

Changes in Local Government Fund Balance During the Recession

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Executive Summary

As local governments recover from the recent recession, it is important to study the changes in one of the most significant aspects of local government financial condition: the fund balance. This paper compares fund balance with long-term debt, expenditures, and financial condition ratios during the recession years 2007-2011. Findings indicate that the external socioeconomic factors and internal financial controls had little effect on fund balance. The results of this study imply that changes in fund balances are based more on managerial decisions and management controls than on other factors.

Introduction

The recession years of 2007-2011 possessed many challenges for local governments. Personnel reductions, position and departmental consolidations, as well as service reductions were common strategies that local governments used to combat declining property and sales tax revenues. Fortunately, many North Carolina local governments did not experience potential bankruptcy like cities in Michigan, California, and Nevada (Stenberg, 2011). However, they did experience significant layoffs and consolidations (Stenberg, 2011). This crisis has brought renewed attention to municipal financial issues (Wang and Hou, 2011). Therefore, it is important to investigate one of the most significant aspects of local government finance: the fund balance.

The fund balance attracts more focus than any other item on a local government's financial statements (Wang and Hou, 2011). Fund balance, also known as rainy day funds, slack resources, or reserve funds are a flexible reserve fund designed to protect a local government's finances. Local governments maintain fund balances for several reasons including: increasing their bond rating, covering unexpected expenses, and purchasing assets or the funding of capital improvement projects (GASB, 2006). In the event of a sudden loss of revenue, national and state organizations recommend having specific fund balance levels to cover expenditures for a certain time.

In the following paper, I study how socioeconomic and financial condition factors affected changes in fund balance during the recession period of 2007-2011. Understanding how local governments used their budgets to absorb the negative effects of the recession will help local government professionals improve their preparation for future recessions.

Research Question

Presumably, during times of recession, citizens have an increased demand for services. In addition, difficult financial situations force local governments to postpone capital improvements and raise taxes. My hypothesis is that increases in expenditures and debt service payments as well as decreases in operations ratios will cause a decrease in the change of fund balances ratios in my sample of cities. I included socioeconomic variables to control for economic and demographic differences in the cities.

Literature Review

Fund balance is the focus of local government fiscal stability, because state and bond agencies view fund balance as a key indicator of fiscal health (Wang and Hou, 2011, Baker 2005). The key to evaluating the level of fund balance in a municipality is the size of expenditures, ending balances for the various funds, and long-term fiscal conditions (Hendrick, 2006). The GFOA recommends that fund balance be no less than one to two months of general fund operating expenditures (Wang and Hou, 2011). The North Carolina Local Government Commission also recommends that local governments maintain a minimum unreserved fund balance of 8% of annual expenditures, and encourages them to retain a much higher amount of fund balance (Wang and Hou, 2011). In most of the literature on fund balance levels, local governments tend to maintain fund balance levels far above these recommended levels (Marlowe, 2012).

Many studies have attempted to explain the factors that determine the size of fund balance. Researchers tested many socioeconomic variables that did not affect fund balance. For example,

in a study of Massachusetts municipalities, researchers aggregated birth rates, death rates, unemployment, population growth and new growth to estimate future service demands. They then attempted to use service demand to predict future fund balance levels (Gianakis and Snow, 2007). The ending fund balances showed that neither new growth nor increased service demands resulted in lower fund balance levels (Gianakis and Snow, 2007). In another example, a study of North Carolina counties integrated per capita income and unemployment rates into an analysis of fund balance. Researchers also found that these economic factors were not significant in determining fund balance levels (Wang and Hou, 2011).

Two studies confirmed factors that did affect fund balance. The amount of debt that a city takes on negatively correlates to their amount of fund balance. The cities that took on more debt, had less fund balance (Hendrick, 2006; Wang and Hou, 2011). In addition, the Hendrick's study found that governments with larger populations accumulated fewer reserves than smaller populated cities, and more wealthy municipalities, with fewer spending needs, had higher reserves than poor communities (Hendrick, 2006).

One argument against the above findings is that the previous studies examined cities during periods of economic booms (Marlowe, 2012). Marlowe states that there is little data testing the behavior of cities during times of economic downturns. His study samples 600 municipalities from 2006 to 2009, with populations greater than 35,000, to observe the trends of their fund balance as a percent of revenues. As anticipated, fund balance decreased; however, it decreased by an insignificant amount (Marlowe, 2012). In particular, most cities maintained fund balance levels greater than 25 percent of total revenues. It is important to note that cities decreased their fund balance more than counties (Marlowe, 2012).

The literature possesses conflicting reports on what changes fund balance. In some studies, a community's wealth affects fund balance; however, in many others, socioeconomic factors had little effect on fund balance. Through many of the studies, there is a theme that management decisions and preferences affect fund balance levels more than socioeconomic factors (Gianakis and Snow, 2007; Hendrick, 2006). For example, the acquisition of additional debt, which is typically a management decision, negatively correlates with fund balance. The literature does recommend that the best way to study fund balance is to evaluate expenditures, debt, and ending balances in the general fund (Hendrick, 2006; Wang and Hou, 2011).

Methodology

This study focuses on 78 municipalities in North Carolina with populations over 10,000 in 2007. Financial condition information about these 78 municipalities came from annual financial reports aggregated by the State and Local Government Division of the Department of State Treasurer.

I chose to study only North Carolina municipalities. North Carolina counties fund education expenses and rely on greater amounts of intergovernmental revenue than cities. In addition, Marlowe's (2012) research showed that his sample of fund balances in cities changed more than his sample of fund balance in counties. I chose cities with populations over 10,000 because fund balances in small towns have higher fluctuations and are more susceptible to many financial and non-financial changes.

According to the literature, the best way to evaluate fund balance is by comparing fund balance to long term financing (debt), expenditures, and ending balances in the general fund (Hendrick, 2006; Wang and Hou, 2011). I will compare fund balance changes to debt, expenditures, and financial condition ratios, which provide additional context than just the ending balances in the general fund.

To control for socioeconomic variables and intergovernmental revenues, I have included several socioeconomic factors in the regression analyses. Wang and Hou used per capita income and unemployment rates to control for differences in communities (2011). In addition, I will use education levels, housing costs, race, and intergovernmental revenue. I obtained these variables from five-year averages published in 2007-2011 American Fact Finder Community Surveys and data from the North Carolina Department of the Treasurer.

Dependent Variable

Percentage Point Change in Fund Balance Ratio:

$$\frac{FundBalance}{TotalExpenditures} = Fund\ Balance\ Ratio$$

$$2011\ Fund\ Balance\ Ratio - 2007\ Fund\ Balance\ Ratio = \% \ pt.\ change\ in\ fund\ balance$$

Independent Variables

Percentage Change in per capita expenditures 2007-2011

$$\frac{Expenditures}{Population} = per\ capita\ Expenditures$$

$$\frac{2011\ per\ Capita\ Expenditures - 2007\ per\ Capita\ Expenditures}{2007\ per\ Capita\ Expenditures} = \%Change, \ per\ cap.\ Expenditures$$

Expected Result: I hypothesize that cities will increase expenditures; thus, causing fund balance change to decline.

Percentage Point Difference in Debt Service Ratio:

$$\frac{DebtService}{Total\ Expenditures} = Debt\ Service\ Ratio$$

$$2011\ Debt\ Service\ Ratio - 2007\ Debt\ Service\ Ratio = \% \ pt.\ diff.\ in\ Debt\ Service\ Ratio$$

Expected Result: Cities will take on more debt and have to pay more debt service. Fund balance change will decline.

Percentage Point Difference in Operations Ratio:

$$\frac{TotalRevenues}{Total\ Expenditures^i} = Operations\ Ratio$$

$$2011\ Operations\ Ratio - 2007\ Operations\ Ratio = \% \ pt.\ diff.\ in\ Operations\ Ratio$$

Expected Result: Economic conditions will force cities to have smaller operations ratios, and as a result, fund balance change will decrease.

Percentage Point Difference in Quick Ratio:

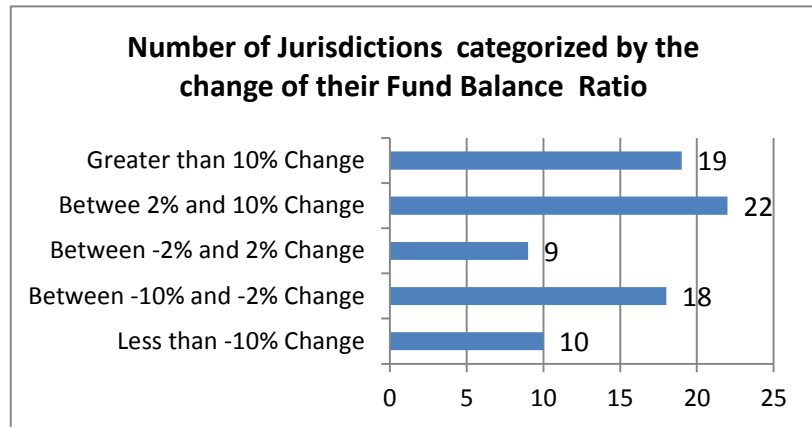
$$\frac{Cash\ \&\ Investments}{Current\ Liabilities} = Quick\ Ratio$$

$$2011\ Quick\ Ratio - 2007\ Quick\ Ratio = \% \ pt.\ diff.\ in\ Quick\ Ratio$$

Expected Result: Economic decline forces cities to have less cash and smaller quick ratios. Thereby, fund balance change will decrease.

Results

Figure 1. shows the distribution of the cities according to their percentage point change of fund balance. The categories are arranged to show the frequency of cities in a particular range of fund balance change. It is interesting to note that the majority of cities, 41, had a definitively positive change in their fund balance. These results contrast Marlowe's national



study of 600 cities where fund balance decreased, but only by less than 5 percent (Marlowe, 2012). It is also interesting that the distribution of cities is somewhat bimodal. Thus, these results do not show a defining outcome of fund balance percent change between 2007 and 2011.

Regression Analysis

Testing the percentage point change of Fund Balance and the independent variables did not yield significant results. This regression returned an adjusted r-squared of 0.111ⁱⁱ. Only the percent point difference in the Operations Ratio yielded a significant p-value of 0.005.

These results could occur for many reasons. First, actual fund balance levels increase during 2007 to 2011. The average percentage change for actual fund balance was an increase of 34.9 percent. The average fund balance difference was a positive change of \$292,741,529. These positive changes illustrate that these cities made concerted efforts to build up fund balances as opposed to decreasing expenditures.

Second, these results provide further evidence for findings from Gianakis and Snow and Wang and Hou that fund balance could be more based on management determinations and idiosyncratic policies than on economic factors or financial conditions (2007; 2011). Manager's decisions such as incurring more debt or using fund balance to pay for expenditures, would likely be specific to a manager and not a summation of an entire sample of cities.

Third, fund balance change could have a homeostatic relationship with other financial factors instead of a causal or conditional relationship. In this case, managers adjust fund balances each year knowing that other variables will change. This preemptive action would remove any causal relationship while maintaining a recommended fund balance.

Additional Regressions

To confirm if fund balance influences the financial condition variables, I ran an additional four regressions. Each new regression had a financial condition variable as the dependent variable and

fund balance change as an independent variable. The four variables I tested were: percent change in per capita expenditures 2007-2007, percentage point difference in the debt service ratio 2007-2011, percentage point difference in the operations ratio 2007-2011, and the percent change in actual fund balance. The literature recommends that the first three variables represent the best way to test fund balance, and the percent change of actual fund balance controls for how did governments manipulate the fund balance ratio (Hendrick, 2006; Wang and Hou, 2011).

Testing these variables, also yielded few significant relationships. Each test had high adjusted r-squares, but most of the variables did not have significant p-values. The percentage point change in the operations ratio and the change in expenditures are correlated when each one is the independent variable, but largely because expenditures is part of the operations ratio. Three variables are significant when testing per capita expenditures and change in operations ratio: the percent of the population 25 years and older with a bachelor's degree or higher, percent of home values less than \$150,000, and the median income. These significant results indicate that communities with more wealth or education attainment present, have lower expenditures than other communities. However, the coefficients for these variables are almost zeroⁱⁱⁱ; thus, there is only a slight ability to predict per capita expenditures. The test of the percent change of actual fund balance yielded similar results with only education, operations ratio and debt service have any levels of significance.

In addition, the only significant variable when analyzing debt service percentage point difference was debt service levels in 2007. Thus, jurisdictions with already high levels of fund balance tended to decrease their debt. These results provide further evidence that debt service and fund balances could respond more to management decisions than outside forces. In all the tests, I ran percentage point change in fund balance as an independent variable, and it did not have any relationships with the dependent variables.

Conclusion

Although this study showed virtually no relationship comparing fund balance changes to financial condition ratios, or various socioeconomic variables, it does identify several key reasons for the lack of findings. First, actual fund balances increased during this time by 34.9 percent. Second, these results confirm findings from the literature that fund balance changes could rely more on management decisions. Third, fund balance change could have a more homeostatic than causal relationship with the financial condition variables. We can see this homeostatic relationship in these financial condition variables because even though fund balance increases, only a few variables, the operations ratio and the debt ratio of 2007 have an effect on that change. All the other variables remain the same and have no effect on fund balance.

These findings on fund balance are significant for managers interested how they can control their levels of fund balance. This study shows that other economic factors and financial condition ratios have little relationship with fund balance. Managerial decisions on how much unused revenue to allocate to fund balance, seem to be the main reason of why fund balance changes. Rather than allowing fund balance to change and fluctuate, managers usually have targets in mind for fund balance levels, and they maintain these levels despite different factors. In particular, this sample local governments maintained high fund balance ratios and then increased those ratios during 2007-2011. While doing so, few economic or financial condition factors influenced this change of fund balance.

Bibliography

- Baker, David L. "Strategies for local government fiscal stability: six strategies public managers must master to stabilize year-to-year variances in local government funding." *The Public Manager*. 34.4. Winter 2005: 31-39.
- Cooper, Steven D. "Local government budgeting responses to fiscal pressures." *Public Administration Quarterly*. Fall 1996: 305-319.
- Gianakis, Gerasimos and Snow, Douglas. "The Implementation and Utilization of Stabilization Funds by Local Governments in Massachusetts." *Public Budgeting and Finance*. Spring 2007. P. 86-103.
- Hembree, Holly et al. "Benchmarking and Local Government Reserve Funds: Theory versus Practice." *Public Management*. October 1999: 16-21.
- Hendrick, Rebecca. "The Role of Slack in Local Government Finances." *Public Budgeting & Finance*. Spring 2006: 14-46
- Kriz, Kenneth A. "The Optimal Level of Local Government Fund Balances: A Simulation Approach." *State Tax Notes*, Vol. 27, No. 10. March 2003: 78-84.
- Mahdavi, Saeid and Westerlund, Joakim. "Fiscal stringency and fiscal sustainability: Panel evidence from the American state and local governments." *Journal of Policy Modeling*. 33. 2011: 953-969.
- Marlowe, Justin. "The Local Fund Balance: Explanations and Implications." PhD diss., Univeristy of Wisconsin-Milwaukee. 2004.
- Marlowe, Justin. "Fiscal Slack, Reserves and Rainy Day Funds," In *Handbook for Local Government Fiscal Health*, edited by Helisse Levine, Eric A. Scorsone, and Jonathan B. Justice. 321-343. Burlington, MA. Jones & Bartlett Learning, 2012.
- "Looking for a Way to Make Fund Balance More Useful." Governmental Accounting Standards Board. October 2006.
- Okubo, Derek. "Fiscal Sustainability and local government." *National Civic Review*. 99.4 Winter 2010: 34-42.

Rivenbark, William C., Roenigk, Dale J., and Allison, Gregory S. "Communicating Financial Condition to Elected Officials in Local Government." *Popular Government*. Fall 2009. 4-13

Stenberg, Carl. "Coping with Crisis: How are local governments reinventing themselves in the wake of the Great Recession?"

http://icma.org/en/icma/knowledge_network/documents/kn/Document/303228/Coping_with_Crisis. December 2011.

Tyer, Charlie B. "Local Government Reserve Funds: Policy Alternatives and Political Strategies." *Public Budgeting & Finance*. Summer 1993: 75-84

Wang, Wen and Hou, Yilin. "Do local government save and spend across budget cycles? Evidence from North Carolina." *The American Review of Public Administration*. 42: 152. 2011: 152-169.

Appendix

Table 1.

Summary Statistics				
<i>Variable</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
Percentage Point Difference in Fund Balance Ratio 2007-2011	4.985	18.760	-26.160	79.330
Actual Fund Balance Percent Change 2007-2011	0.349	0.635	-0.95	2.89
% Change in per capita Expenditures 2007-2011	16.4%	0.122	-9.0%	5.00%
Percentage Point Difference Debt Service Ratio 2007-2011	0.000	0.034	-0.110	0.110
Percentage Point Difference Operations Ratio 2007-2011	-0.035	0.092	-0.270	0.250
Percentage Point Difference Intergovernmental Ratio 2007-2011	0.017	0.076	-0.280	0.350
Percentage Point Difference Quick Ratio 2007-2011	-6.018	50.760	-439.300	48.340
Population	53743.1	100361.5	10461.0	722234.0
% Population White	66.8%	0.153	28.0%	96.0%
% Population age 25 & older with Bachelor's degree or higher	31.0%	0.151	0.100%	0.730%
% Population age 16 & older unemployed	6.4%	0.019	2.0%	11.0%
Median Income in thousands	48.354	17.650	18.668	91.997
% home value less than \$150,000	45.5%	0.228	7.0%	94.00%
% living in Poverty	16.0%	0.089	2.0%	58.0%
2007 Fund Balance Ratio	41.858%	28.907	11.590%	162.130%
2007 Operations Ratio	1.065%	0.103	0.860%	1.350%
2007 Intergovernmental Ratio	0.222%	0.127	0.060%	0.500%
2007 Debt Service Ratio	0.064%	0.044	0.000%	0.200%
2011 Operations Ratio	1.030%	0.080	0.830%	1.230%
2011 Intergovernmental Ratio	0.239%	0.127	0.050%	0.520%
2011 Debt Service Ratio	0.064%	0.039	0.000%	0.180%
Observations	78			

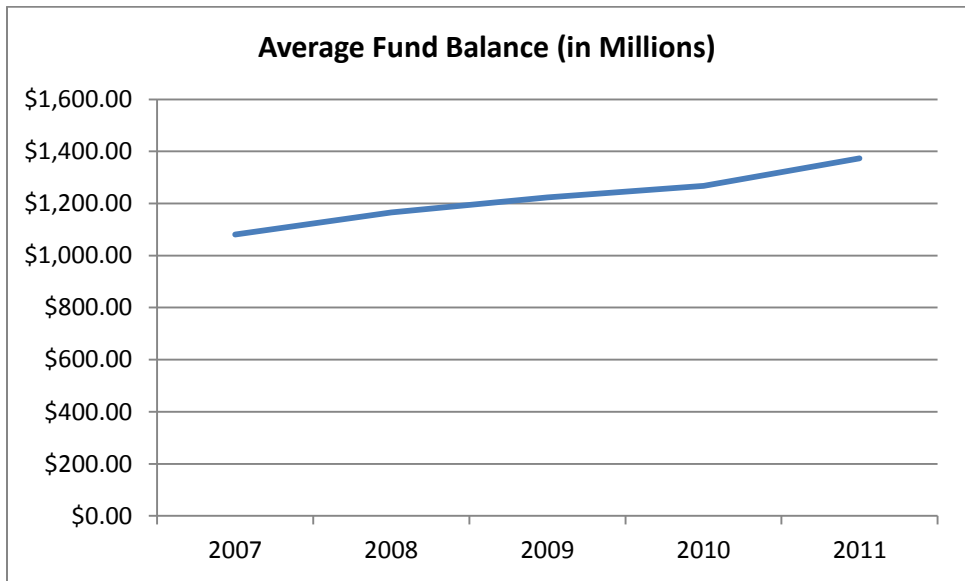
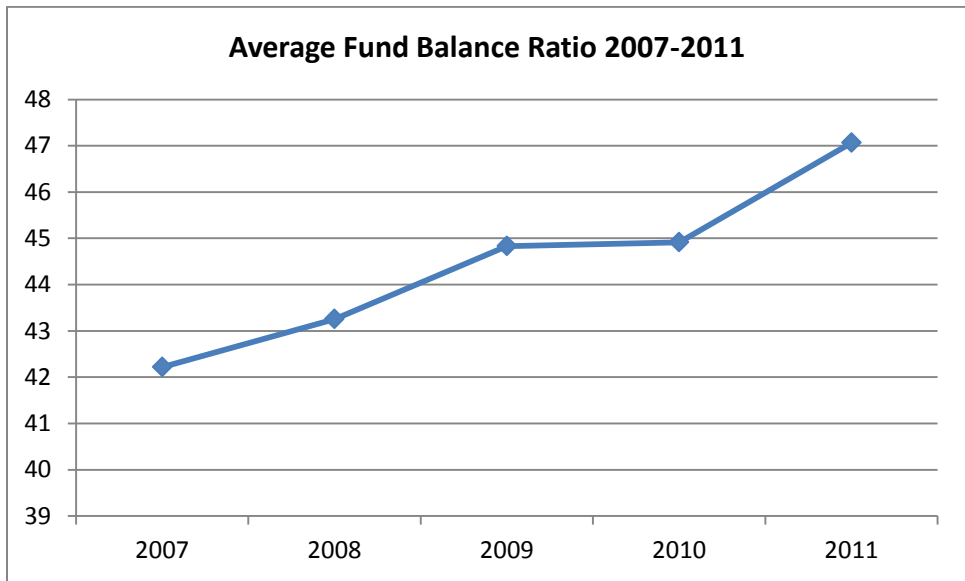
Regression 1: Fund Balance Ratio Change			
Dependent Variable	% Point Change in Fund Balance	Coef.	Std. Err.
Independent Variables	% Change in Per Capita Expenditures	-2.799	25.337
	% Point Difference in Debt Service	72.117	68.954
	% Point Difference in Operations Ratio	90.521***	27.960
	% Point Difference in Intergovernmental Ratio	-17.917	28.219
	% Point Difference in Quick Ratio	-0.009	0.043
	LN Population	1.397	2.659
	Percent of Population White	19.970	18.136
	% Pop. 25 yrs & older with Bachelor's Degree and Higher	72.123	41.338
	% Unemployed age 16 and up	22.163	148.405
	LN Median Income	-6.731	24.838
	% Home Value less than \$150,000	42.126	26.664
	% Living in Poverty	-41.486	68.683
	LN 2007 Fund Balance Level	3.786	4.824
	_cons	3.684	270.864
Observations		78	
Adjusted R-Squared		0.111	
Depending on the level of significance, variables are identified according to the following index: *10%, **5%, ***1%			

Regression 2: per capita Expenditures			
	<i>Variables</i>	<i>Coefficient</i>	<i>Std. Error</i>
Dependent Variable	% Change in Per Capita Expenditures		
Independent Variables	% Point Change in Fund Balance	0.000	0.001
	% Point Difference in Debt Service	0.630	0.381
	% Point Difference in Operations Ratio	-0.595***	0.195
	% Point Difference in Intergovernmental Ratio	0.198	0.156
	% Point Difference in Quick Ratio	0.000	0.000
	Population	0.000	0.000
	Percent of Population White	0.040	0.089
	% Pop. 25 yrs & older with Bach. Deg. & Higher	-0.505**	0.217
	% Unemployed age 16 and up	0.399	0.774
	Median Income in thousands	3.000***	0.000
	% Home Value less than \$150,000	-0.259*	0.145
	% Living in Poverty	0.373	0.262
	2007 Fund Balance Level	-0.001	0.001
	2007 Operations Ratio	-0.100	0.194
	2007 Intergovernmental Ratio	0.122	0.108
	2007 Debt service Ratio	-0.319	0.346
Observations		78	
Adjusted R-Squared		0.482	
Depending on the level of significance, variables are identified according to the following index:			
*10%, **5%, ***1%			

Regression 3: Debt Service			
	<i>Variables</i>	<i>Coefficient</i>	<i>Std. Error</i>
Dep. Var.	% Point Difference in Debt Service		
Independent Variables	% Point Change in Fund Balance	0.000	0.000
	% Change in Per Capita Expenditures	0.068	0.041
	% Point Difference in Operations Ratio	0.017	0.069
	% Point Difference in Intergovernmental Ratio	0.063	0.051
	% Point Difference in Quick Ratio	0.000	0.000
	Population	0.000	0.000
	Percent of Population White	-0.001	0.029
	% Pop. 25 yrs & older with Bach. Deg. & Higher	-0.054	0.074
	% Unemployed age 16 and up	-0.197	0.254
	Median Income in thousands	0.000	0.000
	% Home Value less than \$150,000	-0.055	0.048
	% Living in Poverty	-0.137	0.086
	2007 Fund Balance Level	0.000	0.000
	2007 Operations Ratio	0.034	0.064
	2007 Intergovernmental Ratio	0.028	0.036
	2007 Debt service Ratio	-0.393***	0.103
	Observations		78
Adjusted R-Squared		0.261	
Depending on the level of significance, variables are identified according to the following index: *10%, **5%, ***1%			

Regression 4: Operations Ratio			
	<i>Variables</i>	<i>Coefficient</i>	<i>Std. Error</i>
Dependent Variable	% Point Difference in Operations Ratio		
Independent Variables	% Point Change in Fund Balance	0.002***	0.000
	% Change in Per Capita Expenditures	-0.221***	0.073
	% Point Difference in Debt Service	0.058	0.237
	% Point Difference in Intergovernmental Ratio	0.097	0.096
	% Point Difference in Quick Ratio	0.000	0.000
	Population	0.000	0.000
	Percent of Population White	0.000	0.054
	% Pop. 25 yrs & older with Bach. Deg. & Higher	-0.377***	0.130
	% Unemployed age 16 and up	-0.786	0.462
	Median Income in Thousands	0.000	0.000
	% Home Value less than \$150,000	-0.272***	0.084
	% Living in Poverty	-0.075	0.162
	2007 Fund Balance Level	0.000	0.000
	2007 Operations Ratio	-0.635	0.086
	2007 Intergovernmental Ratio	0.103	0.065
	2007 Debt service Ratio	-0.105	0.212
	Observations		78
Adjusted R-Squared		0.661	
Depending on the level of significance, variables are identified according to the following index: *10%, **5%, ***1%			

Regression 5: Percent Change of Actual Fund Balance			
	<i>Variables</i>	<i>Coefficient</i>	<i>Std. Error</i>
Dependent Variable	Percent Change of Actual Fund Balance		
Independent Variables	% Change in Per Capita Expenditures	0.703	0.945
	% Point Difference in Debt Service	3.917	2.873
	% Point Difference in Operations Ratio	2.479*	1.343
	% Point Difference in Intergovernmental Ratio	-0.668	1.162
	% Point Difference in Quick Ratio	0.000	0.002
	Population	0.000	0.000
	Percent of Population White	-0.535	0.653
	% Pop. 25 yrs & older with Bach. Deg. & Higher	3.119*	1.620
	% Unemployed age 16 and up	2.352	5.679
	Median Income in thousands	-0.015	0.000
	% Home Value less than \$150,000	1.242	1.056
	% Living in Poverty	0.262	1.965
	2007 Fund Balance Level	0.006	0.004
	2007 Operations Ratio	0.570	1.309
	2007 Intergovernmental Ratio	0.135	0.795
	2007 Debt service Ratio	4.321*	2.520
	Constant	-1.422	2.231
Observations		78	
R-Squared		0.176	
Depending on the level of significance, variables are identified according to the following index:			
*10%, **5%, ***1%			



ⁱ Plus transfers to debt service fund and less proceeds from capital leases and installment purchases

ⁱⁱ Another regression where I took the natural log of several variables including: population, median income, and 2007 fund balance level, did not yield more significant results. The adjusted r-squared for this test was 0.119, and the variables remained insignificant.

ⁱⁱⁱ Bachelor's Degree and higher coefficient (-0.505), Median income coefficient (6.72E-06), Percent home value less than \$150,000 (-0.259)