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Georgia Revenues and Expenditures: An Analysis of Their Geographic Distribution

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Executive Summary

Introduction

Georgia has often been characterized not as one, but as "two states"—the metropolitan Atlanta region and the rest of the state. One Georgia is more urbanized, has higher per capita income, and is experiencing rapid growth. The "other Georgia" is more rural, has lower per capita income, and a lack of economic growth. The differences in the level of economic activity between the metropolitan and non-metropolitan parts of the state likely lead to differences in flows of public finances between the different parts of the state. Areas with more economic activity will generate higher amounts of revenue, and areas in greater need will attract more of certain types of public expenditures such as aid to families and targeted economic development programs. An important set of policy questions relate to the relationship between the revenues generated in an area and the public expenditures received. While claims have been made regarding the potential geographic imbalance between revenues generated and expenditures made, there has been no attempt to document these flows. In this report we address that issue. In particular, we estimate the flow of revenue from and public expenditures to the Atlanta metropolitan area and the rest of the state.

This report presents a geographic analysis of "who bears the burden" of state taxes and who benefits from state public expenditures. By adding up the taxes paid and benefits received by individuals, families, and businesses by county, we estimate the proportion of taxes paid and benefits received in the Atlanta metropolitan area and the rest of the state. We use standard tools employed in fiscal policy analysis to determine who bears the burden of taxes and who benefits from public expenditures; those tools are discussed in detail in the report. Determining the burden and benefit of public finances is not an easy thing to do. First, one must determine who *really* pays specific taxes and who benefits from specific expenditures. For example, who bears the burden of corporate taxes? It may be consumers (through higher prices) or business owners (through lower profits). Who benefits from public education expenditures? Certainly the children in school benefit from spending on education, but their parents and general community also benefit. Once the hard questions of

who pays and who benefits are answered, we need to find the appropriate data to allocate the burden of taxes and the benefit of public expenditures. Because of the nature of the analysis, we present the analysis under some alternative assumptions about these benefits and expenditures—but find that these alternative assumptions make very little difference in our overall results.

We find that the Atlanta metropolitan area generates more revenue than it receives in expenditures, a result that is not surprising. The policy question is: Is the magnitude of the net flows appropriate? Certainly, wealthier areas of the state should have a negative net flow, but the issue is whether the current net outflow of revenue less expenditures is too high or too low. That is not an issue we address in this report.

The metropolitan Atlanta region is defined in two ways for this analysis. The first definition is the ten county core area defined by the Atlanta Regional Commission (ARC) planning district.[1] We call this area the Metro10. The second is a 28 county area that the U.S. Census currently defines as the Atlanta metropolitan area.[2] We call this area the Metro28. We find that the residents of the Metro10 area provided approximately 51 percent of Georgia state revenues and received approximately 37 percent of Georgia state expenditures. The residents of the Metro28 area accounted for approximately 61 percent of Georgia state revenue and received approximately 47 percent of Georgia state expenditures for fiscal year 2004. We next briefly discuss revenue and expenditure allocations as well as the robustness of our estimates.

[1] The list of Metro10 counties is: Cherokee, Clayton, Cobb, DeKalb, Douglas, Fayette, Fulton, Gwinnett, Henry, and Rockdale.

[2] The Metro28 include the Metro10, plus: Barrow, Bartow, Butts, Carroll, Coweta, Dawson, Forsyth, Haralson, Heard, Jasper, Lamar, Meriwether, Newton, Paulding, Pickens, Pike, Spalding, and Walton.

Revenue Allocation

The analysis presented in this report finds that for fiscal year 2004, the residents of the Metro10 area provided approximately 51 percent of Georgia state revenues.[3] The residents of the Metro28 area accounted for approximately 61 percent of Georgia state revenue. Taxes accounted for 89 percent of Georgia state total revenue for fiscal year 2004. Much of Georgia state tax revenue consists of two taxes: income tax and sales tax. Georgia state income tax and sales tax accounted for 75 percent of total state *tax revenue*, with income tax accounting for 44 percent and sales tax comprising 31 percent. The remaining 25 percent of Georgia *tax revenue* is provided by eight other taxes: Georgia corporate income tax, the estate tax, alcohol tax, tobacco tax, motor vehicle tax, motor fuel tax, property tax, and insurance premium tax.

TABLE I. GEORGIA REVENUE SOURCES FOR FISCAL YEAR 2004

			-------% Generated From------	
Revenue Source	**Revenue**	**% of Total**	**Metro10**	**Metro28**
Income Tax	$6,288,520,378	44%	56%	66%
Sales Tax	$4,860,904,312	31%	49%	59%
Motor Fuel Tax	$731,856,759	5%	41%	51%
GA Corp. Inc. Tax	$486,970,358	3%	54%	64%
Insurance Premium Tax	$317,462,533	2%	46%	59%
Motor Vehicle License Tax	$262,806,813	2%	38%	50%
Tobacco Tax	$227,549,406	1%	45%	56%
Alcohol Tax	$153,178,078	1%	48%	59%
GA Estate Tax	$65,110,425	0.4%	68%	72%
Property Tax	$63,677,784	0.4%	52%	63%
Total Tax Revenue	$13,458,036,846			
Fees and Sales	$120,977,978	0.8%	56%	66%
Lottery*	$787,354,547	5%	35%	46%
Other Georgia Revenues	$580,704,997	3.7%	47%	57%
Total GA Revenue	$14,947,074,368		51%	61%

Source: Office of Planning and Budget (2007) and author's calculations.
* Lottery revenue is net the expenses of administration.

[3] Data for 2004 are used since that is the most recent year for which all of the data necessary to make the calculations are available.

The remaining 11 percent of Georgia general revenues is generated from interest, miscellaneous fees, charges, and the lottery. Interest accounts for 1 percent of total state revenue, but is not included in our calculations. Georgia lottery revenue comprises 5 percent of state revenue. Fees, charges, and miscellaneous revenue make up the remaining 5 percent of Georgia state revenue in fiscal year 2004 (see Table I).

Expenditure Allocation

We next examine state expenditures and allocate them to metropolitan Atlanta and the rest of the state based on who benefits from the expenditures. We find that for fiscal year 2004, the residents of the Metro10 area received approximately 37 percent of Georgia state expenditures. The residents of the Metro28 area received approximately 47 percent of Georgia state expenditures.

In fiscal year 2004, Georgia spent approximately 56 percent of total general fund expenditures on education. Three social welfare categories accounted for 31 percent of total state expenditures: health care, human resources, and public safety. The remaining 13 percent of state expenditures fall under the categories of government administration, transportation, environment and housing, veteran services, and workers' compensation (see Table II).

TABLE II. GEORGIA EXPENDITURES FOR FISCAL YEAR 2004

			--------% Received By-------	
General Category	**Budget Amount**[1]	**% Total**	**Metro10**	**Metro28**
PK-12 Education	$6,185,350,097	40%	36%	47%
Post-Secondary Education	$2,416,001,126	16%	38%	49%
Environment and Housing	$267,365,026	2%	32%	42%
Gov. Administration	$998,966,643	6%	43%	53%
Health Care	$2,009,455,214	13%	28%	31%
Social Services	$1,431,479,890	9%	38%	44%
Public Safety	$1,396,318,193	9%	46%	54%
Transportation	$664,624,076	4%	38%	49%
Veterans Services	$22,131,693	0.14%	39%	49%
Workers' Comp.	$17,056,071	0.11%	45%	56%
Georgia Total Expenditures	$15,408,748,029		37%	46%

Source: Office of Planning and Budget (2004) and author's calculations.

[1]The budgeted expenditures from the Governor's budget report are used because they provide the necessary level of expenditure detail to perform accurate incidence analysis. This level of detail is not available in reports that list actual fiscal year expenditures.

Accounting for differences in the size of the population in the Atlanta metropolitan area and the rest of the state, we find that the Metro10 area generated approximately $500 per capita more in state revenue than it received in state expenditures. Similarly, for every $1,000 of adjusted gross income, the Metro10 area generated approximately $22 of revenue more than it received in expenditures. The numbers are similar for the Metro28 area. The other 149 counties generated approximately $30 less in revenue than they received in expenditures, per $1,000 of adjusted gross income.

Robustness of Estimates

These estimated allocations are based on a set of assumptions regarding who bears the burden of taxes and other revenue and who benefits from expenditures. These assumptions are the ones we believe are most appropriate. However, other assumptions could be made. Therefore, we considered an alternative set of assumptions.

It is possible that due to the methods used to estimate metropolitan Atlanta contributions to state revenue and receipt of state expenditures that these figures may be inaccurate. To check the robustness of these estimates we arbitrarily subtracted 20 percent of estimated metropolitan Atlanta revenue for which county level data did not exist. This results in the Metro10 and Metro28 contributions to state revenue declining to 49 percent and 59 percent respectively. Due to a lack of county level data, some of the expenditure estimates may also be inaccurate. Thus, we arbitrarily allocated an additional 20 percent to all expenditures that did not have county level data to the Atlanta metropolitan area. The result of these adjustments is the Metro10 and the Metro28 areas received an estimated 41 percent and 51 percent of state general fund expenditures, respectively. These expenditures represent a two percentage point decrease in revenue share and roughly a five percentage point increase in the expenditure share for the metropolitan Atlanta area.

We provide another robustness check on our estimation of expenditure allocations. We examine how the distribution of state expenditures changes if we alter some of our assumptions regarding the distribution of the benefit for a group of

expenditures that may have a large public benefit component. It is possible that some state expenditures have a greater public benefit than we assigned them. For instance, PK-12 education benefits were assumed to flow almost entirely to students currently enrolled in school and their families. State spending on education has local spillover effects that benefit the community. Examples are education facilities open to the public such as athletic fields or community meeting facilities, or increases in property values due to the perceived value of education. We adjust some of our incidence assumptions to test if allocating these public benefits to the surrounding communities has a significant effect on our results. When we assume more "public" benefits, we find that metropolitan Atlanta expenditures increase, but by no more than 2 percentage points.

One potential source of the gap between revenue generated and expenditures received is that metropolitan Atlanta has greater adjusted gross income and that the income tax is somewhat progressive. For instance, without the income tax the Metro10 area would have generated 47 percent of state revenue and the Metro28 area would have generated 57 percent. These figures are closer to their share of state population of approximately 43 percent for the Metro10 area and 54 percent for the Metro28 area.

Another potential explanation for the gap is that the state in effect allocates expenditures in a per capita manner. This is particularly true for the PK-12 education expenditures. Quality Basic Education Act (QBE) dollars allocated per student, are approximately the same for the metropolitan Atlanta area and the rest of the state. This is not surprising as this is one of the stated goals of QBE. However, if one examines the amount of QBE dollars received per $1,000 of adjusted gross income, metropolitan Atlanta received approximately $30 while nonmetropolitan Atlanta received approximately $50.

Conclusion

In fiscal year 2004 the metropolitan Atlanta area appears to have contributed more to state revenue than it received in state expenditures under the assumptions specified in this report. The Metro10 area of Atlanta is home to approximately 43 percent of the state's population and generated 53 percent of Georgia's total state adjusted gross taxable income. The Metro10 area contributed an estimated 51 percent of total Georgia state revenue. However, the Metro10 area received an estimated 37 percent of state general fund expenditures. The story is similar for the Metro28 area. It comprised approximately 54 percent of the state's population and generated 64 percent of Georgia's total state adjusted gross taxable income. The Metro28 area contributed an estimated 61 percent of total Georgia state revenue but received 47 percent of state general fund expenditures.

These results are robust to reasonable errors in estimating the incidence of metropolitan Atlanta revenue and expenditures. Preliminary analysis indicates that the reason that the Metro10 and Metro28 contribute a greater share of revenue than they receive in expenditure benefits may be due to two principal factors: 1) the state income tax, which raises greater revenue per capita from the wealthier metropolitan Atlanta area; 2) state expenditures are in affect largely allocated on a per capita basis and to a lesser extent negatively related to income per capita.

I. Introduction

Georgia has often been characterized not as one, but as "two states"—the metropolitan Atlanta region and the rest of the state. One Georgia is more urbanized, has higher per capita income, and is experiencing rapid growth. The "other Georgia" is more rural, has lower per capita income, and a lack of economic growth. The differences in the level of economic activity between the metropolitan and non-metropolitan parts of the state likely lead to differences in flows of public finances between the different parts of the state. Areas with more economic activity will generate higher amounts of revenue, and areas in greater need will attract more of certain types of public expenditures such as aid to families and targeted economic development programs. An important set of policy questions relate to the relationship between the revenues generated in an area and the public expenditures received. While claims have been made regarding the potential geographic imbalance between revenues generated and expenditures made, there has been no attempt to document these flows. In this report we address that issue. In particular, we estimate the flow of revenue from and public expenditures to the Atlanta metropolitan area and non-Atlanta area of the state.

This report presents a geographic analysis of "who bears the burden" of state taxes and who benefits from state public expenditures. By adding up the taxes paid and benefits received by individuals, families, and businesses by county, we estimate the proportion of taxes paid and benefits received in the Atlanta metropolitan and non-Atlanta areas. We use standard tools employed in fiscal policy analysis to determine who bears the burden of taxes and who benefits from public expenditures; those tools are discussed in detail in the report. Determining the burden and benefit of public finances is not an easy thing to do. First, one must determine who *really* pays specific taxes and who benefits from specific expenditures. For example, who bears the burden of corporate taxes? It may be consumers (through higher prices) or business owners (through lower profits). Who benefits from public education expenditures? Certainly the children in school benefit from spending on education,

but their parents and general community also benefit. Once the hard questions of who pays and who benefits are answered, we need to find the appropriate data to allocate the burden of taxes and the benefit of public expenditures. Because of the nature of the analysis, we present the analysis under some alternative assumptions about these benefits and expenditures—but find that these alternative assumptions make very little difference in our overall results.

The metropolitan Atlanta region is defined in two ways for this analysis. The first definition is the ten county core area defined by the Atlanta Regional Commission (ARC) planning district.[1] We call this area the Metro10. The second is a 28 county area that the U.S. Census currently defines as the Atlanta metropolitan area.[2] We call this area the Metro28.

The analysis presented in this report finds that for fiscal year 2004, the residents of the Metro10 area provided approximately 51 percent of Georgia state revenues and received approximately 37 percent of Georgia state expenditures.[3] (For specific revenue and expenditure items and their percentage of state totals, see Appendix A.) The residents of the Metro28 area accounted for approximately 61 percent of Georgia state revenue and received approximately 46 percent of Georgia state expenditures.

These estimated allocations are based on a set of assumptions regarding who bears the burden of taxes and other revenue and who benefits from expenditures. These assumptions are the ones we believe are most appropriate. However, other assumptions could be made. Therefore, we considered an alternative set of assumptions. Based on these alternative assumptions we estimate that the Metro10 area contributed 49 percent of the revenue and received 41 percent of the expenditures, while the Metro28 area contributed 59 percent of the revenue and

[1] The list of Metro10 counties is: Cherokee, Clayton, Cobb, DeKalb, Douglas, Fayette, Fulton, Gwinnett, Henry, and Rockdale.

[2] The Metro28 include the Metro10 plus, Barrow, Bartow, Butts, Carroll, Coweta, Dawson, Forsyth, Haralson, Heard, Jasper, Lamar, Meriwether, Newton, Paulding, Pickens, Pike, Spalding, and Walton.

[3] Data for 2004 are used since that is the most recent year for which all of the data necessary to make the calculations are available.

received 51 percent of the expenditures. These expenditures represent a two percentage point decrease in revenue share and roughly a five percentage point increase in the expenditures share for the metropolitan Atlanta area. Accounting for differences in the size of the population in the Atlanta metropolitan and non-Atlanta areas, we find that the Metro10 area generated approximately $500 per capita more in state revenue than it received in state expenditures. Similarly, for every $1,000 of adjusted gross income, the Metro10 area generated approximately $22 of revenue more than it received in expenditures. The numbers are similar for the Metro28 area. The 149 non-Atlanta counties generated approximately $30 less in revenue than they received in expenditures, per $1,000 of adjusted gross income.

That the Atlanta metropolitan area generates more revenue than it receives in expenditures is not surprising. The policy questions are: Is the magnitude of the net flows appropriate? Is the current net outflow of revenue less expenditures too high or too low? These are not issues we address in this report.

This report is organized as follows: The first section discusses state revenue incidence and the allocation of state revenue to the Atlanta metropolitan area and the rest of the state. The second section discusses the state expenditure incidence and the allocation of state expenditures to the Atlanta metropolitan area and the rest of the state. The third section concludes.

II. Revenue Incidence and Allocation

In the first part of this study we seek to allocate state revenue to counties. We do that by estimating the taxes and fees paid or borne by residents of each county. Thus for example, we attempt to allocate sales taxes to the county in which the consumer lives, not the county in which the sale was made.

Some state revenue is paid by individuals from out of state, and we have to determine how to treat this revenue. In general, we try to allocate it to the county in which the revenue was generated. Thus, for example, we treat out-of-state persons that generate sales tax and any other state revenue as "residents" of the county in which the revenue was generated. However, because of a lack of information, we cannot do that for income taxes paid by individuals from out of state. Thus, we exclude income tax revenue generated from out-of-state residents.

To allocate revenue it is necessary to first determine who bears the final burden of the tax, fee, or charge, i.e., to determine the tax incidence. In general, we follow the incidence assumptions of Chamberlin and Prante (2007a, 2007b). Once the incidence assumptions are determined we rely on various data and empirical techniques to allocate the revenue to counties. We turn first to a discussion of the incidence assumptions and data used to assign the burden of revenue to individuals and hence to counties.

A. Revenue Incidence

A formal revenue incidence study determines who ultimately bears the economic burden of a tax, fee, or charge, that is, whose purchasing power fell (either from reduced income or increased prices) as a result of the tax, fee, or charge. A key premise in revenue incidence analysis is that the party with the statutory (legal) responsibility to remit the tax, fee, or charge to the state (the party who on paper pays the revenue to the state) may not be the party who actually suffers the economic burden of the revenue payment. Sometimes the statutory incidence and economic incidence of a tax, fee or charge are the same, such as the individual income tax. However, sometimes statutory incidence differs from economic incidence. For example, the statutory (legal) incidence of the corporate income tax is on businesses;

however, the economic incidence is assumed to be on the stockholders and workers. As another example, the state sales tax is remitted to the state by the retailer. However, the sales tax is assumed to be totally passed through to the consumer because it is difficult for consumers to find tax-free substitutes.[4] We next discuss the incidence assumptions used in the literature; for a summary of the incidence assumptions for taxes and expenditures see Table 1. For the personal income tax and sales tax, incidence assumptions are well established in the literature. The incidence of personal income tax is assumed to fall on the household paying the income tax (Chamberlain and Prante 2007a and Wong 2006). Because the income tax is a statewide tax, it is difficult for Georgia residents to shift the tax to employers unless many taxpayers are willing to move to avoid the tax or to reduce their work effort. In Georgia the statutory incidence of the sales tax is on the consumer, although, retail businesses actually collect the sales tax. The economic incidence is assumed to fall entirely on the consumer due to the difficulty of avoiding the sales tax (Chamberlain and Prante 2007a and Wong 2006). The sales tax is also levied on certain purchases by firms. We allocate this revenue to the county in which the sale was made.

The statutory incidence of the property tax falls on the owners of residential, rental, and commercial property. For owner occupied residential housing, the economic incidence is the same as the statutory incidence. However, for rental property it is possible for the owner of the property to pass some of the property tax onto the renter as higher rents. Property tax rates vary by jurisdiction, but the rental property owners must still keep rental rates competitive with areas that have lower property tax rates. Thus, it is not possible to fully pass through all property tax to renters and the owner of the building (a capital asset) still bears some of the economic burden of the property tax. We assume the incidence of the property tax is borne by

[4] The increase in internet shopping makes this assumption less valid in the future. Estimates for Georgia state sales tax lost in 2003 are approximately 3.2 percent of total state sales tax collected or $154 million (Bruce and Fox 2004**).** While this is a sizable loss of state revenue, it is not large enough to materially affect the pass through assumptions of sales tax incidence.

TABLE 1. STATE AND LOCAL TAXES INCIDENCE ASSUMPTIONS AND STATISTICAL ALLOCATORS

Revenue Source	Incidence Assumption	Allocation Method
Income Tax	Individual Earners	DOR[a] County Level Income Tax Data
Sales Tax	Consumers	DOR County Level Special Local Option Sales Tax Data
Motor Fuel	Car and Truck Drivers	County DVMT[b] Estimates
GA Corp. Income Tax	70% on Wages And Salaries, and	70% By Individual Income Tax
	30% on The Owners Of Capital	30% On The Individual Rental and Investment Income
Tobacco	Consumers of Tobacco	CEX[c] Tobacco Consumption
GA Estate Tax	Wealthy Decedents	Tax Foundation County Federal Estate Tax Estimate
Property Tax	Owners of Property	DOR County Level Property Tax Data
Alcohol Tax	Consumers of Alcoholic Beverages	CEX Alcohol Consumption Southern Consumer
Motor Vehicle License Tax	Owners of Automobiles	County Level Number of Registered Vehicles
Insurance Premium Tax	Consumers of Insurance Services	County Level Insurance Tax
Expenditures	**Incidence Assumption**	**Allocation Method**
Prek-12 Education	Prek-12 School Children	GA QBE[d] District Expenditures
Higher Education	College Students	School District of University Incoming Freshman
Environment And Housing	All Georgians	GA Total Households
Gov. Administration	All Georgians	GA Total Households
Health Care	Recipients of Health Care	Grants to Counties from DCA[e] Data
Social Services	Recipients of Social Services	TANF County Total Payments
Public Safety	Residents of Counties	GBI County Crime Statistics
Transportation	Georgia Drivers	County DVMT
Veterans' Services	Veterans	Veterans per County
Workers' Compensation	Workers' Comp. Recipients	Employed Workers in County

[a] DOR= Georgia Department of Revenue
[b] DVMT = Daily Vehicle Miles Traveled
[c] CEX = Consumer Expenditure Survey
[d] QBE= Quality Basic Education Act
[e] DCA= Georgia Department of Community Affairs

owners and renters of residential property. The validity of this assumption is discussed in the allocation section.

The burden of excise taxes, the insurance premium tax, and the motor vehicle tax are all assumed to fall on the purchaser of the items taxed (Chamberlain and Prante 2007a and Wong 2006). Georgia levies excise taxes on three consumer commodities: alcohol, tobacco, and motor fuel. The incidence of the motor vehicle license tax is assumed to fall on the owners of motor vehicles (Chamberlain and Prante 2007a and Wong 2006). In the literature, the incidence of insurance premium tax is assumed to fall on the purchaser of insurance (Chamberlain and Prante 2007a and Wong 2006) and we assume the same incidence.

Recent research suggests that due to globalization, some of the burden of the corporate income tax is passed through to workers in the form of lower net compensation (Chamberlain and Prante 2007a citing: Randolph, 2006 and Hassett and Mathur, 2006). This view asserts that due to the ability of firms to move overseas and avoid the corporate income tax, U.S. workers must accept lower wages or benefits to equalize the returns to capital invested outside the United States.[5] Chamberlin and Prante (2007b) assume that 70 percent of the corporate tax is borne by labor due to potential domestic capital flight and 30 percent is borne by owners of capital. Owners of capital are considered to be the shareholders of the company stock, owners of mutual funds that own stocks, as well as bond holders. While a corporation may own the physical assets of a business such as buildings and machinery, taxes are paid by people. Thus, at least part of the corporate income tax is passed through to the owners of capital in the form of lower returns to investment. How this incidence is computed for owners of capital as well as labor is discussed in the corporate tax allocation section.

The incidence of the estate tax is unsettled in the literature. In general, there are three incidence theories (Chamberlin and Prante 2007b). The first is that the full

[5] It is also possible that the corporate income tax can be passed on to consumers in the form of higher output prices. However given global completion in most consumer goods the literature has deemed this an unlikely occurrence (see Chamberlain and Prante 2007a and Chamberlain and Prante 2007b).

burden of the estate tax falls on wealthy decedents (see Burman, Gale, and Rohaly, 2005). The second is that a portion of the estate and gift tax is borne by heirs of wealthy decedents (see Entin 2004). While a third approach claims some portion is borne by workers and owners of capital throughout the economy, similar to the incidence of the corporate income tax (see Mankiw 2003). Unfortunately, there is little empirical evidence to help guide researchers in choosing among the three incidence assumptions (Chamberlin and Prante 2007b). This report adopts the incidence assumption of Chamberlin and Prante and assumes that the estate tax burdens are borne primarily by wealthy decedents.

The incidence assumptions used to allocate lottery revenue and miscellaneous fees and charges are varied.[6] The incidence of the lottery is assumed to fall on the purchasers of lottery tickets. The incidence assumptions for individual fees, charges, miscellaneous revenue, and the other minor revenue categories are assumed to be related to the benefits received for certain public services and we discuss those under the expenditure section of this report.

B. Georgia Revenue Allocation

In this subsection we discuss how state revenue is allocated to counties based on the incidence assumptions discussed above. As background, Table 2 contains population and income data for metropolitan Atlanta area counties. State revenue consists of taxes, fees, interest, and charges. Fiscal year 2004 is used in this report as that is the latest year for which all relevant data that is needed to allocate revenue and expenditures is available. Table 3 contains a list of all revenue sources and their amount for fiscal year 2004. Georgia county level data are available for the major sources of tax revenue from the Georgia Department of Revenue (DOR).

[6] Interest revenue and tobacco settlement funds are not included in this analysis. Interest revenue is that which is generated by the state by depositing funds received in interest bearing accounts or instruments, thus it is not included in the revenue stream. Another large single miscellaneous revenue source is the tobacco settlement. This is omitted as the funds come from out of state companies.

TABLE 2. 2004 METROPOLITAN ATLANTA COUNTY POPULATION AND PERSONAL INCOME

County	Population	% GA Pop.	AGI (000's)	% GA AGI
Cherokee	174,851	2.0%	$4,054,125	2.5%
Clayton	264,227	3.0%	$2,949,782	1.9%
Cobb	654,649	7.3%	$15,679,412	9.9%
DeKalb	674,335	7.6%	$12,658,490	8.0%
Douglas	107,084	1.2%	$1,898,284	1.2%
Fayette	101,200	1.1%	$2,873,772	1.8%
Fulton	905,802	10.2%	$25,880,326	16.3%
Gwinnett	700,577	7.9%	$14,416,405	9.1%
Henry	158,939	1.8%	$3,181,068	2.0%
Rockdale	76,858	0.9%	$1,322,768	0.8%
Metro10	3,818,522	42.8%	$84,914,432	53.4%
Barrow	56,656	0.6%	$888,491	0.6%
Bartow	86,914	1.0%	$1,411,271	0.9%
Butts	20,587	0.2%	$301,033	0.2%
Carroll	102,143	1.1%	$1,481,656	0.9%
Coweta	105,395	1.2%	$2,013,669	1.3%
Dawson	19,041	0.2%	$369,532	0.2%
Forsyth	131,950	1.5%	$3,648,151	2.3%
Haralson	27,965	0.3%	$351,983	0.2%
Heard	11,266	0.1%	$126,524	0.1%
Jasper	12,778	0.1%	$191,024	0.1%
Lamar	16,326	0.2%	$207,867	0.1%
Meriwether	22,790	0.3%	$261,048	0.2%
Newton	81,624	0.9%	$1,319,990	0.8%
Paulding	106,035	1.2%	$1,964,929	1.2%
Pickens	27,798	0.3%	$535,900	0.3%
Pike	15,689	0.2%	$262,996	0.2%
Spalding	60,745	0.7%	$817,228	0.5%
Walton	72,044	0.8%	$1,291,520	0.8%
Metro28	4,796,268	53.8%	$102,359,244	64.4%
GA total	8,918,129		$159,033,229	

Source: Georgia Department of Revenue (2007).
AGI (000's)= Adjusted gross income in $1,000s.

Population and adjusted gross income are relevant factors when comparing the metropolitan Atlanta region with the remainder of the state. Table 2 lists the Metro10 and Metro28 area's population, Georgia adjusted gross income, as well as the percentage of the state totals for population and adjusted gross income. The Metro10 area had 42.8 percent of the state's population and accounted for 53.4

percent of the state's adjusted gross income in fiscal year 2004.[7] The Metro28 area was home to 53.8 percent of Georgia's population and accounted for 64.4 percent of the adjusted gross income.

Taxes accounted for 89 percent of Georgia state total revenue for fiscal year 2004. Much of Georgia state tax revenue consists of two taxes: income tax and sales tax. Georgia state income tax and sales tax accounted for 75 percent of total state *tax revenue*, with income tax accounting for 44 percent and sales tax comprising 31 percent. The remaining 25 percent of Georgia *tax revenue* is provided by eight other taxes: Georgia corporate income tax, the estate tax, alcohol tax, tobacco tax, motor vehicle tax, motor fuel tax, property tax, and insurance premium tax.

The remaining 11 percent of Georgia general revenues is generated from interest, miscellaneous fees, charges, and the lottery. Interest accounts for 1 percent of total state revenue, but is not included in our calculations. Georgia lottery revenue comprises 5 percent of state revenue. Fees, charges, and miscellaneous revenue make up the remaining 5 percent of Georgia state revenue in fiscal year 2004. We estimate that the Metro10 counties accounted for 51 percent of all Georgia state revenue, while the Metro28 counties accounted for 61 percent of state revenue (see Table 3). The methods used to allocate these various sources of revenue to counties are discussed next. (For a discussion of the data sources used to allocate state revenue to counties see Appendix B and C).

[7] Georgia adjusted gross income starts with federal adjusted gross income which is the household taxable income from all sources including wages, interest dividends, etc. minus allowable deductions. Georgia then makes additional state specific adjustments to income and deductions listed on the Georgia Department of Revenue website at (http://www.quickfinder.com/files/georgiaupdate.pdf).

TABLE 3. GEORGIA REVENUE SOURCES FOR FISCAL YEAR 2004

			-----% Generated From-----	
Revenue Source	**Revenue**	**% of Total GA Rev**	**Metro10**	**Metro28**
Income Tax	$6,288,520,378	44%	56%	66%
Sales Tax	$4,860,904,312	31%	49%	59%
Motor Fuel Tax	$731,856,759	5%	41%	51%
GA Corp. Inc. Tax	$486,970,358	3%	54%	64%
Insurance Premium Tax	$317,462,533	2%	46%	59%
Motor Vehicle License Tax	$262,806,813	2%	38%	50%
Tobacco Tax	$227,549,406	1%	45%	56%
Alcohol Tax	$153,178,078	1%	48%	59%
GA Estate Tax	$65,110,425	0.4%	68%	72%
Property Tax	$63,677,784	0.4%	52%	63%
Total Tax Revenue	$13,458,036,846	90%	51%	62%
Fees and Sales	$118,230,877	0.8%	56%	66%
Other Fees and Sales	$2,747,101	0.0%	56%	66%
Other Georgia Revenues				
Driver Services	$47,478,666	0.3%	38%	50%
Natural Resources	$48,449,865	0.3%	54%	64%
Secretary of State	$56,159,555	0.4%	54%	64%
Labor Department	$27,381,739	0.2%	54%	64%
Human Resources	$20,828,829	0.1%	38%	44%
Banking and Finance	$20,702,647	0.1%	54%	64%
Corrections	$13,798,294	0.1%	46%	54%
Workers Compensation	$17,441,124	0.1%	54%	64%
Public Service Commission	$3,679,613	0.02%	43%	53%
Nursing Home Provider Fees	$96,231,538	0.6%	33%	44%
Peace Officers	$22,755,180	0.1%	46%	54%
All Other Departments	$54,981,911	0.4%	43%	53%
Brain & Spinal Injury Trust Fund	$1,625,000	0.01%	43%	53%
Payments from Georgia Ports	$10,000,000	0.1%	55%	66%
Job and Growth Tax Relief	$139,191,036	0.9%	55%	66%
Lottery*	$787,354,547	5%	35%	46%
Total Other GA Revenue	$1,489,037,522			
Total GA Revenue	$14,947,074,368		51%	61%

Source: Office of Planning and Budget (2007) and author's calculations.
* Lottery revenue is net the expenses of administration.

Personal Income Tax

Personal income tax is the largest source of revenue for Georgia, generating approximately $6.2 billion and representing 44 percent of total state tax revenue. We allocate the burden of the personal income tax using Department of Revenue data on personal income tax liability by county. Based on this method, we find the Metro10 counties accounted for 56 percent of personal income tax collected in the state, while the Metro28 counties accounted for 66 percent of personal income tax collected (see Table 3). As was discussed earlier, we exclude the personal income tax payments of non-Georgia residents. The Department of Revenue categorizes income tax revenue generated by out-of-state residents as "other" in the county data report. "Other" revenue represented 3.6 percent of total state income tax due in 2004.

Sales Tax

Sales tax is the second-largest source of state revenue, raising approximately $4.86 billion in fiscal year 2004, accounting for 31 percent of total state tax revenue. Based on Department of Revenue local option sales tax collections, we find that the Metro10 counties accounted for 49 percent of sales tax revenue, while the Metro28 counties accounted for 59 percent of sales tax revenue (see Table 3). However, the extent to which individuals shop outside their area (e.g. nonMetro10 residents shop in the Metro10 area); these percentages do not reflect allocations by residence of consumers.

There are two potential sources of misallocation of state sales tax revenue from using local option sales tax data. First, Georgia is a vibrant tourism destination, and possibly more out-of-state visitors shopped in metropolitan Atlanta than in the non-Atlanta area.[8] This would inflate the metropolitan Atlanta sales tax figures with dollars from outside Georgia. Second, there could be an unequal flow of sales tax revenue generated from out-of-region visitors. Metropolitan Atlanta residents shop

[8] It is estimated that tourism generated an estimated $1.2 billion in total Georgia state and local tax revenue for 2004 (Travel Industry Association of America 2005).

and recreate in all parts of the state, including the mountains and coastal regions, while non-Atlanta residents also shop and recreate in the Atlanta metropolitan area, for instance taking in a ballgame or shopping at one of the areas upscale malls. It is possible that non-Atlanta residents generate more sales tax revenue for the Atlanta metropolitan area than metropolitan Atlanta residents generate for the non-Atlanta area.

To try to determine the magnitude of these two potential sources of misallocation, we examine tourist dollars spent in the metropolitan Atlanta area using data from Travel Industry Association of America (TIA). The Travel Industry Association of America's definition of a tourist includes any person who makes an overnight trip or person who makes a day trip who travels at least 50 miles away from home one way. Thus, metropolitan Atlanta residents who spend the night in a metropolitan Atlanta hotel would be considered tourists. As we are interested in sales tax generated by in-state residents and out-of-state residents, we will use the term visitor rather than tourist. The Travel Industry Association of America defines the metropolitan Atlanta region as a nine county region that includes the following counties: Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Fulton, Gwinnett, and Henry of our Metro10 counties. Cherokee county is not included in the Travel Industry Association of America Atlanta metropolitan area. While these definitions are limiting, they do offer insight into the magnitude of the effect that out-of-state spending and out-of-region spending might have on our metropolitan Atlanta sales tax estimates.

The Travel Industry Association of America data indicate that out-of-state visitor spending and out-of-region visitor spending should not materially alter the results reported above. First, the difference between out-of-state visitor dollars spent in metropolitan Atlanta and that spent in the non-Atlanta area is a relatively insignificant part of the total sales tax collected in metropolitan Atlanta. Second, the difference in sales tax revenue generated by out-of-region visitors in metropolitan Atlanta and the rest of the state is not large enough to significantly affect the sales tax distribution between metropolitan Atlanta and the rest of the state. The methods used to estimate these affects are discussed next.

First, we estimate the amount of sales tax collected from out-of-state visitors in the metropolitan Atlanta area. Residents and nonresident visitors spent approximately $9.3 billion in the nine county metropolitan Atlanta area in 2004, while residents and nonresident Georgia visitors spent approximately $6.1 billion in the rest of the state in 2004. It is estimated that 66 percent of visitors to both regions are non-Georgia residents (Travel Industry Association of America 2005). Thus, non-Georgia residents spent $2.1 billion more in metropolitan Atlanta than in the rest of the state. If one assumes that the full $2.1 billion difference is fully subject to the four percent state sales tax, this generates approximately $84.5 million in state sales tax revenue from nonresident Georgia visitors to metropolitan Atlanta.[9] This represents approximately 3.6 percent of total sales tax revenue collected in the Metro10 area. If this sales tax revenue was allocated to the counties outside metropolitan Atlanta, this would reduce the total Metro10 state revenue share by less than one percentage point. Thus, the difference in sales tax revenue generated from out-of-state visitor spending in the Metro10 area and that in the rest of the state is a relatively insignificant part of the total state revenue collected in the Metro10 area.

Second, we estimate the amount spent by Georgians while visiting outside their region of the state. We again turn to the visitor spending estimates from TIA. It is estimated that Georgia resident visitor spent $3.2 billion in the nine county metropolitan Atlanta area. We do not know where in Georgia these visitors are from. Based on the Travel Industry Association of America definition of a tourist they could reside within the nine county area. However, we make the extreme assumption that all these Georgia residents reside outside the Metro10 area, thus non-Atlanta area visitors spent approximately $3.2 billion in the nine county metropolitan Atlanta area in 2004. If one assumes all of this spending is eligible for the state sales tax, this would generate approximately $126.7 million in state sales tax revenue. This figure represents approximately 5.4 percent of the Metro10 sales tax revenue. If this sales

[9] The composition of tourism spending is almost all subject to sales tax such as, lodging, restaurant meals, car rental, and the purchase of gifts and souvenirs.

tax revenue was allocated to the counties outside the metropolitan Atlanta area, this would diminish the percent of total Metro10 revenue by approximately one percentage point.

Correcting for these two sources of sales tax misallocation results in a minor adjustment to the overall results and does not materially affect the conclusions of this report. Furthermore, it is likely that the above calculations overestimate the value of the spending by non-Atlanta area residents due to the assumption that all the metropolitan Atlanta visitors are non-Atlanta area residents. Given the size and population of both the Metro10 area as well as the Metro28 area, it is likely that a significant portion of in-state visitor spending in metropolitan Atlanta is from metropolitan Atlanta residents.

Another method to estimate the effect of out-of-state or out-of-region purchases on county sales tax revenue is to examine the amount of sales tax collected per $1,000 of adjusted gross income. One would expect county-level adjusted gross income to be related to county- level sales tax generating expenditures. If out-of-state visitors or out-of-region visitors made significant sales tax generating purchases in metropolitan Atlanta, this should cause sales tax per $1,000 of adjusted gross income to be higher than in the non-Atlanta region. This does not seem to be the case.

For instance, Fulton County, a county with many out-of-state and out-of-region visitors, generated approximately $32 in state sales tax per $1,000 of adjusted gross income. The Metro10 area generated approximately $34 in state sales tax per $1,000 of adjusted gross income. This is in contrast to the 149 non-Atlanta counties which generated on average of approximately $41 per $1,000 of adjusted gross income. This is additional evidence that out-of-state and out-of-region visitor spending did not significantly affect sales tax collections in fiscal year 2004. Thus, we will maintain the current sales tax generation location assumption; in which the metropolitan Atlanta region state sales tax revenue is generated solely by the region's own residents. Some firms do pay sales tax, for example contractors. Similarly situated firms can generally pass sales tax on to customers. However, it is possible that firms may buy materials in different counties with different sales tax rates. These firms that purchased in the higher sales tax county may not be able to pass

through the total sales tax if they compete with firm that purchased materials in a lower sales tax county. However, the number of firms affected is likely to be small. Also the difference in sales tax among counties in Georgia is small particularly among counties that are neighbors. Thus, the amount of tax not passed through to consumers is likely to be small. We therefore maintain the assumption that all sales taxes are passed through to the consumer.

Property Tax

The state property tax generated approximately $64 million and made up 0.4 percent of Georgia state revenue in fiscal year 2004. This report uses the Department of Revenue figures for county assessed property values to allocate the state's property tax to metropolitan Atlanta and the non-Atlanta area. We estimate the Metro10 counties accounted for 52 percent of property tax revenue, while the Metro28 counties accounted for 63 percent of property tax revenue (see Table 3). This method assumes that property owners reside in the county in which the property is located. For owner-occupied housing, this is a reasonable assumption.

Owners of other types of property, e.g. rental property, second homes, business property, etc., could possibly live outside of the state or in a different region of the state than the property. However, due to the small share of state revenue generated by the property tax as well as the fact that residential real estate makes up 56 percent of the state's digest, this effect would not have a meaningful impact on total metropolitan Atlanta and non-Atlanta area allocations of revenue.

Several additional methods exist for allocating property tax to households. One method assumes half the property tax burden falls on the renters and the other half on the owners of the property (Chamberlain and Prante 2007a). This view adopts the dual nature of owner occupied housing with the owner "paying rent to himself" but also owning the underlying capital asset, the house. In this view a portion of the property tax is passed on in the form of higher rents. The remainder of the property tax reduces the rate of return on the capital asset. All else equal, an area with higher property taxes will have lower rates of return on housing than an area with lower property taxes. Under this alternative approach, the property tax burden is

thus allocated with half the burden determined by population and the other half by the allocation method used for the corporate income tax (Chamberlain and Prante 2007a). The details of corporate income tax allocation will be examined further in the tax allocation section.

This report uses the Department of Revenue figures for county assessed property values to allocate the state's property tax to metropolitan Atlanta and non-Atlanta area. We are only interested in the aggregate value of all property attributed to the individuals that live in the region. Because we do not allocate dollar values of property tax paid to individual households, it is unnecessary for us to use the more sophisticated measures from the literature described above.

Corporate Income Tax

The Georgia corporate income tax generated approximately $487 million and accounted for three percent of Georgia total revenue in fiscal year 2004 (see Table 3). To allocate the corporate income tax to Georgia counties, we use estimation methods from Chamberlin and Prante (2007b). Chamberlin and Prante assume that 70 percent of the corporate tax is borne by labor due to domestic capital flight and 30 percent is borne by owners of capital.

To calculate the county level corporate tax share, county level data on dividends, interest, and rent ("capital income") (Bureau of Economic Analysis 2004) is used. The amount of the corporate tax borne by owners of capital is based on "capital income." For instance, residents' of Fulton County received 20.2 percent of all dividends, interest, and rent for Georgia. This 20.2 percent is considered capital income and is given a 30 percent weighting per Chamberlin and Prante above. The labor portion of the tax burden is determined using total personal income tax liability per county (from the Georgia Department of Revenue). Continuing our example, Fulton County paid 18.6 percent of all individual income tax for the state. This percentage is given a 70 percent weighting. Taking the weighted average of the capital portion and the labor portion of the corporate income tax for Fulton County yields 19.1 percent. The total corporate income tax collected in the state was approximately $487 million, and thus we allocate 19.1 percent or $93 million to

Fulton County. These county level allocations are summed by the appropriate metropolitan area and the percentage of the state total is calculated. This results in an estimated 55 percent of the corporate income tax being borne by the Metro10 counties and 66 percent being borne by the Metro28 counties.

The burden of some the corporate income tax falls on non-Georgia residents, while Georgia residents pay part of other states' corporate income tax. If the true amount of Georgia corporate income tax paid by Georgia residents was known, it would be less than the amounts allocated in this report, as non-Georgia residents own stock in corporations that pay corporate income tax in Georgia. However, it is reasonable to assume that this amount paid by nonresidents is distributed between metropolitan Atlanta and non-Atlanta counties in the same proportion as calculated above. Thus, while the total corporate tax paid by Georgians maybe less than the revenue collected, the percent paid by metropolitan Atlanta and non-Atlanta counties as calculated would not change if we exclude the burden borne by nonresidents.

Estate Tax

Georgia received $65.1 million in fiscal year 2004 in estate and gift taxes. This figure represented approximately 0.4 percent of Georgia total revenue (see Table 3). In 2004, Georgia's estate tax law was coupled with the federal estate tax law. Georgia charged a tax that was equivalent to the allowable federal tax credit for estate tax paid to states. However, the federal estate tax state credit lapsed on December 31, 2005. The Georgia legislature took no action to decouple the state estate tax, thus Georgia's ability to collect estate tax in the future lapsed as well.[10]

This report uses the Chamberlin and Prante approach for Georgia counties to allocate the Georgia estate tax collected in 2004. Chamberlin and Prante (2007a) base their estimates of the estate tax burden on the number of wealthy decedents in an area. Due to the national nature of their study, a proxy must be used for the actual number of wealthy decedents that incur the estate tax in an area. Chamberlin and

[10] It was estimated that some revenue will continue to be generated due to the delay in paying the tax while large estates are settled.

Prante (2007a) use the geographic distribution of housing valued over $1 million based on postal ZIP code figures from the 2000 U.S. Census. The distribution of estate taxes is assumed to follow the geographic distribution of homes valued at $1 million or above (Chamberlin and Prante 2007a). We use a similar approach, utilizing the 2000 U.S. Census data on the number of $1 million dollar homes in each Georgia county.

For example, Fulton county had an estimated 2,499 homes valued at $1 million or more in 2000. This represents 49.4 percent of all homes valued at $1 million or more in Georgia. Using Fulton County's share of 49.4 percent, we can allocate its portion of the $65.1 million in estate tax collected in Georgia. Thus, it is estimated that Fulton county residents paid approximately $32.2 million in Georgia estate tax. These county level allocations are summed by the appropriate metropolitan area and a percentage of the state total is calculated. This results in an estimated 68 percent of the estate tax being borne by the Metro10 counties and 72 percent being borne by the Metro28 counties.

Tobacco, Alcohol, and Motor Fuel Tax

In the empirical literature on tax incidence, consumer expenditure survey data are used to allocate these excise taxes to individual taxpayers based on the assumption that the incidence of these taxes falls on the purchaser of the product (Chamberlain and Prante 2007a and Wong 2006). Regional consumer expenditure data grouped by income range for purchases of alcohol, tobacco, and motor fuel are used to allocate excise taxes to counties. This is a reasonable method when conducting a national study or when individual county data are unavailable. In Georgia, since county level data on motor fuel purchases exist, we use those data to allocate motor fuel tax burdens. When county level data are not available as is the case for tobacco and alcohol purchases, we use data from the Bureau of Labor Statistics, Consumer Expenditure Survey (2004) (CEX) as described below.

The state of Georgia received approximately $228 million in tobacco taxes. This figure represented approximately 1.5 percent of Georgia total revenue (see Table 3). Two data sets were used to estimate the amount of tobacco excise tax generated

by residents of metropolitan Atlanta and the rest of the state. The first is the CEX survey which itemizes tobacco spending by region for various income ranges. The "southern region" is the CEX group that includes Georgia. Second, we use income data from the IRS by zip code to apportion the CEX reported consumption of tobacco in the southern region by income group to specific counties. For instance, an average southern consumer unit or household with an annual income of less than $10,000 spent approximately $444 on tobacco in the 2004 calendar year (CEX). Using IRS data that lists tax filings by income group and zip code we estimate that there are 91,255 households in Fulton County with annual income less than $10,000. We multiply 91,255 by $444 to determine that Fulton county consumers with incomes of less than $10,000 spent approximately $40.5 million on tobacco products. We repeat this procedure with the remaining income brackets for all counties.[11] Georgia's total revenue from tobacco excise taxes was approximately $228 million, thus we estimate that Fulton County contributed approximately 3.7 percent or $8.4 million to Georgia's tobacco revenue. These county level allocations are summed by the appropriate metropolitan area and a percentage of the state total is calculated. Thus, an estimated 45 percent of the tobacco tax was borne by the Metro10 counties and 56 percent was borne by the Metro28 counties.

The state of Georgia received approximately $153 million in alcohol taxes. This figure represented approximately one percent of Georgia total revenue (see Table 3). Allocation of alcohol tax revenue to regions is done in the same manner as tobacco revenue. We use CEX survey data for southern consumers that lists the amount spent on alcohol by various income ranges. We aggregate this data with IRS zip code data with corresponding income ranges. These county level allocations are summed by the appropriate metropolitan area and a percentage of the state total is calculated. Thus, an estimated 48 percent of the alcohol tax was borne by the Metro10 counties and 59 percent was borne by the Metro28 counties.

[11] The income brackets used for both alcohol and tobacco are as follows: Under $10,000; $10,000 under $25,000; $25,000 under $50,000; $50,000 under $75,000; $75,000 under $100,000; $100,000 or more.

Georgia motor fuel taxes generated $732 million in fiscal year 2004. This figure represented approximately 4.7 percent of Georgia total revenue (see Table 3). In addition to gasoline, motor fuel taxes are collected on jet fuel and aviation gasoline. To allocate the motor fuel excise tax generated from gasoline, we use county level data for gasoline station retail sales for 2004 from the Georgia County Guide (University of Georgia Cooperative Extension Service 2008). This results in an estimated 37 percent of retail gasoline motor fuel tax being borne by the Metro10 counties and 48 percent being borne by the Metro28 counties.

In Georgia, $673.7 million in jet fuel and $20.9 million in aviation gasoline was purchased in 2005 (Energy Information Administration 2005).[12] The total amount of aviation gasoline and jet fuel sold was approximately 8 percent of the total 2004 retail sales of gasoline of approximately $9 billion. We allocate 90 percent of jet fuel and aviation gasoline sold to the Metro10 and Metro28 areas and the other 10 percent to the non-Atlanta area counties, as the state's largest airport is in the Atlanta metropolitan area. Most of the jet fuel is associated with flyers and thus is likely associated with non-Georgians. We apply our approach that revenue from non-Georgians is allocated to the county from which the revenue is derived. In any case, we simply do not know the county of residence of Georgians who fly, the amount they fly, although a reasonable assumption is that flyers are concentrated in the Atlanta area.

Adding metropolitan Atlanta area weighted amounts of gasoline, jet fuel, and aviation gasoline yields an estimate that the Metro10 area generated approximately 41 percent of motor fuel tax revenue and the Metro28 area generated approximately 51 percent.

Out-of-state and out-of-region generators of motor fuel tax are treated as residents of the county in which they make their purchases. Recall from the sales tax section that changing the location of these out-of-state or out-of-region consumers to the metropolitan Atlanta region or the non-Atlanta region did not materially affect the sales tax allocation. Thus we will assume a similar result for the motor fuel tax.

[12] Data for 2004 was not available from the Energy Information Administration thus 2005 is used.

Motor Vehicle License Tax

Motor vehicle license tax generated approximately $263 million and accounted for approximately 2 percent of total Georgia state revenue (see Table 3). In Georgia both the tag fee, currently $20, and the ad valorem portion of the tax is collected at the county tag agent office. We use the percentage of motor vehicles registered in each county as the allocator for the amount of state motor vehicle license tax collected. For example, Fulton County had approximately 553,798 vehicles registered, which is 7.2 percent of the total motor vehicles registered in the state. We sum these county allocations by the appropriate region. This yields an estimate that the Metro10 area generated approximately 38 percent of motor vehicle license tax revenue and the Metro28 area generated approximately 50 percent.

Insurance Premium Tax

The state of Georgia received approximately $318 million in insurance premium tax. This figure represented approximately two percent of Georgia total revenue (see Table 3). We use county level insurance tax collections, which is associated with the residence of the purchaser, to allocate state insurance premium taxes to counties. This yields an estimate that the Metro10 area generated approximately 46 percent of insurance premium tax revenue and the Metro28 area generated approximately 59 percent.

Lottery, Miscellaneous Fees and Charges

Lottery, miscellaneous fees, and charges generated approximately $1.5 billion and account for approximately 10 percent of Georgia state revenue (see Table 3).[13] The lottery generated approximately 5 percent of state revenue with net revenue of $787 million. Lottery revenue is allocated to counties based on county level lottery sales from the Georgia lottery corporation. Because of lack of data we are forced to assume that the county in which the ticket is purchased is also the county of residence

[13] The lottery proceeds reported in Table 3 are net of any administrative expenses. This is the only revenue category that is reported net of administrative expenses.

of the purchaser. As lottery tickets are sold in all counties, it seems unlikely people travel very far from their homes to purchase them. The exceptions might be for border states without a lottery (Alabama and South Carolina for a few weeks of 2004), where lottery revenues allocated to counties at those borders may overstate residents' tax burdens. Our estimate is that the Metro10 area generated approximately 35 percent of lottery revenue and the Metro28 area generated approximately 46 percent.

Fees, charges, and miscellaneous revenue make up the remaining 5 percent of Georgia state revenue. These relatively minor revenue categories shown in Table 3 are allocated in a similar manner as their associated component expenditures, as described in Section 3. The only exception is the nursing home fee which is allocated based on the percent of the county population that is 65 and over. We sum the weighted county amounts of these fees, charges, and miscellaneous revenues by metropolitan area. This yields an estimate that the Metro10 area generated approximately 37 percent of fees, charges and miscellaneous revenue and the Metro28 area generated approximately 46 percent.

C. Revenue Summary

Based on the methods, assumptions, and data discussed above we estimate that the Metro10 and Metro28 counties provided 51 percent and 61 percent of total Georgia revenue, respectively. Due to the presence of county level data for much of Georgia revenue, the above estimates should be fairly accurate. Where feasible, we reallocated revenue from the county in which the revenue was collected to the county in which the taxpayer resides. Georgia county level revenue data exist for several taxes that allow the direct observation of revenue such as the income tax and the gasoline portion of the motor fuel tax. For other taxes county level data exist that allow one to impute the share of tax revenue generated by residents of the county; these taxes are: sales tax, motor vehicle license tax, insurance premium tax, and the lottery. These two groups of taxes represent approximately 89 percent of Georgia total revenue. Thus, we have a high degree of confidence for this portion of the revenue allocations.

However, the remaining revenues may be misallocated. To test the effects of a potential misallocation, we arbitrarily reassigned 20 percent of the remaining categories of revenue for which county level data are not available to the rest of the state. This reassignment changes the allocations such that the Metro10 area is estimated to contribute 49 percent to total state revenue and the Metro28 area is estimated to contribute 59 percent. This adjustment to the revenue figures does not materially change the revenue estimates for the metropolitan Atlanta area. The next section examines the amount of state expenditures received by the different regions.

III. Incidence and Allocation of State Expenditures

There is a limited literature discussing methodologies for allocating the benefits of government expenditures across households. A recent study by the Tax Foundation focuses on federal and state and local government spending (Chamberlain and Prante 2007a). It groups budgetary categories into functional categories such as public safety, education, etc. In addition, Chamberlain and Prante group the functional categories into four conceptual types of goods: public goods, private goods, quasi-private goods, and transfer payments.

The general goal of this literature is to determine the incidence of the benefits of government expenditures, which is usually the final recipient of the spending. For some state expenditures, this task is relatively straightforward. For instance, K-12 education might be allocated by student enrollment per county. For certain types of public good expenditures such as environmental services, the dollar amount of service received by the final recipient is less clear. These public goods expenditures may benefit all citizens and thus be allocated equally to all citizens of the study population.

The population unit for expenditure analysis differs from that of revenue analysis. Households are used to allocate county level contributions to state revenue to counties, while individuals tend to be used to allocate expenditures. The household is the unit for revenues because tax return information from the IRS and the Georgia Department of Revenue are listed by tax-filing status or household. Individuals are used to allocate expenditure data to counties because individuals are considered the beneficiaries of state and local government services.

A. Expenditure Incidence

To determine the final beneficiaries of the individual budgetary outlays, we assign each expenditure a general heading. These headings correspond roughly to those used by the U.S. Census in its state and local public finance data tables. The headings are Pre-K through 12th grade (PK-12) education, post-secondary education, environment and housing, government administration, health, social services, public safety, transportation, veteran services, and workers' compensation. State general

fund expenditures are assigned to these categories. Only expenditures that flow out of the general fund are used. For instance, the university system is financed by general appropriations and tuition. However, tuition paid by Georgia residents to state colleges and universities is considered "other revenue" by the Georgia budget office and thus is offset against the university system total budget. We consider only the expenditures from appropriations. Table 4 lists the state expenditures for the ten general headings as a percent of total state expenditures as well as our estimate of the percent of state expenditures that benefit the different metropolitan Atlanta regions.

TABLE 4. GEORGIA EXPENDITURES FOR FISCAL YEAR 2004

			-----% Received By------	
General Category	**Budget Amount[1]**	**% Total Exp.**	**Metro10**	**Metro28**
PK-12 Education	$6,185,350,097	40%	36%	47%
Post-Secondary Education	$2,416,001,126	16%	38%	49%
Environment and Housing	$267,365,026	2%	32%	42%
Gov. Administration	$998,966,643	6%	43%	53%
Health Care	$2,009,455,214	13%	28%	31%
Social Services	$1,431,479,890	9%	38%	44%
Public Safety	$1,396,318,193	9%	46%	54%
Transportation	$664,624,076	4%	38%	49%
Veterans Services	$22,131,693	0.14%	39%	49%
Workers' Comp	$17,056,071	0.11%	45%	56%
Georgia Total Expenditures	$15,408,748,029		37%	46%

Source: Office of Planning and Budget (2004) and author's calculations.
[1]The budgeted expenditures from the Governor's budget report are used because they provide the necessary level of expenditure detail to perform accurate incidence analysis. This level of detail is not available in reports that list actual fiscal year expenditures.

Expenditures are allocated to counties based on the location of the final beneficiaries of state expenditures. We first determine who benefits from the expenditure. For example, there are some expenditures for which the benefit is largely "private." This is the case for many services since there is little spillover beyond the benefit received by the individual who receives the service, e.g., job training. For other state expenditures, the benefit may be split between individuals and the public at large. For example, PK-12 education provides a private benefit to families in that children become educated and increases their chances for higher education and employment. There is a public benefit as well—a well-educated

population typically has lower levels of crime and a better functioning economy. In general, if the expenditure provides private benefits, the benefits are assumed to flow to a unique subset of the study population. If the expenditure is deemed to confer public benefits, the benefits are assumed to flow to all members of the study population equally. If the expenditure is deemed to confer quasi-private benefits, the incidence is determined on a case-by-case basis.

The assumptions made to determine the location of final recipients of state expenditures as well as the allocation methods for the budgetary categories above is discussed next. We adopted a set of assumptions to allocate revenue and expenditures that we believe are the most appropriate. However, we do consider alternative assumptions. These are discussed in Section III.C.

The final beneficiaries of PK-12 education spending are generally assumed to be students—a private benefit, with some public benefit. Post-secondary education, on the other hand, has two missions. The first mission is the instruction of students. This mission primarily confers private benefits on the students that attend Georgia post-secondary institutions. One can assume that a student receives at least the amount of benefit paid by in-state tuition. However, the cost of educating a college student is higher than the in-state tuition the student pays. The difference between the actual cost of college education and the amount of in-state tuition paid can be thought of as the benefit the student receives from the state general fund expenditure. The second mission is to provide research services and technical assistance on matters of state and local interest, and is considered a public good. The primary beneficiaries of this second mission are the citizens of Georgia.

State expenditures on health care, social services, public safety, and government administration have component expenditures that confer private, quasi-private, and public benefits. In the literature, state health care provision and the provision of social services are considered private goods, with the final beneficiaries being the recipient of the care or service (Chamberlain and Prante 2007a). There are two different incidence assumptions regarding public safety spending in the literature. Chamberlain and Prante (2007a) assume that spending on courts and corrections are

public goods and thus benefit all households equally. Police and fire protection are considered quasi-private goods (Chamberlain and Prante 2007a and Hawkins and Hendrick 1994). Government administration is classified as a public good, with benefits that flow to all members of the population equally (Chamberlain and Prante 2007a). We generally follow the above incidence assumptions regarding healthcare, social services, public safety, and government administration.

In Georgia, the majority of Department of Transportation funds are spent on road projects and maintenance. Chamberlain and Prante (2007a) consider government spending on highways to be private spending and benefit the users of road infrastructure. The incidence theory allocates benefits to individual drivers directly and to individuals indirectly through firms that utilize road infrastructure as an input. Our initial incidence assumption is that in Georgia it is individual drivers who are the final beneficiaries of state transportation spending.

There are five departments included under the broad category of environment and housing. They are the Department of Agriculture, the Department of Community Affairs, the State Forestry Commission, the Department of Natural Resources, and the Department of Soil and Water. Chamberlain and Prante (2007a) consider natural resources spending a public good that benefits all households equally. However, a part of agriculture spending is considered private spending that benefits only those households with farm income. We follow both incidence assumptions above.

The final category is that of Veteran Services and Workers Compensation. The benefits of Veteran Services are assumed to flow to veterans. The benefits of worker compensation are assumed to flow to all employed people in the geographic area (Chamberlain and Prante 2007a).

B. Expenditure Allocations for Georgia

In this subsection we examine state expenditures and allocate them to metropolitan Atlanta and the rest of the state based on who benefits from the expenditures. In fiscal year 2004, Georgia spent approximately 56 percent of total general fund expenditures on education. Three social welfare categories accounted for 31 percent of total state expenditures: health care, human resources, and public

safety. The remaining 13 percent of state expenditures fall under the categories of government administration, transportation, environment and housing, veteran services, and workers' compensation.

State budgetary expenditures by county are not generally available.[14] Thus, expenditures are allocated to counties based on the location of beneficiaries of the state expenditures as was discussed in the previous section. When broad categories have subcategories or contain individual departments, we use the individual budgets for the expenditure benefit allocation. These regional amounts are then summed and used to determine the total regional allocation for the broad category. All figures are for fiscal year 2004, unless otherwise noted. Next, we discuss allocating state level expenditures to the different state regions. (For a discussion of the data sources used to allocate state expenditures to counties see Appendix B).

Education PK-12

Georgia spent approximately $6.2 billion on PK-12 education. This represented approximately 40 percent of state expenditures. Departments under the category of PK-12 education include the State Board of Education and the Office of School Readiness. The administrative expenses for three different teacher and educational employee retirement systems are included as well. Based on the budgets of these departments, we estimate that the Metro10 counties and the Metro28 counties received approximately 36 percent and 48 percent respectively of PK-12 education spending (see Table 4).

The methods in the literature for allocating expenditures on education are based on school attendance or the presence of school age children in the household (Chamberlain and Prante 2007a). For this report, data are available for the actual level of state funds allotted to school districts for education purposes. County and district level data on student enrolment are also utilized to allocate other education related expenditures.

[14] For this study the Georgia Quality Basic Education Act expenditures are an exception, state level data exist on the sum received by school district and county.

Most of the PK-12 budget, $5.9 billion, is spent by the State Board of Education. To allocate this amount to counties is straightforward as the state utilizes the formulas in the Quality Basic Education Act (QBE) to allocate funds to school districts. We use the QBE county level data to allocate the State Board of Education budget to the two Atlanta metropolitan areas (QBE Report 2004). The Metro10 counties received 36 percent of total QBE expenditures, while the Metro28 counties received 48 percent.

The Office of School Readiness received approximately $261 million in fiscal year 2004. We use data on the amount of money received for state funded pre-K programs by each county (University of Georgia Cooperative Extension Service 2008). The Metro10 and Metro28 counties received 40 percent and 52 percent of Office of School Readiness funds, respectively.

The three retirement funds received approximately $4.5 million for administrative expenses. The likely beneficiaries of these funds are the current teachers and employees that will retire in the future. Data on student enrollment is used to allocate the retirement administrative funds that benefit teachers and other school district employees. Districts with large student enrollment are likely to have more employees to qualify for the district retirement plan. QBE funds are allocated based on formulas that take into account the property tax base of the district. Thus, in districts with large property tax bases such as the City of Atlanta, the amount of QBE dollars per student may be less than a district with a lower property tax base. Thus, the number of students enrolled is likely to be a better indicator of retirement fund beneficiaries. Based on this approach we estimate that the Metro10 area received 39 percent of these administrative expenses, while the Metro28 area received 54 percent. The weighted sum of all PK-12 education spending yields the estimate that the Metro10 area received 36 percent of PK-12 education spending and the Metro28 area received 48 percent of PK-12 education spending.

Post-Secondary Education

Under the category of post-secondary education, Georgia spent approximately $2.4 billion; this represented approximately 16 percent of total state expenditures. Four general budgetary subcategories are included in higher education: the Board of Regents, the Board of Regents Unit B, the Lottery for Education Account, and technical and adult education.[15] The budget for the Board of Regents Unit B is primarily spent on the mission of university level research and technical assistance, while the other three subcategories focus on the mission of student instruction. Based on the allocation methods discussed in detail below, we estimate that the Metro10 area received approximately 38 percent of post-secondary education spending while the Metro28 area received approximately 49 percent (see Table 4).

We allocate post-secondary education expenditures for the instruction of students to the Atlanta metropolitan area based on the school districts of incoming freshmen to the university system as well as the type of post-secondary institution the student attends. The allocation is not based on where the post secondary institution is located. This methodology is similar to Hawkins and Hendrick (1997) who utilize the residence of students at Milwaukee area technical colleges to determine whether the beneficiaries of Milwaukee county spending are city or county residents. We allocate post-secondary education expenditures for research to counties based on the number of households in the county.

To estimate the regional benefits, we first determined the amount of state spending received by the Atlanta metropolitan counties based on student instruction. Georgia categorizes its post-secondary institutions into five types: research universities, regional universities, state universities, state colleges, and two-year colleges. State appropriations vary by university type. Research universities received approximately 66 percent of state appropriations.[16] However, research

[15] The Lottery for Education Account is prescribed by Georgia law and is the account that the state uses to pay out lottery funded scholarships and other higher education related expenses.
[16] Research institutions include: University of Georgia, Georgia Institute of Technology and Georgia State University.

universities only enrolled approximately 34 percent of the full-time equivalent students in the post-secondary system. In addition, approximately 21 percent of the students attending research universities were not Georgia residents. To allocate the money Georgia spends on post-secondary education to Georgia counties, we calculate the average amount of state money received by each type of institution per full-time equivalent student who is a Georgia resident. For example, in fiscal year 2004 research universities received approximately $847 million in state funds and had an enrollment of 73,024 full-time equivalent students. Approximately 79 percent of the full-time equivalent students were Georgia residents. To calculate the state funds received per full-time equivalent Georgia resident student, we divide the total research university funding, $847 million, by the 57,981 Georgia resident full-time equivalent students. This yields the average amount of state funds received by research universities per Georgia resident full-time equivalent student of $14,609.

We then allocate the average Georgia resident full-time equivalent funds received to the Atlanta metropolitan counties based on the number of incoming freshmen to that type of post-secondary institution. Data on graduating high school senior college attendance was gathered for all counties by university type. For instance, the Fulton County school district had 773 graduating seniors entering state research universities in the fall of 2004 (University System of Georgia's Board of Regents 2004). To allocate funding to the Atlanta metropolitan areas we multiply the percent of incoming freshmen by university type average Georgia resident full-time equivalent funding. For the Metro10 area, this generates approximately $8,450 for research universities. We repeat this procedure for the different types of post-secondary education institutions for both the Metro10 and Metro28 regions.

Next, we sum the dollar amounts to yield the amount of total average full-time equivalent funding for the Metro10 and Metro28 areas. The Metro10 and Metro28 area totals are divided by the system wide total average full-time equivalent funding to generate the percent of Georgia post-secondary education money received by the Atlanta metropolitan areas. For instance, the sum of the five types of post-secondary education monies in the Metro10 area was approximately $12,083 per student. This is divided by the system total of approximately $31,850 per student, to

yield approximately 38 percent. This percentage indicates the amount of state post-secondary education funding benefits received by Metro10 area students. The procedure is repeated for the Metro28 region and the result implies that approximately 48 percent of state post-secondary education funding benefits go to Metro28 area students.

The second component in the estimation of post-secondary education benefits is allocating the Board of Regents Unit B budget of approximately $201 million. Recall that the incidence assumption is that research and technical assistance conducted at post-secondary intuitions is a public good and benefits all Georgians equally. We allocate the Board of Regents Unit B budget based on the number of households in Georgia counties. The resulting estimate is that in the Metro10 counties received 43 percent and the Metro28 counties received 53 percent of the benefits of Board of Regents Unit B spending respectively. The final allocation of the total $2.4 billion post-secondary education budget is the weighted sum of the Atlanta metropolitan area allocations of the instructional budget and the Unit B budget, which is 38 percent to the Metro10 area and 49 percent to the Metro28 area.

Health Care

Georgia spent approximately $2 billion on state health-care initiatives in FY2004. The expenditures accounted for approximately 13 percent of total state spending. Three subcategories are included in healthcare: the Department of Community Health, the Indigent Care Trust Fund, and Peachcare for Kids. Chamberlain and Prante (2007a) utilize the U.S. Census Current Population Survey data on household Medicaid benefits received to allocate health care expenditures to counties. We utilize a similar method to allocate the Indigent Care Trust Fund and Peachcare for Kids.

The Indigent Care Trust Fund and Peachcare for Kids primarily serve low income individuals and families. To allocate the approximately $200 million these two programs receive to regions, we use the amount of Medicaid dollars received by counties (Georgia Department of Community Health 2005). The Department of Community Health received $1.8 billion of the state health care budget. This

department assists county health departments through the issuance of grants. Because the beneficiaries of the Department of Community Health programs have more heterogeneous income ranges, we use the amount of these grant dollars received by counties to allocate this type of health care spending (Georgia Department of Community Affairs 2005). Based on the above allocations, we estimate the Metro10 area received approximately 28 percent of total health expenditures while the Metro28 area received 31 percent of Georgia total health expenditures (see Table 4).

Social Services

The Department of Human Resources had a budget of approximately $1.4 billion and accounted for nine percent of total Georgia general fund expenditures. Chamberlain and Prante (2007a) use public assistance income from the Current Population Survey for federal spending on welfare and social services to allocate social service expenditures. In Georgia, the focus of much of the Department of Human Resources' work is with low income families. The distribution of the budget is as follows: The Division of Mental Health Developmental Disabilities and Addictive Diseases received 44 percent, the Division of Family and Children Services received 33 percent, the Division of Public Health received 13 percent, and the Division of Administrative Services accounted for 13 percent.[17] As limited county level data exist for these Georgia programs, we use as a proxy Temporary Assistance for Needy Families (TANF) receipts to allocate these funds to counties (Fiscal Research Center 2005).[18] We estimate that 38 percent of Department of Human Resources funds are apportioned to the Metro10 counties while 44 percent are apportioned to the Metro28 counties (see Table 4).

[17] We assume that social service expenditures primarily benefit low-income Georgians. However, it is possible that the mental-health component of social services does not follow this distribution. We explore this possibility further in Section III.C.

[18] The country's share of the state population in poverty might also be used as a proxy measure. The county's share of the state population in poverty is highly correlated with the county's share of state TANF recipients. We prefer the TANF measure as participants in a federal program for low income people seem more likely to participate in state programs for low income people. It is possible to have people below the poverty line that do not participate in any of the state programs.

Public Safety

Georgia spent approximately $1.4 billion under the category of public safety. This represents approximately nine percent of all general fund state expenditures. There are two methods of allocating public safety spending in the literature. Chamberlain and Prante (2007a) assume that spending on courts and corrections are public goods and thus benefit all households equally. Police and fire protection are considered quasi-private goods but are still allocated to all households equally (Chamberlain and Prante 2007a). In the Milwaukee study of county and city expenditures, spending on police and corrections are allocated based on the location of the crime committed (Hawkins and Hendrick 1994). We follow the allocation methods of Hawkins and Hendrick, as we have access to county level crime data.

There are seven departments included in the category of public safety: Department of Corrections, Department of Defense, Georgia Bureau of Investigation, Department of Juvenile Justice, Department of Law, Department of Pardons and Paroles, and Department of Public Safety. Of the seven departments included in the category of public safety, the Department of Corrections accounted for 65 percent of total state spending in this category. If the three additional departments of, Juvenile Justice, Pardons and Parole's and GBI are added to the Department of Corrections, these four departments account for 92 percent of total public safety spending. As much of the public safety budget is allocated toward fighting crime and prosecuting criminals, we allocate the public safety expenditures based on the number of crimes committed in each county.[19] This is done using GBI data (Georgia Bureau of Investigation 2008). By this method, the Metro10 counties were apportioned 46 percent of public safety funds, while the Metro28 counties were apportioned 54 percent (see Table 4).

[19] Possibly, the Department of Law and the Department of Defense expenditures might be considered public goods. However, as the total expenditures of both departments were only 1.6 percent of total Public Safety expenditures, their reallocation made no significant difference to the public safety results. Thus, we maintain our original assumptions.

Government Administration

Under the category of government administration, Georgia spent approximately $999 million. This accounted for 6.5 percent of total state spending. Recall, Chamberlain and Prante (2007a) quantify government administration as a public good. We make the same assumption but include the judicial branch in government administration as the benefits of the judicial branch are available to all Georgians as well.

Fifteen total departments are included in this broad category (see Appendix A for a complete list). However, the five departments with the largest budgets accounted for 85 percent of the spending on government administration. These five, from largest budget to smallest, are the Department of Revenue, the Judicial Branch, the Department of Motor Vehicle Safety, the Department of Industry, Trade and Tourism, and the Governor's Office.[20] Government administration spending is allocated to regions by households, with 43 percent of this spending allocated to the Metro10 area and 53 percent allocated to the Metro28 area (see Table 4).

Transportation

In the general category of transportation, Georgia spent approximately $665 million; this represented 4.3 percent of total state general fund spending. The majority of Department of Transportation funds were spent on road projects and maintenance, thus the final beneficiaries are assumed to be Georgia drivers. To allocate these funds to counties, we use the amount of county level daily vehicle miles traveled. We estimate that the Metro10 counties received 38 percent of the state transportation funds and the Metro28 counties received 49 percent of state transportation funds (see Table 4).

Chamberlain and Prante (2007a) allocate half of highway funds based on gasoline and motor oil expenditures from consumer expenditure survey data and the

[20] The Department of Industry, Trade and Tourism is currently called the Department of Economic Development.

other half via the corporate income tax allocator.[21] There are limitations to using consumer expenditure survey data for allocating the benefits received by Georgians from state transportation spending. First, consumer expenditure survey data are based on regional responses and may not accurately reflect the differences in driving patterns across Georgia's geographically diverse counties. Second, consumer expenditure survey data use the sum spent on gasoline and motor oil as a proxy for the amount of benefit received from road use. Money spent on gasoline and motor oil is likely to be a function of the type and age of the cars in the household as well as how much the household drives. To avoid these limitations we use the amount of county level daily vehicle miles traveled to allocate transportation funds to regions. County level daily vehicle miles traveled is a more direct measure of the benefits drivers receive from state level transportation spending. A potential problem with this method is that not all Georgians drive solely within their region of residence. We assume that non-Atlanta residents and metropolitan Atlanta residents drive equally in the other region.

An alternative method for estimating the benefits of state Department of Transportation spending is to calculate the lane miles of roads for metropolitan Atlanta and the rest of the state. We utilize Department of Transportation lane miles of public roads in Georgia by surface type, which lists total mileage as well whether the road is paved. For instance, in Fulton County in 2004, there were 9,160 total lane miles of road. Summing metropolitan Atlanta and non-Atlanta counties total lane miles yields Metro10 and the Metro28 counties with approximately 17 percent and 28 percent of total Georgia lane miles, respectively. If unpaved roads are excluded from the calculation, the Metro10 and Metro28 area have approximately 21 percent and 33 percent of roads respectively.[22] In addition, we obtained the value of transportation project for three years. The Metro10 counties received 28.6 percent and the Metro28 counties received 43.0 percent of the three-year total of project values.

[21] Recall that Prante and Chamberlin assume that 70 percent of the corporate tax is borne by labor due to potential domestic capital flight and 30 percent is borne by owners of capital.
[22] Ninety percent of unpaved road mileage is in the 131 non-Atlanta area counties.

Using lane miles or project values as an allocator for the benefit of transportation spending reduces the benefits of state transportation spending received by metropolitan Atlanta. The vehicle miles traveled benefit estimates are fairly consistent with the percent of retail gas expenditures in the Atlanta metropolitan areas. Metropolitan Atlanta and the non-Atlanta area receive about the same amount of benefit in transportation spending as they paid in motor fuel taxes. This result has an intuitive appeal which supports using vehicle miles traveled to measure transportation spending benefits. However, it is possible given the lane miles estimate that vehicle miles traveled underestimates the non-Atlanta areas benefit from transportation spending.

Environment and Housing

Under the broad category of environment and housing, Georgia spent approximately $267 million, which was 1.7 percent of total general fund spending. We assume that the services of the Department of Community Affairs, the Department of Natural Resources, and the Department of Soil and Water generally benefit all taxpaying Georgians equally. Thus, we allocate them based on the number of households in a county, with 43 percent of these three departments spending allocated to the Metro10 counties and 53 percent allocated to the Metro28 counties.

For the State Forestry Commission and the Department of Agriculture, county data on the value of forest and agricultural products is used to allocate expenditures to regions. To allocate State Forestry Commission spending we utilize county forest products total farm gate value (University of Georgia Cooperative Extension Service 2008). For the Metro10 and Metro28 counties this is approximately one percent and nine percent of total Georgia state forest product farm gate value, respectively.[23] For the Department of Agriculture we utilize total agricultural cash receipts for the latest year available, 2002 to allocate the approximately $33 million spent to help farmers

[23] The farm gate value of an agricultural or forestry product is generally considered to by the price at which the farmer or grower sells the product. This price is usually less than the retail price as it does not include the cost of shipping, handling, storage, or marketing incurred by the purchasing agent.

and promote agricultural interests in the state. For the Metro10 and Metro28 counties this yields approximately two percent and 11 percent respectively of total Georgia agricultural cash receipts. We allocate the approximately $8 million the Department of Agriculture spent on consumer protection by households. Summing these five departments' budgets by the Metro10 and Metro28 allotments yields that the Metro10 area received approximately 32 percent and the Metro28 area received approximately 42 percent of total environmental and housing category spending (see Table 4).

Veterans' Services and Workers' Compensation

Veterans' services and workers' compensation expenditures were approximately $39 million and accounted for 0.25 percent of state spending. Chamberlain and Prante (2007a) combine the categories of Veteran Services and Workers' Compensation due to data constraints. The CEX survey quantifies the total amount of the three following programs: unemployment, workers' compensation, and veterans' benefits received. We can separate these programs at the state level. We utilize the data on the number of veterans in a county to allocate the total amount of Georgia veterans benefits paid (University of Georgia Cooperative Extension Service 2008). Workers' compensation is allocated by the number of people employed in the region.

Georgia spent approximately $22.1 million on veterans' benefits. The Metro10 and Metro28 area was home to 39 percent and 49 percent of veterans in the state, respectively. For workers' compensation, the state spent approximately $17.1 million. The Metro10 and Metro28 area accounted for 44 percent and 56 percent of employed people in the state respectively (see Table 4).

C. State Expenditure Robustness Checks

We estimate that the Metro10 and Metro28 areas received 37 percent and 47 percent of total state spending, respectively, using the above estimation methods. For state expenditures, we believe that there is somewhat more uncertainty in allocating funds to metropolitan Atlanta counties then for revenues. In only one category, PK-12 education, does specific county level expenditure data exist. The remaining 60

percent of state expenditures must be allocated to counties using various estimation methods as described above. To test the robustness of these county allocations we arbitrarily allocate an additional 20 percent of the nonPK-12 expenditures to metropolitan Atlanta. This increases the level of total state expenditures received by the Metro10 area to 41 percent and to 51 percent in the Metro28 area. Recall that the Metro10 area had approximately 43 percent of the state's population and accounted for approximately 53 percent of the state's adjusted gross income. While the Metro28 area was home to approximately 54 percent of Georgia's population and accounted for approximately 64 percent of the adjusted gross income. This large adjustment to the expenditure figures does bring the metropolitan Atlanta area's share of expenditures close to its share of population but there is still a sizable gap between the expenditure share and share of state adjusted gross income.

We provide another robustness check on our estimation of expenditure allocations. We examine how the distribution of state expenditures changes if we alter some of our assumptions regarding the distribution of the benefit of these public expenditures. It is possible that some state expenditures have a greater public benefit than we assigned them in the text above. For instance, in the previous sections, PK-12 education benefits are assumed to flow almost entirely to students currently enrolled in school and their' families. State spending on education has local spillover effects that benefit the community. Examples are education facilities open to the public such as athletic fields or community meeting facilities, or increases in property values due to the perceived value of education. We adjust some of our incidence assumptions to test if allocating these public benefits to the surrounding communities has a significant effect on our results. When we use more "public" benefits, we find very little difference in the overall results.

We next examine the various public benefit assumptions listed in the Table 5. In Table 5 we include the budget general category, its percent of total expenditures, the new percentage of the total spent in the Metro10 area, the change from Table 4 under our original assumptions, the new percentage of the total spent in the Metro28 area, the change from Table 4 for the Metro28 area. All expenditure categories are included in Table 5 even if no changes to the assumptions are made, as in the

TABLE 5. ALTERNATIVE EXPENDITURE INCIDENCE ASSUMPTIONS

		Metro10 Area		Metro28 Area	
General Category	**New Incidence Assumptions**	**% Total Exp.**	**Change from Tbl 4**	**% Total Exp.**	**Change from Tbl 4**
PK-12 Education	75% by QBE and GA Student Enrollment 25% Georgia Public Good	38%	2%	49%	2%
Post-Secondary Education	75% by GA HS Freshmen State$/FTE & Unit B 25% Georgia Public Good	39%	1%	50%	1%
Health Care	75% by Grants to Counties From DCA 25% Georgia Public Good	32%	4%	36%	5%
Social Services	56% by TANF County Total Payments 44% General Population	40%	2%	48%	4%
Public Safety	75% by County Crime Stats. 25% by share of state property value	47%	1%	56%	2%
Transportation	50% by County DVMT 25% County tourism benefit 25% Georgia Public Good	44%	6%	53%	4%
Environment and Housing	GA Total Households and Ag. & Forest Prods.	31%	NA	41%	NA
Gov. Administration	GA Total Households	43%	NA	53%	NA
Veterans Services	Veterans per County	39%	NA	49%	NA
Workers' Comp.	County Employed Workers	45%	NA	56%	NA
Total Percent of State Expenditures		39%	2%	48%	1%

Sources: QBE Report (2004), University System of Georgia's Board of Regents (2004), Department of Community Affairs (2005), Fiscal Research Center (2005), Georgia Bureau of Investigation (2008), Georgia Department of Revenue (2007), Georgia Department of Transportation (2003), Travel Industry Association of America (2005).

category of Environment and Housing. We also offer a brief description of the new incidence assumptions. It should be noted that all our incidence adjustments in this section are somewhat arbitrary. Again our purpose in this section is to test the robustness of our estimates of metropolitan Atlanta receipts of state expenditures.

In the category of PK-12 education we assume that 75 percent of all benefits flow to students, while 25 percent flow to the community at large. In the original assumption all benefits flow to the direct beneficiaries of education spending: students and teachers. A potential explanation for this alternative distribution is that the public receives some direct benefits from local public schools. The public might use the school grounds for exercise or recreation, or the library facilities, and attend sporting events. The public may utilize the school auditorium for putting on plays or pageants and holding community meetings. The value of housing may be enhanced by the perceived quality of the schools and educated community. While the entire state benefits from a better educated populace that can read and write. Thus, we distribute the 25 percent of state PK-12 education expenditures using the number of households in each area.[24] When we reallocate PK-12 education expenditures along these lines, it is estimated that the Metro10 area received 38 percent and Metro28 area received 49 percent PK-12 expenditures.

In the category of postsecondary education, we make a similar assumption as PK-12 education; 75 percent of benefits flow to students, while 25 percent flow to the community. The reasoning is the same as in the PK-12 education expenditures. The result yields the Metro10 area with an estimated 39 percent of expenditures for postsecondary education and the Metro28 area with 50 percent.

In the category of health care, we assume that there could be a local public benefit to the services provided by the state. We assume that 25 percent of the total expenditure is a public benefit and that it is distributed equally across the state. The new estimation of expenditure benefits yields the Metro10 area receiving 32 percent of the state health care spending and Metro28 area receiving 36 percent.

[24] Recall, the Metro10 area is home to 43 percent of all Georgia households and the Metro28 area 53 percent.

In the prior incidence analysis we assumed that social service expenditures are distributed throughout the state based on TANF recipients. The assumption is that low-income Georgians are the primary beneficiaries of state social services. However, it is possible that the mental-health component of social services, which represents 44 percent of all social service spending, does not follow this distribution. We redistribute mental-health services by county households in Georgia, which results in the Metro10 area receiving an estimated 40 percent of state expenditures for social services and the Metro28 area receiving an estimated 48 percent.

We base our initial distribution of public safety expenditures on the percent of total state crimes committed in each area. However, it is possible that wealthier areas have less crime because they receive more police attention. To account for this, we allocate 25 percent of public safety expenditures based on property values. This alteration yields estimates of the Metro10 area receiving 47 percent of state public safety spending and the Metro28 area receiving 56 percent.

Transportation may also have a public benefit component as well as a tourism component. The public component might be that all Georgians benefit from the ability to travel throughout the state and that general transportation investment helps to distribute economic activity within the state. The tourism component captures the incremental benefit from state transportation spending to counties with high levels of tourism spending. Without good roads, tourism in these counties might suffer. To account for the general population benefit and the tourism benefit, we allocate 25 percent of state transportation expenditures based on county households and 25 percent based on county tourist spending for 2004. Based on these assumptions, we allocate 44 percent of state transportation expenditures to the Metro10 area and 53 percent to the Metro28 area.

We include the remaining categories from Table 4 and then sum the weighted expenditure amounts for the Metro10 and Metro28 areas. The Metro10 area receives a revised share of 39 percent of total state expenditures included in this analysis, an increase of two percentage points over our previous results, while the Metro28 area

receives 48 percent, an increase of two percentage points over the previous results discussed earlier.[25]

Table 5 summarizes the distributive affects on expenditures when we assume that some expenditures have a public component. The overall results do not differ significantly from the previous incidence assumptions illustrated in Table 4. As the metropolitan areas are more populous, we would expect an increase in the metropolitan share of expenditures when the benefit of the public expenditure is more public. The expenditure category with the largest increase in share of benefits is transportation, with the Metro10 area increasing its share of state expenditures by six percentage points. As noted above, most of the increases in the other categories are either one or two percentage points. The total increase is modest in both the Metro10 area and the Metro28 area. The Metro10 area receives a revised share of 39 percent of total state expenditures included in this analysis, an increase of two percentage points over our previous results, while the Metro28 area receives 48 percent, an increase of two percentage points over the previous results. Thus even with different incidence allocations and weighting, the Metro10 and Metro28 areas received a smaller share of state expenditures than the share they contributed to state revenue.

[25] Even if the largest state expenditure category, PK-12 education, is thought to have a greater public component of, for instance, 50 percent that would still only raise the Metro10 allocation to 40 percent and the Metro28 allocation to 49 percent.

IV. Conclusion

In fiscal year 2004 the metropolitan Atlanta area appears to have contributed more to state revenue than it received in state expenditures under the assumptions specified in this report. The Metro10 area of Atlanta is home to approximately 43 percent of the state's population and generated 53 percent of Georgia's total state adjusted gross income. The Metro10 area contributed an estimated 51 percent of total Georgia state revenue. However, the Metro10 area received an estimated 37 percent of state general fund expenditures. The story is similar for the Metro28 area. It comprised approximately 54 percent of the state's population and generated 64 percent of Georgia's total state adjusted gross income. The Metro28 area contributed an estimated 61 percent of total Georgia state revenue but received 46 percent of state general fund expenditures.

It is possible that due to the methods used to estimate metropolitan Atlanta contributions to state revenue and receipt of state expenditures that these figures may be inaccurate. To check the robustness of these estimates we subtracted 20 percent of estimated metropolitan Atlanta revenue for which county level data did not exist. This results in the Metro10 and Metro28 contributions to state revenue declining to 49 percent and 59 percent respectively. Due to a lack of county level data, some of the expenditure estimates may also be inaccurate. Thus, we arbitrarily allocated an additional 20 percent to all expenditures that did not have county level data to the Atlanta metropolitan area. The result of these adjustments is the Metro10 and the Metro28 areas received an estimated 41 percent and 51 percent of state general fund expenditures, respectively. Our results show that the metropolitan Atlanta area’s contributions to state revenues are less than its share of population and adjusted gross income. Metropolitan Atlanta appears to receive a smaller share of state expenditures in comparison to its population and adjusted gross income.

On the revenue side one potential source of this inconsistency between revenue generated and expenditures received is that metropolitan Atlanta has greater adjusted gross income and income tax is somewhat progressive. For instance, without the income tax the Metro10 area would have generated 47 percent of state revenue and the Metro28 area would have generated 57 percent. These figures are

closer to their share of state population of approximately 43 percent for the Metro10 area and 54 percent for the Metro28 area.

A potential explanation for the distribution of expenditures in the different regions is that the state in effect allocates expenditures in a per capita manner. This is particularly true for the PK-12 education expenditures. For instance, when QBE dollars are allocated per student for the metropolitan Atlanta and the non-Atlanta area, the per student amounts are approximately the same. This is not surprising as this is one of the stated goals of QBE. However, if one examines the amount of QBE dollars received per $1,000 of adjusted gross income, metropolitan Atlanta received approximately $30 while the non-Atlanta area received approximately $50.

Table 6 further examines revenues and expenditures per capita and per $1,000 of adjusted gross income. The figures are very similar for the Metro10 and Metro28 areas so we will only focus on the core Metro10 area. The Metro10 area generated $1,982 in state revenue per capita while receiving $1,492 in per capita state expenditures. These numbers are essentially reversed for the 149 non-Atlanta counties; they generated approximately $1,454 in revenue per capita and received approximately $1,904 per capita.

TABLE 6. REVENUES AND EXPENDITURES PER CAPITA AND PER $1,000 OF ADJUSTED GROSS INCOME

Metro10 Area	Expenditures Received	Revenue Generated
Per capita Metro10	$1,492	$1,982
Per capita nonMetro10	$1,904	$1,454
Per $1,000 of AGI Metro10	$67	$89
Per $1,000 of AGI nonMetro10	$131	$100
Metro28 Area	**Expenditures Received**	**Revenue Generated**
Per capita Metro28	$1,484	$1,906
Per capita nonMetro28	$2,012	$1,416
Per $1,000 of AGI Metro28	$70	$89
Per $1,000 of AGI nonMetro28	$146	$103

The pattern is similar for the Atlanta metropolitan area and non-Atlanta area for every $1,000 of adjusted gross income to that of the per capita values. For every

$1,000 of adjusted gross income, the Metro10 area generated $89 of revenue and received approximately $67 in expenditures. The 149 non-Atlanta counties generated approximately $100 per $1,000 of adjusted gross income while receiving $131 of expenditures per $1,000 of adjusted gross income.

In summary, the metropolitan Atlanta area seemed to contribute more to state revenues than it received in state expenditures. These results are robust to reasonable errors in estimating the incidence of metropolitan Atlanta revenue and expenditures. Preliminary analysis indicates that the reason that the Metro10 and Metro28 contribute a greater share of revenue than they receive in expenditure benefits may be due to two principal factors: 1) the state income tax, which raises greater revenue per capita from the wealthier metropolitan Atlanta area; 2) state expenditures are in affect largely allocated on a per capita basis and to a lesser extent negatively related to income per capita.

APPENDIX A. GOVERNOR'S RECOMMENDED BUDGET FY 2004

Category	Amount	Category	Amount	Category	Amount
K-12 Education		*Government Administration*		*Social Services*	
State Board of Education	$5,920,073,988	General Assembly	$35,126,970	Department of Human Resources	$1,431,479,890
Office of School Readiness	$260,749,413	Audits and Accounts,	$30,885,636	Public Safety	
Employees' Retirement System	$617,000	Judicial Branch	$141,727,805	Department of Corrections	$904,518,819
Public School Employees' Retirement	$1,420,696	Department Administrative Services	$39,164,276	Department of Defense	$7,895,875
Teachers Retirement	$2,489,000	Banking and Finance,	$10,456,726	Georgia Bureau of Investigation	$59,854,420
	$6,185,350,097	Office of Governor	$39,836,550	Department Juvenile Justice	$273,467,722
Post Secondary Education		Trade and Industry	$45,161,151	Department of Law	$14,264,933
Board of Regents,	$1,434,694,537	Office of Insurance	$16,427,511	Pardon & Paroles	$46,609,659
Regents Central Office, Unit B	$201,428,424	Department of Labor	$24,792,062	Department of Public Safety	$75,396,033
Student Finance Commission	$38,308,251	Division Rehabilitation Services	$27,675,736	Attached Units	$14,310,732
Lottery for Education Account	$441,305,643	Motor Vehicle Safety	$77,991,832		$1,396,318,193
Technical and Adult Education	$300,264,271	Public Service Commission	$8,752,157		
	$2,416,001,126	Department of Revenue	$467,089,947	Transportation	$664,624,076
Environment and Housing		Secretary of State	$31,548,012		
Department of Agriculture	$41,230,794	Real Estate Commission	$2,330,272	Veterans Services	$22,131,693
Department Community Affairs,	$93,415,991		$998,966,643	Workers' Comp.	$17,056,071
State Forestry Commission,	$33,504,861	*Health Care*			$39,187,764
Department Natural Resources,	$96,020,583	Department of Community Health	$1,837,669,004		
Soil and Water	$3,192,797	Indigent Care Trust	$90,602,023	Total Georgia Expenditures	$15,408,748,029
	$267,365,026	Peach Care for Kids	$81,184,187		
			$2,009,455,214		

Source: Office of Planning and Budget (2004).

Appendix B: Data

When possible, state budgetary sources are used for revenue and expenditure data. The sources of this data for fiscal year 2004 are generally; The Governor's Budget Report (Office of Planning and Budget 2004), Georgia Department of Revenue 2006 Statistical Report (Georgia Department of Revenue 2007), and Budget In Brief (Nickel 2007). In some cases such as income tax, property tax, and sales tax, county level data are available directly. Additional data sources are used to allocate the revenue and expenditure figures to counties. These include U.S. Census Consumer Expenditure Survey, Georgia Bureau of Investigation crime database, K-12 data from the county education web site, data on freshman from the Georgia school district Crystal reports, Georgia Lottery Corporation, Medicaid data, TANF data, daily vehicle miles traveled from the Department of Transportation, IRS zip code files, and zip code to county data. Only state tax and expenditure data amounts are allocated to households by county, however local tax collections are used to distribute these state revenues and expenditure totals in some instances.

APPENDIX C. ALLOCATION METHODS OF OTHER STATE REVENUE SOURCES

Revenue Source	Method of Allocation
Driver Services	Motor Vehicle License Tax
Natural Resources	GA Corp. Inc Tax
Secretary Of State	GA Corp. Inc Tax
Labor Department	GA Corp. Inc Tax
Human Resources	From County TANF Data
Banking and Finance	GA Corp. Inc Tax
Corrections	Corrections Public Safety
Workers Compensation	GA Corp. Inc Tax
Public Service Commission	GA Total Households
Nursing Home Provider Fees	County Age 65 +
Peace Officers	Corrections Public Safety
All Other Departments	GA Total Households
Brain & Spinal Injury Trust Fund	GA Total Households
Payments from Georgia Ports	GA Corp. Inc Tax
Job and Growth Tax Relief	GA Corp. Inc Tax
Lottery	County Lottery Sales

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