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MEASURING MUNICIPAL FISCAL CONDITION: DO OBJECTIVE MEASURES OF FISCAL HEALTH RELATE TO SUBJECTIVE MEASURES?

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ABSTRACT. The intent of this research is determine the extent to which self-reported measures of fiscal condition are consistent with commonly identified measures of fiscal condition using secondary financial data. While the field of government finance has amassed a lengthy list of research on fiscal condition and fiscal stress assessment, there remains a gap in the research on the extent to which practitioners' perceptions of fiscal stress are consistent with such measures. Our results suggest that there is limited evidence of a relationship between self-reported and objective measures of fiscal condition.

INTRODUCTION

Today's fiscal environment is unlike that seen in recent history. The federal government has accumulated nearly $13 trillion in debt which is estimated to be nearly 60 percent of GDP (US Government Printing Office, 2009). The debt value for 2009 alone is projected to be $1.8 trillion. The federal debt also has long-term implications for state and local governments. According to the Government Accountability Office (2008, p. 5):

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> … absent policy changes, state and local governments will face an increasing gap between receipts and expenditures in the coming years. Since most state and local governments actually face requirements that their operating budgets be balanced… the declining fiscal conditions our simulations suggest are really just a foreshadowing of the extent to which these governments will need to make substantial changes to avoid these potential growing fiscal imbalances.

The GAO report states that both in terms of net borrowing and operating balances, state and local fiscal conditions will get *worse* over the next decade. Based on a recent National League of Cities survey, the 2008-09 fiscal year looks particularly challenging for cities (Hoene & Pagano, 2009). According to the League's study 88 percent of city financial officials report that their communities are …"less able to meet fiscal needs in 2009 than in the previous year…city sales tax revenues and income tax revenues are predicted to decline through 2009… (city finance officers) predict that revenues will decline (-0.4 percent) and, while spending will increase by 2.5 percent (in 2009)" (2009, p.1).

Making matters even more challenging for state and local governments are restrictions on their revenue -raising capacity. Dissatisfaction with taxation levels and perceived excessive government spending grew substantially over the latter half of the twentieth century. As a result, the number of tax and expenditure limitations (TELs) efforts such as California's Proposition 13, Massachusetts's Proposition 2½ and Colorado's Taxpayers' Bill of Rights (TABOR) has grown. By 2006, forty-six states had implemented state statutory or constitutional limits on local government tax revenue and expenditures, with thirty-one states placing limits on state taxes and/or expenditures (Deller & Stallmann, 2007; Mullins, 2004).

It thus appears that in various ways the environment in which many local governments find themselves today is just as alarming, if not worse, than where they found themselves in the 1970s. The fiscal crises faced by major metropolitan areas, most notably New York, in 1975 has been well documented and, in fact, led to a number of important publications on fiscal stress (Clark & Ferguson, 1983; Rose & Page, 1982; Rubin, 1982; Levin, 1980; Alcaly & Mermelstein, 1977). Just recently, Vallejo, CA (2008) declared

bankruptcy, and there is a good deal of discussion about the depth of the State of California's fiscal woes. Surprisingly, after nearly 30 years of research, we have yet to fully understand causes of fiscal stress in state or local governments. This stems, in part, from the lack of an accepted definition of fiscal stress (Honadle, Costa & Cigler, 2004; Hendrick, 2004; Boles, 1984). Further complicating matters is the lack of effort linking "objective" measurement of fiscal condition to perceptions of fiscal condition by those making policy decisions.

The intent of this applied research is to build on the extensive literature which offers measures of fiscal condition, or health, by linking self-reported levels of fiscal condition to measures of fiscal health based on secondary fiscal data. If "objective" fiscal measures actually approximate the "true" fiscal conditions of a local government, how close do self-reported perceptions of local fiscal conditions come to those "true" conditions? If perception and "reality" are closely tied then our faith in these fiscal data- based measures is reinforced. In addition, through a statistical screening process we can explore which "objective" measures are most closely tied to perceptions. In contrast, if the two are contradictory and perceptions do not match "reality", we are left with one of three possible conclusions. First, perceptions are closer to the true fiscal condition and our fiscal data based measures need further development. Second, there is a disconnect between what local officials believe their fiscal condition to be and what it really is. Third, local officials may misrepresent the status of their fiscal condition for political reasons. Officials may act strategically and report that fiscal conditions are worse than they really are to build political support for raising taxes, cutting services or lobbying for more state aids (Meltsner, 1971). The opposite may also be true, where officials paint a rosier picture than exists in an effort to look better.

While such a basic research question is intuitively appealing in its own right, it may also help expand on one of the more theoretically grounded studies of fiscal condition (Hendrick, 2004). Hendrick's analysis is based on the development of an open system model of fiscal condition that includes government systems and subsystems. According to Hendrick (2004, p. 81), "… departments or other working groups that participate in the government's financial management functions" need to be included as inputs in models of

financial condition. Unfortunately, due to measurement challenges, few studies capture this dimension when analyzing financial condition. Our work reported here will help address the extent to which the omission of this dimension matters in models of fiscal condition. If the survey results are consist with the "objective" measures then their omission is of less concern. On the other hand, finding that the survey results are unrelated to the objective measures suggests a greater need for capturing the effects of government subsystems in models of fiscal condition.

In the next section of this study we review the extensive literature on measures of fiscal health. A brief discussion of Wisconsin municipal government is provided as background for our analysis. We then present our survey findings followed by our empirical results. We close the study with a discussion of the implications of our findings and suggestions for future research efforts.

LITERATURE REVIEW

Stemming from the fiscal woes facing major cities in the 1970s, a number of important studies of local government fiscal condition were published. Clark and Ferguson (1983) presented one of the more comprehensive models of fiscal strain that captures relationships between political outcomes, the economic base, and fiscal policies (1983). Ladd and Yinger (1989) developed a "need-capacity gap" for the largest cities in the US that combines expenditure needs with revenue-raising capacity. Other important works during that era include Rubin's case study of a medium-sized Midwestern city (1982) and Levin and Rubin's (1980) edited work on cutback strategies. Aronson (1984), and Hondale, Costa and Cigler (2004) commendably summarized a number of such studies and identified the "objective" fiscal indicators cited in them.

As reported earlier, Hendrick (2004) designed an "open system" model for the study of fiscal health that captured three dimensions in local government: properties of the government's environment; balance of fiscal structure with environment; and properties of the government's fiscal structure. Studying communities in the Chicago area, Hendrick found support for her more extensive model of fiscal health and identified fiscal slack, measured in terms of fund balance, degree of discretionary spending, level of off-budget fiscal activities and size of the government to be particularly noteworthy and in need

of further study. Seeking to predict fiscal condition, Kloha, Weissert and Kleine (2005) developed a 10-point scale and applied it to communities in Michigan. Their scale includes population growth, real taxable value growth; large real taxable value decrease; general fund expenditures as a percentage of taxable value; general fund operating deficit; prior general fund operating deficits; size of general fund balance; fund deficits in the current or previous year and; general long-term debt as a percentage of taxable value.

The two most frequently used financial condition assessment reports by practitioners are the ICMA Financial Trend Monitoring System (FTMS) and Ken Brown's 10-Point Test (1989). The FTMS was developed by the International City Management Association to provide local governments help in assessing their own financial condition. As broadly defined here, financial condition is "a local government's ability to finance its services on a continuing basis." This system of financial ratio indicators was specifically designed for use by cities for management purposes (Groves, Godsey & Shulman, 1984; Groves & Valente, 1986). The FTMS is a system of twelve factors affecting local financial condition. Seven of the twelve factors can be measured by a series of thirty-six indicators. The remaining factors reflect external or non-quantifiable conditions. Local governments are encouraged by the handbook to select and develop those indicators that will be most important for their own purposes and analyses. The study developers believe that the most useful way of evaluating these indicators is through trend analysis.

The "Ten-Point Test of Financial Condition: Toward an Easy-to-Use Assessment Tool for Small Cities," developed by Brown (1989) and updated by Maher and Nollenberger (2009) is a set of indicators that can be easily calculated for cities and across the nation. Data are obtained from the Government Financial Officers Association (GFOA), thus providing a good cross-section of municipalities. The tool is designed to evaluate a local government's financial health in terms of resources available to fund its obligations. The ratios are used by comparing an individual city to other sized cities around the country. The strength of the tool is its simplicity; practitioners are guided through the calculations which can then be compared to comparably-sized places by quartile. The drawbacks of Brown's indices include sample bias, one time-point (1989) and lack of enterprise fund

measures. The latter two points have been addressed by Maher and Nollenberger (2009).

Despite the intent of the fiscal condition research, either implicit or explicit is the obvious assumption that government action is involved. Yet, to date, our ability to understand the extent to which measures of fiscal condition are actually being used by those making decisions in government is limited. When attempts have been made to directly measure government behavior, particularly in the area of fiscal condition, the research has been limited due to reliance on case studies or survey data (Levine, 1980; Levine, Rubin & Wolohojian, 1981; Downs & Rocke, 1984). For instance, Pammer (1990) conducted one of the few cross-sectional analyses of cities to study the degree to which 120 cities utilized a variety of retrenchment strategies in response to fiscal stress. Similarly, Ward (2001) surveyed local governments in Louisiana to gauge how they responded to fiscal stress. Unfortunately, in both cases there is little ability to generalize from the samples about the appropriate measures of fiscal condition to which the governments were responding. Maher and Deller (2007) attempted to accomplish this when they examined the relationship between measures of fiscal stress (revenues/expenses, tax rate and change in revenues/change in expenditures) and local government response strategies in Wisconsin. Their analysis found little relationship between the measures.

In summary, the literature provides an abundance of examples of measures concerning the fiscal condition and performance of local municipalities and counties. The reasons authors have offered for developing and using these measures vary, yet are premised on the expectation that indicators may be used by local, state and federal officials, municipal employees, resident voters, and creditors (Lowry & Alt, 2001; Aronson 1984; Honadle etal., 2004). When it comes to government officials, however, what indicators are useful and how they are used remains an empirical question. The latter point is particularly intriguing because previous research has found that elected local officials and mangers manipulate revenue estimates during times of fiscal stress in order to maximize fiscal slack and provide support for tax increases (Meltsner, 1971; Chapman, 1982). What has yet to be determined are those cues used by local officials to determine fiscal stress.

CITY AND VILLAGE GOVERNMENTS IN WISCONSIN

In Wisconsin, city and village governments are primarily responsible for providing urban services such as public safety, roads and transportation, sanitation, and human enrichment as well as managing development and land use for the city. The distribution of expenditures shown in Table 1 acts as a proxy for the relative level of services provided in Wisconsin by cities and villages. The largest single category of expenditures is protective services (police and fire) accounting for $314 dollars per person in cities and $241 per person in villages. Transportation services, in particular road maintenance, account for another $281 per person in cities and $242 per person in villages. Debt service payments were comparable to expenditures for both protective services and transportation ($247 per capita for cities and $242 per capita for villages). Cultural services, such as parks, conservation and development efforts represent 20 percent of city expenses and 18 percent of village spending.

The level and mix of public goods and services that local governments can provide in response to demand is constrained in part by available revenues, or fiscal capacity, to meet those demands. At the municipal level in Wisconsin, general state non-targeted aids and property taxes are the primary sources of revenue, as shown in Table 1. Together they accounted for over 60% of total revenue in 2007. In Wisconsin, aids take two forms, general targeted aids, such as road maintenance aids, and general non-targeted aid in the form of state-shared revenues. The latter aid follows the model of the old federal "General Revenue Sharing" program of the 1970s and 1980s. In essence a direct transfer from the state to local government is made with "no strings attached." Wisconsin's state revenue program is one of the most generous aid programs in the US and accounts for over $200 per person in Wisconsin cities and $186 per capita in villages. While the Wisconsin state shared revenue program is distributed based on individual municipal population, spending, and property values, it has the potential to be strategically manipulated. Because the amount of aid distributed is fixed, however, the aid directed to an individual community also depends on population, spending, and property values of other municipalities. Thus nearly all city governments treat this significant source of revenue as something beyond their control. This historically has left the property tax as the

TABLE 1
Comparison of Mean Per Capita Expenditures and Revenues in Wisconsin Cities and Villages in Fiscal Year 2007

Budget Component	Cities	Villages
Expenditures		
Transportation	$275.67	$261.19
Debt Service	$243.15	$179.73
Law Enforcement	$216.54	$106.53
General Government	$153.45	$164.76
Conservation and Development	$118.12	$81.73
Fire Prevention	$106.29	$107.61
Parks and Recreation	$75.38	$80.29
Culture and Education	$69.18	$35.24
Solid Waste	$43.72	$44.04
Ambulance	$20.76	$14.68
Revenues		
Property Taxes	$407.71	$324.42
Shared State Revenues	$212.87	$193.66
Highway Aid	$65.92	$54.99
Public Charges	$70.82	$57.41
In Lieu of Tax Payments	$33.35	$21.17
Federal Aid	$22.27	$9.48
Interest Income	$48.96	$34.25
Licenses and Permits	$21.65	$17.69
Special Assessments	$12.51	$10.37
Fines, Forfeitures & Penalties	$13.17	$9.36

Source: Wisconsin Department of Revenue.

primary revenue producer under the control of city policy makers. However, user fees have emerged recently as an important tool for generating revenue. User fees are a politically popular way of maintaining non-essential public services through requiring the users of those services to pay for them. For Wisconsin cities, user fees and charges accounted for about $84 per person; for villages, fees and charges amounted to $71 per person in 2007. While for many services user fees and charges are attractive, Wisconsin law limits the level of revenue generation to the recoupment of capital costs under specific criteria. In other words, fees and charges cannot be set by what the market will bear nor act as a potential excess revenue generator.

Many Wisconsin communities also receive payments in lieu of taxes and special assessments. Payments in lieu of taxes are provided by property-tax exempt entities for receipt of municipal services. For Wisconsin in 2007, per capita revenue from this source amounted to $31 in cities and $28 for villages. Special assessments are typically charged for capital projects to individual property owners. Payments for special assessments to cities and villages were $18 and $25 per person, respectively.

Municipal Fiscal Health Survey

By 2007, Wisconsin municipalities had been under two years of property tax levy growth limitations (a form of TEL). Beginning in 2004 and again, in 2007, we administered a web-based survey of local finance officials to document viewpoints about current fiscal health and examine coping strategies being adopted. A total of 147 city and village officials responded in 2004 and 187 responded in 2007 for a total of 334 cases.

In both years respondents were asked to rate financial condition and prospects, as shown in Table 2. To specifically gauge the fiscal

TABLE 2
Fiscal Conditions in Wisconsin Cities and Villages, 2004 and 2007

Fiscal Health Survey Questions & Response Choices	2004		2007	
	Freq.	%	Freq.	%.
Please rate the current financial condition of your city/village				
Adequate revenues and able to reduce taxes.	7	4.5%	13	6.5%
Adequate revenues but not able to expand services	65	41.9%	89	44.7%
Inadequate revenues but not reducing services	46	29.7%	62	31.2%
Inadequate revenues and reducing services	37	23.9%	35	17.6%
What are the financial prospects for your city/village for the next five years?				
Adequate revenues and able to reduce taxes.	6	3.8%	11	5.5%
Adequate revenues but not able to expand services	59	37.6%	60	30.2%
Inadequate revenues but not reducing services	36	22.9%	54	27.1%
Inadequate revenues and reducing services	56	35.7%	74	37.2%

Source: University of Wisconsin Fiscal Health Surveys, 2004 and 2007

health of Wisconsin municipalities, in both years respondents also were presented with eight statements and asked to indicate their reaction to each using a scale from strongly agree to strongly disagree, as shown in Table 3. The 2007 results suggest several areas of concern. For instance, less than half (45 percent) agreed that their fiscal situation was acceptable and only 28 percent of the communities reported an acceptable credit rating. In addition, only 35 percent were able to maintain their current employee benefit package. These results are discussed in the next section.

METHODS

Wisconsin is one of a handful of states that systematically collects and reports audited financial reports for all municipalities. This data has been collected for several years and has been available electronically annually since 1987. Data are reported in four broad categories: (1) expenditures; (2) revenues; (3) assessed values for property taxation; and (4) property tax levies by jurisdiction.

TABLE 3
Measures of Fiscal Conditions in Wisconsin Cities and Villages in 2004 and 2007

Statements Regarding Fiscal Conditions Measures:	Percent Selecting Response by Year									
	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
	2004	2007	2004	2007	2004	2007	2004	2007	2004	2007
Our current fiscal situation is acceptable.	8.4	5.0	36.1	39.7	21.3	19.6	23.9	29.1	8.4	6.5
We are able to maintain three months of operating expenditures with current cash reserves.	3.2	19.1	49	56.3	7.7	11.1	9.7	9.5	30.3	4.0
Our current capital improvement plan is fully financed.	17.1	24.2	20.4	48.5	19.1	22.2	33.5	4.5	9.9	0.5

TABLE 3 (Continued)

Statements Regarding Fiscal Conditions Measures:	Percent Selecting Response by Year									
	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
	2004	2007	2004	2007	2004	2007	2004	2007	2004	2007
Our current credit rating is acceptable.	0.0	5.5	47.7	22.5	14.8	13.5	5.8	39.5	31.6	19.0
We are near our debt level capacity.	25.5	7.1	15.3	15.8	10.8	12.8	40.1	38.3	8.3	26.0
We have been able to roll over cash reserves from the previous budget cycle.	3.9	9.5	49.7	42.5	14.8	20	14.8	23	16.8	5.0
We are faced with unfunded pension responsibilities.	24.5	5.6	20.6	16.7	12.3	13.1	29.7	38.9	12.9	25.8
We are able to maintain our current employee benefits package.	7.7	17.0	30.3	16.5	24.5	24.5	29	22	8.4	20.0

Source: University of Wisconsin Fiscal Health Surveys, 2004 and 2007.

Expenditure data are provided for seventeen general operations and capital categories, such as law enforcement and parks and recreation, and a handful of debt categories. Revenues are reported for eighteen separate categories including own source funding, intergovernmental revenues and various miscellaneous funding sources. This allows for the construction of a wide range of fiscal health indicators, but not all that have been suggested in the literature. For example, we have no data on cash reserves.

Given the survey data, detailed fiscal data and census and other data on socioeconomic characteristics we are able to explore several questions. First, are fiscal indicators from secondary data closely related to self-reported levels of fiscal health? If yes, which indicators are most closely tied to perceptions? In addition, to what extent do

socioeconomic characteristics of the community influence perceived levels of fiscal health? For example, are larger or poorer municipalities more likely to experience higher levels of stress?

For this analysis we pooled the 2004 and 2007 survey data for a sample of 320 Wisconsin cities and villages, from a total of 592 cities and villages.[1] Table 4 shows the survey questions used and response coding. We then developed models that attempt to predict or explain the responses to the ten questions from the survey that are specific to fiscal health (see Tables 1 and 2).[2] The model can be expressed as follows:

$$RS = \sum_{i=1}^{n} \beta_i FI_i + \sum_{i=1}^{m} \alpha_i SE_i + \varepsilon$$

Where *RS* is the response in the individual survey question related to fiscal health, FI_i are *n* fiscal indicators and SE_i are *m* socioeconomic variables. The fiscal indicators (*FI*) include the following:

- Total Revenues Per Capita
- Ratio of Total Intergovernmental Aid to Total Revenue
- Ratio of Total Taxes to Total Revenue
- Ratio of Deficit to Total Revenue
- Ratio of Debt to Total Equalized Assessed Value

While this list is not exhaustive of the potential fiscal indicators that are available given the Wisconsin data, these specific indicators most closely match the predominate measures in the literature.[3] The socioeconomic measures include the following:

- City Identified,
- Year Identifier 2004,
- Median Household Income,
- Poverty Rate,
- Number of Households, and
- Median Rent.

The city identifier is a simple dummy variable separating cities from villages. The year identifier is also a simple dummy variable separating the two survey years. Median household income and the poverty rate are aimed at capturing the ability of local governments to not just raise revenues but also the demand for services that local

governments face. The number of households captures the scale of the municipality and median rent reflects not only local cost of living but also the ability to generate property tax revenues. We expect larger and poorer municipalities to experience higher levels of fiscal stress.

TABLE 4
Survey Questions, Statements for Reaction, and Coding

Item Number	Questions or Statements	Response Choices and Coding
Q1	Please rate the current financial condition of your city/village.	Adequate revenues and able to reduce taxes (4), Adequate revenues but not able to expand services (3), Inadequate revenues but not reducing services (2), Inadequate revenues and reducing services (1)
Q2	What are the financial prospects for your city/village for the next five years?	
Q3a	Our current financial situation is acceptable	Strongly Agree (5), Agree (4), Neutral (3), Disagree (2), Strongly Disagree (1)
Q3b	We are able to maintain 3 months of operating expenditures with current cash reserves	
Q3c	Our current capital improvements plan is fully financed	
Q3d	Our current credit rating is acceptable	
Q3e	We are near our debt capacity level	
Q3f	We have been able to rollover cash reserves from the previous budget cycle	
Q3g	We are faced with unfunded pension responsibilities	
Q3h	We are able to maintain our current employee benefits package	

Because the survey responses are categorical (i.e., a Likert-scale response) the use of traditional classical regression analysis is problematic, for example, producing heteroskedasticity and predicted probabilities outside the unit interval, among other issues. In addition there is a natural ordering to the responses that provides a richness which is lost when using traditional regression analysis. As a result we used an ordered probit estimator.

The observed and coded response to the fiscal condition variable SR_n is determined from the model as follows:

$$SR_n = \begin{cases} 1 if\ -\infty \le RS_n^* \le \mu_1 (stronglydisagree) \\ 2 if\ \mu_1 < RS_n^* \le \mu_2 (disagree) \\ 3 if\ \mu_2 < RS_n^* \le \mu_3 (neutral) \\ 4 if\ \mu_3 < RS_n^* \le \mu_4 (agree) \\ 5 if\ \mu_4 < RS_n^* \le \mu_5 (stronglyagree) \end{cases}$$

Where m_i represents a threshold to be estimated along with the two sets of parameter vectors (b and a). The probabilities associated with the coded survey response of an ordered problem model for the i^{th} response are as follows:

$$P_n(i) = \Pr(\mu_i < SR_n^* \le \mu_{i+1}) = \Phi(\mu_{i+1} - \sum_{i=1}^{n} \beta_i FI_i - \sum_{i=1}^{m} \alpha_i SE_i) - \Phi(\mu_i - \sum_{i=1}^{n} \beta_i FI_i - \sum_{i=1}^{m} \alpha_i SE_i)$$

Where:
n is an individual municipality,
k is a response alternative,
P(*Tn*=*k*) is the probability that municipality *n* responds in manner *k,* and
$\Phi(\bullet)$ is the standard normal cumulative distribution function.

Given the increasing nature of the ordered classes, the interpretation of this model's primary parameter set (β,α) as follows: positive signs indicate higher values of *FI* and *SE* are associated with higher levels of stated fiscal health (lower levels of fiscal stress), while negative signs suggest the converse. Given the wording of the questions, this is true for survey questions codes Q1, Q2, Q3a

through Q3e and Q3g, but reversed for Q3f and Q3h. For the latter two, higher response values are associated with poorer fiscal health.

In addition to modeling the responses to each individual question we also constructed an overall index of fiscal health (Health), which is based on linearly combining questions Q3a through Q3h. Questions Q3a through Q3d and Q3h were added together and Q3e and Q3g were subtracted with higher values of the index representing better fiscal health and lower values indicating higher levels of fiscal stress. The average value of the stress index is 13.5 and ranges from a low (low levels of fiscal health) of -3 to a high (high levels of fiscal health) of 28 and a standard deviation of 4.9.

RESULTS

The results of the ordered probit analysis are presented in Table 5. Consider first the results for the individual survey questions. The first impression when scanning the results is the surprisingly large number of statistically insignificant variables, both fiscal indicators (*FI*) as well as socioeconomic (*SE*) variables. Indeed, none of the socioeconomic variables are statistically significant suggesting that these characteristics do not appear to play a role in influencing self-reported levels of fiscal health. Only the two simple dummy variables identifying cities (as opposed to villages) and the year of the survey appear to help explain self-reported fiscal health. Cites tend to report slightly better levels of fiscal health and, inconsistent with the descriptive analysis presented earlier, it appears that fiscal health is higher in 2004 relative to 2007. This latter result suggests that simply comparing mean responses may mask more complex patterns. The fiscal indicators (*FI*) provide some explanatory power in the survey responses. Total revenue per capita is statistically insignificant for all ten individual survey question models as is the ratio of total taxes to total revenue and ratio of the computed deficit to total revenues. The ratio of total intergovernmental aid to total revenues is significant in three of the ten models, but the results are not necessarily consistent. For example, the higher the ratio of aids to revenues, the lower the level of fiscal health in two of the three significant models Q3f (we have been able to roll over cash reserves from the previous budget cycle) and Q1 (what is the current financial condition of your city/village) but the opposite results for Q3c (our current capital improvement plan is fully financed). The ratio of debt

to total equalized assessed value is statistically significant in two of the ten models. The higher the ratio, which would generally be associated with lower levels of fiscal health (conversely higher levels of fiscal stress), the more likely respondents to Q1 were to express higher levels of fiscal health. This is opposite to what we would expect. The second statistically significant result is associated with Q3d (our current credit rating is acceptable) with again the opposite results from what we would expect.

Now turn to the ordered probit results of the constructed index (Health) also reported in Table 5. Here the results are a bit more encouraging with five of the eleven explanatory variables statistically significant. The city and year identifiers are not statistically significant but municipalities with higher income levels and lower poverty rates have higher levels of fiscal health (conversely, lower levels of fiscal stress.) Municipal scale, measured by number of households, does not appear to help explain the overall health index but higher median rents are associated with lower levels of fiscal health. This latter result may hint at the cost of providing services within the municipality.

The fiscal indicators (*FI*) also provide results that are more consistent with expectations. The higher the total revenues per capita, the higher the level of fiscal health while a higher dependence on intergovernmental aid does not appear to influence fiscal health. The ratio of the municipal government deficit to total revenue is not statistically significant nor is the ratio or debt to total equalized assessed value.

Because the ordered probit results for the constructed health index, just discussed, provide somewhat stronger results than the results for the individual survey questions, it is worth exploring this constructed index in more detail. Because the index more closely approaches a continuous variable, we elect to use traditional regression analysis. These results are presented in Table 6. We estimate the full model (Model A) and then different specifications that vary by the inclusion of one of the fiscal indicators (Models B through G). Unfortunately, these models do not perform well;the amount of the index explained by each model (i.e., R^2) ranges from 14.38 to 13.16 percent and the equation F statistics are all low

TABLE 5
Analysis of Demographics and Objective and Subjective Measures of Fiscal Stress

Ordered Logit Analysis	Survey Questions										Health/Stress Measures	
	Q1	Q2	Q3A	Q3B	Q3C	Q3D	Q3E	Q3F	Q3G	Q3H	Health	Stress (OLS)
City Identifier	0.653	0.644	0.159	-0.042	-0.077	-0.167	0.175	-0.261	0.857	0.282	0.013	0.345
	(0.005)	(0.006)	(0.480)	(0.863)	(0.734)	(0.499)	(0.444)	(0.267)	(0.000)	(0.218)	(0.953)	(0.561)
Year Identifier 2004	0.053	-0.054	0.320	0.374	1.370	1.326	0.739	-0.201	0.390	-0.139	0.127	-3.557
	(0.807)	(0.799)	(0.133)	(0.095)	(0.000)	(0.000)	(0.001)	(0.355)	(0.068)	(0.504)	(0.538)	(0.000)
Median Household Income	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.700)	(0.831)	(0.304)	(0.765)	(0.854)	(0.955)	(0.339)	(0.334)	(0.404)	(0.988)	(0.029)	(0.730)
Poverty Rate	-4.490	-0.836	1.611	4.098	0.326	-2.269	-0.300	-3.232	2.368	-1.870	-8.408	4.820
	(0.195)	(0.785)	(0.604)	(0.240)	(0.920)	(0.474)	(0.923)	(0.316)	(0.441)	(0.576)	(0.008)	(0.563)
Number of Households	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.222)	(0.532)	(0.920)	(0.808)	(0.560)	(0.252)	(0.721)	(0.763)	(0.688)	(0.365)	(0.906)	(0.834)
Median Rent	0.001	0.000	0.000	-0.002	-0.002	0.000	-0.001	0.001	-0.001	0.002	-0.003	0.005
	(0.381)	(0.960)	(0.947)	(0.281)	(0.190)	(0.999)	(0.491)	(0.455)	(0.599)	(0.178)	(0.100)	(0.176)
Total PC Revenues	0.000	0.000	0.000	0.000	0.000	-0.001	0.000	0.000	0.000	0.000	0.001	0.000
	(0.734)	(0.158)	(0.251)	(0.419)	(0.111)	(0.147)	(0.361)	(0.566)	(0.294)	(0.980)	(0.015)	(0.791)
Ratio of Total IG Aid to Total Revenue	2.913	2.098	0.101	-1.763	-2.309	0.480	-0.436	4.083	-0.967	0.167	-0.477	-4.729
	(0.035)	(0.107)	(0.938)	(0.210)	(0.086)	(0.720)	(0.739)	(0.004)	(0.461)	(0.898)	(0.708)	(0.172)
Ratio of Total Taxes to Total Revenue	-0.139	-0.874	-0.667	-1.471	-0.031	0.729	0.603	3.290	0.929	-0.704	-2.441	-5.502
	(0.919)	(0.502)	(0.607)	(0.306)	(0.982)	(0.593)	(0.633)	(0.018)	(0.495)	(0.583)	(0.060)	(0.110)
Ratio of Deficit to Total Revenue	0.238	-0.040	-0.078	-0.212	0.057	0.113	-0.486	0.286	-0.015	-0.095	0.045	1.057
	(0.494)	(0.905)	(0.811)	(0.551)	(0.855)	(0.743)	(0.143)	(0.434)	(0.963)	(0.770)	(0.897)	(0.228)
Ratio of Debt to Total Equalized Value	67.089	33.734	18.797	-8.570	1.742	71.986	-28.385	37.749	-49.629	-22.817	41.252	5.624
	(0.086)	(0.364)	(0.604)	(0.822)	(0.962)	(0.054)	(0.391)	(0.292)	(0.152)	(0.506)	(0.284)	(0.952)

Note: Pr > ChiSq in Parentheses.

Table 6
Least Squares Regression Analysis of Municipal Fiscal Stress Index

MODELS	Intercept	City Identifier	Year Identifier 2004	Median Household Income	Poverty Rate	Number of Households	Median Rent	Total Revenue Per Capita	Ratio of Total IG Aid to Total Revenue	Ratio of Total Taxes to Total Revenue	Ratio of Deficit to Total Revenue	Ratio of Debt to Total Equalized Assessed Value	F Ratio	R Squared
A	17.5480	0.3446	-3.5566	-0.00001	4.8200	0.000003	0.0053	-0.0002	-4.7289	-5.5025	1.0568	5.6237	4.70	0.144
	(0.0001)	(0.5611)	(0.0001)	(0.7298)	(0.5626)	(0.8343)	(0.1763)	(0.7912)	(0.1716)	(0.1099)	(0.2277)	(0.9520)		
B	13.5372	0.2087	-3.6004	-0.00001	4.0517	0.000005	0.0043						7.91	0.132
	(0.0001)	(0.7101)	(0.0001)	(0.7032)	(0.5993)	(0.7288)	(0.2276)							
C	13.6355	0.2716	-3.6144	-0.00001	4.6227	0.000005	0.0044	-0.0003					6.78	0.132
	(0.0001)	(0.6415)	(0.0001)	(0.7621)	(0.5560)	(0.7361)	(0.2181)	(0.6863)						
D	13.7538	0.1910	-3.5886	-0.00001	4.4072	0.000005	0.0041		-0.3972				6.76	0.132
	(0.0001)	(0.7382)	(0.0001)	(0.6904)	(0.5813)	(0.7265)	(0.2870)		(0.8622)					
E	14.0368	0.3248	-3.6238	-0.00001	2.5250	0.000004	0.0056			-2.0665			6.89	0.134
	(0.0001)	(0.5730)	(0.0001)	(0.7574)	(0.7491)	(0.7741)	(0.1464)			(0.3674)				
F	13.5770	0.2077	-3.6187	-0.00001	4.2726	0.000005	0.0046				0.9483		7.02	0.136
	(0.0001)	(0.7111)	(0.0001)	(0.7271)	(0.5793)	(0.7401)	(0.1996)				(0.2032)			
G	13.6628	0.2705	-3.5701	-0.00001	4.5461	0.000005	0.0043					-56.8899	6.84	0.133
	(0.0001)	(0.6341)	(0.0001)	(0.7131)	(0.5573)	(0.7304)	(0.2363)					(0.4668)		

Notes: Dependent variable = Municipal Fiscal Stress Index; Regression coefficients (Pr> t-value).

(ranging from 4.70 to 6.78). Based on individual marginal significance levels for each variable, only the survey year identifier is statistically significant and strongly suggests that fiscal health was significantly lower in 2004 compared to 2007. No socioeconomic (*SE*) variable is statistically significant in any of the models.

The fiscal indicators (*FI*) reveal that unlike the ordered probit results (Table 5) our set of indicators do not perform well in the least squares estimated models. Indeed, a joint F test comparing the restricted model which contains only the city and year identifiers and socioeconomic variables to the full model which also includes the fiscal indicators suggests that as a block the fiscal indicators do not contribute to explaining the fiscal health index based on the surveys (F=0.8826 with a marginal significance of 0.4934). Introducing one fiscal indicator at a time, to minimize any multicollinearity influences, does not alter the general result that our fiscal indicators are not associated with the self-reported levels of fiscal health.

Returning to our based research question, which asks whether "objective" measures of fiscal health based on financial data relate to subjective measures based on surveys or interviews, our response would be a resounding no. Unfortunately, our research design does not allow us to answer the natural question: why are the two sets of fiscal health indicators not related? We offer three possible explanations. First, the "objective" measures of fiscal health fall short. Second, local officials do not fully understand the extent of their government's fiscal health. Third, respondents act strategically when filling out the survey in an attempt to influence policy discussions. We feel confident that we have adequately addressed the measurement issue, but suggest future research capture data not available for this analysis, including fund balance and unfunded liabilities.

This raises a fundamental concern: if local officials' perceptions do not match "objective" measures, then attempts to better understand policy responses to fiscal stress become extremely difficult. Studies that attempt to link measures of fiscal condition to subsequent fiscal decisions using secondary data are bound to fall short. What our results suggest is that there is sufficient "white noise" in our concepts and measures of fiscal conditions that any policy recommendations from the subsequent research are suspect.

DISCUSSION

This study explores the relationship between self-reported levels of municipal fiscal condition and commonly identified measures of fiscal condition using surveys, secondary data -based indicators of fiscal condition, and actual revenue and expenditure data. Our ultimate goal is to identify which fiscal indicators from a wide range are most closely tied to self-reported fiscal health. If we treat the self-reported levels as important perceptual cues of municipal fiscal condition, then we can systematically shift through the range of fiscal indicators offered in the literature. By identifying which fiscal indicators are most closely tied to the perceived levels of fiscal condition, we can refine our thinking about fiscal indicators.

Using survey and secondary data from a sample of Wisconsin cities and villages, we find very limited statistical associations between self-reported (i.e., survey) indicators of fiscal conditions, what we refer to as "perceptions" and fiscal indicators based on secondary data, and what we call "objective" measures. In other words, based on these results we cannot conclude that any one subset of "objective" fiscal condition indicators is better than any other subset. Indeed, none of our "objective" indicators is consistently tied to self-reported measures of fiscal condition.

This could be explained by at least three possible hypotheses. First, the "objective" fiscal indicators offered in the literature are a poor proxy for fiscal health. Second, local officials do not fully understand the extent of their fiscal condition and survey- based data is suspect. Third, local officials are acting strategically in how they respond to surveys. Specially, local officials may over-state or even under-state the level of fiscal stress that they are under in order to influence policy discussions and decisions at either (or both) the local and state level. During the survey periods there was serious debate over the level of state aid to local governments with serious proposals to significantly reduce it as well as debates over and the subsequent implementation of property tax limits. Determining the most appropriate of the three hypotheses as an explanation of the findings requires further exploration.

It is also important to note that the range of secondary data to build our "objective" measures of fiscal conditions is rather limited. Our secondary data is limited to revenue and expenditure flows, and we do not have data on many variables that help measure fiscal

condition such as cash on reserve. Future work linking "objective" and "subjective" (i.e., survey) measures of fiscal conditions should expand the set of "objective" measures – most importantly, fiscal slack.

The findings raise some fundamental questions about the measurement of fiscal condition and the interpretation of decision-making processes relating to fiscal condition. Much of the scholarship on this subject since the late 1970s was premised on defining "objective" measures of fiscal stress using secondary data and identifying appropriate response strategies without confirmation of strategy execution by actual policy implementers. Where this has been tried (this study and Maher & Deller, 2007) the results were discouraging to say the least. It may be the case that for this subfield to truly evolve an agreement needs to be reached on the conceptual definition of fiscal stress, which needs to consider both objective and subjective measurement. From a practical standpoint, the current fiscal crisis is forcing local governments to make some very difficult decisions, apparently with very little help from academic research. For this research to have practical significance, it must have utility for intended users. This may require further qualitative research, to learn how fiscal decisions are being made by local officials.

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NOTES

1. Missing values reduced the sample size slightly from the descriptive analysis. Some towns and counties were not included because the constitutional and statutory responsibilities were fundamentally different from cities and villages. There were also a number of municipalities that responded to both surveys and for this work they were treated as independent observations.

2. The survey questions have external validity based on their consistent use over the past decade. In addition, the questions are generally consistent with those asked by Hoene and Pagano (2009).

3. In fact, in a recent report Miller and Svara (2009) rank city fiscal vulnerability on the bases of intergovernmental transfers from states and state budget gaps.

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