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**Wisconsin Local Government, State Shared Revenues
And the Illusive Flypaper Effect**

By

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Wisconsin Local Government, State Shared Revenues and the Illusive Flypaper Effect

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Executive Summary

Local governments in Wisconsin are highly dependent upon transfers from the state for their general operating budgets. In 1999 approximately 47 percent of municipal and county government revenues came in the form of states aids including highway aids, health and human services aid, and shared revenues. Shared revenues in Wisconsin are unique because the state has put in place an aggressive aids formula modeled after the now defunct federal shared revenue program. For the past several years the state has passed down to local governments nearly $900 million annual in the form of shared revenues. Like the federal revenue sharing program of the 1970s and 1980s these funds are transferred to local governments with no strings attached. Local governments are free to use these funds in any means they see appropriate. These funds can be used to replace locally generated property tax dollars, fund programs at higher levels or some combination of the two. For some municipalities shared revenues accounts for a large percentage of operating dollars. The average city in Wisconsin is dependent on shared revenues for about one in every four dollars of revenue, for villages about one in five dollars of revenue comes from shared revenues and for towns about 16 percent of total revenues is from shared revenues.

Given Wisconsin's ongoing state budget deficit, the state shared revenues program has come under increased scrutiny. Facing a $1 billion structural deficit due to a commitment to fund two-thirds of K-12 public education with no new taxes, coupled with an economic slowdown, the $900 million shared revenues program to municipalities and counties has been recommended for elimination. While some wealthy municipalities receive little state shared revenue dollars and could easily accept the elimination of the program, poorer communities would loose significant dollars. The City of Beloit, for example, would loose nearly 50 percent of its operating budget if state shared revenues ceased to exit. Needless to say the political fight over the future of Wisconsin's state shared revenues program has been heated.

This study focuses on the impacts state shared revenues has on local government finances. Specifically we examine what is referred to in the academic literature as the "flypaper effect." Using a simple model of local fiscal behavior Bradford and Oates (1971a, 1971b) predict that aids to local governments is the equivalent to cash transfers to local constituents. Thus aids to local governments should have the same impact on local government spending as does increases in local personal income. Empirical studies, however, have found that aids to local governments has a much greater simulative affect on local spending than does a comparable increase in the income of local constituents. Private income is disproportionately spend on private consumption while aids, income received by local governments, is primarily spent on public services.

Using data on 581 Wisconsin cities and villages from the later 1990s we find that for every dollar increase in per capita income, per capita total expenditures increased by between 12 and 15 cents. For every dollar increase in state shared revenues per capita, per capita total expenditures increased by between 46 and 55 cents. These results are consistent with the flypaper effect. In addition, we find that property taxes per capita decreased by between 32 and 41 cents for every dollar of per capita shared revenues. While state shared revenues stimulates spending at the local level more than we would expect (i.e., the flypaper effect), shared revenues does place significant downward pressure on local property taxes. As developed in the paper itself, we speculate that this patter is partially driven by the structure of the shared revenues formula itself.

Wisconsin Local Government, State Shared Revenues and the Illusive Flypaper Effect

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Introduction

How do local government decision makers react to grants and aids received from higher units of government? Do they take the additional resources to leverage local funds to enhance the level and quality of services or do they substitute those resources for locally generated dollars in an attempt to lower local taxes? If local officials choose some combination of the two, what is the balance most widely selected? As Wisconsin enters into a serious debate about the relationship between state and local governments, insights into these basic questions seems almost a prerequisite. The analysis presented in this paper attempts to provide some insights into these fundamentals with attention to share revenues.

The shared revenues program is unique to Wisconsin. Patterned after the federal revenue sharing program of the 1970s and 1980s, the Wisconsin shared revenues program takes the form of unrestricted grants. There are no matching requirements or "strings attached" and goes directly into the local governments general fund to be used in any manner deemed appropriate by local officials. The shared revenue program differs from other state and federal aid programs that are targeted to specific needs and often require matching local dollars. Unlike transportation aids that must be spent on local roads and public transit programs, shared revenues can be used for an almost unlimited range of options, including reducing local property taxes.

Because of the strength of the Wisconsin economy and correspondingly the state fiscal budget, local officials have tended to treat shared revenues as a permanent source of revenues. Given the perceived permanence of shared revenues local officials have been able to plan on these revenues for not only current operations but also for long-term capital purchases and investments. Within the past few years, however, the growth in shared revenues has slowed significantly and indeed has stagnated (Figure 1). As the demands for local services continues to growth with the state's population and overall economy, local officials have tended to respond to the slow down in shared revenues with modest increases in the property tax (Figure 2). The upward shift in the later is most evident with villages.

Governor McCullam's recent proposal to eliminate shared revenues as a strategy to solve a massive structural deficit in the state budget has wreaked havoc on the budgeting process at the local level. As outlined in Table 1, local municipalities have become very dependent on shared revenues with one in four dollars for cities coming from shared revenues. For some local governments, such as the City of Beloit, over half of their operating budget comes from shared revenues. Clearly the elimination of shared revenues, a program which local

governments have come to depend on for vital services, would decimate local budgets. Local officials would be faced with either massive increases in property taxes, structural reductions in local services or most likely some combination of the two.

The intent of this applied research study is to gain some insights into how local cities and villages in Wisconsin treat shared revenues. To what extent are shared revenues used to reduce property taxes or leverage local funds? Beyond these introductory comments, the paper is composed of three parts. Next we provide an overview of the grants and aid literature and present a simple conceptual model that provides some theoretical insights into how local officials treat aids. We then present our simple empirical model for Wisconsin cities and villages and discuss our results. We close the paper with a review of the issues, our findings and the policy ramifications of some of the options currently being discussed.

<u>Background and Conceptual Model</u>

In order to understand how local governments treat intergovernmental grants and aids it is important to develop a theoretical understanding of local behavior in which to frame our analysis. One simple political economy model advanced Bradford and Oates (1971a, 1971b), and latter expanded upon by Gramlich and Galpher (1973) and Gramlich (1977), argues that grant and aid revenue would crowd out local spending leading to little if any increase in spending at the local level. In other words, local officials would simply substitute grant and aid money for locally generated revenues. Within the framework of a simple median voter model grants and aids can be viewed as a direct increase in local income, hence the two should have identical impacts on local spending levels. From a policy perspective, the theoretical result that follows from a median voter approach to local fiscal behavior predicts that grant and aid income is returned to local taxpayers directly via rebates or indirectly through reduced local taxes. Although a detailed derivation of this result is beyond the scope of this paper, it is widely discussed in the public finance literature (e.g. Boadway and Wildasin 1984, Rubinfeld 1987, Bailey and Connelly 1998 and most recently by Knight 2002).

Despite the predictions developed from the theoretical discussions empirical studies have shown repeatedly that a lump-sum grant to a community has a much greater stimulatory effect on local government spending then the equivalent increase in individual income. In their respective reviews of this literature Becker (1996) and Bailey and Connelly (1998) report that empirical studies of the effect of grants and aids find measures of $\Delta E/\Delta I$ (with E defined as expenditures and I defined as income) ranging between about .001 and .01 whereas measures of $\Delta E/\Delta G$ (with G defined as grants and aids) range between .25 and 1.00. The empirical data suggest that grants and aids were not finding their way back to local taxpayers through rebates or reduced local taxes, but rather the funds "stuck where they landed" or exhibits the characteristic of what is

now referred to as the "flypaper effect." This is troublesome because the presence of a flypaper effect is not theoretically consistent with our stylized model.

Bailey and Connelly (1998) suggest that there has been over fifty publications in journals and books that have attempted to find a theoretical and/or empirical explanation for the flypaper effect, the search has yielded much debate and heat, but little light. Suggestion advanced for the presence of the flypaper effect include that few grant and aid programs provide direct payments, but rather are subject to complex matching and formula rules, inappropriate functional forms for the estimated equations (Becker 1996), variables are misidentified or omitted from the models (Hamilton 1983), bureaucratic behavior, uncertainty and risk with the stability of fund flows (Fossett 1990; and Deller and Walzer 1995), among others. Unfortunately, no satisfactory conclusions have been reached.

A simple way to lay out the relationship between grants and aids and local fiscal behavior is to focus on the budget constraint local governments operate under. This can be expressed as:

$$g = \tau \bullet Y + G \qquad (1)$$

where g is local government spending, Y is the total tax base within the jurisdiction, τ is the local tax rate, and G is grant and aid revenue. Note that within the framework developed here no behavioral assumptions are imposed on either the voters (consumers, taxpayers) or local officials. Rather, the explicit derivation is used to illustrate the conceptual framework developed below.

Available evidence, both empirical and theoretical, suggests that the local tax rate τ is related to several factors ranging from local prices (e.g., wages of public employees) to the level of intergovernmental support. Specifically, τ is an implicit function of G and z, where z is a vector of other factors. Rewriting (1) yields:

$$g = \tau(G,z) \bullet Y + G. \qquad (2)$$

The stimulative (i.e., flypaper) or non-stimulative effect of grants and aids can be inferred from (2). Holding other factors (z) constant and taking partial derivatives we have:

$$\partial g/\partial G = \partial \tau/\partial G \bullet Y + 1. \qquad (3)$$

The effect of a dollar increase (or decrease) in aid can take one of three forms. A one dollar increase in aid will have no effect on total local spending (i.e., $\partial g/\partial G = 0$) if $\partial \tau/\partial G \bullet Y = -1$, or local officials completely substitute aid monies for local monies in the form of lower local tax rates. The one dollar increase will have something less than a stimulative effect (i.e., $0 < \partial g/\partial G < 1$) if local officials partially substitute aid monies for local monies (i.e., $-1 < \partial \tau/\partial G \bullet Y < 0$). The aid is said to

have a stimulative effect ($\partial g/\partial G > 1$) if local officials use the aid as seed money to level local funds, or $\partial \pi/\partial G \bullet Y > 0$. The key is to form a rationale or logic for the sign and magnitude of $\partial \pi/\partial G$ given that Y is assumed to be constant.

Following the logic of Bradford and Oates (1971a, 1971b), Courant, Gramlich and Rubinfeld (1979), Gramlich and Galpher (1973), Gramlich (1977) and Wilde (1971) among others, we need to focus our attention on the price elasticity of public goods within the framework of a median voter type model. If local public goods are deemed to be a luxury good, we would expect to see the net effect of grants and aids to have a stimulative effect (i.e., $\partial g/\partial G > 1$). If public goods are seen as a normal good, then the effect of an increase in aids should be identical to an increase in income. If public goods are inferior, any increase in aids should actually see a decrease in spending. Because nearly all of the available empirical evidence suggests that public goods are a normal good, the effect of an increase in aids should be identical to an increase in income.

Grossman (1989, 1990) notes that these general rules reflect myopic behavior by local officials. If local officials follow the "greedy politician model" as advanced by Niskanen (1971, 1975) and Romer and Rosenthal (1979a, 1979b, 1982) local spending will increase at a rate significantly higher than a corresponding increase in income. Using the notion of "fiscal illusion" (Hewitt 1986; O'Brien and Shieh 1990), local officials can take advantage of the lack of knowledge local residents have of the budgeting process to advance their own agenda of larger expenditures.

A third way of thinking about the problem advanced by Bahl and Duncombe (1988), Bahl and Sjoquist (1990), Benton (1992), and Deller and Walzer (1995) considers local budgetary decision making in a slightly longer term view. Using the notion of permanent and transitory income local officials, much the same as individual households, can view revenue as something that is dependable (i.e., permanent), or something less than dependable (i.e., transitory). Given the generally accepted notion that residents demand a high level of services, but want someone else to pay for the services, one might reasonably expect intergovernmental aid to substitute at least in part for local revenues, or $\partial \pi/\partial G < 0$ and hence $\partial g/\partial G < 1$. In other words, because there is a level of certainty or dependability to the aid monies, local officials can count on those revenues and from a long-term budget planning perspective easily substitute aids for local money.

Alternatively, if aid is considered transitory, something that cannot be dependent upon from one budgeting cycle to the next, local officials may shift the use of those funds to one-time ventures such as expensive construction projects or the purchasing of equipment. In this instance, grant and aid monies complement local funds, or $\partial \pi/\partial G > 0$ and hence $\partial g/\partial G > 1$.

This view of the local budget planning process can be expressed in our simple mathematical representation by rewriting (2) within a planning horizon as:

$$g_t = \tau_t(E(G_t), z_t) \bullet Y_t + E(G_t). \tag{4}$$

Here $E(G_t)$ is the expected level of intergovernmental aids to be received during the relevant planning horizon t. Using a simple adaptive process, $E(G_t) = \lambda(G_{t-1})$ where λ is a measure of the treatment of grants and aids in the budget planning process. If $\Delta G_{t-1} \geq 0$, or aids are steadily raising or at least remaining constant over time then local officials are more inclined to treat the funds as permanent, thus building the funds into operating budgets, which for a given level of services, serves as a substitute for local funds. If aids are declining or time, $\Delta G_{t-1} < 0$, local officials are less likely to view grants and aids as permanent, but rather as transitory. Given this framework, grants and aids will not be built into the general fund of the local government and will tend to be to level local monies for more expensive single time projects.

Empirical Model and Results

To see how local officials treat state shared revenues we construct and estimate two simple linear equations using a cross section of data for 581 Wisconsin cities and villages. Expenditure and revenue data are drawn from the Wisconsin Department of Revenue's annual municipal and county revenues and expenditure report. Socioeconomic data are from Claitus, a private vendor of local economic marketing data, including enhanced socioeconomic data that are drawn from the census. Expenditure and revenue data are an annual average over the period 1996 to 1998. We use an average to minimize the effects of large one-time capital expenditures that tend introduce "spikes" into the data.

We estimate two basic equations:

$$PCE = \alpha_0 + \alpha_1 SSRPC + \alpha_2\, PCI + \Sigma_{I=3\ldots8}\alpha_I Z_i + e \tag{5a}$$

and

$$PCPT = \beta_0 + \beta_1 SSRPC + \beta_2\, PCI + \Sigma_{I=3\ldots8}\beta_I Z_i + u \tag{5b}$$

where PCE is per capita total expenditures, SSRPC is state shared revenues per capita, PCI is local per capita income, PCPT is local per capita property taxes, Z is a set of six socioeconomic control variables ranging from percent of the population with at least a high school education to percent of housing owner occupied, and e and u are regression error terms that assumed to be well behaved.

Based on the theories of intergovernmental aid advanced by Bradford and Oates (1971a, 1971b), Gramlich and Galpher (1973) and Gramlich (1977) we should pay particular attention to the parameters α_1 and α_2 in (5a). If grants and aids are treated like an increase in local income,

then $\alpha_1 = \alpha_2$. If, on the other hand, the data find $\alpha_1 > \alpha_2$ this is evidence of the flypaper effect, or grants and aid have a greater stimulative effect on local spending than predicted by traditional theory. Our second equation, (5b), is a more direct test to see what if any effect shared revenues has on local property tax burdens and is a complement to the indirect test of (5a). Between the two estimated equations, we should be able to gain rigorous insight into how local officials treat shared revenues in establishing local budgets.

We estimate versions of (5a) and (5b) by stepping in first shared revenues, then per capita income, then finally the set of socioeconomic control variables. Looking first at (5a) we see that the simplest specification (Model A) where we regress just shared revenues per capita on total expenditures per capita, does not perform well from a statistical perspective (Table 2). The low individual t-statistic and the poor performance of the equation statistics (R^2 and F-statistic) suggest that we cannot draw any inference from this simple specification. The second specifications of (5a) yield much stronger statistical results. For Models B and C the estimated parameter α_1 ranges from .4579 to .5477 suggesting that for every dollar increase in per capita state shared revenues total expenditures at the local level increase by between 46 cents and 55 cents. The estimated parameter α_2, or the income effect, ranges from .0123 to .0149 implying that for every dollar increase in local per capita income, total per capita expenditures increased by slightly more than a penny. These results are consistent with the presence of the flypaper effect. The stability of the two parameters across Model B and C lends additional confidence in our results.

To complete our analysis turn to the property tax results presented in Table 3. Across all three specifications of the model we find that increases in state shared revenue per capita places strong downward pressure on the property tax. The estimated parameter β_1 ranges from -.8298 for Model A to -.3181 for Model B. Given the more complete specification of Models B and C, we lend more credence to the lower end estimates of -.3181 and -.4080 which suggests that for every dollar of state shared revenues per capita, local property taxes per capita decreases between 31 and 41 cents. We also see that an increase in per capita income is positively associated with per capita property tax levies, along with per capita total expenditures from the previous model, providing strong evidence that local public goods and services are what economists refer to as normal goods; as income increases, people demand more of the good.[1]

These results are consistent with what other studies have found looking at the relationship between intergovernmental grants and aids and local budgeting decisions. In short we find that state shared revenues tends to have a stimulating effect on local spending to a greater extent than predicted by the theory. We also find that local public goods and services are

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[1] An alternative interpretation might be linked to the shared revenues aidable formula. As incomes increase, property values also tend to increase placing downward pressure on the flow of shared revenues to the locale. If incomes increase, shared revenues tend to decline making the municipality more dependent on locally generated revenues.

normal goods suggesting that as incomes grow, people demand more public goods and services, and are willing to raise their own taxes to ensure those goods and services are available. More importantly, we find that local officials use state shared revenues to a) ensure that the local services that residents have come to demand and expect at a satisfactory level and b) provide some property tax relief.

The structure of the state shared revenue formula provides a strong motivation for the behavior of local officials we have identified in this research. The aidable revenues formula is structured to help a) property poorer communities and b) those communities that tend to spend more on local services. The first component follows in a widely held belief that the state should help poorer communities that need to ensure basic levels of services are offered yet have a difficult time raising their own revenues due to lower property values. The second component is based on the premise that the state should help maintain downward pressure on the property tax. In addition, there is the belief that the state should provide more help to those communities that are willing to tax themselves. The structure of the aid formula provides an incentive to local officials to use state shared revenues to enhance local spending in order to receive more shared revenue. If local officials used shared revenues to reduce local property taxes in a dollar for dollar trade off, they risk loosing shared revenues in the future. Hence, local officials use shared revenues in a balanced manner, to ensure local services are available while at the same time placing downward pressure on property taxes.

Conclusions and Policy Implications

Local governments in Wisconsin are highly dependent upon transfers from the state for their general operating budgets. In 1999 approximately 47 percent of municipal and county governments revenues came in the form of states aids including highway aids, health and human services aid, and shared revenues. Shared revenues in Wisconsin are unique because the state has put in place an aggressive aids formula modeled after the now defunct federal shared revenue program. For the past several years the state has passed down to local governments nearly $900 million annual in the form of shared revenues. Like the federal revenue sharing program of the 1970s and 1980s these funds are transferred to local governments with no strings attached. Local governments are free to use these funds in any means they see appropriate. These funds can be used to replace locally generated property tax dollars, fund programs at higher levels or some combination of the two. For some municipalities shared revenues accounts for a large percentage of operating dollars. The average city in Wisconsin is dependent on shared revenues for about one in every four dollars of revenue, for villages about one in five dollars of revenue comes from shared revenues and for towns about 16 percent of total revenues is from shared revenues.

Given Wisconsin's persistent structural deficit in the state budget, the fiscal relationship between state and local governments has come under intense scrutiny. Because of the relative size of the program, state shared revenues have been at the focal point of this discussion. The applied research presented in this paper attempts to shed light on a simple question: how do local officials treat state shared revenues. Do they use shared revenues to expand local programs and spending higher than if the shared revenues programs were not in place? Or do they substitute state monies for local monies driving down the property tax? More generally, how do local residents benefit from shared revenues?

Using data for 581 Wisconsin cities and villages from the late 1990s, we find four piece of evidence that sheds light on these fundamental questions. First, using simple growth indices (Figures 1 and 2) we find that when shared revenues started to stagnate, local officials where forced to place upward pressure on the property tax. We speculate that as the future of share revenues became less certain, local officials started treating the revenues in a different light. Rather than building shared revenues into the base budget and substitute them for local property taxes, local officials are now less willing to depend on shared revenues with any degree of certainty. Rather, as shared revenues become less predictable, local officials increasingly treat shared revenues as transitory in nature.

Second, we find strong statistical evidence that shared revenues are stimulative to local spending at a level greater than predicted by simple economic theory. For every dollar of shared revenues per capita we find that total local spending per capita increase by between 46 and 55 cents. Given our first result, we might expect stimulative effect to increase as the future of shared revenues become cloudier. Third, the presence of shared revenues does place some downward pressure on property taxes to the tune of between 32 and 41 cents for every dollar of shared revenues. Finally, we find strong evidence that as local income increases, the demand for local public goods and services increases and local residents are willing to raise property taxes to ensure that those services are provided.

Given the structure of the aidable revenues formula, local officials have a strong incentive not to make a dollar-for-dollar substitution of shared revenues for local property taxes. Our theory of local government fiscal behavior and the empirical evidence documents the level to which such a substitution will take place. Local officials have tended to use shared revenues to simultaneously increase local spending and place downward pressure on property taxes. Given the high demand for quality public goods and services Wisconsin residents have come to expect, coupled with the incentives built into the shared revenues aidable formula, local officials tend to use shared revenues to enhance local services.

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Table 1: Wisconsin Local Governments Sources of Revenue

	All Local Government	Cities	Villages	Towns	Counties
General Property Taxes	32.8%	41.6%	49.5%	45.6%	36.0%
State Shared Revenues	4.3%	27.4%	19.3%	15.7%	5.3%
Other State Aids	42.9%	9.6%	11.6%	23.6%	40.6%
Federal Aids	4.8%	7.2%	3.4%	4.6%	3.6%
Charges/Fees	15.2%	14.2%	16.3%	10.6%	14.5%

Table 2:   Flypaper Effects Wisconsin Cities and Villages

Dependent Variable: Per Capita Total Expenditures	Model A	Model B	Model C
Shared Revenues Per Capita	-0.0772	0.5477	0.4579
	(0.51)	(3.25)	(2.57)
Per Capita Income	-	0.0123	0.0146
		(7.30)	(7.42)
Percent of the Population Under 18	-	-	-601.6752
			(1.58)
Percent of the Population Over 65	-	-	713.7371
			(2.37)
Percent of the Population with at Least a HS Ed.	-	-	14.2123
			(0.05)
Total Number of Households	-	-	0.0036
			(1.07)
Percent of Housing Stock Built between 1970-1990	-	-	69.3617
			(0.60)
Percent of Houses Owner Occupied	-	-	-673.6551
			(5.09)
Constant	681.5391	318.5563	669.4052
	(20.75)	(5.42)	(5.09)
Adjusted R^2	-0.0003	0.0817	0.1724
Fstat	0.26	26.81	14.89
N	581	581	581

The t-statistics are in parentheses where a value greater than 1.96 suggests that the relationship
is statistically significant.

Table 3 Flypaper Effects Wisconsin Cities and Villages

Dependent Variable: Per Capita Property Taxes	Model A	Model B	Model C
Shared Revenues Per Capita	-0.8289	-0.3181	-0.4080
	(10.92)	(4.10)	(5.40)
Per Capita Income	-	0.0101	0.0106
		(12.97)	(12.65)
Percent of the Population Under 18	-	-	-393.5627
			(2.44)
Percent of the Population Over 65	-	-	406.5018
			(3.18)
Percent of the Population with at Least a HS Ed.	-	-	-330.4735
			(2.48)
Total Number of Households	-	-	0.0029
			(2.06)
Percent of Housing Stock Built between 1970-1990	-	-	-85.3483
			(1.75)
Percent of Houses Owner Occupied	-	-	-488.9945
			(8.71)
Constant	350.9869	54.3062	480.4228
	(21.36)	(2.01)	(5.59)
Adjusted R^2	0.1707	0.3554	0.4997
Fstat	119.19	160.92	73.43
N	581	581	581

The t-statistics are in parentheses where a value greater than 1.96 suggests that the relationship
is statistically significant.

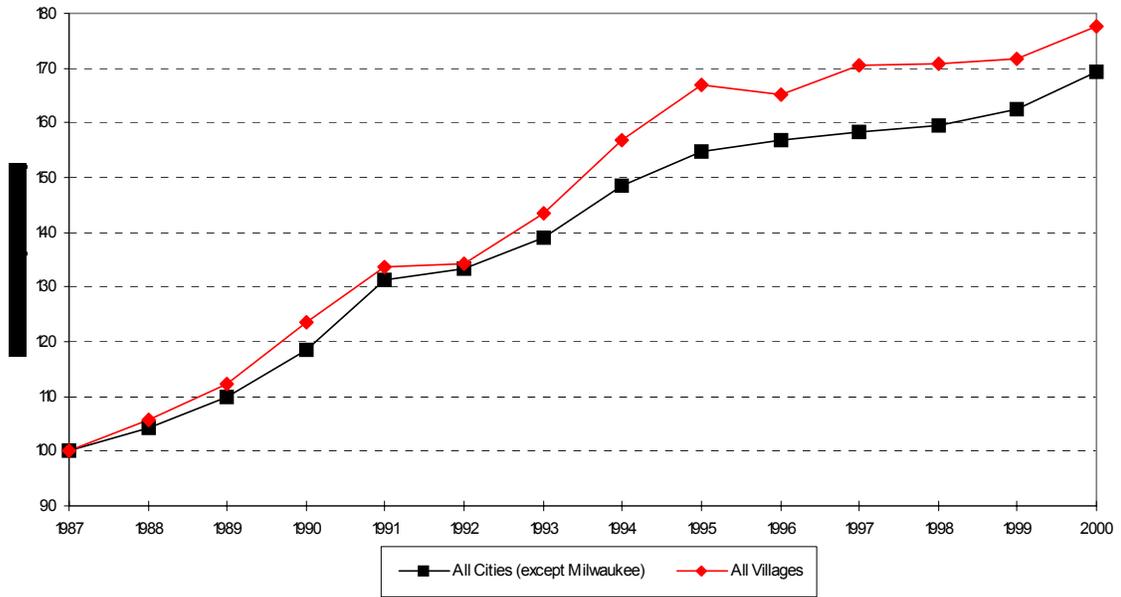**Figure 1: Growth in Shared Revenues: 1987-2000 Wisconsin Cities and Villages**

Figure 2: Growth in General Property Taxes: 1987-2000 Wisconsin Cities and Villages