

LOSTs in Translation: Yardstick Competition among Florida Counties

Sarah E. Larson
School of Public Administration
University of Central Florida
4364 Scorpius Street
HPA II, Room 238
Orlando, FL 32816
sarah.larson@ucf.edu

Bruce D. McDonald, III
Department of Public Administration
North Carolina State University
Campus Box 8106
Raleigh, NC 27695
bmcdona@ncsu.edu

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Abstract

Political yardstick competition holds that the fiscal policy decisions within one jurisdiction will be related to the policy decisions of neighboring jurisdictions; the degree to which the interaction between neighboring jurisdictions will occur is based on how sensitive or insensitive the executive is to neighbor jurisdictional changes (Besley & Case, 1995). Local option sales taxation is the second largest revenue source for municipalities throughout the United States. However, the effects of this competition on county local option sales taxes has not been addressed significantly by the research yet to date. Through a spatial analysis of the local option sales tax rates and revenue collections of four different local option sales taxes (Local Government Infrastructure Surtax, Small County Surtax, School Capital Outlay Surtax, and Local Option Tourist Development Surtax) in Florida between 1977 and 2015, this research highlights the rise and fall of yardstick competition among Florida counties for Local Option Tourist Development rates and revenues. The strategic behaviors of Florida counties over the tenure of the various local option sales taxes highlights counties desires to maximize the potential revenue collections in the case of high tax exportation, as well as the ability to use the taxation as a means of revenue diversification.

The Florida Legislature passed legislation in 1978 authorizing the ability of county governments to enact local option sales taxes. On passage, Orange and Volusia counties began collecting the first local option sales taxation in the state at the county level on May 1, 1978. Since that point in time, Florida has adopted nine types of local option sales taxes that can be ratified by counties, the newest of which was approved in 2009. Local option sales taxes can be levied to support a variety of services in Florida counties, including tourist development, infrastructure, and school capital projects. While the majority of these nine local option sales taxes possess an ad valorem rate between 0.5% and 1%, the local option sales tax on tourist development maximum rate is 6%. This study will focus on the four local option sales taxes that have the largest revenue development for counties in Florida.

Yardstick competition can be identified as the belief that agents use the performance of others as a benchmark for their own behaviors and actions (Shleifer, 1985). The impact of yardstick competition on the setting of taxation rates by municipalities has been widely studied within the literature (Allers & Elhorst, 2005; Besley & Case, 1995; Bordignon, et al., 2003). However, the effects of this completion on county local option sales taxes (LOSTs) has not yet been addressed significantly in the research. Florida represents a unique opportunity to test the effects of yardstick competition upon local option sales taxation due to the plethora of LOST options available to local governments in Florida as well as the variation in rate options. Florida counties have the unique opportunity for independence as local government autonomous units through the charter option. Adopted through citizen referendum and often referred to as a “mini-constitution” (McDonald, 2015), charters are formal written documents that grant residents the power of self-governance by conferring powers, duties, and privileges to the government (see

also McDonald & Gabrini, 2014). As an extreme form of home rule, a charter allows the county to adopt a range of LOSTs that are not available to other counties.

Through a spatial analysis of the population of LOST rates and revenue collections in Florida between 1977 and 2015, this research highlights the rise and fall of yardstick competition among Florida counties for Local Option Tourist Development LOST rates and revenues.

Counties are strategically employing the small county surtax to their advantage as a revenue collection option, due to the fact that the state has not updated the definition of a small county. The variation in competition suggests a potential substitution effect of local taxation instrument choices within Florida counties, supporting earlier research by Burge and Piper (2012) and Sjoquist et al (2007). Furthermore, the rise and fall of yardstick competition suggests that other mitigating factors are driving the counties to engage in yardstick competition, such as the maximizing of the rate across by all neighbors in a geographical area for a period of time.

The subsequent sections of the paper will proceed as follows. The next section will provide a review of the relevant literature, focusing on the history of local option sales taxation throughout the United States, the theoretical underpinnings of yardstick competition, horizontal fiscal competition and interdependence as well as other factors that affect the adoption and subsequent changing of a local option sales tax. In the section that follows, the methods employed in the analysis as well as the key independent and dependent variables as well as the data sources will be discussed. Next, a results section will highlight the findings from the spatial analysis on each of the four local option sales taxes within Florida over their respective tenures. Finally, the paper concludes with a discussion of the contribution of the results to the broader literature, as well as a mention of what further questions need to be answered.

Literature Review

Local Option Sales Taxation

Local option sales taxation began in New York City in 1934 (Mikesell, 1971). New Orleans followed in 1936 with a narrow version of a local option sales tax, expanding in 1938 to a fuller version of a tax. The creation of local option sales taxes in New York City and New Orleans were as a product of citizen discord over raising property tax rates due to foreclosures (Howe & Reeb, 1997). States began to adopt local option sales taxes during the post-World War II era of the 1940s and 1950s. The large scale expansion of local option sales taxation as a form of local level revenue collection occurred between the mid-1960s and 1980, fueled by an increase in demand for local services, coupled with a displeasure with the property tax rate and a lack of desire to raise rates at the state level (Mikesell, 1971). By 1994, thirty-three states had authorized the collection of local option sales taxation by their municipalities (Howe & Reeb, 1997).

Local governments have two processes by which they can garner the ability to levy sales taxes. These processes are through state constitution or the adoption of a charter. Traditionally, this authorization came from three different methods: home rule charter (California is an example of a state that authorizes local governments to collect sales taxation through this method), general licensing powers (Alabama authorizes local governments the independent ability to impose license charges, which are also administered at the local level), and specific state legislation (Mississippi requires specific state legislation for the authorization) (Due, 1963).

Currently, local option sales taxation acts as the second largest form of own-source revenue for local governments (Agrawal, 2014). On average, local option sales taxation accounts for 12 percent of local governmental revenues, though wide variation in the dependence on the

tax exists (Mikesell, 2010; Sjoquist & Stoycheva, 2012). Arkansas and Louisiana, for example, depend on the sales tax for about half of their revenue (Fox, 2012). The dependence of governments on local option sales taxes, as measured by the share of local option sales taxation to local government revenue, remained relatively consistent between 1980 and 1993 (Fox, 1997). More recently, local option sales tax rates increased between 2003 and 2011 as a result of increases in the county and municipality sales tax rate. These rates have exceeded changes in state sales tax rates (Agrawal, 2014).

The administration of local option sales taxation falls into three broad categories: state administered, locally administered, and both state and locally administered (Due & Mikesell, 1994). Administration at the local level of the local option sales tax increases the administrative complexity, as multiple levels of governments are collected consumption based taxation in tandem. Despite the administrative complexity, states that historically allowed for the local administration of the taxation are likely to continue this practice due to a desire to preserve local autonomy (Due & Mikesell, 1983).

Florida represents a unique case in the administrative difficulties associated with collection of sales taxation at the state and local level. In 1989, Florida created its Certified Audit Program as a public/private partnership with the state's accounting association to allow private certified public accountants to perform taxpayer compliance audits (Birch, 1997; Florida Department of Revenue, 2017). The state of Florida lauded the "net profit" of the program for the state, but the program possesses a potential conflict of interests. While the certified public accountants are prohibited from performing audits on tax returns they prepared, larger firms are not prohibited from representing an audited taxpayer after their contracted initial audit is

completed (Birch, 1997). The unusual audit process within the state makes Florida an interesting case study for local option sales taxation.

Yardstick Competition

Yardstick competition is the belief that agents use the performance of others as a benchmark for their own behavior and actions (Shleifer, 1985). This can be seen in the behavior of individuals, organizations, and local governments as they look to their peers for an identification of appropriate behaviors and actions. The presence of yardstick competition is especially relevant in the case of franchised monopolies because these organizations have minimal incentives to reduce costs. Shleifer (1985) holds that in the presence of yardstick competition among franchised monopolies, the firms will choose a socially efficient level of cost reduction, i.e. the process of cost reduction is optimal if the cost reduction amount is similar to peer firms. Within yardstick competition the perceived performance of peer institutions is seen as a benchmark of behavior for the institution in question.

The theoretical model of yardstick competition has been applied towards the political sphere by Salmon (1987) and further defined by Besley and Case (1995). The political yardstick competition theory suggests that in the case of fiscal policy the policy decisions within one jurisdiction will be related to the policy decisions of neighboring jurisdictions. Under political yardstick competition, the degree to which the interaction between neighboring jurisdictions will occur is based on how sensitive or insensitive the executive is to neighbor jurisdictional changes (Besley & Case, 1995). In cases of extremely sensitive local government executives, one should expect to see mirroring in local governmental fiscal behavior, such as tax rate setting and local governmental spending.

Political yardstick competition depends on an information asymmetry of the voting public, specifically that voters do not know specifically what level of public services a certain level of taxation affords local citizens (Besley & Case, 1995). In the case of the information asymmetry, the voting public rely on the information regarding the performance of surrounding municipalities to judge the executives within their own municipality (Wrede 2001); tax rate differentials and expenditure differentials in neighboring municipalities are easy for citizens to identify through cheaper prices at the register at the grocery store or cleaner streets in the neighboring community. Under political yardstick competition, municipal executives are able to delineate independent policies in two cases: term limits and confidence in reelection (Besley & Case, 1995).

Yardstick competition has been tested widely in the literature to explain tax rate setting behavior in Europe. Elhorst and Fréret (2009) find evidence of the behavior in expenditure levels for welfare spending in France between 1992 and 2000. Buettner and von Schwerin (2016) find neighboring municipalities in Germany set identical local business tax rates. Allers and Elhorst also (2005) find evidence of yardstick competition by Dutch municipalities in property tax rate setting. In their findings, a 10 percent higher property tax rate in a neighboring municipality leads to a 3.5 percent higher rate in the municipality in question (Allers & Elhorst, 2005). Bordingnon et. al. (2003) find the presence of yardstick competition in rate setting of local property taxes in Italy in the cases where the mayors were in elections where their reelection was uncertain; yardstick competition in rate setting could not be found in cases where mayors were backed by a large majority of support, suggesting their re-election was not as questionable. Similar findings were also found for Italian municipalities when the data set was expanded over a longer period of time (Padovano & Petrarca, 2014). However, Bosch and Solé-Ollé (2007) find

similar findings for Spanish municipalities, where the electoral effects of property tax increases are conditional on the neighboring jurisdictional tax policy.

Evidence of yardstick competition has also been found to impact rate settings within the United States. Hall and Ross (2010) find the presence of yardstick competition regarding the passage of an income tax to fund school districts in Ohio. Besley and Case (1995) find yardstick competition at the state level between 1960 and 1988.

Yardstick competition as a theoretical underpinning to explain the creation of tax rate as well as the variation of an existing tax policy's rate has been studied throughout the literature. The vast majority of the literature, however, focuses on the use of yardstick competition for property tax rate setting behavior. The extant literature has failed to look at the possibility of its theoretical application towards local option sales tax policy. Rather than focusing on the duration of a tax, what little literature there is has tended to focus on samples from a single year or a small number of years.

Fiscal Competition and Interdependence

A related line of literature to that of yardstick competition is that of horizontal tax competition. Horizontal tax competition occurs when jurisdictions of the same level of government set tax rates competitively in order to attract a mobile tax base (Goodspeed, 1998). Wilson (1986) defines tax competition as, "a situation where public service outputs and tax rates are 'too low' in the sense that a federal government could raise the nation's welfare by requiring each region to increase its public service output" (p. 297). This forced rise in public service outputs could be seen as requiring the tax rate to be raised.

In the case of local option sales taxation, horizontal tax competition occurs when localities are setting rates slightly lower than their neighboring jurisdictions in hope of encouraging a mobile tax base to shop within their locality. Efficiency problems within tax competition highlight the potential for less than optimal levels of local services; local officials may hold spending below the levels where marginal benefits are equal to marginal costs in an attempt to keep tax rates low to attract business investment (Oates, 1972, Wilson, 1999). Therefore, the potential wasteful nature of horizontal tax competition must be determined.

For horizontal tax competition to occur, the substitutability of the good must be high (Wilson, 1986). In addition, residents must be freely able to cross borders to purchase the good at the lower tax rate (Kanbur & Keen, 1993; Mintz & Tulken, 2006). Luna (2004) finds in the short term, a change in the local sales tax rate has a statistically significant negative relationship on the sales tax base, suggesting that there is an initial increase in cross-border shopping. Jacobs et al. (2010) find effects of strategic interactions among state governments in their consumption rate setting between 1977 and 2003. Agrawal (2016) expands these findings, suggesting that should a neighboring jurisdiction choose to lower their rate to mirror a lower neighboring jurisdiction, the effects of the tax differential at the border are minimized.

Local option sale taxation rate decisions impact the local jurisdictions own revenue as well as that of competing and neighboring jurisdictions at both higher and lower levels of government. The spillover and tax competition models tend to focus on one tier of government (state, county, or municipality) (see Baicker, 2005; Buettner, 2003; Case et al, 1993; Rork, 2003; Rork & Wagner, 2008). The use of strategic interactions (Jacobs et al, 2010) suggests a level of fiscal interdependence among local taxation rate setting. Burge and Rogers (2011) find that municipal level local option sales tax revenues can be affected by the rate setting decisions of the

counties the municipal governments are located within, as well as nearby regional commerce centers. Therefore, rate setting decisions at the county level do matter for the municipalities within the county, both in rate and revenue collection potential. Beyond the rate setting decisions, vertical and horizontal spillovers play a role in the ability of the strategic interdependence of the local governments. Burge and Piper (2012) find that the ability to engage in tax exportation as well as fiscal stress of the municipality increase the likelihood of local option sales tax adoption within Oklahoma. Finally, the behavior of the neighboring municipality plays a role within fiscal interdependence. Sjoquist et al. (2007) find that as the number of neighboring municipalities in Georgia adopting a local option sales tax increases, the time to adoption to the county falls by approximately two quarters.

Several other factors can affect a local government's decision to enact a local option sales tax, as well as a subsequent change to the rate of taxation. These factors include the desire for the local revenue decentralization (Mu & Rogers, 2004) as well as local revenue diversification (Afonso, 2015). States with local option sales tax policies tend to have increased levels of decentralization as related to local revenue and expenditure share (Mu & Rogers, 2004), but the use of local option sales taxation does increase revenue volatility (Afonso, 2015). Even with increased revenue volatility, local option sales taxation can be used in substitution for property tax revenue (Jung, 2001; Kim et al., 2009). Finally, the potential barriers to adoption of a local option sales tax or rate change must be considered. These barriers include high existing sales tax rates and high tax competition (Zhao, 2005) as well as state maximums (Luna et al., 2007).

Local Option Sales Taxation in Florida

Florida first allowed for the adoption of local option sales taxation within the state with the passage of F.S. 212.055 in 1978. While administered at the county level, a local option sales tax may be enacted in Florida by a local authorization, state authorization, or charter county. The first adoption by counties was Orange and Volusia on May 1, 1978. Since 1978, Florida's legislature has authorized 9 types of local option sales taxes. These are:

- Charter County and Regional Transportation System;
- County Public Hospital;
- Emergency Fire Rescue Services and Facilities;
- Indigent Care and Trauma Center;
- Local Government Infrastructure;
- Local Option Tourist Development;
- School Capital Outlay;
- Small County Surtax; and,
- Voter-approved Indigent Care.

The Emergency Fire Rescue Services and Facilities Surtax, authorized in 2009, is the newest of the taxes and is only available to counties that have not already imposed two separate local option sales taxes. To date, no counties have enacted this form of local option sale taxation. The range of potential rates for the taxes varies between 0.25 percent and 6 percent, with the majority of the local option sales tax rates being capped at 0.5 percent or 1 percent. The local option tourist development represents an outlier in rate range, where the minimum rate is 1 percent and the top rate is 6 percent.

Counties in the United States were historically established as an administrative branch of the state (National Association of Counties, 2008). Out of this tradition, counties continue to provide a wide variety of services but have little autonomy as the basics of their organizational structure, including their tax and revenue policies, are determined by state statute (Benton, 2003, 2012). In Florida, counties have the option of escaping this traditional role with the adoption of a charter (McDonald & Gabrini, 2014). Functionally, a charter is a legal document that is

equivalent to a constitution for the county. It bestows the authority of self-governance by conferring certain privileges and powers, as well as duties, onto the county (McDonald, 2015). Among the privileges granted is some freedom in choosing what taxes are adopted and what rates may be applied. In 1957, Dade County became the first to adopt a charter with Duval following suit in 1968. Currently, 20 of Florida's 67 counties (about 30%) have adopted a charter. A map of Florida with the current charter counties can be found in Figure 1.

[Figure 1 about here]

This research focuses on the four local option sales taxation methods with the largest revenue collection: Local Government Infrastructure Surtax, Small County Surtax, School Capital Outlay Surtax, and the Local Option Tourist Development Surtax. The Local Government Infrastructure Surtax (LGIS) was authorized by Section 212.055(2) of the Florida Statute. The LGIS can be used to finance, plan, and construct infrastructure, or for the acquisition of public land for recreation, conservation, or natural resource preservation. LGIS can also be used to provide loans, grants or rebates to residential or commercial property owners who make energy efficient improvements or for the financing of the closure of a solid waste landfill. While all 67 counties in Florida are eligible to levy the LGIS, only 17 (25.4%) have done so. In total, the tax brought in \$650 million in additional revenue in 2015.

The Small County Surtax (SCS) was authorized for any county that had a population of 50,000 or less on April 1, 1992. The population total has not been adjusted for county growth since its authorization, allowing many of the 31 counties that are eligible for the levy to have populations that exceed the 50,000. The use of the revenue of the SCS is broad in nature as local governments can use the proceeds for any public purpose authorized in the local authorizing ordinance. As of 2015, 29 counties (94%) levy the tax, raising a total of \$80 million in revenue.

The School Capital Outlay Surtax (SCOS) allows for school districts in the state, which are located at the county level, to levy the tax for the construction, reconstruction or improvements of school facilities. In 2015, 15 counties (about 22.4%) were actively levying the SCOS at that time, raising \$362 million.

The Local Option Tourist Development (LOTD) allows for the levying of an additional sales tax on leases such as apartments, condominiums or time shares and rentals such as hotels, motels, mobile home parks and RV parks, as long as the terms of occupation are six months or less. The revenues from the LOTD can be used for capital construction of tourist-related facilities, tourist promotion, and beach and other shoreline maintenance. The rate structure for LOTD is tiered in nature and depends on the local governing board of the tax, often an economic development office. Rate increases can be justified for the promotion of tourism within the state, as well as nationally and internationally, and for the reconstruction of a professional sports facility. High tourism counties, defined as counties that exceed \$600 million in sales taxes from tourism, are eligible for an additional one percent rate increase.

Florida represents a unique case study on the potential impacts of yardstick competition upon local option sales taxes adoption and subsequent rate adjustments for a number of reasons. First, there is a literature that argues that Florida provides a reasonable representation of the demographic and economic makeup of the United States, making it uniquely suited for studying the impact of financial and tax policies (see Eger, McDonald, & Miller, 2017; McDonald, 2015; Arapis & Reitano, 2016). Second, the presence of a large number of charter counties within the state of Florida (approximately 30 percent), suggests a larger level of fiscal autonomy at the local level to engage in yardstick competition is present within Florida versus other states within the United States. Finally, Florida local governments obtain a larger than average portion of their

revenue from local option sales taxation, suggesting a desire to compete for revenue among neighboring counties.

Research Question

This research attempts to answer the following research question: does yardstick competition exist among the counties in both adoption and rate selection? Specifically, this research seeks to understand if neighboring counties are following similar adoption and subsequent rate changing strategies for the four local option sales taxation policies (Local Government Infrastructure Surtax, Small County Surtax, School Capital Outlay Surtax, and the Local Option Tourist Development Surtax). It has been suggested in the previous literature that yardstick competition explains the passage of local level forms of revenue based taxation (property and business rates) (see Besley & Case, 1995; Bosch & Solé-Ollé, 2007; Buettner & von Schwerin, 2016; Padovano & Petrarca, 2013).

Data

The data for this research comes from a variety of state and local Florida agencies. In total, our county wide panel contains 67 counties from the years 1977-2015. This panel is a complete coverage over the time frame in question, as we have data from all counties from a year prior to the passage of the authorization legislation for the first local optional sales tax legislation to present. Therefore, selection issues should not be present within the complete panel.

To understand the timing of adoption and subsequent rate changes by Florida counties of the four local option sales taxes (Local Government Infrastructure Surtax, Small County Surtax, School Capital Outlay Surtax, and the Local Option Tourist Development Surtax), historical rate

data was obtained from the Florida Department of Revenue. Often times the date of the rate change or adoption was not January 1st of that year, suggesting that the rate was only in effect for some subsection of the year. To adjust for these subset of a year collections, the number of days that the rate was in effect for the calendar year was calculated. That percentage of a year was multiplied by the rate to allow for a weighted rate for a portion of the year. As the data set is over 30 years, several leap years were a part of the data set; the additional day of potential revenue collection was included within the partial year calculations.

As the analysis is being done at the county level, municipal level local option sales tax adoptions that did affect the entire county were not included within the data set. Within the four local option sales taxes included within the study, the only local option sales tax that had municipal level collections was the Local Option Tourist Development Surtax. Only a select number of municipalities are able to levy the Local Option Tourist Development Surtax¹ separate from the parent county; therefore countywide dates of adoption and rate levels were used within the analysis. Over the entire course of the adoption and subsequent rate changes, municipality and county differences occurred within two counties (Monroe and Miami-Dade) and the rates were uniform countywide within the calendar year. Therefore, *Local Government Infrastructure Surtax*, *Small County Surtax*, *School Capital Outlay Surtax*, and *Local Option Tourist Development Surtax*, each independently refer to a tax rate for a given year for a given county. These values are in percentage terms between 0 and 6 percent.

As explained previously, charter counties within the state of Florida have some freedom in choosing what taxes are adopted and what rates may be applied. Therefore, *charter* represents a dummy variable indicating if a county had adopted a particular charter for a given year. Within

¹ Both the City of Key West and Monroe County adopted the Local Option Tourist Development Surtax in the same year; Key West, however, adopted the rate changes earlier in the year than the county. The county dates for both adoption and subsequent rate changes were used within the analysis.

the data set, once a county had adopted a charter, the county remained a charter county for the remainder of the tenure of the study. Data on charter adoption is from the Florida Association of Counties.

Local option sales taxation adoption and subsequent rate changes depend on the overall fiscal health of the municipality. Therefore, general independent variables for the overall fiscal health were considered at the county level for all four local option sales taxes. The four overall fiscal health measures of the county for a particular year are sales tax reliance, expenditure per capita, unemployment rate, and personal income per capita. *Sales tax reliance* is the percentage of total county revenue for a given year that is obtained from sales taxation. *Expenditure per capita* represents the total county expenditures for a given year per individual in the county. Data on a county's revenue and expenditures were obtained from the Florida Department of Financial Services and the population data for each county for each year is from the Florida Demographic Estimating Conference. *Unemployment rate* is the unemployment rate of the county labor force and was obtained from the Bureau of Economic and Business Research (BEBR) at the University of Florida. Finally, *personal income per capita* comes from the Regional Economic Accounts, U.S. Bureau of Economic Analysis.

Next, we turn our attention to the measurement of the control variables included in the study, beginning with our controls for tourism. The control variables for tourism were only included in the analysis of the Local Option Tourism Development Surtax, as the base of the tax is directly impacted by the leisure industry. The Local Option Tourism Development Surtax is levied on the rentals of hotels and motels. Therefore, the impact of tourism is captured in the availability of hotels and motels within a county. *Hotels* refers to the number of licensed hotels in the county and *hotel rooms* accounts for the total number of hotel rooms available across all

hotels. Similarly, *motels* refers to the number of licensed motels in the county and *motel rooms* accounts for the total number of motel rooms available across all motels. Data on hotels and motels are from BEBR.

Revenue from the School Capital Outlay Surtax are used by counties to fund construction, reconstruction or improvements to school facilities. Part of the demand for new school facilities is increasing enrollment, as well as the racial makeup of the enrollment (Lee, Ready, & Welner, 2002). We also account for educational demands within the county, as captured in data on student enrollment by race. *Total enrollment* captures the total student enrollment in public schools from pre-kindergarten through 12th grade. The remaining variables on school enrollment (*school white*, *school black*, *school Hispanic*, *school Asian*, and *school native American*), capture the demographics share of the total enrollment where each demographic is defined according to the traditional Census categorization. Data on school enrollments were collected from the BEBR.

While revenues from the Local Government Infrastructure Surtax can be used for a variety of reasons, the vast majority of the reasons is for the planning, financing, and construction of infrastructure. One of the drivers of infrastructure is population growth and change (Duranton & Puga, 2014). To capture county growth, we rely on the total *number of building permits* issued for both the construction of new single family and multi-family housing units. Data on the number of permits issued by a county is from the BEBR.

Considering the Small County Surtax, revenues from the local option sales tax can be used for any public purpose authorized in the local authorization ordinance. Therefore, the only control variable included within the analysis was the *population* of the county for a given year. Again, the population data for each county for each year is from the Florida Demographic Estimating Conference.

Methodology

As the research question suggests, yardstick competition should explain the passage and subsequent rate changing of four local option sales tax policies within Florida. Traditionally, a Cox (1972) proportional hazard model would be employed to understand the time to passage of the law. However, a spatial lag is necessary to account for two characteristics: the spatial nature of the yardstick competition and the issue of time to implementation often found within yardstick competition (i.e., the neighbor needs to view the change in fiscal policy prior to altering its own fiscal policy to mirror its neighbor).

Recent literature has adopted forms of a spatial lagged model (Revelli, 2006; Sollé-Ollé, 2003). Traditionally, these spatial lagged models have fallen into three different categories: two-equation spatial lag model, cross products spatial lag model, and two regime spatial lag model. These three methods all possess strengths and weaknesses on three different characteristics key to the fit of the model: the ability to control for fixed effects, the restriction of the Jacobian term in the log-likelihood function of the maximum likelihood estimates, and the ability to control for simultaneity bias in the dependent and independent variables. However, the largest shortcoming of the previous spatial models is the dependence on an instrumental variable in the analysis. The estimators created by instrumental variables during a two-equation or cross-product spatial lag models can be influenced by the possibility of a faulty instrument being selected; a poor instrument has some independent association with the dependent variables or does not clearly predict the underlying factor.

To overcome the issues outlined above, a spatial Durbin model is employed in this analysis. The selection of this methodology allows for the inclusion of a spatially lagged dependent variable, spatially lagged independent variables, and a spatially autocorrelated error

term simultaneously. Lagging adoption and subsequent rate changes of local option sales taxes allows for the observation by the neighboring municipalities of the effects of the adoption and yardstick competition response. Many of the independent variables measure the overall fiscal health of the municipality. Variables such as these are typically lagged as well to allow for governmental change. Finally, a spatially autocorrelated error term makes sense in the case of local option sales tax implementation.

Mathematically, the model is explained as:

$$y_{it} = \delta_1 d_{it} \sum_{j=1}^N w_{it} y_{jt} + \alpha + X_{it} \beta + \sum_{j=1}^N w_{it} X_{jt} \theta + \mu_i + \lambda_t + \varepsilon_{it}$$

where i is an index for the cross-sectional dimension (counties), with $i=1, \dots, N$; and t is an index for the time dimension (years). The dependent variable, the four local option sales taxes, are represented by the y_{it} , suggesting observations for each county at each year. The independent variables are referenced through a matrix, X_{it} . The binary variable, d_{it} , indicates if the county is a charter county at that particular point in time. The interaction effects of the adoption or rate upon neighboring counties is represented through $d_{it} \sum_{j=1}^N w_{it} y_{jt}$. The value w_{it} , represents the element of the spatial weighting matrix that describes each particular county. The final values in the equation, μ_i , λ_t , and ε_{it} represent the spatial fixed effects, the time fixed effects, and the error term.

Separate models were run for each of the four local option sales taxes within the study as the assumption was made that the yardstick competition was in relation to adoption of the same local option sales tax legislation as a neighboring county, not simply the adoption of any form of sales taxation. The focus of the taxes and what the money can be used for are inherently different and a combined consideration would miss out on the detail by assuming that they are all equal.

Results

A short description of all of the variables included within the four equations can be found in Table 1, and the summary statistics can be found within Table 2. As seen from Table 2, the average Local Government Infrastructure Surtax was 0.2 percent with a minimum of 0 percent and a maximum of 1 percent. The average Small County Surtax rate was 0.18 percent with the same minimum and maximums as the Local Government Infrastructure Surtax. In contrast, the average school capital outlay was 0.04 percent suggesting that for the entire tenure of the study, only a small portion of the counties had enacted this local option sales tax. Finally, the average local option tourist development surtax was 1.66 percent; the minimum rate for adoption is 1 percent, suggesting that a large proportion of the counties had adopted this local option sales tax.

[Table 1 about here]

[Table 2 about here]

Turning to the results of the spatial Durbin models found in Table 3, testing the overall null hypothesis that the spatial fixed effects are not jointly significant, the likelihood ratio test suggest that for all four local option sales taxes the null hypothesis can be rejected (all have 66 degrees of freedom). The Log L for all four equations (2405.84, 1304.76, 987.52, and 1264.11) all result in p-values smaller than 0.001. Similar testing was done on all four models with regards to the time-period fixed effects to identify if the time period fixed effects for each model are jointly significant with p-values in all four cases smaller than 0.001. The results of these two tests suggests that the spatial Durbin model with spatial and time fixed effects is justified as a modeling method.

[Table 3 about here]

Looking at the results of the spatial Durbin model with respect to the Local Government Infrastructure Surtax, several of the independent as well as control variables were statistically significant. Expenditures per capital as well as unemployment rate both had a positive effect upon the adoption of the local government infrastructure surtax. In addition, the number of building permits, combining permit for single family and multi-family dwellings was positively related towards the local government infrastructure surtax. Evidence of yardstick competition was also found in the case of the local government infrastructure surtax, but the results suggested a reduction of the rate, opposite to what previous literature predicted. Should a neighboring county increase their building permits by one, the rate of the local government infrastructure surtax should go down in the county in question by 0.533 percent, holding all else equal. In addition, should neighboring counties be charter counties, the rate of the local government infrastructure surtax of the county in question goes down by 0.497 percent, holding all else equal. The negative coefficients of the statistically significant neighbor variables suggests a negative effect upon the adoption and rate setting of the local government infrastructure surtax for the county in question.

Turning to the results for the Small County Surtax, a vast majority of the independent and control variables were insignificant. The control variable of population was marginally significant in predicting the adoption of and subsequent rate change of the tax for each individual county in question, but not statistically significant when looking at neighbor effects. This suggests that the population of an individual county mattered, but not of neighboring counties. The lack of yardstick competition could be explained by the static population requirement within the law (50,000 or less individuals as of April 1, 1992). Therefore, even if a neighboring county wanted to adopt the small county surtax, the county would be prohibited due to the static

population requirement. Analysis of the counties that actively collect the Small County Surtax in 2015, the final year in this research, shows that several counties are collecting the tax far exceed the 50,000 population upper bounds. For example, both Sumter and Flagler counties have populations of more than 100,000 as of 2015 and collect the Small County Surtax. Similar to the case of the local government infrastructure surtax, the presence of neighboring charter counties decrease the rate of the Small County Surtax (0.398 percent) holding all else constant. Part of these findings may be due to the flexibility in rate setting of charter counties to go above state maximum rates for local option sales taxes. Unemployment rate of the individual county as well as the neighboring counties play statistically significant relationships towards the Small County Surtax rate, but in opposite directions; increased unemployment rate of the county in question increases the Small County Surtax rate but increased unemployment in neighboring counties decrease the Small County Surtax rate in the county in question holding all else constant.

For the School Capital Outlay Surtax, many of the independent and control variables were not statistically significant towards explaining the adoption of and subsequent rate change. These finding suggest that other factors explain the adoption and rate of the School Capital Outlay Surtax that are not found currently within the model. The one variable that it is statistically significant, total enrollment, is statistically significant for both the county in question and its neighboring counties. However, similar to the outcome of the unemployment rate in the case of the Small County Surtax, an increase in total enrollment by the county in question and neighboring counties has opposite effects upon the local option sales tax rate. Increased total enrollment in a county increased its School Capital Outlay Surtax rate by 0.892 percent holding all else equal; these findings were marginally statistically significant. In contrast, increases in neighboring counties total student enrollment in public schools from pre-kindergarten through

12th grade lead to a decrease in the School Capital Outlay Surtax rate of the county in question by 0.464 percent, holding all else constant. These findings suggest that total enrollment within the county matters with regards to the adoption of and rate setting of the School Capital Outlay Surtax as well as neighboring counties enrollments do matter for the county in setting of the School Capital Outlay Surtax.

Finally, several independent and control variables were statistically significant in explaining the Local Option Tourist Development local option sales tax. The sales tax reliance of the county as well as of its neighboring counties mattered towards explaining the adoption of the Local Option Tourist Development Surtax as well as the rate set. In both cases, the higher the sales tax reliance, the higher the rate of the Local Option Tourist Development Surtax, holding all else equal. Given a one percent increase in the sales tax reliance of a county, the rate of the Local Option Tourist Development Surtax will increase by 0.245 percent, holding all else equal. For every one percent increase of the neighboring counties sales tax reliance, the county will increase its Local Option Tourist Development Surtax by 0.288 percent. These findings suggest that the Local Option Tourist Development Surtax is a popular revenue mechanism for counties that depend on sales taxation as a main part of their revenue base, or in regions where the sales taxation makes up a larger portion of local government revenue. Being a charter county has a strong statistically significant relationship with lower rates for the Local Option Tourist Development Surtax (0.193 percent). Similarly, neighboring counties being charter counties lowers the Local Option Tourist Development Surtax rate of the county in question by 0.237 percent, holding all else constant. The number of hotels and the total number of hotel rooms within any particular county does not relate to the Local Option Tourist Development Surtax rate, but increases in the number of hotels and the total number of hotel rooms in neighboring counties

does decrease the Local Option Tourist Development Surtax rate by 0.226 and 0.27 percent, respectively. This finding suggests that counties are aware of the stock of taxable rooms in neighboring counties and will set their Local Option Tourist Development Surtax lower to attract additional tourism.

Conclusion and Future Work

In conclusion, mixed results were found regarding the presence of yardstick competition for the four largest, in terms of total revenue collection annually, local option sales taxes in Florida. Evidence of yardstick competition was also found in the case of the Local Government Infrastructure Surtax, Small County Surtax, and the Local Option Tourist Development Surtax. In the case of the Local Option Tourist Development Surtax, sales tax reliance of the county as well as its neighboring counties matter, while the number of building permits predicts rate changes for the Local Government Infrastructure Surtax. Overall, findings suggest that counties are paying attention the behaviors of their neighbors, but the effects of this knowledge lead to different rate setting. In certain cases, the county is mimicking the rate of its neighbor, and in other cases, the county is strategically setting its rate lower to encourage potential business.

This research furthers the yardstick competition literature in two unique ways: the extension of the theory of yardstick competition to another form of municipal taxation, local option sales taxes, and the use of a spatial approach without an instrumental variable. Within yardstick competition the perceived performance of peer institutions is seen as a benchmark of behavior for the institution in question. This suggests that the perceived performance of peer organizations matters for all types of fiscal policy, including local option sales taxation. As municipalities continue to increase their reliance on this form of revenue collection, a better

understanding of the adoption and rate setting of local option sales taxes is critical. The use of instrumental variables has been critiqued within the literature for the assumptions associated with the identification of the instrument, especially the lack of association with the dependent variable but explanation of some underlying trend. Spatial Durbin allows for the inclusion of a spatially lagged dependent variable, spatially lagged independent variables, and a spatially autocorrelated error term simultaneously.

Future work should dive into the timing associated with the counties implementing their rate setting decisions for local option sales taxes. Specifically, future studies should determine the duration of the lag before the yardstick competition behavior occurs. Pinpointing the duration of the lag would aid in a better understanding of yardstick competition. Future work should focus on identifying the drivers of the School Capital Outlay Surtax, as the drivers were not well defined in the model presented in this research. Finally, future work should focus on the concept of peer intuitions within yardstick competition. The tested assumption within the existing literature is that municipalities look at their physical neighboring municipalities as peers; however, local government officials may be using other factors in defining a peer. Understanding how political yardstick competition effects local governments' tax rate setting allows for a better understanding the complexities of municipal fiscal policy.

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Table 1. Variable Descriptions

Name	Description	Source
Local Government Infrastructure Surtax	Rate of local government infrastructure surtax	Florida Department of Revenue
Small County Surtax	Rate of small county surtax	Florida Department of Revenue
School Capital Outlay Surtax	Rate of school capital outlay surtax	Florida Department of Revenue
Local Option Tourist Development Surtax	Rate of local option tourist development surtax	Florida Department of Revenue
Charter	Chartered County	Florida Association of Counties
Sales Tax Reliance	Sales tax revenue as a percentage of total revenue	Florida Department of Financial Services
Expenditure per Capita	Total expenditure per capita	Florida Department of Financial Services
Unemployment Rate	Unemployment rate of the county labor force	Bureau of Economic and Business Research
Personal Income per Capita	Individual income per capita	US Bureau of Economic Analysis
Hotels	The number of licensed hotels	Bureau of Economic and Business Research
Hotel Rooms	The total number of hotel rooms available across all hotels	Bureau of Economic and Business Research
Motels	The number of licensed motels	Bureau of Economic and Business Research
Motel Rooms	The total number of motel rooms available across all motels	Bureau of Economic and Business Research
Total Enrollment	Total student enrollment in public schools from pre-kindergarten through 12th grade	Bureau of Economic and Business Research
School White	White population of public school enrollment	Bureau of Economic and Business Research
School Black	Black population of public school enrollment	Bureau of Economic and Business Research
School Hispanic	Hispanic population of public school enrollment	Bureau of Economic and Business Research
School Asian	Asian population of public school enrollment	Bureau of Economic and Business Research
School Native American	Native American population of public school enrollment	Bureau of Economic and Business Research
Number of Building Permits	Number of single family and multi-family building permits	Bureau of Economic and Business Research
Population	Total county population	Florida Demographic Estimating Conference

Table 2. Summary Statistics

Name	Mean	Standard Deviation	Minimum	Maximum
Local Government Infrastructure Surtax	0.0020	0.0040	0	0.01
Small County Surtax	0.0018	0.0039	0	0.01
School Capital Outlay Surtax	0.0004	0.0014	0	0.01
Local Option Tourist Development Surtax	0.0166	0.0173	0	0.06
Charter	0.1989	0.3992	0	1
Sales Tax Reliance	0.0803	0.0583	0	0.4457
Expenditure per Capita	760.5616	544.9895	56.1563	4,960.3375
Unemployment Rate	0.0658	0.0308	0	0.9
Personal Income per Capita	20,040.8841	12,344.6572	2,836	84,523
Hotels	16.0708	48.0503	0	517
Hotel Rooms	2,280.4498	7,093.8089	0	66,265
Motels	58.9549	92.5766	0	696
Motel Rooms	2,779.1767	4,549.1072	0	59,754
Total Enrollment	31,317.7478	53,487.6812	791	374,806
School White	0.6893	0.2194	0.0324	7.06
School Black	0.2134	0.4301	0.0172	21.74
School Hispanic	0.0853	0.1120	0	0.6912
School Asian	0.0097	0.0094	0	0.0489
School Native American	0.0030	0.0090	0	0.1558
Number of Building Permits	2,042.1577	3,404.0455	0	30,505
Population	210,668.326	364,117.953	3,200	2,653,934

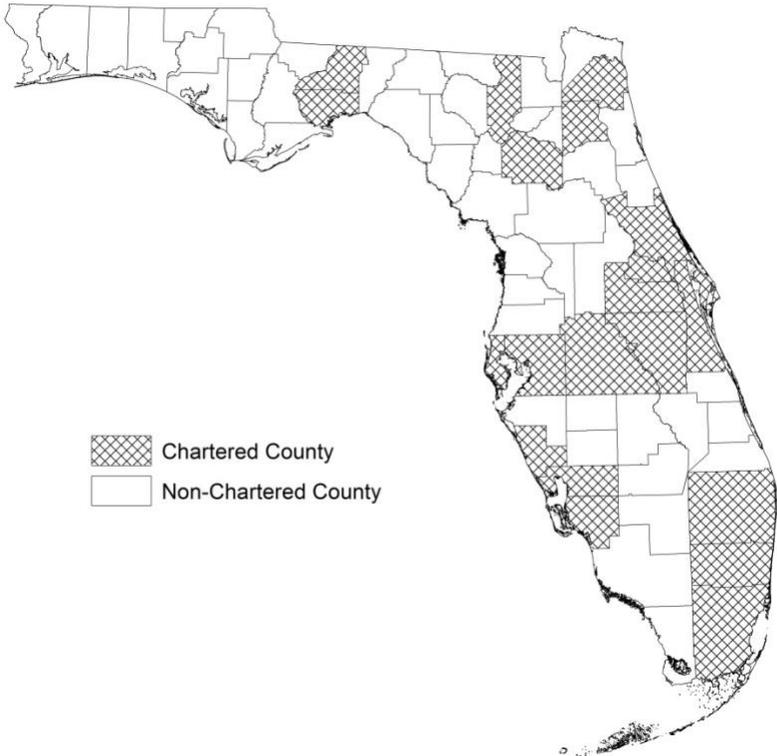
Table 3. Estimation Results

	Local Government Infrastructure Surtax	Small County Surtax	School Capital Outlay	Local Option Tourist Development
Charter	0.071 (1.30)	0.938 (0.10)	0.103 (0.38)	-0.193*** (-7.85)
Sales Tax Reliance	0.064 (0.57)	0.106 (1.21)	0.330 (1.64)	0.245** (5.44)
Expenditure per Capita	0.459** (5.47)	0.407 (0.16)	0.147 (0.71)	0.447 (0.67)
Unemployment Rate	0.340*** (6.02)	0.282* (2.82)	0.631 (0.13)	0.881 (0.40)
Personal Income per Capita	0.004 (0.003)	0.521 (0.53)	0.461 (1.05)	0.113 (0.88)
Hotels				0.107 (1.58)
Hotel Rooms				0.229 (0.47)
Motels				0.078 (0.27)
Motel Rooms				0.469 (1.24)
Total Enrollment			0.892* (2.15)	
School White			0.237 (0.22)	
School Black			-0.717 (1.61)	
School Hispanic			0.12 (0.81)	
School Asian			0.001 (0.03)	
School Native American			-0.003 (0.00)	
Number of Building Permits	0.607* (2.18)			
Population		0.325* (2.80)		
W*Charter	-0.497* (-2.15)	-0.398** (-5.75)	-0.188 (-0.96)	-0.237*** (-9.15)
W*Sales Tax Reliance	-0.190 (-1.69)	-0.242 (-0.86)	-0.71 (-1.12)	0.288*** (11.63)
W*Expenditure per Capita	-0.717** (-5.37)	-0.335 (-1.28)	-0.485 (-0.57)	-0.161 (-1.78)
W*Unemployment Rate	-0.279 (-0.225)	-0.15*** (-8.46)	-0.782 (-0.04)	-0.563 (-0.32)
W*Personal Income per Capita	0.035 (1.14)	-0.794 (-0.08)	-0.18 (-0.52)	-0.172 (-0.75)
W*Hotels				-0.226*** (-8.70)
W*Hotel Rooms				-0.276*** (-11.17)
W*Motels				0.031 (1.11)
W*Motel Rooms				-0.004 (-1.28)
W*Total Enrollment			-0.464** (3.68)	
W*School White			-0.222 (-1.13)	
W*School Black			0.067 (1.21)	
W*School Hispanic			0.453 (1.07)	
W*School Asian			0.214 (1.64)	
W*School Native American			0.472 (0.30)	
W*Number of Building Permits	-0.533*** (-11.78)			
W*Population		1.07 (1.14)		
Spatial FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Log L	2405.84	1304.76	987.52	1264.11
R ²	0.941	0.88	0.67	0.85

Note: t-values are in parentheses

***($p < 0.001$), **($p < 0.01$), *($p < 0.05$)

Figure 1. Chartered Counties in Florida



Source: Florida Association of Counties (2016)

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