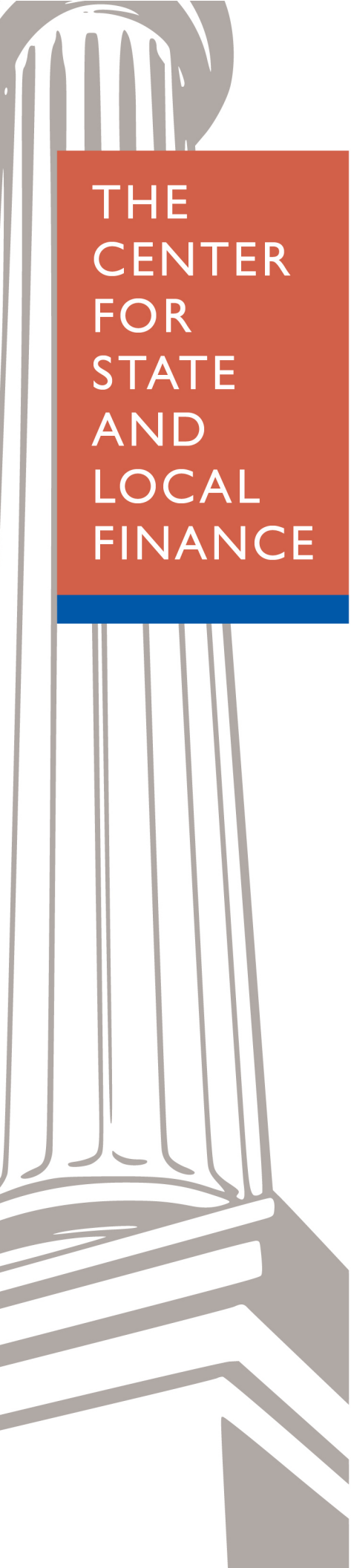


THE CENTER FOR STATE AND LOCAL FINANCE

AUGUST 2024

Personal Income, Property Bases, and Sales Tax Bases: Variation Across Georgia Counties

David L. Sjoquist
Jake Vaughan

Georgia State University | Andrew Young School
Center for State & Local Finance

The Center for State and Local Finance
Andrew Young School of Policy Studies

The Center for State and Local Finance's (CSLF) mission is to develop the people and ideas for next-generation public finance by bringing together the Andrew Young School's nationally ranked faculty and the broader public finance community. CSLF conducts innovative, nonpartisan research on tax policy and reform, budget and financial management, education finance, and economic development and urban policy. Additionally, it provides premier executive education in public finance for state and local finance officials and works with local and state partners on technical assistance projects on fiscal and economic policy.

CSLF reports, policy briefs, and other publications maintain a position of neutrality on public policy issues in order to safeguard the academic freedom of the authors. Thus, interpretations or conclusions in CSLF publications should be understood to be solely those of the author(s).

For more information on the Center for State and Local Finance, visit our website at cslf.gsu.edu.

1. Introduction

This report explores the distribution of personal income, the sales tax base, and the property tax base across Georgia counties. These three variables are measures of fiscal capacity, meaning that counties with greater total personal income and larger sales and property tax bases have more resources to fund public services. Income—such as wages, salary, and return on investment (i.e., interest, dividends, profits, and changes in the value of assets)—reflects household purchasing power, including the power to pay taxes as well as government charges and fees. The sales tax and property tax bases are measures of the potential economic power that counties have to fund public services; actual ability to fund public services depends on the tax rate that is applied to these tax bases.

Our interest in the distributions of the three fiscal capacity measures is motivated by the importance of equity. For income, equity is concerned with the ability of individuals to consume goods and services. We argue that the distribution of per capita income across counties—not the distribution of total county income—is the better measure of equity. For tax bases, inter-county equity is measured by the distribution level of public services that individuals enjoy. This depends on the tax base, but also on the cost of public services and how that cost varies with the size of the population served (i.e., economies of scale).[1] At one extreme are pure public goods, for which the cost does not depend on the size of the population, such as emergency warning systems, but for most public services, the total cost for a given level of service increases with population, while the cost per capita could decrease or increase with population size. Research suggests that for small populations, the cost per capita decreases some degree as population increases, but for most jurisdictions the cost per capita is the same regardless of population. Our discussion assumes that the cost per capita, for a given level of public service, is constant, and thus we consider the distribution of tax base per capita to be a measure of equity.[2]

Before proceeding, we present some institutional features of taxes in Georgia. First, only the state government levies an income tax in Georgia, but on the other hand, only local governments levy property taxes. The definition of the property included in the property tax base is the same for all local governments. However, there are differences across local jurisdictions in homestead exemptions and in the tax rates imposed. Our measure of the property tax base is gross of homestead exemptions (see

[1] Of course, this ignores that the differences in needed expenditures depend on the percentage of the population that attends public schools.

[2] For a review of empirical studies of economies of scale, see Boyne (1995) and Gómez-Reino, Lago-Peñas, and Martinez-Vazquez (2021).

footnote 3). Sales taxes are imposed by both the state and local governments, and there are several local sales taxes that local governments might adopt. Apart from a sales tax imposed in the city of Atlanta, local sales taxes are imposed countywide. Local sales taxes differ in how the tax base is defined, how revenue can be used, and how the revenue is shared among the local governments in a given county. We consider the county-wide property tax base and county-wide sales tax base, but we do not include sub-county measures of income or tax bases.

In section 2, we illustrate the distribution of county totals for these three fiscal variables. In sections 3–5, we explore variations across counties in personal income per capita, sales tax base per capita, and property tax base per capita, as well as factors that might explain the variations across counties. In section 6, we compare the distributions of county income per capita, sales tax base per capita, and property tax base per capita. In section 7, we discuss possible policies to address the inequalities across counties in their fiscal health.

2. Total Personal Income, Sales Tax Base, and Property Tax Base

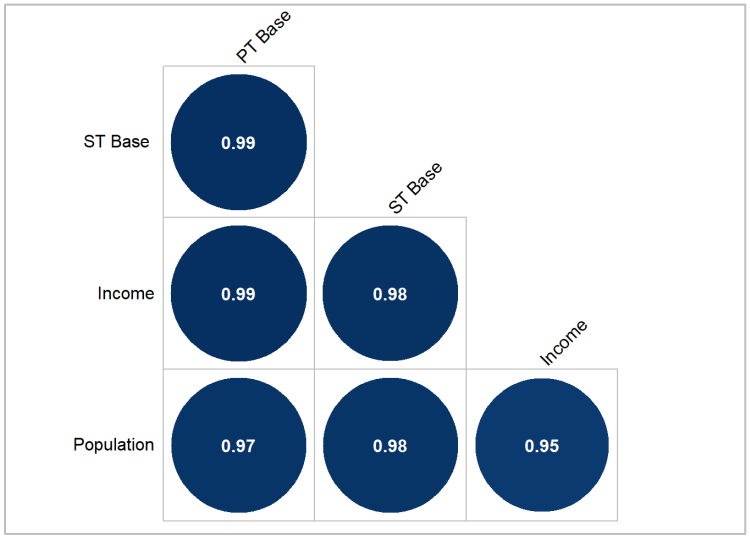
This section explores how total personal income, sales tax bases, and property tax bases varied across Georgia's counties in 2022.[3] Overall, each variable varied widely across counties. The minimum and maximum values for each are presented in Table 1, as are the means, medians, and standard deviations. Figure 1 shows the pairwise correlation coefficients. As should be expected, total income, property tax base, sales tax base, and population are highly correlated, with correlation coefficients greater than 0.95.

[3] Income and population data were obtained from the U.S. Bureau of Economic Analysis, table CAINC1. Sales tax base data for 2022 are from the county allocation data reported by the Georgia Tax Center in the Department of Revenue. We used education sales tax (ESPLOST) revenue, except for Burke and Towns Counties, which do not have an ESPLOST. For those two counties, we used revenue for the Local Option Sales Tax (LOST). We divided revenue by 1 percent to determine the tax base. The sales tax base for Heard County for 2022 ($945.8 million) is much larger than for 2021 ($480.9 million) and for 2023 ($388.0 million), and thus we used the average of 2021 and 2023 for Heard. Property tax base data for 2022 were obtained from the Georgia Department of Audits and Accounts, which calculates the uniform property tax base for each school district that is used in the school funding formula: www.audits.ga.gov/ReportSearch/download/30347. These data differ from the actual property tax base because the former adjusts for misestimation of market value and the lack of uniformity across counties in policies such as homestead exemptions.

Table 1. Total Personal Income, Sales Tax Base, and Property Tax Base, 2022

($ in millions)	INCOME	SALES TAX BASE	PROPERTY TAX BASE
Minimum	$69.8	$12.7	$173.6
County with Minimum	Taliaferro	Webster	Chattahoochee
Maximum	$108,123.2	$36,754.3	$246,297.5
County with Maximum	Fulton	Fulton	Fulton
Mean	$3,884.0	$1,674.8	$10,058.6
Median	$1,013.7	$472.4	$2,490.4
Standard Deviation	$11,139.6	$4,206.4	$27,725.1

Figure 1. Correlation Coefficients



To examine the distributions of the three fiscal variables, we ranked Georgia's counties from highest to lowest by each respective measure. We then used those rankings to split the counties into 10 groups of equal size (16 counties each, with 15 in the last group) and calculated for each group the proportion of total income, total sales tax base, and total property tax base. The results are shown in Table 2.

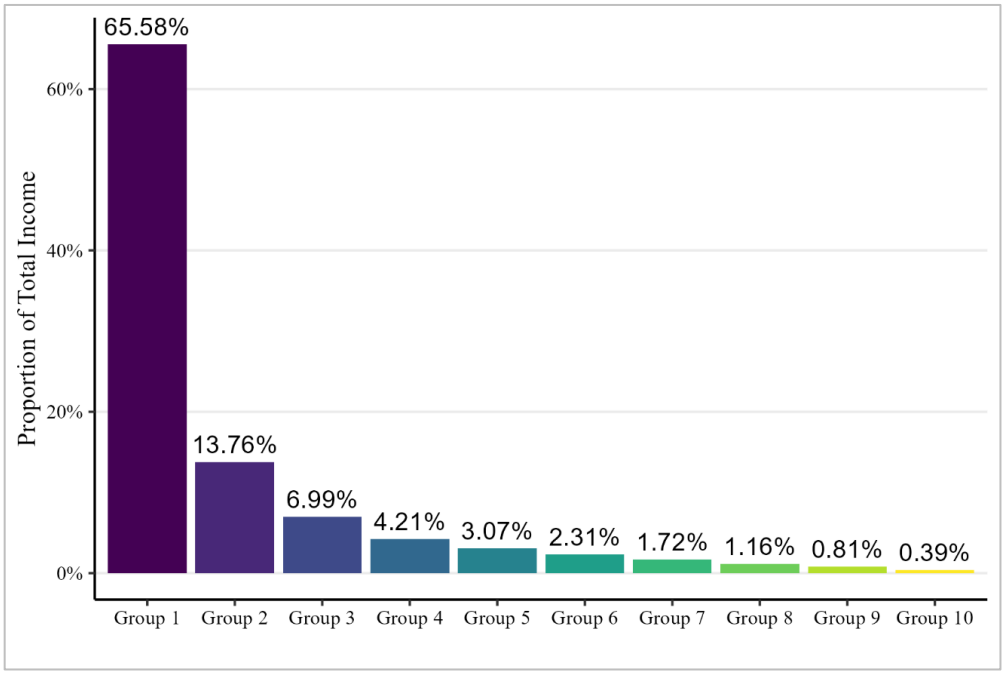
Group 1, which comprises counties with the 16 highest total incomes, accounts for 65.6 percent of total state income. Conversely, group 10, which comprises the 15 counties with the smallest total incomes, accounts for less than 0.5 percent of the state's total income. Each group contains approximately 10 percent of the counties in Georgia, but only the first two groups account for at least 10 percent of state income. Group 1 accounts for more income than the other 147 (90 percent of the counties) counties combined. Furthermore, the 47 (30 percent) counties with smallest incomes account for only 2.36 percent of state income. Since income is highly correlated with both sales and property tax bases, the distributions of those are quite similar to that of income (see Table 2).

Table 2. Distribution of Personal Income, Property Tax Base, and Sales Tax Base, 2022

	NUMBER OF COUNTIES	PROPORTION OF TOTAL INCOME	PROPORTION OF TOTAL PT BASE	PROPORTION OF TOTAL ST BASE
Group 1	16	65.6%	65.7%	62.2%
Group 2	16	13.8%	14.4%	16.4%
Group 3	16	7.0%	6.9%	7.9%
Group 4	16	4.2%	4.5%	4.9%
Group 5	16	3.1%	2.9%	3.4%
Group 6	16	2.3%	2.0%	2.2%
Group 7	16	1.7%	1.4%	1.4%
Group 8	16	1.2%	1.0%	0.9%
Group 9	16	0.8%	0.7%	0.6%
Group 10	15	0.4%	0.3%	0.2%

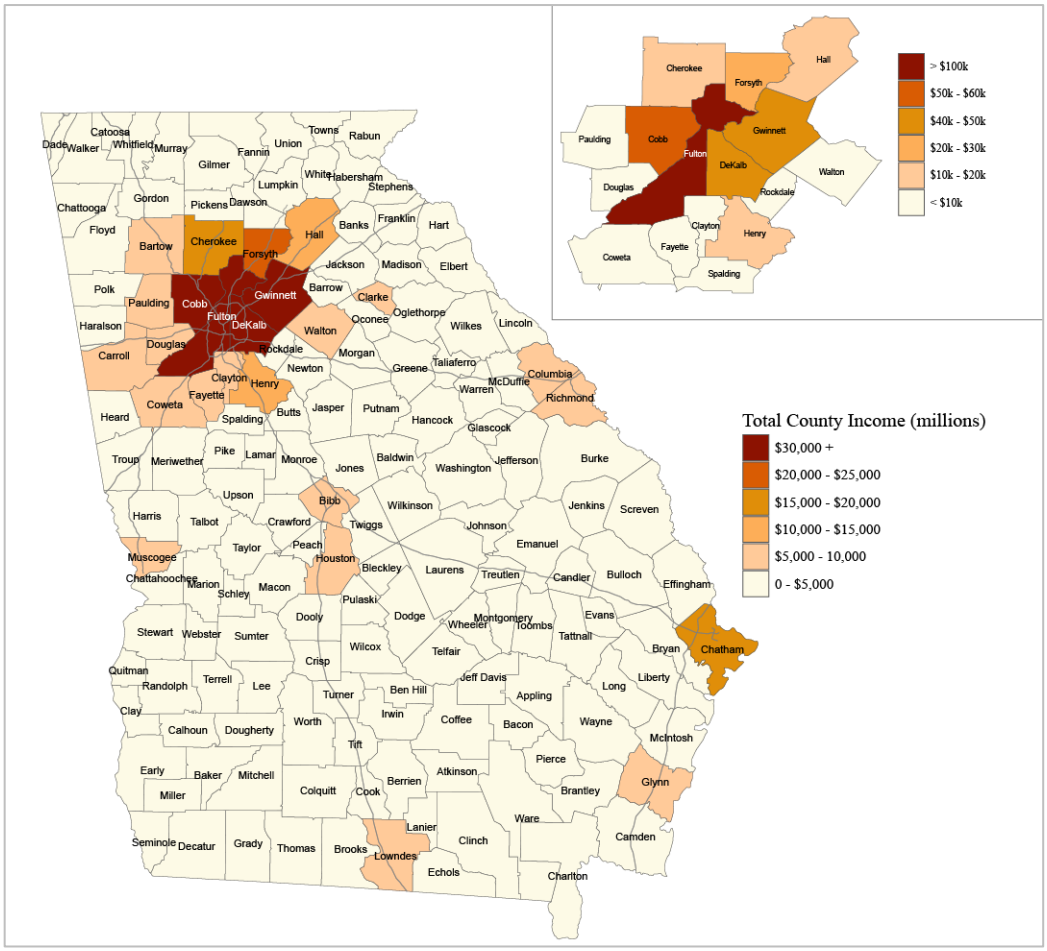
Figure 2 shows the distribution of income. Given that the correlation coefficients are large, i.e., greater than 0.95, the distributions of sales and property tax base are very similar to the distribution of income. Thus, we only show the figure for income. The distributions of the three measures are highly skewed to the right, i.e., most counties have relatively small values while only a handful of counties have very large values. This is why in Table 1 the medians are significantly smaller than the means.

Figure 2. Distribution of County Personal Income, 2022



The geographic distribution of personal income is shown in Map 1. Given that income, sales tax base, and property tax base are highly correlated with population, the maps for sales and property tax bases as well as population are very similar and are therefore not presented. As the distribution of county income is highly skewed, the scale of the map is capped in order to see some variation at the lower end of the distribution. The few high-income counties at the top end of the distribution are located in the metro Atlanta area, so an inset map of this area, with a larger scale, is included. The median total county income is $1.01 billion, while Fulton's income is over 100 times larger at $108.1 billion, and by itself accounts for 17 percent of Georgia's total income. Fulton County is an outlier, and the next three highest earning counties had incomes close to $50 billion in 2022. This large variation implies vastly different abilities to fund public services across counties in Georgia.

Map 1. Total Income in Georgia Counties, 2022



Counties with large total incomes, sales tax bases, and property tax bases are in metropolitan areas. To illustrate this, we created the variable *Urban*, which equals 1 if the county is part of an urbanized area

and equals zero otherwise. Table 3 shows how the mean values of the three variables differ between counties that are urban and nonurban. The values of the three variables are much larger for urban counties than for nonurban counties; the percentage differences are around 1,000 percent. Given that the values of the three variables are so highly correlated, it is expected that the percentage differences will be similar for the three measures, which they are.

Table 3. Differences in Means Between Urban and Nonurban Counties, 2022

($ in millions)	URBAN = 1 (45 COUNTIES)	URBAN = 0 (114 COUNTIES)	DIFFERENCE	PERCENTAGE DIFFERENCE
Personal Income	$11,268.0	$969.2	$10,298.7	1,062.5%
Sales Tax Base	$4,782.7	$448.0	$4,334.7	967.5%
Property Tax Base	$29,022.8	$2,572.7	$26,450.2	1,028.1%

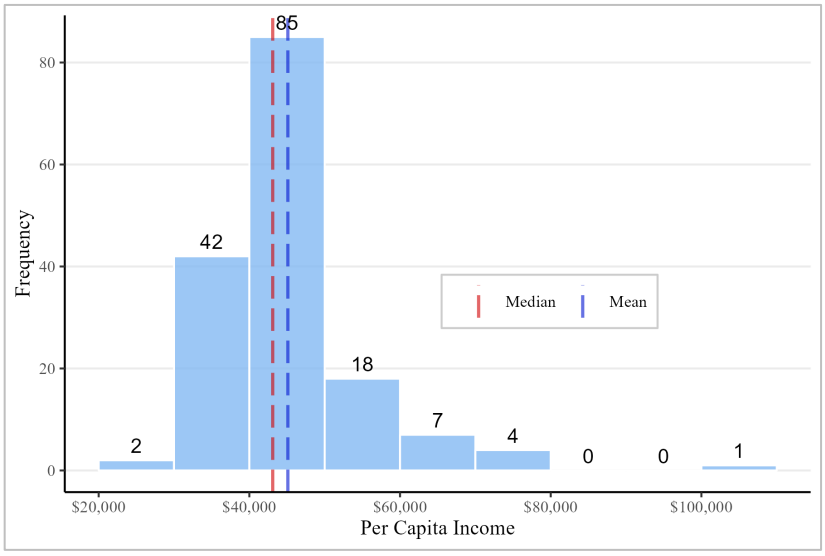
In this section, we considered the across county variations in total personal income, sales tax base, and property tax base. In the next three sections, we look at the distribution of per capita personal income, per capita sales tax base, and per capita property tax base, respectively. We argue that variations in per capita sales tax and property tax bases is a better measure of the across county equity than total sales and property tax bases.

3. Per Capita Income

Per capita income (*PCInc*) varies widely across Georgia counties. In 2022, county *PCInc* ranged from $23,545 (Wheeler County) to $100,614 (Fulton County), meaning that the largest *PCInc* was 4.27 times larger than the smallest *PCInc*. State-level *PCInc* was $56,589, while the average of county *PCInc* was $45,110, which implies that counties with larger *PCInc* have larger populations.

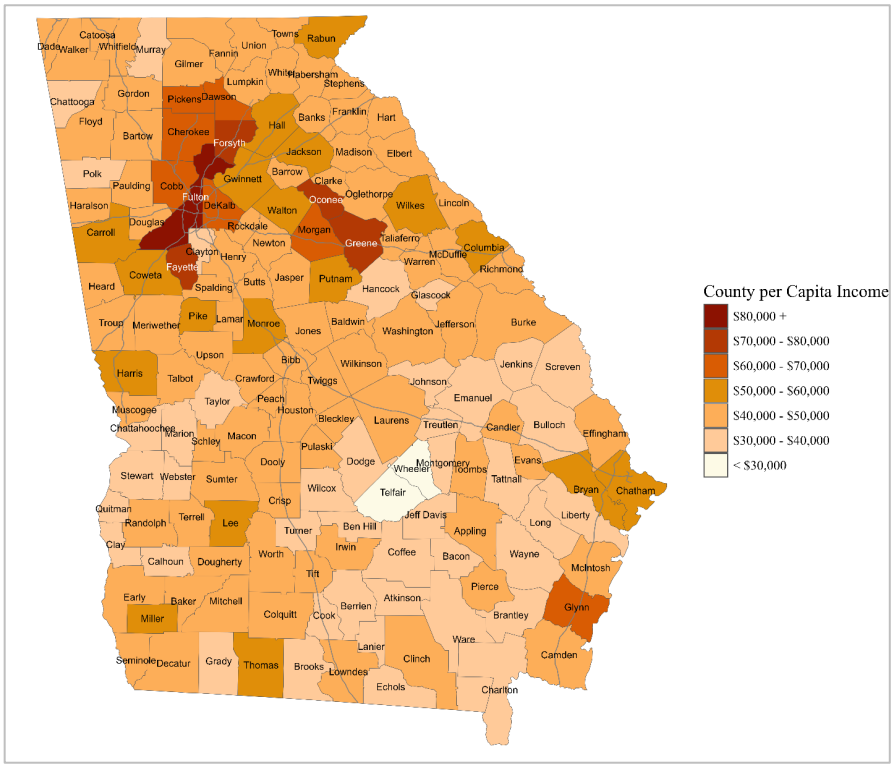
Figure 3 shows the distribution of county *PCInc. PCInc* was divided into nine bins, two of which are empty, and thus there are seven bars in Figure 3. The width of each bin is $10,000, so the first bar includes counties with *PCInc* between $20,000 and $30,000, while the height of each bar is the number of counties within the income range. The distribution of *PCInc* is skewed to the right—that is, the median *PCInc* ($43,102) is less than the average *PCInc* ($45,110). The largest *PCInc* of $100,614 (Fulton County) is an outlier, the second largest *PCInc* is $79,902 (Oconee County). Most Georgia counties (85) have a *PCInc* between $40,000 and $50,000.

Figure 3. Distribution of Per Capita Income, 2022



Map 2 shows the geographic variation in *PCInc*. The map suggests that *PCInc* is larger in counties that are urban, in counties located in the northern part of the state, and in counties in which an interstate passes.[4]

Map 2. Per Capita Income for Georgia Counties, 2022



[4] We classify GA 400 and GA 316 as interstates highways.

In addition to *Urban,* we created a dummy variable *North,* which equals 1 if the county is in the northern part of the state and equals zero otherwise, and a dummy variable *Interstate*, which equals one if an interstate is contained in the county and zero otherwise.[5] Table 4 reports the average *PCInc* for counites sorted by the values for *North*, *Interstate*, and *Urban*. The percentage differences are much smaller than for total income, but still sizable and statistically significant.

Table 4. Per Capita Income by County Categories, 2022

CATEGORY	NUMBER OF COUNTIES	AVERAGE INCOME	DIFFERENCE	PERCENTAGE DIFFERENCE
North Georgia (North = 1)	56	$50,802	$8,748	20.8%
South Georgia (North = 0)	103	$42,016		
Interstate in County (Interstate = 1)	69	$49,534	$7,815	18.7%
No Interstate (Interstate = 0)	90	$41,719		
Urban (Urban = 1)	45	$50,701	$7,797	18.2%
Nonurban (Urban = 0)	114	$42,904		

The urban-nonurban income gap is well documented in economic literature and in national data. In the last couple of decades, data from the Federal Reserve has shown this gap to be widening. The exacerbation of this gap has largely been driven by structural changes to the U.S. economy that have shifted more towards services and knowledge-based industries and somewhat away from agriculture, manufacturing, and mining (Dumont 2024). While less commonly discussed, the connection between interstates and economic development is also well established. A wide variety of macroeconomic literature documents the strong correlation between infrastructure and productivity in the United States. The construction of the U.S. interstate system connected major urban markets. This in turn increased economic efficiency and productivity by reducing transportation costs and facilitating the transfer of both goods and knowledge. This connectivity allows firms with interstate access to supply their products to a much larger geographical area at lower costs (Phelps 2021). The increased efficiency and productivity along with increased market access associated with interstates helps explain the higher average income in counties containing a major interstate. The observed differences in income between North and South Georgia are much more specific to the state. In the way the northern and southern regions are defined here, the metro Atlanta counties fit into the North category. As is evident from the income and *PCInc*

[5] Counties that are classified as north are those that are above I-20, either in whole or part, plus Fayette, Clayton, and Henry Counties.

maps, Georgia's total income is heavily concentrated in the Atlanta area and per capita income tends to be higher near the metro area. Furthermore, the North Georgia mountains and national forests bring in tourists, vacation homes, and higher property values, which may in turn lead to higher income residents.

County differences in *PCInc* for each of the three categories could be due to differences between the characteristics of the population in the two sets of counties for each category. Empirical studies of income find that individual incomes vary by age, education, race, and gender, among other factors. Thus, we might expect that the variation in county *PCInc* could be due to variations in these same factors. Table 5 contains correlation coefficients between *PCInc* and each of several variables measured at the county level, as well as the corresponding P-values. The signs of the correlations are as expected, although the correlation with the percentage male, denoted as *Gender*, is not statistically significant. The correlation with the percentage having at least a college degree, denoted *Education*, has the largest correlation, 0.80. *Age* is measured by the median age and *Race* is measured by percentage white. The correlations of *PCInc* with *North*, *Interstate,* and *Urban* are larger than for any of the household variables other than education.

Table 5. Correlation with Per Capita Income, 2022

VARIABLE	CORRELATION	SIGNIFICANCE LEVEL (P-VALUE)
Age	0.12	0.12
Education	0.80	0.00
Gender	0.07	0.39
Race	0.14	0.08
North	0.42	0.00
Interstate	0.39	0.00
Urban	0.35	0.00

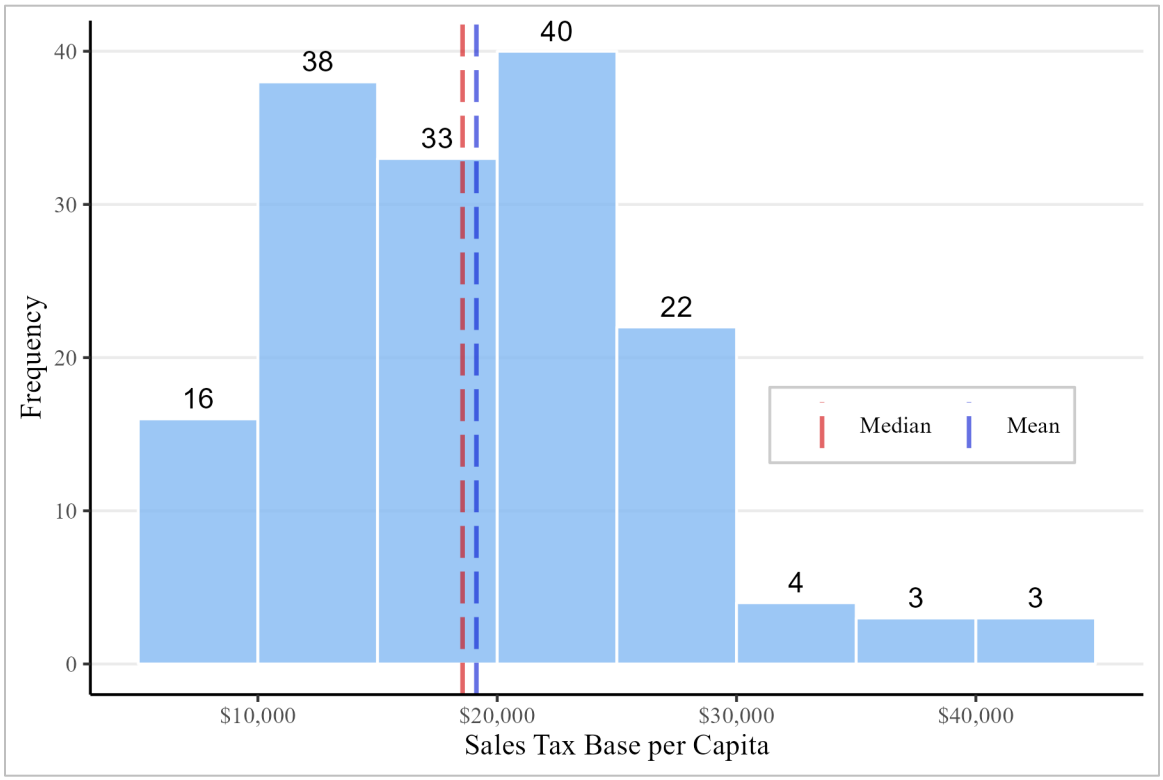
4. Per Capita Sales Tax Base

PCInc is a measure of a county's overall economic wellbeing, while a county's per capita sales tax base (*PCSt*) and per capita property tax base (*PCPt*) are measures of a county's fiscal health and ability to fund public services. Although the per capita variables facilitate better comparison between counties, it should be noted that small-population, rural counties may face an additional hurdle in providing services, as the populations are likely more spread out. In this section, we explore the distribution of *PCSt* for 2022.

The maximum *PCSt* is $43,613 (Dawson County) and smallest is $5,435 (Webster County), so the ratio of largest to smallest is 8.02—almost twice the ratio for *PCInc*. The average *PCSt* is $19,130 and the median *PCSt* is $18,552. This implies that *PCSt* is skewed to the right, which is clear from Figure 4 that shows the

distribution of *PCSt*. Figure 4 was constructed equivalently to Figure 3, although the width of each bin in Figure 4 is $5,000, and the first bar represents the 16 counties with *PCSt* between $5,000 and $10,000.

Figure 4. Per Capita Sales Tax Base, 2022



Map 3 shows the geographic distribution of *PCSt*. It appears that *PCSt* is larger in counties for which *Interstate*, *North*, or *Urban* equal one. Table 6 presents the difference in *PCSt* for the three county categories, similar to what is shown in Table 4. As with *PCInc*, *PCSt* is larger for counties in which *North*, *Interstate*, and *Urban* equal to one. The percentage differences in *PCSt* are much larger than for *PCInc* as reported in Table 4.

Map 3. Sales Tax Base per Capita for Georgia Counties, 2022

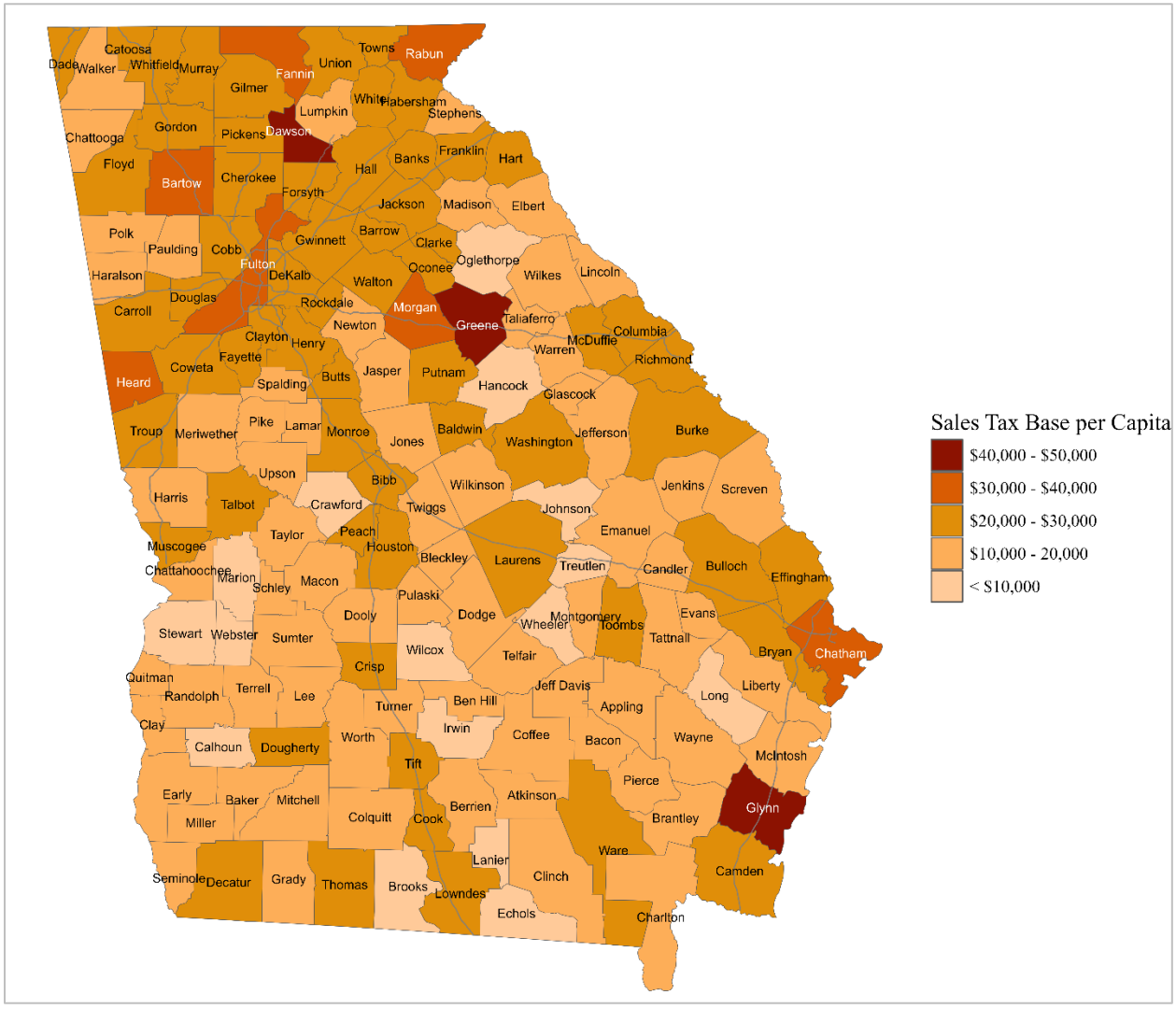


Table 6. Sales Tax Base per Capita by County Categories, 2022

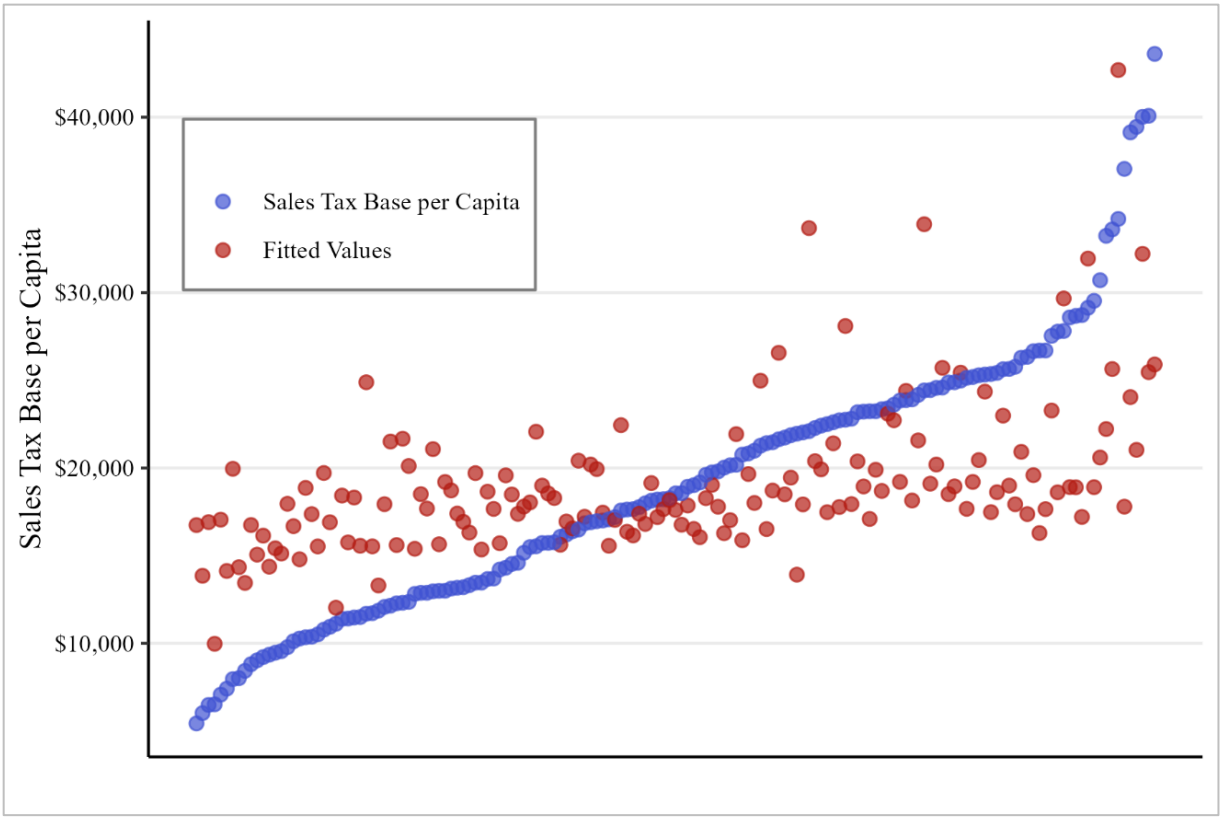
CATEGORY	NUMBER OF COUNTIES	SALES TAX BASE PER CAPITA	DIFFERENCE	PERCENT DIFFERENCE
North Georgia (*North* = 1)	56	$23,115	$6,151	36.3%
South Georgia (*North* = 0)	103	$16,964		
Interstate in County (*Interstate* = 1)	69	$22,881	$6,626	40.8%
No Interstate (*Interstate* = 0)	90	$16,255		
Urban (*Urban* = 1)	45	$22,355	$4,498	25.2%
Nonurban (*Urban* = 0)	114	$17,857		

We expect that *PCSt* is positively correlated with *PCInc*, and in fact, the correlation coefficient is 0.55. While modestly large, the correlation implies there is substantial variation in *PCSt* not explained by *PCInc*.

The remaining variation may be partly explained by the fact that at higher levels of income, spending on services drives much of the additional consumption and services are not a part of the sales tax base. Additionally, certain characteristics lead to higher cross-border spending in some counties, which contributes to a higher sales tax base.

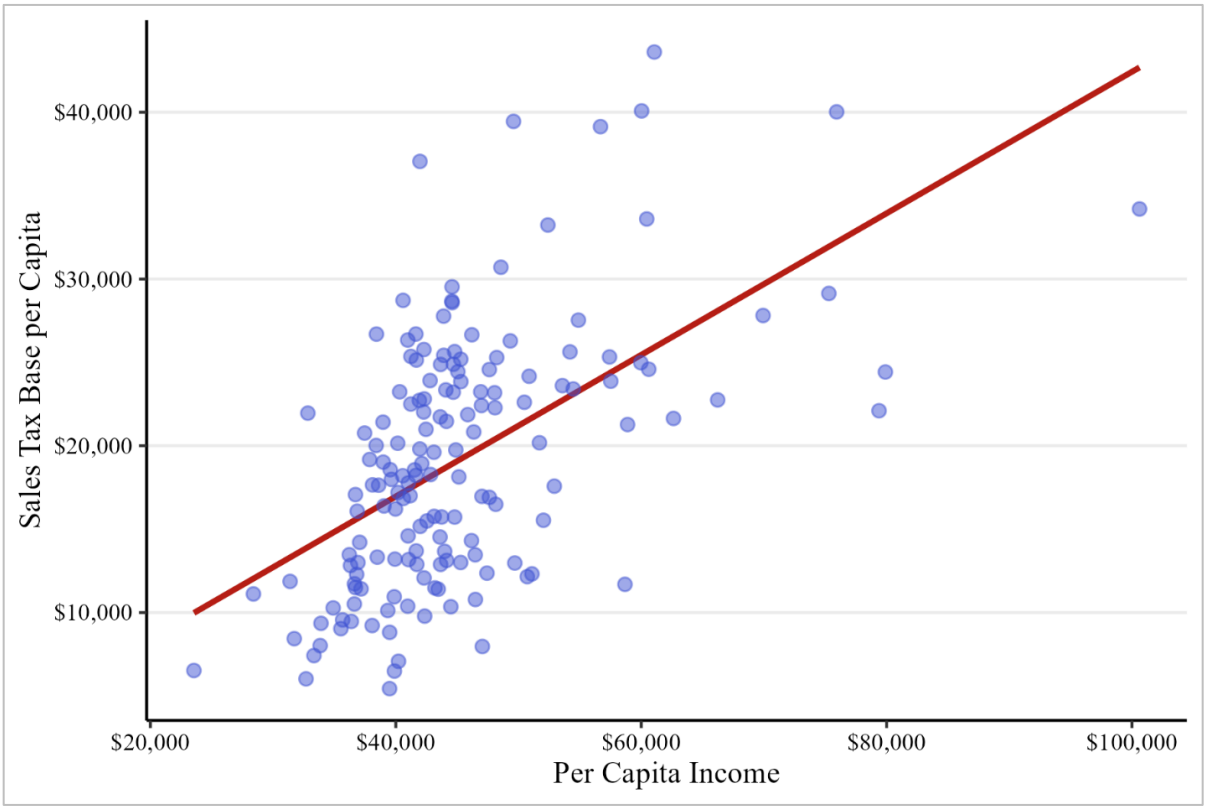
Figure 5 shows the distribution of *PCSt*, sorted from smallest to largest values, in blue. The red dots are the predicted values of *PCSt* using *PCInc* as the only explanatory variable. The figure is very similar if we include other explanatory variables in the regression equation. At smaller values of *PCSt*, the predicted values are greater than *PCSt*, and vice versa.

Figure 5. Distribution of Actual and Predicted *PCSt*, 2022



Next, we focus on counties for which *PCSt* are outliers. To do that, we plotted *PCSt* against *PCInc* and created a trend line by regressing *PCSt* against *PCInc* (Figure 6). Somewhat arbitrarily, we selected counties for which *PCSt* are above the trend line and are greater than $27,500. There are 15 such counties, listed in Table 7.

Figure 6. Sales Tax Base per Capita and Income per Capita, 2022



To explore why these counties are outliers, we consider sales tax revenue by NAICS industry group as presented in the Commodity Report from the Georgia Department of Revenue. For a comparison sample, we selected the 54 non-outlier counties with *PCSt* greater than $20,000. Using the Commodity Report, we estimated for each of the eight commodity categories the means and standard deviations of *PCSt* for the comparison sample.[6] If an outlier county's *PCSt* for a commodity category was greater than the comparison sample's mean plus twice the standard deviation for that commodity category, we considered that county to be an outlier for that commodity category. Table 7 indicates (with a "X") which counties are outliers for each commodity category.

[6] We combined five categories in the commodity report—food and beverage, general merchandise, home furnishings, other retail, and other services—to create the retail category.

Table 7. Outlier Georgia Counties for Sales Tax Base, 2022

COUNTY	PCST	COMMODITY CATEGORIES								
		ACCOMMODATIONS	AUTO	CONSTRUCTION	MANUFACTURING	SERVICE	UTILITY	WHOLESALE	RETAIL	TOTAL
Jackson	$27,535				X					1
Peach	$27,774		X					X		2
Union	$28,587					X				1
Tift	$28,672		X						X	2
Burke	$28,720						X			1
Crisp	$29,531					X				1
Bartow	$30,707				X					1
Rabun	$33,239					X			X	2
Morgan	$33,602		X					X	X	3
Heard	$37,054				X		X			2
Chatham	$39,137	X	X	X	X	X		X	X	7
Fannin	$39,453	X			X	X			X	4
Greene	$40,024		X	X	X	X			X	5
Glynn	$40,082	X				X			X	3
Dawson	$43,613			X		X			X	3
Total		**3**	**5**	**3**	**6**	**8**	**2**	**3**	**8**	**38**

The three counties that are outliers for accommodations, Fannin, Chatham, and Glynn, are either in the north Georgia mountains or on the coast and are thus tourist destinations. Burke and Heard Counties are outliers for utilities,[7] and both counties have large utility assessed value per capita. Chatham County is an outlier for every commodity category other than utility. Savannah is the major urban area for much of the southeastern section of the state, a major port city, and a tourist destination. There are eight counties that are outliers for retail and eight for services, and of these counties, six are outliers for both retail and services. All six counties are tourist destinations—in the mountains, on the coast, or as vacation retreats (Reynolds Plantation in Greene and Lake Oconee in Morgan). Tift and Crisp Counties are on I-75 and serve as retail centers for many surrounding counties. Two of the three counties that are outliers for construction (Greene and Dawson) had the 7th and 4th largest population growth between 2018 and 2022, and Chatham had the 61st largest population growth. We expect that population growth will lead to

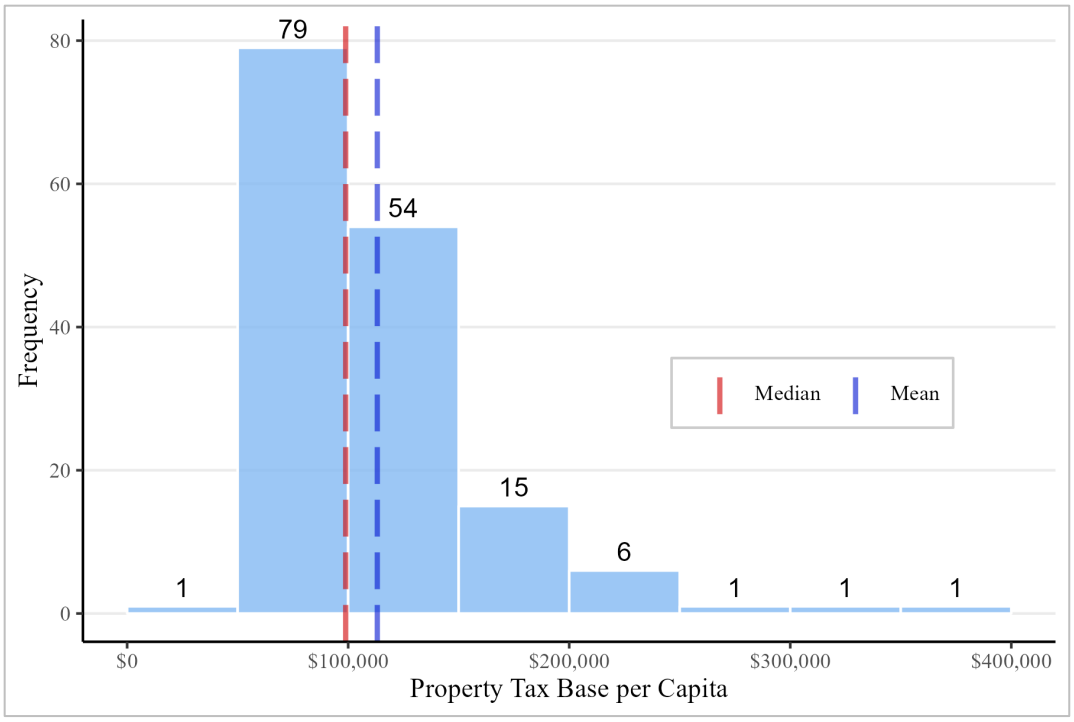
[7] Burke County is home to Plant Vogtle, the largest nuclear power plant in the United States. Heard County is home to Plant Wansley, a large natural gas power plant.

construction for expanded housing. Bartow County, which is an outlier for manufacturing, has the 11th largest manufacturing employment per capita and is home to several large manufacturing firms, including Shaw Industries and Toyo Tires.

5. Per Capita Property Tax Base

We turn now to the per capita property tax base (*PCPt*) for 2022. The largest *PCPt* is $740,612 (Burke County) while the smallest is $19,688 (Chattahoochee County), for a ratio of 37.62. Burke county's *PCPt* is an extreme outlier predominantly due to the presence of Plant Vogtle, the largest nuclear power plant in the United States. Excluding Burke County, the largest *PCPt* is $371,679 (Greene County), and the ratio of the second largest to the smallest *PCPt* is 18.88. Figure 7 shows the distributions of the *PCPt* using a bin width of $50,000. About half of the state's counties (79) have a *PCPt* between $50,000 and $100,000.

Figure 7. Distribution of *PCPt* (excluding Burke County), 2022



Map 5 shows the geographic distribution of *PCPt*. As with the sales tax, property tax bases are larger in metro areas, along interstates, and in the northern part of the state. Table 8 presents the difference in *PCPt* for the three county categories, similar to what is shown in Table 6. As with *PCInc* and *PCSt, PCPt* is larger for counties in which *North*, *Interstate*, or *Urban* equals one. The percent difference in *PCPt* is larger than for *PCSt* for *North* as reported in Table 6, but much smaller for the other two categories.

Map 5. Property Tax Base per Capita for Georgia Counties, 2022

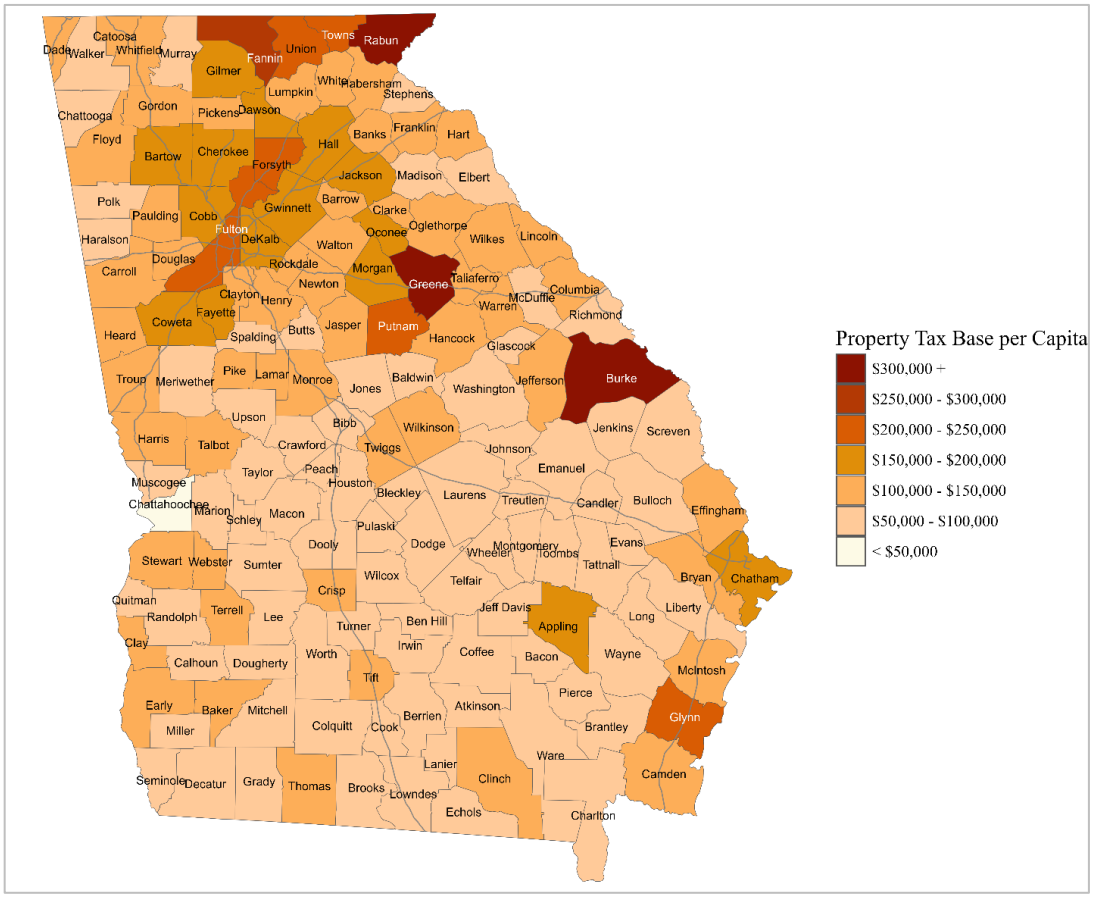


Table 8. Property Tax Base per Capita by County Categories, 2022

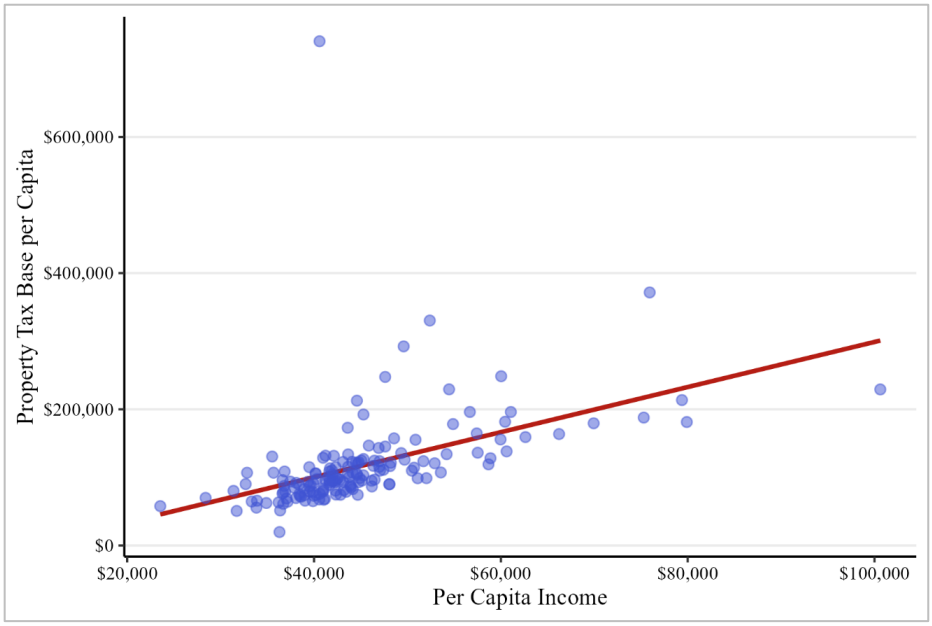
CATEGORY	NUMBER OF COUNTIES	PROPERTY TAX BASE PER CAPITA	DIFFERENCE	PERCENT DIFFERENCE
North Georgia (*North* = 1)	56	$146,741	$45,723	45.6%
South Georgia (*North* = 0)	103	$101,018		
Interstate in County (*Interstate* = 1)	69	$126,984	$17,423	15.9%
No Interstate (*Interstate* = 0)	90	$109,560		
Urban (*Urban* = 1)	45	$125,075	$11,093	9.7%
Nonurban (*Urban* = 0)	114	$113,982		

PCPt is positively correlated with *PCInc.* The correlation coefficient is 0.47, which is slightly lower than the correlation between *PCSt* and *PCInc*. However, if we exclude Burke County, the correlation coefficient between *PCInc* and *PCPt* is 0.69. While relatively large, the correlation implies that there is substantial variation in *PCPt* not explained by *PCInc*. We predicted *PCPt* using a set of explanatory variables that included *PCInc*, *North*, *Urban*, *Interstate*, public utility property per capita (*PCUtil*), the ratio of housing

units to resident population (*PCHou*), and manufacturing employment per capita (*PCMfg*). Burke County is excluded. Figure 8 plots the actual (blue dots) and predicted values (red dots) of *PCPt*. As with the sales tax base, at smaller values of *PCPt*, the predicted values are greater than *PCPt*, and vice versa, but the differences between the blue line and red dots are not as pronounced as with the sales tax base, indicating higher predictive power.

Figure 8. *PCPt* and Predicted Property Tax per Capita (excludes Burke County), 2022

Figure 9. Property Tax Base per Capita and Income per Capita, 2022



Next, we focus on counties for which *PCPt* are outliers. To do this, we plotted *PCPt* against *PCInc* and created a trend line by regressing *PCPt* against *PCInc* (Figure 9). The trend line, which is the red line in Figure 9, suggests that *PCInc* explains much of the variation in *PCPt*. However, there are some observations that are well off the trend line. For the analysis of property tax outliers, we used property tax digest data by property category.

To identify outliers, we took the trend line and shifted it to capture observations within the confidence interval. We take the counites that are outside the confidence interval to be outliers. There are 10 counties that we treat as outliers: Appling, Gilmer, Putman, Glynn, Union, Towns, Greene, Fannin, Rabun, and Burke. We find that three of these counties—Burke, Appling, and Rabun—have substantial public utility property per capita (*PCUtil*) and in fact rank first, second, and third in the state, respectively. These three counties are home to major power plants in the state. Six of these 10 counties—Gilmer, Glynn, Union, Towns, Fannin, and Rabun—are either in the North Georgia mountains or on the coast and have housing that is rented for short-term stays. We measure such property by the ratio of housing units to resident population, denoted *PCHou*. Greene and Putnam Counties also have high values of housing units per capita and are vacation retreats; Reynolds Plantation is in Greene County and both Greene and Putnam have proximity to Lake Oconee, Lake Sinclair, and the Oconee River, all of which are recreation sites.

6. Comparing Distributions

In this section, we compare the distributions of *PCInc*, *PCSt*, and *PCPt* to identify which is more widely distributed. Table 9 summarizes the above discussion regarding the basic measures of the distributions.

Table 9. PCInc, PCSt, and PCPt: Summary Measures of Distribution, 2022

	PCINC	PCST	PCPT
All Observations			
Minimum	$23,545	$5,435	$19,688
Maximum	$100,614	$43,613	$740,612
Ratio of Maximum to Minimum	4.27	8.02	37.62
Range	$77,069	$38,178	$720,925
Mean	$45,111	$19,130	$117,122
Median	$43,102	$18,552	$98,909
Standard Deviation	$9,973	$7,655	$70,756

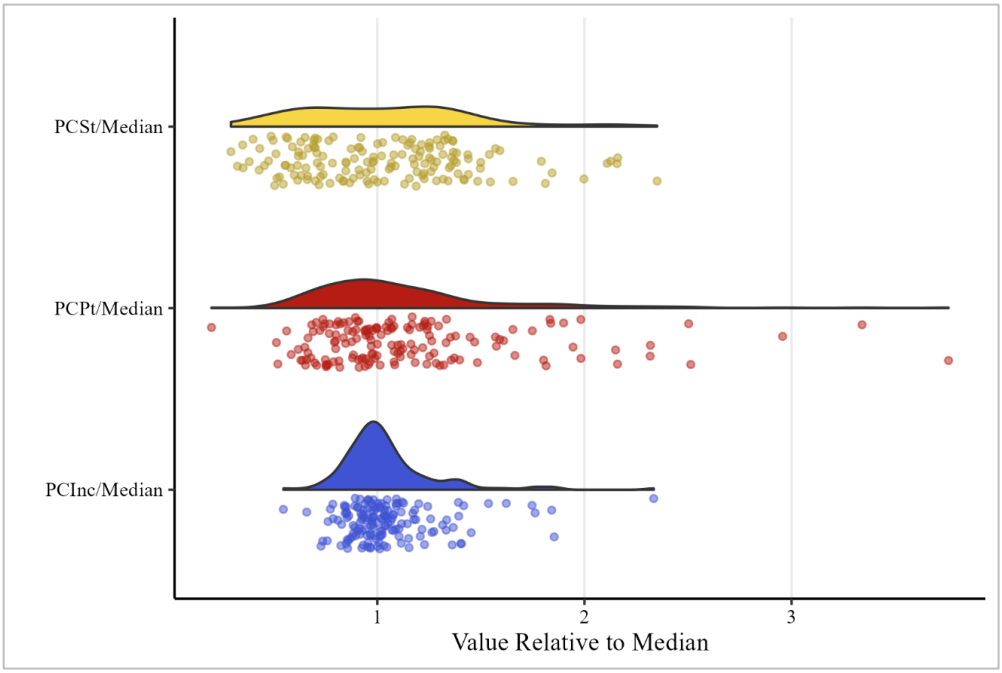
Table 9. Continued

	PCINC	*PCST*	*PCPT*
Excluding Max and Min Observations			
Minimum	$28,393	$6,023	$50,709
Maximum	$79,902	$40,082	$371,680
Ratio of Maximum to Minimum	2.81	6.66	7.33
Range	$51,509	$34,059	$320,970
Mean	$44,894	$19,062	$113,771
Median	$43,102	$18,552	$98,909
Standard Deviation	$8,830	$7,649	$50,065

The ratio of the largest value to the smallest value suggests that *PCPt* has the widest distribution, followed by *PCSt* and *PCInc*. However, this measure uses the two extreme values. If we exclude the minimum and maximum observations (lower panel of Table 9), the ratios are reduced. The change is particularly large for *PCPt*, which is due to the extreme value for Burke County. The standard deviation is a measure of the variation of the entire distribution, and it suggests that *PCSt* has the narrowest distribution. We can measure the skewness of the distributions by the ratio of mean to median. The ratio of the mean of *PCInc* to its median is 1.047, while the corresponding ratios for *PCSt* and *PCPt* are 1.031 and 1.184, respectively. Excluding the outliers the ratios are 1.042, 1.027 and 1.150, respectively.

Comparing the distributions of the three variables is difficult because the median values differ so much. To 'normalize' the three variables, we divided each by its median value. Figure 10 compares the distributions of the three variables divided by their respective medians. The distribution of each variable is shown in two ways: The smoothed histogram visualizes the shape of the distribution, with the height of the shape representing the density of observations around the corresponding value on the x-axis. The points below each shape represent the individual observations and help provide a complete picture of the three distributions. Figure 10 suggests that *PCInc* is more equally distributed than the two other variables, i.e., the values of *PCInc* divided by its median are closer to one than for the other two variables. *PCSt* is more evenly distributed than *PCPt* for counties for which both *PCSt* and *PCPt* divided by their medians are less than one, and just the reverse for observations with values greater than one.

Figure 10. Distributions of Income and Taxes Divided by Their Medians (Excludes Burke County from Property Tax Distribution), 2022



7. Policy Implications

We have shown that county-level sales tax base per capita and property tax base per capita vary widely across counties. We have also shown that much, but not all, of the variation is due to the variation in per capita income. Of course, the underlying concern is not with the size of the tax bases, per se, but with the revenue that can be generated with a given tax rate.

The inequality in the ability to fund public services suggests that the state might adopt policies that would reduce this inequality. But designing an intergovernmental transfer program that would reduce the inequality in local tax bases is complicated. Our analysis focused on county-wide sales and property tax bases, but any intergovernmental transfer program would have to consider all of the individual local governments.

Public K-12 education is financed through a mix of state and local revenues. State funding is done through the Quality Basic Education program (QBE) that includes an equalization grant program under which a local school system is guaranteed a certain amount of revenue per student from the state for each mill of property tax, up to some maximum millage rate. Warner (2017) reports the extent to which this grant program closes the funding gap between low and high property tax base districts. However, a

household's property tax burden for a given property tax rate is not affected by this grant program. The state could consider modifying QBE by incorporating a revenue component based on a school district's per capita income.

Most school districts also impose a local option sales tax. But there is no state grant that addresses the wide variation in sales tax bases per student. The state could consider a matching grant program. A similar grant program could be adopted for general purpose local governments, i.e., county and municipal governments.

There are many ways that a matching grant program could be designed, but consider the following example, which could be used to match either sales or property taxes. The state would select some tax rate, for example the median tax rate, and some tax base per capita. The product of the two gives a target tax revenue per capita. The program would provide transfers equal to some percentage of the difference between actual tax revenue per student or per capita and the target value of revenue per student or per capita.

References

Boyne, G. A. (1995). "Population size and economies of scale in local government." *Policy and Politics*, 23(3), 213–222.

Dumont, A. (2024). *Changes in the U.S. economy and rural-urban employment disparities*. The Federal Reserve. www.federalreserve.gov/econres/notes/feds-notes/changes-in-the-us-economy-and-rural-urban-employment-disparities-20240119.html

Gómez-Reino, J.L., Lago-Peñas, S. and Martinez-Vazquez, J. (2021). *Evidence on Economies of Scale in Local Public Service Provision: A Meta-Analysis.* Working Paper 21-16, International Center for Public Policy, Andrew Young School of Policy Studies, Georgia State University.

Phelps, H. (2021). *When interstates paved the way*. Federal Reserve Bank of Richmond. www.richmondfed.org/publications/research/econ_focus/2021/q2-3/economic_history#:~:text=Dissertational%20research%20by%20Daniel%20Leff,%241.80%20of%20additional%20economic%20output.

Warner, N. (2017). *Georgia's Equalization Grant.* CSLF Report No. 35. Center for State and Local Finance. Andrew Young School of Policy Studies, Georgia State University.