Fiscal Crises in U.S. Cities: Structural and Non-structural Causes

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Bonn, January 30, 2004

Fourth version.[1]

Word count: approximately 8200

Abstract

Financial difficulties of U.S. cities have recently become a major issue of concern. However, there is little agreement on why certain cities experience crises while others do not. Two arguments are put forward: Cities suffer from (1) structural problems like high immigration, congestion etc. (2) non-structural political problems like the weakness of the mayor, union-power etc. We present a common pool resource framework of municipal goods and derive estimation equations. It is shown that spending and debt levels increase in the degree of the common pool problem. The common pool problem is operationalized by socio-demographic variables, which capture structural problems. The estimation is based on 900 U.S. cities in 1985, 1991 and 1999. Structural factors explain most of the variation of spending and debt levels. Furthermore, coefficients are stable over time. However, excessively high debt burdens, which are taken as indicators of potential crisis, and high spending levels are regression outliers and not explained by structural factors. We conclude that fiscal crises are not predicted by socio-demographic, structural factors.

JEL: H74, H72, E62, P1, R0

Keywords: fiscal crisis, U.S. cities, local public finance, common pool resource problem, cluster analysis

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[1]Part of the research for this paper was done during a stay at the University of Pittsburgh. Financial support by the DAAD (German Academic Exchange Service) is gratefully acknowledged. I would like to thank Alberta Sbragia, Jürgen von Hagen, Mark Hallerberg, Ronald Moomaw, Kerstin Bernoth, Matthias Paustian, Bert Rockman, Rolf Strauch, Jennifer Wu and seminar participants at Ohio State University, Bonn Graduate School of Economics and ZEI for many helpful discussions. Remaining errors are mine.

1 Introduction

Recently, fiscal distress and crises have become issues of considerable concern for U.S. States and cities. Mayors ask for State aid to compensate for revenue short falls (The Economist May 22nd, 2003) and (Herbert January 16, 2003). Some argue that New York City now faces the worst fiscal crisis since the mid-1970 (Cooper May 7, 2003). In Oregon, school districts are thinking of shortening the school year to avoid large deficits. Even States are affected by the fiscal distress and lay off employees. While media coverage of fiscal distress and crises is substantial, systematic evidence on determinants of crises and, at an earlier stage, distress is quite scarce.

Views on what constitutes a fiscal crisis are diverging in the literature.[2] Inman (1995) defines a fiscal crisis as a situation when a city's potential to raise revenues is insufficient to cover the city's legally required expenditures. Case studies have shown that a fiscal crisis is usually characterized by the refusal of lenders to give any additional credit. In the case of Philadelphia, for example, the lenders of the city government refused further credit, since part of the credit was to be used to repay accumulated debt. Lenders evaluate the credit worthiness of a city among others on the basis of the debt burden. If the debt burden is too high, further credit is refused (Capeci 1991, 1994), (Bayoumi, Goldstein, and Woglom 1995). This happened in for example New York city. Debt levels are therefore a good indicator of fiscal distress of a city as also argued by Fuchs (1992, p. 30) and Clark (1994). Ultimately long lasting fiscal distress can lead to a fiscal crisis. Thus, fiscal crisis can be operationalized by identifying cities with high debt burdens.

Following the period of fiscal crises in the mid-1970s, numerous papers investigated the determinants of fiscal crises in specific cases. Gramlich (1976) and Shefter (1992) study the crisis of New York in 1975, Inman (1995) studies the case of Philadelphia in 1990. These case studies usually emphasize a combination of factors to be responsible for the crisis. On the one hand, changes in socio-economic conditions are mentioned. On the other hand, specific political actors (e.g. a mayor) are seen to be at the root of the problem. In a series of articles, Bradbury (1982, 1983a, and 1983b) investigates fiscal distress and its causes in a number of major American cities. She finds that besides structural factors, city management and unmeasured costs determine fiscal difficulties of a city. Fuchs (1992) compares fiscal policies of New York City and Chicago and argues that Chicago avoided fiscal instability in 1975 because of the role of politics, especially the role of local party organization. The mayor of New York had little support in his party and therefore had to buy support by satisfying the demands of various interest groups. Similarly Poterba (1994) shows that political and institutional factors matter for adjustments to fiscal shocks. A State with a governor of one party and a congress with opposing political party majority

[2]Honadle (2003) in a survey of State auditors finds that only 10 States have a formal definition of crises, 21 States made clear that their states do not define fiscal crises in any way. 36 States reported that they had a crises recently. McConnel and Picker (1993) discuss municipal bankruptcy from a legal point of view.

is slower to react to shocks. The First National Bank of Boston (1981) points out that, while socio-economic indicators cause fiscal conditions, they are not the main cause for fiscal distress. Fiscal distress is not inevitable but within the "grasp of management control of most cities". Also Honadle (2003) summarizes the answers of State government officials on causes of fiscal crises. Officials mention structural (economic, demographic and institutional) factors, and non-structural factors (management and politics) as reasons. However, the relative importance of these factors is not assessed. There is thus little systematic evidence on the main determinants of fiscal crises in a large sample of U.S. cities.

The present paper investigates the determinants of fiscal crisis in 900 U.S. cities in the mid 1980s, early 1990s and late 1990s. Since no systematic data-set on the occurrence of fiscal crises in U.S. cities exists, we identify cities in fiscal crises with a cluster analysis. The cluster of cities with a high debt-per-capita level is in state of distress, while low levels are a sign of fiscal health. We argue that fiscal distress is a situation from which fiscal crisis is likely to result. Potential determinants of fiscal distress are derived from a common pool resource framework (Persson and Tabellini, 2000). In this framework, the budget of a city is considered to be a pool from which the inhabitants of a city want to get as many services as possible. Since many services benefit only limited groups, while the burden of financing is spread on all tax payers through the common budget, voters will demand more than they would if they incorporated the full cost of the service. In an intertemporal setting, it is shown that the common pool problem will in addition to higher spending levels lead to higher debt levels.[3] The degree of the common pool resource problem is operationalized by structural factors such as socio-demographic characteristics. As these characteristics vary across cities, expenditure and debt of city governments will be different. We empirically test the model and show that 90 percent of the cross-city variation in spending and debt is explained by the model. In a second step, we assess the importance of the factors identified by the model to explain fiscal crises. An analysis of the identified distressed cities shows that their high spending and debt levels are not explained by this empirical common pool model based on measurable socio-demographic factors. Fiscal crisis thus results from non-structural factors such as mismanagement, union-power in public administrations and weak mayors.

The remainder of the paper is organized as follows. The next section presents the common pool model and develops the empirical strategy. We then discuss the available data. Section 4 presents the estimation results for the determinants of public spending and debt. Section 5 discusses the cluster of fiscally distressed cities and compares them with the non-distressed cities. The last section concludes.

[3] A large political economy literature investigates debt accumulation on a country level, for surveys see Alesina and Perotti (1995) and Woo (2003). On the other hand, Barro (1979) explains accumulation of public debt in a neoclassical model by a now standard tax-smoothing argument. Sustained accumulation of debt can, however, not be explained by his model.

2 Framework: the common pool resource problem

Consider a city with a variety of different population groups, which differ in their preferences for local public goods. The members of each group mainly benefit from the specific good provided for them. The good is financed by the general budget of the city which is a common pool. An example are swimming pools which are typically financed out of the common budget, while their benefits accrue exclusively to those who go swimming. Similarly, social services for the poor benefit a restricted group of people, while the related costs are paid out of the common budget. The common pool resource literature shows that these constellations will lead to an inefficient over-provision of the public good if individual groups manage to influence the government in their interest. The intuition for this result is the following: The cost of each municipal good is spread to all tax-payers, while the benefit accrues to the individual. Thus the individual will demand more than a benevolent planner of the municipal good, since the benefit from the good in the view of the beneficiary is larger than it is for the general public.

2.1 Demand for municipal goods in a common pool setting

Bergstrom and Goodman (1973) and similarly Borcherding and Deacon (1972) present a model of demand for municipal goods, which we take as a starting point. From the municipal good g an individual consumer i receives the fraction

$$g_i^* = n^{-\gamma} g, \tag{1}$$

where n is the population size and g is the total amount of the municipal good provided. Thus g_i^* characterizes the actual quantity received by an individual consumer. If $\gamma = 0$, the municipal facility is a pure Samuelson (1954)-type public good, which fulfills the condition of non-rivalry. If $0 < \gamma \leq 1$, there is a limited degree of rivalry in the use of the good, $\gamma > 1$ indicates considerable crowding out in the use of the good. In the latter case a city with a larger population needs to provide over-proportional quantities of the municipal good in order for the individual consumer to enjoy the same level of municipal good consumption as she would in a small city.

The utility of an individual i is given by

$$V_i = \ln c_{i,1} + \ln c_{i,2} + \ln g_{i,1}^* + \ln g_{i,2}^* \tag{2}$$

where $c_{i,t}$ denotes private consumption of individual i in period t. It is assumed that first period municipal consumption is financed by issuing debt $b = \sum b_i$. Furthermore the public sector cannot default.[4] The city raises a tax rate τ on second period income in

[4]The last assumption is not as strict as it might appear as pointed out by Inman (2001). In fact, the number of American cities going bankrupt in recent years was very limited. In the last years, the main defaults were incurred by NYC, Camden, Philadelphia, Bridgeport, Miami and Orange County and Washington D.C. (p.60). Of these cities, only Camden and Washington D.C. received bail-outs for specific reasons.

order to repay the debt and to cover second period public consumption. Every individual pays a fraction $0 < \zeta_i < 1$ of the public good, which has a relative price q. Given that r is the interest rate, the budget constraint of individual i can be specified as follows:

$$c_{i,1} = y_{i,1} - b_i \tag{3}$$

$$c_{i,2} = (1-\tau)y_{i,2} + (1+r)b_i \tag{4}$$

where $y_{i,t}$ denotes the income of person i in period t. Thus, first period income of an individual is used to consume and to buy city debt, in the second period, private consumption equals the sum of after tax income and the repaid debt.

The tax income received from the individual i is thus equivalent to the share of the municipal good in period 1 and period 2 paid by individual i:

$$\tau y_{i,2} = q_1 \zeta g_1 + q_2 \zeta g_2 \tag{5}$$

and

$$b_i = q_1 \zeta g_1 \tag{6}$$

The consolidated budget constraint is, assuming for simplicity an interest rate of zero ($r = 0$) and no discounting, then given by:

$$c_{i,1} + c_{i,2} = y_{i,1} + (1-\tau)y_{i,2} = y_{i,1} + y_{i,2} - q_1 \zeta g^*_{i,1} n^\gamma - q_2 \zeta g^*_{i,2} n^\gamma \tag{7}$$

Persson and Tabellini (2000, pp.345) have shown that spending and debt levels are larger than socially optimal in such a setting if a common pool problem exists.[5] They start by calculating the optimal allocation of a benevolent planner and compare this allocation with the allocation under decentralized decision taking. It is shown that first and second period consumption of municipal goods is larger than in the case of the benevolent planner. This effect arises since the individuals living in a city take as their budget constraint for municipal goods the entire budget of the city. Thus, as the cost of a good is spread on all taxpayers and the benefit accrues to only a limited group, the demand will be higher than optimal.[6] In a two period setting it can further be shown that there exists an intertemporal common pool problem, which will give rise to accumulation of debt higher than in the case of a benevolent planner (Velasco 2000).

2.2 Estimation strategy

Maximizing the utility function subject to the budget constraint (Equation 7), it follows immediately, that $c_1 = c_2$ and $g^*_1 = g^*_2$ if $q_1 = q_2$. Let δ be the constant price elasticity

[5] A model with infinite periods is presented in Velasco (2000), the main insights, however, remain the same.

[6] An important issue concerns the question whether the demand of individual groups will actually be fulfilled by the government. Hallerberg and von Hagen (1997), von Hagen and Harden (1995) and von Hagen (1992) investigate the importance of the common pool problem in the context of budget processes and show that budget institutions are a way to reduce this problem.

and ϵ the constant income elasticity and abstract from the common pool problem, using the first order conditions from the above maximization problem yields

$$g_1 = n^{\gamma} g_1^* = k(y_1 + y_2)^{\epsilon}(q_1 \zeta n^{\gamma})^{\delta}$$

where k is a constant. It simplifies to

$$g_1 = n^{\gamma(1+\delta)}(y_1 + y_2)^{\epsilon}(q_1 \zeta)^{\delta} \cdot k. \tag{8}$$

Taking logs, the following equation can be estimated:

$$\ln(g) = c + \alpha \ln(n) + \epsilon \ln(y) + \delta \ln(q_1 \zeta) + \beta X \ldots \tag{9}$$

where

$$\alpha = \gamma(1 + \delta). \tag{10}$$

from which the degree of crowding out γ can be calculated.[7] Demand for municipal goods thus depends on the population size, income, the price of the municipal good in terms of taxes and X, which is a vector of variables capturing the importance of the common pool problem. In the estimation, we need to operationalize these factors and we include social and demographic variables influencing the degree of the common pool problem (see Ladd and Yinger (1989) and Bergstrom and Goodman (1973)).

The common pool resource model predicts that those factors increasing spending, will also lead to higher debt. Thus we performed the same regressions taking the debt level as the dependent variable.

$$\ln(debt) = c + \alpha \ln(n) + \epsilon \ln(y) + \delta \ln(q_1 \zeta) + \beta X \ldots \tag{11}$$

However, we do not assume that income and the tax rate should determine the debt level, since they do not constitute factors of the common pool problem.

3 Data

The data set is taken from the County and City data book (CCDB) (U.S. Census Bureau 1988, 1994, 2000) and includes data for 971 (CCDB 1988) incorporated cities, boroughs, town, and villages (short: cities) in the United States that had 25,000 or more inhabitants in April 1980, 1070 (CCDB 1994, 2000) cities with more than 25,000 inhabitants as of April 1, 1990. The data set consists of a compilation of different data. It includes data on the city budget (tax income, grants, expenditure, debt), the economic conditions of the inhabitants (income, employment, unemployment, poverty, employment in different

[7] Oates (1988) argues that the estimated coefficient of 1 (the quasi-private nature of public goods) can be the result of the so-called "zoo-effect". Larger communities offer a greater variety of goods and services. Therefore, there is no congestion but rather a greater range of services. However, most expenditure categories, like social services, policing, fire, sewerage, and highways do not appear to be subject to Oates' point.

industries), and socio-demographic data (population, age, education, housing, races and ethnic composition, birth rates, crime rates). The debt levels were taken from the County and City Extra book (Bernan Press, DeBrandt, and Gaquin 1994, 2002) if not available in the other source.

4 Regression analysis

4.1 Municipal expenditure

Table 1 presents estimation results of equation 9. More than 90 percent of the variance can be explained by structural variables.[8] Municipal spending is largely determined by price, income, population size and additional demographic and control variables reflecting the common pool problem. The income elasticity of demand is 0.9, the price elasticity is negative, however not always significant.[9] Population size is significantly different from 1 in those regression, that do not include the tax base. Larger cities need to spend over-proportionally more to achieve the same level of perceived consumption. There are thus dis-economies of scale to the production or consumption of local municipal goods. Computing the coefficient γ of crowding out according to Equation (10) confirms the result. It is larger than 1 in all specifications. The advantages of sharing costs are overcompensated by increased costs of either production or the sharing of these goods. There are no economies of scale to larger municipalities. Spending reacts to employment. Cities with 1 percentage point more employment per capita spend around 0.85 percent more. Poverty and birth rates are also factors increasing spending as predicted by the common pool model.

The coefficients of the variables are stable over time. We tested formally for equivalence of coefficient and had to reject the H_0 that the difference of coefficients for columns 3-5 is zero. The Chow (1960) test on all variables except intergovernmental grants, however, did not allow to reject the hypothesis of constant coefficients in time. We therefore present results of pooled regressions allowing for flexibility of the coefficient intergovernmental grant in time (last column).

House ownership significantly reduces spending of cities. Cities taking care of schools (education) on average spend 28 percent more than those that do not. Health spending is a strong factor of city spending. Cities engaged in the provision of health services, spend 50 percent more than cities which do not. Increasing intergovernmental grants to cities clearly increases spending. Each additional 100 dollars per capita will increase spending by 0.07 percent, the effect of intergovernmental transfers on spending is thus negligibly

[8] We also performed robust (Huber/White/sandwich estimator) estimation to account for heteroscedasticity problems. The results did not change. We also controlled for those cities performing county functions, the coefficient is insignificant and therefore not reported.

[9] We approximated the tax price $q_1\zeta$ with the base of the most important tax, the property tax. The median house value is the best available approximation of this tax base.

low, they are apparently used to reduce tax burdens. City with a larger percentage of Hispanics have lower spending levels. This might reflect thee difference in voting participation of Hispanics, which is about half as high as voting participation of Whites and African Americans (U.S. Census Bureau 1989). The percentage of seniors increases the demand for municipal spending. Crime rates significantly increase spending of municipalities. Central cities spend more, since they probably have to provide a lot of infrastructure for neighboring communities. The system of municipal organization in form of a council-manager (CM) system or a mayor-council (MC) had no influence on spending. We therefore do not report the regression results. However, the system of MC is more common in larger cities, which also have higher spending per capita.

The cross sectional variation in spending levels is explained to more than 90 percent by structural, economic and socio-demographic factors. This can be taken as an indication of the low importance of political factors like the degree of organization of municipal employees, the "fiscal liberalism" of the mayor or the party membership of the mayor, factors not included in the regression. In fact, Miranda and Walzer (1994) find that these variables are insignificant in regressions explaining the level spending and also the change in this spending for a limited set of cities.

4.2 Municipal debt

Only few articles empirically investigate the determinants of municipal debt (Sharp 1986), (Farnham 1988). The findings indicate that debt levels are largely influenced by longer-term factors, such as population, functional scope and regional location.

The results of the estimation of Equation 11 are presented in Table 2. 63 percent of the cross city variation in debt is explained by our model in all three years. The driving factor behind debt is the population size. Larger cities have significantly higher debt. In addition, the coefficient for the log of population is significantly larger than 1 as it was for spending. Cities, that have experienced higher population growth in the years before the cross section also have accumulated more debt. Income per capita does not explain the observed debt levels. The median house value was also insignificant (not reported). The coefficient on population density is significantly negative, thus more densely populated cities have lower debt levels. The percentage of people living in their own house significantly reduces accumulation of public debt. Again it can be argued that house-owners know about the future cost of debt. Increased intergovernmental grants increase the debt level. However, they are probably an endogenous variable and therefore we performed the regressions without them and found no considerable changes for the other variables. The higher the percentage of seniors in a city, the lower will be the debt level of a city. This probably reflects the fact that seniors are less likely to leave a city and thereby escape the debt burden of the city, as young people might intend to do. Seniors appear to internalize the future cost of debt. Higher crime rates are associated with higher debt levels. Poverty significantly explains debt levels. Its significance increases after dropping the insignificant

variable income, possibly reflecting the common pool problem. Alternatively, we find some evidence for the theory by Cukierman and Meltzer (1989), who relate the choice of the debt level to inter- and intra-generational redistribution. Central cities all have clearly higher debt burdens in 1985 and 1999, the coefficient is however not significant in 1991. Cities with a larger public labor force per capita also have chosen significantly higher debt levels. A city with 1 additional city employee per 100 inhabitants will have a 37 percent higher debt burden in 1985, which dropped to 27 percent in 1991. The level of formal education of the population has no significant influence on the debt level (not reported).

The estimated coefficients are very stable in time. We had to reject the H_0 of equal coefficients with the Chow test. However, if we test for equality of coefficients omitting the coefficient of "central" the H_0 of coefficient equality could not be rejected with an $F(20, 1805) = 1.15$, giving a p-value of 0.289. Therefore we present the results for the balanced pooled regressions allowing for different coefficients of central in 1992 and 1999.

In the pooled regression debt over-proportionally increases with population size, the coefficient is significantly different from 1. More densely populated cities have a comparatively lower debt level. If population density increases by 1000/square mile, the debt level will decrease by 0.04 percent. An increase of 1 percentage point of house owner will decrease the debt level by -0.5 percent. Cities providing health services have higher debt levels. A city with 1 percentage point additional seniors will have a -1.6 percent lower level of debt. Cities with higher crimes rates have significantly higher debt burdens. This captures in part the effect of poverty, a variable which we expected to be associated with higher debt levels. Central cities have a 17 percent higher debt level. The debt levels increased in time by 27 and 56 percent as indicated by the time dummies. This captures exactly the change of the price level, which was 26.6 and 54.8 percent in the period 1985-91 respectively 1985-99. The structural variables in our empirical specification explain roughly 67 percent of the cross sectional variation in debt levels.

5 Fiscal crises: a cluster analysis

Economic and socio-demographic factors explain almost the entire variance of municipal spending and a large percentage of the variance of debt. In this section we want to identify cities, which are likely to be in state of distress and those that are not. It is then assessed whether these cities are in a situation of crises because of the identified economic, social and demographic factors, or whether the causes of crises must be sought in non-structural factors. There is no data set available reporting the occurrence of crises in American cities. Therefore we must employ indicators of crises. In all reviewed case studies of municipal fiscal crises, a high debt level was mentioned as a symptom of fiscal crisis. High debt implies that the financial independence of a city is limited. Resources must be used to pay the interest. Credit worthiness is reduced. Thus, cities with a high debt burden can only to a limited extent react to financial challenges. Ultimately this fiscal distress can lead to crisis.

We partition the cities in two clusters, one with high, the other with low debt per capita level.[10] Applying the described method to our data set taking the debt burden as the relevant variable results in the cluster characterized in Tables 3 to 5. We limit our analysis to the same set of cities for all three years, for which we were able to run both regressions in the previous section, in total 592 cities.

The cluster of cities, which are in distress, is characterized by an average debt burden per capita 10 times higher than in the rest of the cities in the sample, in later years the ratio is still 4 to 1. 14 cities have a very high debt burden in 1985, in 1991 the cluster analysis calculates a lower threshold and the distressed cluster has 37 cities. Finally, in 1999 the threshold is even lower and 75 cities are clustered to be high debt cities. Over the 15 years considered, the average debt level increased with inflation. The standard deviation of debt levels did not change. However, the extremely high debt levels went down as for example Farmington, NM, reduced its nominal debt level from more than 30,000 US$ to less than 25,000 US$ per capita. Public expenditure per capita is twice as high at 1100 dollars in 1985, and roughly 50 percent higher in the later years.

Income per capita is almost the same in the two clusters. Income growth in the last 5 years was somewhat lower in 1985 for the fiscally distressed cities, but not in 1991. Population growth in the preceding 5 years was more than 11 percentage points higher in 1985 and 5.7 percentage points higher in 1991 for distressed cities. The ten year population growth in the two 1999 groups does not differ. Distressed cities also have larger population in 1991 and 1999, the difference is however not statistically significant. Nevertheless, in 1991 the population size is three times as high and in 1999 almost four times as high.[11] Taxes raised by the city government per capita are the same except for 1999, so are intergovernmental general revenue and federal grant awards and procurement contract awards.

Although the structural factors seem to be different in the crises cluster, the differences are statistically not significant. Are the extreme debt levels respectively spending decisions well predicted by the regression model? A closer look at the data shows, that all 14 cities in 1985 have a positive residual in the spending and in the debt regressions. Their absolute mean error is 1.4 as compared to the mean absolute error of the remaining cities of 0.59. The mean error is thus more than twice as high as the average standard deviation of the error in the sample. If we take as a threshold $2 * Std.Dev. = 2 * 0.56 = 1.12$ of the absolute residual error, 10 of the 14 cities in the "bad" cluster are outliers. This means, that in 70 percent of the cases, the model can not explain the overly high debt burden well. In

[10] We also performed the clustering with debt as percent of income. The resulting cluster is almost the same. Another possible way to cluster the cities is to take the debt level per house per median house value. The higher this ratio, the lower the possibility to raise funds to pay back the debt. Using this variable as a cluster variable, however, gives very similar results (available from the author).

[11] Buettner and Wildasin (2003) find some evidence for a soft budget constraint for larger cities, which is in line with our result that cities with higher debt per capita levels are larger. However, this result has to be interpreted cautiously since it is not statistically significant.

1991, the threshold is $2 * 0.63 = 1.26$ and even with a broader set of cities found to be in distress, roughly 50 percent are outliers. The mean absolute residual is larger than in the non-distressed cluster. In 1999, the threshold is $2 * 0.50 = 1.00$ and also 50 percent of the distressed cities are outliers. The mean absolute residual is higher in the distressed cluster for all years. As concerns spending, the analysis of residuals yields similar results. The fit in the distressed cluster is much lower than in the non-distressed cluster.

Thus, a majority of cities have high debt levels because of other reasons, while the high debt burden of only few cities in the "crisis cluster" can be explained by structural factors of the regression analysis. Similarly, the regression analysis explains the spending decisions of the cities in the distressed cluster far worse than the non-distressed cluster. Thus, other factors must have caused these extreme cities to accumulate large debt and spend more than non-distressed cities. The common pool model of municipal spending and debt does not explain extreme fiscal outcomes well, even though it explains a large part of the variation in debt and spending. For these extreme fiscal outcomes other factors must have been in place. Our results are in line with the result of case studies, which emphasize non-structural factors like negotiation power of public employees/unionization (the case of New York and also Philadelphia), excessively high social security programs because of political preferences of the mayor (New York: John Lindsay in the 1960s, for Philadelphia see Inman (1995)) as determinants of excessive spending, debt and ultimately crisis. Miranda (1994) stresses the importance of strong party organization (SPO) to impose fiscal discipline. If SPO is missing, fiscal crisis will likely arise. Thus, fiscal distress and crisis have a large non-structural element.

6 Conclusion

Why do some US cities experience a fiscal crisis and others do not? This paper proposes an indirect approach of assessing the relevance of economic and socio-demographic (structural) factors on the one side and non-structural (management and political) factors on the other hand. Are cities in distress, and therefore likely to experience a crisis, because of measurable structural factors or because of other factors?

We present a common pool resource framework. In this model, municipal expenditure can be explained by simple demand factors like income per capita, the population size and the value of the tax base and in addition by factors measuring the possible degree of the common pool problem, like employment per capita, poverty, birth rates, percentage of seniors, hispanics and crime rates. The common pool model further predicts that debt levels are higher the worse the common pool problem is. We test this model in a regression analysis explaining municipal expenditure. The model is able to explain more than 90 percent of the cross city variation in municipal spending. The coefficients are shown to change little from 1985 to 1991 and 1997. Thus, municipal spending is a result of measurable structural factors. Similarly, we show that municipal debt levels are

determined by the same common pool factors, with a somewhat lower explained variance of around 67 percent.

Cities in fiscal distress are identified by means of a cluster analysis. The criterion for distress is high debt levels. It is shown that distressed cities can be characterized by debt levels 10 times as high as the average debt level. Spending is around twice as high. However, the socio-demographic and economic factors of distressed cities appear to have fairly average values. Spending and debt levels of distressed cities can not be well explained by the common pool model of spending and debt. In the regression analysis the distressed cities constitute outliers. Thus, the structural, measured factors can only to a limited degree account for their specific debt and spending outcomes. We therefore conclude that distress and ultimately crisis is a result of non-structural factors, socio-demographic and economic factors can not account for extreme fiscal outcomes.

Future research should investigate the interactions between political factors and economic factors and their relevance for fiscal crisis. Glaeser and Shleifer (2003), e.g., study the effect of mayors appealing on feelings of strong minorities (in their example the Irish) that an Irish mayor can better represent their interest, with bad consequences for the local economy. How is fiscal outcome affected by these and other political factors? An additional avenue for future research concerns intergovernmental relations and their effect on crises. Inman (2001) argues that the American system is rather successful in preventing cities from receiving bail-outs. The moral hazard issue thus seems to be solved. However, it remains to be investigated whether intergovernmental transfer rules can be improved in such a way as to prevent crisis and not to fall in the trap of moral hazard problems. A further extension of this line of research would look at the effects of an increased number of local authorities on fiscal outcomes. Our ongoing research suggests that consolidation of schooling and health services in the municipal budget leads to lower spending for other services. Are crises more likely to occur in smaller public authorities with a limited number of responsibilities? Or does, on the contrary, consolidation of all local responsibilities in one authority prevent crises?

	1985	1991	1985	1991	1997	pooled
log(income per capita)	**0.92**	**0.95**				
	0.16	0.14				
log(population)	**1.00**	**1.03**	**1.04**	**1.07**	**1.07**	**1.06**
	0.02	0.02	0.02	0.02	0.02	0.01
log(median house value)	**-0.10**	**-0.16**				
	0.09	0.08				
own house	**0.00**	**-0.18**	**-0.43**	**-0.43**	**-0.60**	**-0.49**
	0.18	0.18	0.14	0.14	0.14	0.08
school	**0.22**	**0.23**	**0.30**	**0.32**	**0.27**	**0.28**
	0.11	0.12	0.12	0.13	0.12	0.07
health	**0.44**	**0.56**	**0.41**	**0.56**	**0.57**	**0.50**
	0.05	0.06	0.06	0.06	0.08	0.04
grant per capita	**0.11**	**0.06**	**0.09**	**0.05**	**0.03**	**0.07**
	0.02	0.01	0.02	0.01	0.01	0.01
employment per capita	**1.08**	**0.58**				
	0.28	0.38				
income growth	**-0.04**	**0.14**				
	0.34	0.18				
hispanic	**-0.31**	**-0.05**	**-0.78**	**-0.57**	**-0.64**	**-0.63**
	0.13	0.13	0.12	0.11	0.09	0.06
seniors	**0.84**	**0.72**	**1.22**	**1.17**	**0.67**	**0.91**
	0.34	0.37	0.32	0.34	0.26	0.17
birth	**11.51**	**8.42**				
	3.50	3.03				
crime	**2.16**	**1.75**	**2.99**	**2.05**	**3.17**	**2.37**
	0.66	0.51	0.65	0.54	0.75	0.33
poverty	**1.98**	**1.78**				
	0.45	0.36				
central	**0.09**	**0.09**	**0.07**	**0.07**	**0.07**	**0.08**
	0.03	0.03	0.03	0.03	0.03	0.02
t2*grant per capita						**-0.01**
						0.01
t3*grant per capita						**-0.03**
						0.01
t2						**0.35**
						0.02
t3						**0.61**
						0.03
constant	yes	yes	yes	yes	yes	yes
state dummies	yes	yes	yes	yes	yes	yes
obs	606	606	606	606	606	1818
adj. R^2	0.93	0.93	0.91	0.9	0.91	0.92

Table 1: Determinants of general municipal expenditure, comparison of the different years for the same set of cities and if possible the same set of regressors. Standard errors are reported below the coefficient.

	1985	1991	1999	pooled
log(population)	**1.06**	**1.20**	**1.17**	**1.15**
	0.06	0.06	0.05	0.03
population growth	**0.01**	**0.01**	**0.00**	**0.00**
	0.00	0.00	0.00	0.00
population density	**-0.06**	**-0.04**	**-0.02**	**-0.04**
	0.02	0.02	0.01	0.01
own house	**-0.90**	**-0.37**	**0.04**	**-0.51**
	0.41	0.45	0.40	0.23
school	**-0.12**	**-0.26**	**0.05**	**-0.08**
	0.27	0.31	0.28	0.15
health	**0.34**	**0.34**	**0.19**	**0.34**
	0.16	0.19	0.20	0.10
grant per capita	**0.16**	**0.08**	**0.04**	**0.06**
	0.04	0.03	0.01	0.01
hispanic	**-0.47**	**-0.06**	**-0.20**	**-0.21**
	0.37	0.35	0.26	0.18
seniors	**-1.63**	**-1.92**	**-1.84**	**-1.63**
	0.93	1.06	1.09	0.56
crime	**2.60**	**3.42**	**3.38**	**2.70**
	1.53	1.42	1.79	0.81
central	**0.23**	**0.03**	**0.23**	**0.23**
	0.10	0.10	0.08	0.08
t2*central				**-0.08**
				0.10
t3*central				**-0.09**
				0.10
t2				**0.32**
				0.08
t3				**0.62**
				0.08
constant	yes	yes	yes	yes
state dummies	yes	yes	yes	yes
obs	629	629	629	1887
adj. R^2	0.63	0.615	0.669	0.667

Table 2: Determinants of municipal debt for a constant set of cities. Standard errors are reported below the coefficient.

Variable	Obs	Mean	Std. Dev.	Min	Max
distressed cities					
debt per capita	14	7472.4	6803.1	4090.8	30594.1
mean income	14	10646.4	1638.3	8574.0	14840.0
income growth	14	-0.01	0.05	-0.13	0.09
population growth	14	12.3	11.4	-3.8	30.6
population	14	104940.7	98420.3	39050.0	356840.0
expenditure per capita	14	1117.8	526.1	533.0	2452.0
police exp. per capita	14	83.4	24.2	53.1	143.1
highway exp. per capita	14	17.1	10.3	1.5	38.0
sewerage expenditure per capita	14	110.9	81.1	7.4	275.7
residuals spending	14	0.52	0.35	0.02	1.18
residuals debt	14	1.40	0.77	0.26	2.78
tax per capita	14	225.8	64.6	113.0	330.0
intergov't grants per capita	14	140.8	92.7	78.2	407.7
non-distressed cities					
debt per capita	578	830.9	643.7	10.8	3693.8
mean income	578	11189.4	2755.5	5275.0	33839.0
income growth	578	0.00	0.07	-0.18	0.22
population growth	578	7.7	12.8	-13.2	65.0
population	578	130483.4	380310.6	24180.0	7262750.0
expenditure per capita	578	625.7	339.7	152.0	2835.0
police exp. per capita	578	79.3	32.3	27.7	346.6
highway exp. per capita	578	15.8	11.5	-28.1	64.4
sewerage expenditure per capita	568	78.0	64.0	0.6	664.5
residuals spending	578	0.21	0.18	0.00	1.35
residuals debt	578	0.59	0.55	0.00	3.52
tax per capita	578	270.2	171.0	35.0	1464.0
intergov't grants per capita	578	173.1	165.8	9.0	1274.2

Table 3: Summary statistics of cities in the crises and the non-crises cluster in 1985.

Variable	Obs	Mean	Std. Dev.	Min	Max
distressed cities					
debtpc	37	5624.9	3783.2	3369.2	25599.4
debt per capita growth	37	6.4	29.5	-0.3	180.7
mean income	37	14613.4	3919.9	7238.0	24812.0
income growth	37	0.13	0.11	-0.06	0.44
population growth	37	13.6	26.9	-9.1	117.4
population	37	336049.8	1193024.0	31793.0	7311966.0
expenditure per capita	37	1368.1	861.7	599.0	4587.0
police exp. per capita	37	137.1	61.7	53.4	343.7
highway exp. per capita	37	21.9	13.5	0.9	70.3
sewerage expenditure per capita	34	147.2	102.4	11.5	460.2
residuals spending	37	0.35	0.31	0.00	1.38
residuals debt	37	1.30	0.81	0.03	2.89
tax per capita	37	449.4	388.7	107.0	2193.4
intergov't grants per capita	37	219.0	328.1	36.0	1838.9
interest as percent of expenditure	37	21.5	13.4	2.2	55.6
non-distressed cities					
debtpc	555	1038.7	716.4	3.6	3311.9
debt per capita growth	555	1.0	4.4	-1.0	76.7
mean income	555	14407.6	4462.7	6284.0	55463.0
income growth	555	0.13	0.11	-0.16	0.89
population growth	555	8.8	15.8	-18.9	107.8
population	555	122393.6	238713.2	24356.0	3489779.0
expenditure per capita	555	922.8	510.5	220.0	3751.0
police exp. per capita	555	116.8	49.8	31.4	611.6
highway exp. per capita	555	20.2	12.0	-20.7	78.0
sewerage expenditure per capita	536	110.3	76.2	0.3	604.9
residuals spending	555	0.20	0.17	0.00	1.20
residuals debt	555	0.57	0.59	0.00	5.06
tax per capita	555	385.9	244.6	36.8	1908.3
intergov't grants per capita	555	232.1	264.9	1.5	1770.6
interest as percent of expenditure	555	6.9	6.1	0.0	77.7

Table 4: Summary statistics of cities in the crises and the non-crises cluster in 1991.

Variable	Obs	Mean	Std. Dev.	Min	Max
distressed cities					
debtpc	75	4482.3	2827.5	2775.7	24682.9
debt per capita growth	75	1.6	4.9	-0.6	40.1
mean income	n.a.				
income growth	n.a.				
population growth	75	8.1	12.7	-11.1	55.8
population	75	425934.4	1077344.0	30273.0	8008278.0
expenditure per capita	75	1673.1	956.0	627.0	5612.0
police exp. per capita	75	190.3	97.0	63.7	644.2
highway exp. per capita	75	22.4	16.2	0.9	68.5
sewerage expenditure per capita	75	175.0	101.8	12.1	487.0
residuals spending	75	0.29	0.26	0.00	1.36
residuals debt	75	0.93	0.56	0.00	2.68
tax per capita	75	648.4	407.9	90.8	2418.5
intergov't grants per capita	75	464.0	543.8	67.6	2283.5
interest as percent of expenditure	75	11.8	8.6	2.0	50.8
non-distressed cities					
debtpc	517	1175.6	645.4	2.9	2714.1
debt per capita growth	517	1.4	8.2	-1.0	136.6
mean income	n.a.				
income growth	n.a.				
population growth	517	10.0	14.8	-21.4	140.8
population	517	107449.2	119288.9	25514.0	1321045.0
expenditure per capita	517	1091.2	601.9	301.0	4130.0
police exp. per capita	517	147.4	56.9	44.1	571.7
highway exp. per capita	517	22.9	12.8	-49.5	70.7
sewerage expenditure per capita	503	127.1	74.3	0.8	594.2
residuals spending	517	0.19	0.17	0.00	1.04
residuals debt	517	0.48	0.46	0.00	5.58
tax per capita	517	457.8	273.7	53.7	2070.2
intergov't grants per capita	517	321.8	399.8	9.5	2929.0
interest as percent of expenditure	516	5.2	3.8	0.0	26.0

Table 5: Summary statistics of cities in the crises and the non-crises cluster in 1999.

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