Analysis by

BALL STATE UNIVERSITY
CENTER FOR BUSINESS AND ECONOMIC RESEARCH

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LOCAL GOVERNMENT CONSOLIDATION:

POTENTIAL SAVINGS DUE TO ECONOMIES OF SCALE & EFFICIENCY GAINS

ANALYSIS OF LOCAL GOVERNMENT FUNCTIONS

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LOCAL GOVERNMENT FUNCTIONS

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» EXECUTIVE SUMMARY

This study provides estimates of the potential savings from consolidating local government units in New Jersey. To provide these estimates, we examine data on local government units in New Jersey and surrounding states. A detailed analysis of school districts in New Jersey is provided in a separate report. Here we evaluate savings that may occur through combining local governments to achieve economies of scale and reduce G-inefficiency (*G-inefficiency* is the type of government inefficiency resulting from overlapping districts, redundant activities and unclear lines of responsibility).

We employ two different models to examine these potential savings. The economies of scale model examines how average local government expenditures (or costs) vary with population. The efficiency model examines how average local government expenditures vary with the number of local governments in a county. Estimates from these models are used to calculate the annual savings that could be achieved from reducing the number of local governments. We examine several government functions within the five-state region. We find that the potential savings from consolidation are substantial and are attributable to improvements in efficiency rather than taking advantage of economies of scale.

Our study reports clear evidence that the per-resident costs of services in the smallest governments in New Jersey are higher than in medium sized and larger governments. This is true across services, including central staffing, financial administration, fire services, highways, parks and recreation, police and sewage systems. Our technical analysis matches the common sense observation that the necessary overhead costs of government services will be lower for each taxpayer if they are spread across more taxpayers. However, our estimates point to relatively small potential savings due to economies of scale. This does not mean that specific governmental activities and especially small districts cannot be consolidated to reduce costs, however significant statewide savings due to economies of scale from consolidation of non-school activities are unlikely.

In contrast, we find widespread and meaningful costs associated with G-inefficiency in the provision of local services. To illustrate our findings, we simulate a single consolidation in each New Jersey county, reducing the average number of local governments by one. We report the impacts on the average, and the largest of New Jersey's counties. Here the savings are quite significant. We find that the consolidation of two school districts in a typical county would save roughly $10.5 million, and over $39 million in the largest county (for counties with population less than 500,000). Other savings are more modest, but still significant. Consolidation of city police functions

would save $964,000 in the average sized county (a merger of two departments only), and over $4.5 million in the largest counties (for counties with populations below 1 million). Likewise, health services consolidation would result in roughly $215,000 in an average New Jersey county and over $1 million in a large county (for counties with populations below 1 million). The smaller effects involve fire departments, where consolidation would save $98,000 in the average county and $365,000 in the largest county (for counties with populations below 500,000).

Potential savings from government consolidation in New Jersey are significant, and result from the inefficiencies of overlapping government, with unclear and duplicate responsibilities. To place this in context, the median New Jersey county has 58 local governments (including county, cities, townships, special districts and school districts) for which we have simulated the consolidation of but two local governments. This leaves an astonishing 57 local governments in a typical county. Even under this modest simulation of consolidation, we see savings in the average New Jersey County of roughly $11.5 million and roughly $45 million in a large county. More ambitious consolidations would result in much larger savings. However, the savings associated with this type of consolidation should be considered 'potential' savings to taxpayers. Local fiscal decisions permit governments to either realize savings or employ these savings to provide other public goods or services, or improve the quality of existing services.

We find that the potential savings from consolidation are substantial and are attributable to improvements in efficiency rather than taking advantage of economies of scale.

» INTRODUCTION

The goal of this project is to estimate the potential savings from consolidating local government units. To do so, we examine local government units in New Jersey and the surrounding states (Connecticut, Delaware, Pennsylvania, and New York). A detailed analysis of school districts is provided in a separate report. In this analysis, we evaluate potential savings due to economies of scale and improved efficiency that may result from consolidation. To do so, we estimate potential savings using two sets of statistical (regression) models and data on local government spending per capita in New Jersey and the surrounding states (Figure 1). The economies of scale model examines how average local government expenditures (or costs) varies with population. The efficiency model examines how average local government expenditures vary with the number of local governments in a county. Estimates from these models are used to calculate the annual savings that could be achieved from reducing the number of local governments.

Economies of scale arise from the presence of fixed costs. These costs do not vary with the size of a municipality and will be higher in smaller communities. Proponents of local government consolidation argue that by consolidating units of government, fixed cost can be spread over a larger geographic area and larger population, therefore lowering the average cost of providing local government services. We examine how observed local government spending varies with the population served to determine if consolidation is likely to lower spending. If so, then we determine the magnitude of this potential savings.

Government efficiency is measured differently from economies of scale. We measure what we term "G-inefficiency." This type of inefficiency results from overlapping jurisdictions or unclear boundaries of authority (either geographic or functional), which increases the cost of coordinating the provision of public services. We examine how the number of local governments in a county influences local government spending.

FIGURE 1 » **FIVE-STATE STUDY AREA**

For communities of different sizes, we examine economies of scale and efficiency for several government functions including fire, police, community development, parks and recreation, etc. In this analysis we control for other factors that might lead to differences in per capita government spending. The results of these models provide information on: the specific government functions that are likely to experience cost savings from consolidation; the source of the savings (economies of scale or efficiency gains); the population size of jurisdictions likely to experience savings; and how the average expenditures for these government functions in New Jersey compare with the surrounding states.

BACKGROUND

Before providing empirical estimates of scale economies and G-inefficiencies, it is helpful to explain both phenomena in detail. Scale economies arise from the presence of fixed production costs (such as overhead). For local governments, the existence of costs that do not vary with the size of the municipality will, all else being equal, be higher in smaller communities.[1] As is the case in similar studies, we cannot estimate what is the optimal (or least cost) size of government. Instead, we can simply measure whether or not observed expenditures in the states we sample differ with the quantity of public services they provide. Like other researchers in this field, we typically use a jurisdictions population as a measure of public service quantity. Local governments understand overhead costs, and this understanding is the dominant explanation for annexation efforts by local governments. Annexation by cities is an acceptance of the potential presence of scale economies in local government service provision.

We measure the efficiency of local government differently from the way we estimate scale economies. In this study we measure what we term G-inefficiency. This type of inefficiency arises when the mechanisms for making optimal managerial decisions are distorted or absent. This G-inefficiency is present when governments suffer overlapping or unclear boundaries of authority (either geographic or functional) which give rise to increasing coordination costs during service provision. Berry (2008) provides a strong argument and empirical evidence of inefficiency related to overlapping governmental activities. And, the remainder of this study provides both an empirical framework and estimation results supporting the presence of G-inefficiency.

Managerial related inefficiencies attributable to large size has long been observed in private sector firms. This X-inefficiency arises when the mechanisms for making appropriate managerial decisions are weakened. "X-efficiency is not the same thing as what is frequently referred to as technical efficiency, since X-efficiency may arise for reasons outside the knowledge or capability of management attempting to do the managing . . . In other words, it is not only a matter of techniques of management, or anything else "technical" in carrying out decisions, that is involved in X-efficiency" (Leibenstein 1980, 27-28).

[1]*Because local governments are not perfectly competitive firms, the strict use of a cost curve to estimate optimal production is inappropriate. This means the cost model can only be estimated against the "best" or least cost production, not optimal level. This holds little import to the overall findings.*

We extrapolate this argument to local government and label this concept G-inefficiency to differentiate this type of inefficiency from that which occurs in private sector firms. G-inefficiency occurs because some key factors that would control costs or improve quality are not present in the structure of government. While this is hardly a challenging argument to make, empirical findings have supported the argument. Vitaliano (1997) does this specifically in his treatment of public library efficiency, specifying a cost function from which he estimates a deviation from efficient production levels. However, a clear delineation between our G-inefficiency and the more traditional X-inefficiency is not clear, not least because the basic analysis of X-inefficiency was aimed at the private sector. Niskanen (1971) links Leibenstein's X-inefficiency to the public sector by arguing that overprovision of public services, not technical efficiency, results from public sector decisions.

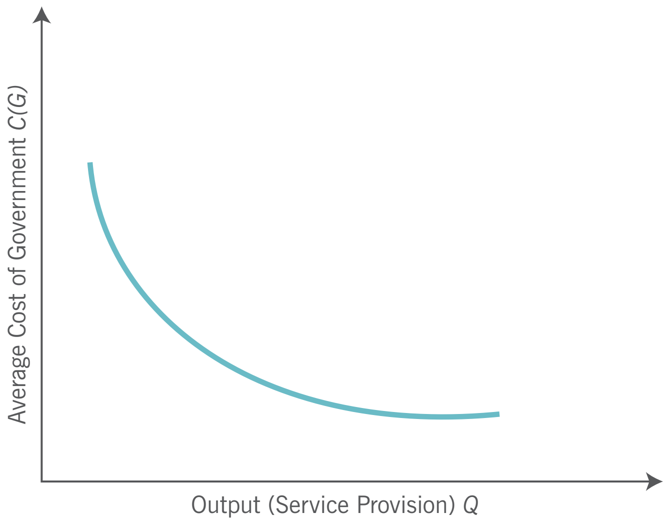
Reporting the results of a meta-analysis of X-inefficiency studies in the *American Economic Review*, Ken Button and Thomas Weyman-Jones find: "bureaucratic or publicly administered industries are on average less efficient, have lower extremes of efficiency, and show a wider dispersion of efficiency than privately owned, competitive, or weakly regulated industries." (1992, 444). The magnitude of these effects, scale economies and G-inefficiencies, is the focus of the following section of the study. We begin with scale economies.

Economies of Scale in Local Government

Scale economies exist in the private sector when a firm that optimizes its production costs in the face of some fixed costs (e.g. plant and equipment, office space, or insurance coverage) enjoys lower per unit production costs as production grows. This idea is among the first economic phenomenon to be discussed by scholars (as early as Thomas Aquinas) and is applicable to government as well as the private sector, though we might relax the assumption that government is attempting to minimize costs. There is an extensive literature that estimates the presence of economies of scale in government activities, ranging from public safety to schools. An economist writing in 1934 found:

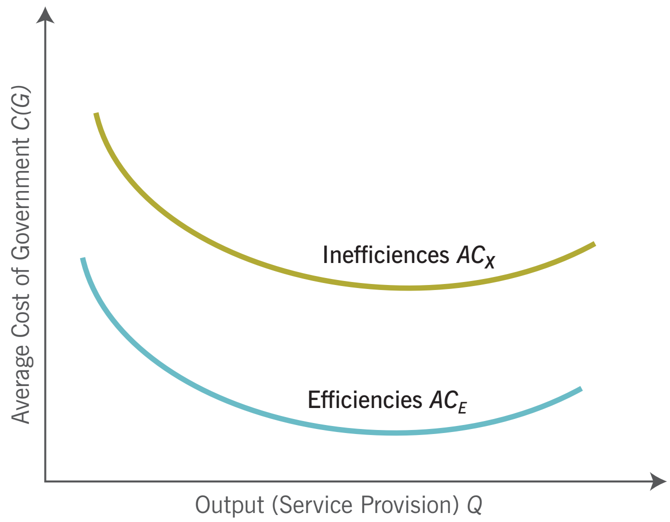
> In Colorado counties with less than 20 million dollars in assessed valuation and below 20,000 in population paid more than three times as much for county services as compared to costs of similar services in the wealthier counties above 20 million in valuation and 20,000 in population. Similar findings were made in Mississippi and North Carolina only the costs of the poorer coun-

FIGURE 2 » **ECONOMICS OF SCALE**



SOURCE: Adapted from Faulk and Hicks (2011).

FIGURE 3 » **G-INEFFICIENCY**



SOURCE: Adapted from Faulk and Hicks (2011).

> ties were higher compared with the wealthier units. (Heckart 1934, 536).

Another researcher, writing in regard to local government structure and costs in 1937 offers:

> Many of the modern functions of government cannot be performed efficiently unless they are conducted on a reasonably large scale. A small population means high unit costs. Furthermore, a small population generally is associated with a low population density. A few people are distributed over a large area in such a way that the cost of roads and schools per capita becomes very high. (Scoville 1937, 288-289).

The traditional picture of scale economies [2] presents the cost of an activity across the range of production. See Figure 2.

G-inefficiency in Local Government

Economists (and the general public) have long recognized that there is likely to be a general slackness in government operations. G-inefficiency occurs when a government fails to produce the maximum output obtainable with a given level of inputs. The result is that costs are higher. Graphically, AC_e is the efficient level of average cost while AC_x represents higher costs to produce any given level of output. See Figure 3. Lack of competition is one reason that government fails to achieve minimum costs. Local government is the only provider of many services and for many services this makes sense. Without competition, local government, like a monopoly in the private sector, does not have the same incentive (and perhaps ability if cost saving technology is expensive) to minimize costs. Government inefficiency may result from several sources, including coordination difficulties, corruption, or padding the budget.[3] It is important to note that this is an inherent condition of government, and though it may result from corruption or intentional inefficiencies, it is the absence of efficiency signals through a market that causes the G-inefficiency in government. Coordination difficulties are particularly relevant in this analysis.

Niskanen (1971) developed a specific model of inefficiency in government, which details the relationship between elected officials and bureaucrats. This is an example of a specific model. We will not force a single example of G-inefficiency to explain all circumstances of inefficiency. Without further arguing what most readers will accept as self evident – that government is often less efficient than the private sector—we offer a model of G-inefficiency in local government. Suppose one element of G-inefficiency is, as we have mentioned, caused by coordination failures between local governments. This could simply be the cost involved with police or fire departments resolving border concerns, or perhaps a more complex interaction of tax rates and harmonization.

[2] *Economies of scale and scale economics are synonymous and occur where the average cost (or cost per unit) of producing good* i*, declines as output, Q, increases. In our example, output is government services to residents.*

[3] *Cost savings may also be realized from the joint use of certain common inputs such as billing or accounting. This type of cost savings results from economies of scope which are not addressed in this study. It is generally believed that higher costs resulting from X-inefficiency outweigh cost reductions due to economies of scope (Kaserman and Mayo 1995).*

This has a cost we describe as:

$$C(I) = \alpha + \Omega_1 \sum_{i=1}^{n} G + \tfrac{1}{2}\Omega_2 \left[\sum_{i=1}^{n} G\right]^2$$

which takes the same form as the normalized quadratic cost function with information flows replacing output from the cost function. This form also permits us to derive some simple conclusions about the role coordination costs potentially play in government activity. The first order conditions of this expression suggest that information costs should be a positive, but decreasing cost of the number of units (G) with which a government must coordinate. This is an inter-agency coordination issue and one of several potential mechanisms, all of which have similar predictions about government efficiency.

REVIEW OF RELEVANT STUDIES

Studies of Public Safety Services

Consolidation of specific government functions has a long history in the United States. Public safety services – especially police and fire protection—have been the target of consolidation efforts for over two hundred years. We examine issues surrounding the consolidation of two police or fire departments. The consolidation of police and fire into one public safety unit in a county is not addressed. Proponents of this functional consolidation argue that the consolidation of police (fire) services will increase efficiency through a reduction of duplicate services, equipment and positions, and increase effectiveness by eliminating political tampering, lessening the ability of criminal activity to move from one jurisdiction to another, increasing professionalism, and lowering turnover rates by providing more opportunities in the merged agency. Opponents of the consolidation of police (fire) services argue that local control is important to citizens and lower expenditures are not likely to result from consolidation. Differences between pay scales and issues involving longevity and union membership are identified in the literature as the most difficult to address during consolidations.

If economies of scale exist, the average cost of producing police (fire) services decreases as the level of production increases. Hence, the per citizen costs for police (fire) services will be smaller in larger communities. However, it is particularly difficult to measure the quantity of police (fire) services provided.

Some measures of police services that have been used in the literature include the number of arrests and the inverse crime rate, both of which represent only a small portion of the activities that police officers perform. Studies testing for economies of scale in the production of police services use different measures of cost and services and different assumptions and statistical methods, so it is difficult to compare results or draw firm conclusions. The more recent literature in this area suggests that police services do not experience economies of scale as the level of production increases, so creating larger departments through the consolidation of police services would not lead to lower costs of provision.

McDavid (2007) examined the 1996 consolidation of three police departments in Halifax, Canada. The study compared data from surveys, interviews, and budget and manpower reports three years before and four years after the consolidation. After consolidation the number of sworn officers decreased which resulted in higher workloads for sworn officers. Service levels, as measured by the number of officers serving the population, also decreased. Expenditures on police services increased primarily due to union negotiations, which included substantial salary increases. Consolidation did not affect crime rates. Citizens were also surveyed on their perception of the quality of policy services before and after consolidation. The majority of respondents in each year surveyed (78.1 percent in 1999) believed that the quality of police services stayed the same.

McAninch and Sanders (1988) conducted a survey to measure attitudes of 102 police officers (the entire population of officers) in Bloomington and Normal, Illinois on consolidation of the two departments. They found that majority of the officers believed that a consolidated department would operate more economically, more effectively address local crime, and eliminate duplicate services and equipment. Perceived threats to pension, future raises, choice of days off, and choice of shift assignment were identified as the primary determinants of opposition to consolidation by officers in Bloomington (the larger city).

Finney (1997) examined economies of scale in consolidated police departments for 14 suburban departments over a four-year period in Los Angeles County (CA). In Los Angeles County, 45 percent of the local jurisdictions use intergovernmental agreements to provide police services. He found that the average cost of providing police services (measured by the inverse crime rate and the number of arrests) increased with the quantity of police services provided, which might suggest they experience diseconomies of scale.[4] However, the author noted that the jurisdictions that contracted for police services appear to base their decision on cost considerations in that "police expenditures by the contracting municipalities typically are far below those found in comparably sized cities with independent police departments."[5]

Two earlier studies are worth mentioning at this point.[6] Gyapong and Gyimah-Brempong (1988) estimated a production function for police services using 1984 and 1985 data on 130 municipal police departments in Michigan cities with populations of 5,000 or more. Number of arrests is the measure of output.[7] Their estimate of economies of scale is positive indicating increasing returns to scale, but it is not statistically significant. Earlier, Gyimah-Brempong (1987) found statistically significant diseconomies of scale (average costs increase as the number of arrests increase) in the average police department in Florida using 1982 and 1983 data from 256 police departments in municipalities with populations of 5,000 or more. He also divided the sample to test for economies of scale in small, medium, and large cities. He found that police departments in large cities (41 of the 256 cities in the dataset) experienced statistically significant diseconomies of scale for police services, while police services in small and medium cities did not exhibit significant economies or diseconomies of scale.

Duncombe and Yinger (1993) perform a rigorous analysis of returns to scale in the provision of fire protection services. Their analysis indicates that the provision of fire services exhibits constant returns to population scale, meaning average costs remain constant as provision (measured by the population) increases. This result implies that significant cost savings will not result from the consolidation of fire departments.

Although the analysis of fire services is limited, these studies suggest that the potential for economies of scale and efficiency gains in public safety services may be different for cities of different sizes. The magnitude of scale economies and G-inefficiencies in New Jersey and the surrounding states is the focus of the following section.

[4] *Whether diseconomies of scale exist is difficult to determine. Diseconomies of scale imply that average costs (costs per unit of a service provided) increase as output increases. Thus, the cost of providing law enforcement per average unit increases as more public services are provided. These studies use total expenditure on police services, total number of arrests, and crime rate in each jurisdiction. They find a positive relationship between police expenditures and number of arrests and between police expenditures and the crime rate – two separate equations -- and interpret this relationship to mean that police costs increase with the number of arrests and the crime rate.*

[5] *This suggests that there are severe measurement problems with the statistical methods used in these sorts of studies. The fundamental problem is that public outputs like the production of police services are difficult to measure; these studies have used the intermediate good, arrests, as a proxy for production.*

[6] *Several studies in the 1970s addressed economies of scale and the provision of police services, but studies from this period are not the main focus of this literature review. Walzer (1972) finds that police departments in Illinois experience economics of scale – decreasing average costs (measured as per capita expenditure on police) as the scale (a measure of the quantity of services provided by the police in different jurisdictions) increased. Other studies not reviewed in detail here: Chapman, Hirsch and Sonenblum (1975) also find economies of scale are present for police services. Ehrlich (1973), Popp and Sebold (1972) and Votey and Philips (1972) find diseconomies of scale.*

LOCAL GOVERNMENT IN NEW JERSEY AND SURROUNDING STATES

In Table 1, we show the distribution of local governments by state for the five states included in the analysis: Connecticut, Delaware, New Jersey, New York and Pennsylvania.

In Table 2, we provide an adjusted measure of the number of governments, with the number of governments, by type, per million state residents. New Jersey has the highest number of school districts and the lowest number of special districts per person relative to the surrounding states. For other levels of government, New Jersey is in the middle to lower end of the distribution.

TABLE 1 » LOCAL GOVERNMENTS IN THE STUDY REGION

Local Government Unit	CONNECTICUT	DELAWARE	NEW JERSEY	NEW YORK	PENNSYLVANIA
General Purpose	179	60	587	1,604	2,628
County	—	3	21	57	66
Municipal	30	57	324	618	1,016
Town or Township	149	—	242	929	1,546
Special Purpose	470	278	796	1,799	2,243
Special Districts	453	259	247	1,119	1,728
Public School Systems	166	19	625	716	515
School Districts	17	19	549	680	515
Dependent Public School Systems	149	—	76	36	—
TOTAL	**649**	**338**	**1,383**	**3,403**	**4,871**
State Population (2007)	3,502,309.0	864,764.0	8,685,920.0	19,297,729.0	12,432,792.0
Land Area (State, sq.miles, exclud. water)	4,844.80	1,953.56	7,417.34	47,213.79	44.816.61

SOURCE: 2007 Census of Governments for local government units, 2007 Census Annual Estimates for state population, and 2000 U.S. Census Bureau QuickFacts for land area.

TABLE 2 » GOVERNMENTS PER MILLION RESIDENTS

Local Government Unit	CONNECTICUT	DELAWARE	NEW JERSEY	NEW YORK	PENNSYLVANIA
General Purpose	51.11	69.38	67.58	83.12	211.38
County	—	3.47	2.42	2.95	5.31
Municipal	8.56	65.91	37.30	32.02	81.72
Town or Township	42.54	—	27.86	48.14	124.35
Special Purpose	134.19	321.47	91.64	93.22	180.41
Special Districts	129.34	299.50	28.44	57.99	138.99
Public School Systems	47.39	21.97	71.95	37.10	41.42
School Districts	4.85	21.97	63.20	35.24	41.42
Dependent Public School Systems	42.54	—	8.75	1.86	—
TOTAL	**185.31**	**390.86**	**159.22**	**176.34**	**391.79**

SOURCE: 2007 Census of Governments for local government units, 2007 Census Annual Estimates for state population, and 2000 U.S. Census Bureau QuickFacts for land area.

MODELING PROCEDURE

Overview of Data and Regression Models

We investigate economies of scale for several local government functions including total expenditures, central staffing, financial administration, fire services, highways, parks and recreation, police services and sewage. Using the G-inefficiency model, we examine total expenditures, police, fire, housing and community development, health, parks and recreation, sewage, and solid waste management. We examined several other government functions, including corrections, hospitals, natural resources, and public welfare. Findings indicate either no evidence of economies of scale over any population range, or only a limited number of local governments offer these services in the states examined. These services are not included in the analysis.

Economies of Scale for Government Functions

The specification of the cost function that we use to test for scale economies examines whether local government expenditures increase or decrease with population size. If economies of scale exist, we expect our estimate to reveal coefficients in the negative range along the typical U-shaped cost curve.

We estimate the following regression model:

$$E_i = f(P_i, P_i^2, \text{CT Dummy, DE Dummy, NY Dummy, PA Dummy}, \varepsilon_i)$$

where E_i is per capita expenditures on central staffing, financial administration, etc. in jurisdiction *i*. P is population in jurisdiction *i*. The inclusion of the squared (quadratic) population term is to determine whether or not the estimates occur over a nonlinear range. The state dummy variables control for differences between New Jersey and each of the surrounding states. The random error term ε_i captures unexplained variation.

We use data from the *Census of Governments* for local government units (municipalities, townships, villages, boroughs, etc.) in New Jersey and the surrounding states (Connecticut, Delaware, Pennsylvania, and New York). The Census of Government contains data on the local government expenditures on various government services. We start with the entire sample, over 4,300 general purpose local government units in the five-state region, and then limit the sample to those municipalities, towns, townships, boroughs, villages with smaller and smaller populations. The investigation seeks to determine the size of local government unit where economies of scale are evident in New Jersey and the surrounding states. The purpose of this exercise is to identify the population range at which local government expenditures per capita declines with population and is just above minimum efficient scale, which is the population level where average cost approaches zero. We then examine per capita expenditures for jurisdictions with smaller populations. These models provide estimates of per capita expenditures that are used to simulate potential savings that are attributable to economies of scale due to merging local units of government. The results of these simulations are presented in the next section.

We also determine if the expenditures per capita for various government functions are different among the states in each sample. Descriptive statistics for local governments in the population ranges used in the regression models for each functional area are shown in Appendix A. The definitions of the variables used in analysis are shown in Appendix B.1.

We are interested in identifying that population range where average costs (measured as per capita expenditures) decrease as the population increases. For local government units in this population range, merging with another unit may reduce costs. The specification that we use also allows us to compare per capita expenditures on various services in New Jersey and the surrounding states to test whether expenditures are statistically higher or lower.

We find that for several of the local government functions that we examine (Table 3) economies of scale are evident. Local general purpose governments with populations at 25,000 or below show economies of scale for central staffing, financial administration, parks and recreation and would potentially decrease the cost of providing these services if consolidated with another local government. For fire services, economies of scale are evident in local government units serving a population of 30,000 or less, so consolidating fire services in units with populations smaller than 30,000 has the potential to decrease costs. For police services, economies of scale are evident in units with a population of 4,000 or below, so government units in this population range could decrease policing costs by merging with other units. For highways and sewage, economies of scale are available over the entire population range but the model fit is better for lower population ranges and the potential savings from consolidation is higher for smaller governments.

These results do not explain most of the cost variation. One measure of this is the adjusted R square, which measures the variation in the data that is explained by the model. As is

TABLE 3 » ECONOMICS OF SCALE, LOCAL GOVERNMENT EXPENDITURES (PER CAPITA)—MINIMUM EFFICIENT SCALE

	TOTAL EXPEND.	CENTRAL STAFFING	FINANCIAL ADMIN.	FIRE	HIGHWAYS		PARKS & RECREATION	POLICE	SEWAGE	
Population	<35,000	<25,000	<30,000	<30,000	<1 million	<25,000	<25,000	<4,000	<1 million	<15,000
Constant	1,453.04***	46.31***	88.72***	46.11***	129.31***	193.82***	66.11***	897.85*	171.50***	339.49***
Population	-0.03*	-0.003**	-0.003***	-0.002***	-0.001***	-0.017***	-0.005*	-0.22*	-0.001***	-0.05***
Population SQ	1.23E-06**	1.25E-07*	1.13E-07***	1.01E-07***	2.07E-09***	6.26E-07***	2.46E-07**	4.76E-05*	1.84E-09***	2.81E-06**
CT Dummy	1,397.69***	24.28***	10.77	11.98	42.90***	40.69***	-16.82	-626.14*	-60.79***	-94.65***
DE Dummy	216.91	27.61	248.34**	-24.77	104.64	72.89	1088**	-266.96	108.22*	84.11
NY Dummy	-572.91***	-14.19***	-51.51***	13.06*	63.09***	39.63***	-15.33	-589.72*	-22.66	-65.13***
PA Dummy	-936.12***	-7.60***	-72.93***	-27.88***	-15.13	-46.08***	-37.76***	-634.47*	-64.38***	-122.93***
Adj. R-sq.	0.038	0.002	0.136	0.088	0.054	0.077	0.005	0.082	0.005	0.026
F-statistic	28.48***	2.35**	104.62***	60.03***	41.93***	57.59***	4.16***	20.64***	2.62**	7.75***
Durbin Watson	1.98	2.08	1.97	1.86	1.79	1.82	2.37	0.54	1.91	2.38
Observations	4,165	3,939	3,962	3,647	4,277	4,043	3,167	1,317	1,905	1,541

NOTE: ***0.01 level of significance, **0.05 level of significance, *0.10 level of significance.

TABLE 4 » ECONOMICS OF SCALE, LOCAL GOVERNMENT EXPENDITURES (PER CAPITA)—SMALLER JURISDICTIONS

	TOTAL EXPEND.	CENTRAL STAFFING	FINANCIAL ADMIN.	FIRE	HIGHWAYS	POLICE	SEWAGE
Population	<1,000	<6,000	<1,000	<1,000	<1,500	<2,000	<3,000
Constant	6,285.07***	56.41***	290.03***	132.74***	437.96***	1,629.46*	759.96***
Population	-13.54*	-0.03**	-0.45**	-0.35**	-0.52***	-1.03*	-0.50**
Population SQ	0.01*	4.45E-06**	003**	002**	003***	004*	001**
CT Dummy	-2,117.05	17.61**	-144.17***	-13.79	20.36	-980.69	-303.18***
DE Dummy	-1,849.70	1.09	441.77*	-45.16**	55.05	-602.73	60.97
NY Dummy	-1,268.76	0.94	-111.88***	64.50***	18.20	-948.94	-129.37
PA Dummy	-2,230.98	4.11	-158.46***	-18.32	-123.63	-1021.68	-285.27***
Adj. R-sq.	0.044	0.007	0.271	0.148	0.088	0.138	0.043
F-statistic	8.65***	4.59***	56.41***	25.91***	24.74***	20.80***	6.34***
Durbin Watson	0.39	1.46	2.86	1.20	2.37	0.65	2.87
Observations	985	3,070	897	862	1,468	743	709

NOTE: ***0.01 level of significance, **0.05 level of significance, *0.10 level of significance.

common in most studies across jurisdictions in a single time period, these are quite low for most of the services examined.

At the population nearest the minimum efficient scale, the change in average expenditure for an additional person served is small for most government functions. Average total expenditures decrease by three cents for each additional person served by a local government unit. The decrease in central staffing, financial administration, and parks and recreation expenditures is less than one cent for each additional person served. The largest effect is for police in communities with populations up to 4,000: average police expenditures decrease by 22 cents for each additional person in the service area (Table 3).

In Table 4, we examine a subsample of local governments with much smaller populations. As expected, when an additional resident is added to the jurisdiction, the decrease in per capita expenditures is much larger. For jurisdictions with populations lower than one thousand, total expenditures per capita decreases by $13.54 for each additional resident in the jurisdiction. The largest effect for specific government functions is for police. Per capita expenditures decrease by $1.03 for each additional resident in a jurisdiction with a population lower than 2,000.

TABLE 5 » POTENTIAL SAVINGS DUE TO ECONOMICS OF SCALE—SMALLER GOVERNMENTS

Government Functions	Population	COEFFICIENT	NUMBER OF LOCAL GOVERNMENTS	AVERAGE SAVINGS	AGGREGATE SAVINGS
Total Expenditures*	<1,000	-13.54	985	-6,024	-593,374
Central Staffing	<6,000	-0.02	3,070	-113	-34,593
Financial Administration	<1,000	-0.54	897	-188	-16,842
Fire	<1,000	-0.34	862	-151	-13,016
Highways	<1,500	-0.51	1,468	-366	-53,690
Police	<2,000	-1.03	743	-902	-67,057
Sewage	<3,000	-0.50	709	-767	-54,358

NOTE: *Coefficient is additional expenditure for a one unit change in population. SOURCE: Author's calculations.

Estimates of Potential Savings from Economies of Scale for Specific Government Services

We estimate potential savings from consolidation using the smaller population thresholds in Table 5. For each general purpose local government unit in a county in the five-state region with a population that is below this threshold, we simulate potential savings and then get aggregate savings by summing these potential savings across all units with populations below the threshold. The potential savings from merging the 985 units with a population less than 1,000 into local government units with populations of at least 1,000 is $593,000 per year, for an average savings of just over $6,000 per year. Savings from consolidating central staffing into units with a population of at least 6,000 is $34,593 per year. The potential savings from consolidating 743 police departments in jurisdictions with less than 2,000 with other jurisdictions so that the population is at least 2,000 is just over $67,000 per year or an average of around $900.

Conclusions

In this section, we have estimated the presence of economies of scale for several local government functions across five Mid-Atlantic States. It is clear from these estimates that the per-resident costs of services in the smallest governments are higher than in medium sized and larger governments. These findings hold across service areas, including central staffing, financial administration, fire services, highways, parks and recreation, police and sewage systems. These findings are consistent with economic theory and with the vast majority of published reports and studies that empirically examine the issue. They also align with the common sense observation that the necessary overhead costs of government services will be lower for each taxpayer if they are spread across more taxpayers.

However, the presence of scale economies is not sufficient to spawn a policy intervention. The size of potential savings from local government consolidation also matters. In our estimates, these potential savings are quite small, and are unlikely to be of sufficient magnitude to spawn state level efforts to consolidate governments. This does not mean that specific governmental activities and especially small districts cannot be consolidated to reduce costs, but rather the issue is not a broad, statewide opportunity for savings. However, the presence of other types of efficiencies also influences a discussion of the appropriate size of government and the efficiency by which services are provided. We next turn our attention to this issue.

G-inefficiency in Governmental Functions

In this section, we provide empirical models that examine the presence and size of G-inefficiency in governmental functions. We dicsuss the theory of G-inefficiency as it applies to local governments and the implications for governments that suffer G-inefficiency in their operations. We begin, however, with an explanation of the data we use to test the model of G-inefficiency.

Data, Models and Results

For the analysis of government efficiency, we examine the relationship between the number of local government units in a county and per capita expenditures (total expenditures per capita and expenditures for various local government services). In this analysis we are particularly interested in the differential effects on expenditures per capita of the types of local government, namely cities, townships, or special districts (and school districts for total expenditures).

For the analysis of G-inefficiency, we use data for county areas from the 2002 Census of Governments augmented with other Census data. To estimate G-inefficiencies we use the normalized quadratic cost function. In the efficiency model, information flows replace output as traditionally modeled in a cost function.

The literature with regard to government size is mixed with respect to the interpretation of inefficiencies. Large organizations are more likely to experience intra agency coordination difficulties, a feature of firms documented in Hicks (2007), while the proliferation of many small units may exacerbate interagency coordination. Berry (2008) identifies this problem in overlapping tax jurisdictions. In this paper we are attempting to empirically capture the costs associated with interagency coordination, labeling them G-inefficiency.

We estimate the following regression model:

$$E_i = f(N_i, N_i^2, X_i, \textit{CT Dummy, DE Dummy, NY Dummy, PA Dummy}, \varepsilon_i)$$

where N_i is the number of cities, townships, special districts or school districts in a county (each type of government is a separate variable in the regression). The squared (quadratic) term is included to determine if the number of local government units has a nonlinear effect on per capita expenditures. The vector X_i represents a variety of socioeconomic variables (defined in Appendix B.2). State dummy variables are included to control for differences between New Jersey and each of the surrounding states. The random error term ε_i captures unexplained variation.

The models used to examine G-inefficiencies focus on the relationship between expenditures per capita for various government services in a county area and the number and type of local government units in each county in New Jersey and the surrounding states. The types of local government units included in the analysis are cities, townships and special districts (and school districts for total expenditures). If G-inefficiencies exist, expenditures per capita will increase with the number of government jurisdictions in a county. The higher expenditures may result from coordination problems, managerial inefficiency or other factors discussed above.

We also control for other characteristics that are expected to influence expenditures. GINI is a measure of income inequality, where a GINI coefficient of zero means that the income distribution is perfectly equal (i.e., everyone has the same income) and a GINI coefficient of 100 means one person has all the income and everyone else has none, thus very unequal. We also control for the education level of the population in the county area using two variables, the percentage of persons age 25 or older who have a bachelor's degree or higher and the percentage of persons age 25 or older who have a high school diploma. We include variables to control for per capita income and population density per square mile. The dummy variables for the surrounding states measure expenditures per capita in New Jersey relative to each of the surrounding states. A negative sign on the coefficient indicates that expenditures per capita are lower in the comparison state while a positive sign indicates that expenditures per capita are higher in the comparison state relative to New Jersey. Descriptive statistics appear in Appendix C.

We examine the relationship between the number of local governments and government expenditures per capita for counties in four population groups: counties with population less than 1 million, counties with populations less than 500,000; counties with populations less than 250,000; and counties with population less than 150,000. In this model, we also include school districts in the model for total expenditures, since the presence of any governmental body within the district may contribute to G-inefficiency.

Expenditures

Total Expenditures

In these samples, we find that total local government expenditures per capita is strongly related to the number of school districts and dependent school systems in a county. In counties with populations lower than 500,000, per capita expenditures increase by almost $80 for each additional school district or system in a county. For smaller counties (population lower than 150,000), the effect is even larger. Per capita local government expenditures increase by $108.94 for each additional school district or dependent school system in a county.

Police Expenditures

Per capita expenditures on police are positively and significantly related to the number of cities in counties. For counties with populations below 500,000, per capita police expenditures increase by $6.23 for each additional city in a county within this five-state region.

Other Government Functions

We find that for many local government functions, fire, housing and community development, health, parks and recreation, sewage, and solid waste management, the number of special districts is positively and significantly related to per capita expenditures (Table 6A-E), but the effects are relatively small.

Comparisons with Other States

The results show substantial variation in expenditures among the states in the five-state region that we consider. Total expenditures are significantly lower in Connecticut and Pennsylvania than New Jersey for each of the population groups that we examine. For example in counties with populations below one million, total per capita expenditures by local governments is $750 lower in Connecticut than New Jersey and $719 lower in Pennsylvania than New Jersey.

For police services, per capita expenditures in other states range from $41 to $96 lower than New Jersey for counties with populations below one million. Fire expenditures are more variable with Delaware (-$68) and Pennsylvania (-$36) having lower per capita expenditures than New Jersey and Connecticut ($20) and New York ($18) having higher per capita expenditures than New Jersey (among all counties with populations below one million).[8]

With the exception of New York, per capita expenditures on housing and community development in the surrounding states are not significantly different from New Jersey. Among counties with population lower than one million, per capita expenditures on health are lower in Connecticut (-$35) and Delaware (-$80) than New Jersey and higher in New York ($91). There is no significant differences in per capita health expenditures between New Jersey and Pennsylvania.

In counties with populations lower than one million, per capita spending on parks and recreation is lower in Delaware (-$39) and higher in New York ($19) compared to New Jersey. There is no significant difference in Connecticut and Pennsylvania. Per capita sewer expenditures are lower in Connecticut (-$58) and New York (-$32) relative to New Jersey and not significantly different from New Jersey in the remaining two states for counties with populations lower than one million.

Considering solid waste management for counties with populations lower than one million, per capita expenditures are lower in each of the other states considered relative to New Jersey ranging from $36 lower in New York to $118 lower in Delaware. We do not discuss the remaining variables in detail but proceed to the simulations of potential savings due to efficiency improvements that may result from consolidation.

Potential Savings

In Table 7, we provide a variety of simulations of potential savings from efficiency improvements resulting from consolidation, i.e. lowering the number of local governments in a county. We limit our simulations to those functions and population sizes that show a positive relationship between the number of local government units and per capita expenditures. For example model results for total expenditures in counties with populations less than one million (Table 6A) show that total expenditures per capita are negatively related to the number of townships and positively related to the number of school districts. These competing effects preclude the estimation of potential savings and are not included in the following simulations.

The simulations show the potential savings attributable to a one unit reduction in the number of local governments in a county for different functions and for counties of different population sizes. For the sample of counties with populations below 500,000, merging two school districts (reducing the number of school districts by one) in the average county would result in over $10.5 million in savings per year. In the most populous county, reducing the number of school districts by one would results in over $39 million in savings. Potential savings in counties with populations below 250,000 and below 150,000 are smaller but still substantial. Consolidating several pairs of school districts would result in more saving.

For counties with populations below one million, if the police services of two cities are merged, reducing the number of cities by one in the county, the potential annual savings is over $964,000 per year in the average-sized county and over $4.5 million in the most populous county (Westchester County, CT). For the sample of counties with populations below 250,000, the potential annual savings from consolidating police services is $491,000 in the average county and $1.3 million in the most populous county.

For most other services, savings are based on the consolidation of special districts within a county and vary according to the type of services and population of the counties considered. Savings from merging fire districts range from almost $98,000 a year in the average-sized county to over $365,000 in the largest county (for those counties with populations below 500,000).

Among those counties with populations lower than one million, potential annual savings on health expenditures ranges from $215,000 in the average county to over $1 million in the largest county.

[8] *We recognize that many areas in the five-state region considered in this analysis have volunteer fire departments. We are not able to differentiate between volunteer and paid fire departments in the data used in this analysis.*

TABLE 6 » EFFICIENCY MODEL, LOCAL GOVERNMENT EXPENDITURES PER CAPITA

A. Total Expenditures

	TOTAL			
Population	< 1 million	< 500,000	<250,000	< 150,000
C	-3,597.76	-3,539.67	-2,595.14	-2,265.78
Number of Cities	-13.48	-9.44	-48.12	-29.06
Number of Cities Sq	0.35	0.09	1.30	0.09
Number of Townships	-41.52*	-38.05	-28.07	-54.18
Number of Townships Sq	0.77*	0.73*	0.67	1.34
Number of Special Districts	2.24	2.25	-2.67	-21.81
Number of Special Districts Sq	-0.04	-0.04	-0.039	0.49
Number of School Districts and Dependent Schools	51.98***	79.93***	105.93**	108.94**
Number of School Districts and Dependent Schools Sq	-0.69**	-1.68***	-3.04*	-3.32*
GINI Coefficient	103.73***	100.20**	81.29	86.66*
High School Graduate (%)	39.69	43.65	52.46*	48.31
Bachelors Degree (%)	-52.63***	-53.19***	-48.86**	-48.62**
Per Capita Income	0.06***	0.05*	0.032	0.04
Population Density	-0.07**	-0.20	-0.79	-1.37
CT Dummy	-750.74**	-1,090.67***	-1,729.35***	-1,817.39***
DE Dummy	-862.09*	-968.28	-789.76	-2892.95
NY Dummy	1,232.01***	882.71**	330.56	312.11
PA Dummy	-719.29**	-1,036.79**	-1,646.39***	-1,731.91***
Adjusted R-squared	0.72	0.72	0.77	0.78
F-statistic	24.24***	21.73***	22.21***	21.46***
Durbin-Watson stat	2.02	2.23	2.49	2.49
Observations	152	134	111	97

NOTE: ***0.01 level of significance, **0.05 level of significance, *0.10 level of significance.

Potential savings is largest for consolidation of school districts, police services, health services, and sewerage. However, while statistically significant, mergers of some services may not be practically feasible. For example, the merging of sewerage services is likely to involve large investments in infrastructure which dwarfs potential savings or may be infeasible due to geographic distances.

DISCUSSION AND IMPLICATIONS

In this report we evaluated the presence of scale economies and G-inefficiency for various levels of local government in New Jersey and the surrounding states. The goal was to provide an estimate that would permit us to simulate the cost savings of functional or jurisdictional consolidation of existing government services in New Jersey.

In this approach, we estimated two distinct types of savings. The first are those derived from consolidating services to meet a minimum efficient scale, or, as commonly termed, achieve economies of scale. The second approach measured the level of G-inefficiency, which is caused by the presence of multiple jurisdictions within a county.

From our estimates of potential savings through consolidating governments to the minimum efficient level, it is clear that the per-resident costs of services in the smallest governments are higher than in medium-sized and larger governments. These findings hold across functions, including central staffing, financial administration, fire services, highways, parks and recreation, police and sewage systems. This is not surprising and matches the common sense observation that the necessary overhead costs of government services will be lower for each taxpayer if they are spread across more taxpayers. However, the size of potential savings from local government consolidation also matters. In our estimates, the potential savings attributable

B. Police and Fire

Population	POLICE < 1 million	POLICE < 500,000	POLICE <250,000	POLICE < 150,000	FIRE < 1 million	FIRE < 500,000	FIRE < 250,000	FIRE < 150,000
C	-119.37	-74.56	-141.74	-163.15	-320.96***	-310.04***	-353.82***	-314.31**
Number of Cities	4.79***	6.23***	5.65**	5.89**	0.02	-0.40	-0.54	-3.34
Number of Cities Sq	-0.08***	-0.11***	-0.11*	-0.09	-0.01	0.0002	-0.004	0.12
Number of Townships	-2.56	-4.03**	-2.68	-3.79*	-1.97*	-1.87	-2.66	-3.09*
Number of Townships Sq	0.03	0.05	0.03	0.06	0.03	0.03	0.05*	0.06**
Number of Special Districts	0.28	0.35	-0.07	-0.18	0.72**	0.74**	0.73**	2.71***
Number of Special Districts Sq	-0.005	-0.002	-0.002	-0.002	-0.004**	-0.003*	-0.003*	-0.05***
GINI Coefficient	4.39***	3.02*	4.35**	4.57*	6.41***	5.62***	6.03***	4.90
High School Graduate (%)	-0.08	0.20	-0.81	-0.97	2.08**	2.49***	2.45**	2.52
Bachelors Degree (%)	-0.28	-0.39	-0.36	-0.04	-1.08	-1.02	-1.09	-0.63
Per Capita Income	0.006***	0.006*	0.01**	0.01**	0.0004	-0.0002	0.001	0.001
Population Density	0.008*	0.002	0.05	0.03	0.006***	0.009	0.02	-0.01
CT Dummy	-41.20*	-55.81**	-85.73**	-83.05**	20.38*	7.54	5.77	-14.06
DE Dummy	-83.12***	-167.13***	-103.24***	-96.15	-68.13***	-96.98***	-84.99***	76.87
NY Dummy	-51.25***	-59.45**	-52.005*	-43.81	18.31**	11.48	22.06*	17.06
PA Dummy	-96.27***	-103.89***	-89.54***	-76.88**	-36.49***	-43.09***	-30.37**	-36.75**
Adjusted R-squared	0.77	0.70	0.72	0.74	0.67	0.58	0.59	0.61
F-statistic	34.47***	21.88***	19.78***	19.65***	21.14***	13.50***	11.93***	11.09***
Durbin-Watson stat	1.98	1.56	1.32	1.17	2.01	1.90	1.75	1.85
Observations	152	134	111	97	152	134	111	97

Note: ***0.01 level of significance, **0.05 level of significance, *0.10 level of significance.

C. Housing and Community Development and Health

Population	HOUSING & COMMUNITY DEVELOPMENT < 1 million	HOUSING & COMMUNITY DEVELOPMENT < 500,000	HOUSING & COMMUNITY DEVELOPMENT <250,000	HOUSING & COMMUNITY DEVELOPMENT < 150,000	HEALTH < 1 million	HEALTH < 500,000	HEALTH < 250,000	HEALTH < 150,000
C	-87.85	-37.78	-53.18	-59.34	-186.43	-240.29	-249.45	-286.50
Number of Cities	-0.10	-0.50	-3.98**	-2.55	-0.17	-2.49	-6.23*	-4.92
Number of Cities Sq	0.006	0.04	0.14***	0.07	0.01	0.08	0.22**	0.12
Number of Townships	1.26	0.89	4.28**	4.03*	-2.11	-0.79	2.52	2.64
Number of Townships Sq	-0.02	-0.02	-0.08**	-0.07*	0.05	0.03	-0.04	-0.04
Number of Special Districts	0.78*	0.53	0.42	-0.98	1.07*	0.94*	0.73	-1.32
Number of Special Districts Sq	-0.006*	-0.003	-0.003	0.03	-0.004	-0.002	-0.003	0.06
GINI Coefficient	4.79***	3.73**	3.15*	3.57	3.25	5.28	5.003	6.66
High School Graduate (%)	-0.35	-0.43	-0.17	-0.37	1.65	1.18	2.45	1.81
Bachelors Degree (%)	-0.64	-0.64	-0.39	-0.59	-0.66	-0.95	-0.67	-0.87
Per Capita Income	-0.001	-0.001	-0.001	-0.0007	-0.0004	0.0009	-0.002	-0.0007
Population Density	0.01***	0.02*	0.04	0.02	0.001	0.01	-0.01	0.02
CT Dummy	18.60	6.35	-8.54	18.04	-35.57*	-44.69	-78.47***	-76.69**
DE Dummy	-0.03	-53.37	7.73	-104.57	-80.41***	-89.03	-62.49	-279.43
NY Dummy	-22.51*	-21.32	-16.33	-13.82	91.71***	91.24***	50.47***	68.22***
PA Dummy	4.01	2.98	2.79	4.61	4.62	-4.76	-54.73***	-42.51
Adjusted R-squared	0.42	0.31	0.26	0.17	0.33	0.37	0.42	0.46
F-statistic	8.20***	4.95***	3.59***	2.35***	6.05***	6.15***	6.24***	6.41***
Durbin-Watson stat	2.17	2.23	2.39	2.27	2.05	2.24	2.42	2.61
Observations	152	134	111	97	152	134	111	97

Note: ***0.01 level of significance, **0.05 level of significance, *0.10 level of significance.

D. Parks and Recreation

Population	PARKS AND RECREATION < 1 million	< 500,000	<250,000	< 150,000
C	-267.94	-293.64**	-291.59*	-243.82
Number of Cities	0.60	0.29	-0.33	-3.79
Number of Cities Sq	-0.01	-0.004	0.002	0.14
Number of Townships	-2.37*	-2.43	-3.16	-3.46
Number of Townships Sq	0.03	0.03	0.05	0.06
Number of Special Districts	0.73**	0.61	0.71	3.34**
Number of Special Districts Sq	-0.005**	-0.004**	-0.005*	-0.06**
GINI Coefficient	4.005**	4.58*	4.52	3.07
High School Graduate (%)	1.49	1.56	1.85	1.89
Bachelors Degree (%)	-0.89	-1.01	-1.06	-0.60
Per Capita Income	0.003***	0.004***	0.003**	0.004**
Population Density	-0.001	-0.007	-0.02	-0.07*
CT Dummy	-6.74	-4.95	-19.40	-44.42*
DE Dummy	-39.15*	-46.07	-53.41	106.57
NY Dummy	19.32**	17.54*	7.37	1.84
PA Dummy	-1.31	-1.42	-11.91	-23.03
Adjusted R-squared	0.37	0.29	0.21	0.29
F-statistic	6.97***	4.57***	2.92***	3.62***
Durbin-Watson stat	2.18	2.05	2.02	2.47
Observations	152	134	111	97

NOTE: ***0.01 level of significance, **0.05 level of significance, *0.10 level of significance.

E. Sewage and Solid Waste Management

	SEWAGE				SOLID WASTE MANAGEMENT			
Population	< 1 million	< 500,000	<250,000	< 150,000	< 1 million	< 500,000	< 250,000	< 150,000
C	-237.32	-190.69	-189.62	-93.05	-86.76	-96.66	-163.42	-166.25
Number of Cities	2.32	4.66*	6.31	5.57	-1.10	-1.81	-1.68	-1.33
Number of Cities Sq	-0.03	-0.08	-0.14	-0.12	0.02	0.03	0.02	0.02
Number of Townships	-1.18	-2.80	-5.17	-5.98	-2.52	-2.13	-2.44	-4.19
Number of Townships Sq	0.009	0.03	0.08	0.087	0.05*	0.05	0.05	0.09
Number of Special Districts	1.36*	1.38	1.32	4.29**	0.83**	0.85**	0.84	0.40
Number of Special Districts Sq	-0.01**	-0.01**	-0.01**	-0.06	-0.005**	-0.004	-0.004*	0.001
GINI Coefficient	6.64**	7.00**	7.94**	6.02	3.69*	4.13	4.92	4.83
High School Graduate (%)	1.39	0.42	0.39	0.05	0.54	0.79	1.29	1.63
Bachelors Degree (%)	-1.05	-0.73	-1.08	-0.49	-1.35	-1.41	-1.37	-1.32
Per Capita Income	0.0003	0.001	0.0006	5.74E-06	0.002	0.001	0.002	0.002
Population Density	-0.005	-0.03	0.02	0.009	0.0006	0.004	-0.07**	-0.08*
CT Dummy	-58.40**	-38.18*	-37.26	-62.09*	-51.47**	-53.75**	-60.17	-55.97
DE Dummy	-20.62	-59.39	-87.22	22.56	-102.13***	-118.83***	-112.56**	-125.71
NY Dummy	-44.99**	-37.65*	-44.62	-50.07	-22.32	-36.16**	-37.19*	-36.38
PA Dummy	-31.95	-24.19	-31.25	-43.48	-61.67***	-77.06***	-76.34***	-73.91***
Adjusted R-squared	0.12	0.08	0.06	0.07	0.29	0.26	0.21	0.20
F-statistic	2.43***	1.77**	1.51	1.45	5.13***	4.04***	2.99***	2.61***
Durbin-Watson stat	2.18	2.28	2.02	2.07	1.85	1.58	1.63	1.72
Observations	152	134	111	97	152	134	111	97

NOTE: ***0.01 level of significance, **0.05 level of significance, *0.10 level of significance.

TABLE 7 » ESTIMATES OF POTENTIAL SAVINGS FROM EFFICIENCY IMPROVEMENTS FOR SPECIFIC GOVERNMENT SERVICES

			MEAN		MEDIAN		MINIMUM		MAXIMUM	
Government Function	Population	COEFFICIENT	County Population	Potential Savings	County Population	Potential Savings	County Population	Potential Savings	County Population	Potential Savings
Total—School Districts*	<500,000	79.93	132,057	10,555,316	93,087	7,440,444	4,995	399,250	493,537	39,448,412
Total—School Districts	<250,000	105.93	86,996	9,215,486	69,489	7,360,970	4,995	529,120	233,068	24,688,893
Total—School Districts	<150,000	108.94	71,878	7,830,389	62,335	6,790,775	4,995	544,155	149,833	16,322,807
Police—Cities*	<1 million	4.79	201,309	964,270	108,770	521,008	4,995	23,926	941,371	4,509,167
Police—Cities*	<250,000	5.65	86,996	491,527	69,489	392,613	4,995	28,222	233,068	1,316,834
Fire—Special Districts	<500,000	0.74	132,057	97,722	93,087	68,884	4,995	3,696	493,537	365,217
Fire—Special Districts	<250,000	0.73	86,996	63,507	69,489	50,727	4,995	3,646	233,068	170,140
Housing & Community Development —Special Districts	<1 million	0.78	201,309	157,021	108,770	84,841	4,995	3,896	941,371	734,269
Housing & Community Development—Townships	<150,000	4.03	71,878	289,668	62,335	251,210	4,995	20,130	149,833	603,827
Health—Special Districts	<1 million	1.07	201,309	215,401	108,770	116,384	4,995	5,345	941,371	1,007,267
Health—Special Districts	<500,000	0.94	132,057	124,134	93,087	87,502	4,995	4,695	493,537	463,925
Parks & Recreation—Special Districts	<150,000	3.34	71,878	240,073	62,335	208,199	4,995	16,683	149,833	500,442
Sewage—Special Districts	<1 million	1.36	201,309	273,780	108,770	147,927	4,995	6,793	941,371	1,280,265
Sewage—Cities	<500,000	4.66	132,057	615,386	93,087	433,785	4,995	23,277	493,537	2,299,882
Solid Waste Management—Special Districts	<1 million	0.83	201,309	167,086	108,770	90,279	4,995	4,146	941,371	781,338
Solid Waste Management—Special Districts	<500,000	0.85	132,057	112,248	93,087	79,124	4,995	4,246	493,537	419,506

NOTE: *Coefficient is additional expenditure per capita.

to economies of scale are quite small, and are unlikely to be of sufficient magnitude to spawn state level efforts to consolidate governments. This does not mean that specific governmental activities and especially small districts cannot be consolidated to reduce costs, rather the issue is not a broad, statewide opportunity for savings in non-school activities.

In contrast, we find widespread and meaningful costs associated with G-inefficiency in the provision of local services. In this approach, we estimate the costs of G-inefficiency, and then simulate consolidation in the most conservative fashion possible – the elimination of a single governmental functional unit in each county. For example, we merge two fire departments in each county into one and estimate the cost savings in two contexts: an average sized county and the largest county in each population grouping.

From the simulations derived from the efficiency model, we find that a minimal consolidation of schools would annually save roughly $10.5 million in a typical county to over $39 million in the largest county. Other savings are more modest, but not trivial. Consolidation of police functions would save $964,000 in the average sized county (a merger of two departments only), and over $4.5 million in large counties. Likewise, health services consolidation would result in roughly $215,000 in an average New Jersey County and over $1 million in a large county. Fire department consolidation would save $98,000 in the small county and $365,000 in the large county.

Potential savings from government consolidation in New Jersey are significant. The median New Jersey county has 58 local governments, for which we have simulated the consolidation of but two local governments, leaving an astonishing 57 local governments in this county. Even under this modest simulation of consolidation, we see savings in the average New Jersey County of roughly $11.5 million and roughly $45 million in a large county.

As we have noted, the savings associated with this type of consolidation should be considered 'potential' reductions in costs to taxpayers. Local fiscal decisions permit governments to either realize cost savings or employ these savings to provide other public goods or services.

» REFERENCES

Berry, C. R. 2008. Piling on: Multilevel government and the fiscal common-pool. *American Journal of Political Science* 52(4): 802-820.

Button, K., and T. Weyman-Jones. 1992. Ownership, institutional organization and measured X-inefficiency. *American Economic Review* 82(2): 439-445.

Chapman, J. I., W. Z. Hirsch and S. Sonenblum. 1975. Crime prevention, the police production function and budgeting. *Public Finance* 30(2): 197-215.

Duncombe, W., and J. Yinger. 1993. An analysis of returns to scale in public production, with an application to fire protection. *Journal of Public Economics* 52(1): 49-72.

Ehrlich, I. 1973. Participating in illegitimate activities: A theoretical and empirical analysis. *Journal of Political Economy* 81(3): 521–567.

Faulk, D. and M.J. Hicks. 2011. *Local government consolidation in the United States.* Youngstown, New York: Cambria Press.

Finney, M. 1997. Scale economics and police department consolidation: Evidence from Los Angeles. *Contemporary Economic Policy* 15(January): 121-126.

Gyapong, A. O., and K. Gyimah-Brempong. 1988. Factor substitution, price elasticity of demand and returns to scale in police production: Evidence from Michigan. S*outhern Economic Journal* 54(4): 863-878.

Gyimah-Brempong, K. 1987. Economies of scale in municipal police departments: The case of Florida. *Review of Economics and Statistics* 69(2): 352-356.

Heckart, S. R. 1934. County consolidation in Colorado. Journal of Farm Economics 16(3): 535-539.

Hicks, M. J. 2007. *Why keep Indiana's property tax?* Bureau of Business Research, Ball State University, Muncie, Indiana.

Leibenstein, H. 1980. *Inflation, income distribution and X- efficiency theory: A study prepared for the Internacional Labour office within the framework of the World Emploment Programme.* Lanham, MD: Rowman & Littlefield Publishers.

McDavid, J. C. 2007. The impacts of amalgamation on police services in the Halifax Regional Municipality. *Canadian Public Administration* 45(4): 538-565.

McAninch, T., and J. Sanders. 1988. Police attitudes toward consolidation in Bloomington/Normal, Illinois: A case study. *Journal of Police Science and Administration* 16(2): 95-104.

Niskanen, W. A. 1971. *Bureaucracy and Representative Government.* Chicago: Aldine Atherton.

Popp, D. O., and F. D. Sebold. 1972. Quasi return to scale in provision of police service. *Public Finance* 27(11): 1-18.

Scoville, O. J. 1937. Liquidating town government in decadent rural areas of Maine. *The Journal of Land & Public Utility Economics* 13(3): 285-291.

U.S. Census Bureau. 2000. *State and county quickfacts.* http://quickfacts.census.gov/qfd/index.html.

U.S. Bureau of the Census. 2002. *Compendium of government finances.* Census of Governments 2002 vol. 4, no. 5. Washington D.C.: U.S. GPO.

U.S. Bureau of the Censues. 2002. *Compendium of public employment*. Census of Governments 2002 vol. 3, no. 2. Washington D.C.: U.S. GPO.

U.S. Bureau of the Censues. 2007. *Employment of major local governments*. Census of Governments 2007 vol. 3, no. 1. Washington D.C.: U.S. GPO.

U.S. Bureau of the Censues. 2007. *Government organization*. Census of Governments 2007 vol. 1, no. 1. Washington D.C.: U.S. GPO.

Vitaliano, D. F. 1997. X-inefficiency in the public sector: The case of libraries. *Public Finance Review* 25(6): 629-644.

Vojnovic, I. 2000. The transitional impacts of municipal consolidations. *Journal of Urban Affairs* 22(4): 385-417.

Votey, H. L., and L. Philips. 1972. Police effectiveness and the production function for law enforcement. *Journal of Legal Studies* 1(2): 423-436.

Vojnovic, I. 2000. The transitional impacts of municipal consolidations. *Journal of Urban Affairs* 22(4): 385-417.

Votey, H. L., and L. Philips. 1972. Police effectiveness and the production function for law enforcement. *Journal of Legal Studies* 1(2): 423-436.

Walzer, N. 1972. Economies of scale in municipal police services: The Illinois experience. *The Review of Economics and Statistics* 54(2): 423-436.

» APPENDIX A

TABLE A.1 » DESCRIPTIVE STATISTICS OF ECONOMIES OF SCALE FOR VARIOUS GOVERNMENT FUNCTIONS

	MEAN	STANDARD DEVIATION	MEDIAN	MINIMUM	MAXIMUM	OBSERVATIONS (N)
Total Expenditures, Population < 35,000						
Population	4,620	5,953	2,306	4	34,950	4,165
Expenditures per capita	695.08	2,176.89	3997	0.00	119,857	4,165
CT Dummy	0.03					115
DE dummy	0.01					28
NJ Dummy	0.06					241
NY Dummy	0.35					1,473
PA Dummy	0.55					2,308
Central Staffing, Population < 25,000						
Population	4,119	4,754	2,251	13	24,993	3,939
Expenditures per capita	29.99	119.40	19.90	0.77	6,371	3,939
CT Dummy	0.02					68
DE dummy	0.00					3
NJ Dummy	0.04					162
NY Dummy	0.36					1,429
PA Dummy	0.58					2,277
Financial Administration, Population < 25,000						
Population	4,149	4,722	2,301	13	24,993	3,962
Expenditures per capita	21.25	82.79	9.01	0.13	2,960	3,962
CT Dummy	0.03					103
DE dummy	0.01					22
NJ Dummy	0.06					223
NY Dummy	0.36					1,418
PA Dummy	0.55					2,196
Fire, Population < 30,000						
Population	4,475	5,467	2,314	13	29,871	3,647
Expenditures per capita	30.23	66.05	14.60	0.05	1,428	3,647
CT Dummy	0.03					100
DE dummy	0.00					8
NJ Dummy	0.06					225
NY Dummy	0.31					1,120
PA Dummy	0.60					2,194
Highways, Population < 1 million						
Population	7,311	22,202	2,458	13	755,924	4,277
Expenditures per capita	136.40	171.56	101.11	0.07	6,535	4,277
CT Dummy	0.03					139
DE dummy	0.01					26
NJ Dummy	0.06					275
NY Dummy	0.36					1,521
PA Dummy	0.54					2,316

TABLE A.1 » CONTINUED

	MEAN	STANDARD DEVIATION	MEDIAN	MINIMUM	MAXIMUM	OBSERVATIONS (N)
Highways, Population < 25,000						
Population	4,076	4,709	2,255	13	24,993	4,043
Highway Expenditures per capita	1390	175.65	102.56	3.69	6,535	4,043
CT Dummy	0.03					102
DE dummy	0.01					23
NJ Dummy	0.05					214
NY Dummy	0.35					1,429
PA Dummy	0.56					2,275
Parks and Recreation, Population < 25,000						
Population	4,845	5,022	2,960	13	24,993	3,167
Expenditures per capita	30.93	196.55	8.65	0.11	9,256	3,167
CT Dummy	0.03					101
DE dummy	0.00					14
NJ Dummy	0.07					215
NY Dummy	0.42					1,316
PA Dummy	0.48					1,521
Police, Population < 4000						
Population	1,885	1,014	1,802	20	3,995	1,317
Expenditures per capita	98.12	417.71	37.37	0.25	12,800	1,317
CT Dummy	0.01					19
DE dummy	0.01					17
NJ Dummy	0.03					35
NY Dummy	0.38					495
PA Dummy	0.57					751
Sewer Expenditures, Population < 1 million						
Population	12,065	30,168	4,768	24	755,924	1,905
Expenditures per capita	117.75	369.71	68.38	0.03	8,162	1,905
CT Dummy	0.05					90
DE dummy	0.01					13
NJ Dummy	0.11					213
NY Dummy	0.39					752
PA Dummy	0.44					837
Sewer Expenditures, Population < 15,000						
Population	4,550	3,732	3,348	24	14,991	1,541
Expenditures per capita	126.23	4096	65.99	0.07	8,162	1,541
CT Dummy	0.02					38
DE dummy	0.01					10
NJ Dummy	0.08					117
NY Dummy	0.40					618
PA Dummy	0.49					758

SOURCE: Calculated from 2002 Cenus of Governments.

» APPENDIX B

TABLE B.1 » VARIABLES AND DATA DEFINITIONS, ECONOMIES OF SCALE MODEL

VARIABLE	DEFINITION
Total Expenditures	Per capita expenditures related to all amounts of money paid out by a government—net of recoveries and other correcting transactions—other than for retirement of debt, investment in securities, extension of credit, or as agency transactions. Note that expenditure includes only external transactions of a government and excludes noncash transactions, such as the provision of perquisites or other payments in kind.
Central Staffing	Per capita expenditures related to government-wide executive, administrative, and staff service agencies other than financial, judicial, legal, and Federal or state legislative activities. EXAMPLES: Office of the chief executive, mayor, city manager, county administrator; central personnel administration; overall planning and zoning; clerk's office, recorder, and general public reporting; central staff executive and administrative agencies. For local governments, this also includes legislative activities such as city or county council, board of supervisors, commissioners, etc.
Financial Administration	Per capita expenditures on activities involving finance and taxation. Includes: central agencies for accounting, auditing, and budgeting; the supervision of local government finances; tax administration; collection, custody, and disbursement of funds; administration of employee retirement systems; debt and investment administration; and the like in local government units with population below 25,000.
Fire	Per capita expenditures related to fire fighting organization and auxiliary services; fire inspection and investigation; support of volunteer fire forces; and other fire prevention activities. Includes cost of fire fighting facilities, such as fire hydrants and water, furnished by other agencies of the government.
Highways	Per capita expenditures related to construction, maintenance, and operation of highways, streets, and related structures, including toll highways, bridges, tunnels, ferries, street lighting and snow and ice removal. However, highway policing and traffic control are classed under Police protection.
Parks and Recreation	Per capita expenditures related to the provision and support of recreational and cultural-scientific facilities and activities including golf courses, play fields, playgrounds, public beaches, swimming pools, tennis courts, parks, auditoriums, stadiums, auto camps, recreation piers, marinas, botanical gardens, galleries, museums and zoos. This also includes building and operation of convention centers and exhibition halls.
Police	Per capita expenditures related to the preservation of law and order and traffic safety. Includes police patrols and communications, crime prevention activities, detention and custody of persons awaiting trial, traffic safety, and vehicular inspection.
Sewage	Per capita expenditures related to provision of sanitary and storm sewers and sewage disposal facilities and services, and payments to other governments for such purposes.
Population	Population in 2002
CT Dummy	=1 for local governments in Connecticut =0 otherwise
DE Dummy	=1 for local governments in Delaware =0 otherwise
NY Dummy	=1 for local governments in New York =0 otherwise
PA Dummy	=1 for local governments in Pennsylvania =0 otherwise

TABLE B.2 » VARIABLES AND DEFINITIONS, G-INEFFICIENCY MODEL

VARIABLE	DEFINITION
Total Expenditures	Per capita expenditures related to all amounts of money paid out by a government—net of recoveries and other correcting transactions—other than for retirement of debt, investment in securities, extension of credit, or as agency transactions. Note that expenditure includes only external transactions of a government and excludes noncash transactions such as the provision of perquisites or other payments in kind.
Fire	Per capita expenditures related to fire fighting organization and auxiliary services; fire inspection and investigation; support of volunteer fire forces; and other fire prevention activities. Includes cost of fire fighting facilities, such as fire hydrants and water, furnished by other agencies of the government.
Health	Per capita expenditures related to outpatient health services, other than hospital care, including: public health administration; research and education; categorical health programs; treatment and immunization clinics; nursing; environmental health activities such as air and water pollution control; ambulance service if provided separately from fire protection services; and other general public health activities such as mosquito abatement. School health services provided by health agencies (rather than school agencies) are included here. Sewage treatment operations are classified under Sewerage.
Housing and Community Development	Per capita expenditures related to construction and operation of housing and redevelopment projects, and other activities to promote or aid housing and community development.
Parks and Recreation	Per capita expenditures related to the provision and support of recreational and cultural-scientific facilities and activities including golf courses, play fields, playgrounds, public beaches, swimming pools, tennis courts, parks, auditoriums, stadiums, auto camps, recreation piers, marinas, botanical gardens, galleries, museums and zoos. This also includes building and operation of convention centers and exhibition halls.
Police	Per capita expenditures related to the preservation of law and order and traffic safety. Includes police patrols and communications, crime prevention activities, detention and custody of persons awaiting trial, traffic safety and vehicular inspection.
Sewage	Per capita expenditures related to the provision of sanitary and storm sewers, sewage disposal facilities and services, and payments to other governments for such purposes.
Solid Waste Management	Per capita expenditures related to street cleaning, solid waste collection and disposal, and provision of sanitary landfills.
Number of Municipalities	Organized local governments authorized in state constitutions and statutes and established to provide general government for a defined area; includes those governments designated as cities, boroughs (except in Alaska), towns (except in the six New England states, Minnesota, New York, and Wisconsin), and villages. This concept corresponds generally to the ''incorporated places'' that are recognized in Census Bureau reporting of population and housing statistics, subject to an important qualification: the count of municipal governments in this report excludes places that are currently governmentally inactive.
Number of Townships	Organized local governments authorized in state constitutions and statutes and established to provide general government for areas defined without regard to population concentration. This includes those governments designated as towns in Connecticut, Maine (including organized plantations), Massachusetts, Minnesota, New Hampshire (including organized locations), New York, Rhode Island, Vermont, and Wisconsin, and townships in other states.
Number of Special Districts	All organized local entities (other than counties, municipalities, townships, or school districts) authorized by state law to provide only one or a limited number of designated functions, and with sufficient administrative and fiscal autonomy to qualify as separate governments; known by a variety of titles, including districts, authorities, boards, and commissions.

TABLE B.2 » CONTINUED

VARIABLE	DEFINITION
Number of School Districts and Dependent Schools	Organized local entities providing public elementary, secondary, and for higher education that, under state law, have sufficient administration and fiscal autonomy to qualify as separate governments. Excludes dependent public school systems of county, municipal, township, or state governments.
GINI Coefficient	Measure of income inequality: 0 means a perfectly equal income distribution and 100 means a very unequal income distribution
High School Graduate (%)	Proportion of population age 25+ with a high school diploma
Bachelors Degree (%)	Proportion of population age 25+ with a bachelor's degree or higher
Per Capita Income	Aggregate income/population
Population Density	Persons per square mile
CT Dummy	=1 for local governments in Connecticut =0- otherwise
DE Dummy	=1 for local governments in Delaware =0- otherwise
NY Dummy	=1 for local governments in New York =0- otherwise
PA Dummy	=1 for local governments in Pennsylvania =0- otherwise

» APPENDIX C

TABLE C.1 » DESCRIPTIVE STATISTICS OF EFFICIENCY MODELS FOR VARIOUS GOVERNMENT FUNCTIONS Counties with population < 1 million

A. Total Sample	MEAN	STD. DEV.	MEDIAN	MINIMUM	MAXIMUM
Observations n=152					
Population	201,309	224,194	108,770	4,995	941,371
Total Local Government Expenditures per capita	3,551	1,116	3,479	1,320	8,111
Fire Expenditures Per Capita	54	41	41	5	215
Housing and Community Development Expenditures per Capita	54	44	43	0	251
Parks and Recreation Expenditures Per Capita	38	32	31	0	219
Police Expenditures Per Capita	106	77	86	1	495
Sewerage Expenditures Per Capita	95	58	84	1	405
Solid Waste Management Expenditures Per Capita	54	46	41	1	257
High School graduates (%)	81.7	4.2	81.7	68.5	91.5
Bachelor's Degree (%)	20.5	8.5	18.3	8.8	47.5
Per Capita Income (1999) $	20,346	5,051	18,610	14,341	38,350
Population Density 2000	545	1,319	172	3	12,957
GINI Coefficient 2000	37.07	2.37	37.15	31.58	47.82
NJ Dummy	0	0	0	0	1
NY Dummy	0	0	0	0	1
PA Dummy	0	0	0	0	1
CT Dummy	0	0	0	0	1
DE Dummy	0	0	0	0	1
Number of Cities	12	9	10	0	61
Number of Townships	19	9	17	0	57
Number of Special Districts	24	20	22	2	146
Number of School Districts	11	10	8	1	74
Number of Dependent Public School Systems	2	4	0	0	27

B. New Jersey

	MEAN	STD. DEV.	MEDIAN	MINIMUM	MAXIMUM
Observations n=21					
Population	407,020	241,761	436,230	64,511	890,457
Total Local Government Expenditures per capita	3,885	572	3,783	3,024	5,307
Fire Expenditures Per Capita	76	44	65	19	160
Housing and Community Development Expenditures per Capita	66	64	49	0	251
Parks and Recreation Expenditures Per Capita	53	32	45	11	150
Police Expenditures Per Capita	236	85	218	124	495
Sewerage Expenditures Per Capita	123	68	117	38	359
Solid Waste Management Expenditures Per Capita	100	32	109	39	157
High School graduates (%)	82.3	6.4	83.0	68.5	91.5
Bachelor's Degree (%)	28.0	9.1	27.2	11.7	46.5
Per Capita Income (1999) $	26,459	5,628	25,728	17,376	37,970
Population Density 2000	2,124	2,922	975	190	12,957
GINI Coefficient 2000	38.26	3.54	38.22	33.05	47.82
NJ Dummy	1	0	1	1	1
NY Dummy	0	0	0	0	0
PA Dummy	0	0	0	0	0
CT Dummy	0	0	0	0	0
DE Dummy	0	0	0	0	0
Number of Cities	15	13	12	4	61
Number of Townships	12	6	10	2	31
Number of Special Districts	13	10	13	2	37
Number of School Districts	26	16	22	7	74
Number of Dependent Public School Systems	3	2	3	1	10

C. Connecticut

	MEAN	STD. DEV.	MEDIAN	MINIMUM	MAXIMUM
Observations n=8					
Population	431,033	337,086	224,249	110,896	890,913
Total Local Government Expenditures per capita	3,024	464	2,906	2,450	3,720
Fire Expenditures Per Capita	94	27	91	60	134
Housing and Community Development Expenditures per Capita	74	38	65	26	124
Parks and Recreation Expenditures Per Capita	47	16	46	22	73
Police Expenditures Per Capita	143	58	167	50	210
Sewerage Expenditures Per Capita	66	23	64	30	105
Solid Waste Management Expenditures Per Capita	58	29	49	26	122
High School graduates (%)	84.9	3.0	85.2	79.6	89.2
Bachelor's Degree (%)	29.6	5.8	28.6	19.0	39.9
Per Capita Income (1999) $	27,011	4,880	25,761	20,443	38,350
Population Density 2000	686	494	405	198	1,410
GINI Coefficient 2000	37.15	3.73	35.90	32.41	44.88
NJ Dummy	0	0	0	0	0
NY Dummy	0	0	0	0	0
PA Dummy	0	0	0	0	0
CT Dummy	1	0	1	1	1
DE Dummy	0	0	0	0	0
Number of Cities	4	3	3	0	9
Number of Townships	19	4	19	13	26
Number of Special Districts	48	22	44	25	99
Number of School Districts	2	1	2	1	5
Number of Dependent Public School Systems	19	5	18	11	27

D. Delaware

	MEAN	STD. DEV.	MEDIAN	MAXIMUM
Observations n=3				
Population	267,925	170,820	163,727	508,773
Total Local Government Expenditures per capita	2,645	193	2,667	2,870
Fire Expenditures Per Capita	21	14	18	40
Housing and Community Development Expenditures per Capita	41	37	19	93
Parks and Recreation Expenditures Per Capita	26	10	20	40
Police Expenditures Per Capita	125	43	103	186
Sewerage Expenditures Per Capita	122	23	127	147
Solid Waste Management Expenditures Per Capita	18	9	18	28
High School graduates (%)	80.5	3.8	79.4	85.5
Bachelor's Degree (%)	21.6	5.7	18.6	29.5
Per Capita Income (1999) $	21,468	2,8710	20,328	25,413
Population Density 2000	519	464	215	1,174
GINI Coefficient 2000	37.37	1.00	37.20	38.67
NJ Dummy	0	0	0	0
NY Dummy	0	0	0	0
PA Dummy	0	0	0	0
CT Dummy	0	0	0	0
DE Dummy	1	0	1	1
Number of Cities	19	5	19	25
Number of Townships	0	0	0	0
Number of Special Districts	87	46	81	146
Number of School Districts	6	1	6	8
Number of Dependent Public School Systems	0	0	0	0

E. New York

	MEAN	STD. DEV.	MEDIAN	MAXIMUM
Observations n=55				
Population	150,026	197,037	80,525	941,371
Total Local Government Expenditures per capita	4,656	741	4,497	8,111
Fire Expenditures Per Capita	79	34	78	215
Housing and Community Development Expenditures per Capita	31	25	25	153
Parks and Recreation Expenditures Per Capita	48	36	35	219
Police Expenditures Per Capita	108	49	101	288
Sewerage Expenditures Per Capita	80	55	72	405
Solid Waste Management Expenditures Per Capita	65	51	50	257
High School graduates (%)	81.9	3.6	82.3	91.4
Bachelor's Degree (%)	20.7	7.4	18.2	47.5
Per Capita Income (1999) $	19,336	3,795	18,264	36,726
Population Density 2000	251	389	106	2,133
GINI Coefficient 2000	37.14	2.05	37.19	45.09
NJ Dummy	0	0	0	0
NY Dummy	1	0	1	1
PA Dummy	0	0	0	0
CT Dummy	0	0	0	0
DE Dummy	0	0	0	0
Number of Cities	9	6	9	29
Number of Townships	17	7	16	32
Number of Special Districts	17	12	13	53
Number of School Districts	10	6	9	39
Number of Dependent Public School Systems	0	1	0	2

F. Pennsylvania

	MEAN	STD. DEV.	MEDIAN	MAXIMUM
Observations n=65				
Population	146,893	157,843	88,882	763,205
Total Local Government Expenditures per capita	2,615	542	2,608	4,370
Fire Expenditures Per Capita	22	15	19	90
Housing and Community Development Expenditures per Capita	67	40	57	169
Parks and Recreation Expenditures Per Capita	23	23	15	137
Police Expenditures Per Capita	57	34	50	142
Sewerage Expenditures Per Capita	101	55	104	379
Solid Waste Management Expenditures Per Capita	30	30	17	103
High School graduates (%)	81.0	3.7	80.7	89.3
Bachelor's Degree (%)	16.8	6.9	14.8	42.5
Per Capita Income (1999) $	18,353	3,392	17,224	31,627
Population Density 2000	267	430	131	2,994
GINI Coefficient 2000	36.60	1.77	36.79	40.97
NJ Dummy	0	0	0	0
NY Dummy	0	0	0	0
PA Dummy	1	0	1	1
CT Dummy	0	0	0	0
DE Dummy	0	0	0	0
Number of Cities	14	10	12	44
Number of Townships	23	10	22	57
Number of Special Districts	27	16	23	66
Number of School Districts	7	5	6	23
Number of Dependent Public School Systems	0	0	0	0

ABOUT THE AUTHORS

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Dagney Faulk, Ph.D. is Director of Research in the Center for Business and Economic Research (CBER) at Ball State University in Muncie, IN. Her research focuses on state and local tax policy and regional economic development issues and has been published in *Public Finance Review, the National Tax Journal, the Review of Regional Studies, State and Local Government Review* and S*tate Tax Notes*. She has worked on numerous Indiana-focused policy studies on a variety topics including the regional distribution of state government taxes and expenditures, senior migration, and local government reform.

She is coauthor (with Michael Hicks) of the forthcoming book *Local Government Consolidation in the United States* (Cambria Press). Prior to joining the CBER, she was Associate Professor of Economics at Indiana University Southeast in New Albany, Indiana. She has also worked at the World Bank, the U.S. Department of Housing and Urban Development, and the Indiana Legislative Services Agency. She received her Ph.D. in economics from the Andrew Young School of Policy Studies at Georgia State University.

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Michael J. Hicks, PhD is the director of the Center for Business and Economic Research and an associate professor of economics in the Miller College of Business at Ball State University. He came to Ball State following stints at the Air Force Institute of Technology's Graduate School of Engineering and Management and research centers at Marshall University and the University of Tennessee.

Hicks' research has focused on issues affecting local and state economics. His work on the effects of federal regulation of energy and mining industries has resulted in testimony in state and federal courts and the U.S. Senate. His work in modeling flood and hurricane damages has received a number of awards and been heavily reported. While he studies such diverse issues as local telecommunication de-regulation, state tax incentives and local government consolidation, he is best known for his research on Wal-Mart's effect on local economies. He has authored one book on Wal-Mart and papers on the subject in the *Eastern Economics Journal, Atlantic Economics Journal, Economic Development Journal, Regional Economic Development, Journal of Private Enterprise* and *Review of Regional Studies.*

Hicks received research and teaching awards from Tennessee, Marshall, AFIT and Ball State, and his research has been highlighted in such outlets as the Wall Street Journal, New York Times and Washington Post. He has appeared nationally on CSPAN, MSNBC, NPR's "All Things Considered" and Fox Business News. His weekly column on economics and current events is distributed through newspapers including the Indianapolis Business Journal, the South Bend Tribune and The Star Press.

Hicks earned doctoral and master's degrees in economics from the University of Tennessee and a bachelor's degree in economics from Virginia Military Institute. He is an infantry lieutenant colonel in the U.S. Army Reserves, having served in combat and peacekeeping operations in North Africa, Southwest Asia, Korea and Japan.

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ABOUT THE CENTER

The Center for Business and Economic Research (CBER) is an award-winning economic policy and forecasting research center housed within Ball State University's Miller College of Business. CBER research encompasses health care, public finance, regional economics, transportation, and energy sector studies.

The center produces the CBER Data Center—a one-stop shop for economic data, policy analysis, and regional demographics—and the Indiana Business Bulletin—a weekly newsletter with commentary on current issues and regularly updated data on housing, wages, employment, and dozens of other economic indicators.

In addition to research and data delivery, the center serves as the business forecasting authority in the Muncie area—holding the annual Indiana Economic Outlook luncheon and quarterly meetings of the Ball State University Business Roundtable.