

# Causes and Consequences of Fiscal Stress in Michigan Municipal Governments

May 2010

Mark Skidmore<sup>†</sup>

and

Eric Scorsone<sup>‡</sup>

---

<sup>†</sup> Michigan State University, 208 Agriculture Hall, East Lansing, MI 48824-1039; [mskidmor@msu.edu](mailto:mskidmor@msu.edu); 517-353-9172.

<sup>‡</sup> Michigan Senate Fiscal Agency, 201 N. Washington Sq., Suite 800, The Victor Center, P.O. Box 30036, Lansing, MI 48909-7536; [escorsone@senate.michigan.gov](mailto:escorsone@senate.michigan.gov); 517-373-2768.

**Acknowledgements:** We thank the Lincoln Institute of Land Policy and Michigan State University Extension for financial support. We thank Fredrick Headen, Suzanne Schafer and Carol Goslin of the Michigan Department of Treasury for their ongoing commitment the creation of a new web-based local government data management system. The authors also thank Nicole Bradshaw for capable research assistance.

JEL Classification Code: H72

## **Abstract**

Over the last several years Michigan municipalities have experienced significant and ongoing fiscal crises. The purposes of this study are to identify the underlying causes of fiscal hardship, and then systematically examine how municipal officials have responded to these difficult circumstances. Using data for nearly all municipalities in Michigan for years 2005 through 2010, we find that nearly all municipalities experienced some level of crises, but there is variation across the state both in the severity and the sources of fiscal stress. We find that expenditures in the General Government, Public Works, and Parks and Recreation categories were responsive to fiscal stress. Capital Expenditures have been particularly vulnerable. However, expenditures in essential services such as Public Safety were generally not adversely affected. Our research may offer insights regarding the likely implications of the real estate crises for communities in other parts of the country that have, until very recently, enjoyed relative economic prosperity and limited fiscal challenges.

## **I. Introduction**

In recent years Michigan local governments have experienced significant and ongoing budgetary challenges. The underlying causes of this fiscal crisis are threefold. First, Michigan's economy, with its shrinking manufacturing base, has struggled and this is especially true since 2001. In 2000, Michigan's economy was performing well as indicated by its low 3.8 percent rate of unemployment. However, beginning in 2001 Michigan's economy began a long and steady decline. Unemployment jumped to 5.2 percent in 2001 and increased over the next seven years, reaching 14.5 percent by December 2009.

Through 2006, Michigan's economic hardship was largely due to declines in manufacturing, in the context of a state that has historically relied on manufacturing as the primary component of its economic base. Since 2007, however, the challenges have been exacerbated by the severe national recession.<sup>1</sup> Second, continuing structural deficits at the state level have led to reductions in revenue sharing to local units. Third, the combination of restrictive property tax limitations and a declining housing market over the past two years has further exacerbated fiscal conditions.

In Michigan, policymakers and practitioners point to anecdotal evidence of fiscal challenges across the state, but systematic analysis of how local government has coped with ongoing and continued fiscal stress has been hampered by unavailability of data. Over the past two years Michigan State University Extension has worked with the State of Michigan Department of Treasury to develop a new web-based local government financial data management system. A vast array of local government fiscal data is now

---

<sup>1</sup> The recent declarations of bankruptcy by Chrysler and General Motors illustrates the severe economic challenges, both nationwide and in Michigan.

publicly available, and we draw on this new resource for our analysis of fiscal stress across Michigan municipalities.

Our analysis identifies the primary causes of fiscal stress and examines its consequences for nearly all Michigan municipalities using data for fiscal years 2005 through 2009. To preview our complete analysis, we find that of the core expenditure categories, General Government, Public Works and Parks and Recreation spending has been vulnerable. We also find that spending on Capital projects has been very responsive to fiscal stress.

This research may offer critical insights regarding the likely implications of the real estate crises for communities in other parts of the country that have, until very recently, enjoyed relative economic prosperity and limited fiscal distress. In a number of ways, Michigan may be a harbinger for what is to come in other parts of the country. In the next section, we provide a brief summary of existing research that has focused on state and local government fiscal crises. We then present the framework used to guide the empirical analysis. This is followed by a presentation of our analysis, and the last section concludes.

## **II. Literature Review**

There is now an extensive literature that attempts to measure and evaluate how local governments in the United States cope with fiscal stress. However, measuring abstract notions of “fiscal capacity” or “fiscal stress” in the context of subnational governments is a challenging task. Given that our objective is to develop an appropriate measure of fiscal stress and then evaluate how municipalities in Michigan have coped with the

challenges, we restrict our literature review to articles that focus on the measurement of and responses to fiscal stress in subnational governments in the United States.

As noted in Chernick and Reschovsky (2007), there is now an extensive literature that attempts to address the difficult challenge associated with developing an accurate measure of local government fiscal conditions. Generally, we place such measures into two categories. The first is fiscal stress that has, in part, been determined by local government decisions. For example, poor financial management may lead to significant fiscal challenges (i.e., substantial and on-going debt or the use cash from restricted funds for general purposes). However, fiscally conservative local officials may very well make the difficult decisions to cut expenditures in order to avoid fiscal irresponsibility. In such a case, a local government, though it is in fact experiencing significant fiscal stress may appear to be fiscally sound. A second approach is to define fiscal stress, not based on local official actions, but on the underlying economic circumstances causing the crisis. For example, rising health care insurance costs might be a driving factor, especially in combination with a flat or declining property tax base. Similarly, flat or declining state revenue sharing may also be a key determinant of underlying fiscal conditions. For purposes of this study, we seek to measure fiscal stress by these underlying fiscal and economic conditions, not by the mismanagement of local government fiscal affairs.

A report published by the ACIR (1973) is one of the early studies that examined the fiscal health of cities. In particular, the report identified six indicators of fiscal stress: 1) Imbalance in the operating fund; 2) a consistent pattern of current expenditures exceeding current revenues over several years; 3) an excess of current operating liabilities over current assets; 4) short-term operating loans outstanding at the end of the fiscal year,

or the borrowing of cash from restricted funds; 5) a high and rising rate of property tax delinquency; and 6) a substantial decrease in assessed values. Others, including Dommel and Nathan (1978), the Congressional Budget Office (CBO 1978), U.S. Department of Treasury (1978) the Municipal Finance Officers Association (MFGOA 1978), the International City/County Management Association (Groves and Valente 1994), Brown (1993, 1996), and Kloha, Weissert, and Kliene (2005) have each subsequently attempted to measure fiscal health using variations/modifications on this general theme. However, a drawback of this approach in the context of the present study is that it combines both external forces with internal local government management decisions. For example, a local decision maker, in the interest of maintaining fiscal responsibility, may decide to significantly cut spending in order to avoid fiscal imbalance and short-term operating loans, etc... By measures such as these, this community may appear to be fiscally sound, even though it is experiencing fiscal distress. These measures, though useful for many purposes, will not provide an effective measure of fiscal distress if one seeks to understand how local decision makers have responded in terms of allocating increasingly limited resources to the various functional categories.

The recent work of Hendrick (2004) makes distinctions between three categories of fiscal health, which she characterizes as “slack”, “balance”, and “environmental” factors. “Slack” includes measures such as unreserved fund balances, capital expenditures as a percentage of total expenditures and reliance on enterprise income, whereas “balance” is meant to capture expenditures/needs of a community relative to its revenue generating capacity. Finally, “environmental health” measures the overall fiscal condition of the community. For our purposes, it is appropriate to focus on the external

forces (“balance” and “environment health”) that determine fiscal health, and we now turn our attention to this work.

Ladd and Yinger (1989) defined fiscal health in terms of the “need-capacity gap.” This approach attempts to measure fiscal stress by combining expenditure needs with revenue raising capacity. Generally, expenditure need is defined as the spending required to provide an average level of public services, whereas revenue raising capacity is defined as the revenue that could be raised at the average tax rate for all local governments. Reschovsky (1993), Sjoquist (1996), Chernick and Reschovsky (2007) and others have used similar frameworks to assess fiscal health. The approach we use to assess fiscal health in the present study, while different, generally follows this line of research. We also extend this line of research by examining the relationship between this externally driven measure of fiscal health and changes in the various municipal spending categories: General Government, Public Safety, Public Works, Health and Welfare, Community Economic Development, Recreation and Culture, Other Expenditures, as well as Capital and Non-capital expenditures.

### **III. Framework for Evaluating Fiscal Stress**

The primary research objective is to examine the impacts of ongoing local government fiscal challenges on public service delivery across Michigan. A critical component in the evaluation of how governments have responded to ongoing fiscal crises is developing an appropriate measure of fiscal stress. While there are a number of possible indicators of “fiscal stress”, as highlighted earlier for purposes of this study the fiscal stress indicator should be independent of local government financial decisions. For example, one might

be compelled to use deficits or reserves as a measure of fiscal stress. However, as discussed earlier responsible local officials may very well make difficult decisions to cut expenditures in order to avoid fiscal irresponsibility. In such a case, a local government, though it is in fact experiencing fiscal stress may appear to be fiscally sound. By this measure, it is indeed maintaining fiscal health, but it is doing so by cutting public services.

With this challenge in mind, we propose the following formulation of “fiscal stress” in which we attempt to measure the wedge between the costs of providing government services and the actual revenues being generated. We acknowledge that there are a number of ways one might measure the fiscal gap (the difference between expenditure needs and fiscal capacity). The approach we use relies on the difference between the changing costs of public service provision and actual revenue growth. Consider the following framework for measuring fiscal stress:

$$\text{Fiscal Stress (FS}_{it}) = \text{Gov't Services Cost Index (GCI}_{it}) - \text{Gov't Revenues Index (GRI}_{it})$$

where

$$\text{GCI}_{it} = \text{GECI} * a + \text{CCI} * b$$

and

$$\text{GECI}_t = \text{Government Employee Cost Index}$$

$$\text{CCI}_t = \text{Capital Cost Index}$$

for municipality  $i$  in period  $t$ .  $a$  and  $b$  are the shares of expenditures devoted to employee costs (GECI)<sup>2</sup> and capital costs (CCI), respectively, and where  $a + b = 1$  and are determined by statewide averages.<sup>3</sup> The revenue index is generated by taking the sum of all revenue sources (property tax, income tax, state and federal revenue sharing, and other revenues) and generating the percent change from the 2005 base year.<sup>4</sup>

GECI <sub>$t$</sub>  and CCI <sub>$t$</sub>  are taken from the Bureau of Labor Statistics (<http://data.bls.gov/cgi-bin/surveymost?ci>) and the Turner Building Cost Index ([http://www.turnerconstruction.com/corporate/files\\_corporate/CI4q2007.pdf](http://www.turnerconstruction.com/corporate/files_corporate/CI4q2007.pdf)), respectively.  $a$  and  $b$  are generated from municipal government fiscal data provided by the Michigan Department of Treasury through the new local government fiscal data web portal. It must be acknowledged that these national indices may not be entirely reflective of the actual costs faced by a particular local unit. We note, however, that the key drivers in employee costs (health insurance) and capital costs are largely determined in national markets. In addition, given that our interest is in using fiscal stress originating from external conditions (as opposed internal decisions), these indices are appropriate proxies for measuring the costs of government service provision. GRI <sub>$it$</sub>  is also generated from the municipal government fiscal data. The approach taken here is generally consistent with Reschovsky (2004).

### **Revenue Restrictions in Michigan**

---

<sup>2</sup> We use non-capital expenditures as a proxy for employee costs because our data do not allow us to extract employee costs from other expenditures. We note that with the exception of capital costs, most municipal spending is devoted to wages, salaries and employee benefits.

<sup>3</sup> Over the period of analysis, municipalities devoted about 90 percent of budgets for non-capital purposes, and 10 percent for capital projects. Thus,  $a=0.9$  and  $b=0.1$ .

<sup>4</sup> The base year index equals 100.

Nearly all sources of revenue (or potential revenue) for municipal governments are restricted by state law. The most important revenue source for municipal governments, the property tax, is constrained by tax limitations.<sup>5</sup> The nature of these limitations requires some explanation. In 1994, Proposal A was approved by voters, and this resulted in major changes in the property tax environment. First, a taxable value cap was imposed. The new cap limited the growth of the value of property for tax purposes to the lesser of the rate of inflation (as measured by the national Consumer Price Index) or five percent, regardless of the actual increase in state equalized value (SEV) of property.<sup>6</sup> Thus, over time, the taxable value (TV) of a property could fall well below the SEV. However, Proposal A also specifies that the taxable value of a property is returned to the current market-based SEV when the property is sold.<sup>7</sup> Proposal A also introduced a distinction between “homestead property” and “non-homestead property,” where the homestead is defined as the homeowner’s principal residence. For homestead property, Proposal A imposed a maximum on the statutory property-tax millage rate<sup>8</sup> that local school districts could use for public school operating expenses. This is known as the “homestead exemption,” since it does not apply to non-homestead property. As a result of the homestead exemption, average statutory millage rates were reduced by about one-

---

<sup>5</sup> These policies are discussed in detail in Feldman, Courant, and Drake (2003).

<sup>6</sup> The inflation rate has been lower than five percent throughout this entire period. Thus, the five-percent limitation has not had any practical effect; the assessment growth cap has been determined by the inflation rate.

<sup>7</sup> This “pop up” also occurs in the case of a property transfer. For example, property ownership may be transferred from one family member to another, but the tax benefits cannot be transferred to the new owner.

<sup>8</sup> One mill is defined as \$1 per \$1,000 of taxable value.

third.<sup>9</sup> The state government then added a 6-mill “state education tax,” and increased sales taxes and cigarette taxes to provide for the financing of elementary and secondary public education.<sup>10</sup>

Proposal A was not the first mechanism for restraining property-tax revenues in Michigan. Prior to Proposal A, property-tax revenues were limited by the “Headlee Amendment,” which was passed in 1978.<sup>11</sup> While Proposal A limits *statutory millage rates* and imposes a limit on the growth in *taxable values*, the Headlee Amendment puts a direct limitation on property-tax *revenue growth*. The Headlee Amendment restricts property-tax revenue growth to the rate of inflation (with an adjustment for new construction). Any jurisdiction with potential revenue increases exceeding the Headlee limit is required to reduce property-tax rates, to bring revenues into line with the revenue growth restriction. This type of tax-rate reduction is known as a “Headlee rollback.”<sup>12</sup> Prior to the introduction of the taxable value cap, rapidly rising property values resulted in numerous Headlee rollbacks. After Proposal A, however, rollbacks were greatly reduced in both number and magnitude.

---

<sup>9</sup> The homestead exemption effectively equalized the statutory property-tax millage rates for local school operating expenses on homestead properties across the state. This reduced the disparities in overall statutory millage rates across jurisdictions, but it did not eliminate them. Substantial differences in overall millage rates remain, as a result of differences in millage rates between homestead and non-homestead properties, and as a result of differences in the millage rates for school capital expenditures, and for municipal governments, county governments, and special districts.

<sup>10</sup> Proposal A also put severe restrictions on the ability of local units to increase property taxes on their own. Thus, the financing of operating expenses for K-12 public education became highly centralized, whereas it had previously been highly decentralized. Also, the funding formulas pushed in the direction of more equal per-student funding for operating expenses, although considerable gaps remain between the highest- and lowest-spending districts. For discussion, see Arsen, *et al.* (2005).

<sup>11</sup> The Headlee Amendment is named for its author, Richard H. Headlee.

<sup>12</sup> Local residents can choose to exceed the Headlee limitation by referendum, but this has occurred only rarely.

In addition to the very restrictive property tax environment, other potential sources of revenue are also constrained. In Michigan, municipalities do not have the authority to levy a local option sales tax. They are, with voter approval, allowed to levy a city income tax. However, to date only 22 cities have imposed an income tax. The ability to charge fees is also limited by state statute and court rulings; fees must not exceed the cost of service provision. A number of communities have, by referenda, approved “extra-voted” millage for special purposes, but generally Michigan municipalities have few options for generating revenues, and have historically relied on the growth in taxable values to bolster property tax revenues. Beginning in 2001, growth in property values began to slow down and then began to decline in 2006.

Figure 1 shows the rates of change of average property values based on residential sales data in Michigan between 1994 and 2007. For comparison, Figure 1 also shows the rate of change of the national Consumer Price Index (CPI), since the property tax assessment cap is determined by the change in the CPI. To summarize, this institutional detail suggests that the property tax index will be relatively stable and flat over time and across jurisdictions, although beginning in 2006 many communities began to experience significant declines in the value of real estate. It is important to note that there is typically a delay in between the time that property values change and the time those changes are reflected in assessments and incorporated into the tax rolls.

**<Figure 1 here>**

## **Spending and Fiscal Stress**

Once  $FS_{it}$  is generated for each municipality, we use it to examine the severity and sources of fiscal stress. For example, fiscal stress may be the result of cuts in state revenue sharing, or it may be driven by declining real estate markets/property tax revenues. Economic hardship and revenue sharing are not evenly distributed across the state, and our fiscal stress variable is designed to capture these differences.

We now turn to our primary objective, which is to understand how municipalities have responded to ongoing fiscal stress. Because municipalities are restricted from increasing property taxes beyond that which the property tax limitations allow, the primary ways to deal with fiscal stress are to improve efficiencies in service provision and/or cut services.<sup>13</sup> While we acknowledge that it is possible for municipal governments to improve efficiencies of public service delivery, difficult fiscal conditions have continued for a number of years and therefore we suspect that at this point in the prolonged fiscal crises, many communities are now experiencing significant reductions in public services.<sup>14</sup> We examine the impact of the fiscal stress measure ( $FS_{it}$ ) by regressing  $FS_{it}$  on various per capita expenditure ( $EXP_{jit}$ ) categories:

$$EXP_{jit} = f(FS_{it}, X_{it})$$

where  $EXP_{jit}$  represents a vector of  $j$  expenditure categories. We also include  $X_{it}$ , a limited array of demographic and economic control variables that we are able to collect

---

<sup>13</sup> Municipal governments have limited authority to generate revenues from alternative source. Twenty-two municipalities have an income tax. Municipalities may exceed property tax limitations by referenda.

<sup>14</sup> One dimension of “efficiency” is the potential elimination of public services that are not valued as highly by the public.

annually at the municipal level to control for changes in demand for public services.

Included in  $EXP_{jit}$  are the following expenditure categories:

General Government

Public Safety

Public Works

Health and Welfare

Community Economic Development

Recreation and Culture

Other Expenditures

We also examine the impact of  $FS_{it}$  on Capital and Non-capital Expenditures.

Based on discussions with local officials as well as previous research, we hypothesize that expenditures that are perceived to be non-essential or non-mandated are most likely to be reduced in times of ongoing fiscal hardship. Specifically, we estimate the following regressions:

$$\ln(\text{Exp}_{jit}) = \alpha FS_{it} + \beta' (\ln(X_{it})) + \tau_t + \varepsilon_{it}$$

where  $\text{Exp}_{jit}$  represents spending for expenditure category  $j$  in municipality  $i$  at time period  $t$ ,  $FS_{it}$  is the measure of fiscal stress as defined earlier and  $X_{it}$  is vector of control variables that includes the municipal population<sup>15</sup> and taxable value. We begin our examination by using a random effects estimation procedure with a correction of standard

---

<sup>15</sup> Data on municipal population is not yet available for 2009. We therefore use 2008 for 2009. The 2009 population data are expected to become available in July 2010.

errors to allow for non-independence of observations from the same municipality through clustering (Arellano 1987; Bertrand et al. 2004).

However, because some communities do not spend funds in certain functional areas, we have a censoring issue where the lower bound is truncated at a value of zero. Thus, the censored dependent variable could bias the coefficient estimates. We therefore estimate these regressions using a random effects Tobit procedure with bootstrapping to obtain robust standard errors.<sup>16</sup> To examine the robustness of these core estimates, we also estimate corresponding series regressions using the two-way fixed effects estimation procedure.<sup>17</sup> As we discuss in detail in the next section, our results are robust to alternative estimation approaches.

#### **IV. Empirical Analysis**

Before turning to the more formal econometric analysis, we offer a brief discussion of the data. Summary statistics are provided in Tables 3-5 and include fiscal data for cities in Michigan for years 2005 through 2009 that were included in the regression analysis. Appendix contains detailed definitions and sources for all variables used in this analysis. During this period, we have observed moderate changes in property tax base, and revenue generating capabilities. For all summary statistics and analyses, we use an unbalanced panel; that is, we include all available information on municipalities even if data are

---

<sup>16</sup> See Freeman and Peters (1984) for an overview of the bootstrapping technique.

<sup>17</sup> See Hsiao (1986) and Kennedy (1992) for excellent overviews of panel data estimation techniques.

unavailable for a particular community in a given year. Using a balanced panel, however, yields qualitatively similar results.<sup>18</sup>

Consider Table 1, which reports summary statistics for the municipal government data. All economic and fiscal data reported in Table 1 and elsewhere are expressed in real 2005 dollars. Population in Michigan municipalities modestly through 2007 and then began to decline. Similarly, per capita taxable value grew steadily through 2007, and then began to fall due to the real estate crisis<sup>19</sup> and we expect continued declines through 2010. Note that state equalized value increased through 2007 and then dropped 18 percent from its peak and 12 percent over the entire period.

For this initial analysis, our goal is to evaluate overall fiscal conditions, and therefore all fiscal data include total revenues and spending as opposed to general fund revenues and expenditures. Property taxes grew modestly through 2007 and then flattened out thereafter. Income taxes dropped sharply between 2008 and 2009, while revenue sharing from the state government declined steadily over the period for a total decrease of 13 percent from 2005 levels. Michigan state government has also been in fiscal crisis for several years, leading to forced cuts; revenue sharing has therefore been vulnerable. Intergovernmental revenue from the federal sources was the most deeply affected over this period with a real decline of 48 percent by 2009. These data are used

---

<sup>18</sup> Of the 1365 possible municipality-year observations, we include about 1103 or about 81 percent of the total in our analysis. Unfortunately, Detroit, Michigan's largest and perhaps most troubled city is not included in the analysis. Detroit officials failed to submit its financial information to the Treasury during the years included in this study. In about half of the cases city officials failed to submit financial data. In the remaining cases we chose to omit observations because municipal revenues fluctuated up or down from year to year in an unreasonable way. We suspect that these fluctuations are probably due to errors in reporting.

<sup>19</sup> Michigan has a taxable value cap in place. Thus, the rate of change in taxable value is different than the state equalized value. State equalized value is a better overall measure of property value growth, and taxable value is better overall measure of tax base growth.

to develop the government revenue index. Taken together, flat or declining own source revenue and flat or declining state government revenue sharing should generate a government revenue index (GRI) that is growing much more slowly (even declining in a number of jurisdictions) than the government cost index. We then use the difference between the GCI and GRI to determine to the degree to which key expenditure categories have been affected by fiscal stress.

Also provided in Table 1 are the summary statistics for the major expenditure categories for municipal governments: General Government, Public Safety, Public Works, Health and Welfare, Community Economic Development, Recreation and Culture, Other Expenditures, and Total Expenditures. Several major spending categories increased over the five year period, namely General Government, Public Safety and Public Works. Public Works experienced the highest rates of growth, whereas the other spending categories grew rates below or near the rate of growth in Total Expenditures. Note that the largest categories of spending were Public Works, Public Safety and All Other Expenditure.

**<Table 1 here>**

In Table 2 we report summary statistics for capital spending and non-capital spending. For any given municipality, capital spending can vary greatly from year to year.<sup>20</sup> Over the 2005-2009 period, the average total expenditure on capital outlay grew

---

<sup>20</sup> For example, the city of Saginaw has experienced fiscal stress for a number of years, and has continually cancelled road maintenance spending. In fact, officials are now considering returning some city streets back to gravel.

from \$2.99 million to \$3.48 million through 2007, or about 16 percent in real terms. However, capital spending fell thereafter, dropping 23 percent by 2009 from its high in 2006. Over this period, the city of Charlevoix spent the most in per capita on capital outlay at approximately \$2,666 per person.

Non-capital expenditures account for approximately 90 percent of all municipal expenditures, and exhibited a different growth pattern over the 2005-2009 period as compared to capital outlay. The total average non-capital expenditures grew very modestly over the period with the average per capita expenditures rising 3.6 percent over the period. The City of Sturgis spent the most in non-capital per capita expenditures at \$6,386 and \$5,989 in 2006 and 2009, respectively.

**<Table 2 here>**

Table 3 provides a summary of the average and standard deviations of all the indices used in this report. A critical factor of increasing statewide fiscal stress was the continual increase in the government cost index (GCI), which grew by more than 15 percent over the 2005-2009 period. As previously discussed, the GCI is the weighted average of capital cost index (CCI) and the government employee cost index (GECI), each of which grew over the period (15 and 16 percent, respectively). Note, however, that the capital cost index peaked in 2008 at 126.6, and then fell to 116 in 2009.

Statewide, the shares of total expenditures from capital costs (b) and employee costs (a) changed little over the period.<sup>21</sup>

As the major government cost factors grew substantially, on average the government revenue index (GRI) consistently lagged behind the cost index over the period. In addition, as illustrated by the standard deviation there is significant variability in both the government revenue index and the fiscal stress index. Recall that these indices are generated from the nominal, not inflation adjusted data.

The fiscal stress (FS) variable, which is calculated by subtracting GRI from GCI, provides an indication of the degree to which Michigan cities experienced the greatest stress. Some municipalities fared reasonably well over the period in that they did not experience significant fiscal stress despite the worsening of the national economy. To illustrate, the city of Grand Haven had consistently low levels of fiscal stress over the entire period. Grand Haven, whose main industry is tourism, saw healthy growth in revenues through 2008 as well as modest population growth. At the other end of the spectrum, New Baltimore consistently spent more than it was taking in for revenues over the period. While property taxes grew very modestly, other revenue sources such as federal revenue sharing and other revenues were volatile. For 2007 and 2009, New Baltimore's revenues were only 70 to 75 percent of expenditures and only 60 percent of expenditures in 2008. Capital spending was the greatest contributor to the spending in excess of revenues for this city. The City of Onaway also experience severe stress but its troubles stem from drastic changes in revenues. The city saw property tax revenues grow

---

<sup>21</sup> Also, the share of total revenues from property taxes is appears to be relatively low at around 33 percent. This is because we are using total revenues and not just general fund revenues. Total revenues included fees for water and sewer services, etc...

a modest 3 percent over the 2005 to 2009 period. However, unlike other cities, Onaway only received 6 percent of its revenue from property taxes in 2005. Because intergovernmental revenue from federal sources declined rapidly over the period, by 2009 total revenues had fallen 75 percent. By 2009, property taxes made up almost 25 percent of revenue collections. According to our fiscal stress measure, by 2009 all but 63 communities were experiencing some level of stress.

These illustrations provide some indication of the range of experiences of Michigan municipalities over this time period. While most municipalities experienced some level of stress over the period, some experienced severe stress. Sources of stress largely stem from flat or falling property tax revenues, but other revenue sources are also contributors to stress in a number of communities.

In the econometric analysis presented below, we include time indicator variables to control for changing conditions statewide. In an attempt to control for changes in the demand for public services and to isolate the fiscal stress effect, we also include population and taxable value as additional explanatory variables. We note, however, that our core findings are similar even if we exclude these control variables. In some regressions we incorporate municipal fixed effects in order to further isolate the fiscal stress effect; in these regressions coefficient estimates are generated from the within-municipality variation over time in fiscal stress, net of changes in population and taxable values. We now turn to the econometric analysis.

**<Table 3 here>**

## **Responses to Fiscal Stress**

To examine how municipalities across the state have responded to varying degrees of fiscal stress, we present the formal econometric analysis. As outlined earlier, the empirical strategy is to create a measure of fiscal stress that is largely driven by external forces (as opposed to internal management decisions). This measure is then included as an explanatory variable in our regressions to determine which of functional municipal spending categories are most adversely affected by fiscal stress.

Consider first the random effects estimates which are presented in Table 4. The explanatory power as measured by the adjusted  $R^2$  generated ranges from 0.63 to 0.94 across the set of regressions. The results indicate that many of the coefficient estimates are statistically significant. The two control variables are positive and significant in most regressions, indicating that increases (decreases) in both population and taxable value lead to increases (decreases) in most functional spending categories. Further, both capital and non-capital spending are positively correlated with population and taxable value. These results are largely driven by the cross-sectional variation in the dependent variables; municipalities with more people and higher taxable values have higher spending. As shown fixed effects regressions presented in Table 5, once we control for municipal fixed effects the coefficients on population and taxable value are significant less often.

The coefficient on the fiscal stress variable is negative in all functional spending categories. However, the magnitude and statistical significance of the coefficients across spending categories differs. The estimates can be interpreted as elasticities: A one point divergence between the costs of providing government services (GCI) and revenue

generating capabilities (GRI) results in a given percentage point reduction in spending. Keep in mind that, on average, fiscal stress increased by nine points over the period of analysis. Results indicate that the coefficient on the fiscal stress variable is statistically significant in the General Government, Public Works, Parks and Recreation and Other functional categories, with the strongest response to fiscal stress occurring in the Parks and Recreation category.<sup>22</sup> Here, a nine point increase in fiscal stress results in a 6.3 percent reduction in real spending in this category. We interpret this to be fairly responsive. Spending in the Other category is even more responsive: A nine point increase in fiscal stress results in an 11 percent reduction. Fiscal stress is also statistically significant in the General Government and Public Works regressions, but spending here is much less responsive: A nine point increase in fiscal stress reduces spending by one and 1.5 percent, respectively.

In the last two columns, we report estimates for capital and non-capital spending. Here, we see that both capital and non-capital spending is adversely affected by fiscal stress, but capital spending is especially responsive. A nine point increase in fiscal stress reduces capital spending by 16 percent, whereas non-capital spending only falls by 3.4 percent.

**<Table 4 here>**

To examine the robustness of our findings and to evaluate the degree to which censoring could bias our results, we present in Table 5 an analogous set of regressions

---

<sup>22</sup> The Other Expenditure category includes expenditures for the function of fringes, benefits, FICA, insurances, etc., capital outlay, debt service, transfers (out), and extraordinary/special items.

except they are estimated using the two-way fixed effects estimation procedure that include controls for both municipal and time effects. First, note that the coefficients on population and taxable value are now only sometimes significant, and sometimes negative. This is not surprising given that municipal fixed effects are picking up all the time invariant municipal characteristics, and the time indicator variables are picking up general statewide trends.

It is, however, reassuring to see that in most cases the coefficients on the fiscal stress variable are consistent with the random effects estimates. By and large, the results are very similar and thus require little additional explanation except to note that they suggest that neither the omission of fixed effects nor the censoring issue is leading to significant bias in the coefficients on the fiscal stress variable.

<Table 5 here>

These estimates reveal some consistent patterns in the ways that municipal officials in Michigan have responded to fiscal stress. In particular, we note that General Government, Public Works, Parks and Recreation, and Other spending are shown to be systematically related to fiscal stress, with the latter two categories being most responsive. Public Safety, Health and Welfare, and Economic Development are not systematically related to fiscal stress.<sup>23</sup> These patterns are consistent with the idea that municipal officials cut spending in areas that can be delayed or put off (Public Works and

---

<sup>23</sup> Economic Development also exhibits a relatively higher responsiveness to fiscal stress, but the coefficient is not statistically significant.

Capital) or perceived to be non essential (Parks and Recreation).<sup>24</sup> Public Works spending for municipalities includes maintenance of roads and streets, sanitation/landfill/solid waste, water and/or sewer systems, and other public works enterprise activities. It is perhaps not too surprising that municipal officials put off important but less urgent capital investment and maintenance activities. Finally, anecdotally one can point to a number of municipalities that have either significantly reduced or completely eliminated spending on Parks and Recreation.<sup>25</sup> Thus, our finding that spending on parks and recreation is in decline is consistent with our general observations.

## **V. Conclusion**

In this paper we presented detailed data on municipal public finances in Michigan over the 2005-2009 period. Using this information we developed an indicator of fiscal stress and identified the some of the underlying causes of stress across most municipalities in Michigan. While we find that many communities have experienced fiscal crises, those communities whose tax revenues have been most stagnant or were in actual decline experienced relatively more stress. We then used these data to examine how communities across the state have responded to fiscal crises brought on by external forces. Consistent with our initial notions, we find that while real spending was cut in several categories. Parks and Recreation, Other spending and Capital were found to be

---

<sup>24</sup> In Michigan, County governments are charged by state government with the provision of health and welfare services.

<sup>25</sup> See for example a recent article cuts to spending on parks in Colorado Springs (<http://www.coloradoconnection.com/news/story.aspx?id=448143>). Volunteers help when the city cannot. Also, the City of Saginaw completely eliminated spending on recreation in 2007.

most vulnerable. General Government and Public Works were also vulnerable, whereas Public Safety, Health and Welfare, and Economic Development were not found to be systematically related to fiscal stress. It appears that municipalities cut spending on activities related to recreation and have put off capital improvements as well as maintenance for roads, building and the like. While such delays may be an effective short-run strategy, it may result more extensive costs in the long-run.

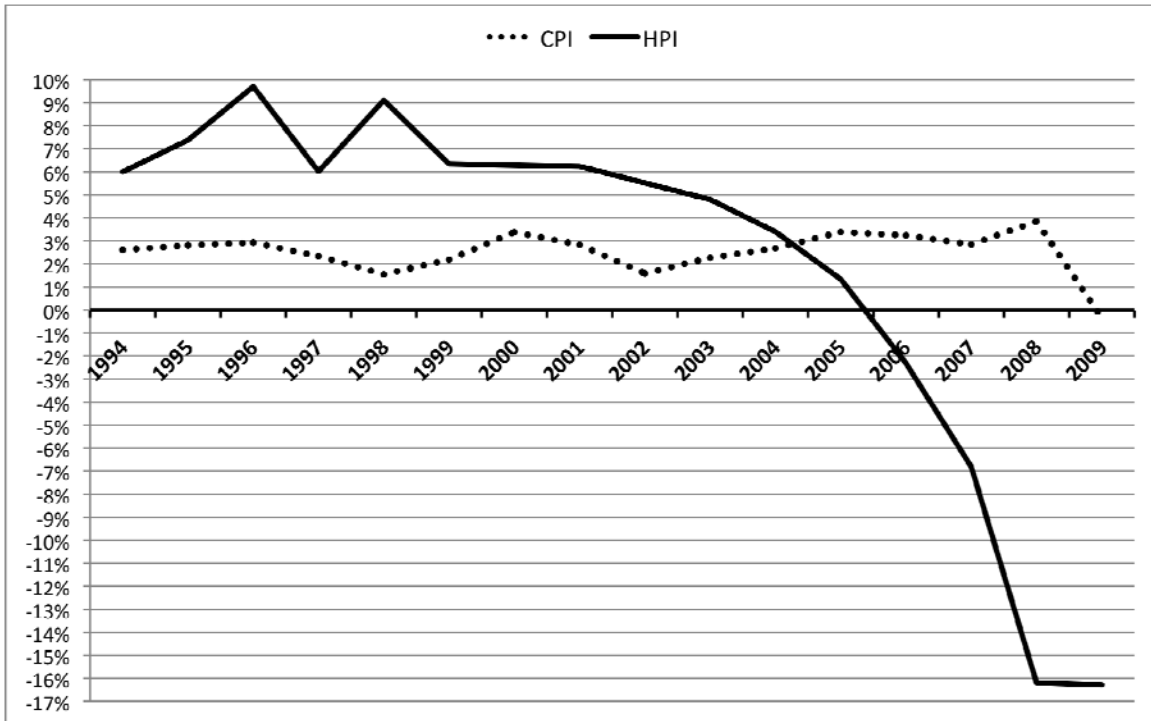
Given the recent nationwide real estate crisis, this research is especially timely; policymakers and public officials in Michigan and across the nation are concerned about the implications of the foreclosure/financial crises and accompanying decline on property tax revenues for local governments. Our research suggests that strategic decisions will be made. For Michigan, fiscal crisis has meant delays in important but less urgent capital and infrastructure maintenance and cuts in programs related to recreation. This study also highlights the value of the new web-based local government database. The new web portal and database, as well as this accompanying analysis will be of use to the state policymakers in both the short- and long-run.

## References

- Advisory Commission on Intergovernmental Relations (ACIR). 1973. *City Financial Emergencies: The Intergovernmental Dimension*. Washintgon, DC: U.S. Government Printing Office.
- Arellano, M. 1987. Computing Robust Standard Errors for Within-Groups Estimators. *Oxford Bulletin of Economics and Statistics*. 49(4): 431-434.
- Arsen, David, Tom Clay, Thomas Davis, Thomas Devaney, Rachel Fulcher-Dawson, and David N. Plank. 2005. *Adequacy, Equity, and Capital Spending in Michigan Schools: The Unfinished Business of Proposal A*. Citizens Research Council of Michigan and Michigan State University Center for Education Policy (May). Available at <http://www.crcmich.org/PUBLICAT/2000s/2005/schoolcapital.pdf>.
- Bertrand, M., E. Duflo, S. Mullainathan, 2004. How Much Should We Trust Differences-in-Differences Estimates? *Quarterly Journal of Economics*, 119(1): 249-75.
- Brown, Arthur. 1993. The 10-Point Test of Financial Condition: Toward an Easy-to-Use Assessment Tool for Smaller Cities. *Government Finance Review* 9(6): 21-26.
- 1996. Trend in Key Ratios Using the GFOA Financial Indicator Database 1989-1993. *Government Finance Review* 12(6): 30-44.
- Chernick, Howard, and Andrew Reschovsky. 2007. Fiscal Disparities in Selected Metropolitan Areas. *National Tax Association Proceedings of the 99<sup>th</sup> Annual Conference on Taxation*: 76-84.
- Dommel, Paul R., and Richard P. Nathan. 1978. Measuring Community Distress in the United States. Paper presented at the Seminar on Measuring Local Government Expenditure Needs, December, Denmark.
- Feldman, Naomi E., Paul N. Courant, and Douglas C. Drake. 2003. The Property Tax in Michigan. In Charles L. Ballard Paul N. Courant, Douglas C. Drake, Ronald C. Fisher, and Elisabeth R. Gerber (eds.), *Michigan at the Millennium*. East Lansing: Michigan State University Press.
- Freeman, David, A., and Stephen C. Peters. 1984. Bootstrapping a Regression Equation: Some Empirical Results. *Journal of the American Statistical Association*, 79(85): 97-106.
- Groves, Sanford M., and Maureen G. Valente. 1994. *Evaluating Financial Condition: A Handbook for Local Governments*. Washington, DC: International City/County Management Association.

- Hendrick, Rebecca. 2004. Assessing and Measuring the Fiscal Health of Local Governments: Focus on Chicago Suburban Municipalities. *Urban Affairs Review*. 40(1): 78-114.
- Hsiao, C. *Analysis of Panel Data*, Cambridge University Press, New York, 1986.
- Kennedy, Peter. 1992. *A Guide to Econometrics, Third Edition*. Cambridge Massachusetts: The MIT Press.
- Kloha, Philip, Carol S. Weissert, and Robert Kleine. 2005. Developing and Testing a Composite Model to Predict Local Fiscal Distress. *Public Administration Review* 65(3): 313-23.
- Ladd, Helen F., and John Yinger. 1989. *America's Ailing Cities: Fiscal Health and the Design of Urban Policy*. Baltimore, MD: Johns Hopkins University Press.
- Municipal Finance Officers Association (MFOA). 1978. *Is Your City Heading for Financial Difficulty: A Guidebook for Small Cities and Other Governmental Units*. Chicago: MFOA.
- Reschovsky, Andrew. 1993. Are City Fiscal Crises on the Horizon? In *Urban Finance under Siege*, edited by Thomas R. Swartz and Frank J. Bonello, 107-37. New York: M.E. Sharpe.
- Reschovsky, Andrew. 2004. The Impact of State Government Fiscal Crises on Local Governments and Schools. *State and Local Government Review* 36(2): 86-102.
- Sjoquist, David L. 1996. Local Government Fiscal Effort. Atlanta: Georgia State University, Andrew Young School of Policy Studies, Fiscal Research Center. [http://aysps.gsu.edu/frc/files/report\\_96\\_5.pdf](http://aysps.gsu.edu/frc/files/report_96_5.pdf).
- U.S. Congressional Budget Office (CBO). 1978. City Need and the Responsiveness to Federal Grant Programs. Washington, DC: CBO.
- U.S. Department of the Treasury. 1978. Report on the Fiscal Impact of the Economic Stimulus Package on 48 Large Urban Governments. Washington, DC: U.S. Government Printing Office.

Figure 1: Consumer and Housing Price Indices



Source: CPI from the Bureau of Labor Statistics and home price data from the Michigan Association of Realtors.

**Table 1: Summary Statistics**  
**Statewide Average Municipal Fiscal Variables**  
**(standard deviation in parentheses)**

<b>Year</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>%Δ '05-'09</b>
Number of Cities	241	211	189	217	230	
<b>Population</b>						
Population	15,662.50 (26,041.67)	15,869.67 (26,247.75)	16,355.65 (27,400.6)	16,264.68 (26,281.32)	15,944.64 (25,974.02)	2%
<b>Fiscal Data in Per Capita Terms</b>						
<b>Property Value Data</b>						
Taxable Value	\$28,542.47 (23,323.71)	\$30,093.36 (25,346.49)	\$31,192.19 (23,426.28)	\$30,637.24 (25,243.77)	\$29,564.42 (24,040.04)	4%
State Equalized Value	\$40,129.55 (33,690.2)	\$41,773.43 (36,474.36)	\$42,739.26 (33,864.38)	\$40,059.78 (33,951.72)	\$35,125.59 (30,142.39)	-12%
<b>Revenues</b>						
Property Tax	\$499.68 (274.27)	\$514.75 (283.1)	\$543.02 (296.48)	\$536.02 (296.73)	\$535.16 (293.11)	7%
Income Tax <sup>a</sup>	\$194.06 (63.3)	\$190.08 (52.64)	\$192.90 (61.58)	\$196.95 (63.01)	\$182.96 (58.02)	-6%
Revenue Sharing from State Government	\$117.08 (41.41)	\$112.35 (38.7)	\$107.12 (35.55)	\$102.46 (33.87)	\$101.67 (35.03)	-13%
Other Intergovernmental Rev. from State Gov't	\$89.68 (60.07)	\$43.17 (63.01)	\$92.97 (70.16)	\$93.16 (95.95)	\$86.55 (60.99)	-3%
Intergovernmental Rev. from Federal Gov't	\$65.14 (223.61)	\$54.67 (138.33)	\$51.24 (179.36)	\$45.57 (94.53)	\$34.09 (58.59)	-48%
Total Revenues	\$1,721.42 (878.91)	\$1,686.59 (912.12)	\$1,747.26 (898.76)	\$1,749.45 (918.89)	\$1,698.67 (909.98)	-1%
<b>Expenditures</b>						
General Government	\$179.07 (99.36)	\$179.64 (93.57)	\$179.45 (88.88)	\$171.60 (86.75)	\$181.26 (97.25)	1%
Public Safety	\$268.35 (144.82)	\$276.44 (149.57)	\$282.60 (150.25)	\$282.10 (153.33)	\$283.38 (157.39)	6%
Public Works	\$571.48 (442.63)	\$608.65 (532.75)	\$601.79 (458.03)	\$614.02 (503.95)	\$631.38 (504.99)	10%
Health and Welfare	\$32.95 (281.02)	\$35.25 (284.27)	\$39.20 (307.75)	\$33.83 (278.03)	\$32.44 (271.22)	-2%
Community & Economic Development	\$56.81 (121.46)	\$54.52 (89.02)	\$50.80 (72.24)	\$51.57 (77.44)	\$56.11 (82.28)	-1%
Recreation & Culture	\$85.98 (93.3)	\$83.50 (80.64)	\$85.45 (88.14)	\$87.31 (85.34)	\$82.74 (79.5)	-4%
All Other Expenditures	\$481.22 (373.24)	\$487.25 (503.98)	\$459.25 (377.98)	\$455.80 (363.)	\$456.54 (379.59)	-5%
Total Expenditures	\$1,675.87 (837.33)	\$1,725.09 (1,019.69)	\$1,697.56 (864.39)	\$1,696.23 (899.89)	\$1,723.85 (929.47)	3%

<sup>a</sup> Only 22 cities have an income tax—of these only 15, 13, 11, 14 and 14 reported fiscal data in 2005, 2006, 2007, 2008 and 2009 respectively.

**Table 2: Summary Statistics**  
**Statewide Average Municipal Capital and Non-Capital Expenditures**  
**(standard deviation in parentheses)**

<b>Year</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
<b>Total Capital</b>	\$2,987,604.14	\$3,610,337.16	\$3,480,235.63	\$2,739,351.71	\$2,772,408.49
<b>Outlay</b>	(7,028,667.28)	(8,796,314.9)	(8,817,272.63)	(7,404,993.78)	(7,126,404.64)
<b>Per Capita</b>	\$194.59	\$233.82	\$206.64	\$183.46	\$180.37
<b>Capital Outlay</b>	(261.36)	(291.02)	(287.88)	(260.82)	(246.02)
<b>Total Non-Capital</b>	\$24,213,540.56	\$22,640,785.19	\$25,686,049.96	\$25,163,136.55	\$24,862,766.12
<b>Outlay</b>	(46,826,456.5)	(36,897,445.73)	(50,198,104.74)	(46,760,904.53)	(46,078,423.61)
<b>Per Capita</b>	\$1,489.34	\$1,450.55	\$1,494.85	\$1,501.41	\$1,543.48
<b>Non-Capital</b>	(745.00)	(755.82)	(745.57)	(780.85)	(793.27)

**Table 3: Summary Statistics**  
**Statewide Average Municipal Service Cost and Revenue Growth Indices**  
**(standard deviation in parentheses)**

<b>Variable</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Share of expenditures from employees costs (a)	0.901 (0.096)	0.882 (0.104)	0.895 (0.108)	0.903 (0.095)	0.905 (0.094)
Share of expenditures from capital costs (b)	0.099 (0.096)	0.118 (0.104)	0.104 (0.108)	0.097 (0.095)	0.095 (0.094)
Gov't service cost index (GCI)	100.00	104.59	109.60	113.65	115.39
Gov't employee cost index (GECI)	-	-	-	-	-
Capital cost index (CCI)	100.00	110.60	119.11	126.60	116.00
Government Revenue Index (GRI)	100.00	100.87	104.99	109.81	106.77
Fiscal stress (FS)	-	(18.02)	(18.80)	(21.492)	(22.09)
	0.00	3.72	4.61	3.84	8.62
	-	(18.022)	(18.80)	(21.49)	(22.09)

**Table 4: Municipal Expenditure Random Effects Regression Results**  
(t-statistics or z-statistics in parentheses)

	Dependent Variable:									
	General Gov't	Public Safety	Public Works	Health & Welfare <sup>a</sup>	Economic Development <sup>a</sup>	Parks and Recreation <sup>a</sup>	Other		Capital <sup>a</sup>	Non-Capital
Independent Variable										
<b>Fiscal stress</b>	<b>-0.0012**</b> <b>(-2.134)</b>	<b>-0.0005</b> <b>(-1.522)</b>	<b>-0.0017**</b> <b>(-2.305)</b>	<b>-0.0020</b> <b>(-0.860)</b>	<b>-0.0062</b> <b>(-1.065)</b>	<b>-0.0074***</b> <b>(-2.623)</b>	<b>-0.0131***</b> <b>(-6.783)</b>		<b>-0.018***</b> <b>(-2.975)</b>	<b>-0.0038***</b> <b>(-9.048)</b>
Ln(Population)	0.4481** (2.235)	0.5874** (2.268)	0.3745 (1.446)	5.1373*** (2.727)	1.6521** (2.395)	0.4762* (1.818)	0.7673*** (8.648)		0.1257 (0.223)	0.4409* (1.733)
Ln(Taxable value)	0.402** (2.523)	0.492** (2.401)	0.385** (1.981)	-1.976 (-1.195)	0.348 (0.584)	0.678*** (2.799)	0.321*** (4.176)		0.982* (1.957)	0.404** (2.101)
Adjusted R <sup>2</sup>	0.911	0.942	0.741				0.629			0.911
Log likelihood				-1237.74	-2636.56	-1783.92			-2772.88	
Number of Observations	1103	1103	1103	1103	1103	1103	1102		1102	1095
Left-censored Observations				813	160	17			72	
<i>Notes:</i> All regressions include time effects.										
<sup>a</sup> These coefficients are generated from a random effects Tobit estimation with bootstrapping.										
* Indicates significance at the 90 percent confidence level for a two-tailed test.										
** Indicates significance at the 95 percent confidence level for a two-tailed test.										
*** Indicates significance at the 99 percent confidence level for a two-tailed test.										

**Table 5: Municipal Expenditure Fixed Effects Regression Results  
(t-statistics in parentheses)**

	Dependent Variable:									
	General Gov't	Public Safety	Public Works	Health & Welfare	Economic Development	Parks and Recreation	Other		Capital	Non-Capital
Independent Variable										
<b>Fiscal stress</b>	<b>-0.0013**</b> <b>(-1.977)</b>	<b>-0.0005</b> <b>(-1.577)</b>	<b>-0.0016**</b> <b>(-2.137)</b>	<b>-0.0063</b> <b>(-0.909)</b>	<b>-0.0052</b> <b>(-1.106)</b>	<b>-0.0075**</b> <b>(-2.571)</b>	<b>-0.017***</b> <b>(-7.062)</b>		<b>-0.022***</b> <b>(-3.221)</b>	<b>-0.0039***</b> <b>(-8.938)</b>
Ln(Population)	-0.00643 (-0.628)	0.0799*** (6.252)	-0.0168** (-2.233)	2.3746*** (12.53)	0.0083 (0.0805)	-0.1568** (-2.214)	1.5052*** (50.46)		-1.5629*** (-11.27)	0.0171*** (3.406)
Ln(Taxable value)	0.029 (1.194)	-0.003 (-0.150)	0.028 (1.019)	-0.082 (-0.328)	0.218 (1.315)	0.131 (1.105)	0.016 (0.228)		-0.138 (-0.434)	0.024 (1.259)
Adjusted R <sup>2</sup> (within)	0.019	0.014	0.030	0.018	0.011	0.014	0.119		0.024	0.201
Number of Observations	1103	1103	1103	1103	1103	1103	1095		1103	1095
<i>Notes:</i> All regressions include time effects.										
* Indicates significance at the 90 percent confidence level for a two-tailed test.										
** Indicates significance at the 95 percent confidence level for a two-tailed test.										
*** Indicates significance at the 99 percent confidence level for a two-tailed test.										

**Appendix  
Definitions of Variables**

Property Tax Revenues	Property Tax- total of all funds and accounts. Includes delinquent taxes, penalties, interest, and fees. (MDT)
Income Tax Revenues	Income tax revenues – total of all funds and accounts. Includes income tax revenues from 22 Michigan cities which impose the tax. They include Albion, Battle Creek, Big Rapids, Detroit, Flint, Grand Rapids, Grayling, Hamtramck, Highland Park, Hudson, Ionia, Jackson, Lansing, Lapeer, Muskegon, Muskegon Heights, Pontiac, Port Huron, Portland, Saginaw, Springfield and Walker. (MDT)
Intergovernmental Revenue from Federal Government	Intergovernmental revenues from federal government – total of all funds and accounts. Includes all revenues for the functions of general government, public safety, streets and highways, sanitation, health and/or hospitals, welfare, culture and recreation, housing and community development, water, electric, transit, and all other federal aid grants. (MDT)
Revenue Sharing from State Government	State revenue sharing revenues – total of all funds and accounts. (MDT)
Other Intergovernmental Revenues from State Government	Revenues from state government – total of all funds and accounts excluding revenues from state revenue sharing. Includes all revenues for the functions of general government, payment in lieu of taxes, swamp land taxes, forest reserve, public safety, streets and highways (Act 51), streets and highways (non-Act 51), sanitation, health and/or hospitals, welfare, culture and recreation, housing and community development, water, electric, transit, and all other general or state aid grants. (MDT)
Other Revenues	Other revenues – total of all funds and accounts. Includes all tax revenues except property and income taxes, and revenues from licenses and permits, contributions from local units, charges for services, fines and forfeits, interest and rents, and any other miscellaneous revenues such as, but not limited to sale of fixed assets or extraordinary/special items. (MDT)
Total Revenues	Total revenues for all funds and accounts. (MDT)
General Government Expenditures	General government expenditures – total of all funds and accounts. Includes all expenditures for the functions of the legislative and judicial bodies, chief executive, treasurer, assessing equalization, clerk, elections, finance and tax administration, building and grounds and all other general government revenue. (MDT)
Public Safety Expenditures	Public safety expenditures – total of all funds and accounts. Includes expenditures for the functions of police/sheriff, fire, combined public safety departments, emergency 911 dispatch activities, corrections/jails, building inspection and regulations activities, and all other public safety activities. (MDT)
Public Works Expenditures	Public works expenditures – total of all funds and accounts. Includes all expenditures for the functions of public works and infrastructure (non-Act 51), road commission/street department (Act 51), sanitation/landfill/solid waste, water and/or sewer systems, electric utilities, airports, public transportation, water, and all other public works enterprise activities. (MDT)
Health and Welfare Expenditures	Health and welfare expenditures - total of all funds and accounts. Includes expenditures for the functions of health departments, boards and clinics, alcoholism and substance abuse, hospitals, medical examiner, mental health, emergency services (ambulance), child care activities/human services, human services and medical care facilities, area agency on aging, veteran’s programs, and all other health and welfare expenditures. (MDT)
Community and Economic Development Expenditures	Community and economic development expenditures - total of all funds and accounts. Includes expenditures for the functions of redevelopment and public housing, community planning and zoning, economic development, and all other development activities. (MDT)
Recreation and Culture	Recreation and culture expenditures - total of all funds and accounts. Includes

Expenditures	expenditures for the function of parks and recreation, libraries, and various cultural activities, fine arts, historical societies, museums, etc. (MDT)
Other Expenditures	Other expenditures - total of all funds and accounts excluding those for general government, public safety, public works, health and welfare, community/economic development, and recreation and culture. Includes expenditures for the function of fringes, benefits, FICA, insurances, etc., capital outlay, debt service, transfers (out), and extraordinary/special items. (MDT)
Total Expenditures	Total expenditures for all funds and accounts and for all activities. (MDT)
Capital Expenditures	Capital outlay expenditures for land, equipment, buildings, and construction. Includes expenditures for the function of legislative, judicial, general government, police, fire, combined public safety, parking meters/off-street parking, corrections, other public safety, streets and highways, sanitation/solid waste, sewerage, water, electric utilities, airports, public transportation, hospital and hospital operations, welfare, housing and redevelopment, all other health and welfare, parks and recreation, library, other recreation and culture, and other functions. (MDT)
Non-Capital Expenditures	Non-capital expenditures as calculated by subtracting capital expenditures from total expenditures. (MDT)
CPI	Consumer price index. Source: U.S. Bureau of Labor Statistics
GECI	Government employee cost index. (BLS)
CCI	Capital cost index. Source: Turner Building Cost Index (TBC) (AC)
SEV	State equalized value on real and personal property (MDT) (AC)
TV	Taxable value on real and personal property (MDT) (AC)
Pop	Population (MDT) (AC)
a	Share of expenditures from employees costs (MDT) (AC)
b	Share of expenditures from capital costs (MDT) (AC)
GCI	Gov't service cost index (MDT) (AC)
GECI	Gov't employee cost index (MDT) (AC)
GRI	Government Revenue Index (MDT) (AC)
FS	Fiscal stress indicator (MDT) (AC)
Sources: Michigan Department of Treasury (MDT), Authors Calculations (AC), U.S. Bureau of Census (BC), U.S. Bureau of Labor Statistics, Turner Building Cost Index (TBC)	