The Indiana Property Tax Caps

and Their Effect on Local Government Spending

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Introduction

Residents across the state of Indiana were outraged in 2007 when they learned that their property tax bills were significantly higher than expected. A tax revolt erupted, with some citizens going so far as to express their dissent by throwing a giant tea bag in the White River Canal in Indianapolis (Kirschner, 2007). Governor Mitch Daniels and the Indiana General Assembly responded with a seemingly simple and very appealing solution that was marketed as being "easy as 1,2,3": reckless local governments would be reined in by a state-level policy limiting an individual's total tax bill to a given percentage of his or her property's gross assessed value. The policy was a massive hit with voters, passing with an overwhelming 71% when it was proposed as a constitutional amendment in a 2010 referendum (Bradner, 2010). Since then, the effects of the Indiana property tax caps have proven themselves to be anything but *easy* to reckon with. While the neediest municipalities struggle, it is unclear if the policy has induced the fiscal restraint it promised.

This paper will seek to answer the question: how have the property tax caps affected the spending decisions of local government units in Indiana? The answer to this question could have implications for equity, economic development, and future policy. If the policy has been successful, analysis may find that local governments are responding to the tax caps by eliminating wasteful spending not demanded by the electorate. Otherwise, there may be indications that the property tax caps are leading to negative fiscal outcomes without encouraging restraint.

Background

The sequence of events that led to Indiana's constitutional tax caps started in 1998, when the Indiana Supreme Court overhauled the state's system of property tax assessment. In *State Bd. of Tax Commissioners v. Town of St. John*, the court noted that the true tax value system used by the state, which relied on internal statutory provisions to assess value, lacked "meaningful reference to property wealth… resulting in significant deviations from substantial uniformity and equality." The court mandated that state taxing authorities adopt a system of assessment based on objectively verifiable data ("State Board of Tax Commissioners v. Town of St. John," 1998). Ultimately, market valuation was the chosen method, as it is in all states today. Property assessments would be based on the price a property would theoretically sell for, allowing assessments to be verified by sales data for similar properties.

Between 1998 and 2006, property in the state was periodically reassessed using the new system. It became clear that certain classes of property, such as residential homes, had been underassessed by the old system and would thus see large increases in their tax bills. The state made efforts to lessen the effect of a shock with credits and deductions, but many taxpayers received unexpectedly large property tax bills in 2007 nonetheless. One individual, for example, reported receiving a bill that was 200% higher than before (Huffstutter, 2007). Large, unexpected increases like this caused widespread outrage throughout the state, leading some to call for a complete repeal of the property tax (Deboer, 2015).

The General Assembly responded to calls for reform by restructuring fiscal policy during the 2008 session. As a part of this reform, property tax caps that limited the total allowable tax bill

for a given property to some percentage of the property's gross assessed value (GAV) were implemented in 2009 (Faulk, 2013). After the first year, the General Assembly decreased the caps slightly and then put them to vote in a public referendum. The referendum passed with 71% in favor and 29% against, thereby transforming the caps from an experimental policy into a constitutional provision (Indiana Election Division, 2011).

Thereafter, Article 10, Section 1 of the Indiana Constitution stated that the maximum tax bill on any property cannot exceed one, two, or three percent of that property's GAV, depending on the exact type of property in question. The one percent cap applies to homestead residential properties, the two percent cap applies to "other residential" property (i.e. rental houses and apartments) and farmland, and the three percent cap applies to other real and personal property, including all commercial and industrial parcels (Ind. Const. art. 10, § 1). Since these caps were predicted to cause significant revenue shortfalls, the state concurrently assumed responsibility for several categories of local spending, including school operating costs, child welfare levies, indigent healthcare, and police and fire pensions, among others (Faulk, 2013). The state sales tax was raised by 1 percent to cover these costs.

The imposition of the caps did not change how property tax rates were determined. Local governments are still responsible for setting the levies they need according to their budgets. The amount of the gross levy is divided by the total assessed value in the relevant jurisdiction to get the rate. The rates of all overlapping units are aggregated to get the district rate for a given property. If this rate results in the bill going over the cap, revenues and losses are apportioned to each government unit proportionally based on their share of the overall rate. The lack of

coordination means these revenues and losses are unknowable prior to being realized and consequently must come directly out of the budget a government unit has already planned. As such, losses to the property tax caps are “structural deficits” for local governments (Ross, Farrell, & Yang, 2015).

While the state has taken responsibility for certain expenses that were previously covered by local units, many counties and school districts are clearly under fiscal stress. For example, in Madison County, 36 percent of the gross property tax levy was lost to the caps in 2012 (Faulk, 2013). Since that time, the situation has not improved by much. In 2018, units in the county collectively lost $40 million, with many units receiving only around half of their budgeted levy (Department of Local Government Finance, 2018).

Literature Review

This section will outline the main findings in the national public financial literature about policies like the Indiana property tax caps. It will then detail the findings of the small body of literature focused specifically on Indiana’s policy.

The Indiana property tax caps are a form of what is referred to in the national literature as a Tax and Expenditure Limit (TEL). Forty-three states have some sort of property tax limitation in place. Revenue and tax rate limits are the two most common forms of property tax TELs. The third most common are limitations on the increase in taxable assessed value of a property (Anderson, 2006).

However, in general, TELs are not necessarily effective at limiting government spending. Instead, they may encourage a shift in the financial strategy of the government units affected by the policy. When a certain type of revenue is limited, government units will attempt to replace the lost earnings using other methods at their disposal. Increases in fees and other "miscellaneous revenues" have been observed as an especially popular replacement mechanism (Jung & Bae, 2010; Kousser, McCubbins, & Moule, 2008; Shadbegian, 1999), though sales tax increases may also be enacted (Sun, 2012; Wang, 2018).

Because there are often multiple revenue-replacement options open to governments, the ability of a TEL to limit spending is contingent on local circumstances. Overall, TELs seem to be effective constraints only when they have the will of the electorate, local public servants, or both behind them. Since voters generally prioritize low taxes more than bureaucrats, counties with elected officials have been observed to have lower tax burdens after the enactment of a TEL, while counties with hired administrators saw their tax bills either remain the same or increase (Maher, Deller, & Amiel, 2011). Similarly, the origin and perceived legitimacy of a TEL may be critical to its effectiveness. "Bottom-up" TELs passed by citizen initiative have been shown to be more effective at limiting spending than "top-down" TELs enacted by state legislatures (New, 2010).

TELs change the relationship between state and local governments, increasing the reliance of the latter on aid from the former (Joyce & Mullins, 1991; Skidmore, 1999). TELs have also been shown to have negative effects on government performance. For example, the performance of public school students in California declined in the long-run after the implementation of a TEL,

indicating a reduction in the quality of local public services (Downes & Figlio, 1999). Even more concerning, the negative effects of TELs are disproportionately distributed: government units in urban areas with large at-risk and vulnerable populations are generally harmed more by the policies (Mullins, 2004).

A common argument in support of TELs is that the lower taxes they supposedly bring will bolster economic growth, but this claim has not been supported in the literature. In fact, TELs have been shown to have a dampening effect on economic growth, especially when they are strongly enforced (Deller, Stallmann, & Amiel, 2012). More specifically, the data show that TELs have a null effect on personal income per capita in a state while negatively affecting the level of employment (Bae, Moon, & Jung, 2012).

Indiana's property tax caps are rather unique and have therefore been examined in their own small body of literature. While the Indiana policy is similar to TELs in Nevada and Oregon, it differs greatly in operation. In Nevada, local government units are forced to cooperate to lower tax rates that are above the state cap. In Oregon, revenue losses are distributed in a system like that of Indiana, but local governments are much more restrained in their ability to raise the tax rate in the first place. Therefore, Indiana's system is unique for the continued freedom of government units to raise rates paired with a lack of enforced cooperation among those units (Ross et al., 2015).

Unfortunately, the Indiana TEL raises the same equity concerns observed in the general literature. Urban counties where there are more overlapping government units have had their

revenues affected more by the property tax caps than rural counties. Aggregate property tax rates in these areas are generally higher than in rural areas where there are: 1) fewer taxing authorities contributing to the rate, and 2) fewer residents demanding services. To demonstrate the effect of overlapping units on the tax rate, take the example of the urban Marion County Tax District 101, in which fourteen independent taxing units contributed to a rate of 2.7908% in 2019. This can be compared to the rural Monroe County Tax District 001, in which five units contributed to the much lower rate of 1.4950%. The higher tax rate in urban areas means more revenue is lost to the caps. City governments and inner-city school districts are the units most affected (Faulk, 2013).

Because of these tendencies, Indiana counties with worse statistical indicators of economic distress have been hit harder by the property tax caps than more affluent counties. Ross and Cheek (2014) studied the impact of the caps and found that counties with lower employment rates, lower median incomes, and higher poverty rates were losing more on average to the property tax caps than more affluent counties. Furthermore, the authors showed that these same counties were spending less and taking out less debt under the strain of the caps. This led to their concern that "local governments with greater citizen needs might be disproportionately affected" by the caps and that these counties may respond to revenue losses with "reductions in services and infrastructure improvements" (Ross & Cheek, 2014, pp. 1-4).

On the taxpayer side, the owners of rental, commercial, and industrial properties have benefitted more than those owning farms or homesteads. Farmland is less likely to benefit from a cap because it is generally in rural districts that maintain a low rate. Homestead properties are unlikely to hit their cap because various exemptions and deductions drive a substantial wedge

between the GAV and the net assessed value [NAV] of homes. Within this category though, the presence of a standard deduction means that higher valued homes have a higher proportion of NAV to GAV and are therefore more likely to receive a tax cut from the caps (Deboer, 2015).

The tax caps alter the incentives of both voters and local policy makers. Taxpayers at their caps have an incentive to vote for increased spending since they will not see any increase in their bill. Furthermore, when a high proportion of taxpayers are at their caps, an increase in rate by one government unit will garner that unit more revenue, but that will be at the direct expense of overlapping units since no new revenue is generated in the process. A "prisoner's dilemma" is therefore created: the best outcome for all the overlapping units is to cooperate and limit rate hikes, but each unit can individually gain by turning on the group and raising their own rate. According to this model, without cooperation mechanisms, governments in Indiana will theoretically try to absorb each other's revenue, creating a collective action problem that has been referred to as "cannibalization" (Ross et al., 2015).

Since there are no limits on the growth of assessed value, the revenue captured can potentially be increased through either economic development or clever assessment techniques (Deboer, 2015; Faulk, 2013; Ross & Cheek, 2014). Local government units in Indiana may therefore be incentivized to make up for revenue losses in ways other than decreasing spending. This is consistent with the general literature on TELs mentioned above, which has found evidence of governments circumventing limits on expenditures.

However, certain Indiana municipalities experiencing large tax cap losses have been shown to respond by decreasing their budgets. Out of twenty-eight cities selected from across the state, Faulk, Taylor, and Schaal (2019) found that eight exhibited nominal budget decreases over the period from 2010 to 2015, with another fifteen experiencing real budget decreases over this time after adjusting for inflation. The authors found a statistically significant, negative relationship between circuit breaker losses and certified budget per capita. Municipalities with the largest circuit breaker losses were generally those with the largest budget decreases. Because of budget decreases, several municipalities were found to have reduced staffing between 2010 and 2015, with reductions to police and fire employment especially concentrated among those with large revenue losses. Eighteen of the twenty-eight municipalities studied increased local income tax (LIT) rates between 2010-2019, perhaps as a revenue replacement measure in response to circuit breaker losses (Faulk et al., 2019).

In summary, the general literature on TELs is often doubtful of the ability of these policies to constrain local spending. Several researchers have found evidence of government units replacing lost revenue through other means (Jung & Bae, 2010; Kousser et al., 2008; Shadbegian, 1999; Sun, 2012; Wang, 2018). Other researchers have noted that the success of a TEL is dependent on whether local citizens and officials agree with the policy (Maher et al., 2011; New, 2010).

Furthermore, when TELs are enforced, research has shown that the results may not be desirable. Consequences of TELs include reductions in the quality of public services (Downes & Figlio, 1999), increased dependence of local governments upon state aid (Joyce & Mullins, 1991; Skidmore, 1999), and decreased economic growth (Bae et al., 2012; Deller et al., 2012). The

negative effects of TELs are not distributed equally, with poor urban areas generally being hit the hardest (Mullins, 2004).

While the specifications of Indiana's property tax caps are unique (Ross et al., 2015), research into their effects has been consistent with findings in the general TEL research. Deboer (2015), Faulk (2013), and Ross et al. (2015) have theorized about the incentives introduced by the caps and the ways in which local governments may potentially avoid decreasing spending. While Faulk et al. (2019) found that a selection of municipalities did actually decrease spending in response to the caps, they also noted that the local governments in question may have found other revenue replacement mechanisms. Like other TELs, the Indiana property tax caps have been shown to adversely affect urban areas (Faulk, 2013; Ross & Cheek, 2014).

Theories of how the Indiana property tax caps might affect local government decisions have been put forward by Deboer (2015), Faulk (2013), and Ross et al. (2015), but there has been little empirical examination of their effects. Ross and Cheek (2014) found evidence of a negative correlation between circuit breaker losses and spending, but only using data for 2012 and 2013. Faulk et al. (2019) similarly found a negative relationship between circuit breaker losses and spending, though their study focused selectively on twenty-eight municipalities.

This thesis sought to add to the relatively small body of quantitative literature on the Indiana property tax caps by using statewide data to answer the question: how do tax cap losses affect the spending decisions of Indiana local governments? The full details of this study's methods,

including further differences that made it a valuable follow-up to Ross and Cheek (2014) and Faulk et al. (2019), will be discussed in the next section.

Methods

This study used a multivariate regression to model the relationship between tax cap losses and local government spending. The model was drawn from county-level panel data for the years from 2010 to 2018 for all but one of Indiana's ninety-two counties. The only exception was La Porte County, for which a lack of reporting meant that data was only available from 2014-2018.

As described by the research question, the main relationship of interest in the model is between the independent variable of tax cap losses and the dependent variable of local government spending decisions. While the independent variable was clearly defined within the data, finding a way to operationalize the concept of local government spending was an initial challenge. Spending could have been represented by a government unit's total annual budget, its gross property tax levy, or actual disbursements of funds, among other possibilities. Ross and Cheek (2014) used adjusted-disbursements as their metric for spending, while Faulk et al. (2019) used certified budget per capita.

For this paper, the gross levy was identified as the most appropriate metric. Using gross levy as the dependent variable allowed a gap in the research to be filled while also remaining logically consistent. The gross levy is the portion of the certified budget that a government unit plans to raise through property taxes. As previously mentioned, it is divided by the net assessed value to set the property tax rate. The circuit breaker losses, which are unfunded credits, and LITs, which

are funded credits, are subtracted from the gross levy to get the net levy, which is what a local government unit actually receives in property taxes. Given that circuit breaker losses are directly tied to the gross levy, one would expect a fiscal response to the policy to be most likely to occur within that metric specifically. A government unit losing part of its planned property tax revenue to the credits may be expected to reduce its gross levy in order lower its rate and reduce unfunded losses. At the same time, as shown by Faulk et al. (2019), they may increase reliance on LITs in order to supplement property tax revenues. Alternatively, government units competing for limited revenue through the process of "cannibalization" may be expected to increase their gross levy in order to secure a greater share for themselves (Ross et al., 2015). All these reactions would occur within the gross levy metric.

The parts of the total certified budget outside of the gross levy are funded by revenues raised from fees, excise taxes, and intergovernmental transfers, among other sources. It is possible that these non-levy revenue streams included in the total certified budget could be affected by the tax caps if local governments found ways to increase them as a source of revenue replacement. However, many of these revenue streams are beyond the control of local governments. Since, as discussed in the preceding paragraph, the tax caps would be expected to have the most immediate and visible effect on gross levies, this was the metric used.

The independent variable, tax cap losses, is a metric published annually. However, the finalized amount of tax cap losses each year is not determined until the final gross levy for that year has already been decided. Therefore, budgeting decisions in a given year are not made with the knowledge of that year's circuit breaker losses. It was therefore assumed that if tax cap losses

had an effect on planned spending, that effect would occur in a fiscal cycle where losses were clear and could be acted upon. A lag of one year was applied to the tax cap losses variable to account for the information delay. This meant that tax cap losses for 2010 were included as an independent variable where the dependent variable was the gross levy for 2011. This approach was a key difference from Faulk et al. (2019), in which the model included tax cap losses and budget information from the same year.

Changes in net assessed value and income per capita were controlled for by including these figures as independent variables within the model. Data on county-level income per capita were downloaded directly from the Stats Indiana database, which is operated by the Indiana Business Research Center at the IU Kelley School of Business. To control for population, the local fiscal data (gross levy, tax cap losses, and net assessed value) were also scaled to be per capita. Adjusting the data to be per capita also kept the study consistent with the methods used by Faulk et al. (2019) in order to allow for more appropriate comparisons between results. The per capita scaling was done by dividing each county-level financial figure by an estimate of that county's population. The estimates of the population for each Indiana County for the years 2010 to 2018 were downloaded from a public database made available by the U.S. Census Bureau, Population Division.

Data on gross levy, tax cap losses, and net assessed value were collected from the "Property Tax" section of the *Indiana Handbook of Taxes, Revenues, and Appropriations.* This publication is produced annually and published online by the Indiana Legislative Services Agency. In the Handbook, data are listed by county. The figures do not simply indicate the county government's

data but are a summation of the data for all taxing units in that county. So, for example, the St. Joseph County data for 2010 include the totals for the county government, South Bend city government, Mishawaka city government, St. Joseph County Public Library, Penn-Harris-Madison School corporation, and several more local taxing units.

The year 2010 was used as the starting period since this was the first year that the Indiana tax caps went into operation in their current form. The year 2018 was the last year for which data was available at the time of analysis.

All dollar values (gross levy, net assessed value, tax cap losses, and income per capita) were adjusted for inflation using the *U.S. City Average, All Items* Consumer Price Index (CPI) published by the U.S. Bureau of Labor Statistics. The yearly average CPI for each year from 2010-2018 was used. All figures used in the regression model were expressed in 2018 dollars.

The final regression model is presented below:

$$GrossLevyPC_{it} = \beta_0 + \alpha_i + \beta_1 TaxCapLossesPC_{it-1} + \gamma_2 AssessedValuePC_{it} + \gamma_3 IncomePC_{it} + \varepsilon_{it}$$

The letters "PC" after each variable mean "per capita." All units were kept at their original scales. The log-log form of the model was used. The time-invariant differences among counties were controlled for by using fixed effects. The data were balanced; as previously mentioned, La Porte County was the only panel missing data. Robust standard errors were used to correct for heteroskedasticity in the data.

Building on the work of Faulk et al. (2019), it was hypothesized that a negative relationship would exist between *TaxCapLossesPC* and *GrossLevyPC*. If the tax caps are working as

expected, then an increase in *TaxCapLossesPC* in one year would be expected to lead to a decrease in the *GrossLevyPC* in the next year. This relationship would be indicated by a negative value for the β_1 coefficient. However, Ross et al. (2015) argue that the relationship could be positive if "cannibalization" occurs, whereby local governments are strategically increasing their levies to get a larger share of next year's taxes, or if they are attempting to increase revenues to make up previous years' deficits from the caps.

AssessedValuePC and *IncomePC* are both expected to be positively correlated with *GrossLevyPC*. This hypothesis was built on the expectation that counties with higher property values per capita and more income per capita would also spend more per resident, perhaps as a result of both capacity and voter preferences.

Results

Using the log-log functional form and the robust standard errors, the regression model yielded the results in *Table 1.*

Table 1: Results of Regression

Variable	Regression Coefficient
	Y=*GrossLevyPC*
TaxCapLossesPC	0.0211** (0.0061)
AssessedValuePC	0.2369** (0.0817)
IncomePC	0.2871*** (0.0584)
Constant	1.1823 (0.867)
F-Value	34.41***
R^2	0.9742
N	732

Standard errors in parentheses:

*p<0.05, **p<0.01, ***p<0.001

The regression model indicated evidence of a statistically significant, positive relationship between *TaxCapLossesPC* and *GrossLevyPC* at the α=0.01 level of significance. The β_1=0.0211 value of that coefficient indicates that holding all else constant, a 1% increase in a county's tax cap losses in a given year led to a 0.0211% increase in that county's gross levy in the next year, on average. This result stood in contrast to the expected negative relationship between the two variables if the policy was expected to constrain local governments, and more consistent with the "cannibalization" or perpetual search for recovered revenues.

Evidence of a statistically significant, positive relationship was also found between *AssessedValuePC* and *GrossLevyPC* and between *IncomePC* and *GrossLevyPC*. These relationships matched expectations.

Descriptive statistics for the *GrossLevyPC*, *TaxCapLossesPC*, *AssessedValuePC*, and *IncomePC* variables can be found in *Table 2*.

Variable	**Descriptive Statistic**			
	Mean	Std. Dev	Min.	Max.
GrossLevyPC	$960.93	$220.68	$400.52	$1,684.49
TaxCapLossesPC	$63.69	$68.42	$0	$404.17
AssessedValuePC	$48,735.82	$15,544.71	$26,751.17	$135,431.10
IncomePerCapitaPC	$40,616.79	$6,342.68	$27,777.05	$74,717

Discussion

The statistically significant, positive relationship between *TaxCapLossesPC* and *GrossLevyPC* in the model indicates that the Indiana property tax caps may not encourage reductions in spending. The policy therefore may not be achieving its goal of encouraging fiscal restraint among local government units. Adding this failure to the negative implications that have been observed for equity and service delivery, the policy may have more consequences than benefits for local government finance in Indiana.

The magnitude of the *TaxCapLossesPC* coefficient is small (β_1=0.0211). As such, there is no evidence that tax cap losses encourage a large spending increase in the next year. Instead, government units seem to be holding their gross levies mostly constant in real terms. Some units may slightly increase their levies in response to increased losses, but these effects are likely not widespread. These results are nonetheless important as they indicate that on average, increased property tax caps did not encourage the expected downward trend in planned spending between 2010 and 2018.

This result conflicts with the findings of Faulk et al. (2019), who found that tax cap losses were correlated with nominal or real budget decreases for several Indiana municipalities between the years of 2007 and 2014. The difference in these findings may largely be a result of focus and scope. The Faulk et al. (2019) regression was modeled using data from before the Indiana property tax caps had fully been implemented (2007-2009). Some amount of the negative relationship found could therefore be reflective of the one-time initial budgetary change that may have occurred when the policy first took effect. In addition, the model includes data from only

five years after the caps (2010-2014), meaning that some developing trends may not have been fully captured.

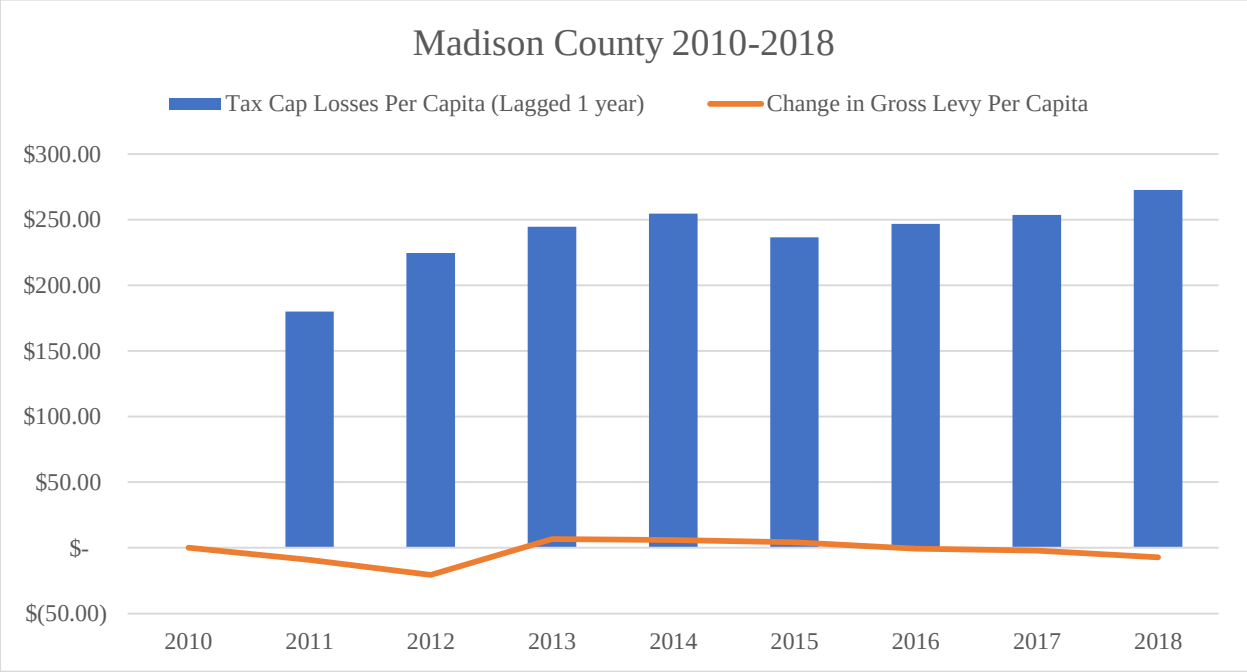
Furthermore, Faulk et al. (2019) focused specifically on twenty-eight of Indiana's largest municipalities. These municipalities are some of the government units that are most affected by circuit breaker losses. Therefore, what is true for those units may not be generalizable to the rest of the county they reside in or to the rest of the state in general.

As previously mentioned, another key difference between this study and Faulk et al. (2019) was the way in which concepts of spending and its relationship to tax cap losses were operationalized. While this study used gross levy per capita as the dependent variable, Faulk et al. (2019) used certified budget per capita. That study also measured the correlation between tax cap losses per capita in a given year (i.e. 2014) and the certified budget per capita in the same year (i.e. 2014). Alternatively, this study introduced a lag to the independent variable of interest in order to measure the correlation between tax cap losses per capita in a given year (i.e. 2014) and the gross levy per capita in the following year (i.e. 2015). Both of these decisions may have led to differences in the final results.

However, even counties with municipalities directly identified by Faulk et al. (2019) as enacting budget decreases in response to tax cap losses do not always seem to do so in a clear cut way when the gross levy per capita is examined. Take for example Madison County, which is the home of Anderson, Indiana. *Figure 1* shows the tax cap losses per capita compared to the change

in the gross levy per capita for the period 2010-2018. The tax cap losses are lagged by one year, meaning that the bar found for 2011 represents the tax cap losses for the year 2010.

Figure 1: Madison County, 2010-2018

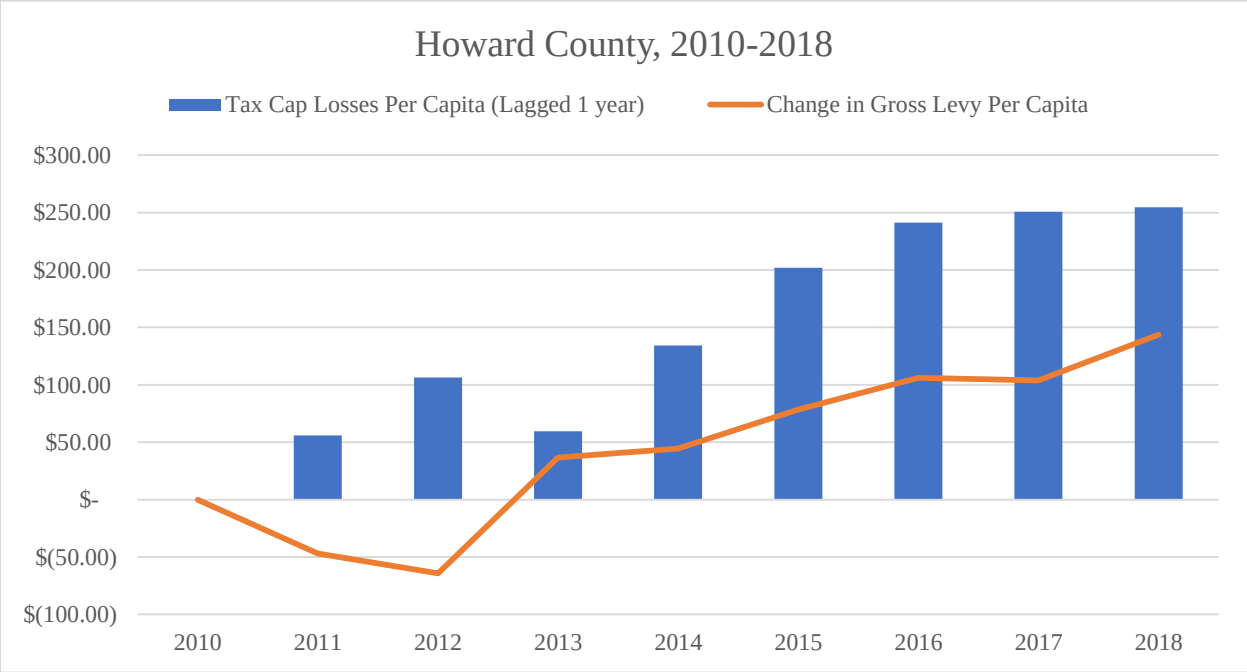


As the graph demonstrates, an increase in tax cap losses from 2010-2017 was correlated with a slight gross levy decrease from 2010-2018 in Madison County. This finding is consistent with the expectations of Faulk et al. (2019). However, the gross levy per capita stayed relatively constant over this period. From 2010-2017, tax cap losses increased from $180.18 to $272.72, a difference of $92.54 per capita. Meanwhile, from 2010-2018 the gross levy decreased from $1,004.86 to $997.69, a difference of only $7.17 per capita that does not even come close to offsetting the increased losses from the tax caps. Furthermore, in 2013, an observed increase in tax cap losses in the previous year was actually correlated with a gross levy increase. Between 2011 and 2012, the tax cap losses for Madison County increased $20.02 per capita. Despite

having the information of the increased 2012 circuit breaker losses to act on in 2013, the gross levy per capita was increased by $27.37 over 2012 levels.

Howard County, which is home to Kokomo, Indiana, shows a more dramatic change. From 2010-2017, tax cap losses increased $198.77 from $55.83 to $254.60 per capita. This was followed by a $143.70 increase in the gross levy per capita, which went from $1,326.60 in 2010 to $1,470.31 in 2018.

Figure 2: Howard County, 2010-2018



At times over this period, the expected negative relationship between the lagged tax caps and the gross levy can be observed. For example, between 2010 and 2011, tax cap losses per capita increased by $50.65 per capita. In response, the 2012 gross levy per capita was $17.43 lower than it had been in 2011. The 2012 tax cap losses per capita were then $47.01 lower than they were in 2011, leading to a $100.96 increase in the gross levy per capita for 2013. After this

massive increase in the gross levy, the negative correlation between the lagged tax cap losses and the gross levy disappeared as increasing losses were followed by increasing or stagnant gross levies. Most dramatically, the tax cap losses per capita increased $67.94 from $135.15 in 2013 to $202.10 in 2014. Local taxing units in the county responded to the elevated 2014 tax cap losses by increasing the gross levy from $1,370.97 per capita in 2014 to $1,405.13 in 2015, an increase of $34.16.

It is unclear how the positive relationship between tax cap losses per capita and gross levy per capita would operate in practice. Ross et al. (2015) refer to tax cap losses as "structural deficits" that a local government unit plans to spend on one thing but that they must ultimately spend on paying a credit to a taxpayer. In the case of Madison County, how would it possible for local government units to lose over 20% of their planned property tax revenues year after year? In a case like Howard County, it is even more confounding that local government units would respond to increased fiscal stress by spending even more.

A theoretical way that local governments may be able to cope with the deficits introduced by the property tax caps is by inflating their budgets beyond what they actually need. If they then suffered tax cap losses, they could essentially "pay" for those credits using the excess money they had asked for. So, for example, if a school district was planning to increase their gross levy by $100 but knew that 20% of whatever they asked for would likely be lost to the tax caps, they could find a way to justify asking for $125 without actually planning to spend the extra $25. Or, they could find $20 in savings among existing spending but choose not to reflect those savings in

their budget. Instead, they could ask for the $100 increase they need and then use the $20 in savings to supplement what is lost to the tax caps.

Several overlapping units could theoretically be artificially inflating their budgets in this way at the same time and without cooperation, thereby causing tax cap losses to be larger than planned for. Such an effect, which would be an extension of the "cannibalization" process defined by Ross et al. (2015), could perhaps cause tax cap deficits to spiral out of control. In this scenario, local government units would artificially raise their budgets in one year based off of previous-year estimates of how much they will lose to the tax caps. However, because many other units are doing this at the same time, the collective losses accrued are actually greater than previous year figures would have indicated. This cycle of "spiraling cannibalization" repeats, and the difference between what the units say they plan to spend and what they actually receive continues to grow.

All budgets and property tax levies in Indiana must be certified by the Department of Local Government Finance, so it does not seem likely that tactics like these could be successful over long periods of time. However, the above phenomenon could be one explanation for the positive relationship between tax cap losses and gross levy per capita that is observed in the regression in general and in Howard County specifically.

Regardless of the explanation for the positive relationship, the finding has concerning implications for equity. Several past studies have detailed the ways in which different jurisdictions and populations are affected by the tax caps. Most notably, Ross and Cheek (2014)

found that the most vulnerable areas of the state were those that were the most affected by the policy. The positive relationship found by this study implies that jurisdictions losing their budget to the caps may get stuck in a cycle of continuously increasing losses, essentially digging themselves into a deeper and deeper deficit. Unfortunately, connecting the findings of this study with the past research could mean that the most vulnerable areas in Indiana may be the most likely to fall into this harmful cycle.

Conclusion

This study found that on average, an increase in tax cap losses per capita in one year is correlated with a slight increase in the gross levy per capita in the next. This finding calls into question the rationale and effectiveness of one of Indiana's signature policies. Instead of encouraging fiscal restraint, it is theorized that the tax caps could actually be causing a self-destructive cycle of budget inflation. This theory is highly speculative, but it builds on past research to explain how the observed positive relationship between tax cap losses and gross levy per capita could exist. Further connections to past research raise concerning implications for equity.

Future research should focus on examining how local government units that are losing significant portions of their planned spending to circuit breaker credits each year are staying afloat. While this study and others have offered theories of the incentives and behaviors of local governments under the caps, no investigation to confirm them has yet been published. Regardless of if the positive coefficient revealed in this study is confirmed by other researchers, it has been widely observed that some units in Indiana are losing 20% or more of their gross levies each year to the tax caps. Data analysis at the fund and expenditure level may show where

cuts and increases are made. Interviews or surveys with local officials may reveal tactics that they use to deal with large losses. They may also indicate any collaboration or lack thereof among taxing units in the creation of budgets.

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