

**Causes and Consequences of Fiscal Stress
in Michigan Municipal Governments**

Mark Skidmore and Eric Scorsone

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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.

About the Authors

Mark Skidmore, Morris Chair in State and Local Government Finance and Policy
Department of Agricultural, Food, and Resource Economics/Department of Economics
Michigan State University, 208 Agriculture Hall, East Lansing, MI 48824-1039
E-mail: mskidmor@msu.edu.

Mark Skidmore is Professor and Morris Chair in State and Local Government Finance and Policy at Michigan State University. He holds joint appointments in Agricultural, Food and Resource Economics and Economics. Much of Professor Skidmore's research has focused on public sector economics and economic development. Current research interests include state and local government tax policy, intergovernmental relations, the interrelationship between public sector decisions and economic activity, and the economics of natural disasters. His research has been funded by organizations such as the Lincoln Institute of Land Policy, the Urban Institute and the Fulbright Program. His articles have appeared in journals such as *Economic Inquiry*, *Economics Letters*, *Journal of Urban Economics*, *Kyklos*, *Land Economics*, *National Tax Journal*, *Public Choice*, and the *Southern Economics Journal*. He received his doctorate in economics from the University of Colorado in 1994, and his bachelor's degree in economics from the University of Washington in 1987.

Eric Scorsone, Chief Economist
Michigan Senate Fiscal Agency
201 N. Washington Sq.
Suite 800 The Victor Center
P.O. Box 30036
Lansing, MI 48909-7536
E-mail: escorsone@senate.michigan.gov

Eric Scorsone is the Chief economist for the Michigan Senate Fiscal Agency. Prior to moving to the agency in January 2010, he served as an Assistant Professor, Extension Specialist, and Co-director of the State and Local Government Program in the Department of Agricultural Economics at Michigan State University. Dr. Scorsone has also worked as an economist for the Colorado Governor's Office of State Planning and Budget and as Senior Economist for the City of Aurora, Colorado. He is the recipient of a \$200,000 grant from the W.K. Kellogg Foundation to study "Combining Local Government Services." He received his B.A. from Loyola University of Chicago (1993), his M.S. in Agricultural Economics from Michigan State University (1996), and his Ph.D. in Agricultural Economics (Local Public Finance) from Colorado State University (2001).

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Causes and Consequences of Fiscal Stress in Michigan Municipal Governments

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.¹ 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. In order to examine this issue in a systematic way, a complete panel of local government fiscal data is required. As described in Appendix A, a critical component of the project is to develop a new web-based local government data management system. Now that the key features of the new web-based local government data management system are in place, a vast array of local government fiscal data are now 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 2009.² 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,

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

² Fiscal year 2008 will be available soon and we plan to update this report once we have access to these data.

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 a particularly illuminating case study of Saginaw, Michigan, a city that has experienced prolonged fiscal stress. We then present the framework used to guide the empirical analysis. Both the case study and the theoretical framework inform the econometric analysis. This is followed by a presentation of our analysis, and the last section concludes.

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. We now turn to a review of the fiscal history of Saginaw, Michigan, a city that has been in intense fiscal crises for a number of years.

The Experience of the City of Saginaw

The City of Saginaw exemplifies the challenges and struggles of many Michigan manufacturing-based municipalities. The city's population, which peaked in the 1950's at over 100,000, has declined to just under 60,000 by 2009; an exodus of nearly 40 percent of the population. This exodus has been driven by the aging and decline of the automobile and related industries and a continuing and sustained rise in lawlessness and lack of public safety. This city government has struggled to both respond to these challenges and proactively stem the decline. This case study is designed to highlight the changes in public finance and service delivery from the period of the late 1970's through

the first decade of the 2000's. This examination will provide some guidance for developing hypotheses about the types of changes to financing and public services that other struggling Michigan cities have used to stabilize themselves.

As in most states, the state of Michigan requires local units to have a balanced budget. A balanced budget implies that all forms of incoming resources are equal to outgoing or uses of resources. Resource use may include current and capital expenditures as well as transfers to other funds. Incoming resources includes taxes, fees, other forms of income as well as transfers into a fund from other funds and any emergency stabilization or rainy day funds used. For the City of Saginaw, the choices for balancing the budget over time are to: 1) Increase revenues; 2) use of one time resources such as fund transfers and rainy day funds; and 3) reduce expenditures. In this section, we discuss the trends and use of all three of these strategies in Saginaw, Michigan.

Revenues

In 1979, the city's general fund revenues (in 2005 dollars) were \$61.71 million, but by 2007 had fallen to \$31.05 million.³ However, in 2005 the city passed for the first time a public safety extra voted millage, which generates approximately \$3.6 million to supplement the general fund. Thus, true total general fund available resources are \$34.65 million. Real general fund revenues have fallen by nearly 50 percent over the period. While this reduction roughly matches the decline in the city's population, the land area and corresponding public infrastructure over which services are provided has not changed.

One important aspect of the City of Saginaw's financial resources relates to a unique property tax cap that was implemented in 1979. This cap limits the city property tax revenues to the 1979 levels. Any potential revenue growth resulting from growth in the tax base is foregone as the millage rate must be rolled back to maintain the 1979 property tax revenue levels. In 1979, the city collected over \$10.3 million from property taxes but by 2007 these revenues had been cut by nearly two thirds. The imposition of this Saginaw-specific tax limitation severely constrained revenues, and has led to a major shift from the property tax to a reliance on the city income tax.

Table 1: Saginaw Revenues and Spending in Real 2005 Dollars (in millions of dollars)

Category	FY 1979	FY 1995	FY 2007
Income Tax	\$20.23	\$16.87	\$12.71
Property Tax	\$10.31	\$5.18	\$3.76
Stated Shared Revenue	\$10.88	\$12.05	\$9.26
Total Revenue	\$61.71	\$41.32	\$31.05
Police	\$14.36	\$15.33	\$11.43
Fire	\$8.07	\$9.91	\$8.98
Total Expenditures	\$58.12	\$41.16	\$30.23
Population	77,508	69,512	62,422

³ All dollar figures are expressed in real terms (2005 dollars) unless otherwise stated.

As a result, revenue structure has changed dramatically over the past few decades. Today, the city income tax and state revenue sharing are the dominant sources of funding for the city's general fund, followed in distant third by the property tax. The City of Saginaw is one of 22 cities in the state of Michigan that uses a city income tax. City income tax collections equaled \$17.65 million in 2000 and have since dropped dramatically over the past nine years. By 2007, the income tax revenues had declined to just \$12.71 million. For comparison, income tax collections in 1979 were \$20.23 million. Thus, in real terms income tax collections in 2007 were about \$7.52 million lower than they were in 1979.

Table 2: Saginaw Per Capita Revenue and Spending

Category	FY 1979	FY 1995	FY 2007
Income Tax	\$261.01	\$242.72	\$203.65
Property Tax	\$133.02	\$74.49	\$60.29
Stated Shared Revenue	\$179.04	\$173.29	\$148.40
Total Revenue	\$796.21	\$594.37	\$497.42
Police	\$185.32	\$220.47	\$183.10
Fire	\$104.09	\$142.51	\$143.90
Total Expenditures	\$749.89	\$592.14	\$484.23
Population	77,508	69,512	62,422

State shared revenue is another major source of funding to the city general fund. In 2000, revenue sharing accounted for over \$14.62 million, but has since decreased. In 2007, state revenue sharing was down to \$9.26 million, a drop of over 36 percent. These cuts are largely due to the state budget problems and budget reductions. This mirrors the experience of many other local governments across the state. From a longer term perspective, the city collected state shared revenues of \$13.88 million in 1979; revenue sharing is considerably less today than it was in 1979.

The property tax is the third most important source of revenue in the city. For the general fund, property tax revenues are limited to collections of about \$3.8 million and have declined dramatically since the 1970's. As stated earlier, an extra voted millage was passed in 2005 for police and fire operations. This millage, which required the city to maintain a certain level of effort with regards to police and fire staffing, is set to sunset in 2011 and must be renewed by the voters. The extra voted millage has allowed the city to avoid further cuts in the public safety departments.

Other revenue sources for the general fund include licenses and permit fees, penalties, sales of assets, indirect costs (overhead charges) and interest income. Generally, these sources of funding have been declining in real terms over the years. For example, these revenue sources accounted for approximately \$10.42 million in 1979, had fallen to \$5.18 million by 2007.

Expenditures and Services

The city's finances are divided into a general fund that covers core services such as police, fire, planning and zoning, public works and administrative services, and other funds such as the water fund, the sewer fund and some smaller internal funds. This analysis primarily covers the general fund services.

In 1979 the City of Saginaw spent \$58.12 million, and by 2007, general fund expenditures had decreased to \$30.23 million. For 2007, the bulk of spending falls under the category of public safety (\$20.41 million). As previously highlighted, an additional \$4.5 million of public safety spending occurs via special revenue funds and in particular the public safety extra voted millage. The rest of the general spending was accounted for in general government, administrative services, and public works. It should also be noted that the bulk of public works spending on infrastructure, particularly the road system occurs in special revenue funds dedicated to local and major street funds. These funds are constrained by receipts from the state gas tax. A likely result of the ongoing fiscal stress within the city is the inability of the general fund to provide additional resources to the local or major street funds and the inability of city leaders to provide resources through an extra voted millage, for example.

Saginaw spent \$14.36 million (in 2005 dollars) on police operations in 1979. In 2007, the city spent \$15.03 million, including funding from the millage. Thus, the police department in the city has, to some extent at least, maintained its funding levels in real terms, however, police staffing has declined. In 1997 for example, there were 154 full-time equivalent (FTE) sworn officers in Saginaw PD and 99 FTE in 2007. In 2007, police employees accounted for one quarter of all city employees and about one quarter of the city's general fund budget. This represents a reduction of over 55 FTE positions over ten years, but the losses were concentrated during the 1999 to 2005 period--coinciding with the ongoing major state recession that began in 2000. Despite the ongoing challenges, police expenditures over this period have held steady in real terms. The fact that police expenditures were constant while staffing fell indicates that either the remaining staff were working significant overtime or nonwage benefits and salaries increased substantially over the period. The different stories regarding staffing and the financial figures indicate that addressing fiscal stress is often complex. While it is clear that the budget has not increased in real terms, which may be beneficial in terms of managing short term fiscal conditions, reductions in staffing diminishes response time and capacity of the police personnel that remain. Minor crimes are often not responded to at all, and if they are responded to, only after a significant delay.

The Saginaw Fire department is another major component of the general fund budget. In 1979, the total fire budget was \$8.07 million and was \$8.98 million in 2007. In terms of staffing, the city fire department was at 100 FTE in the early 1990's and maintained that level until the early 2000's. Since the early 2000s, staffing has been reduced to 64 FTE. The city's fire department accounts for about 15 percent of the general fund budget. Fire

workload has changed in terms of the mix of services provided; the actual number of fires has fallen, but the number of ambulance runs has increased.

Expenditures for Fiscal Services in Saginaw declined slightly in real terms since 1979. However, relative to the substantial cuts in other expenditure categories spending has been largely maintained, perhaps because of state and federal mandates around auditing and billing processes. After an adjustment for inflation, the Fiscal Services department currently has a total budget of \$2.05 million, as compared to \$2.38 million in 1979.

In the area of general government, which includes city clerk, city council, city manager, human relations (employee services) and some other basic services, spending has been constrained. In 1978, spending was approximately \$2.65 million for general government. By 2007, these same categories expended \$1.96 million. Since 2000, this area has experienced budget reductions. Total general government spending in 2002 was \$2.85 million, but was reduced to \$1.96 million in 2007. Since 1979, the biggest reduction came in the city manager's budget allocation, which was cut by \$171,049 (-39%).

Another major service area is called general services. These services include civil engineering, street lighting, building and grounds, cemeteries, recreation and rubbish collections. These are generally covered under the Public Works Department of the city. In 1979, total spending in this area was \$11.97 million. Of this amount, nearly \$2.21 million was spent on rubbish collection. In 1982, the rubbish collection was removed to a separate rubbish collection fund, which included a new millage. At that time, the new adjusted general services budget was \$8.4 million, but has since declined to \$2.89 million in 2007. Expenditures in this category remained at around \$4 million, through the 1980's and 1990's until about 2002. Services affected by these cuts included public works, engineering, and a total elimination of the nearly \$500,000 recreation budget by 2007. General services and public works have clearly suffered significant reductions since the 1970's.

The final category is the community services budget which includes the civic center, inspections and zoning, planning and economic development and some other miscellaneous categories. In 1978, the city spent just \$5.33 million on these services in real terms. Over time, large cuts were made to the planning and economic development line item. Further, in 2002, the city privatized the civic center and spent no further general funds in that area. This was part of the budget balancing effort that began in the 1990s when the large cuts to state revenue sharing occurred. By 2007, the total allocation for these services (inspections and zoning, and planning and economic development) had dropped to \$1.25 million.

Revenues, Expenditures, and the Overall Budget

Fiscal stress in the city's general fund has been largely the result of reductions in state revenue sharing and the city income tax. In the 1990's these sources of revenue actually grew with the economy at a 5 percent annual rate, well above the rate of inflation. Income tax revenues increased modestly from \$17.27 million in 1990 to \$17.65 million

in 2000, just over 2 percent. During this period, state shared revenue grew from \$12.19 million to over \$14.6 million by 2000. This growth more than made up for stagnation in other revenue sources such as the property tax. Over that same period, total general fund expenditures grew from \$36.88 million in 1990 to over \$41.11 million. During this decade, the city was generally running a nominal surplus of \$1 million or more. The number of fire fighters generally remained in the 100 range and the number of police officers remained in the 150 range during the decade. Further, the number of total employees remained at around 650. Despite the challenges in the 1990s, the city maintained relative fiscal health, but reduced its unreserved general fund balance from \$2.37 million in 1990 to just under \$300,000 by 2000. However, since 2000 the city has experienced significant fiscal challenges.

Generally, the expenditure categories that were most vulnerable were community development and public works. The total elimination of parks and recreation was one casualty of the fiscal strain facing the city. Another major cut, although the service is supported by the private sector, was the elimination of funding for the civic center. In the case of parks and recreation, it is unclear the whether private sector has been able to provide a viable substitute. Another major area of cuts has come to public services such as street lighting and road maintenance. From this point, other cuts are more difficult or more marginal in nature. Police and fire services have continued to be funded, but the adequate growth of these services has been constrained as evidenced by very difficult working environments. This detailed overview of the Saginaw experience provides a frame of reference for thinking about how other Michigan municipalities have and are responding to fiscal stress. Below, we present a more general framework for thinking about how to assess the degree of fiscal stress and examine how municipalities have responded.

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

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

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)⁴ and capital costs (CCI), respectively, and where $a + b = 1$ and are determined by statewide averages.⁵ 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.⁶

GECI _{t} and CCI _{t} 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), 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 _{i} t is also generated from the municipal government fiscal data. The approach taken here is generally consistent with Reschovsky (2004).⁷

Revenue Restrictions in Michigan

⁴ 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.

⁵ 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 $b=0.1$.

⁶ The base year index = 100.

⁷ In practice, we Other approaches are also valid, and some these alternative approaches will be explored in future research.

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.⁸ 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.⁹ 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.¹⁰ 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 rate¹¹ 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-third.¹² 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.¹³

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 1978.¹⁴ While Proposal A limits *statutory millage*

⁸ These policies are discussed in detail in Feldman, Courant, and Drake (2003).

⁹ 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.

¹⁰ 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.

¹¹ One mill is defined as \$1 per \$1,000 of taxable value.

¹² 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.

¹³ 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).

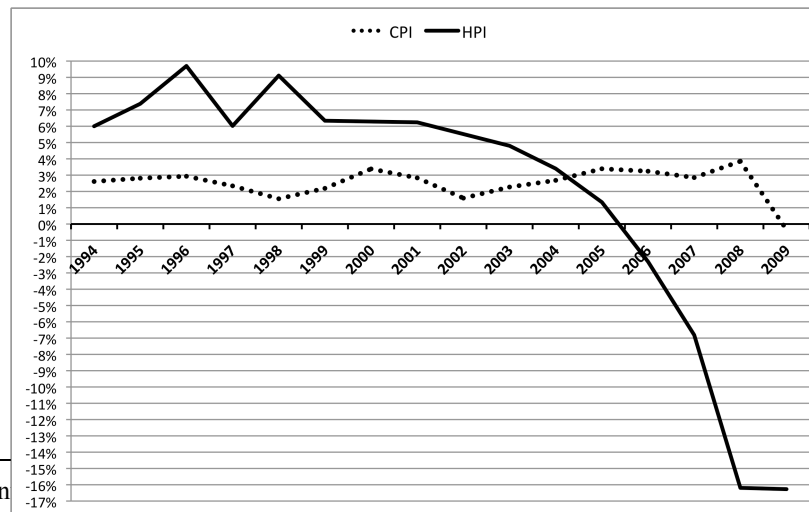
¹⁴ The Headlee Amendment is named for its author, Richard H. Headlee.

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.”¹⁵ 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.

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: Consumer and Housing Price Indices



¹⁵ Local residents rarely.

occurred only

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

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.¹⁶ 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.¹⁷ 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 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.

¹⁶ 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.

¹⁷ One dimension of “efficiency” is the potential elimination of public services that are not valued as highly by the public.

Based on our case study and discussions with local officials, 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:

$$\text{Ln}(\text{Exp}_{jit}) = \alpha \text{FS}_{it} + \beta'(\text{ln}(X_{it})) + t_t + \varepsilon_{it}$$

where 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 population¹⁸ and taxable value. We begin our examination by using a random effects estimation procedure with a correction of standard errors to allow for non-independence of observations from the same state 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.¹⁹ To examine the robustness of these core estimates, we also estimate corresponding series regressions using the two-way fixed effects estimation procedure.²⁰ As we discuss in detail in the next section, our results are robust to alternative estimation approaches.

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 B 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 unavailable for a particular community in a given year. Using a balanced panel, however, yields qualitatively similar results.²¹

¹⁸ 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.

¹⁹ See Freeman and Peters (1984) for an overview of the bootstrapping technique.

²⁰ See Hsiao (1986) and Kennedy (1992) for excellent overviews of panel data estimation techniques.

²¹ Of the 1365 possible municipality-year observations, we include about 1089 or 80 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 official failed to provide a report. In the remaining cases we chose to omit observations because city revenues fluctuated in an unreasonable way from year to year. We suspect that the fluctuations were due to errors in reporting.

Consider Table 3, which reports summary statistics for the municipal government data. All economic and fiscal data reported in Table 3 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 crisis²² 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 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 3 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.

²² 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.

Table 3: Summary Statistics Statewide Average Municipal Fiscal Variables (standard deviation in parentheses)

Year	2005	2006	2007	2008	2009	%Δ '05-'09
Number of Cities	241	211	189	217	230	
Population						
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%
Fiscal Data in Per Capita Terms						
Property Value Data						
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%
Revenues						
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 ^a	\$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%
Expenditures						
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%

^a 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.

In Table 4 we report summary statistics for capital spending and non-capital spending. For any given municipality, capital spending can vary greatly from year to year.²³ Over the 2005-2009 period, the average total expenditure on capital outlay grew 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

²³ 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.

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 4: Summary Statistics

Statewide Average Municipal Capital and Non-Capital Expenditures
(standard deviation in parentheses)

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

Table 5 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.²⁴

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

²⁴ 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...

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 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. By 2009, all but 63 communities were experiencing some level of fiscal stress according to our measure.

These illustrations provide some indication of the range of experiences of Michigan municipalities over this time period. By the measure of fiscal stress that we use, most municipalities experienced some level of stress over the period, and 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 5: Summary Statistics**Statewide Average Municipal Service Cost and Revenue Growth Indices**
(standard deviation in parentheses)

Variable	2005	2006	2007	2008	2009
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)	- 100.00	- 103.97	- 108.40	- 111.60	- 115.33
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)	- 0.00	(18.02) 3.72	(18.80) 4.61	(21.492) 3.84	(22.09) 8.62
	-	(18.022)	(18.80)	(21.49)	(22.09)

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 6. 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 7, 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.²⁵ 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 6: Municipal Expenditure Random Effects Regression Results
(t-statistics or z-statistics in parentheses)**

	Dependent Variable:									
	General Gov't	Public Safety	Public Works	Health & Welfare ^a	Economic Development ^a	Parks and Recreation ^a	Other		Capital ^a	Non-Capital
Independent Variable										
Fiscal Stress	- 0.0012** (-2.134)	-0.0005 (-1.522)	- 0.0017** (-2.305)	-0.0204 (-0.860)	-0.0621 (-1.065)	-0.0074*** (-2.623)	- 0.0131*** (-6.783)		- 0.018*** (-2.975)	- 0.0038*** (-9.048)
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 ²	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	

Notes: All regressions include time effects.

^a 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.

²⁵ 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.

To examine the robustness of our findings and to evaluate the degree to which censoring could bias our results, we present in Table 7 an analogous set of regressions 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 7: 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										
Fiscal Stress	- 0.0013** (-1.977)	-0.0005 (-1.577)	- 0.0016** (-2.137)	-0.0063 (-0.909)	-0.0052 (-1.106)	-0.0075** (-2.571)	-0.017*** (-7.062)		-0.022*** (-3.221)	- 0.0039*** (-8.938)
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 ² (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.										

These estimates reveal some consistent patterns in the ways that municipal officials in Michigan have responded to fiscal stress. In particular, we note that while 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.²⁶ These patterns are consistent with the idea that municipal officials cut spending in areas that can be delayed or put off (Public Works and Capital) or perceived to be non essential (Parks and Recreation).²⁷ 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. Anecdotally, one can list a number of municipalities that have either significantly reduced or completely eliminated spending on Parks and Recreation.²⁸ Thus, our finding that spending on parks and recreation is in decline is consistent with our general observations.

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 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.

²⁶ Economic Development also exhibits a relatively higher responsiveness to fiscal stress, but the coefficient is not statistically significant.

²⁷ In Michigan, County governments are charged by state government with the provision of health and welfare services.

²⁸ 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.

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 99th 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.
- U.S. Congressional Budget Office (CBO). 1978. City Need and the Responsiveness fo 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.

Appendix A

Description of the New Local Government Fiscal Data Web Portal

Beginning in 2007, the MSU Extension State and Local Government Program began discussions with the Michigan Department of Treasury to determine whether it was feasible to develop a web-based system of local government fiscal management. For years, local government officials have been required to complete an annual fiscal data form in an Excel spreadsheet and then submit it to the State of Michigan Department of Treasury (Treasury) by e-mail or post. Historically, the Treasury then compiled the documents and filed them, but did not otherwise fully use the detailed fiscal information. In response to the limited access of the valuable fiscal information, a partnership arose between the Michigan Municipal League, Michigan State University, University of Michigan, Wayne State University, and the Citizens Research Council of Michigan to input the data into a database on an annual basis. This system was labor intensive and did not fully utilize the available technology. Over the past two years, Professor Skidmore and Dr. Scorsone have met with the officials from Treasury and have implemented a plan to create a new web-based multi-year local government fiscal database. The Internet access point through which local officials will submit fiscal information is currently near completion. All data submitted through the new web-based system is automatically folded into the new local government database. Also, an Internet data access point has been developed so that the policymakers, practitioners, researchers, and the general public will have easy and open access to the publicly available information.

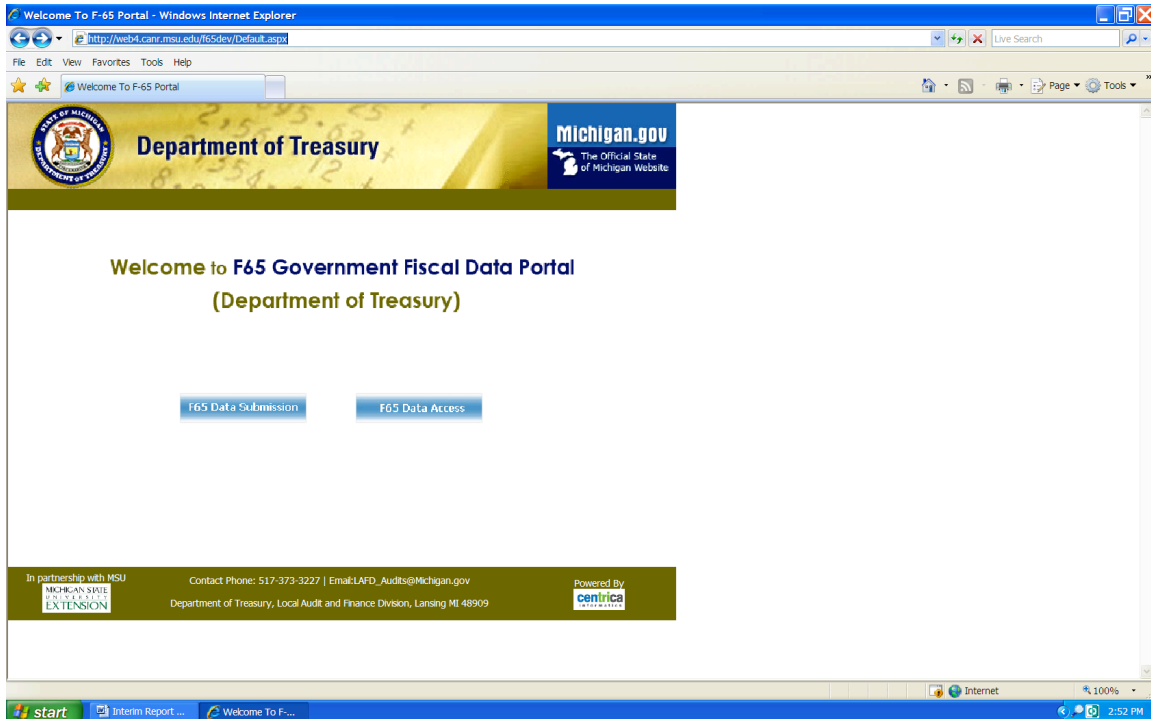
Database and Web Portal Features

Historically, the Treasury required all local government units to provide detailed fiscal information on an annual basis via an Excel spreadsheet called the “F-65 Form”. While not all local units submitted their financials to the Treasury, typically most comply with the law.²⁹ Every five years, the Treasury uses these data to provide the Federal Census of Governments with Michigan local government fiscal data. These same data are used in the interim years to supplement the census.

The objectives of the web portal project are threefold: 1) develop a web-based database, which would include data from 2005 to the present. Unfortunately, data prior to 2005 are incompatible data collected prior to 2005 because major changes in the form were implemented beginning in 2005; 2) develop a web-based data input system that would have the look and feel of the original “F-65” Excel spreadsheet; 3) develop a web-based data access system whereby any interested party could easily obtain local government fiscal information. As can be seen by examining the attached “F-65” Excel file, Treasury requests a substantial amount of fiscal information from each local unit. In all, there are more than 1,300 data fields in the database. This web application is built using ASP.NET technology which is accessible by Microsoft Internet Explorer 6.0 or a later version. MS SQL Server 2000 is used for data housing.

²⁹ The Treasury cannot force compliance, and its options for using incentives to encourage compliance are limited.

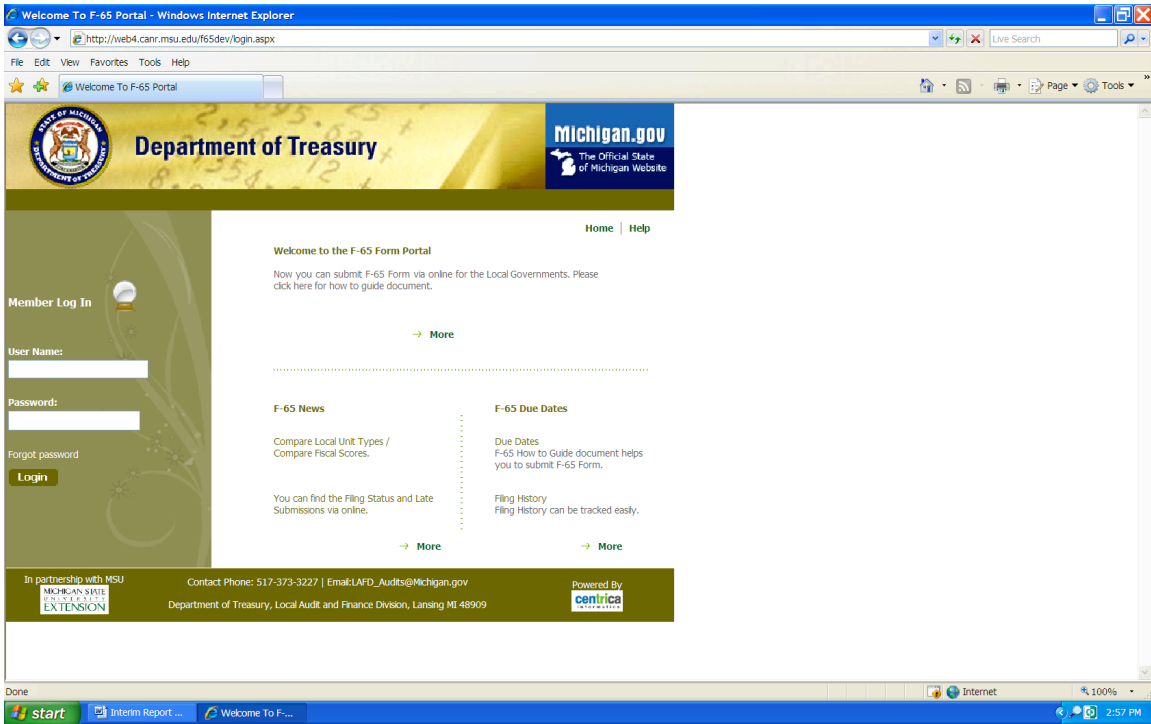
Clicking on the link <http://f65dev.mitreasury.msu.edu/> will take you to the development site welcome page of “Local Government Fiscal Data Portal.” There are a few remaining issues to resolve before the system is fully functional. The welcome page is presented below:



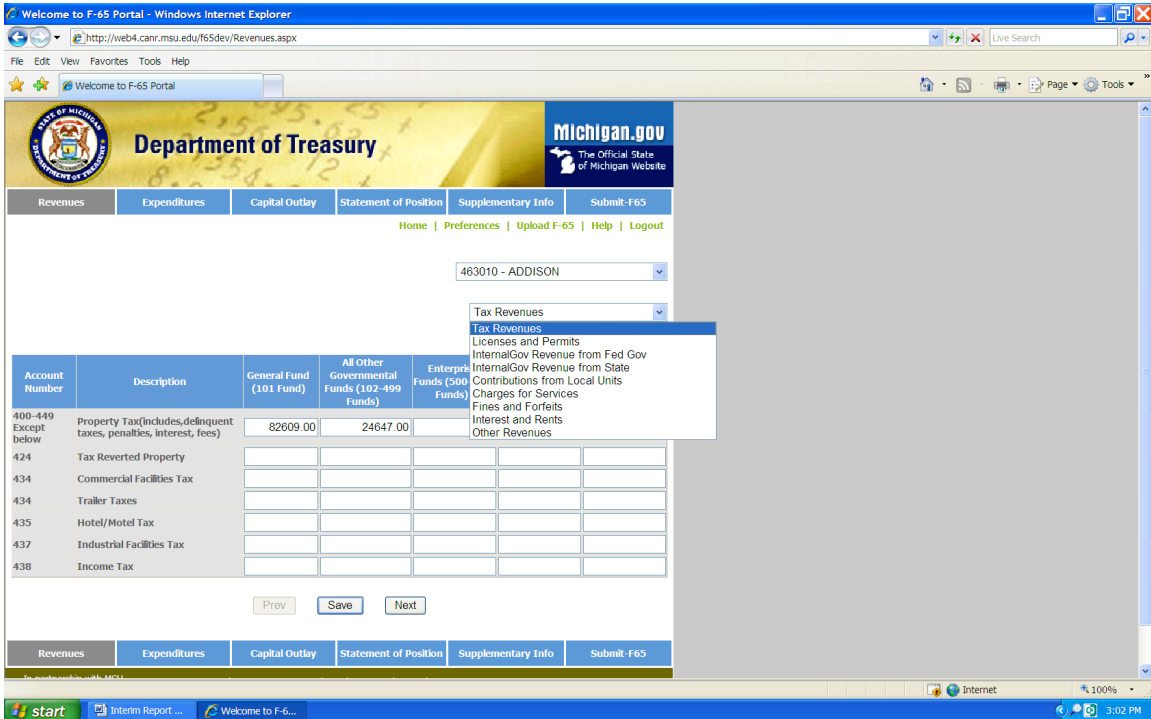
From the welcome page, one can either enter the site as a local government user through “F65 Data Submit”, or to obtain data through “F65 Data Access.” Below, we briefly describe the “F65 Data Submission” portal, and then turn attention to the “F65 Data Access” portal.

F65 Data Submission

Clicking on “F65 Data Submission” will take you to the log in page which requires a username and password. A secure system is required to prevent potential tampering. The log in page looks like this:



This page will be used by Treasury to provide important information such as fiscal year deadlines, news, technical assistance and educational materials, etc... Once the user logs in, he/she will come to an “Introductory Local Unit Information” page. The user has an opportunity to update contact information, etc... The user then enters the data input portal, beginning with revenues. This page looks like:



The data input categories are divided in to five general categories highlighted in blue across the top (and bottom) of the page: Revenues, Expenditures, Capital Outlay, Statement of Position, and Supplementary Information. Within each category are a series of subcategories. For example, under revenues there are nine subcategories: Tax Revenues, Licenses and Permits, Intergovernmental Revenue from Federal Government, Intergovernmental Revenue from State Government, Contributions from Local Units, Charges for Services, Fines and Forfeits, Interest and Rents, and Other Revenue, which correspond to the subcategories found in the original form. Expenditures and the other categories are formatted in a similar way. See below for a screen shot of Expenditures:

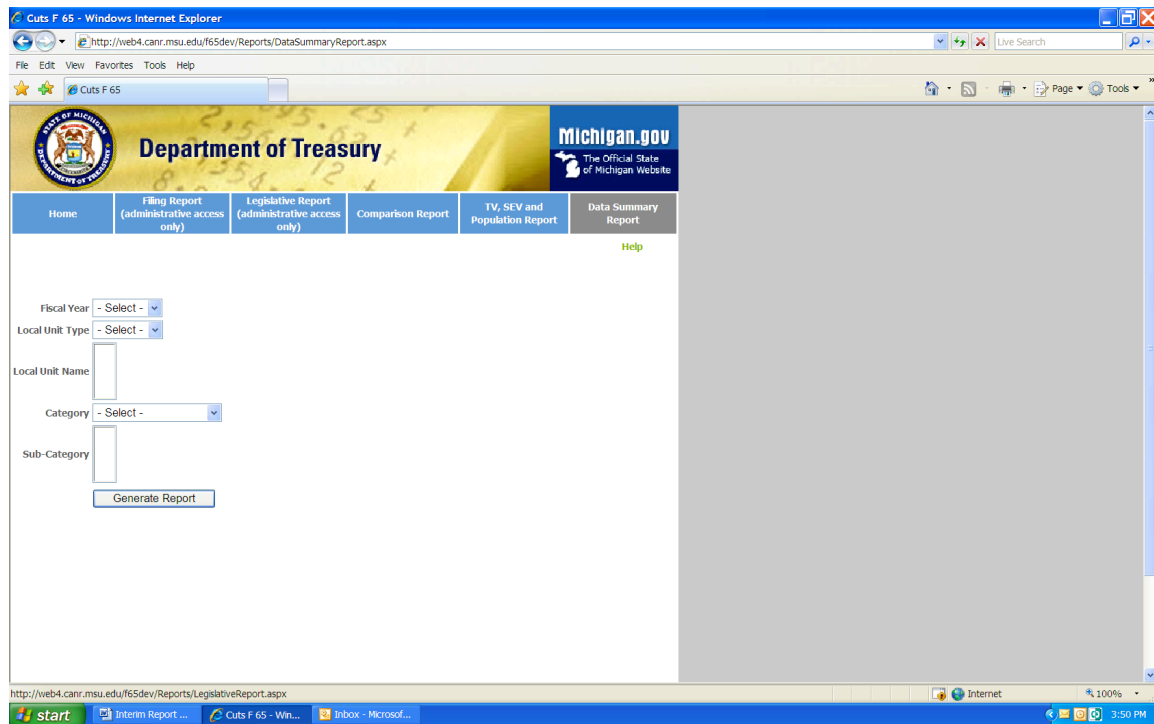
The screenshot shows the Michigan Department of Treasury's F-65 Portal. The 'Expenditures' category is selected and highlighted in blue. A dropdown menu is open for the activity '463010 - ADDISON', showing a list of subcategories including 'General Government', 'Public Safety', 'Public Works', 'Health and Welfare', 'Community/Economic Development', 'Recreation and Culture', and 'Other'. Below the dropdown is a table with the following columns: 'Activity Number', 'Description', 'General Fund (101 Fund)', 'All Other Governmental Funds (102-499 Funds)', and 'Enterprise Funds(500 Funds)'. The table contains data for various activities, including 'Legislative (Council, Board, Commission)', 'Judicial', 'Chief Executive', 'Treasurer', 'Assessing Equalization', 'Clerk', 'Elections', 'Finance & Tax Administration', and 'Building & Grounds'. The 'General Fund' column shows values such as 5682.00, 7944.00, 22136.00, and 15163.00. The 'Enterprise Funds' column shows values such as 5682.00, 7944.00, 22136.00, and 15163.00. The table also includes a 'Total' row for each activity.

The local unit representative can either input the information by systematically working his/her way through each data field, or in many cases local units employ accounting firms to prepare annual audit reports. These firms often times generate much of the data required for the F65 form from the audit report. Importantly, the firms have developed programs to upload data from the audit report into the old F65 Excel spreadsheet. Thus, to save time, we have also developed a loader program in which the local unit representative may upload data from the Excel spreadsheet into the web-based database using the feature “Upload F-65”, which is highlighted in green on the screen above. The Treasury is also currently using the uploading feature to upload already submitted data from fiscal years 2009. We now turn our attention to the Data Access Portal.

Data Access

One of the limitations of the old system of data collection is that, even though all fiscal data are technically in the public domain, the data were, for practical purposes, publicly

inaccessible. An important goal of this project is to make all this information easily accessible via the Internet. Returning to the Welcome (or Home) page, one can click on “F65 Data Access” to get to the following data access page:



Here you can see that we have selected “Data Summary Report”, which enables one to download in Excel format a full range of local government fiscal information. One has the capability of selecting data according to the fiscal year (2005-2009), the type of local unit (township, city, village, county), primary fiscal category (revenues, expenditures, capital outlay, statement of position), and once the primary category is selected, sub-categories can be selected. The functionality allows one to download a limited to full range of fiscal data.

In addition, the “TV, SEV, and Population” report enables one to download the taxable value, state equalized value and population data for each local jurisdiction in the state. These data are uploaded into the system by Treasury on an annual basis. Again, the user has the ability to download these data for a limited to full set of local units. Last, the “Comparison Report” allows one to download detailed fiscal information for two local units in order to compare the financial structure of any two local units in the state. Currently, this feature only reports nominal values of fiscal data, but in time a feature will be added to make comparison in per capita terms. The screen shot below illustrates the features of the “Comparison Report.”

The screenshot shows the Michigan Department of Treasury's web portal. The main navigation bar includes: Home, Filing Report (administrative access only), Legislative Report (administrative access only), Comparison Report, TV, SEV and Population Report, and Data Summary Report. The 'Comparison Report' section is active, displaying a form to generate a report. The form fields are: Fiscal Year (2006), Category (Revenues), Sub-Category (Tax Revenues), Local Government 1 (Bloomfield Hills - Oakland), and Local Government 2 (East Lansing - Ingham). Below the form, there are two tables of financial data.

Local Government Name: Bloomfield Hills - Oakland					
Account No	Description	Fiscal Year	General Funds	Component Units	Total
101	Property Tax (includes delinquent taxes, penalties, interest, fees)	2006	6839199.00		6839199.00
102	Tax Reverted Property	2006			0.00
103	Commercial Facilities Tax	2006			0.00
104	Trailer Taxes	2006			0.00
105	Hotel/Note Tax	2006			0.00
106	Industrial Facilities Tax	2006			0.00
107	Income Tax	2006			0.00

Local Government Name: East Lansing - Ingham					
Account No	Description	Fiscal Year	General Funds	Component Units	Total
101	Property Tax (includes delinquent taxes, penalties, interest, fees)	2006	14952530.00	945528.00	17158156.00
				1260098.00	

The two remaining reports (“Filing Report” and “Legislative Report”) are for administrative use only by Treasury. These reports are designed to generate information about the filing status and delinquency in filing F65 data for all local units. Our expectation is that over time we will develop a range of reporting features that will save the Treasury time in providing key fiscal indicators to legislators and other decision makers.

Another important feature is that all data, once submitted will become available in real time. This feature is very useful, particularly in periods of fiscal hardship, for understanding how circumstances are evolving in the state. Thus far, we have outlined the key features of the new database and web portal. Lincoln staff may enter the development web site at <http://f65dev.mitreasury.msu.edu/> and peruse the all the features.

**Appendix B
Definitions of Variables**

(Abbreviated variable name in parentheses)

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 Expenditures	Recreation and culture expenditures - total of all funds and accounts. Includes 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)	