Does Benchmarking Encourage Improvement or Convergence? Evaluating North Carolina's Fiscal Benchmarking Tool

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Abstract

Several states monitor the fiscal health of their local governments by "benchmarking" them — using a suite of financial indicators to track performance over time. Benchmarking of public organizations can facilitate performance management, leading to the spread of best practices and improved organizational performance. It is also possible that benchmarking, absent other performance routines, could create isomorphic pressures that encourage local governments to adopt policies that converge performance or financial indicators towards the group mean. This paper tests these hypotheses using the introduction of North Carolina's financial benchmarking tool in 2010. We construct a panel of the 14 indicators used to assess and compare the financial positions of North Carolina county and municipal governments from fiscal year 2008 to 2014. We find support for isomorphism as the dispersion of several indicators declined in the post-implementation period without offsetting beneficial changes in the mean indicator value. These findings pose a dilemma for the quantitative evaluation of both benchmarking and performance management systems; could offsetting changes result in null findings at the mean of the distribution?

JEL Code: H72; H83

1. Introduction

Financial condition monitoring systems are a tool used by state and local policymakers to track the fiscal health of local governments. These programs typically assess fiscal health based on how each local government performs across several financial indicators relative to similar peer governments or a statewide benchmark. Kloha, Weissert, and Kleine (2005) count 15 states that use indicator-based systems to assess local government fiscal condition. Their survey also found that another 10 states were contemplating adoption of a financial condition model.

Several states that currently monitor their local governments go a step further by publishing the results for each local government in an annual report or by making them available in an online database. This performance information allows local governments across that state to benchmark their financial positions relative to one another each year and over time. The monitored governments can use that information to gain a better understanding of their financial position relative to their peers. Often the aim of these programs is for governments to act on that information and make changes in their financial management. Those changes are manifested in the financial indicators in future periods.

This paper tests whether the introduction of a state fiscal benchmarking program leads to changes in local financial management and whether those changes are purely performance improvements or are isomorphic in nature. The stated intent of benchmarking programs is to report financial information that reveals deficiencies and facilitates policy decisions to improve performance on financial indicators (Rivenbark & Roenigk, 2011). Over time, these policy

changes should result in beneficial changes to the mean indicator values. This form of benchmarking is one component of performance management; financial performance information is created and then connected to decision venues where it is intended to influence a range of possible decisions (Moynihan, 2008). A competing hypothesis follows from the work on isomorphism pioneered by DiMaggio and Powell (1983) wherein fiscal benchmarking accelerates isomorphism in local governments. Local governments, previously unaware of neighbors' financial performance, make managerial decisions that move their financial indicators toward the average value of their peers. The result is that both high and low performers converge towards their peers; the group mean remains (largely) unchanged, but the dispersion of financial indicators declines. The potential for inverse responses across the distribution is an important consideration in any system that publishes performance indicators. Absent controls to prevent performance declines, a finding of "no statistically significant change" in the mean (typical of most commonly examined change in empirical analyses) may be masked by offsetting changes across the distribution.

We test these ideas using the introduction of North Carolina's benchmarking tool introduced by the North Carolina Department of State Treasurer in 2010. The tool consists of 14 financial indicators produced from governmental financial statements that are compiled and reported annually. We construct each of the 14 monitored indictors for North Carolina county and municipal governments using financial statements spanning 2008 to 2014. We estimate the impact of North Carolina's benchmarking program on measures of central tendency and dispersion; specifically, the indicator's mean, standard deviation, and interquartile range (IQR) using Weighted Least Squares (WLS) regression methods.

We find that the introduction of the benchmarking program exerted only a small effect on the mean values of many of the monitored indicators, but that the variance and interquartile ranges of several indicators declined following its introduction. The preponderance of the evidence suggests isomorphism (rather than mere improvement) among municipal and county governments. We observe this result because both jurisdictions with poor financial ratios improve over time while jurisdictions with healthy ratios decline towards the mean, offsetting poor performers at the mean of the distribution. This is a result that has important implications for evaluations of performance and benchmarking programs. Our results show isomorphism is slightly stronger among municipal governments than county governments, for reasons we discuss below. Our findings contribute to a larger benchmarking and performance management literature suggesting that prior "null results" in this area may be obscured by a convergence to the mean. In a typical program evaluation using regression analysis, our results would be attributed to heteroskedasticity.

We should note that although we use the term improvement in contrast to isomorphism as they are not directly rivalrous. In fact, isomorphism would likely result in local governments both above and below the mean converging toward the mean, implying improvement for some governments. Moreover, whether isomorphism should be viewed as detrimental or beneficial to organizations is unclear. For example, local governments with high liquidity ratios may be withholding valuable resources from the local economy; spending down accumulated reserves would likely benefit the local economy. However, it is less clear whether moving from the 30th or 70th percentile toward the mean is beneficial to local governments. We therefore do not ascribe the predominately isomorphic results as normatively positive or negative.

The remainder of this paper is organized as follows. Section 2 describes the relevant literature on assessing local financial condition and provides a short background on North Carolina's benchmarking tool. Section 3 discusses the competing hypotheses around the impact of benchmarking of fiscal performance: performance improvement versus isomorphism. Next, section 4 formally introduces the hypotheses we test in this paper, and section 5 details the methodology we use to evaluate each hypothesis. Section 6 presents the results of our empirical analysis, followed by a discussion of the implications of these results and concluding remarks.

2. Background: Assessing Local Government Financial Conditions

The wave of fiscal stress experienced by several large U.S. cities in the 1970s, including New York City's near default in 1975, inspired several state governments to adopt legislation that allowed for monitoring and intervention into the fiscal affairs of local governments (Kloha et al., 2005). During this period, several non-governmental organizations, federal agencies, and academic researchers began developing financial ratio indicator systems to detect or predict local government fiscal distress.

Mead (2013) states that financial condition systems fall into two separate but parallel categories: the fiscal approach and the financial approach. The fiscal approach emphasizes fiscal capacity, that is, a government's ability to self-finance its expenditures. The financial approach uses balance sheet measures that are plausibly influenced by changes in financial management. The Financial Trend Monitoring system (FTMS), introduced by the International City/County Management Association (ICMA) is representative of the financial approach. The FTMS

measures financial condition on four dimensions of solvency: long-run, budgetary, cash, and service-level (Groves, Godsey, & Nollenberger, 2003).

More recently, academics and practitioners have begun to experiment with a variety of financial ratios to assess fiscal health. Kloha et al. (2005) count a total of 174 indicators among the 15 states that monitored local government fiscal health in 2003. There is some question as to whether these programs are effective at accurately assessing fiscal health. For example, Kloha et al. (2005) find that seven of the 15 state financial condition monitoring programs they review were likely to commit type-II errors by classifying fiscally distressed local governments as healthy. Maher and Deller (2005) find a weak correlation between indicators of financial condition and qualitative survey responses of local government financial managers regarding the financial health of their government for a large sample of Wisconsin municipalities.

While financial condition monitoring systems have the potential to provide valuable financial performance information, there has been little quantitative evaluation of the use of that information to improve outcomes. Rivenbark and Roenigk (2011) study three North Carolina local governments to see how they made use of the financial condition measures described in Rivenbark, Roenigk, and Allison (2009, 2010) and used in North Carolina's benchmarking tool. They find that the elected officials and financial managers were more informed about the financial position of their local governments, especially in comparison to peer governments. More importantly, they find that the elected officials of the three local governments made use of the information provided by benchmarking data to make policy decisions. For example, one local

government that was experiencing low liquidity increased water and sewer rates, despite the political costs of doing so.

North Carolina's Fiscal Benchmarking Tool

The state of North Carolina has a long-held interest in monitoring and regulating the financial affairs of its local governments (Coe, 2007). This interest arose from a wave of municipal defaults that occurred during the Great Depression. The state legislature consequently created the Local Government Commission (LGC) in 1932 as a division of the North Carolina Department of State Treasurer. According to Coe (2007), the LGC's principal functions are to control municipal debt issuance and maintain oversight over local budgetary and fiscal affairs.

As part of its oversight powers, the LGC is responsible for collecting and reviewing the financial reports of 100 counties, 555 cities, and 345 special districts for signals of fiscal distress (Coe, 2008). The LGC may send as many as 200-250 letters annually to local governments that fail to meet one or more established standards. These letters typically concern issues such as fund deficits, low general fund balances, significant uncollected property taxes, and management-identified internal control violations and weaknesses (Coe, 2007). Local governments that are unable to address these issues internally may receive assistance from LGC staff. If a serious condition remains, the LGC may exercise its intervention authority, assuming financial control of the troubled government or district.

Given the LGC's role in monitoring for and responding to local government fiscal distress, the agency possessed a natural interest in the development and adoption of a formal model of fiscal condition. That model arose when three researchers at the University of North Carolina's School of Government proposed a new indicator-based system that made use of financial information already collected by the office. The model's developers, Rivenbark, Roenigk, and Allison (2009, 2010) define financial condition as "a local government's ability to meet its ongoing financial, service, and capital obligations based on the status of resource flow and stock as interpreted from annual financial statements." This approach eschews exogenous environmental indicators, such as population growth or the unemployment rate, in favor of financial ratios calculated using information only from audited financial statements.

The fiscal benchmarking framework developed by Rivenbark et al. (2009, 2010) assesses financial condition using fiscal indicators, capturing resource stock and flow at the governmental activities, enterprise fund, and general fund levels.[1] Table 1 reports the eight indicators selected to evaluate economic resources at the government-wide and enterprise-fund levels. Table 2 reports the six indicators used to assess the financial resources of the general fund. Each indicator selected for benchmarking captures a dimension of financial condition; for example, financing obligations are measured using the debt service ratio. The two sets share some common indicators, such as the quick ratio, while others are unique to each model. Each of the

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[1] The Generally Accepted Accounting Principles (GAAP) drafted by the Government Accounting Standards Board's (1999) Statement No. 34 directs local governments to produce basic financial statements from the government-wide perspective. Specifically, "these statements should report all of the assets, liabilities, revenues, expenses, and gains and losses of the government (and) distinguish between the governmental and business-type activities of the primary government." The governmental activities perspective captures all financial transactions pertaining to government services, while business-type activities such as public utilities are reported separately as enterprise funds. The general fund includes all expenditures and revenues pertaining to governmental activities that are not statutorily required to be reported in a specialized fund, e.g. a debt service, capital project, or special revenue fund.

14 indicators is calculated using financial data from annual financial reports submitted to the LGC.[2]

A significant goal of the North Carolina financial condition model is to make financial performance information available in a timely and accessible manner. This is accomplished in part through a public web-based dashboard that reports each local government's performance along each of the indicators in the current and prior fiscal years. An important feature of the dashboard is inclusion of a benchmark value for each indicator, based on a peer group of governments or districts selected by the user.

The North Carolina Department of State Treasurer adopted the proposed financial condition model in 2009. The dashboard was introduced in spring 2010 as the benchmarking tool for Municipalities and Counties on the North Carolina State Department of State Treasurer's website.[3] The web-based tool was created by the Department of State Treasurer's Information Technology Division, though its design closely mirrors that of Rivenbark et al. (2009, 2010). At its launch, the tool was backfilled with indicator data for county and municipal governments for fiscal years 2005 to 2009. The North Carolina Department of State Treasurer handles all operations pertaining to the tool, including annual updates of the financial indicators for every unit each summer. The tool allows users to benchmark the financial condition of a local government in comparison to up to five peers over the five most recent fiscal years, although more peers can be examined by resetting the tool.

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[2] The North Carolina benchmarking tool also reports financial ratios for sewer/water and electrical enterprise funds.
[3] The benchmarking tool can be accessed on the North Carolina Department of State Treasurer website here: https://www.nctreasurer.com/slg/lfm/financial-analysis/Pages/Financial-Statistics-Tool.aspx.

The financial records used in our analysis were obtained from the North Carolina Department of State Treasurer, which provided us with complete financial records for all North Carolina municipalities and counties over fiscal years 2008 to 2014. We computed the financial ratios used in the benchmarking tool, creating a dataset for all 100 counties, 555 cities, and 345 special districts in North Carolina. We subsequently verified our calculations against the official records for several local governments on the benchmarking tool website. In the next section, we formalize the competing hypotheses about the behavior of local governments under financial benchmarking.

3. Benchmarking: Performance Improvement or Institutional Isomorphism?

This paper tests two distinct, though not strictly mutually exclusive, theories about the impact of benchmarking programs on organizational outcomes. Specifically, we examine how the introduction of a new local government fiscal benchmarking program impacted the measured financial ratios in aggregate.

A survey of relevant literature reveals there are two streams of thought on the effects of performance information on the measured outcomes. The first, one advocated by Ammons and Rivenbark (2008), Rivenbark and Roenigk (2011), and Ammons and Roenigk (2015), is that benchmarking provides valuable performance information that facilitates better policy decisions.[4] They argue that fiscal benchmarking gives administrators a management tool "when

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[4] Ammons and Rivenbark (2008) and Ammons and Roenigk (2015) study the North Carolina Benchmarking Project, a separate benchmarking effort than the program examined in this paper. The North Carolina Benchmarking Project focuses on municipal service delivery and is sponsored by the University of North Carolina. More information on the project can be found at www.sog.unc.edu/node/910.

they are helping elected officials embrace the responsibility of managing the fiscal matters of local government" (Rivenbark, Roenigk, and Allison, 2009, page 13). This argument mirrors a broader literature on the use of performance data in public organizations.

The specific tool we examine in this paper would not be considered a fully-realized performance management system as benchmarking an organization's performance is just one aspect of performance management. Some of the other elements in a performance management cycle include (but are not limited to): training (Kroll and Moynihan, 2015), leadership meetings (Behn, 2014), performance feedback (Kroll, 2013), and use of performance information in strategic planning and connecting that information to decision venues (Moynihan, 2008).

Clearly, the creators of fiscal benchmarking programs hope that this performance information will be used in these processes. Indeed, Rivenbark, and Roenigk present case study evidence that the benchmarking tool "helps local officials move from financial position to condition and that the information is actually used for decision-making" (2011, page 264). The use of benchmarking information to correct fiscal problems fits with the view of benchmarking spurring "improvement." Other empirical work has noted the importance of benchmarking as part of a performance regime. In a meta-analysis of 49 performance management systems, Gerrish (2016a) found a small effect size of performance management systems, but a much larger effect when management systems employed the use of extensive benchmarking, defined as benchmarking to both past performance and to performance of their peers, as is the case with North Carolina's fiscal benchmarking tool.[5]

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[5] As noted in Gerrish (2016a), it is possible that this effect partially captures other characteristics of the performance management systems that were difficult to discern from the original research.

On the other hand, a handful of papers in the performance management literature suggest that measurement and reporting of performance is insufficient to expect improvements in performance (Moynihan and Pandey, 2010; Behn, 2003). North Carolina's benchmarking tool simply summarizes and reports financial condition, leaving jurisdictions to use that information as they please. For example, Spreen and Cheek (2016) study a similar, short-lived local financial condition monitoring program in Michigan. They find that state monitoring and reporting exerted no significant effect on the monitored financial indicators.

There are two reasons quantitative evaluations of benchmarking programs (and similarly, programs that measure performance) may find a null effect. The first is that these programs simply have no effect on financial indicators or financial performance. The second, more nuanced argument is that positive and negative changes roughly offset one another, resulting in a null effect on average. This finding in the empirical research overlooks significant changes in the policy and organizational fiscal health across the distribution of governments. DiMaggio and Powell (1983), argue in their seminal article there is a tendency for organizations under the same set of environmental conditions to become increasingly similar over time—isomorphism. For example, organizational actors may mimic the practices (or outcomes) of other successful organizations to legitimize their own actions. There is empirical evidence in the literature that public organizations engage in isomorphic behavior. Frumkin and Galaskiewicz (2014) find that public organizations are more susceptible to isomorphic pressures than private or non-profit organizations. Teodoro (2014) shows that engineering professionalism in public water utilities contributes to normative isomorphic pressures in public executive management.

We explore whether new performance information, specifically, the financial performance data provided by North Carolina to its local governments, mediates isomorphic pressures to conform to a group or peer mean. DiMaggio and Powell (1983) argue that the four forms of isomorphic pressures that typically influence organizations — competitive, coercive, mimetic, and normative — are difficult to disentangle empirically. Regardless, the implications of isomorphism are the same: organizations at either end of the spectrum may converge on the average or typical government under a benchmarking regime. Although organizational isomorphism can be measured in several ways, we measure it here through the convergence in financial ratios once that information becomes more readily available. Thus, we omit an analysis of the type of isomorphism exerted by performance information in lieu of focusing on the interaction between performance management and isomorphism.

We exploit the introduction of North Carolina's fiscal benchmarking tool to test whether the mean financial indicators for local governments improve or become more similar to one another in response to benchmarking. As Rivenbark and Roenigk (2011) argue, there is potential for financial benchmarking to foster improvement in the monitored financial ratios for all jurisdictions, particularly as some local governments recognize their weaknesses relative to their peers using the benchmarking tool. We also argue that benchmarking high-performing jurisdictions should also encourage them to set and achieve loftier goals. We term this the *improvement hypothesis*, which argues that the introduction of the benchmarking tool will have an impact on the mean values of the monitored indicator values and an indeterminate impact on the dispersion of the indicators.

Conversely, the *isomorphism hypothesis* predicts local governments will mimic the position of the average unit, resulting in a decline in the indicator's variance without improvement in the average value. This hypothesis predicts that low-performing jurisdictions will converge toward their peers, but so too will jurisdictions with healthy financial ratios. For example, once governments can observe that they possess higher liquidity than their peers, they respond by spending down cash reserves or other current assets until their liquidity ratio mirrors that of their peers. This sort of behavior leads to a "race to the middle," a form of isomorphism suggested by DiMaggio and Powell (1983). Succinctly, the *isomorphism hypothesis* suggests that the North Carolina benchmarking tool will have little to no impact on the mean financial indicator values of municipalities and counties and a negative impact on their dispersion as measured by standard deviation or interquartile range.

Importantly, while the improvement and isomorphism hypotheses are framed in this article as nominally rival, both may be true; the overall mean of financial performance may improve while the dispersion shrinks. In fact, this must be mechanically true—if organizations with nominally low financial ratios improve them, holding middle and top performers constant, an indicator's dispersion will decline.

This is not, however, how researchers typically conduct public program evaluations. A typical evaluation examines only the change in the conditional mean (conditional on a set of covariates), using various strategies to estimate the effect relative to a counterfactual. This would overlook a competing hypothesis that there was an important change in the performance indicators that did not alter the mean. In other words, the antonym to improvement is not isomorphism; the

alternative to both exists in a catch-all third category of alternative scenarios. These include (1) that the policy had no effect on means or standard deviations of the indicators (a classic null effect); (2) all jurisdictions worsened in their financial situation (deterioration); or (3) the poor performers got worse while "star" performers improved. The last type of response resists a ready description as it would appear statistically as no effect on the mean but an increase in measures of dispersion.

Last, it is important to note that isomorphism rather than improvement under benchmarking is not necessarily a negative outcome for North Carolina's local governments. If governments with substantially higher liquidity ratios than peers draw down on this liquidity, that may be an improvement from the status quo, where scarce resources are tied up by local governments. The term "improvement" used in this paper derives largely from the literature on local financial condition which suggests low liquidity or an excessive debt load increases the likelihood of service disruption or reduction. Explicit in the empirical research in this area (Spreen and Cheek, 2016, for example) is a search for a statistically significant improvement in the mean ratio across all jurisdictions. We use the term improvement rather than increase because not every increase in a financial ratio implies a positive trend, e.g. ratios corresponding to debt burden.

We do not wish to make a normative judgement whether a response characterized as improvement or isomorphism represents a more desirable outcome. For example, the use of term "star" or "top" to categorize local governments with high (or low) financial ratios indicating fiscal health will largely be in quotations as a term of art because, for example, very high levels of solvency may actually be detrimental. However, the term "star" or "top" performer

nevertheless conveys the idea that these jurisdictions are not at risk of fiscal stress based on their financial ratios. We also hope to demonstrate that empirical evaluation of only the improvement hypothesis (implicit in the benchmarking and performance management literature), may unintentionally overlook another viable outcome: isomorphism. In the next section, we present the research design for evaluating these theories.

4. Methods

We test the competing hypotheses described above using a panel interrupted time series design to examine the change in financial ratios among North Carolina local governments before and after the benchmarking tool was introduced in 2010. As is the norm in public program evaluation, we examine the change in the mean to test the improvement hypothesis. We also test the conditional change in the standard deviation to verify the isomorphism hypothesis.

We test the improvement hypothesis by reviewing how the mean of each financial indicator changed after the benchmarking tool went live. We infer that a beneficial change in the mean indicates jurisdictions began improving their financial position after the introduction of the tool, regardless of the change in the dispersion of financial ratios. We test whether the change in the mean is statistically different from zero using fixed effects regression analysis with standard errors clustered at the government level. The implementation of the policy is captured by a binary variable equal to one in the years after the North Carolina benchmarking tool was introduced and zero in the years preceding.

16

Although the benchmarking tool was introduced in early calendar year 2010, the 2011 fiscal year (FY) began in July, giving local governments little time to incorporate the tool's performance information into the FY 2011 budgets. We expect managerial changes could be made to liquidity and solvency ratios by spending down reserves relatively quickly. The financial ratios pertaining to long-term debt and fixed assets, however, likely require a minimum of one to two fiscal years for managerial changes to be observed. Therefore, we separately evaluate the effect of the policy on outcomes using FY 2011 and FY 2012 as the start of the post-implementation period as a robustness check to our baseline analysis.

Each observation (a government-year) is weighted by the local government's average population over 2005 to 2014. This accounts for the fact that large jurisdictions like Charlotte, NC are typically marked with high levels of managerial professionalism. The regression model contains additional controls for exogenous, time-varying, social and economic characteristics of each municipality. Specifically, we control for median household income, poverty rates, the share of the population with a college degree and age 65 or older (U.S. Census Bureau), and the local unemployment rate (U.S. Bureau of Labor Statistics). These data are gathered at the county level or the city level when possible.[6] The regression model also contains a linear trend control.

To test the isomorphism hypothesis, we examine the change in the standard deviation of the 14 financial ratios between the benchmarking tool pre- and post-implementation periods. We test the change in the standard deviation using an ANOVA-variant, Bartlett's test.[7] Bartlett's test is a

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[6] Due to limited data at the local level, city governments take the value of the county government in which it resides for each of these variables.

[7] To examine the robustness of our assumption of distributional normality, we also conducted Levene's test (Levene, 1960; Brown and Forsythe, 1974). Brown and Forsythe (1974) proposed a variant of the test that relies on the

test of equal variance between groups. A rejection of the null hypothesis indicates that the groups have unequal variances. Because we want to examine the change in standard deviations conditional on socioeconomic environmental factors, we conduct Bartlett's test on the residuals of the same fixed effects model as described above. This is intended to strip the observations of contaminating influences such as the impact of the change of median income on revenues as well as fixed effects. Since the standard deviation can be strongly influenced by the presence or absence of outliers, we also use residuals to examine the change in the interquartile range (IQR), or the range between the 25th and 75th percentiles. The IQR excludes some of the local governments perpetually at the top or bottom of the distribution, focusing instead on the central half of the distribution of local governments. We do not test changes in the IQR for statistical significance.

A limitation of this panel interrupted time-series design is the lack of a comparison group. All North Carolina local governments were exposed to the benchmarking tool simultaneously in 2010, so no control municipalities or county governments exist in the dataset. In addition, because North Carolina requires all local governments to produce Generally Accepted Accounting Principles (GAAP)-compliant financial statements, it is exceptional among states (Mead, 2008). While the panel nature of the data contributes to the stability to the results, the lack of a comparison group or a longer panel makes estimating the counterfactual change in the financial ratios absent the policy difficult. However, to our knowledge, this is the first study to

median of the distribution rather than the mean. Results of this test are qualitatively similar to those using Bartlett's test. Results are available upon request.

examine the effect of performance or financial benchmarking on the dispersion of organizational outcomes.

Outlier Correction

Examination of the descriptive statistics presented in Table 3 reveals that several of the financial ratios possess very large means and standard deviations that do not appear reasonable given the financial dimensions they purport to measure. Both the liquidity and solvency ratios for governmental activities and general funds register maximum values in the range of 50,000. For example, in one fiscal year, Gamewell, NC reported $5.5 million in cash on hand and total liabilities of $129, resulting in a liquidity ratio exceeding 42,000.

For this reason, we use three related procedures to trim outliers in the county and municipal samples.[8] The first is a panel form of Thompson's Tau Technique (Wheeler and Ganji, 1996). To perform this procedure, we first calculate the panel average for each financial ratio; i.e., the ratio average between fiscal years 2008 and 2014. We eliminate local governments whose panel average was greater than four standard deviations above the sample mean. This procedure is iterative; once the first set of outliers is removed, the procedure is repeated up to 30 times until all outliers are eliminated. Second, we perform the same procedure described above using the pooled mean, which ignores the panel structure of the dataset, to eliminate outliers for specific years.

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[8] We trim rather than winsorize the data because it is unclear whether the outliers contain systematic information about the direction of the outliers.

Third, despite the effort to eliminate outliers using these two methods, the liquidity and solvency ratios for both governmental activities and the general fund remain problematic. Density plots of these ratios revealed a long right tail in the distribution, meaning that a significant number of outliers were not eliminated by the first two procedures. We resolve this by manually eliminating a small number of observations above 500 or below -100 for the four indicators pertaining to liquidity or solvency. Any outliers identified using the processes described above are changed to missing values in our panel dataset. Finally, we remove county or city governments missing three out of seven years of data for any single indicator.

The efforts to eliminate outliers resulted in removal of 3.8 percent of observations, on average, across the 14 financial indicators. The municipal liquidity and solvency ratios were the most problematic, with 13.8 percent and 26.0 percent of observations removed, respectively. Exploratory regression diagnostics reveal that the least populous local governments in the sample were more likely to be outliers.[9] We believe many of these implausibly large values reflect data entry errors in the financial records submitted to North Carolina's LGC. It may also reflect a misunderstanding about how to report financial data in a GAAP-compliant format — the inability, for example, to identify liabilities using accrual rather than cash accounting.

Moreover, Carroll and Marlowe (2009) find that as many as three-quarters of U.S. local governments still do not produce financial statements meeting the GAAP standards, and that more professional governments were the most likely to follow a GAAP-based accounting policy. Similarly, Patrick (2010) finds that small, rural governments are unlikely to voluntarily produce

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[9] Results available upon request. Because we employ population-weighted regressions, the influence of small population outliers on the estimated effects are reduced.

GAAP-compliant financial statements. These studies suggest smaller local governments may lack the sophistication to accurately report the financial information that underlies the financial ratios used in North Carolina's benchmarking tool. Population-weighting the results should reduce the effect of reporting errors from small governments. Additional analysis of the trimmed observations suggests that outliers are distributed roughly equally in the pre- and post-implementation periods of the tool.

Descriptive statistics

Table 3 reports the descriptive statistics for the county and municipal samples for the 14 financial ratios used in the tool. Summary statistics are shown separately for the full dataset and the one trimmed of outliers using the methodology described above. Descriptive statistics also reveal that, overall, the outlier-corrected means and standard deviations of most indicators were little changed from those of the full dataset. Table 4 contains the summary statistics for the seven covariates included in the regression model. In the next section, we discuss the results from our empirical analysis of the tool data.

5. Results

The baseline results of our analysis are presented in Table 5. The table reports the percentage change in each indicator's mean and standard deviation from the pre-implementation period of FY2008-10 to the post-implementation period of FY2011-14 using the output from the fixed effects regression model. To calculate the change in the mean, we divide the parameter estimate

on the critical variable by the pre-implementation mean (similar to a standardized regression coefficient). A statistically significant change in the mean, as estimated by the fixed effects regression, is denoted by stars. Similarly, we calculate the percent change in the standard deviation using the model residuals. This approach controls for other factors that may have caused the dispersion to change in the post-policy period, ceteris paribus. Daggers indicate a statistically significant change in the standard deviation according to Bartlett's test on the model residuals.

We create heuristic categories for our results along three dimensions based on statistically significant changes in the mean and standard deviation. First, if the ratio indicates a beneficial change in the mean, such as a reduction in leverage or an increase in liquidity, we classify this result as supporting the improvement hypothesis, regardless of the change in the standard deviation.[10] Indeed, if organizations with financial ratios that are considered "poor" improve their financial position, holding middle and top performers constant, we would also expect the indicator's dispersion to decline.

If the mean of the financial ratio does not show significant beneficial improvement but there is a statistically significant decline in the standard deviation, we categorize the result as supporting the isomorphism hypothesis. It may be the case that top performing governments tend toward the mean, resulting in a small or detrimental effect, or both low and top performers move towards the mean. In either case, the indicator's dispersion would decline without a corresponding

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[10] We base the classification on a beneficial change as opposed to a positive change. In some cases, such as financial leverage indicator, an increase in tax-supported debt also increases the likelihood of future financial distress. Thus, an increase in this indicator would not be beneficial.

improvement in the mean of the financial ratio. If the mean does not show a statistically significant beneficial change and the standard deviation does not decline, we classify the result as indeterminate, since it supports neither hypothesis.

The preponderance of the evidence in Table 5 supports the isomorphism hypothesis. Among municipal governments, half of the ratios (seven of the 14) demonstrate isomorphic changes following the introduction of the North Carolina benchmarking tool. In other words, these indicators demonstrate a combination of non-beneficial changes in the mean and statistically significant reductions in the standard deviation. Three of the financial ratios support the improvement hypothesis. We classify the remaining four indicators as showing indeterminate changes that support neither the improvement nor isomorphism hypotheses.

While most of the changes in each indicator for county governments are indeterminate, those that did present statistically significant changes point toward the isomorphism hypothesis. Four indicators showed significant declines in the standard deviation without a beneficial change in the mean value. Just one, solvency, experienced a beneficial change in the mean. Although the results are less stark than those of municipal governments, there is some evidence that North Carolina's county governments began mimicking the financial position of the others governments.

We argue that the results for county governments reflect less flexibility among North Carolina county governments in adjusting their short-run revenue and expenditure commitments. For example, North Carolina county governments are statutorily responsible for the finance,

construction, and maintenance of school facilities, although the buildings themselves are owned by independently-elected school boards. Similarly, North Carolina counties administer social and health services on behalf of the state, though the state also supervises and regulates these activities. In addition, the state is responsible for the building and maintenance of secondary roads, a function usually reserved for county governments in other states. Given these constraints, we expect North Carolina county governments are slower to exert isomorphic behavior than municipal governments, and that behavior takes longer to manifest itself in the empirical data.

Table 6 reports the percentage change in the interquartile range (IQR) of each indicator from the pre- to post-implementation periods. The strength of the results reported in this table, as compared to Table 5, is that they are less susceptible to any remaining outliers in the dataset. The IQR, in particular, captures only the change among the middle 50 percent of the distribution of local governments, declining if the middle-half of the distribution shrinks in dispersion.

The results presented in Table 6 strongly support the isomorphism hypothesis. The IQR of 13 of the 14 indicators declined among municipal governments after the benchmarking tool was introduced. The IQR of eight indicators declined by 20 percent or more. County governments similarly show signs of isomorphic behavior; the IQRs of 10 of the 14 indicators declined following the introduction of the tool. While the results from Table 6 show a stronger tendency towards isomorphism, we are not able to use quantile regression to test changes in the median or

IQR as the models would not converge; thus, the changes in the IQR are not tested for statistical significance.[11]

To examine the effect of this policy on the "star" performers in North Carolina (whose behavior is critical in driving isomorphic results), Table 7 reports the top percentiles indicative of financial health for each financial ratio before and after the introduction of the benchmarking tool.[12] The figures reported in this table are not weighted by population (the nature of percentiles) nor do they include controls for environmental factors, as in Tables 5 and 6. We calculate the mean of the ratio before and after the introduction of the benchmarking tool for but municipalities and countries. In the third column, we calculate the percentage change in each ratio by percentile. We previously argued that while these "star" performers may have high indicators of fiscal health they may also be accumulating slack financial resources.

The results in Table 7 show that six of fourteen municipal government financial ratios constantly declined, and 4 showed no change because they were at their natural limits (e.g. zero financing obligation). Some of those declines exceeded 10 percent, suggesting that the top-performing municipal governments in liquidity, solvency, and financial performance began to spend down idle financial resources as they became aware of their peers' financial positions through the tool. Among county governments, four of fourteen "star" performer percentiles declined, following with the less consistent results reported in Tables 5 and 6.

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[11] Quantile regression models are iterative, converging when the sum of absolute weighted deviations are minimized. The addition of multiple covariates, particularly fixed effects, can lead to nonconvergence as was the case in this analysis.

[12] The direction of a beneficial change varies across indicators. Therefore, the top percentiles we display is the 25th and 10th for indicators that lower values indicate a better financial position and 75th and 90th percentiles for ratios in which a higher ratio is better.

We do not test the significance of the results presented in Table 7. Regardless, these results and those from Tables 5 and 6, suggest that isomorphic behaviors accelerated after the roll-out of North Carolina's benchmarking tool. In addition, these behaviors cannot be explained by improvement of low financial ratios alone; in several areas, the performance of "star" jurisdictions decline. Additionally, Table 7 reinforces our finding that the effect appears to vary by government type; municipal governments show significantly more isomorphic results than counties.

While we largely ignore Great Recession's impact on the benchmarking tool's financial ratios until now, the results in Table 6 and 7 help to demonstrate the Great Recession was not a significant influence in our results. If the economic downturn exerted significant effects on the financial ratios in the pre-implementation period, we would expect local governments to consistently show signs of recovery and improvement in the financial ratios over the post-period (FY 2011 to FY 2014). The post-implementation period was marked by stronger economic growth nationally that was coincident with the rollout of the North Carolina benchmarking tool. The data presented in Table 7 suggests the tool had a stronger effect on the financial ratios than aggregate economic conditions; in fact, we observe several significant drops in many municipal financial ratios among top performers after the Great Recession ended.

Robustness Checks

We conduct two robustness checks to examine the sensitivity of baseline results. First, we estimate our results without removing outliers. As we argue earlier, a handful of local

governments possess financial ratios with nonsensical values, but retaining these outliers allows us to make use of all of the information provided by the North Carolina Department of State Treasurer. The results of this analysis are reported in Tables 8 and 9.

The results reported in these tables suggest our baseline results are largely robust with the inclusion of outliers. Seven of the 14 municipal ratios in Table 8 support the isomorphism hypothesis; the same number as the baseline result in Table 5, though some of the specific indicators in support changed. Similarly, six of 14 indicators for county governments support the isomorphism hypothesis. The most noteworthy difference between the results presented in Table 8 and those from the baseline analysis in Table 5 is the magnitude of the change in the indicators' means or standard deviation. Table 8 shows much larger changes following the introduction of the benchmarking tool, a result attributable to the presence of outliers in the sample.

Table 9 shows the changes in each indicator's IQR with outliers included in the sample. The changes in the IQR of most indicators for both municipal and county governments once again support the isomorphism hypothesis. The IQR of 10 out of 14 municipal indicators declined following the introduction of the tool. The IQR of 12 out of 14 county indicators similarly declined. Most of the IQR changes are considerably larger in Table 9 compared to those in Table 6, owing to the inclusion of outliers in this analysis. Regardless, the results of this robustness check again concur with the baseline results with outliers excluded.

As a second robustness check, we conduct the same analysis, treating FY2012 as the first post-implementation year of the policy rather than FY2011. For this robustness check, we exclude all observations from FY2011 due to potential policy contamination. Thus, the pre-implementation period is defined as FY2008-10 and the post-implementation period is FY2012-14. We once again trim outliers for this analysis using the same methods described above, prior to exclusion of the FY2011 data.

Table 10 shows the results of our analysis using FY2012 as the first post-implementation year of the benchmarking tool. Although the lagged analysis generates more indeterminate results, those that are statistically significant support the isomorphism hypothesis. The changes in five municipal indicators register as isomorphic, compared to three improvements and 6 indeterminate changes. The indicators for county governments show three isomorphic changes and two improving changes.

Finally, Table 11 recreates our analysis of indicator IQRs in Table 5 using FY2012 as the post-implementation period. The results are once again consistent with the baseline analysis. A total of 12 of the 14 municipal indicators registered declines in their IQR and 9 of the 14 county indicators similarly declined. The magnitude of the changes in the IQRs are largely consistent with our earlier analyses.

In all four robustness check tables, we find results consistent with those of our baseline analysis. The largest changes in the mean and standard deviations occur when outliers are included, but the results still tend to support the isomorphism hypothesis. We find similar evidence of

isomorphic behavior when using a one-year lag in the implementation of the benchmarking tool in the regression model framework. In the next section, we discuss the implications of the results presented above.

6. Discussion

The use of performance and financial benchmarking holds both promise and perils in efforts improve local government administration. On one hand, administrators have a new tool with which to compare their jurisdictions against their peers, highlighting deviations from behavioral norms (Ammons & Rivenbark, 2008). On the other hand, our analysis shows that the most fiscally healthy governments, the "star" performers, appear to slack towards the mean following the introduction of the benchmarking tool. Table 7 clarifies the results in Tables 5 and 6; changes in many of the financial ratios of top performing governments converge towards the average North Carolina municipality or county after fiscal benchmarking began. This suggests that those local governments made financial decisions that altered their fiscal position but kept them better positioned than the average government, as measured by the several of the financial ratios in the North Carolina benchmarking tool. There are several reasons why this might occur. For one, "star" performers may not realize that their financial ratios demonstrate outstanding financial performance and this new or more easily digestible information may spur them to move toward their neighbors. Another possibility is that elected officials and financial managers may see strong financial ratios (compared to their peers) as an opportunity to spend down reserves on new projects or make other financial management changes.

To summarize, the results presented in this paper show that the financial positions of North Carolina's local governments began converging towards the mean following the introduction of the state's benchmarking tool. These results lend support to the hypothesis that local governments respond to financial performance information by bowing to isomorphic pressures, though the exact reason why is not clear and may vary by jurisdiction. We find that the effect of isomorphic forces is stronger than those that support the improvement hypothesis.

Whether this trend towards the average is beneficial or detrimental to local governments is an open question. The financial positions of the best performing municipalities declined, by some measures, following the introduction of the tool. On the other hand, those same governments were potentially maintaining an excess of reserves that were put to better use financing operations, new capital projects, or tax relief to residents. The introduction of the benchmarking tool allowed those governments to observe their reserves relative to their peers and facilitated managerial decisions to reduce them.

Our results pose a dilemma for research on the impact of performance information, and thus measurement and management of organizational outcomes. On one hand, we found that there was very little meaningful change in the mean of many North Carolina's financial indicators. In a prototypical evaluation of this program, we would conclude that there was little impact of this program and report null results. However, a more careful analysis of the dispersion of financial performance reveals statistically significant and large changes in several standard deviations of the indicators. Rather than create an environment for widespread improvement in local government financial ratios, as suggested by Rivenbark and Roenigk (2011), we instead find a

preponderance of evidence in support of convergence towards the mean following the introduction of North Carolina's financial benchmarking program.

Finally, one lesson from this result is largely intuitive: once public organizations have information about the positions or outcomes of their average peer, organizations begin to mimic that average, regardless of whether they were previously the best or worst performers in their peer group. Future research on performance systems where benchmarking is a central element should consider this result as a possible response by participating actors. We believe that this result may extend to a number of programs which use benchmarking or release performance information to a wide set of "peers."

However, the strength of the isomorphic response likely varies with some of the features of the programs. For example, goal setting may reduce some of the isomorphic response as would examining the year-over-year change in the performance indicators. We hypothesize that explicit financial rewards for performance are likely to strengthen this response, as in the case in policy areas like Federal Child Support Enforcement Gerrish (2016b). In particular, performance information or benchmarking systems which rely on the sharing or publication of information among peer jurisdictions should be especially cognizant of this behavioral response and evaluators should be careful that what they attribute to heteroskedasticity might be a response to the policy.

7. Conclusion

State-sponsored fiscal benchmarking is an increasingly popular tool for monitoring the fiscal health of local governments. Most recently, Indiana and New York introduced local fiscal benchmarking programs with the goal of detecting or predicting local fiscal distress. While much of the literature in this field focuses on which financial ratios "best" identify or predict distress, a small but growing literature is devoted to examining how these programs affect the measured outcomes. We hope to contribute to that literature with a novel analysis of the effects of a new fiscal benchmarking program.

Specifically, we examine the broader effects of benchmarking on the behavior of all organizations who have access to the performance data. We formulate two hypotheses regarding the behavior of local governments under benchmarking. We term the first the improvement hypothesis, which holds that fiscal benchmarking allows organizations with financial ratios that are worse than average to observe their financial weaknesses relative to their peers and will work to correct those deficiencies. A second hypothesis applies DiMaggio and Powell's (1983) isomorphism hypothesis to the introduction of new performance information. We predicted that new performance information would accelerate isomorphic tendencies, encouraging both fiscally distressed and healthy governments to converge towards the average jurisdiction over time.

To test these two hypotheses, we examine how the introduction of North Carolina's benchmarking tool impacted both the central tendency and dispersion of the indicators. We accomplish this using a fixed effects panel interrupted time series design and socioeconomic

controls. We find that following the introduction of the benchmarking tool, North Carolina's local governments tended more closely toward isomorphism rather than improvement as they converged toward the group mean across several indicators. Specifically, we find that a plurality of the financial ratios showed no significant improvement in its mean value while the standard deviation or IQR declined. We additionally find that many of the high performers at the top percentiles of the distribution of a financial ratio experienced sizeable changes following the tool's introduction.

On net, we believe our results raise some concerns about the unintended consequences associated with fiscal benchmarking and performance information. It appears that providing information without guidance or clear goals of the "ideal" ratio may encourage or accelerate a trend towards averageness. Our results show that they encourage otherwise fiscally healthy local governments to spend down cash reserves. On the other hand, North Carolina's benchmarking program appears to result in some below-average jurisdictions getting their proverbial "fiscal house in order," even if we categorized the result as isomorphic in nature.

The results of this analysis provide an important warning to scholars of performance management and benchmarking programs. A traditional pre-post evaluation of the North Carolina fiscal benchmarking tool to test for changes in the means of the ratios would fail to detect an effect explained by both increases at the bottom of the distribution and declines at the top. The results presented here are marked by statistically significant declines in measures of dispersion, which would typically be attributed to heteroskedasticity (and merely corrected) in a regression framework.

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Table 1: NC Benchmarking Tool Government-wide and Enterprise Fund Indicators

Resource Flow				
Dimension	Description	Indicator	Calculation	Interpretation
Inter-period equity	Addresses whether or not a government lived within its financial means during the fiscal year	Total margin ratio	Total revenues divided by total expenses	A ratio of one or higher indicates that a government lived within its financial means.
Financial performance	Provides the magnitude of how a government's financial position improved or deteriorated as a result of resource flow	Percent change in net assets	Change in net assets divided by net assets, beginning	A positive percent change indicates that a government's financial position improved.
Self-sufficiency	Addresses the extent to which service charges and fees covered total expenses	Charge to expense ratio	Charges for services divided by total expenses	A ratio of one or higher indicates that the service is self-supporting.
Financing obligation	Provides feedback on service flexibility with the amount of resources committed to annual debt service	Debt service ratio	Debt service (principal and interest payments on long-term debt) divided by total expenses plus principal	Service flexibility decreases as more resources are committed to annual debt service.
Resource Stock				
Dimension	Description	Indicator	Calculation	Interpretation
Liquidity	Denotes the government's ability to address short-term obligations	Quick ratio	Cash & investments divided by current liabilities (minus deferred revenue)	A high ratio suggests a government is able to meet its short-term obligations.
Solvency	Denotes the government's ability to address long-term obligations	Net assets ratio	Unrestricted net assets divided by total liabilities	A high ratio suggests a government is able to meet its long-term obligations.
Leverage	Describes the extent to which total assets are financed with long-term debt	Debt to assets ratio	Long-term debt divided by total assets	A high ratio suggests a government is overly reliant on debt for financing assets.
Capital	Refers to the condition of capital assets defined as remaining useful life	Capital assets condition ratio	1 − (accumulated depreciation divided by capital assets being depreciated)	A high ratio suggests a government is investing in its capital assets.

Source: Rivenbark, W. C., Roenigk, D. J., and Allison, G. S. (2010). Conceptualizing Financial Condition in Local Government. *Journal of Public Budgeting, Accounting & Financial Management*, 22(2), 149-177.

Table 2: NC Benchmarking Tool Governmental Fund Indicators

Resource Flow				
Dimension	Description	Indicator	Calculation	Interpretation
Service obligation	Addresses whether or not a government's annual revenues were sufficient to pay for annual operations	Operations ratio	Total revenues divided by total expenditures (plus transfers to the debt service fund and less proceeds from capital leases)	A ratio of one or higher indicates that a government lived within its annual revenues.
Dependency	Provides the extent to which a government is reliant on other governments for resources	Intergovernmental ratio	Intergovernmental revenue divided by total revenue	A high ratio may indicate that a government is too reliant on other governments.
Financing obligation	Provides feedback on service flexibility with the amount of expenditures committed to annual debt service	Debt service ratio	Debt service (principal and interest payments on long-term debt, including transfers to the debt service fund) divided by total expenditures plus transfers	Service flexibility decreases as more expenditures are committed to annual debt service.
Resource Stock				
Dimension	Description	Indicator	Calculation	Interpretation
Liquidity	Denotes the government's ability to address short-term obligations	Quick ratio	Cash & investments divided by current liabilities (minus deferred revenue)	A high ratio suggests a government is able to meet its short-term obligations.
Solvency	Denotes the government's ability to continue service provision	Fund balance as a percentage of expenditures	Available fund balance as a percentage of total expenditures plus transfers out	A high ratio suggests a government can continue to provide uninterrupted services.
Leverage	Denotes the extent to which a government relies on tax-supported debt	Debt as percent of assessed value	Tax-supported, long-term debt divided by assessed value	A high ratio suggests a government is overly reliant on debt.

Note: Governmental fund indicators include the general fund.

Source: Rivenbark, W. C., Roenigk, D. J., and Allison, G. S. (2010). Conceptualizing Financial Condition in Local Government. *Journal of Public Budgeting, Accounting & Financial Management*, 22(2), 149-177.

Table 3: NC Benchmarking Tool Indicator Descriptive Statistics, FY2008-14 Average

Governmental Activities Indicators		Municipal Governments						County Governments					
		No Outlier Correction			Outlier Correction			No Outlier Correction			Outlier Correction		
Resource Flow	Beneficial Inter-period change	N	Mean	SD	Outliers trimmed	Mean	SD	N	Mean	SD	Outliers trimmed	Mean	SD
Inter-period equity	(+)	2,055	1.16	0.59	4.9%	1.09	0.21	693	1.01	0.09	0.4%	1.01	0.09
Financial Performance	(+)	1,766	4.18	21.40	3.2%	2.95	7.80	588	2.03	146.19	5.4%	-1.58	46.09
Self-sufficiency	(+)	2,055	0.08	0.08	0.6%	0.08	0.07	693	0.09	0.03	0.4%	0.09	0.03
Financing obligation	(-)	2,055	0.05	0.07	2.8%	0.04	0.04	684	0.11	0.06	0.4%	0.11	0.06
Resource Stock													
Liquidity	(+)	2,005	203.96	2167.19	13.8%	14.62	15.99	687	3.66	3.40	4.6%	3.04	1.24
Solvency	(+)	2,011	214.82	2513.75	26.0%	2.29	2.94	678	-0.18	0.61	5.4%	-0.30	0.29
Leverage	(-)	2,056	0.11	0.14	1.2%	0.10	0.12	689	0.90	0.50	2.3%	0.85	0.42
Capital	(+)	2,038	0.53	0.19	0.0%	0.53	0.19	697	0.59	0.12	0.0%	0.59	0.12
General Fund Indicators													
Resource Flow													
Service obligation	(+)	3,838	1.08	0.27	5.4%	1.06	0.16	691	1.03	0.07	2.3%	1.02	0.04
Dependency	(-)	3,840	0.36	0.22	0.4%	0.33	0.19	697	0.18	0.05	0.0%	0.18	0.05
Financing obligation	(-)	3,838	0.04	0.06	2.5%	0.04	0.05	691	0.11	0.06	0.0%	0.11	0.06
Resource Stock													
Liquidity	(+)	3,714	127	926	9.4%	30.71	33.33	688	10.61	7.46	3.1%	9.57	4.32
Solvency	(+)	3,838	137	195	6.9%	93.39	85.77	695	23.49	8.58	1.2%	23.03	7.50
Leverage	(-)	3,716	0.13	0.31	3.4%	0.14	0.23	698	1.20	0.65	0.0%	1.20	0.65

Notes: See the methods section for a description of fixes for outliers. Data are derived from 553 municipalities and 100 county governments.

Table 4: Social and Economic Control Variable Summary Statistics, 2008-14

Variable	Source	Municipal Governments			County Governments		
		N	Mean	SD	N	Mean	SD
Percent of residents over age 65	U.S. Census Bureau	2,023	12.3	5.5	259	12.1	5.2
Percent with a college degree	U.S. Census Bureau	2,023	23.4	9.3	259	24.3	10.6
Median income	U.S. Census Bureau	2,023	$43,777	$8,184	259	$44,015	$7,686
Poverty rate	U.S. Census Bureau	2,023	17.7	4.9	259	17.4	4.4
ln(Population)	U.S. Census Bureau	2,064	8.0	1.7	259	12.0	0.6
Unemployment rate (county)	U.S. Bureau of Labor Statistics	2,009	9.3	2.6	259	9.0	2.6

Notes: Reported statistics represent the 2008 through 2014 average and standard deviation of each variable.

Table 5: Pre- and Post-FY2011 Percent Change in NC Benchmarking Tool Indicator Mean and Standard Deviation

Governmental Activities Indicators	Municipal Governments			County Governments		
Resource Flow	**Pct Chg in Mean**	**Pct Chg in SD**	**Evidence of…**	**Pct Chg in Mean**	**Pct Chg in SD**	**Evidence of…**
Inter-period equity	3.1% **	-30.5% †††	Improvement	-0.1%	-20.0% †	Isomorphism
Financial performance	58.9 *	-18.9 †††	Improvement	-72.3	28.6 †	Indeterminate
Self-sufficiency	-1.9	-4.5	Indeterminate	-0.7	10.9	Indeterminate
Financing obligation	-15.8	-11.6 †††	Isomorphism	4.1	-5.8	Indeterminate
Resource Stock						
Liquidity	2.9	-17.2 †††	Isomorphism	-12.3	-31.7 †††	Isomorphism
Solvency	-16.7 **	-8.6 ††	Isomorphism	38.4 ***	-20.8 ††	Improvement
Leverage	4.9	-10.6 †††	Isomorphism	5.9 ***	-8.4	Indeterminate
Capital	0.8	-22.9 †††	Isomorphism	0.7	-6.6	Indeterminate
General Fund Indicators						
Resource Flow						
Service obligation	-0.9	-3.0	Indeterminate	-0.3	-8.9	Indeterminate
Dependency	-3.2	-38.2 †††	Isomorphism	1.7	-21.5 ††	Isomorphism
Financing obligation	-15.7 *	6.9	Improvement	18.3	14.4	Indeterminate
Resource Stock						
Liquidity	5.0	0.0	Indeterminate	7.2	2.7	Indeterminate
Solvency	2.9	-9.3 ††	Isomorphism	-1.2	9.5	Indeterminate
Leverage	-2.3	-1.4	Indeterminate	-2.0	-29.7 †††	Isomorphism

Notes: Statistical significance of the change in the mean is denoted by *p<0.05, **p<0.01, ***p<0.001. Statistical significance of the change in the standard deviation is denoted by †p<0.05, ††p<0.01, †††p<0.001, using Bartlett's test. The percent change in the mean is calculated using the parameter estimate on the post-implementation variable divided by the mean of the pre-implementation period. The percent change in the standard deviation is calculated using the model residuals. Control covariates include: jurisdictional fixed effects, percentage of residents aged 65 or older, percent of residents with a college degree or more, median income, poverty rate, ln(population), and a linear year trend. As a heuristic, *Isomorphism* is defined as a change in the mean that is not statistically (p>=.05) different from zero and a statistically significant (p<.05) decline in the standard deviation. A performance *improvement* is defined as statistically significant (p<.05) beneficial change in the mean regardless of the change in the standard deviation (see Table 3 for the relevant direction). An indeterminate effect supports neither hypothesis.

Table 6: Pre- and Post-FY2011 Percent Change in NC Benchmarking Tool Indicator Interquartile Range (IQR)

Governmental Activities Indicators	Municipal Governments		County Governments	
	Pct Chg in IQR	Evidence of Isomorphism?	Pct Chg in IQR	Evidence of Isomorphism?
Resource Flow				
Inter-period equity	-8.8%	Yes	-0.4%	Yes
Financial performance	-23.4	Yes	-20.2	Yes
Self-sufficiency	-5.7	Yes	2.8	No
Financing obligation	-15.7	Yes	-33.9	Yes
Resource Stock				
Liquidity	-29.8	Yes	-15.9	Yes
Solvency	-23.6	Yes	-11.4	Yes
Leverage	-29.1	Yes	-28.6	Yes
Capital	-25.0	Yes	8.5	No
General Fund Indicators				
Resource Flow				
Service obligation	21.9	No	-24.9	Yes
Dependency	-13.9	Yes	-5.5	Yes
Financing obligation	-30.2	Yes	16.0	No
Resource Stock				
Liquidity	-1.5	Yes	14.5	No
Solvency	-22.0	Yes	-10.7	Yes
Leverage	-32.9	Yes	-40.2	Yes

Notes: The percentage change is calculated as (Post-2011 – Pre-2011)/Pre2011*100. The results above use data trimmed of significant outliers. Unlike Table 5, the results presented above do not compare the change in the IQR to the change in the median or mean. We do not test for the statistical significance of the change in the IQR.

Table 7: Percent Change in the "Star" Performers by Percentile

Governmental Activities Indicators		Municipalities			Counties		
Resource Flow	Pctile	Pre	Post	%Δ	Pre	Post	%Δ
Inter-period equity	75th	1.20	1.15	-4%	1.02	1.08	5%
	90th	1.39	1.34	-4%	1.06	1.12	6%
Financial performance	75th	7.30	6.47	-11%	17.13	11.27	-34%
	90th	13.70	12.11	-12%	54.71	33.77	-38%
Self-sufficiency	75th	0.12	0.14	13%	0.10	0.11	7%
	90th	0.16	0.18	16%	0.12	0.15	21%
Financing obligation	25th	0.00	0.00	N/A	0.06	0.08	18%
	10th	0.00	0.00	N/A	0.04	0.05	36%
Resource Stock							
Liquidity	75th	19.87	17.19	-13%	3.86	3.88	1%
	90th	40.73	36.56	-10%	4.87	4.59	-6%
Solvency	75th	3.15	2.37	-25%	-0.09	-0.15	69%
	90th	6.35	5.87	-8%	0.14	0.10	-28%
Leverage	25th	0.00	0.00	N/A	0.63	0.57	-8%
	10th	0.00	0.00	N/A	0.32	0.39	24%
Capital	75th	0.67	0.65	-3%	0.68	0.66	-3%
	90th	0.79	0.77	-4%	0.73	0.72	-2%
General Fund Indicators **Resource Flow**							
Service obligation	75th	1.14	1.12	-1%	1.04	1.06	1%
	90th	1.30	1.22	-7%	1.08	1.08	0%
Dependency	25th	0.16	0.18	9%	0.14	0.14	-1%
	10th	0.12	0.13	8%	0.12	0.12	-6%
Financing obligation	25th	0.00	0.00	N/A	0.08	0.08	-2%
	10th	0.00	0.00	N/A	0.04	0.02	-36%
Resource Stock							
Liquidity	75th	38.16	38.93	2%	11.04	13.11	19%
	90th	76.90	78.91	3%	16.57	15.92	-4%
Solvency	75th	117.65	113.92	-3%	24.81	30.33	22%
	90th	213.55	226.39	6%	29.78	35.60	20%
Leverage	25th	0.00	0.00	N/A	0.75	0.72	-4%
	10th	0.00	0.00	N/A	0.47	0.57	20%

*Note*s: All data are trimmed for outliers using the protocol described in the methods section. The percentiles shown are based on whether a higher or lower value of the ratio is consistent with fiscal health. %Δ=percent change. N/A indicates no change.

Table 8: Pre- and Post-FY2011 Percent Change in NC Benchmarking Tool Indicator Mean and Standard Deviation (outliers included)

Governmental Activities Indicators	Municipal Governments			County Governments		
Resource Flow	**Change in Mean**	**Change in SD**	**Evidence of…**	**Change in Mean**	**Change in SD**	**Evidence of…**
Inter-period equity	2.8%	-37.0% †††	Isomorphism	0.0%	-10.5%	Indeterminate
Financial performance	22.8	-59.1 †††	Isomorphism	-31.2	-45.4 †††	Isomorphism
Self-sufficiency	-2.2	5.7	Indeterminate	-0.3	25.4 †	Indeterminate
Financing obligation	-16.3	-5.1	Indeterminate	-19.6	-22.8 ††	Isomorphism
Resource Stock						
Liquidity	-76.1	-3.0	Indeterminate	-24.1	-49.0 †††	Isomorphism
Solvency	-53.2	75.8 †††	Indeterminate	92.4 **	-31.1 †††	Improvement
Leverage	5.0	-16.1 †††	Isomorphism	7.1 **	-4.0	Indeterminate
Capital	0.8	-22.9 †††	Isomorphism	0.7	-6.6	Indeterminate
General Fund Indicators						
Resource Flow						
Service obligation	-0.8	-24.3 †††	Isomorphism	-0.7	3.1	Indeterminate
Dependency	-3.5	-16.1 †††	Isomorphism	1.7	-21.5 ††	Isomorphism
Financing obligation	-9.1	1.4	Indeterminate	18.3	14.4	Indeterminate
Resource Stock						
Liquidity	32.2	105.8 †††	Indeterminate	5.4	-19.8 †	Isomorphism
Solvency	-1.3	-30.4 †††	Isomorphism	-2.6	4.0	Indeterminate
Leverage	-28.6 **	-33.2 †††	Improvement	-2.0	-29.7 †††	Isomorphism

Notes: Statistical significance change in the mean is denoted by *p<0.05, **p<0.01, ***p<0.001. Statistical significance change in the standard deviation is denoted by †p<0.05, ††p<0.01, †††p<0.001, using Bartlett's test. The percent change in the mean is calculated using the parameter estimate on the post-implementation variable divided by the mean of the pre-implementation period. The percent change in the standard deviation is calculated using the model residuals. Control covariates include: jurisdictional fixed effects, percentage of residents aged 65 or older, percent of residents with a college degree or more, median income, poverty rate, ln(population), and a linear year trend. As a heuristic, *Isomorphism* is defined as a change in the mean that is not statistically (p>=.05) different from zero and a statistically significant (p<.05) decline in the standard deviation. A performance *improvement* is defined as statistically significant (p<.05) beneficial change in the mean regardless of the change in the standard deviation (see Table 3 for the relevant direction). An indeterminate effect supports neither hypothesis.

Table 9: Pre- and Post-FY2011 Percent Change in NC Benchmarking Tool Indicator Interquartile Range (with outliers)

Governmental Activities Indicators	Municipal Governments		County Governments	
	Pct Chg in IQR	**Evidence of Isomorphism?**	**Pct Chg in IQR**	**Evidence of Isomorphism?**
Resource Flow				
Inter-period equity	7.5%	No	-5.3%	Yes
Financial performance	-34.6	Yes	-13.1	Yes
Self-sufficiency	-7.0	Yes	-6.0	Yes
Financing obligation	-29.8	Yes	-29.4	Yes
Resource Stock				
Liquidity	10.8	No	-20.9	Yes
Solvency	48.1	No	-23.1	Yes
Leverage	-34.2	Yes	-24.3	Yes
Capital	-25.0	Yes	8.5	No
General Fund Indicators				
Resource Flow				
Service obligation	7.4	No	-11.4	Yes
Dependency	-14.4	Yes	-5.5	Yes
Financing obligation	-39.6	Yes	16.0	No
Resource Stock				
Liquidity	-5.7	Yes	-6.0	Yes
Solvency	-9.6	Yes	-7.6	Yes
Leverage	-37.0	Yes	-40.2	Yes

Notes: Change (in percent) is calculated as (Post-2011 – Pre-2011)/Pre2011*100. The results presented above include outliers. We do not test for the statistical significance of the change in the IQR.

Table 10: Pre- and Post-FY2012 Percent Change in NC Benchmarking Tool Indicator Mean and Standard Deviation

Governmental Activities Indicators	Municipal Governments			County Governments		
Resource Flow	**Change in Mean**	**Change in SD**	**Evidence of…**	**Change in Mean**	**Change in SD**	**Evidence of…**
Inter-period equity	11.7% *	-22.8% †††	Improvement	-2.3%	-11.4%	Indeterminate
Financial performance	146.4 *	-16.9 †††	Improvement	137.9	36.6 ††	Indeterminate
Self-sufficiency	16.3 ***	-7.6 †	Improvement	17.8 ***	11.4	Improvement
Financing obligation	-8.7	-10.3 ††	Isomorphism	69.7 *	-1.2	Indeterminate
Resource Stock						
Liquidity	4.0	-16.9 †††	Isomorphism	-8.8	-25.0 ††	Isomorphism
Solvency	-22.9 *	-3.8	Indeterminate	36.5 **	-11.2	Improvement
Leverage	7.3	-9.6 ††	Isomorphism	10.6 **	0.8	Indeterminate
Capital	0.7	-13.3 †††	Isomorphism	-2.0	0.5	Indeterminate
General Fund Indicators						
Resource Flow						
Service obligation	-0.7	4.9	Indeterminate	-0.9	-1.8	Indeterminate
Dependency	-5.5	-34.1 †††	Isomorphism	0.5	-24.4 ††	Isomorphism
Financing obligation	-18.0	14.2 †††	Indeterminate	19.3	-1.0	Indeterminate
Resource Stock						
Liquidity	12.7	-3.1	Indeterminate	25.2	12.6	Indeterminate
Solvency	7.9	-5.8	Indeterminate	2.0	10.7	Indeterminate
Leverage	-0.4	-3.5	Indeterminate	-17.0	-22.5 ††	Isomorphism

Notes: Statistical significance of the change in the mean is denoted by *p<0.05, **p<0.01, ***p<0.001. Statistical significance of the change in the standard deviation is denoted by †p<0.05, ††p<0.01, †††p<0.001, using Bartlett's test. The percent change in the mean is calculated using the parameter estimate on the post-implementation variable divided by the mean of the pre-implementation period. Percent change in the standard deviation is calculated using the model residuals. Control covariates include: jurisdictional fixed effects, percentage of residents aged 65 or older, percent of residents with a college degree or more, median income, poverty rate, ln(population), and a linear year trend. As a heuristic, *Isomorphism* is defined as a change in the mean that is not statistically (p>=.05) different from zero and a statistically significant (p<.05) decline in the standard deviation. A performance *improvement* is defined as statistically significant (p<.05) beneficial change in the mean regardless of the change in the standard deviation (see Table 3 for the relevant direction). An indeterminate effect supports neither hypothesis.

Table 11: Pre- and Post-FY2012 Percent Change in NC Benchmarking Tool Indicator Interquartile Range

Governmental Activities Indicators	Municipal Governments		County Governments	
	Pct Chg in IQR	Evidence of Isomorphism?	Pct Chg in IQR	Evidence of Isomorphism?
Resource Flow				
Inter-period equity	-9.8%	Yes	6.0%	No
Financial performance	-25.2	Yes	-24.3	Yes
Self-sufficiency	-3.7	Yes	-19.8	Yes
Financing obligation	-12.7	Yes	-5.4	Yes
Resource Stock				
Liquidity	-36.7	Yes	-18.6	Yes
Solvency	-7.7	Yes	2.6	No
Leverage	-17.3	Yes	-17.5	Yes
Capital	-11.9	Yes	7.3	No
General Fund Indicators				
Resource Flow				
Service obligation	27.6	No	-14.0	Yes
Dependency	-9.9	Yes	18.7	No
Financing obligation	-34.2	Yes	-7.3	Yes
Resource Stock				
Liquidity	15.8	No	68.3	No
Solvency	-3.2	Yes	-0.4	Yes
Leverage	-16.9	Yes	-32.7	Yes

Notes: Change (in percent) is calculated as (Post-2012 – Pre-2012)/Pre2012*100. The results above use data trimmed of significant outliers. We do not test for the statistical significance of the change in the IQR.