state.¹ Property tax limits were first implemented in Indiana in the 1970s. These initial limits focused on constraining local government revenue. According to Anderson (2006) Indiana is one of 43 states in the continental U.S. that imposed some form of property tax limit, and one of four states that imposed only revenue limits at that time. Indiana is also one of 26 states that do not have mandatory annual assessments. The 2008 property tax restructuring effort imposed stringent limits on local government property tax rates in addition to reforming the assessment process.

The 2008 restructuring was driven by taxpayer dissatisfaction resulting from dramatic increases in taxes among some taxpayers during 2007. Reassessment had caused some Indiana taxpayers to experience large increases in their property tax payments. In addition, inconsistent assessment practices caused some taxpayers to experience higher assessed values than owners of similar nearby properties. These assessment-related horizontal inequities led taxpayers to march on the state capital and to organize a campaign to abolish property taxes.

The Indiana General Assembly responded by imposing property tax rate caps which significantly limited the ability of local governments to raise revenue through property taxes. For

¹ Major changes to Indiana's property tax system over the prior decade included a 1998 Indiana Supreme Court ruling that led to the implementation of a new assessment system and a mass reappraisal of properties in the state which exposed severe problems with property tax administration and uniformity of assessment (Brown 2005). In 2002 the General Assembly approved a measure to remove inventories from the business personal property tax by 2006.

tax cap purposes, property was divided into three categories: homestead residential, non-homestead residential, and non-residential. For tax bills payable in 2009, the property tax liability for homestead residential property was capped at a maximum of 1.5 percent of its gross assessed value. For 2010 and beyond the cap was set at 1 percent. Non-homestead residential property was capped at 2.5 percent in 2009 and 2 percent for 2010 and beyond. The caps for non-residential and personal property were 3.5 percent in 2009 and 3 percent for 2010 and beyond.

The caps place a ceiling on a parcel owner's total property tax liability. Therefore, in 2010 and beyond an owner-occupied home with a gross assessed value of \$100,000 would be subject to a maximum total annual property tax bill of \$1,000 split between the county, township, city, school district, and any special districts within which the property is located (Ottensmann, Payton, & Klacik 2008). The legislation also provided an additional circuit breaker to provide further tax relief for senior citizens. If the tax rate is initially above the rate cap, the rate is reduced and associated revenue is "refunded" to the taxpayer as a credit. The cost of funding the credits is shared by local government units in proportion to their shares of the pre-credit property tax bill. In 2009, the initial year in which the tax caps were partially implemented, property owners received a total of \$163 million in tax credits or approximately 2.7 percent of the statewide gross property tax levy. In 2010, after the caps were fully phased-in, total tax credits increased to \$430 million or about 7 percent of the gross levy (Nagle 2011).

Because this provision substantially lowered local government revenue, the state assumed responsibility for funding some local property tax levies. Most notably, the general fund property tax levy for local school corporations was abolished. School corporations still levy property taxes for debt service, capital projects, and transportation, but the state now funds instructional costs through a funding formula. Other levies taken over by the state include child welfare levies,

juvenile incarceration, indigent health care, state fair and forestry levies, pre-school special education levies, and police and fire pensions. To further limit local spending, the statute requires that referenda be held for new school and local government capital projects.

The property tax reform bill also increased the state sales and use tax rate by one percentage point, from 6 percent to 7 percent. The additional revenue generated by this tax increase was committed to pay for the local levies assumed by the state (Ottensmann, Payton, & Klacik 2008; Michael, Spradlin, & Carson 2009).

The impacts of the property tax caps vary widely across Indiana, and within a given county the impact of the tax caps can vary greatly among taxing units. Property parcels within cities and towns are subject to taxation by the greatest number of taxing units and, therefore, tend to have more parcels subject to the tax caps. Consequently, cities and towns often experience the largest impacts among taxing units within their counties (Nagle 2011). For example, while the overall impacts of tax caps in Delaware and Madison Counties for 2011 were 25 and 22.6 percent of their gross levies, the impacts on their county seats, the cities of Muncie and Anderson were equal to 34.5 and 34.2 percent of their gross levies (Indiana Legislative Services Agency 2011).

In 2007 the General Assembly authorized three new local option income taxes (LOITs) to provide local governments with additional ways to raise revenue while reducing property tax burdens. The LOIT to Freeze the Property Tax Levy provides a means to raise revenue to replace normal property tax increases. The LOIT for Property Tax Relief can be used to reduce property taxes. The LOIT for Public Safety can be used to fund public safety programs thus reducing the amount of property taxes needed to fund these services. Faulk, Kuhlman, Salimova and Devaraj

(2010) provide details on these LOITs. As of 2014, 37 of Indiana's 92 counties had adopted at least one of the new LOITs related to property taxes.

MUNICIPAL RESPONSES TO PROPERTY TAX CAPS

Drawing on the prior literature, we develop a theory explaining how Indiana municipalities respond to fiscal stress due to tax caps. Scorsone and Plerhoples (2010) discuss changes in local government responses to fiscal stress. Prior to the 2000s, state and local governments responded to fiscal stress by both increasing taxes and cutting services, but that beginning with the 2001 recession, government strategies shifted away from tax increases and toward service cuts.

In this study, we begin from the premise that the property tax caps imposed in 2009 not only cause fiscal stress but also limit the response strategies available to cities. Because the purpose of the property tax caps is to limit the ability of local governments to increase tax rates, cities impacted by the tax caps will necessarily need to adopt strategies that do not involve increasing property tax rates. Although a city has other revenue-increasing strategies available to it, such as adopting or increasing local option income taxes (LOITs) or annexing territory to increase its tax base, these strategies take time to implement and, in the case of LOIT increases, often require the cooperation of other local governments within the county. Spending cuts, on the other hand, can be implemented immediately and unilaterally. For this reason, we expect that the property tax caps will result in reductions in municipal budgets, leading to our first hypothesis:

H1: Municipalities that experience large reductions in revenue from tax caps will reduce their budgets more than municipalities in which the tax cap impacts are smaller.

Because wages and salaries constitute a large portion of city expenditures, spending cuts eventually lead to decreases in local government employment. A variety of studies have shown

that fiscal stress is associated with decreases in employment as well as spending (Bartle 1996, Lewis 1988). Therefore:

H2: Municipalities that experience large reductions in revenue from tax caps will reduce their staffing levels more than municipalities in which the tax cap impacts are smaller.

When making budgeting and staffing decisions, municipal officials may choose to target budget and staff reductions to preserve services perceived as essential, such as public safety, at the expense of services perceived as less essential, such as parks and recreation. In their study of fiscal stress among Michigan cities, Skidmore and Scorsone (2011) found that general government and recreation were particularly vulnerable to cuts, while public safety services tended to be protected. Unions may also play a role here. Based on these findings we suggest the following hypothesis:

H3a: The impact of tax cap-related revenue losses on staffing reductions will be larger in the administrative and recreation functions than in the police and fire functions.

Not all local government services are funded with property taxes. In Indiana, local highways are funded from shared state gas tax revenue rather than property taxes. We expect that local highway funding and associated staffing will not be affected by property tax caps. We include hypothesis 3b to test this relationship:

H3b: Revenue reductions from property tax caps will not affect highway staffing.

Municipalities may also deal with fiscal stress by finding alternative sources of revenue. In Indiana revenue options are limited. A variety of studies have shown that under property tax limits, local governments adopt alternative revenue sources such as local option taxes, fees and charges (Joyce and Mullins 1991, Mullins and Joyce 1996, Shadbagian 1999, Bartle, Ebdon and

Krane 2003). Kim, Bae and Eger (2009) and Zhao (2005) found that fiscal stress does not influence local sales tax adoption in Georgia.

Annexation is one way that municipalities can potentially raise additional revenue. Annexing properties adjacent to existing boundaries increases the property tax base but also increases a municipality's service area. If economies of scale are present, tax revenue should increase more than service costs after annexation so that per capita taxes and spending decrease after annexation. A contrasting view is that municipalities that annex land may reduce local government competition and exert monopoly power increasing taxes and spending. Older studies using data from the 1960s and 1970s to examine the relationship between taxes or spending and annexation have found mixed results (Mehay 1981, Gonzales and Mehay 1987, Liner 1992, 1994, Liner and McGregor 2002). More recent studies (Edwards and Xiao 2009) found that per capita local government expenditures decrease with annexation indicating that economies of scale exist, with population density hampering the impact of scale. If economies of scale are present, expanding the property tax base through annexation can improve the fiscal situation.

An Indiana city greatly affected by tax caps can also benefit by annexing undeveloped land to capture the value of subsequent development in its tax base. As the tax base increases, the city is able to reduce its tax rate, which reduces the amount of revenue lost to tax caps and thus generate net revenue. We hypothesize that the potential to generate net revenue via annexation will encourage fiscally stressed cities to pursue annexation, leading to our final hypothesis:

H4: Municipalities that experience large reductions in revenue from tax caps will experience larger increases in land area than municipalities with smaller tax cap impacts.

DATA AND METHOD

This study uses data from Indiana municipalities to examine their responses to fiscal stress caused by property tax rate caps. We use certified budgets to examine overall changes in spending. Using the U.S. Census Bureau's annual individual unit files, we assembled data for total full-time equivalent employees (FTEs) and FTEs in six functional areas: financial administration, general administration, fire, police, highways, and recreation. The municipalities included in this analysis consist of the 28 municipalities sampled annually by the Census Bureau from 2007 through 2014. The 2007-2014 period provides an opportunity to examine how Indiana municipalities respond to fiscal stress. Because 2014 is the fifth year after the property tax caps were implemented and also five years into the recovery after the Great Recession, local governments had time to respond to the new fiscal environment.

Figure 1 shows the location and relative populations of these municipalities, while Table 1 provides basic socioeconomic, demographic and fiscal characteristics for these municipalities. There is great variation in population growth and income among municipalities. Those in the Indianapolis suburbs (Carmel, Fishers, Noblesville) tend to have the highest income levels and population growth rates, while former industrial powerhouses (Richmond, Muncie, Marion) tend to have the lowest income levels and population growth.

[Figure 1 and Table 1 here]

Our approach is to use panel regression models to estimate the impact of tax caps on municipal budgets, staffing levels, LOIT rates, and land area (as a proxy for annexation). We compute standard errors clustered by municipality to control for heteroskedasticity and serial correlation within each cluster. The model takes the following form:

$$Y_{it} = \beta_0 + \beta_1 D_{it} + \beta_2 C_{it} + \beta_3 F_{it} + \beta_4 R_t + \varphi_t + \delta_i + \varepsilon_{it} \quad (1)$$

Our model specifies an outcome measure, Y (certified budget, staffing level or land area) in municipality i and year t , as a function of an intercept, β_0 , demographic characteristics (D) of the municipality, the revenue loss due to tax caps (C), other fiscal characteristics (F), and a recession indicator (R). We also control for the presence of municipal (cross section) fixed effects which take into account differences among municipalities that do not vary over time, period fixed effects to control for difference among municipalities that vary over time and a white-noise error term, ε . All dollar values have been converted to real values (2014 purchasing power) using the national consumer price index (CPI). Variable definitions and sources are shown in Table 2 along with descriptive statistics for the total sample. We include both the levels and scaled (per capita or per thousand) versions of each variable. The scaled variables are used in the regression models.

[Table 2 here]

The Impact of Fiscal Stress (C_{it})

The tax cap revenue loss variable is the reduction in municipal property tax revenue due to tax caps and is our measure of fiscal stress. The mean value is \$57 per capita, approximately 6.2 percent of mean certified budget per capita. According to Hypotheses 1, 2, and 4, we expect cities with greater revenue reductions from tax caps to experience greater decreases in local government budgets and employment and more annexation than cities with lower tax cap impacts.

Fiscal Variables and Recession (F_{it} and R_t)

In the budget model, property assessed value is the measure of fiscal capacity. We expect there to be a positive relationship between assessed value and the municipal budget. In the employment and annexation models, we use the municipal budget as the measure of fiscal

capacity and expect there to be a positive relationship between the budget and employment. We have no a priori expectation about the relationship between the municipal budget and annexation. Federal and state intergovernmental aid are other revenue sources used to fund local government functions and programs. In the case of police and fire services, for example, federal intergovernmental aid has been granted explicitly to maintain staffing levels. Communities receiving more intergovernmental aid may be able to better withstand budget cuts due to property tax caps. We expect a positive relationship between intergovernmental aid and staffing levels.

The recession dummy captures the impact of the Great Recession (December 2007 through June 2009) on local governments. We expect the recession to be associated with decreases in budgets and local government employment. We have no a priori expectation about the relationship between the recession and annexation.

Demographic and Socioeconomic Variables (D_{it})

We expect that local government employment will rise with the demand for government services. We include several measures of service demand. Municipalities with larger populations tend to offer a wider array of government services and infrastructure, cover a larger geographic area and may be better able to take advantage of economies of scale. We expect a negative relationship between population and each of the outcome variables.

We control for demographic and socioeconomic characteristics that reflect tastes for public goods and therefore the level and types of local government employment. The state of the local economy may influence local government employment. We include the county poverty rate as a measure of economic distress. Distressed areas may have higher local government staffing to provide services to this population or lower staffing due to fiscal stress, so the sign is

indeterminate. Wagner’s “law” predicts that the demand for government services will increase with income. Median household income is included to capture this effect. Places with higher incomes may demand more public services and associated higher local government employment and budgets. We expect a positive relationship between local government employment and income and a positive relationship between local government budgets and income. We have no a priori expectations about the relationship between the poverty rate or median household income and annexation.

RESULTS

Property Tax Caps and Local Government Spending

Under state law, local governments are required to balance their budgets annually. Table 3 reports estimation results for the budget model. After controlling for demographic and fiscal influences, property tax caps negatively and significantly impact municipal budgets. Using the revenue loss coefficient to calculate the impact, a revenue loss of \$57.02 per capita (the mean value) is associated with a decrease in certified budget per capita of \$40.72 or approximately \$3.67 million (6.77 percent) decrease in the certified budget for a city with mean population of 90,075 (table 7). These results support our first hypothesis: municipalities experiencing large tax cap impacts reduce spending.

[Table 3 about here.]

Property Tax Caps and Local Government Staffing

Model results examining the relationship between revenue losses and local government staffing are presented in Table 4. Model results in Column 1 show the expected pattern and provide support for Hypothesis 2. As the revenue loss from tax caps increase total full-time equivalent staffing decreases. Using the staffing change coefficient to calculate the impact of a

mean revenue loss on a city of mean population results in an estimated reduction in full-time equivalent staffing of approximately 30 workers or 2.67 percent of mean total staffing (table 7).

[Table 4 about here.]

The remaining columns (table 4) show results of FTE employment models for various government functions. These model results provide limited evidence that municipalities tend to protect the fire and police functions at the expense of administration and recreation (hypothesis 3a). The model results show that municipalities tend to decrease fire and police employment along with parks and recreation employment. The estimated mean decrease in fire staffing is 4.58 workers (2.83 percent), in police staffing it is almost seven workers (2.95 percent) and in parks and recreation employment it is about 4.5 workers (9.42 percent) (table 7). The larger proportional decrease in parks and recreation employment suggests that these positions are viewed as more expendable than public safety employment.

Intergovernmental grants also play a role in fire employment. Fire staffing is negatively related to federal intergovernmental revenue and positively related to state intergovernmental revenue indicating that this type of revenue is a significant contributor to employment levels for these government functions either directly or through the fungibility of spending categories.

In contrast to expectations, staffing in financial administration increased with tax caps. This result suggests that municipalities hired more personnel to work in financial administration after the property tax caps were implemented. Perhaps the fiscal stress resulting from tax caps in some municipalities necessitated the hiring of people with these skills. Tax caps had no effect on other government administration

Highway staffing is lower in municipalities experiencing property tax revenue losses due to tax caps. The typical city decreased highway employment by two workers (3.7 percent) (table

8). We did not expect tax caps to affect highway employment to, but the fungibility of spending categories may contribute to this effect.

Property Tax Caps and Annexation

Finally, we investigate changes in another potential revenue source: annexation (table 5). We use land area as a proxy for annexation and find a small but positive and significant relationship between land area and the tax cap revenue losses suggesting that municipalities experiencing greater property tax revenue reductions annex more land. The estimated impact of mean revenue loss on land area is an increase of about a half a square mile or about one percent.

[Table 5 about here.]

Other Influences on Local Budgets, Employment and Annexation

Other control variables generally have the expected relationships. The impact of population on total FTE staffing is negative and significant (Table 4) indicating that employment per capita decreases as the population increases and that economies of scale are present. Financial administration, fire, police and highway staffing are negatively related to population indicating the presence of economies of scale for each of these functions. Lastly, the municipal budget is positively related to total, financial administration and fire staffing indicating that staff levels increase as the budget increases.

Population is negatively related to land area per capita (Table 5) indicating that as population increases land area per capita decreases likely reflecting that larger cities are more densely developed.

Federal and state intergovernmental revenue measure the aggregate amount of intergovernmental transfers from the state and federal government that the municipality received. The certified budget is negatively related to state intergovernmental revenue (Table 3) indicating

that per capita budgets are lower in municipalities that receive less state aid. The impact of intergovernmental aid on employment (Table 4) varies by type of aid and employment function. Federal intergovernmental revenue is negatively related to total and fire staffing but positively related to financial administration staffing, while state intergovernmental revenue is negatively related to other government administration and positively related to fire staffing.

Median household income is a positive and significant determinant of police staff levels, indicating that demand for these services increases with income. Thus, household with higher incomes are more likely to value this service. For parks and recreation staffing, the coefficient on median household income is positive as expected but does not quite meet the threshold of statistical significance. Highway staffing is negatively related to median household income indicating that staff levels decreases as income increases. These income effects are substantively large (table 6). For a city of mean population (90,075), an increase in median household income by one standard deviation (\$14,461) is associated with an increase in police staffing of about 37 FTE (15.9%), an increase in park staffing of about 19.5 FTE (40.7%), and a decrease in highway staffing of about 9 FTE (14.9%).

[Table 6 about here.]

The poverty rate is negatively associated with total local government employment and financial administration employment indicating that municipalities in distressed counties have fewer local government employees overall and working in financial administration. Other government administration is positively related to the poverty rate indicating more poverty leads to more people working in administrative roles perhaps in poverty related programs. Like the income effects, these poverty effects are substantively large. For a city of mean population, an increase in the poverty rate by one standard deviation (5.33 percent) is associated with a total

staffing decrease of almost 26 FTE (2.28%), a financial administration staffing decrease of about 6 FTE (27.4%), and an increase in other administrative staffing of about 6 FTE (16.8%).

The recession indicator is positive and significant for fire and parks and recreation staffing indicating that staff levels in these functions increased during the recession, which is not the expected relationship. In contrast, financial administration, other administration, and police staffing were negatively related to the recession. The significance of the recession dummy and the variable measuring revenue losses due to tax caps suggest that both of these factors affected municipal spending and employment decisions over this period.

CONCLUSION AND EXTENSIONS

The analysis presented in this article shows that local governments adapt to fiscal stress, in this case caused by property tax rate caps, by cutting spending and employment while also increasing the municipal land base via annexation. As revenue losses due to tax caps increased, municipal budgets and staffing levels decreased over this period. There is evidence that public safety is protected from cuts in that fire and police employment experienced lower proportional decreases than parks and recreation employment. Financial administration employment increased, perhaps in response to increased financial complexity resulting from the caps, while there was no change in other government administration related to tax caps.

Highway employment was negatively affected by tax caps, which was not the expected result. The model results suggest that federal grants (intergovernmental revenue) likely enhanced municipalities' ability to maintain police employment, while state grants protected fire employment so that public safety cuts were not more extreme.

Another option for increasing revenue is to annex land. In addition to increasing the number of properties on the municipal property tax rolls, municipal annexation allows the

municipality to expand its customer base and potentially take advantage of economies of scale, which may serve to decrease the average cost of providing services (Carr 2004). Results presented here suggest that municipalities annexed more land after property tax caps were implemented.

The analysis presented here spans an eight-year period corresponding to the Great Recession, slow recovery, and implementation of property tax rate caps in Indiana. Bozeman (2010) calls for life-cycle-oriented studies of public organizations (p.561). Many communities in the rust belt have experienced decades of decline due to changes in the structure of local economies, which have impacted local government. An examination of a longer time period to categorize types of cutbacks and revenue options might reveal clearer patterns or different local government choices.

Future extensions of this analysis will examine the impact of revenue losses from tax caps on local option income tax rates. While there are no general purpose local option sales taxes in Indiana, six local option income taxes (LOIT) exist. LOIT adoption in Indiana is done on a county-wide level, with revenues shared among all local governments in the county. Some of the LOITs may be adopted by a vote of the county council. Others are adopted by a vote of the county income tax council, which is a body in which each local government in the county gets a vote weighted on the basis of its population. Municipalities are not authorized to adopt LOITs unilaterally, although cities with large populations relative to other local governments within the county and to the county as a whole will have a large influence on adoption of LOITs by county income tax councils. We expect that cities with large tax cap impacts will attempt to influence the LOIT process to adopt or increase LOIT rates. Furthermore, counties in which tax cap impacts are large, both the county and municipal governments are likely to experience similar

impacts making it likely that local governments may be willing to cooperate to adopt or increase LOITs. Consequently, we expect LOIT rates to increase for cities with large tax cap impacts.

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Figure 1. Municipalities included in the Analysis

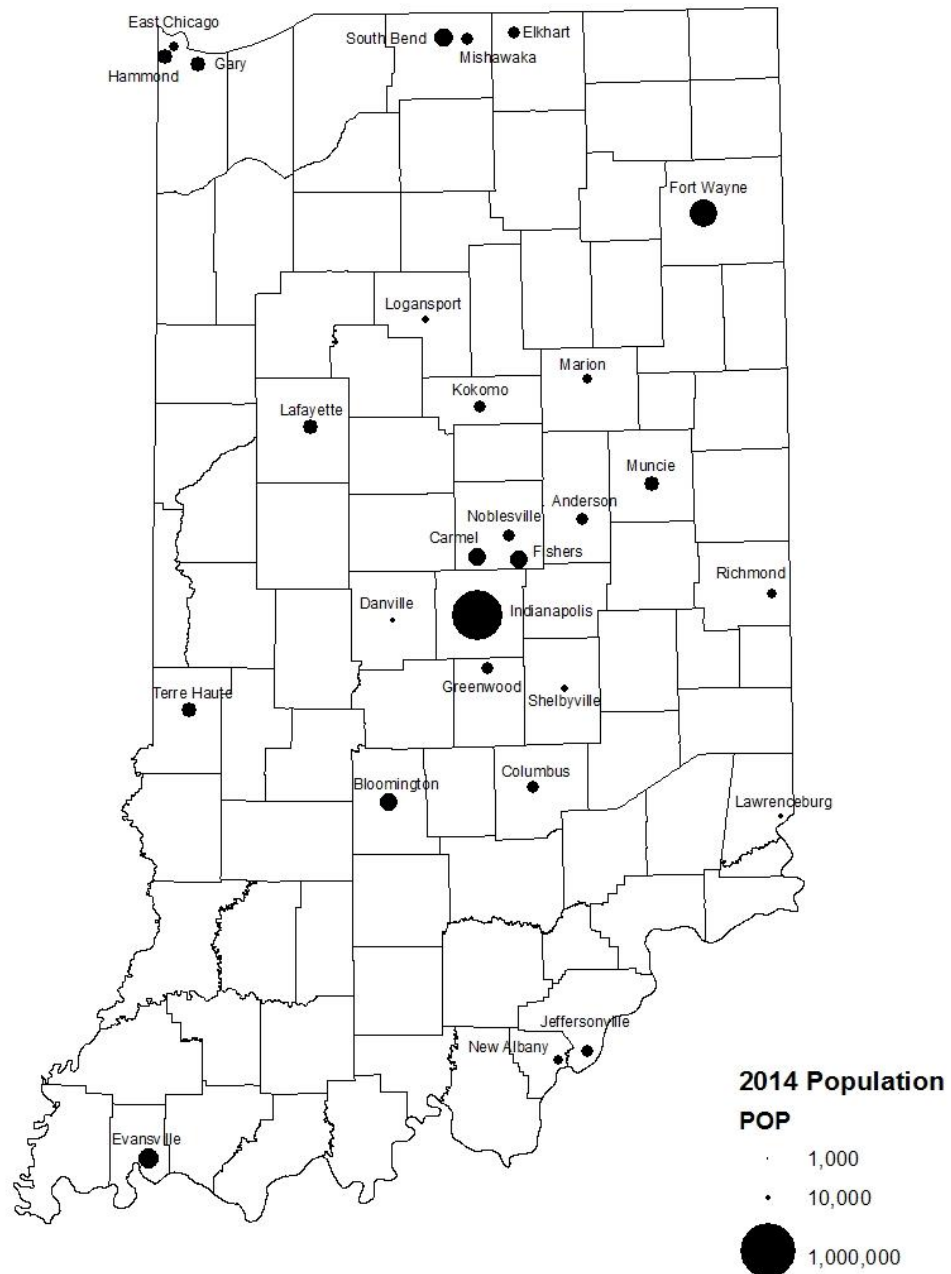


Table 1. Characteristics of Municipalities

	2014 Revenue loss due to tax caps (% of certified levy)	2007 Popul- ation	2014 Popul- ation	Popul- ation (% change)	2007 Local govern- ment employ- ment	2014 Local govern- ment employ- ment	Local govern- ment employ- ment (% change)	2014 median house-hold income \$ (county)
Bloomington	0.7	71,044	83,460	17.48	731	804	9.99	43,841
Lawrenceburg	1.1	4,781	4,968	3.91	120	135	12.50	59,280
Carmel	2.5	65,087	86,588	33.03	417	518	24.22	89,861
Fishers	5.3	65,819	87,022	32.21	352	432	22.73	89,861
Lafayette	5.4	63,905	70,813	10.81	712	701	-1.54	46,276
Greenwood	6.8	46,528	54,615	17.38	253	299	18.18	58,833
Colombus	7.2	39,810	46,112	15.83	472	444	-5.93	54,101
Shelbyville	8.6	18,375	19,069	3.78	753	791	5.05	54,831
New Albany	9.4	36,924	36,627	-0.80	254	260	2.36	53,186
Danville	10.8	8,185	9,590	17.17	64	81	26.56	70,358
Marion	11.0	30,358	29,218	-3.76	260	224	-13.85	40,234
Evansville	13.1	116,445	120,441	3.43	1,265	1,246	-1.50	42,622
Hammond	13.3	77,136	78,489	1.75	931	859	-7.73	50,774
Fort Wayne	14.3	253,194	260,893	3.04	2,026	1,997	-1.43	48,651
Indianapolis	15.7	796,611	848,762	6.55	15,901	14,462	-9.05	42,700
Mishawaka	16.1	49,549	48,189	-2.74	570	527	-7.54	46,388
Richmond	16.4	36,884	36,032	-2.31	545	512	-6.06	40,929
Kokomo	16.8	45,866	58,112	26.70	545	454	-16.70	47,433
Jeffersonville	17.7	31,649	46,330	46.39	254	352	38.58	52,050
Noblesville	18.0	41,504	57,523	38.60	383	361	-5.74	89,861
East Chicago	20.9	30,137	29,007	-3.75	875	706	-19.31	50,774
Logansport	25.4	18,657	17,990	-3.58	257	239	-7.00	44,430
Elkhart	29.4	52,805	52,049	-1.43	588	570	-3.06	50,192
Terre Haute	31.7	59,716	60,948	2.06	609	567	-6.90	41,260
Anderson	34.8	57,003	55,450	-2.72	777	631	-18.79	44,730
Gary	38.1	96,383	77,955	-19.12	1,444	1,148	-20.50	50,774
South Bend	38.8	104,357	101,266	-2.96	1,288	1,259	-2.25	46,388
Muncie	42.4	67,899	69,700	2.65	592	533	-9.97	39,449
Mean	16.8%	85,236	90,972	8.56	1,187	1,111	-0.17	53,217
Std Dev	0.12	146,974	155,937	15.21	2,917	2,648	14.97	14,568
Min	0.7%	4,781	4,968	-19.12	64	81	-20.50	39,449
Max	42.4%	796,611	848,762	46.39	15,901	14,462	38.58	89,861

Table 2. Variable Definitions, Sources and Descriptive Statistics

Notes: All dollar values are adjusted for inflation (to 2014 purchasing power) using the CPI. *Per capita values were used in regression models.

Variable (Source)	Mean	Median	Std. Dev.	Min	Max	Obs.
Certified Budget (\$ Real thou) (DLGF)	54,164	48,195	37,280	5,479	183,376	215
Certified Budget per capita (\$ Real)	915	902	383	42	2,662	215
Total full-time equivalent employment (COG-E)	1,133	567	2,530	64	15,901	215
Total full-time equivalent employment per thousand population*	12.42	10.63	7.42	4.50	42.16	215
Financial administration full-time equivalent employment (COG-E)	21.87	10.00	59.87	3	545	215
Financial administration full-time equivalent employment per thousand population*	0.25	0.21	0.16	0.06	1.17	215
Other government administration full-time equivalent employment (COG-E)	36.66	24.00	62.34	0	499	215
Other government administration full-time equivalent employment per thousand population*	0.55	0.42	0.47	0	3.14	215
Fire full-time equivalent employment (COG-E)	161.86	110.00	201.21	8	1276.0	215
Fire full-time equivalent employment per thousand population*	2.15	2.18	0.62	0.71	4.57	215
Police full-time equivalent employment (COG-E)	233.18	123.00	469.84	17.00	3,276	215
Police full-time equivalent employment per thousand population*	2.54	2.36	0.96	1.08	6.14	215
Highway full-time equivalent employment (COG-E)	48.06	34.00	57.17	4	430	215
Highway full-time equivalent employment per thousand population*	0.71	0.69	0.35	0.09	3.02	215
Parks and Recreation full-time equivalent employment (COG-E)	60.52	30.00	87.61	0	641	215
Parks and Recreation full-time equivalent employment per thousand population*	0.75	0.66	0.53	0	2.92	215
Land Area (sq miles) (Census)**	43.99	27.41	67.83	8.68	361.61	200
Land Area per thousand population*	0.49	0.46	0.13	0.28	0.93	200
Tax Cap revenue loss (\$ Real thou) (COG-F)	3,634	739	6,424	0	34,739	215
Population (ACS)	90,075	55,450	151,715	4,769	848,762	215
Certified Net Assessed Value (\$ Real millions) (DLGF)	3,952	2,116	7,303	335	47,524	215
Certified Net Assessed Value per capita (\$ Real)	45,084	39,748	27,181	19,491	313,584	215
Federal Intergovernmental Revenue (\$ Real thou) (COG-F)	6,897	1,796	16,291	0	116,466	215
Federal Intergovernmental Revenue per capita (\$ Real)	70	32	143	0	1,141	215
State Intergovernmental Revenue (\$ Real thou) (COG-F)	38,418	12,215	113,505	657	804,002	215
State Intergovernmental Revenue per capita (\$ Real)	442	216	1,014	61	10,587	215
Median Household Income, county (\$ Real) (SAIPE)	53,751	49,501	14,461	36,310	94,820	215
Poverty Rate, county (SAIPE)	14.50	15.20	5.33	3.90	24.70	215
Recession dummy =1 if at least two quarters of the year were in recession (NBER)	0.23	0	0.42	0	1	215

Sources: COG-E is Census of Governments Individual Unit Employment file. COG-F is Census of Governments Individual Unit Finances file. DLGF is the Indiana Department of Local Government Finance. ACS is the American Community Survey. LSA is the Indiana Legislative Services Agency (Handbook of Taxes, Revenue and Appropriations). SAIPE is Small Area Income and Poverty Estimates. NBER is National Bureau of Economic Research.

**Land area was not available for the smallest municipalities (Lawrenceburg and Danville).

Table 3. Results, Budget model

	Budget per capita
	Coefficient [p-value]
Constant	5797.102 [0.1054]
Population (ln)	-455.0798 [0.1419]
Tax Cap revenue loss per capita	-0.7143*** [0.0056]
Net Assessed Value per capita	0.0002 [0.2671]
Federal Intergovernmental Revenue per capita	-0.0032 [0.9287]
State Intergovernmental Revenue per capita	-0.0178*** [0.0000]
Median Household Income (County)	0.0015 [0.7855]
Poverty rate (County)	0.6595 [0.8279]
Recession Dummy	69.0892*** [0.0032]
Period fixed effects	Yes
Cross-section fixed effects	Yes
Adj. R sq.	0.9111
F-statistic	53.191***
Durbin-Watson Statistic	1.4882
Obs.	215

*** p<0.01, ** p<0.05, * p<0.1

All dollar values are adjusted for inflation.

Standard errors clustered by municipality.

Table 4. Results, Employment models

	Full-time equivalent employment per capita						
	Total	Financial Administra- tion	Other Government Administra- tion	Fire	Police	Highway	Parks and Recreation
	Coefficient [p-value]	Coefficient [p-value]	Coefficient [p-value]	Coefficient [p-value]	Coefficient [p-value]	Coefficient [p-value]	Coefficient [p-value]
Constant	0.0690*** [0.0000]	0.0022 [0.0429]	-0.0037 [0.2394]	0.0141*** [0.0000]	0.0138*** [0.0001]	0.0158 [0.0000]	-0.0021 [0.3615]
Population (ln)	-0.0053*** [0.0000]	-0.0002* [0.0693]	0.0003 [0.2594]	-0.0011*** [0.0000]	-0.0012*** [0.0008]	-0.0013 [0.0000]	0.0002 [0.3176]
Tax Cap revenue loss per capita	-5.89E-06*** [0.0047]	7.43E-08* [0.0779]	-4.10E-08 [0.8375]	-8.91E-07*** [0.0016]	-1.34E-06*** [0.0001]	-4.36E-07*** [0.0051]	-8.81E-07** [0.0175]
Certified Budget per capita	1.79E-06* [0.0502]	1.26E-07*** [0.0078]	9.38E-08 [0.1321]	4.00E-07* [0.0634]	3.42E-07 [0.3108]	3.38E-08 [0.7603]	1.29E-07 [0.1065]
Federal Intergovernmental Revenue per capita	-1.90E-06** [0.0231]	3.19E-08** [0.0298]	1.09E-07 [0.3745]	-4.39E-07*** [0.0049]	2.50E-07 [0.1163]	8.45E-09 [0.8766]	1.17E-07* [0.0841]
State Intergovernmental Revenue per capita	-3.45E-07 [0.1661]	2.07E-09 [0.7101]	-1.38E-07*** [0.0001]	1.71E-07*** [0.0035]	-1.56E-08 [0.4648]	-1.96E-08 [0.6436]	-1.50E-08 [0.4041]
Median Household Income (County)	8.19E-09 [0.8645]	2.68E-09 [0.1953]	8.37E-09 [0.2607]	-4.82E-09 [0.2424]	2.85E-08** [0.0297]	-6.93E-09** [0.0270]	1.50E-08 [0.1115]
Poverty rate (County)	-5.39E-05** [0.0128]	-1.25E-05*** [0.0000]	1.28E-05*** [0.0002]	-1.62E-06 [0.7868]	-2.06E-06 [0.5310]	-8.58E-06 [0.1747]	-3.93E-06 [0.3645]
Recession Dummy	6.93E-05 [0.5820]	-0.0001*** [0.0000]	-0.0002*** [0.0035]	0.0002*** [0.0004]	-9.97E-05* [0.0572]	-1.98E-05 [0.4091]	0.00034*** [0.0031]
Period fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cross-section fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R sq.	0.9758	0.6841	0.8195	0.8016	0.9207	0.6786	0.8326
F-statistic	206.55***	12.0346***	24.138***	21.584***	60.1745***	13.91***	26.3435***
Durbin Watson statistic	1.6587	1.2112	1.5038	1.1092	1.5876	1.4636	2.4124
Obs.	215	215	215	215	215	215	215

*** p<0.01, ** p<0.05, * p<0.1 All dollar values are adjusted for inflation.

Table 5. Results, Land Area Model

	Land Area (per capita)
	Coefficient [p-value]
Constant	0.0025** [0.0133]
Population (ln)	-0.0002** [0.0283]
Tax Cap revenue loss per capita	9.05E-08* [0.0772]
Certified Budget per capita	3.82E-08* [0.0957]
Federal Intergovernmental Revenue per capita	-5.79E-09 [0.5705]
State Intergovernmental Revenue per capita	-9.64E-10 [0.8977]
Median Household Income (County)	9.27E-10 [0.5710]
Poverty rate (County)	9.16E-07 [0.2320]
Recession Dummy	1.12E-05 [0.1286]
Bond Index	
Time trend	
AR(1)	
Period fixed effects	Yes
Cross-section fixed effects	Yes
Adj. R sq.	0.9415
F-statistic	81.1134***
Durbin Watson statistic	1.1525
Obs.	200^

*** p<0.01, ** p<0.05, * p<0.1

All dollar values are adjusted for inflation.

^Land area is not available annually for Lawrenceburg and Danville.

Table 6. Impact of property tax revenue loss due to tax caps in the typical municipality
Mean population = 90,075
Mean circuit breaker credit per capita = \$57.02

Function	Impact	Percent
Certified Budget (million \$)	-3.67	(6.77)
Municipal government employment (FTE)	-30.25	(2.67)
Financial Administration (FTE)	0.38	1.74
Fire (FTE)	-4.58	(2.83)
Police (FTE)	-6.88	(2.95)
Highway (FTE)	-2.24	(3.70)
Parks and recreation (FTE)	-4.52	(9.42)
Land Area (FTE)	0.46	1.06