POLITICAL ECONOMY

IN THE CAROLINAS

STICKY EXPENDITURES IN LOCAL GOVERNMENTS: EVIDENCE FROM NORTH CAROLINA COUNTIES

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We investigate whether North Carolina county governments exhibit sticky-expense and sticky-expenditure behavior similar to corporations' sticky-cost behavior. We use regressions to investigate the trade-offs governments made among the main areas of public policy. We collect data from the Comprehensive Annual Financial Reports from the forty largest counties by population in North Carolina for the period 2005–14. We find sticky-expense behavior for the business-type activities of North Carolina county governments. We find mixed results for general government services. Education expenditures exhibit stickiness; however, allocational and redistributive expenditures do not. We do not find a link between developmental expenditures and level of revenue or change in revenue. The question of the extent to which these results can be generalized to other local governments and states that experience more or less volatility remains open. Understanding the role of stickiness could help government officials and accountants evaluate expenditure changes in light of changing revenues and help elected officials to more effectively align resources with governments' managerial and political priorities.

JEL CODES:
H71, H72, H75 and H76

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governmental spending, sticky costs, sticky expenses, sticky expenditures, business-type activities, governmental activities, Great Recession

Classical Liberals
THE CAROLINAS

I. INTRODUCTION

The purpose of this study is to gain insight into the spending behavior of North Carolina county governments. The study uses data from the years before, during, and after the Great Recession of 2008–9. The impact of external stimuli on resource-allocation decisions is a central question in the managerial-accounting literature (Balakrishnan et al. 2014).

According to Keynesian economics (Keynes 1936), national governments have a stabilization role and should increase government expenditures and lower taxes to stimulate demand to pull an economy out of a recession. The Economic Stimulus Act of 2008 embodies the stabilization approach taken by the federal government in response to the banking crisis and the Great Recession. This act helped many states to maintain service levels in activities such as education, health, and transportation (Shi 2016). Such countercyclical spending by national governments has been a widely accepted practice (Wang and Hou 2012). Some advocate countercyclical spending at the subnational level as well (Gramlich 1987; Hou and Moynihan 2008). However, at the state and local government levels, countercyclical spending, which includes lowering taxes and increasing governmental expenditures, is much more difficult because of balanced-budget requirements and borrowing limits. Forty-nine of the fifty states have adopted balanced-budget requirements (Joyce 2001). And, over the last fifteen years, county governments have chosen to shift toward reducing expenditures and spending reserves rather than increasing tax rates (Afonso 2013b).

The options available to local governments to address budget shortfalls generally include increasing revenue, reducing expenditures, borrowing money, and using contingency funds (Joyce 2001). Afonso (2014) surveys county commissioners in Georgia and California to identify the mechanisms their counties used to navigate the challenges resulting from the recession. Responses indicated that 88 percent reduced capital programs, 78 percent instituted hiring freezes, 39 percent laid off employees, 18 percent increased current taxes, and 7 percent introduced new taxes.

The sticky-cost concept posits that managers are more likely to increase expenditures in response to an increase in revenue than they are to decrease expenditures when revenues decrease (Anderson et al. 2003). While prior research has addressed the issue of sticky costs in corporations (Anderson et al. 2003; Balakrishnan et al. 2014), no similar research focuses on local governments. In this paper, we look at business-type governmental activities and other governmental activities. The Comprehensive Annual Financial Reports (CAFRs) issued by local governments use the terminology of expenses and expenditures. Hence, we refer to "sticky expenses" and "sticky expenditures" when investigating stickiness in business-type and governmental activities, respectively.

Local governments are sufficiently different from corporations (for example, different management incentives, no profit motive, voter influence, different accounting standards, different role of budgets) that it remains an open question whether and to what extent the sticky-costs concept translates

to sticky expenses for business-type activities and sticky expenditures for governmental activities in (local) governments.

The decisions by governments to change their resource allocations in response to budgetary shortfalls resulting from the Great Recession provide a unique setting in which to test the stickiness concept in a (local) governmental setting. This leads to the following two research questions. First, are local governments increasing expenditure levels more rapidly in times of economic distress, and if so, given the balanced-budget requirements, how? Second, when the economy is improving, are local governments reducing expenditures or are their expenditures sticky similarly to the sticky-cost phenomenon found in corporations? This research has the potential to inform both government officials and citizens about factors that drive government spending and resource-allocation decisions. Local governments play an important role in communities by providing critical services (including public safety, transportation, and water and sewerage) and building and maintaining infrastructure. Governments owe their citizenry both fiscal and operational accountability. Understanding expenditure behavior in local government is crucial in promoting transparency and providing insight into factors that might influence changes in resource-allocation priorities, especially in times of economic crises. And, as Mullainathan and Shafir (2013, p. 34) argue, when scarcity enters the mind, it changes choices and behaviors. These behaviors do not always reflect original priorities.

We use North Carolina county expenditure data from the government-wide statements and the fund statements reported in the CAFRs to examine the concept of stickiness in local governments. Our sample period spans from 2005 to 2014. This period provides a powerful setting in which to test our hypotheses because the combination of balanced-budget requirements and changing economic conditions (including the Great Recession of 2008) required governments to reassess their resource-allocation decisions.

Our findings suggest that stickiness is present in certain governmental activities. For business-type activities performed by local governments, such as public utilities and transportation systems, we find that for a given change in activity, the increase in expenses was larger when the activity level increased than the decrease in expenses was when the activity level decreased. Hence, the results indicate that expenses for business-type activities were sticky, which is consistent with results reported in the sticky-cost literature (Anderson 2003; Balakrishnan et al. 2014). In addition, we find that both revenues and expenditures—as reported in the statement of revenues, expenditures, and changes in fund balance—decreased during the Great Recession for almost three-quarters of the largest North Carolina counties we analyze. Hence, it appears that most counties responded to the budget shortfall by reducing service levels.

Peterson (1981) posits that in government, there are three types of public policy activities: *redistributive* (income transferring), *allocational* (housekeeping), and *developmental* (economic expansion). Because educational activities are difficult to classify, our model considers educational activities separately, consistent with Peterson (1981). We find mixed results

for the stickiness of governmental-activity expenditures. Educational expenditures demonstrated stickiness. In contrast, allocational activities (proxied by public safety) and redistributive activities (proxied by human services) appear to have been symmetric. Expenditures for these activities changed proportionally to the change in revenue; thus we find no evidence of stickiness. Finally, developmental activities do not appear to have been revenue driven.

The remainder of this paper provides an overview of the budgeting and sticky-cost literature and its adaptation to a government setting, followed by a discussion of the model specifications, data, and methodology. We then present a discussion of the results before concluding and suggesting areas for future research.

II. LITERATURE REVIEW

I. STICKINESS

In a corporate setting, costs are considered sticky when a change in cost relative to a decrease in activity is smaller than a change in cost relative to an increase in activity (Anderson et al. 2003). In analyzing the US air-transportation industry, Cannon (2014) posits that sticky costs can arise in three situations: (1) managers retain idle capacity, (2) managers asymmetrically adjust selling price, and (3) managers adjust capacity. Managers retain idle capacity when they anticipate a decrease in demand to be temporary (Anderson et al. 2003; Banker and Byzalov 2014). Rather than leaving capacity idle, managers can reduce prices to stimulate sales volume. When demand increases, managers then add capacity (Cannon

2014). When capacity-adjustment costs are asymmetric, sticky costs arise. This might be the case when the cost of increasing capacity is higher (lower) when demand increases (decreases) than when demand decreases (increases) (Cannon 2014).

II. GOVERNMENTAL-ACCOUNTING MODEL

Governmental Accounting Standards Board (GASB) Statement No. 34 (GASB 1999) significantly changed the state- and local-government reporting model. State and local governments are now required to present a set of government-wide financial statements and a set of fund financial statements (GASB Codification, Sec. 2200.103) (GASB 2015). Governments report government-wide financial statements on an accrual basis of accounting, while they report government-fund financial statements on a modified accrual basis of accounting (Reck and Lowensohn 2014).

The government-wide financial statements present two broad reporting units: governmental activities and business-type activities (Freeman et al. 2013). Governmental activities include administrative support and core government services such as public safety, public works, culture, and recreation. Business-type activities charge users and usually are (mostly) self-supporting. Examples of business-type activities include public utilities, transportation systems, and golf courses (Reck and Lowensohn 2014).

Business-type activities are similar to corporations in that the charges for the services provided usually exceed the expenses incurred. Hence, we anticipate that government officials in their role as managers of business-type activities will respond

similarly to managers in corporations when changes in revenues occur. Since the prior literature has reported sticky-cost behavior in corporations, we hypothesize that the stickiness hypothesis holds for business-type activities in local governments as well.

> H1: Managers of business-type activities of local governments are more likely to increase expenses in response to an increase in revenue than they are to decrease expenses when revenues decrease.

The primary goal of general-government activities is to provide goods and services, usually without regard for the recipients' ability to pay for the services (Freeman et al. 2013). This means that for governmental activities, unlike corporations and governmental business-type activities, there is a weak link (for example, culture and recreation) or no direct link (for example, public safety) between revenues and expenditure.

As noted, there are three types of public policy activities in government: redistributive, developmental, and allocational (Peterson 1981). Redistributive activities involve income transfers from better-off to less well-off citizens. Developmental activities are geared toward expansion and economic development. Allocational activities are neither redistributive nor developmental; an example is public safety (Peterson 1981). Peterson (1981) notes that educational expenditures are difficult to classify. They are more redistributive than public safety but less redistributive than public health and welfare.

Consistent with countercyclical-spending theory, Marlowe (2009) suggests three strategies for local governments to use during recessions: (1) use financial reserves to maintain or increase expenditures, (2) increase the amount or accelerate the schedule of capital projects, and (3) change tax policy to encourage taxpayer spending. If governments follow Marlowe's approach, stickiness should exist in governmental functions. This could result in a decrease in expenditures that is smaller than the decrease in revenue. Alternatively, expenditures may even increase when revenues are decreasing.

Prior research in a hospital setting found that the costs of core activities are more sticky than costs in auxiliary activities (Balakrishnan and Gruca 2008). Hospital activities are relatively homogeneous, whereas local governments' public services differ significantly. Some cities provide a full array of public services including education, public health, and public safety, while other cities share these responsibilities with overlapping governments such as counties and independent school boards (Chernick et al. 2011). By extension, sticky-cost theory anticipates different levels of stickiness among the various government functions. For instance, Jordan (2003) reports that public safety receives more stable funding. The second hypothesis concerns whether stickiness holds for general-government functions. In addition, it concerns whether the core general-government functions are more sticky than other general-government functions.

> H2: Managers of general-government functions are more likely to increase expenditures in response to an increase in revenue than they are to decrease expenditures when revenues decrease. This stickiness varies across public policy functions.

Governmental funds use modified accrual accounting to prepare financial statements, and proprietary funds (governmental business-type activities) use accrual accounting to prepare financial statements. Shust and Weiss (2014) find that the reporting choices required by generally accepted accounting principles (GAAP) affect cost-stickiness estimates in a corporate setting. In particular, they find that operating expenses (accrual basis) are more sticky than operating costs (cash basis). Hence, modified accrual accounting might bias against finding stickiness because the modified accrual basis is closer to the cash basis than is the accrual basis.

III. MODEL SPECIFICATIONS, DATA, AND METHODOLOGY

We base our empirical model on the model proposed in Anderson et al. (2003).[1] Anderson et al. (2003) propose a log-linear model that regresses the log of the year-over-year ratio of selling, general and administrative expenses on the log of the year-over-year ratio of revenue and an indicator variable that specifies a decrease in year-over-year revenue. Revenue is used as a proxy for activity level.

A. MODEL SPECIFICATIONS FOR BUSINESS-TYPE ACTIVITIES

We use the following model to estimate cost stickiness for local-government business-type activities:

$$log\left[\frac{Exp_{i,t}}{Exp_{i,t-1}}\right] = \beta_0 + \beta_1 * log\left[\frac{Rev_{i,t}}{Rev_{i,t-1}}\right] + \beta_2 * Dec_{i,t} * log\left[\frac{Rev_{i,t}}{Rev_{i,t-1}}\right] + \varepsilon_{i,t} \quad (1)$$

Figure 1. Graphical Representation of Stickiness

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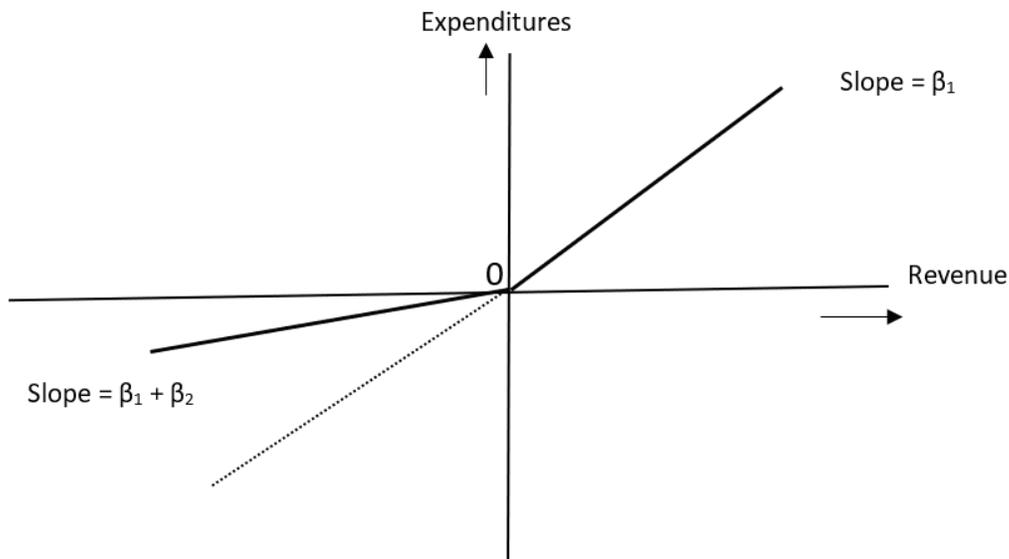
1. Balakrishnan et al. (2014) argue that the log model used in Anderson et al. (2003) induced a bias in the fixed-cost-structure estimation, and they propose a linear specification. However, Banker and Byzalov (2014) show that this claim is unfounded. Because of the intuitive interpretation of the results from the log model and the model's widespread usage in the literature, we use the log model.

Exp is the business-type program expenses, *Rev* is the business-type program revenues, and *Dec* is an indicator variable equal to one if year-over-year program revenue decreases in county i in period t and zero otherwise. This allows us to distinguish between years with a revenue increase and those with a revenue decrease. In particular, ß1 is used as the slope for years with a revenue increase and the sum of ß1 and ß2 for years with a revenue decrease (see figure 1 for a graphical representation). We collected program revenues and expenses from the government-wide statement of activities for business-type activities.

B. MODEL SPECIFICATIONS FOR GOVERNMENTAL ACTIVITIES

In response to a decrease in revenues, local officials can respond by changing the resource allocations to developmental, allocational, redistributive programs, and educational programs. Because the beneficiaries of redistributive policy are different people from the taxpayers, Peterson (1981, pp. 48, 53) hypothesizes that for redistributive policies, there is a strong relationship between expenditures and fiscal capacity (a hypothesis for which he finds support). In contrast, because the marginal benefit/tax ratio is high, fiscal capacity is likely to not have a big effect on developmental expenditure levels. The relationship between expenditures and fiscal capacity for allocational services is expected to fall between those two extremes. In places with low local fiscal capacity, taxes cannot just be raised to provide allocational services. However, the expenditures will in large part also be driven by perceived need and demand. We consider educational programs separately because they are only moderately redistributive and are a large expenditure that is likely sensitive to a community's fiscal capacity (Peterson 1981). Because of balanced-budget requirements, these decisions are necessarily interdependent. Local officials respond to changing circumstances by making a simultaneous choice of how to allocate resources among the programs. We therefore investigate the relationship between revenue constraints and expenditure stickiness using the four simultaneously estimated equations stated below:

$$log\left[\frac{DevExp_{i,t}}{DevExp_{i,t-1}}\right] = \beta_0 + \beta_1 * log\left[\frac{Rev_{i,t}}{Rev_{i,t-1}}\right] + \beta_2 * Dec_{i,t} * log\left[\frac{Rev_{i,t}}{Rev_{i,t-1}}\right] + \varepsilon_{i,t} \quad (2)$$

$$log\left[\frac{AllocExp_{i,t}}{AllocExp_{i,t-1}}\right] = \beta_0 + \beta_1 * log\left[\frac{Rev_{i,t}}{Rev_{i,t-1}}\right] + \beta_2 * Dec_{i,t} * log\left[\frac{Rev_{i,t}}{Rev_{i,t-1}}\right] + \eta_{i,t} \quad (3)$$

$$log\left[\frac{RedistExp_{i,t}}{RedistExp_{i,t-1}}\right] = \beta_0 + \beta_1 * log\left[\frac{Rev_{i,t}}{Rev_{i,t-1}}\right] + \beta_2 * Dec_{i,t} * log\left[\frac{Rev_{i,t}}{Rev_{i,t-1}}\right] + v_{i,t} \quad (4)$$

$$log\left[\frac{EduExp_{i,t}}{EduExp_{i,t-1}}\right] = \beta_0 + \beta_1 * log\left[\frac{Rev_{i,t}}{Rev_{i,t-1}}\right] + \beta_2 * Dec_{i,t} * log\left[\frac{Rev_{i,t}}{Rev_{i,t-1}}\right] + \mu_{i,t} \quad (5)$$

In the above models, *DevExp* represents developmental expenditures, *AllocExp* represents allocational expenditures, *RedistExp* represent redistributional expenditures, and *EduExp* represents educational expenditures. All revenue and expenditure values used in the model were collected from the statement of revenues, expenditures, and changes in fund balance. *Rev* represents total general-government revenue. *Dec* is an indicator variable equal to one if the change in year-to-year revenue decreased and zero otherwise. As with the business-type model, this allows us to distinguish between years with a revenue increase and years with a revenue decrease. As before, ß1 is used as the slope for years with a revenue increase and the sum of ß1 and ß2 is used for years with a revenue decrease. The subscripts *i* and *t* represent the local government and fiscal year, respectively. Because the total spending decisions depended on the allocations among the four categories, it is likely that the error terms were contemporaneously correlated. Because the CAFR data allow for simultaneously modeling the choice among resource allocations, we use seemingly unrelated regressions to test our hypotheses.

C. CONTROL VARIABLES

1. Macroeconomic Environment

Anderson et al. (2003) find in their sample of corporations that costs are more sticky during periods of economic growth. Their argument is that managers are less willing to reduce committed resources when the economy is growing. However, given the balancing role of government, our research anticipates that the result for local governments differs. Our sample includes the years leading up to the Great Recession, the Great Recession, and the postrecession recovery period. To control for the influence of the recession, we use an indicator variable that is equal to one for a recession year and zero otherwise.

The first year of the Great Recession was 2008. This coincided with the passing of the 2008 Economic Stimulus Act. Hence, the recession first significantly affected governments' financial statements with a June 30, 2009, fiscal year end. In September 2010, the National Bureau of Economic Research (2010) announced that the eighteen-month recession had ended in June 2009 and the recovery had started. The bureau also noted that GDP in the second quarter of 2010 was still 1.3 percent below GDP at the start of the recession (December 2007). In this study, we use fiscal year end June 30, 2010, as the end of the recession.[2]

2. Intergovernmental Revenues and Tax Rates

States often reduce intergovernmental transfers to local governments during an economic downturn (Joyce 2001). When a state reduces intergovernmental revenues, local governments tend to increase taxes to preserve programs (Bartle 1996). However, most states also limit the fiscal behavior of local governments (Mullins and Wallin 2004). Property taxes and sales taxes are the two most important sources of general revenue for local governments in North Carolina (Wang and Hou 2012). As a result

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2. Any of the fiscal years from 2010 to 2012 was a potential option, based on the unemployment rate and reduction in local government revenues (see table 1). Sensitivity analysis tested the alternative fiscal periods and yielded similar results.

of revenue fluctuations during economic downturns, local governments seek alternative financing options such as local-option sales taxes to pay for public services (Afonso 2013a). Property tax revenue is often used by local governments to make the budget balance; thus property tax rates often change annually (Anderson and Pape 2008; Bogart and Bradford 1990). Income and sales tax rates, on the other hand, are much more stable (Anderson 2006). However, Stewart (2009) argues that total property tax revenue is more stable than other revenue sources because a change in personal income does not immediately affect property values or property tax revenue.

Because both taxes and intergovernmental revenue are components of general revenues for local governments such as North Carolina counties, we add control variables in the model to capture the potential impact of a decrease in intergovernmental revenues and changes in property tax revenue. For the sensitivity analysis, we include changes in tax rate to capture a government's intent to adjust property tax revenues.

3. Unreserved Fund Balance

Reserves held by governments can help maintain the level of government spending during economic downturns (Hou 2004; Sobel and Holcombe 1996). In particular, the unreserved general fund balance has been shown to have a countercyclical stabilizing effect during down years (Marlowe 2005). Before GASB Statement 54, governments classified fund balances as either reserved or unreserved. GASB 54 (GASB 2009) requires classification of fund balances into five categories of availability: nonspendable, restricted, committed, assigned, and unassigned for governmental-fund financial statements beginning with fiscal years ending after June 15, 2011. GASB 54 was implemented in the North Carolina counties in this study in the fiscal year ending on June 30, 2011. Our analysis uses the amount of unassigned (post–GASB 54) and unreserved (pre–GASB 54) balances to proxy for recessionary cushion. A sensitivity analysis tests total fund balance and finds similar results.

4. Government Size

Anderson et al. (2003) find that larger corporations, measured by the number of employees and total assets, experience more cost stickiness. Our analysis uses county population as a proxy for county size. The number of county employees is used as an alternative proxy in our sensitivity analysis.

Consistent with Anderson et al. (2003), we add control variables through ß2:

$$\beta_2 = \gamma_0 + \gamma_1 * MacroEnv + \gamma_2 * Log\left[\frac{IntGovRev_{i,t}}{IntGovRev_{i,t-1}}\right]$$

$$+\gamma_3 * Log\left[\frac{UnrFundBal_{i,t}}{UnrFundBal_{i,t-1}}\right] + \gamma_4 * Log\left[\frac{PropTaxColl_{i,t}}{PropTaxColl_{i,t-1}}\right]$$

$$+ \gamma_5 * Log\left[\frac{CountyPop_{i,t}}{CountyPop_{i,t-1}}\right]$$

MacroEnv is a control variable for the Great Recession years (fiscal years 2009 and 2010), *IntGovRev* is the amount of intergovernmental revenue, *UnrFundBal* is the unreserved fund balance (pre–GASB 54) or the unassigned fund balance (post–GASB 54), *PropTaxColl* is the amount of property tax collected, and *CountyPop* is the county population. As before, the subscripts i and t represent local government and fiscal year, respectively.

This results in the second (restated) model:

$$
Log \left[\frac{Exp_{i,t}}{Rev_{i,t-1}} \right]
$$

$$
= \beta_0 + \beta_1 * Log \left[\frac{Rev_{i,t}}{Rev_{i,t-1}} \right] + \beta_2 * Dec_{i,t} * Log \left[\frac{Rev_{i,t}}{Rev_{i,t-1}} \right]
$$

$$
+ \beta_3 * Dec_{i,t} * Log \left[\frac{Rev_{i,t}}{Rev_{i,t-1}} \right] * MacroEnv
$$

$$
+ \beta_4 * Dec_{i,t} * Log \left[\frac{Rev_{i,t}}{Rev_{i,t-1}} \right] * Log \left[\frac{IntGovRev_{i,t}}{IntGovRev_{i,t-1}} \right]
$$

$$
+ \beta_5 * Dec_{i,t} * Log \left[\frac{Rev_{i,t}}{Rev_{i,t-1}} \right] * Log \left[\frac{UnrFundBal_{i,t}}{UnrFundBal_{i,t}} \right]
$$

$$
+ \beta_6 * Dec_{i,t} * Log \left[\frac{Rev_{i,t}}{Rev_{i,t-1}} \right] * Log \left[\frac{PropTaxColl_{i,t}}{PropTaxColl_{i,t-1}} \right]
$$

$$
+ \beta_7 * Dec_{i,t} * Log \left[\frac{Rev_{i,t}}{Rev_{i,t-1}} \right] * Log \left[\frac{CountyPop_{i,t}}{CountyPop_{i,t-1}} \right] + \varepsilon_{i,t}
$$

D. DATA

We collect data from the CAFR for the forty largest counties by population in North Carolina for the period 2005 through 2014. (All counties have a June 30 fiscal year end.) This period includes the years leading up to the Great Recession, the Great Recession years, and the postrecession recovery. Hence, the analysis should reveal any change in government spending in response to the budget shortfalls that resulted from the Great Recession. We choose North Carolina counties for several reasons. First, our primary interest is to investigate the spending behavior of North Carolina county governments under different macroeconomic conditions. Second, while various local governments provided a large range of public services, all the counties in North Carolina (with the exception of Mecklenburg) provided funding for developmental, allocational, redistributive, and educational activities. Third, in North Carolina, all local governments are required to use a Statewide Master Account List, which facilitates cross-governmental comparisons. Fourth, North Carolina has medium volatility

of revenue and expenditures, using a volatility index based on volatility in the economic environment, state reliance on federal aid, state reliance on gambling revenues, and the amount of Medicaid expenditures (Joyce 2001). Finally, the Center for Social Inclusion (2009) ranks the impact of the recession on North Carolina as high. These factors allow us to use a sample of counties that encountered significant economic volatility throughout the period while controlling for the variation across counties as much as possible.

IV. RESULTS

Table 1 provides descriptive statistics for the data collected. The initial sample consisted of the forty largest counties by population in North Carolina. The forty largest counties were chosen because a sample of smaller counties indicated that many of the smaller counties do not report business-type activities. We removed three counties because they had incomplete data, and we completed our analysis using thirty-seven counties. Only thirty-five of the counties reported business-type activities. As a result, the analysis of business-type activities has fewer data points than the governmental-activities analysis. The

sample includes nine years of data for each county because some of the variables required lagged data. The top and bottom 2.5 percent of the data[3] was winsorized to mitigate the undue influence of outliers. Panel A of table 1 provides the economic and demographic statistics of the sample.

Average revenues remained fairly stable from 2008 to 2010 (see table 1, panel B), even though twenty-seven of the thirty-seven counties (73 percent) reported a decrease in their revenue. Revenues were down by 3.32 percent. Expenditures, meanwhile, declined by 2.48 percent. Based on the summary of financial data provided in panel B of table 1, the evidence indicates that the counties in North Carolina did not use countercyclical spending to stimulate demand as advocated by some researchers (Gramlich 1987; Hou and Moynihan 2008).

While revenues decreased by 2.9 percent in 2010, education expenditures decreased by 11.1 percent compared to a 7.5 percent overall decrease in expenditures and a 5.2 percent increase in public-safety expenditures. Up to that time, educational expenditures had been increasing annually. However, by 2014 educational expenditures had not yet returned to 2008 levels. In

Table 1. Summary Statistics for North Carolina Counties in Sample from 2005 to 2014
Panel A: Demographics and economic characteristics

YEAR	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Avg Population	157,873	161,748	162,248	169,156	172,350	174,649	177,239	179,538	181,565	183,325
Avg Unemploy. Rate	5.76	5.16	5.07	5.90	10.62	10.73	10.60	10.14	9.28	6.85
Avg Income per Capita	29,484	31,141	32,033	33,263	32,775	33,158	33,416	35,126	35,190	36,544

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3. Truncating rather than winsorizing the data provided similar results (not provided).

fact, for our sample, average expenditures were 8.2 percent lower in 2014 than in 2008. By comparison, average public-safety expenditures did not decline for any of the years and were 20 percent higher in 2014 than in 2010.

The results for the estimation model (1) for the business-type activities are reported in table 2. When revenues are increasing, the coefficient ß1 indicates the change in expenditures. However, as a result of the use of the indictor variable *Dec*, for years in which revenues are decreasing, the sum of the coefficients ß1 and ß2 indicates the change in expenditures. Hence, the sticky-expenses hypothesis is supported when ß1 > 0 and ß2 < 0. ß1 is positive and ß2 is negative as hypothesized, and both results are statistically significant in the sample. This supports our first hypothesis that expenses are sticky for governmental business-type activities. This implies that when it comes to business-type activities, government officials exhibit similar behavior to managers of corporations.

We now shift our analysis to governmental activities. Table 3, panel A reports the results of the Pearson correlations used to analyze mutual relationships among the four public policy activities (that is, allocational, developmental, redistributive, and educational) and total revenues and changes in revenue. Consistent with the results reported in the extant literature, we found a strong, statistically significant (0.001) correlation between redistributive expenditures and 1) revenue (0.565) and 2) change in revenue (0.454). Hence, there is evidence to suggest there is a strong relationship between revenue and redistributive expenditures. Peterson

(1981) finds a strong relationship between redistributive expenditures and fiscal capacity. While revenue is not a perfect measure of fiscal capacity, in our sample 55 percent of the counties' revenues were generated by property taxes. Hence, it does serve as an imperfect proxy for fiscal capacity. The correlations between allocational expenditures and revenue (0.291) and allocational expenditures and change in revenue (0.191) and the correlations between educational expenditure and revenue (0.245) and educational expenditure and change in revenue (0.127) are weaker. The allocational-expenditure correlations and the educational-expenditure correlations were statistically significant at the 0.001 level. These results are also consistent with the Peterson (1981) results. The relationship between revenue and allocational expenditures is weaker because, as Peterson (1981) argues, governments can often only reduce service levels as the services provided are based on need and demand while the fiscal capacity does not allow for tax increases to fund allocational expenditures. The correlation between developmental expenditures and 1) revenue and 2) change in revenue were not statistically significant ($p > 0.10$).

To test the second hypothesis, we used seemingly unrelated regressions to estimate the coefficients for the four models simultaneously. The results are reported in table 3, panel B. Consistent with the Pearson-correlation results, we found that allocational-, redistributive-, and educational-program expenditures were correlated with overall county general-government revenues. The results for educational expenditures provided evidence of sticky-expenditure

Table 1. Summary Statistics for North Carolina Counties in Sample from 2005 to 2014

Panel B: Financial data ($ thousands)

YEAR	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
GOVERNMENTAL ACTIVITIES (AVERAGE OF 37 COUNTIES)										
Avg Total Revenue	162,110	174,293	184,587	196,690	195,852	190,167	193,069	198,704	198,779	205,280
% Counties w/decreases in YOY revenue	n/a	5.4%	8.1%	2.7%	64.9%	73.0%	27.0%	27.0%	24.3%	8.1%
Avg Total Expenditures	174,613	192,404	206,438	222,566	234,667	217,057	220,083	214,328	211,737	214,281
% Counties w/decreases in YOY Expenditures	n/a	0.0%	21.6%	13.5%	35.1%	73.0%	54.1%	51.4%	56.8%	35.1%
Avg Total Fund Balance	46,920	51,271	55,938	58,232	57,171	56,585	60,166	66,356	69,446	72,783
Avg unreserved (or unassigned) Fund Balance**	25,338	29,015	32,490	34,096	35,080	28,599	32,178	34,783	45,687	37,012
BUSINESS-TYPE ACTIVITIES (AVERAGE OF 35 COUNTIES)										
Avg Program Revenue	9,483	10,991	12,413	12,324	11,523	12,058	13,864	11,897	12,366	12,088
% Counties w/decreases in YOY revenue	n/a	26.5%	26.5%	44.1%	61.8%	41.2%	44.1%	38.2%	58.8%	44.1%
Avg Program Expenses	7,962	7,969	9,180	10,554	10,437	10,521	10,759	10,730	10,921	10,980
% Counties w/decreases in YOY Expenditures	n/a	29.4%	17.6%	8.8%	35.3%	52.9%	32.4%	47.1%	47.1%	32.4%

* YOY = year-over-year

** Unreserved before GASB 54 (2009), unassigned after GASB 54

Classical Liberals
THE CAROLINAS

Table 1. Summary Statistics for North Carolina Counties in Sample from 2005 to 2014

Panel C: Financial data governmental-function expenditures analyzed in the project ($ thousands)

YEAR	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Avg Total Expenditures	174,613	192,404	206,438	222,566	234,667	217,057	220,083	214,328	211,737	214,81
Avg Human-Services Expenditures	49,945	51,680	52,002	53,422	51,302	46,963	46,657	46,534	44,527	43,589
Avg Education Expenditures	42,949	48,665	54,091	62,131	66,102	58,782	58,493	57,876	55,357	57,019
Avg Public-Safety Expenditures	25,215	27,327	29,058	32,720	34,872	36,669	37,963	38,564	38,809	39,477
Avg Economic-Development Expenditures	4,984	5,549	5,988	6,310	6,196	5,733	6,140	6,386	6,667	6,774

* We analyzed expenditures on only four functions. Therefore, the sum of the average expenditures for the individual functions analyzed does not equal the average total expenditures for the governments.

Table 2. Results for Regression Models for Business-Type Activites

	COEFFICIENT	P-VALUE	COEFFICIENT	P-VALUE
β_0	-0.0209	0.58	-0.0106	0.85
β_1 (revenue)	1.0904	**0.00**	1.0835	**0.00**
β_2 (decrease in revenue)	-1.0948	**0.02**	-1.0935	**0.02**
β_3 (net position)			-0.0024	0.80
Adjusted R^2	11.1%		10.8%	
Number of Observations	318		318	

Table 3. Results for Regression Models for Business-Type Activites

Panel A: Pearson correlations for governmental activities (two-tailed p-values)

	DEVELOPMENTAL	ALLOCATIONAL	REDISTRIBUTIVE	EDUCATIONAL
Revenue	0.041 (0.451)	0.291 (0.000)	0.565 (0.000)	0.245 (0.000)
Decrease in Revenue	0.078 (0.155)	0.191 (0.000)	0.454 (0.000)	0.127 (0.000)

Panel B: Regression results for governmental activities

	DEVELOP.	P-VALUE	ALLOCAT.	P-VALUE	REDIST.	P-VALUE	EDU.	P-VALUE	VIF
β_0	0.0118	.37	0.0146	**.00**	**-0.0085**	**.00**	-0.0013	.83	
β_1 (revenue)	0.0992	.85	0.5299	**.00**	**0.5404**	**.00**	**1.0891**	**.00**	1.53
β_2 (decrease in revenue)	0.7707	.63	0.0192	.95	-0.1361	.55	**-1.5319**	**.04**	1.44
β_3 (Great Recession)	-0.3545	.83	-0.3391	.27	**0.6265**	**.00**	0.9505	.21	1.13
β_4 (intergov. revenue)	0.0222	.68	-0.0132	.20	-0.0121	.11	-0.0176	.48	1.03
β_5 (fund balance)	-0.1300	.43	-0.0366	.24	0.0200	.39	-0.1405	.07	1.13
β_6 (property tax collected)	.0291	.75	0.0110	53	0.0116	.38	0.0055	.90	1.03
β_7 (county population)	0.1293	.13	-0.0063	.70	0.0059	.63	0.0188	.64	1.00
Adjusted R^2	0.000		0.108		0.340		0.057		
Number of	334		334		334		334		

Panel C: Elasticity of expenditures with respect to county revenues

	BUSINESS-TYPE	ALLOCATIONAL	REDISTRIBUTIVE	EDUCATIONAL
Keeping everything else constant, for every 1% increase in county revenue, expenditures increased by...	1.09%	0.53%	0.54%	1.09%
Keeping everything else constant, for every 1% decrease in county revenue, expenditures decreased by...	0.00%	0.53%	0.54%	-0.44%[1]

[1] On average, educational expenditures were increasing when county revenue was decreasing.

behavior (that is, $\beta_1 > 0$ and $\beta_2 < 0$). More specifically, when county revenues decreased, educational expenditures did not decrease; rather, they increased. The funding for the increase in expenditures could have been linked to the usage of fund balance as the partial correlation was marginally significant ($= 0.07$). However, we need to put this result in context. As shown in table 1, panel C, average education expenditures were reduced dramatically from 2009 to 2010. Because the year-to-year percentage increases and decreases are not additive but multiplicative, education expenditures (and human-services expenditures) had not been restored to the 2008 level by 2014.

Allocational and redistributive expenditures did not demonstrate stickiness. This is consistent with Jordan (2003), who reports that allocational expenditures are more stable. This can also be seen in table 1, panel C, which shows that average public-safety expenses have steadily been increasing from 2008 to 2014. Hence, the impact of an increase in revenue on those expenditures is the same as the impact of a decrease in revenue. Finally, the developmental expenditures were not associated with revenue nor with changes in revenue. Thus, we found partial support for the second hypothesis. The percentage changes for the various expenditures resulting in a change in revenue are summarized in table 3, panel C. Note that the coefficients for developmental activities are not significant. However, those results have also been reported in table 3, panel C.

As the Great Recession resulted in reduced governmental revenues, we also investigated its impact on governmental spending priorities. As expected, the redistributive-program expenditures were significantly correlated to the recession dummy variable. Surprisingly, we did not find an overall increase in average human-services expenditures during the period. This might be the result of other government tiers' engaging in that spending, or, as Peterson (1981) hypothesized, it might reflect the strong link between fiscal capacity and redistributive expenditures. As county revenues decreased, property values decreased, and unemployment increased, counties might not have had the resources to expand these expenditures. Sensitivity analysis indicated that this variable was not significant for other periods. Sensitivity analysis (not reported) found that redistributive-program expenditures were also statistically significantly correlated with changes in county direct tax rates but not with property taxes collected. This suggests that the counties intended to increase funding for these programs by property tax increases, which is consistent with Peterson's (1981) hypothesis. The other public policy expenditures—that is, allocational, developmental, and educational—were not statistically significantly correlated with the Great Recession indicator variable. This could be in part because of the lag in governmental funding. For instance, for our sample roughly 55 percent of the counties' revenue was generated through property taxes. While house prices fell throughout the period, assessed values did not change instantaneously. Additionally, fund-balance surpluses may have been used to soften the impact and (partially) offset the financial consequences of the Great Recession. Finally,

government officials may have responded to the Great Recession as they would to any revenue shortfall and hence it would not have impacted those expenditures differently.

V. CONCLUSION

Counties provide both business-type activities such as public utilities and governmental activities such as public safety and road maintenance. Business-type activities are activities that are also, or could also be, performed by corporations. The user fees for these business-type activities are often set at such a level that the business-type activities are largely self-sustainable. Research has found that costs for corporations are sticky: an increase in revenue is accompanied by an increase in expenses; however, a decrease in revenue results in a comparative smaller decrease in expenses. We found stickiness in business-type activities undertaken by North Carolina county governments. Hence, the behavior of governmental officials funding business-type activities was consistent with the behavior of managers of corporations. These findings have important implications for governmental accountants and officials. Some governments use flexible budgets for business-type activities (Granof et al. 2015). Flexible budgets provide budget estimates for varying input volumes. It is important to consider the stickiness of expenditures to appropriately capture cost behavior.

We next looked at governmental activities. In a governmental setting, budgeting links "financial accountability and managerial control over scarce resources to meet community and entity goals" (Reck and Lowensohn 2014, p. 493). Because a (local)

government's managerial and political decisions related to governmental activities are reflected in the annual budget (Granof et al. 2015), budgeting plays an important role in financial planning, control, and evaluation of the governmental activities. Based on our sample, we found partial support for the stickiness hypothesis in local governments. Specifically, we found that redistributive expenditures and allocational expenditures changed linearly (that is, they did not exhibit stickiness) while educational expenditures did not change linearly (they exhibited stickiness). Understanding the role of cost stickiness can help government officials to better evaluate expenditure changes in light of changing revenues and could help guide government officials to more effectively align resources with managerial and political priorities. The results suggest that government officials' priorities shift in times of revenue growth and revenue decline as they do not respond to the growth and decline the same way for the various programs. For instance, the average spending for human services and education in 2010 was lower than in 2008 while spending on public safety was up over the same time span. By 2014, average spending on public safety had increased again. However, even though expenditures on education and human services were increasing, these expenditures had not yet returned to the 2008 level.

These findings are important when contextualized in the extant literature. While governments report business-type activities using accrual accounting, governmental activities are reported using modified accrual. The analysis found evidence of sticky expenses in the modified accrual basis

of accounting, which adds to the sticky-cost literature. In addition, the analysis found evidence of stickiness during periods of economic decline and in periods of economic growth. This provides support for results previously reported in the literature (Anderson et al. 2003).

Like all research projects, our study has limitations. First, the final sample consisted of thirty-seven of the largest counties by population in North Carolina. Local governments in North Carolina have exerted great financial discipline (Wang and Hou 2012) as the state has the largest number of local governments with the highest bond rating (Coe 2007). North Carolina had medium volatility of revenue and expenditures, and the impact of the Great Recession was high. The generalizability of these results to other local governments (for example, municipalities and school districts), other governments in other states, and different periods is uncertain. Second, the data cover the period leading up to the Great Recession, the Great Recession, and the beginning of the recovery. We specifically chose this period to capture the changing economic environment, but it is possible that the results were driven, in part, by this unique period.

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