Local Option Sales Taxes and Fiscal Disparity: The Case of Georgia Counties

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While local option sales taxes (LOST) have become an important revenue source for local governments, there has been concern about the distribution of LOST revenues: the uneven distribution of sales tax bases may have introduced a new source of fiscal inequality and exacerbated existing fiscal disparity. Using Georgia county data ($N = 159$, 1970–2000), this study examines whether and how LOST have affected local fiscal disparity. Our findings suggest that the effects of LOST on fiscal disparity vary with the approach to measure revenue-raising capacity; thus the issue of LOST distribution is sensitive to the underlying conceptualization of "fiscal equity."

INTRODUCTION

Because of the "property tax revolt" in the late 1970s and early 1980s, many states have enacted policies that are designed to reduce local property tax burden. As a result, local governments have been struggling to find alternative revenue sources, such as other local taxes, user charges and fees, and state aids.[1] In recent years, local option sales taxes (LOST) have become important sources of revenue for many local governments. As of 2001, thirty-four states have authorized their local governments to levy LOST.[2] The state of Georgia, for instance, has four types of LOST: (1) the general-purpose LOST

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1. Ronald J. Shadbegian, "The Effect of Tax and Expenditure Limitations on the Revenue Structure of Local Government, 1962–87," *National Tax Journal* 52 (1999).

2. David L. Sjoquist, Sally Wallace, and Barbara Edwards, "What a Tangled Web: Local Property, Income and Sales Taxes," in *Urban Issues and Public Finance: Collected Essays in Honor of Dick Netzer*, ed. Amy Schwartz (New York: Lincoln Institute of Land Policy, 2004).

earmarked for property tax relief,[3] (2) the special-purpose LOST (SPLOST) for capital expenditures,[4] (3) the educational-purpose LOST (ELOST) for education, and (4) the Metropolitan Atlanta Rapid Transit Authority (MARTA) tax for public transportation.[5] These taxes are collected by the Georgia Department of Revenue and then disbursed to the counties in accord to the point of collection.[6]

Whatever the specific purpose, LOST programs diversify the revenue structures and enhance the fiscal capacity of local governments. Nevertheless, a concern has been raised about the distribution of LOST revenues. Because sales tax bases are not evenly distributed, local governments do not reap "fair shares" of benefits from these taxes, and thus the authorization of LOST may introduce a new source of fiscal disparities among jurisdictions. Moreover, if the dispersion of LOST revenues is positively correlated with that of other revenues, the LOST may exacerbate existing fiscal disparities among localities.

This article examines the effects of LOST on fiscal disparities among local governments using the data of the 159 Georgia counties from 1970 to 2000. We are interested in the dispersion of revenue-raising capacity rather than that of actual revenues, so the analysis focuses on tax base distribution of a generic LOST rather than any specific one. This study will provide further insight into the LOST as new sources of revenue, and help state policymakers to determine whether the LOST makes fiscal conditions among localities even more inequitable and whether and how states should take action to offset these disparities.

The paper is organized as follows. The next section reviews related literature on fiscal disparities, including concepts of fiscal disparities and approaches to measure them. The third section discusses recent studies on the distribution of local option sales tax and its implications for fiscal disparities. The fourth section uses Geographic Information Systems (GIS) techniques to analyze the distribution of sales tax bases among Georgia counties and identifies the pattern of sales tax exportation. The fifth section incorporates the distribution of sales tax base, among others, into two measures of revenue-raising capacity, and uses three indices of dispersion to assess the level of fiscal disparities among the counties. The final section discusses research findings and addresses theoretical and policy implications of the study.

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3. As of January 2004, all but five counties in Georgia have adopted the LOST. The five counties without the LOST are Cobb, Cherokee, DeKalb, Gwinnett, and Rockdale. For more about the LOST, see Zhirong Zhao, "Motivations, Obstacles, and Resources: The Adoption of the General-Purpose LOST in Georgia Counties," *Public Finance Review* 33, no. 6 (2005).

4. Changhoon Jung, *The Impact of the Special Purpose Local Option Sales Tax (SPLOST) on Local Government Finance in Georgia*, Public Policy Research Series (Athens, GA: Carl Vinson Institute of Government, University of Georgia, 2002).

5. This tax is levied only in Fulton County and DeKalb County. See Metropolitan Atlanta Rapid Transit Authority, *Comprehensive Annual Financial Report* (Atlanta, GA: Metropolitan Atlanta Rapid Transit Authority, 2004).

6. Betty J. Clements and J. Devereux Weeks, *County and Municipal Revenue Sources in Georgia* (Athens, GA: Carl Vinson Institute of Government, University of Georgia, 1997).

FISCAL DISPARITIES: CONCEPTS AND MEASURES

Fiscal disparities among local governments refer to the variation in fiscal conditions, which are normally measured as the ease or difficulty a local government faces in providing a standard package of public services at a reasonable tax rate or tax burden on residents.[7] Fiscal conditions vary greatly from one local government to another. A widely accepted belief is that higher levels of governments should take action to reduce the level of such disparity.[8] To offset fiscal disparities at the local level, many states currently provide general-purpose revenue-sharing aid to their local governments. Such programs are intended to direct more aid (per capita) to jurisdictions in poor fiscal conditions than to those in good fiscal conditions. To implement equalizing aid programs, state policymakers need accurate measures of local fiscal condition in determining the extent of disparity and in designing appropriate aid formulas.

Fiscal disparities have been defined in different ways. Historically, the variation in fiscal conditions was often defined as the difference in revenue-raising capacity (RRC), which is most commonly measured with per capita property tax bases.[9] An alternative definition is the need-capacity gap, which accounts for variation across communities in their expenditure need as well as their RRC.[10] The latter definition is more comprehensive but also more complicated to implement, because the expenditure need is harder to conceptualize and measure than RRC. This study uses only the RRC to measure variations in fiscal conditions among local governments.

Two common approaches have been used to measure the capacity of a locality to raise revenue from its own sources. One is the Representative-Tax-System approach,[11] and the other is the Income-With-Exporting approach.[12] In the former, comparison of RRC is based on the assumption of similar tax structures and, in particular, tax rates. In the latter, comparison is based on the assumption of similar tax burdens on residents,

7. Helen F. Ladd, "Measuring Disparities in the Fiscal Condition of Local Governments," in *Fiscal Equalization for State and Local Government Finance* (Westport, CT, and London: Greenwood, Praeger with National Tax Association, 1994).

8. Helen F. Ladd and John Yinger, "The Case for Equalizing Aid," in *Tax Policy in the Real World* (Cambridge, and New York: Cambridge University Press, 1999); John Yinger, "On Fiscal Disparities across Cities," *Journal of Urban Economics* 19, no. 3 (1986).

9. Advisory Commission on Intergovernmental Relations, *Measuring State Fiscal Capacity*, (Washington, DC: Advisory Commission on Intergovernmental Relations, 1986); Ronald F. Ferguson and Helen Ladd, "Measuring the Fiscal Capacity of U.S. Cities," in *Measuring Fiscal Capacity*, ed. H. Clyde Reeves (Boston: Oelgeschlager Gunn & Hain in association with the Lincoln Institute of Land Policy, 1986).

10. Katharine L. Bradbury, et al. "State Aid to Offset Fiscal Disparities across Communities," *National Tax Journal* 37, no. 2 (1984); Ladd, "Measuring Disparities in the Fiscal Condition of Local Governments."

11. Advisory Commission on Intergovernmental Relations, *Measuring State Fiscal Capacity*; Advisory Commission on Intergovernmental Relations, *Tax Capacity of the States* (Washington, DC: Advisory Commission on Intergovernmental Relations, 1986).

12. Ferguson and Ladd, "Measuring the Fiscal Capacity of U.S. Cities."

where tax burden is defined as a share of residents' income. From policy perspectives, the tax-base approach aims at maintaining a competitive local tax structure, while the income-base approach targets the reasonable level of local tax burden.[13] This study uses both because the two approaches each yield an important perspective about our subject of interest.

LOCAL OPTION SALES TAXES AND FISCAL DISPARITIES

Despite the wide use of LOST in many states, few studies have been conducted to examine the distribution of local sales tax base or revenues. We only found a few articles on the cases of Iowa and Georgia, with their analyses emphasizing education-purpose LOST levied by school districts. In Iowa, Craft finds that the collection of sales tax revenue progressively concentrates in large retail centers rather than small communities.[14] As a result, Iowa counties vary significantly in their ability to use LOST revenue: counties with large sales tax bases are able to reduce their property tax rates, which attracts more residents and in turn generates even more LOST revenue. Also in Iowa, Artz and Stone examine the scope of sales tax exportation in fiscal year 2002 and finds that only 20 percent of Iowa counties had a retail trade "surplus," which means sales in the county amounted to more than county residents spent, while the remaining 80 counties had retail sales "leakage."[15] Consequently, LOST in Iowa create inequalities in public funding because they redistribute tax dollars from "retail poor" areas to the "retail rich." Rubenstein and Freeman examine the education-purpose LOST (ESPLOST) in Georgia and go further by relating the distribution of LOST revenues to that of property tax revenues.[16] They assess the dispersion of total school district revenue (per full-time equivalent student) for 1999 and 2000 with four measures of dispersion, and find that each equity measure in each year indicates larger inter-district disparities when the potential ESPLOST revenue is added to operating revenue. The results suggest that introducing local option sales taxes is likely to increase already existing differences in local fiscal capacity.

It is not surprising that extant studies of the distribution of LOST revenues are all conducted in the context of school districts, as issues of fiscal disparities have been

13. Ladd, "Measuring Disparities in the Fiscal Condition of Local Governments"; Thomas A. Downes and Thomas F. Pogue, "Intergovernmental Aid to Reduce Fiscal Disparities: Problems of Definition and Measurement," *Public Finance Quarterly* 20, no. 4 (1992).

14. Matthew M. Craft, "Lost and Found: The Unequal Distribution of Local Option Sales Tax Revenue among Iowa Schools," *Iowa Law Review*, no. 88 (2002).

15. Georgeanne Artz and Kenneth E. Stone, "An Analysis of the Transfer of Funds from Weak Retail Counties to Strong Retail Counties in Iowa via Local Option Sales Taxes," paper presented at the Annual Meeting of American Agricultural Economics Association, Montreal, Quebec, July 27–30, 2003.

16. Ross Rubenstein and Catherine Freeman, "Do Local Sales Taxes for Education Increase Inequities? The Case of Georgia's ESPLOST," *Journal of Education Finance* 28 (2003).

traditionally more visible in education finance. However, fiscal disparity among general-purpose governments is equally undesirable, and many states have created state aid programs to mitigate this problem.[17] Thus the study of the LOST's effect on fiscal disparities should not be confined to education finance.

RESEARCH QUESTIONS AND METHODS

Using fiscal and socioeconomic data of the 159 Georgia counties during the 1970–2000 period, this study addresses three related research questions: (1) how are LOST revenues distributed across counties? (2) how can we incorporate LOST revenues in measuring local fiscal capacity? and (3) do the LOST make fiscal capacity even more disparate among counties? The study seeks to integrate three methods of inquiry. First, the distribution of LOST revenues is analyzed through Geographical Information System (GIS), which enhances our ability to discover spatial patterns that may be hard to discern from mere statistical analysis. Second, in measuring RRC, two major competing approaches—Representative-Tax-System and Income-With-Exporting—are both applied for comparison of the results. Finally, the dispersion of fiscal capacity among localities will be assessed with three inequality indices—the relative mean deviation, the Gini coefficient, and the Mehran Index.[18]

Data of this study are from several sources. GIS-base maps of Georgia counties are from the Georgia GIS Clearinghouse.[19] Taxable sales base, property tax base, and property tax millage rates are from the *Statistical Report* published by the Georgia Department of Revenue. The source of socioeconomic variables is the *Georgia County Guide*. All income and fiscal figures are in 2000 constant dollars.[20]

DISTRIBUTION OF SALES TAX BASES IN GEORGIA COUNTIES

A common presupposition is that taxable sales bases and hence LOST revenues are disproportionately conglomerated in areas that are (1) more urbanized and (2) regional retail centers. This presupposition has been in general confirmed by recent equity studies

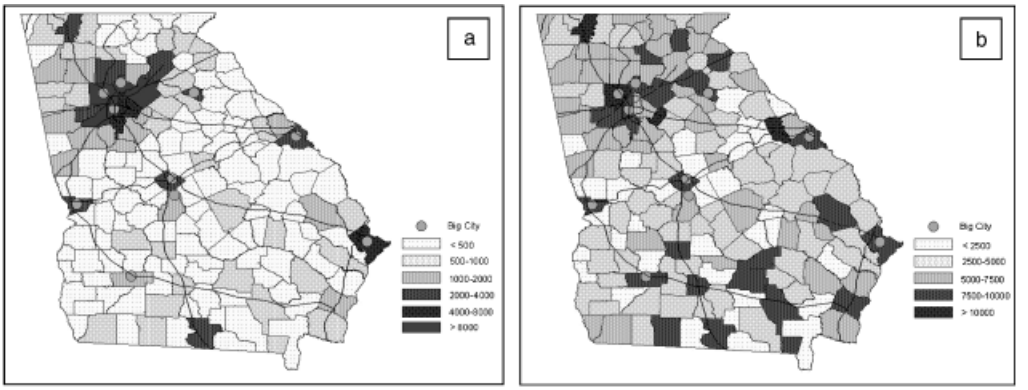
17. Ladd, "Measuring Disparities in the Fiscal Condition of Local Governments."

18. Robert Berne and Leanna Stiefel, *The Measurement of Equity in School Finance: Conceptual, Methodological, and Empirical Dimensions* (Baltimore: Johns Hopkins University Press, 1984); Yaakov Kondor, "An Old-New Measure of Income Inequality," *Econometrica* 39, no. 6 (1971); Farhad Mehran, "Linear Measures of Income Inequality," *Econometrica* 44, no. 4 (1976).

19. Available at the website of Georgia GIS Clearinghouse. Available from: *https://gis1.state.ga.us/login.asp*: accessed 20 September 2006.

20. The deflator used is the Consumer Price Index (CPI). Available at the website of the Bureau of Labor Statistics, Department of Labor: *http://www.bls.gov/cpi/*: accessed 20 September 2006.

FIGURE 1
Distribution of Taxable Sales Bases among Georgia Counties in 2000. Panel a: Total taxable sales base (million dollar). Panel b: Per capita taxable sales base (thousand dollar)



of school district finance.[21] In the context of Georgia counties, however, it is subjected to re-examination for two reasons. First, in studies of local government fiscal equity we look at "individual" fiscal data that have accounted for the size of service-receiving units in different localities. For school districts, the basic units are pupils or equivalent measures; for counties, the units are individual residents. Although the number of pupils is normally larger in counties with a larger population, this is not always the case. Therefore, fiscal disparity as measured by per-pupil revenues may not be comparable to fiscal disparity measured by per-capita revenues. Second, "urban areas" and "retail centers" have often been implicitly treated as identical; this treatment may be problematic. While retail centers are normally located in relatively urbanized areas, not all urban areas serve as retail centers; rural areas may also have regional retail centers where big cities are far away.

Total versus Per Capita Tax Base and Patterns of Distribution

Figure 1a shows the taxable sales base of Georgia counties in 2000. The sales bases are distributed extremely unevenly across counties, with a clear pattern of "one-dominant-pole"—the Atlanta Metropolitan Statistical Area (MSA). The sales tax base of Fulton

21. Artz and Stone, "An Analysis of the Transfer of Funds from Weak Retail Counties to Strong Retail Counties in Iowa Via Local Option Sales Taxes"; Craft, "Lost and Found: The Unequal Distribution of Local Option Sales Tax Revenue among Iowa Schools"; Rubenstein and Freeman, "Do Local Sales Taxes for Education Increase Inequities? The Case of Georgia's ESPLOST."

County, where most of Atlanta City is located, is over $14 billion, while that of Echols County is less than $1 million—a difference of over 15,000 times. The six counties that have the highest sales tax bases account for more than half of the state's total, five of them are in the Atlanta MSA.[22] Georgia counties differ significantly in population size. Figure 1b shows the per capita tax base in each county, looking more evenly distributed than in Figure 1a. The variation among counties is much less extreme: the highest per capita sales tax base (Cobb County) is over $20,000, while the lowest (Echols County) is about $200—a difference of 100 times. Unlike the one-dominant-pole pattern in Figure 1a, however, multiple "sales centers" emerge throughout the state.

Several observations stand out about these sales centers. First, there is a clear link between sales centers and interstate highways. Second, urban counties where major cities (population $>50{,}000$) are located tend to have much higher per capita sales tax bases than other counties. Third, it is worth noting that sales centers are not necessarily urban counties. Figure 1b shows several sales centers in southern Georgia, most part of which is very rural. It seems that the Atlanta metro area serves as the shopping center for northern Georgia, but rural residents in the deep south of the state may rely more on nearby retail centers, probably because these areas are far from Atlanta (150 to 300 miles away) and thus beyond its service radius. This result suggests that the regional conglomeration of sales tax bases is constrained by distance.

Historical Changes

The first LOST in Georgia, the general-purpose local option sales tax, was authorized in 1975, and a variety of other LOST were authorized thereafter.[23] Figure 2 offers a snapshot of how the distribution of tax base has changed in the post-LOST period. In the northern, more urbanized part of the state, the traditional sales center Fulton County became less dominant over the decades of urban sprawl. In the southern, mostly rural part of the state, however, the distribution seemed more polarized with the emergence of several sales centers in the last two decades. Overall, the conglomeration of retail activities has gradually shifted from a one-pole to a multiple-pole pattern. A detailed explanation of the spatial patterns is beyond the scope of this study; nevertheless, the results suggest that the distribution of sales tax base has far more nuance than has been commonly assumed.

22. These five counties are Fulton, Cobb, Gwinnett, DeKalb, and Clayton. The only exception is Chatham County where Savannah City is located.

23. Zhirong Zhao, "Motivations, Obstacles, and Resources: The Adoption of the General-Purpose Local Option Sales Tax in Georgia Counties," *Public Finance Review* 33, no. 6 (2005).

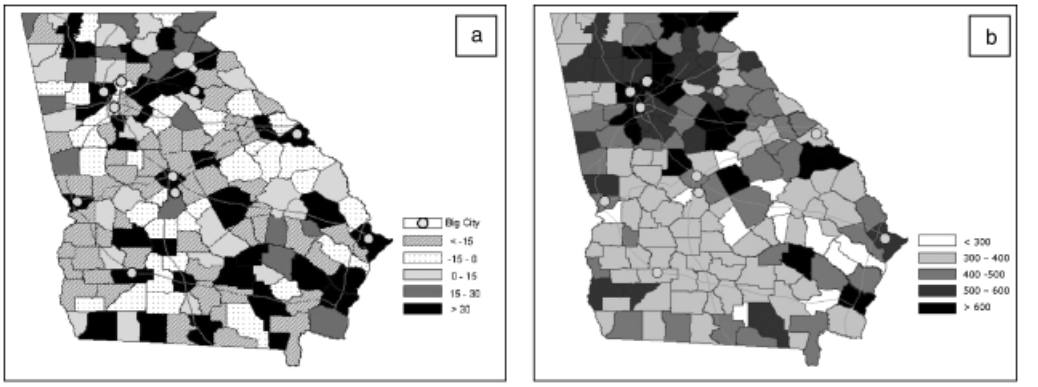
FIGURE 2
Per Capita Taxable Sales Base in Georgia in 1970, 1980, 1990, and 2000 (Thousand dollar)

Tax Exportation

Another indicator of the sales base distribution is the level of sales tax exportation—sales tax burdens "exported" outside a jurisdiction.[24] We calculate tax exportation in county i in year j as the difference between its actual sales tax revenue ($STRVN_{ij}$) and the hypothetical tax revenue ($STRVN^*_{ij}$), which is the amount of sales tax proceeds in the absence of tax exportation. Assuming that all counties adopt a 1 percent LOST, $STRVN_i$ is 1 percent of the taxable sales tax base ($STBASE_{ij}$), while $STRVN^*_{ij}$ is calculated based on the assumption of the average sales-income ratio ($SIRATIO_i$) in year j. It is assumed that

24. Positive tax exportation ("sales surplus") occurs when a county collects sales tax revenue from nonresidents; in contrast, negative tax exportation ("sales deficit") means a county loses sales tax revenue to other counties.

FIGURE 3
Distribution of Sales Tax Exportation and Property Tax Capacity (2000).
(Big cities refer to cities with 50,000 population or above)
Panel a: Per capita sales tax exported in Georgia counties (dollar). Panel b: Per capita property tax capacity in Georgia counties (dollar)



without tax exportation the sales tax base in a county would be a certain proportion of its total personal income ($PINCOME_{ij}$).[25] The formula can be expressed as follows:

$$EXPORT_{ii} = STRVN_{ij} - STRVN^{*}_{ij}$$
$$= STBASE_{ij} \times 1\,\text{percent} - PINCOME_{ij} \times SIRATIO_{j} \times 1\,\text{percent} \quad (1)$$

Figure 3a shows per capita sales tax exportation in 2000.[26] Seventy-six of the 159 Georgia counties had positive tax exportation while 83 had negative exportation. At one extreme, McDuffie County, adjacent to the Augusta MSA, had the highest tax exportation by collecting $180 per capita, over half of the amount ($96) from nonresidents. At the other extreme, Chattahoochee County (adjacent to the Columbus–Muscogee Metropolitan Area) actually collected only $5 per capita sales tax while its hypothetical revenue is $105. Residents of the county seemed to have essentially done all their shopping elsewhere, most probably in the neighboring Muscogee County which had $65 per capita tax exportation.

Comparing Figures 3a and 1b, it is not surprising to see that most sales-center counties enjoy positive tax exportation. A striking exception is Fulton County: though it has the highest average personal income and thus the largest sales tax base, the county

25. Although one may expect that low-income families will spend a higher share of income on sales tax revenue, the aggregate result at the county level is more complicated. In this data we find that the relationship between the sales-income share and per capita income among the counties is roughly U-shaped (the share is highest for median personal income) rather than linear.

26. The exportation can be in-state or out-of-state. Making this distinction, however, will not affect the results of analysis because we focus on the "net" exportation for each county and the corresponding change in its revenue capacity, not on the direction of exportation.

actually "leaked" sales tax revenues to its neighbors. Contrary to "common sense," most Georgia counties that benefit significantly from sales tax exportation are not those located around the metropolitan Atlanta area, but those that serve as regional sales centers in the south.

MEASURING FISCAL CAPACITY OF GEORGIA COUNTIES

Fiscal capacity in Georgia counties is measured in two approaches, Representative-Tax-System (RTS) and Income-With-Exporting (IWE). According to the RTS approach, if a county is empowered to use only the property tax, we can measure its RRC as its property tax base times a standard tax rate, such as the statewide average property tax rate. Extending this approach to multiple taxes, revenue-raising capacity (*RRC*) would be the weighted sum of all tax bases ($BASE_{ik}$) per capita, the weights being the representative tax rates (t_{jk}).[27] The formula can be expressed as follows:

$$RRC_i = \Sigma_k t_{ik} BASE_{ik} \tag{2}$$

This study examines only revenues from the property tax and the local option sales tax. Thus RRC is calculated as the weighted sum of per capita property tax base ($PTBASE_i$) and per capita taxable sales base ($STBASE_i$). The weight for the property tax is the average millage rate for the year ($MILLAGE_j$); for the taxable sales base it is 1 percent:

$$RRC_{ij} = PTBASE_{ij} \times MILLAGE_j + STBASEi_{ij} \times 1\,\text{percent} \tag{3}$$

Table 1 shows the descriptive statistics of RRC in 2000, as measured with the RTS approach. On average, sales tax accounts for 16.2 percent of the total RRC, which is slightly higher for MSA counties (18.3) than for other counties (15.9), indicating that metropolitan counties can raise a higher proportion of their revenues from LOST. Table 2 (the left side) shows that the correlation is low for these two taxes ($r = 0.27$). This occurs because the counties with highest property tax capacity tend to have only modest level of sales tax capacity (see the first scatterplot in Figure 4).[28] GIS analysis provides additional information about spatial patterns of the two measures: the distribution of property tax revenues is more "inter-regional"—northern counties in general have much higher property tax revenues (Figure 3b); the distribution of sales tax revenues is more "intra-regional" because sales centers are scattered throughout the state (Figure 1b).

The IWE approach measures RRC as the per capita revenue that local governments could raise if they imposed a standard tax burden on their residents, augmented by the

27. Advisory Commission on Intergovernmental Relations, *Measuring State Fiscal Capacity*; Advisory Commission on Intergovernmental Relations, *Tax Capacity of the States*.

28. Among the ten counties with highest property tax capacity, only three are located in the Atlanta MSA.

TABLE 1
Descriptive Statistics of Representative-Tax-System (RTS) Revenue-Raising Capacity Measures (2000)

	Revenue-raising capacity based on RTS		
	Property tax capacity	**Sales tax capacity**	**Total revenue capacity**
All counties			
Maximum	$1,527.7	$203.7	$1,593.8
Minimum	$53.8	$2.2	$59.2
Mean	$445.4 (83.9%)	$85.7 (16.1%)	$531.0 (100%)
Standard deviation	$175.7	$46.7	$193.4
In MSA			
Maximum	$816.6	$203.7	$949.8
Minimum	$53.8	$5.4	$59.2
Mean	$477.0 (81.7%)	$107.1 (18.3%)	$584.2 (100%)
Standard deviation	$140.7	$50.0	$169.7
Others			
Maximum	$1,527.7	$184.2	$1,593.8
Minimum	$203.3	$2.2	$237.5
Mean	$434.4 (84.7%)	$78.2 (15.3%)	$512.6 (100%)
Standard deviation	$185.6	$43.2	$198.3

amount that they would generate by exporting tax burdens to nonresidents.[29] The rationale for this approach is that local residents' ability to pay is typically measured by their income. If we assume local residents work and shop only in the jurisdiction where they live, regardless of which tax bases are actually used, all taxes are ultimately paid out of the income of local residents, who can only bear a certain tax burden as a percentage of their incomes. Relaxing the assumption that consumers live, shop, and work in the same community opens up the possibility of tax exporting, because local governments may also generate revenue from nonresidents. More precisely, in Ferguson and Ladd, RRC of county i is calculated as the percentage burden (K) on residents multiplied by: (1) the per capita income of local residents (Y_i), and (2) one plus the ratio of tax exportation (e_i), as follows:

$$RRC_i = KY_i(1 + e_i) \tag{4}$$

Because the ratio of tax exportation (e_i) is difficult to measure, this study takes Ferguson and Ladd's approach with a twist. We assume that a Georgia county can only raise its revenue up to a certain proportion ($BURDEN$) of personal income

29. Ferguson and Ladd, "Measuring the Fiscal Capacity of U.S. Cities."

TABLE 2
Bivariate Correlations between Measures of Revenue-Raising Capacity (2000)

	Representative-Tax-System (RTS) Revenue Capacity	
	Property tax capacity	**Sales tax capacity**
All counties		
Sales tax capacity	0.27	1
Total revenue capacity	0.97	0.48
In MSA		
Sales tax capacity	0.46	1
Total revenue capacity	0.97	0.68
Others		
Sales tax capacity	0.19	1
Total revenue capacity	0.98	0.40

	Income-With-Exporting (IWE) Revenue Capacity	
	Income-based capacity	**Tax exportation**
All counties		
Tax exportation	0.27	1
Total revenue capacity	0.97	0.51
In MSA		
Tax exportation	0.04	1
Total revenue capacity	0.97	0.30
Others		
Tax exportation	0.49	1
Total revenue capacity	0.95	0.74

(*PINCOME*), plus the amount of tax exported outside its jurisdiction (*EXPORT*). The formula is expressed as follows:

$$RRC_{ij} = PINCOME_{ij} \times BURDEN_j + EXPORT_{ij} \tag{5}$$

The amount of tax exporting, $EXPORT_{ij}$, is calculated according to Formula (1). The standard tax burden, $BURDEN_j$ is the average value of tax burden in each county that is calculated as total tax revenue (property tax revenue plus sales tax revenue) divided by personal income.

$$BURDEN_j = \text{Avg}\left[(PTRVN_{ij} + STRVN_{ij})/PINCOME_{ij}\right] \tag{6}$$

FIGURE 4
Scatterplots between Measures of Revenue-Raising Capacity in 2000

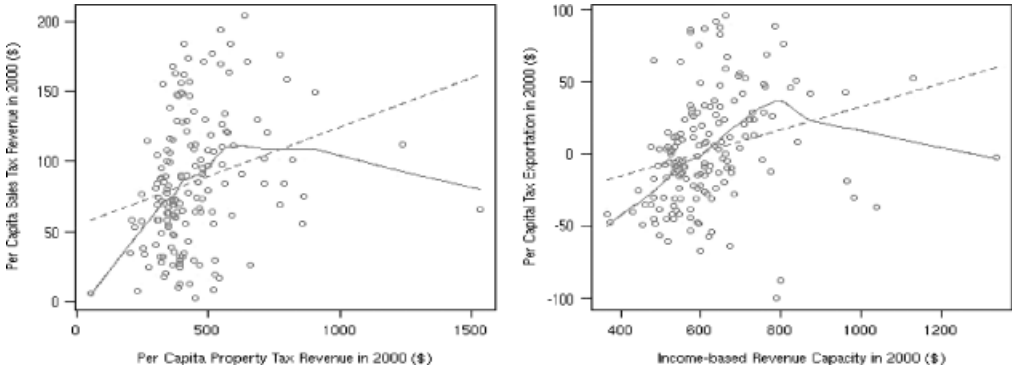


Table 3 shows the descriptive statistics of RRC in 2000, as measured by IWE approach. For all counties, no matter in MSA or rural areas, tax exportation in general is dominated by the income-based revenue capacity, which accounts for above 99 percent of IWE RRC. In Table 2 (the right side), we see that tax exportation and income-based revenue capacity are modestly correlated for counties in rural areas ($r = 0.49$), but not at all correlated for those within MSA areas ($r = 0.04$). For all counties, the correlation between the two measures are low ($r = 0.27$), because the counties with highest income-based revenue capacity tend to have only modest level of tax exportation, as is shown in Figure 4.

DISPERSION ANALYSIS OF RRC

This section examines the dispersion of RRC across the state, with or without LOST proceeds. In particular, we want to see (1) how fiscal (revenue) disparities are associated with LOST proceeds; (2) how dispersed are property tax proceeds or the income-based revenue capacity; and (3) whether and how the introduction of LOST exacerbates fiscal disparities, as measured by either RTS or IWE approach, across Georgia counties.

To measure the disparity of RRC, this study employs three dispersion indices: the relative mean deviation, the Gini coefficient, and the Mehran Index.[30] The relative mean deviation is the sum of the absolute value of the differences between each object (personal income) and the mean value of the object (average personal income), as a proportion of total values (total personal income) in the distribution.[31] The Gini coefficient is calculated as the area between the Lorenz curve and a 45-degree line (representing

30. This study treats each county as a unit for inequality analysis. The dispersion measures are not weighted by population.

31. For details about the relative mean deviation, see Kondor, "An Old-New Measure of Income Inequality."

TABLE 3
Descriptive Statistics of Income-With-Exporting (IWE) Revenue-Raising Capacity Measures (2000)

	Revenue-raising capacity based on IWE		
	Income-based capacity	**Tax exportation**	**Total revenue capacity**
All counties			
Maximum	$1,335.4	$95.5	$1,333.3
Minimum	$366.2	–$100.0	$324.4
Mean	$622.3 (99.6%)	$2.4 (0.4%)	$624.6 (100%)
Standard deviation	$130.2	$38.8	$145.6
In MSA			
Maximum	$1,335.4	$92.1	$1,333.3
Minimum	$477.1	–$100.0	$442.2
Mean	$745.6 (99.0%)	$7.3 (1.0%)	$752.9 (100%)
Standard deviation	$165.2	$43.9	$172.8
Others			
Maximum	$874.0	$95.5	$915.9
Minimum	$366.2	–$67.3	$324.4
Mean	$579.4 (99.9%)	$0.6 (0.1%)	$580.0 (100%)
Standard deviation	$79.8	$37.0	$103.1

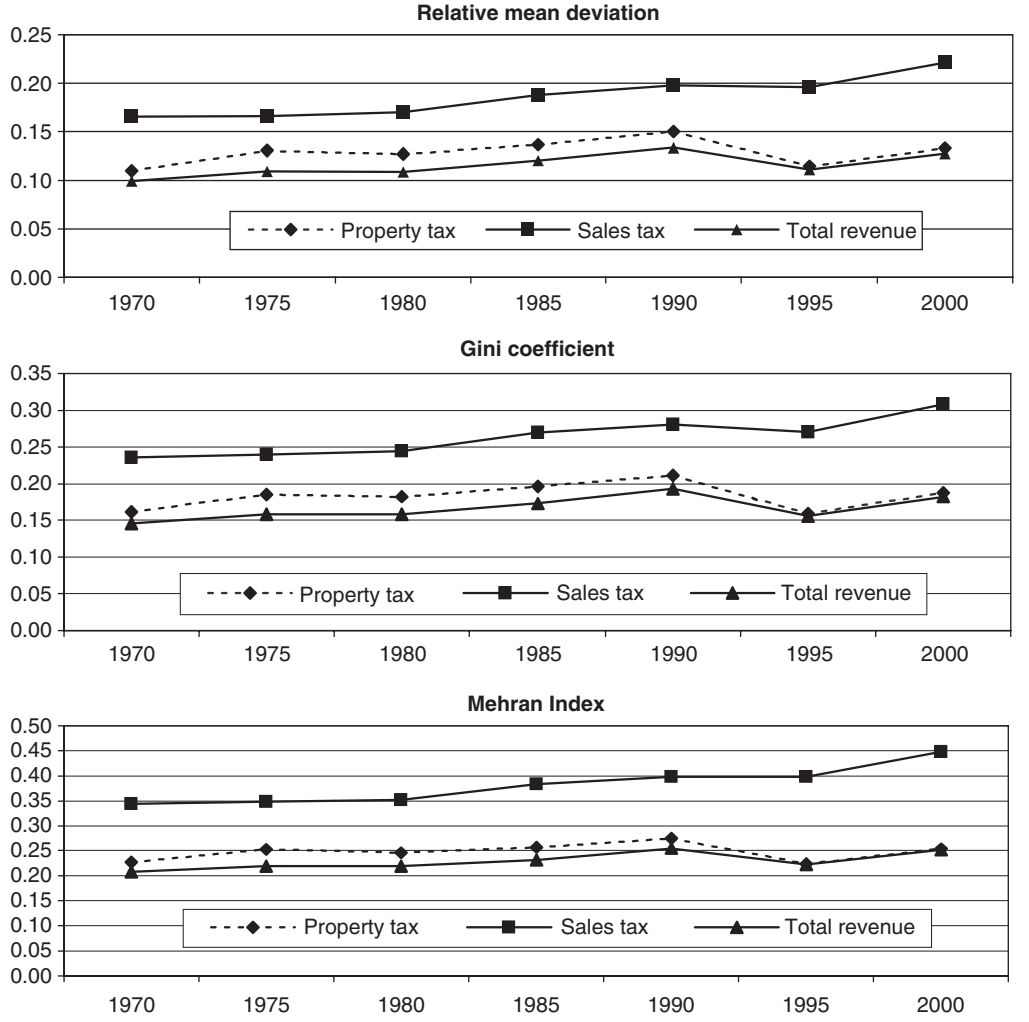
perfect equality) divided by the area under the line. Thus the coefficient represents the difference between the actual distribution of certain object (per capita tax base or tax revenue) and the distribution if all individuals (counties) received equal amount of that object.[32] The Mehran Index is like the Gini coefficient with a twist. It weights the inequality among the poor heavier than inequality among the rich, following the Pigou-Dalton transfer principle that assumes a positive transfer of income from a richer to a poorer decreases income inequality.[33] These indices are often used together in inequality studies because they represent a diversity of value judgments about what would be considered "fair." In this study, perfect equality would exist if all Georgia counties had the same level of RRC, while the three indices are used to measure in slightly different ways how far the actual distribution is deviated from the perfectly equal distribution. For all these indices, higher values indicate higher levels of inequality.

Results of dispersion analysis based on the RTS approach are shown in Figure 5, which includes three diagrams, each representing the level of inequality as measured by

32. Berne and Stiefel, *The Measurement of Equity in School Finance: Conceptual, Methodological, and Empirical Dimensions*.

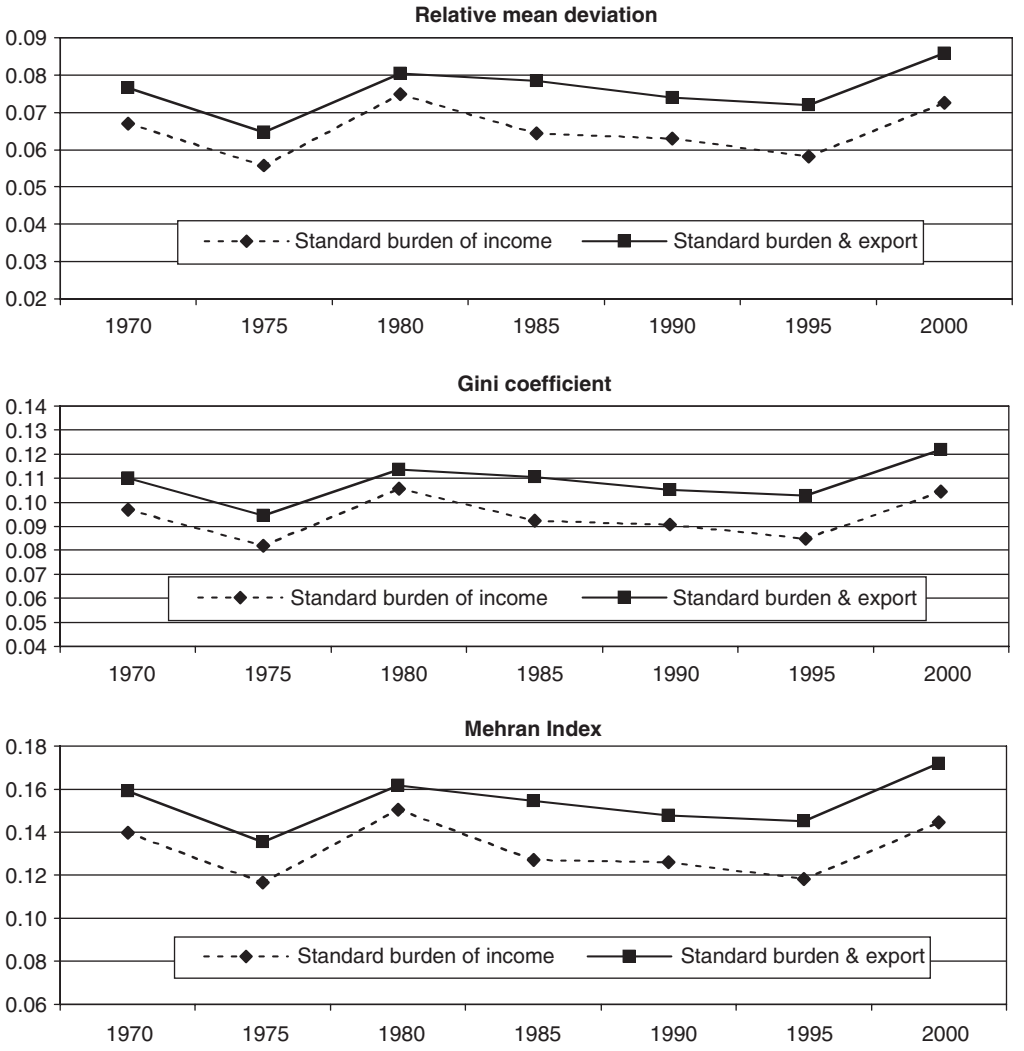
33. For further discussion, see Farhad Mehran, "Linear Measures of Income Inequality," *Econometrica* 44, no. 4 (1976).

FIGURE 5
Fiscal Disparities with Representative-Tax-System Approach (1970–2000)



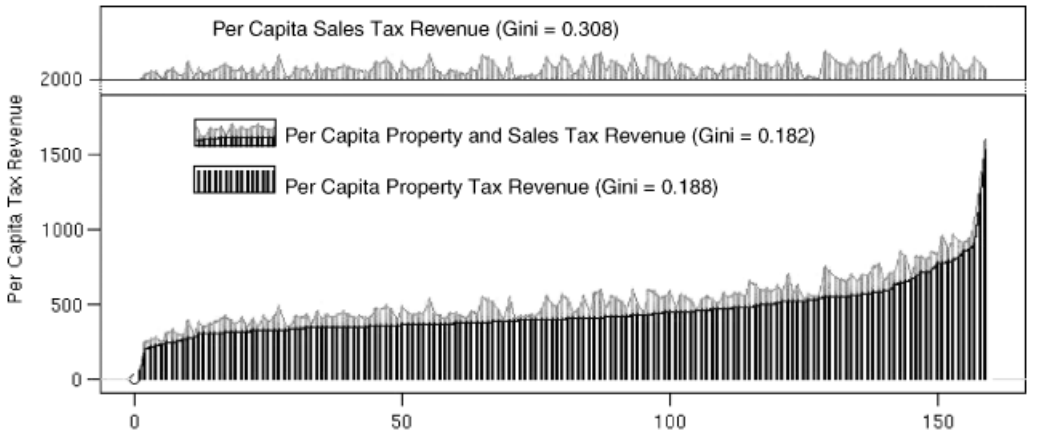
one dispersion index. In each diagram there are three trend lines: the diamond dash trend line shows the dispersion of property tax revenue capacity (levied at the average millage rate); the square solid line shows the dispersion of LOST proceeds (levied at 1 percent tax rate); and the triangle solid line shows the dispersion of the composite RRC based on the RTS approach. We can see trend lines in the same diagram to compare fiscal disparities associated with different sources of revenue, or examine the fluctuation of a trend line to see how fiscal disparities change over time. However, trend lines in different diagrams are not comparable.

FIGURE 6
Fiscal Disparities with Income-With-Exporting Approach (1970–2000)



As Figure 5 shows, the patterns of dispersion are consistent in the three diagrams. Property tax revenues show a general trend of increasing inequality from 1970 to 1990; then it fluctuated in the last decade. For LOST proceeds, the level of inequality grows over time and is much higher than that of the property tax especially in recent years. However, the composite measure of both the property tax and LOST is the lowest in all diagrams, which suggests that adding LOST revenue to property tax revenues does not exacerbate the fiscal inequality. Recall that the two tax bases are somewhat positively

FIGURE 7
Property Tax Capacity and Sales Tax Capacity in FY 2000



correlated ($r = 0.27$ in FY 2000), how would adding the two together produce a more equal distribution than either one individually? The explanation lies in the spatial distribution of these tax bases. While sales bases are more dispersed than property tax bases, the two tax bases are dispersed in different spatial dimensions. As Figures 1b and 3b show, sales bases concentrate on a number of retail-center counties, most of which are not in the top echelon of property tax capacity that are key drivers of original fiscal disparity. In Figure 4, we see that the outlier counties with extremely high property tax capacity tend to have only modest level of sales tax base, and thus adding LOST proceeds partially offsets the fiscal inequality associated with property tax revenues (Figure 7).[34] We should also note that in the last decade the dispersion of RTS RRC seems to gradually converge with that of property tax revenues. The offsetting effect seems to decrease over time as the dispersion of LOST revenue becomes increasingly unequal.

Figure 6 shows the results of dispersion analyses of RRC based on the IWE approach. Each diagram represents the results of dispersion analysis during the 1970–2000 period using one dispersion index. In these diagrams, the dash lines depict the dispersion of income-based revenue capacity, which is calculated as a percentage of personal income, with the assumption of standard tax burden and zero tax exportation. The solid lines show the dispersion of IWE RRC when sales tax exportation is added to income-based revenues.

Analyses again show consistent patterns across indices. For income-based revenues, the level of inequality has fluctuated but generally grown over the past four decades.

34. An intuitive analogy is that dispersion functions like financial risk; so it is possible that adding two dispersed items produces a more equal distribution, as is the case that adding two positively correlated stocks may produce a lower level of (unsystematic) risk than either one individually.

Because the income-based revenue covariates with the average personal income, this measure also indicates similar changes in income disparity across Georgia counties over the time period. Adding the amount of sales tax exportation to income-based revenue comes up with the IWE revenue-raised capacity, which is represented as red solid lines. In all three diagrams, the solid lines are much higher than the dash lines. It suggests that the introduction of LOST significantly increases the level of fiscal disparities across counties.

While Figures 5 and 6 illustrate the trend of fiscal disparities over two decades, many people would be more interested in the changes that have occurred in recent years, when a common trend of increased fiscal inequality is shown in both figures. In Figure 6 the dispersion of IWE (income-based) RRC has become much higher since 1995; this finding is consistent with recent reports about the growing state income disparities in the United States.[35] In Figure 5 we see a similar trend of growing disparities associated with property tax revenues and LOST proceeds. Moreover, Figure 5 shows that the dispersion of LOST proceeds is growing much faster than that of property tax revenues. This may have occurred because of the income disparities in the same period (as indicated by Figure 6), because sales tax is more income-elastic than the property tax.[36] Further investigations, of course, are needed to verify these hypotheses.

SUMMARY AND CONCLUSION

This study examines the effects of LOST on local fiscal disparities. Analysis based on the RTS approach shows that the dispersion of LOST revenue is higher than that of property tax revenue, and it grows over time. Although adding LOST may not have exacerbated fiscal inequality associated with the property tax in the past two decades, it may do so if the current trend of growing LOST disparity continues. Analysis with the IWE approach, however, demonstrates that adding sales tax exportation significantly increases the dispersion associated with the income-based revenue, that is, introducing the LOST does exacerbate revenue disparity. This study is conducted on Georgia's 159 counties. Similar studies have yet to be conducted in other states with LOST before the findings are generalizable. Still, the study bears implications for states that are concerned with fiscal disparities associate with LOST. One possible solution is for the state to collect a standardized rate of sales tax and then distribute the revenue on a per capita basis. This method, however, essentially turns the LOST into a state sales tax. A second option is for the state to create a specific formula that not only retains the "local option"

35. Center on Budget and Policy Priorities and Economic Policy Institute, "State Income Inequality Continued to Grow in Most States in the 1990s, Despite Economic Growth and Tight Labor Markets" (Washington, DC: Center on Budget and Policy Priorities, 2002; available from: *http://www.cbpp.org/1-18-00sfp.htm:* accessed 7 January 2008).

36. National Conference of State Legislatures, *Critical Issues in State-Local Fiscal Policy: A Guide to Local Option Taxes* (Denver, CO: National Conference of State Legislatures, 1997).

feature of the sales tax but also offsets, at least partially, the disparities of its proceeds. To create such a formula, it is critical to have an accurate measure of fiscal inequality. In doing so, policymakers should choose an approach that fits their conceptualization of "fiscal equity," in particular, whether they are attempting to maintain a competitive tax structure (then use RTS) or a reasonable tax burden at the local level (then use IWE),[37] because the measure of fiscal disparity is sensitive to the approach that is used. Lastly, considering the "intra-regional" pattern of sales base distribution, a state with a vast rural area, like Georgia, may provide incentives for the development of rural sales centers, which serves not only as an economic development policy but also as a means to mitigate fiscal disparities between its urban and rural localities.

This study has several limitations. First, it examines only disparities on the revenue side, which are clearly not the whole picture. For example, counties in the Atlanta metropolitan area have higher RRC, but it is also possible that these counties have higher expenditure needs because of the level of urbanization.[38] If this is the case, fiscal disparities measured by the need-capacity gap might be less severe. Second, this study depicts the change of fiscal disparities over three decades, but it does not provide a systematic explanation of the change. Further investigations should be undertaken to provide a causal model of fiscal disparities. Third, this study focuses on the dispersion of revenue capacity, but we may wonder how the actual LOST revenues reduce or exacerbate disparities in actual property tax revenues in Georgia, which will be explored in subsequent studies.

NOTE

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37. Ladd, "Measuring Disparities in the Fiscal Condition of Local Governments."

38. Helen F. Ladd, "Population Growth, Density and the Costs of Providing Public Services," *Urban Studies*, no. 2 (1992).