THE DISTRIBUTIONAL IMPACTS OF LOTTERY-FUNDED AID: EVIDENCE FROM GEORGIA'S HOPE SCHOLARSHIP

Christopher Cornwell
University of Georgia
cornwl@terry.uga.edu

David B. Mustard
University of Georgia
mustard@terry.uga.edu

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Abstract

This paper examines the extent to which Georgia's lottery-funded HOPE Scholarship transfers resources. Unlike most papers that analyze lotteries, we determine the distributional impacts of both the program's revenue, obtained through the lottery, and its expenditures, distributed through the scholarship. Georgia's scholarship provides a unique opportunity to examine disbursements, because it is an entirely new program and the beneficiaries of the increased spending can be clearly identified.

The lottery revenue results confirm the basic conclusions from other studies. Counties with relatively large shares of African Americans, low-income and poorly educated people spend relatively more on lottery tickets, and bear the largest share of the implicit lottery tax burden. However, our estimates of lottery sales go beyond the existing literature by including important variables like religious commitment and the amount of transfers from the government. The fraction of black Baptists significantly lowers lottery purchases and areas that receive more unemployment and income maintenance payments from the government spend significantly more on lottery tickets. The black Baptist effect is larger than any other SES variable. Because the religious commitment of African Americans dampens lottery purchases and is highly correlated with the percentage of African Americans, previous studies of lottery sales suffer omitted variable bias and underestimate the coefficient on the black variable.

The distribution of resources through the HOPE Scholarship definitely does not ameliorate the initial differences. Scholarships are more likely to be awarded to counties with higher per capita incomes, thus exacerbating the difference from the lottery sales. Counties with larger percentages of African Americans are awarded scholarships at a higher rate to private institutions, which comprise only about 5% of the total award recipients. In contrast, counties with large shares of African Americans receive significantly fewer scholarships to state institutions, which constitute about 60% of recipients. Counties with larger shares of poorly educated African Americans receive less aid to all types of institutions.

1. Introduction

To what extent do lotteries transfer resources? What types of people are made better and worse off? Complete answers to these questions require examining both government revenues collected through the lottery and the expenditures of lottery money. Although the revenue side of the problem has been thoroughly evaluated, the expenditure component has received much less attention. This paper fills this research gap by analyzing the distributional impacts of both revenues and expenditures through Georgia's lottery-funded HOPE ("Helping Outstanding Pupils Educationally") Scholarship. The answers to the transfer questions are important, because of the scale of the implicit lottery tax. By 1992, the lottery taxes paid ($7.79 billion) exceeded all state property taxes collected ($7.36 billion) in the United States.[1] In 1997, lotteries existed in 37 states and the District of Columbia, and accounted for $34 billion in sales (not counting sales of electronic gambling devices) and $11.2 billion in government revenues,[2] compared to 1992 cigarette sales of $31.3 billion.[3]

On the revenue side, the literature has demonstrated remarkable consistency in evaluating how lotteries affect three groups of people. First, lotteries are regressive–the burden of taxation falls disproportionately on lower-income people. Research using survey data showed that lotteries were regressive in Pennsylvania (Spiro 1974), Connecticut and Massachusetts (Brinner and Clotfelter 1975), California (Clotfelter and Cook 1987), Canada (Livernois 1987, Vaillancourt and Grignon 1988), Illinois (Borg and Mason 1988) and Texas (Price and Novak 2000). Studies using aggregate data also

[1] Stranahan and Borg (1998), p. 73.

[2] National Gambling Impact Study Commission (1999a), Table 3, "State Lottery Sales, Prizes, Expenses, and Government Revenue, FY 1997," (http://www.ngisc.gov/reports/lottab3.pdf).

[3] *Statistical Abstract of the United States, 1996-1997*, Table 1256, p. 764.

demonstrated regressivity in Pennsylvania (Heavey 1978), Massachusetts (Brinner and Clotfelter 1975), Maryland (Clotfelter 1979), Michigan (Brinner and Clotfelter 1975), and Colorado (Hansen 1995). The National Gambling Impact Study Commission (NGISC) (1999b), which concluded that low-income people play the lottery at disproportionately higher rates, recommended, "states with lotteries reduce their sales dependence on low-income neighborhoods."[4] Mikesell (1989), which concluded that spending on lotteries was proportional to income in Illinois, is a unique exception.

Second, the poorly educated disproportionately pay the implicit lottery tax. Clotfelter (1979) and Clotfelter and Cook (1987 and 1989) concluded that lottery expenditures are inversely related to formal education. Stranahan and Borg (1998) found that players with less than a high-school education spend more than those with at least a high-school diploma. Mikesell (1989) argued that education, which is inversely related to lottery sales, was the most influential variable in determining lottery sales. Price and Novak (2000) concluded that people with a college education play at lower rates than the rest of the population.

Third, lottery play is heaviest among African Americans (National Gambling Impact Study Commission 1999, p. 3-4). Clotfelter (1979), Clotfelter and Cook (1987), Borg and Mason (1988), Hansen (1995) and Price and Novak (2000) all argued that lottery expenditures are disproportionately higher for African Americans than for whites. Stranahan and Borg (1998) argued that although African Americans were not more likely to play than whites, conditioned on playing, they spend much more on lottery tickets than whites.

[4] National Gambling Impact Study Commission (1999b), Recommendation 3-19 (http://www.ngisc.gov/reports/ngisc-frr.pdf).

The most significant weakness of studies that examined distributional impacts of lotteries is that the disbursement of benefits is generally ignored. If the expenditures are directed to low-income, poorly educated minorities, they may offset or even overcome the regressive nature of the tax. Conversely, if the expenditures are distributed disproportionately to highly educated whites with high incomes, the regressivity would be exacerbated. Borg and Mason (1988) and Borg, Mason and Shapiro (1991) examined how lottery revenues are spent. The former study measured the benefits from lottery distributions in Illinois by determining the likelihood of a family's having a child in the public schools, and concluded that those who played the lottery received little direct benefit from the lottery-funded education. The distributions did not affect the regressivity of the lottery revenues. The latter study used two Florida surveys and maintained that lower-income groups pay a larger percentage of their income as lottery tax, and also received a smaller benefit from education as a percentage of their income.

Livernois (1987) studied the allocation of Canadian lottery revenues, which are earmarked for recreational and cultural activities. He used survey data from 1978 of families in 16 major Canadian cities, and concluded that wealthy families spent a relatively large share of their gross annual income on the selected recreational items than did poorer families.

One significant problem in evaluating how lottery funds are distributed is the frequent inability to clearly tie the distributions to specific beneficiaries. Borg and Mason (1988, p. 81) stated, "There has been no way to guarantee that the funds truly go to education since there has been no policy to prevent funds that would otherwise have gone to education from being diverted to other programs." Borg, Mason and Shapiro (1991, p.

103) argued, "states that earmarked their lottery dollars for education saw reductions in expenditures on a per student basis after the lottery and provided inferior funding for education relative to non-lottery and non-earmarked lottery states." Clotfelter and Cook (1989) and NGISC (1999a, pp. 2-3, 2-4) echoed this concern by arguing that there is no practical way to prevent a legislature from allocating general revenues away from earmarked uses. Therefore linking lottery distributions with beneficiaries is difficult. Although states bolster public support for lotteries by claiming that lottery revenues are devoted to education, lotteries typically have little or no net impact on total government spending on education, because increases in funding from the lottery are offset by decreases in funding from the states' general budgets.

In contrast, Georgia's lottery-funded[5] HOPE Scholarship provides a promising opportunity to measure the distributional effects on both the revenue and expenditure sides. First, with the HOPE Scholarship, the state developed a mechanism whereby funds were used for entirely new programs.[6] Because the state spent nothing on the scholarships prior to 1993, decreased funding from the general budget could not offset the increased funding from the lottery. Between 1993 and June 2001, over $1.2 billion was distributed to more than 525,000 students through the HOPE Scholarship.[7] Second, the recipients of

[5] The HOPE Scholarship is funded entirely by the Georgia lottery, administered by the Georgia Lottery Corporation. The Georgia Lottery Education Act requires that 35% of its net proceeds be used for educational purposes. The remaining allocations are returned to players in winnings (51%), paid to retailers (7%) and used for operating expenses (7%).

[6] Georgia Code (O.C.G.A. 50-27) specifies that lottery receipts be used for "educational purposes" only, as defined as: 1) HOPE tuition grants and scholarships, 2) pre-kindergarten for four-year-olds, 3) construction of educational facilities, and 4) technology for educational facilities. We focus on the money distributed through the HOPE Scholarship for a number of reasons. First, the last two purposes existed prior to 1993 and pose similar problems to those faced when trying to examine the expenditures in other states–specifically that after the lottery funds became available, funds that originally went towards these purposes could be used for other types of expenditures. Second, the data on distributions to pre-k programs were not kept until a few years after the program started, and the existing data are incomplete.

[7] The number and dollar value of cumulative HOPE recipients is available from http://www.gsfc.org/gsfc/html_summary_grant_all_cov_H.htm. This page lists total number of students,

the lottery-funded HOPE Scholarships are clearly defined, whereas in other states, it is often hard to determine exactly who benefited from general educational expenditures. Third, the Georgia lottery is recognized as one of the most successful in the US. It is the only lottery that increased revenue in each of its first seven years[8] and it has the second highest per capita sales of any lottery in the nation.[9]

Last, the HOPE Scholarship is one of the most innovative post-secondary educational reforms in recent decades, and exemplifies a recent trend to offer merit-based student aid to retain outstanding students (McPherson and Schapiro 1998). The number of students covered and amount of money awarded make it one of the largest educational subsidies in the US. In 1998-99, over $189 million in scholarship aid was awarded to 141,000 Georgia undergraduates, compared with only $113 million in Pell aid to 62,000 recipients.[10] By 1997, total non-need aid awarded by Georgia exceeded the combined total of non-need aid awarded by the other fourteen states in the Southern Regional Education Board.[11]

Since Georgia adopted HOPE, many states have made a much greater commitment to merit-aid, and used HOPE as a model for their student aid programs.[12] In

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but includes transfer students, who are duplicated in this count. The total of unique student qualifiers is obtained by subtracting off the number of students that appear multiple times.

[8] Georgia lottery revenue was $1.12 billion in fiscal year FY94, $1.42 billion in FY95, $1.59 billion in FY96, $1.72 billion in FY97, $1.74 billion in FY98 and $2.03 billion in FY99. Georgia's fiscal years run from July 1 of the previous year to June 30 of the fiscal year.

[9] Georgia's per capita sales for 1997 were $238 per person, trailing only those of Massachusetts. National Gambling Impact Study Commission (1999a), Table 2 "State Lottery Sales by Game and Sales per Capita, FY 1997" (http://www.ngisc.gov/reports/lottab2.pdf).

[10] The US Department of Education's Office of Postsecondary Education provides data on annual Pell Grant disbursements.

[11] The National Association of State Scholarship and Grant Aid Programs *19th Annual Survey Report, Academic Year 1987-88 and 29th Survey Report, Academic Year 1997-98.*

[12] The following merit-based scholarships are based directly on Georgia's model: Florida's Bright Futures Scholarship Program (1997), Kentucky's Educational Excellence Scholarships (1998), Louisiana's Tuition Opportunity Program for Students (1997), Maryland's Science and Technology Schorship Program (1998), Michigan's Merit Award Scholarship Act, Mississippi's Merit Scholarship Award Program,

Alabama[13] and South Carolina,[14] instituting a Georgia-style scholarship has been a hotly contested economic and political issue.[15] Another measure of the influence of Georgia's HOPE is that it is the model for President Clinton's federal HOPE tuition tax credit. Because Georgia's HOPE Scholarship is the designated model for a new wave of educational reform, has been adopted by other states, and has received such extensive national attention (Zapler 1994, Healy 1995, Appleborne 1996, Healy 1997), it provides a natural empirical setting for understanding the distributional impacts of such transfers. When a government policy affects such a large number of citizens by transferring such substantial sums of money, it is important to determine how this reallocation of money affects its citizenry. When other states use the policy as a model for their own educational reforms, as clearly is the case with Georgia's HOPE, examining the distributional impacts is even more important.

This paper examines the extent to which Georgia's lottery-funded scholarship transfers resources, paying particular attention to differences in race, income, and education. Unlike most of the papers in this literature, we separately determine the

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Missouri's Higher Education Academic Scholarship Program, and the South Carolina's Palmetto Scholarships (1996) and Legislative Incentives for Future Excellence (LIFE) Scholarships (1998). For more information on the details of each of these awards, see the Southern Regional Education Board's website http://www.sreb.org/main/Publications/MeritBased/MeritBasedScholarship.asp.

The Education Commission of the States (http://www.ecs.org/ecs/ecsweb.nsf) lists other merit-based scholarship programs that have greater limitations, like income restrictions, limitations to specific disciplines, tax credits rather than scholarships, or a shorter duration. Examples are the Illinois Merit recognition scholarship program, Minnesota academic excellence scholarship, Maryland Distinguished Scholar Program, New York Scholarships for Academic Excellence, North Dakota Student Financial Assistance and Scholars Program, Ohio Board of Regents Academic Scholarship Program, and South Carolina Superior Scholars for Today and Tomorrow (STAR) Scholarship.

[13] On 12 October 1999, Alabama defeated a proposal to establish a lottery-funded scholarship based on Georgia's HOPE.

[14] On 7 November 2000, South Carolina voters in a state referendum supported amending the state constitution to allow a lottery based on the Georgia model. South Carolina's lottery will start in the fall of 2001.

[15] This was the primary issue in the 1998 Alabama and South Carolina gubernatorial elections. In both states, Democratic challengers who supported a lottery-funded scholarship defeated Republicans who opposed the idea. These states were the only two in which Republican gubernatorial incumbents lost.

distributional impacts of both the program's revenue, obtained through the lottery, and its expenditures, distributed through the HOPE Scholarship. On the lottery revenue side, our analysis supports the standard conclusions that African Americans, low-income and poorly educated people spend relatively more on lottery tickets. By including variables that most studies omit, we show that areas that receive large transfers from the government in the form of welfare or unemployment compensation also spend relatively more on the lottery while black Baptists spend significantly less. The allocation of these resources in the form of HOPE Scholarships and Grants does not mitigate the burden of the implicit lottery tax, and exacerbates some of the differences. Larger HOPE awards are given to counties with relatively high incomes. Although counties with larger shares of African Americans receive more awards to private institutions, they receive significantly fewer awards to state system institutions, which comprise about two-thirds of all HOPE awards. Counties with large fractions of poorly educated African Americans receive significantly fewer HOPE scholarships.

The remaining paper is organized as follows. Section 2 describes the institutional characteristics of Georgia's lottery-funded scholarship before presenting some basic calculations of the distributional impacts. Section 3 outlines the empirical strategy by discussing the data and describing the empirical specification. Section 4 shows the regression results. We conclude in Section 5.

2. Georgia's Lottery-funded Scholarship

The HOPE program is comprised of two types of awards–the merit-based HOPE

Scholarship and non-merit HOPE Grant. The lesser known non-merit grants are essentially entitlements, and can be used for non-degree programs, typically at two-year or less-than-two-year institutions. The grant covers tuition and mandatory fees for a certificate or diploma. Students can receive the HOPE Grant for multiple diplomas or certificates.

To qualify for the HOPE Scholarship, which pays the tuition, fees and book expenses of Georgia citizens who attend state universities, high-school students must graduate with a "B" average.[16] Once in college, they must maintain a "B" average with a minimum number of credits to retain the award. Scholarships to private universities have both merit and grant aspects. The merit program is entirely based on grades and has no income cap.[17] Between 1993 and 1996 private-school scholarship holders essentially had grants–they maintained their aid, independent of their grades. However, since 1996, private-school recipients have had to maintain their "B" average, just like the public students. Qualified students enrolling in private colleges in Georgia receive a fixed payment comparable to the size of the benefit awarded to those attending public institutions. For the 2000-01 academic year, the value of a HOPE award was about $3,000.

Because HOPE has merit and non-merit components, one would ideally like to examine the different distributional effects of each of these categories. Unfortunately, the county-level data cannot be divided explicitly into merit and non-merit groups. Instead the number and dollar value of HOPE funds are divided into three categories: state

[16] HOPE requirements have changed for high-school classes that graduate in 2000 and later. To receive HOPE members of these classes must have a "B" average in their core college preparatory courses.

[17] When the HOPE Scholarship was implemented there was an income cap of $66,000. The cap was subsequently raised to $100,000, and later eliminated completely.

system institutions, technical institutes, and private institutions. However, these groups can still provide insight into the role of merit to distribute aid.

Table 1 shows how the scholarships and grants are allocated to these three types of institutions. Although the number of awards has been evenly split between merit-based scholarship and non-merit grants, the former accounts for 77.5% of total aid disbursed. For technical schools, 98.2% of their students and 97.8% of the aid received goes towards for non-merit grants. Therefore, the regressions for technical schools will essentially show the results for the non-merit grant. Although the number of awards has been evenly split between merit-based scholarship and non-merit grants, the former accounts for 77.5% of total aid disbursed. The last line of the table shows that only a very small number of non-merit aid goes to the state system and private institutions. Only 4.6% of the number of awards at state system and private colleges was given for non-merit grants, and just 2.0% of the total aid at state system and private colleges was for non-merit aid. Although both the state system and private schools are heavily oriented towards merit aid, there is a large difference in the magnitude of the categories. About 88% of the merit-aid winners attend state systems, only 10% attend private institutions, and students at technical schools account for the rest.

3. Empirical Strategy

3.1 Data

To examine the distributional implications of lottery revenues and expenditures

we use a panel of all 159 Georgia counties from 1993-1998.[18] The dependent variables are lottery expenditures,[19] the number of HOPE recipients, and the dollar value of HOPE disbursements.[20] Control variables include the county population, race and gender demographics,[21] measures of economic performance, transfers and welfare,[22] and measures of education, poverty and religious identification.[23] The data also include Table 2 shows the summary statistics. All dollar values are in real 1998 dollars.

Tables 3 and 4 use the 1998 data, the most recent year in our sample, to illustrate how lottery sales per capita and the number and dollar value of HOPE Scholarships per 1,000 residents are divided across racial and income quintiles, respectively. Table 3 shows that lottery sales per capita are much larger in counties with a large share of African Americans than with a small share. The bottom three quintiles spend $201, $201 and $200 per person, per year on lottery tickets, which contrasts sharply with the upper two quintiles (over 36.1% black) that spend $250 and $402 per person on lottery tickets. The quintile with the largest share of African Americans purchases lottery tickets at twice the rate of those in the lowest three quintiles.

The HOPE Scholarship receipt rates and dollar disbursements also exhibit interesting patterns. The four-year public data vary across quintiles, but the lowest receipt rates are for the counties with the highest share of African Americans. The private

[18] We limit the sample to 1998 because that is the last year data are available for all the control variables.

[19] The lottery information is from the Georgia Lottery Corporation.

[20] The Georgia Student Finance Commission provided information on both the number of HOPE recipients and the level of HOPE funding received in each county.

[21] All population data are from the U.S. Census Bureau.

[22] The Regional Economic Information System of the Bureau of Economic Analysis provided these data.

[23] The poverty, education and religious commitment variables are compiled from the US Census reports, and are therefore available only for one year. We obtained the data from Bachtel and Boatright's *The Georgia County Guide*.

institutions show that the three quintiles with the largest share of African Americans generally receive a lower number and value of scholarships than the two groups that are most heavily white. However, the results for the two-year schools, which reflect the largest share of non-merit aid, are very different–HOPE aid was awarded disproportionately in favor of counties with relatively high shares of African Americans. Also, the rate of scholarship receipts systematically increases for counties with larger shares of African Americans. The counties with the largest fraction of African Americans receive 55% more scholarships to two-year schools than counties with the smallest fraction.

The first row of Table 4 shows that income and lottery purchases are strongly negatively related. The richest counties spend about $90 less per person per year than those in the poorest counties. The third row demonstrates that the fraction of income spent on lottery tickets demonstrates even larger disparities. While residents of the highest income counties spend only 0.86% of their income on lottery tickets, residents of the poorest counties spend 1.88% of their income, 220% more than the richest cohorts.

The bottom of Table 4 shows that scholarships for state system and private institutions are highly positively correlated with income. For state and private colleges, respectively, the richest counties receive 8.43 and 2.24 scholarships per thousand people compared to 6.58 and 1.34 per thousand for the poorest counties. The dollar values show similar differences. In per capita terms, the richest counties receive 70% more aid for state institutions than the poorest counties and 77% more aid for private institutions than the poorest counties. The scholarships and aid for technical institutions is unrelated to income. The second quintile receives the largest share of dollars, followed by the fourth,

third, first and fifth.

Figures 1-4 display these results in county-level maps of Georgia. Figure 1 shows that the counties with higher populations of African Americans (shaded darkest) are generally in the southwest corner of the state and in a band across central Georgia. In contrast, Figure 2 shows that the richest counties (shaded darkest) are generally located in the northern part of the state. Figure 3 shows that lottery sales as a percent of income are highest on the borders and in the band of states across central Georgia that are disproportionately African American (Figure 1). The largest cluster of counties with low lottery sales as a percent of income is in the north, in the areas with relatively high personal income (Figure 2). The last figure, showing the value of HOPE Scholarships to state institutions per thousand residents, has the least consistent pattern. A relatively large share of HOPE funding is in the north, in areas that generally have high-income and low fractions of African Americans. However, other areas with a relatively large share of HOPE funding are scattered throughout the south and southeast.

To summarize, Tables 3 and 4 and the Figures are generally consistent with the large lottery literature that concluded that per capita lottery expenditures are higher in poor areas with a larger share of minorities. However, the Georgia data show even greater regressivity than most studies. Typically income expenditures vary little with income (lottery sales have an income elasticity of zero), consistent with the regressivity conclusion because poorer people spend a larger fraction of their income on lottery tickets.

The results from distribution of the lottery proceeds are extremely interesting. Because the state and private HOPE recipients are primarily comprised of merit-aid

scholarships, the distribution of resources based on merit appears to provide funding disproportionately to relatively wealthy counties with higher concentrations of whites, thus exacerbating the regressivity in lottery play. This result confirms the significant concern some have articulated about the extent to which the scholarship redistributes resources to relatively wealthy families, "The whole idea of the HOPE program is to make college possible for those who otherwise might not be able to afford it ... Instead, [HOPE] is a handout to upper middle-class families [who] might even express their thanks at the ballot box…."[24] One reason for the uneven distribution of lottery proceeds is that students from high-income and highly educated families have more resources to excel in high school and college. Another is that the HOPE Scholarship funds substituted dollar-for-dollar for need-based aid such as Pell Grants,[25] and therefore had very little impact on college decisions of the poorest students. Tolly Nagy, Financial Aid Director at Georgia Southern University, said, "If you're going to talk about needy people, the HOPE grant is not well designed for serving them."[26] One weakness of Tables 3 and 4 is that they present raw averages only and do not control for other differences that may affect the results.

3.2 Empirical Model

To control for other things that could affect lottery purchases and scholarship receipts, we estimate the following multivariate model

[24] *Atlanta Journal Constitution*, 2 December 1993.

[25] This is true for the entire period of the sample. However, in response to growing concerns about HOPE's lack of assistance to low-income students, the HOPE recipient rules were changed in 2000 to allow HOPE aid to supplement Pell Grants.

[26] Healy, Patrick, "HOPE Scholarships Transform the University of Georgia." *The Chronicle of Higher Education*, 7 November 1997.

$$Y_{it} = \alpha + \beta_1 I_{it} + \beta_2 F_i + \beta_3 B_i + \beta_4 P_{it} + \sum_t \beta_t T_t + \varepsilon_{it} \quad (1)$$

where Y_{it} is either lottery expenditures or scholarship disbursements in county i at time t, and I_{it} contains real per capita income variables (income, unemployment compensation, and income maintenance.[27] The education, religion and poverty variables in F_i do not change over time, because they are from the decennial census and are available for only one year.[28] These variables include the percentage of whites and African Americans that do not finish high school, the percentage of whites and African Americans that live below the poverty line, and the fractions of the population identified as black Baptist and Southern Baptist. Dummy variables in B_i indicate whether a county borders Alabama, Florida, North Carolina, South Carolina or Tennessee. The set of population variables for each county and year, P_{it}, includes the percentages of the population that are male, under 9 years old, 10-19, 20-29, 40-49, 50-64, over 65, and black, and the population density (population per square mile). The time trend, T_t, controls systematic changes in lottery purchases or HOPE receipts over time. ε_{it} is the county-specific error term.

[27] Income maintenance includes Supplemental Security Insurance, Aid to Families with Dependent children and food stamps. Unemployment benefits include state unemployment insurance compensation, Unemployment for Federal Employees, unemployment for railroad employees, and unemployment for veterans.

[28] One alternative estimation technique is to use county-level fixed effects, which would identify all the results from within county changes over time. We do not use this strategy because we have only six years of data, and consequently, there is very little variance in most of our variables of interest, like per capita income and racial composition. We also estimated Equation (1) for each year separately. All the fundamental results for race, income and education we present in Tables 5-7 are also shown in the year-by-year regressions.

4. Results

4.1 Lottery Revenues

Table 5 shows two specifications of the Equation (1) regression with real lottery sales per capita as the dependent variable. Column 1 excludes the education, poverty and religion variables (F_i), and Column 2 includes them. Although the real per capita income coefficient estimate is negative, it is not statistically different from zero. This result is more consistent with the literature, and indicates that controlling for other characteristics, lottery expenditures are relatively flat across income groups, and that lower-income people spend a larger share of their income on the lottery. The next two variables imply that higher income transfers in the form of either income maintenance or unemployment compensation increase expenditures on lottery tickets, results that are statistically significant at the .01 and .05 levels, respectively.

The results for the border counties are exactly what would be anticipated. Counties that border Alabama, South Carolina and Tennessee have lottery sales of $134, $67 and $67 more per capita than counties with no external borders. None of these states has a lottery, and all have highly populated areas that border Georgia.[29] The North Carolina coefficient estimate is slightly positive but insignificant, because although North Carolina does not have a lottery, only three relatively rural, mountain counties with small populations border Georgia.[30] Also expected is that the estimated coefficient for Florida,

[29] These results are consistent with Georgia Lottery Corporation data for June 29, 1993 to January 28, 1997 that showed the winners' states of residence for prizes over $599. 4.51% of the winners were from Alabama, 5.52% from South Carolina and 3.44% from Tennessee. The Research Department of the Georgia Lottery Corporation prepared these data for the authors.

[30] The Georgia Lottery Corporation data showed that winners from North Carolina accounted for only 0.95% of the total winners between June 29, 1993 to January 28, 1997. The results for North Carolina

the only border state with a lottery, is negative,[31] which may indicate that Georgians purchase more lottery tickets in Florida than the Floridians purchase from their northern neighbors. Also, counties with larger shares of residents who are neither white nor black and with larger fractions of population between ages 10-19,[32] have lower lottery sales. In contrast, middle-aged groups buy lottery tickets at a higher rate.

For the population variables, column 1 shows that for every 1% increase in the percentage of black residents in a county, per capita lottery sales are $2.18 higher. This result is statistically significant at the .01 level and confirms the earlier results from Table 3. There is no gender difference in lottery purchases. Counties with larger fractions of youth between the ages of 10 and 19 make significantly lower purchases, consistent with lottery sales being illegal to youth. The population density variable picks up systematic differences in net purchases across counties within Georgia. For example, if suburban consumers who commute to densely populated urban areas purchase lottery tickets near their place of employment, then the coefficient estimate of the population density variable would be positive and statistically significant. However, the coefficient estimate of population density is essentially 0, which shows that there are no differences in net purchases across counties based on population density.

Column 2 shows the results with the expanded set of poverty, education and religion variables, which although theoretically important, are typically omitted from other estimates in the literature. Because these omitted variables are likely correlated with race, education and income, estimates that omit such information may suffer from

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in column 2 are not included because of a multicollinearity problem when the extra variables are included.

[31] The Georgia Lottery Corporation data showed that winners from Florida accounted for only 0.94% of the total winners between June 29, 1993 to January 28, 1997. Winners from outside Georgia who were not in the five border states accounted for only 0.76% of the winners.

omitted variable bias. The point estimates of the fractions of whites and African Americans that do not finish high school are 1.38 and 1.26, respectively. The latter result is significant at the .10 level and the former is not quite significant at the .10 level. The interpretation is that even controlling for income, those who have lower education play the lottery more. In addition, controlling for all other variables (including income and education) whites below the poverty line play the lottery less. Furthermore, regions with larger shares of Baptists play the lottery at lower rates, consistent with Baptists encouraging their members to be good stewards of the resources God had entrusted to them and discouraging gambling. The effect is insignificant for Southern Baptists, but is extremely large for black Baptists. For a 1% increase in the percentage of black Baptists, lottery sales per capita fall by $5.13, an effect that is far larger than the effect attributed to any education, income, or poverty measure.

The other results in column 2 are qualitatively similar to those in column 1. However, when the extra variables are included in the regression, the coefficients of our primary variables of interest (race and income variables) increase in magnitude. The column 2 results imply that for every 1% increase in the percentage of African American residents in a county, lottery sales increase by $4.36, about twice as large as the previous specification. The effects of income maintenance and unemployment compensation transfers are 72.6% and 25.8% larger in the more complete specification than in column 1. The estimates of the border coefficients are similar to those in column 1.[33] Once again, the coefficient estimates of the fraction of the population that is male and the population

[32] This result is consistent with lottery sales being illegal to most of that age cohort.

[33] The NC estimate cannot be estimated in column 2, because there are only three Georgia counties border NC and the education, poverty and religion variables are not available for some of these counties.

density are not different from zero, the latter variable controlling for cross-county differences in purchases based on population density.[34]

To summarize the lottery ticket regressions, the results confirm the fundamental conclusions from the existing body of literature. African Americans and the poorly educated spend relatively more on lottery tickets. Controlling for other factors indicates that the income profile of lottery ticket purchases is flat, which is further evidence that the implicit lottery tax is regressive.

However, our estimates of lottery sales go beyond the existing literature by including important variables like religious commitment and the amount of unemployment and income maintenance transfers from the government. These variables are conspicuously absent from other studies, but have large and statistically significant effects. Counties that receive more assistance from the government have substantially higher lottery sales. Also, the fraction of black Baptists has a larger effect than any other SES variable. Because the religious commitment of African Americans mitigates lottery purchases and is highly correlated with the percentage of African Americans, previous studies of lottery sales suffer omitted variable bias and underestimate the coefficient on the black variable. When religious commitment is included in our regressions, the coefficient estimate on African Americans more than doubled.

[34] In unreported regressions we also used the number of retailers per square mile as a regressor to control for cross-county purchases of lottery tickets. Including this variable had no effect on any of the results. The coefficient estimates and levels of significance were unchanged. For example, in column 2 of Table 5 including this additional variable reduced the coefficient on the black variable from 4.36 to 4.19, left the income coefficient unchanged, slightly increased the estimate on the unemployment variable (2.18 to 2.20) and slightly decreased the income maintenance coefficient (0.16 to 0.15).

We excluded this variable from the tables for two reasons. First, the Georgia Lottery Corporation could only provide the variable as of July 2001 when we requested it, and could not provide an annual time series of retailers by county. Second, the variable could be endogenous–the number of retailers in a given

4.2 HOPE Expenditures

As discussed in the introduction, most studies that examine the distributional impacts of lotteries examine only half the problem–determining who pays the implicit lottery tax. In contrast, the second half of the issue, how the revenues are spent, has received very little attention. When lottery distributions have been studied, it has been very difficult to tie the distributions to their beneficiaries. Although lottery proceeds are earmarked for certain purposes, general allocations from other sources to the earmarked destination are typically reduced. Because Georgia's HOPE was a completely new program that allocated resources to easily identifiable recipients, we are able to identify the beneficiaries of the lottery distributions.

Table 5 showed that African Americans, the poorly educated and the poor spent a large portion of their incomes on lottery tickets relative to their counterparts, Therefore, if the HOPE program compensates for those distributional implications, the estimated coefficients on these variables must be large, positive and statistically significant. If the estimates are close to 0, then the distribution of dollars will generate no new distributional differences, but those from lottery sales will still remain. If the coefficient estimates for these variables are negative and statistically significant, the differences shown in Table 5 will be exacerbated by the allocation of HOPE awards.

Tables 6 and 7 show how the variables in Equation (1) affect the number of HOPE Scholarships won and the dollar value of those scholarships, respectively.[35] The first three columns in each table present the base specification for state system, technical and private institutions. The last three columns show the results for the specification that

area is a function of the number of sales.

[35] Although all the control variables used in Table 5 are also included in Tables 6 and 7, we do not

includes all of the control variables.

Table 6 shows that counties with higher per capita incomes receive more HOPE Scholarships to state system institutions, where merit is very important. These results are statistically significant in both state system specifications. There is no statistically significant effect of income for the technical or private schools. All the results for unemployment transfers are significant. Counties with more unemployment compensation receive fewer scholarships to state institutions and more to technical and private institutions. Counties that receive more income maintenance also receive more scholarships to technical schools. These results are consistent with people who receive unemployment and income transfers being generally less skilled, and more likely to attend technical institutions.

Interestingly, the effects of the time invariant variables all differ substantially by race. Counties with larger shares of poorly educated African Americans receive fewer HOPE awards to all three types of institutions, results that are statistically significant for technical and private institutions and insignificant at state system schools. Poorly educated whites receive statistically significantly fewer awards to state system schools and significantly more awards to private institutions.

A large concentration of African Americans below the poverty line is related to fewer state system scholarships, a statistically significant result that is the exact opposite of the having a greater concentration of whites below the poverty line. All six religion variables are statistically significant, and are of opposite signs for blacks and whites. Southern Baptists receive relatively more scholarships to all three types of institutions, whereas counties with larger shares of black Baptists receive fewer HOPE awards of all

show the results for all the variables, and concentrate on the ones of primary interest.

types.

The population variables show that HOPE awards to state system and technical institutions are awarded at a lower rate in counties with larger shares of African Americans. These results are statistically significant at the .05 level in both state system cases, and significant at the .01 level in the first specification for the technical schools. The effect of race for private institutions is 0 in the first specification, positive and statistically significant in the second specification, consistent with Cornwell, Mustard and Sridhar (2001), which argued that HOPE increased enrollments most for African Americans who were drawn by Georgia's many private historically black colleges and universities. Those who are neither white nor black receive more scholarships to state system institutions. Also, the estimated coefficient for males is negative for all specifications and statistically significant for both state system regressions, supporting the assertion of McPherson and Schapiro (1998) who showed that a larger fraction of women than men receive merit-aid awards, and that female recipients of awards receive larger awards than male recipients.

Table 7 provides the same specifications as Table 6 except that the real dollar value of scholarships per thousand residents is used as the dependent variable instead of the number of scholarships per capita. Because the dollar values of the scholarships are functions of the numbers of people who receive scholarships, the qualitative results for Table 7 are very similar to those in Table 6. The coefficient estimates on income are always positive, and are statistically significant for both regressions of the state system, which comprises the largest number and value of awards. As before, unemployment and income transfers are both positive and significant at technical institutions. The results for

the education, poverty and religion variables exhibit the same exact combination of qualitative and statistically significant patterns. The coefficient estimates of the percentage black variable are negative for the state system and technical school category, and positive and significant only for one specification of the private schools. Counties with large fractions of males consistently receive fewer scholarships and dollars of awards.

To summarize, the findings on the disbursement of lottery funds offer very little evidence that the disbursement of funds offsets the distributional implications of the implicit lottery tax. HOPE awards are disproportionately given to counties with relatively high incomes, consistent with the literature that has consistently correlated income with academic success (McPherson and Schapiro 1998). The black variable is positive and significant for only one specification of the private school regressions, a category that accounts for only 10% of the merit-aid recipients and slightly more than 5% of the number of total aid recipients. The race results for the remaining categories show either that counties with larger fractions of African Americans either receive no or significantly fewer scholarships. The results for education are less clear, and differ substantially by race. Counties with large fractions of poorly educated African Americans play the lottery at very high rates and receive significantly fewer HOPE scholarships. In contrast, counties with poorly educated whites receive fewer awards to state system institutions but more to private institutions.

5. Conclusion

This paper is one of the first to explicitly tie disbursements from the lottery to specific recipients, and thereby examine both the distributional impacts of the implicit lottery tax and lottery distributions. Our conclusions about the implicit lottery tax confirm the central findings in the literature–lottery expenditures are disproportionately higher for African American, low-income and poorly educated people. Furthermore, we shed new light on understanding lottery sales by controlling for variables that other studies exclude. Lottery expenditures are relatively high when people receive larger income transfers from the government in the form of unemployment and income maintenance. In contrast, after controlling for many characteristics, it was found that citizens below the poverty line and black Baptists are less likely to play the lottery. The impact of religious conviction of African Americans has the largest impact of any SES variable. More important, the previous studies that exclude these variables suffer omitted variable bias that underestimates the true coefficient of the African American variable.

Analyzing the distribution of lottery funds shows that the allocation of HOPE awards definitely does not mitigate the major distributional differences generated in lottery purchases, and more likely slightly exacerbates those differences. The results for income are clear–scholarships are more likely to be awarded to counties with larger per capita incomes, confirming the empirical studies that have linked student performance with family income. Concerning race, blacks are awarded scholarships at a higher rate only for one category–private institutions, which comprise only slightly more than 5% of total award recipients. In contrast, counties with large shares of African Americans receive relatively fewer scholarships to state institutions, which by far is the largest category of HOPE recipients. The education results for whites are mixed–counties with

larger shares of poorly educated whites receive fewer state-system, but more private scholarships. In contrast, counties with poorly educated African Americans receive less aid to all types of institutions.

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Table 1
The HOPE Scholarship and the HOPE Grant
Students Served and Amounts Spent by Institution Type, 1993-1999

HOPE Component by Institution	Number of Students (% of total)	Aid Amount in millions of $ (% of total)
HOPE Program Total	721,246	844.25
HOPE Scholarship Total	356,454	654.13
	(49.4)	(77.5)
State System, 4-year	257,211	503.71
	(72.1)	(77.0)
State System, 2-year	56,829	50.83
	(15.9)	(7.8)
Technical Schools[b]	6,459	4.02
	(1.8)	(2.1)
Private, 4-year[a]	30,098	81.67
	(8.4)	(12.5)
Private, 2-year[a]	5,857	13.90
	(1.6)	(2.1)
HOPE Grant Total	364,792	190.12
	(50.6)	(22.5)
Technical Schools	348,104	176.67
	(95.4)	(93.0)
All Others[c]	16,688	13.45
	(4.6)	(7.0)

Notes: [a] Private two-year and four-year schools were eligible to participate only from 1996.
[b] Of the 34 HOPE-eligible technical schools, 13 offer Associate's Degrees, and therefore can award both the Scholarship and Grant.
[c] A few public, 4-year and 2-year institutions also offer technical certificates and diplomas.
Source: Georgia Student Finance Commission, www.gsfc.org

Table 2
Summary Statistics

Variable	Number	Mean	Std. Dev.	Minimum	Maximum
Real Lottery Sales Per Capita	954	171.98	147.70	7.47	2131.00
HOPE per Thousand					
Number of University	954	5.47	3.20	0.29	19.66
Number of Private	954	2.79	2.66	0.00	20.96
Number of Technical	954	9.19	6.40	0.00	32.78
Real Dollars of University	954	8598.42	5820.85	231.71	39649.49
Real Dollars of Private	954	4938.43	3618.44	0.00	17606.52
Real Dollars of Technical	954	3614.66	3234.01	0.00	23598.82
Real Per Capita Variables					
Personal Income	954	11832.76	3395.76	11651.20	41325.00
Unemployment Transfers	954	55.26	27.26	13.00	300.05
Income Maintenance	954	474.05	206.38	62.70	1026.16
Population Variables					
County Population	954	44860.52	92319.24	1789.00	718336.00
% <9	954	15.03	1.55	8.81	21.39
% between 10-19	954	15.37	1.33	11.60	19.43
% between 20-29	954	13.49	3.03	8.85	36.58
% between 30-39	954	15.75	1.75	11.20	22.64
% between 40-49	954	13.91	1.52	5.83	21.17
% between 50-64	954	13.03	2.03	2.27	20.62
% between >64	954	12.42	3.30	1.29	27.81
% Male	954	48.47	2.03	45.08	65.95
% Black	954	29.80	18.21	0.00	81.81
% White	954	68.02	17.91	17.62	99.35
% Neither white nor black	954	2.17	2.22	0.13	20.70
Pop per square mile	954	144.68	288.87	5.40	2213.45
Education, Religion and Poverty					
% Whites not completing HS	954	33.74	8.68	8.81	51.32
% Blacks not completing HS	936	54.14	13.76	0	100.00
% Whites below poverty line	954	12.14	4.08	2.29	23.80
% Blacks below poverty line	930	34.87	12.39	0	85.07
% Southern Baptist	954	30.41	11.74	2.93	66.22
% Black Baptist	858	15.58	11.70	0.80	61.66
Border Variables					
Border TN	954	0.04	0.19	0.00	1.00
Border SC	954	0.08	0.27	0.00	1.00
Border FL	954	0.07	0.25	0.00	1.00
Border NC	954	0.03	0.16	0.00	1.00
Border AL	954	0.11	0.31	0.00	1.00

Note: Real dollar values are denominated in 1998 dollars.

Table 3
Means by % Black Quintile–1998 data

Variable	Quintile 1 < 11.50%	Quintile 2 11.50-28.00%	Quintile 3 28.01-36.10%	Quintile 4 36.11-46.60%	Quintile 5 >46.60%
Lottery Sales Per Capita	200.74	201.24	200.10	250.12	402.37
Hope per Thousand					
Number of State System	7.27	7.18	7.60	8.27	7.01
Dollars of State System	12,950.00	12,150.24	12,069.16	12,749.06	11,023.57
Number of Private	2.20	1.84	1.47	1.55	1.48
Dollars of Private	5,378.37	4,158.50	3,160.06	3,331.03	3,471.33
Number of Technical	8.80	10.96	13.12	13.10	13.59
Dollars of Technical	5,278.36	6,575.00	6,971.19	7,038.72	7,328.63
Number of Counties	32	32	31	32	32

Table 4
Means by Income Quintile–1998 data

Variable	Quintile 1 <17,445	Quintile 2 $17,445-18,745	Quintile 3 $18,746-19,953	Quintile 4 $19,954-21,900	Quintile 5 >$21,900
Lottery Sales Per Capita	308.41	273.91	220.03	233.91	218.93
Ave. Per Capita Income	16,369.41	18,087.50	19,212.48	20,928.72	25,399.19
Ave. Sales as % of Ave. PCI	1.88	1.51	1.15	1.12	0.86
HOPE per Thousand					
Number of State System	6.58	7.13	7.75	7.44	8.43
Dollars of State System	9,532.30	11,018.30	11,037.05	13,112.32	16,209.81
Number of Private	1.34	1.48	1.34	2.13	2.24
Dollars of Private	2,937.96	3,320.22	3,233.80	4801.74	5,207.88
Number of Technical	11.19	15.66	12.37	12.30	8.03
Dollars of Technical	6,160.56	8,449.95	6,946.25	7008.50	4,625.86
Number of Counties	32	32	31	32	32

Note: All income variables are in real dollars calculated using the Consumer Price Index with 1998 as the base year.

Table 5
Real Lottery Sales per Capita
Ordinary Least Squares Regressions

Variable	(1)	(2)
Income Variables (I)		
Real Per Capita Income	-0.0009	-0.002
	(0.0019)	(0.002)
Real Per Capita Income Maintenance	0.095**	0.164***
	(0.048)	(0.059)
Real Per Capita Unemployment	1.735***	2.182***
Transfers	(0.200)	(0.207)
Fixed Variables (F)		
% Black Not Finishing HS		1.263*
		(0.717)
% White Not Finishing HS		1.382
		(0.911)
% Black Below Poverty Line		-0.606
		(0.715)
% White Below Poverty Line		-4.995***
		(1.670)
% Black Baptist		-5.129***
		(0.685)
% Southern Baptist		-0.530
		(0.475)
Border Variables (B)		
AL Border	134.492***	100.483***
	(12.680)	(13.447)
FL Border	-19.788	-32.395**
	(14.875)	(15.252)
NC Border	21.250	
	(30.696)	
SC Border	66.724***	56.247***
	(13.677)	(14.555)
TN Border	67.454***	26.703***
	(21.289)	(33.798)
Population Variables (P)		
% Black	2.179***	4.358***
	(0.398)	(0.677)
% Neither W nor B	-11.000***	-6.521*
	(3.512)	(3.698)
% Male	-1.874	-5.058
	(4.222)	(4.360)
% Under 9	7.674	12.411
	(7.379)	(7.623)
% 10-19	-33.210***	-20.809***
	(7.567)	(6.669)
% 20-29	26.055***	28.145***
	(6.764)	(5.849)
% 40-49	32.858***	41.802***
	(10.040)	(8.516)
% 50-64	23.992**	13.320**
	(7.697)	(6.598)
% >64	-2.156	5.061
	(6.725)	(5.918)

Variable	(1)	(2)
Density (People per Square Mile)	-0.016	-0.043
	(0.026)	(0.028)
Intercept	-705.548	-1008.759
	(581.273)	(590.013)
Time Fixed Effects	Yes	Yes
R^2	0.4356	0.4818
Sample Size	954	858

*** designates significant at 0.01

** designates significant at 0.05

* designates significant at 0.10

Table 6
Number of Hope Scholarships Per Capita
By Type of Institution
Ordinary Least Squares Regressions

Variable	(1) State System	(2) Technical	(3) Private	(4) State System	(5) Technical	(6) Private
Income Variables (I)						
Real Per Capita	1.1 e-4***	1.1 e-6	-1.0 e-5	7.3 e-5*	-1.7 e-5	4.1 e-5
Income	(0.381e-4)	(8.1 e-5)	(4.0 e-5)	(4.1 e-5)	(9.2 e-5)	(4.7 e-5)
Real Per Capita	0.001	0.008***	-0.002**	0.003**	0.006**	-0.002*
Income	(0.001)	(0.002)	(0.001)	(0.001)	(0.003)	(0.001)
Maintenance						
Real Per Capita	-0.017***	0.026***	0.011***	-0.014***	0.023**	0.012**
Unemployment	(0.004)	(0.009)	(0.004)	(0.004)	(0.009)	(0.005)
Transfers						
Fixed Variables (F)						
% Black Not				-0.018	-0.127***	-0.071***
Finishing HS				(0.014)	(0.031)	(0.016)
% White Not				-0.146***	0.049	0.056***
Finishing HS				(0.018)	(0.040)	(0.020)
% Black Below				-0.037***	0.093***	0.011
Poverty Line				(0.014)	(0.031)	(0.016)
% White Below				0.211***	-0.016	0.005
Poverty Line				(0.033)	(0.073)	(0.037)
% Black Baptist				-0.023*	-0.111***	-0.047***
				(0.013)	(0.030)	(0.015)
% Southern Baptist				0.017*	0.108***	0.031***
				(0.009)	(0.021)	(0.011)
Population Variables (P)						
% Black	-0.019**	-0.128***	0.003	-0.034***	-0.027	0.043***
	(0.008)	(0.017)	(0.008)	(0.013)	(0.029)	(0.015)
% Neither W nor B	0.239***	-0.074	0.050	0.139*	-0.209	0.026
	(0.072)	(0.153)	(0.075)	(0.072)	(0.161)	(0.082)
% Male	-0.452***	-0.245	-0.062	-0.312***	-0.297	-0.150
	(0.086)	(0.184)	(0.090)	(0.085)	(0.190)	(0.097)
Intercept	35.275***	15.806	20.863*	43.900***	45.013*	36.400***
	(11.832)	(25.257)	(12.403)	(11.556)	(25.666)	(13.061)
Border Variables	Yes	Yes	Yes	Yes	Yes	Yes
Age Variables	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.5004	0.4321	0.2057	0.5797	0.4820	0.2282
Sample Size	954	954	954	858	858	858

*** designates significant at 0.01
** designates significant at 0.05
* designates significant at 0.10

Table 7
Real Dollar Value of Hope Scholarships Per Capita
By Type of Institution
Ordinary Least Squares Regressions

Variable	(1) State System	(2) Technical	(3) Private	(4) State System	(5) Technical	(6) Private
Income Variables (I)						
Real Per Capita	0.199***	0.002	0.018	0.139*	0.002	0.052
Income	(0.066)	(0.045)	(0.046)	(0.72)	(0.050)	(0.053)
Real Per Capita	-1.084	4.587***	-3.633***	-0.399	4.020***	-2.580*
Income	(1.690)	(1.148)	(1.176)	(2.024)	(1.405)	(1.484)
Maintenance						
Real Per Capita	-23.490***	12.278**	12.956***	-17.053**	9.433*	13.514**
Unemployment	(7.051)	(4.791)	(4.906)	(7.139)	(4.955)	(5.236)
Transfers						
Fixed Variables (F)						
% Black Not				-16.191	-74.924**	-70.431***
Finishing HS				(24.696)	(17.142)	(18.113)
% White Not				-261.388***	21.608	69.926***
Finishing HS				(31.370)	(21.774)	(23.008)
% Black Below				-47.958*	43.508**	-7.781
Poverty Line				(24.623)	(17.091)	(18.059)
% White Below				403.379***	3.584	-22.726
Poverty Line				(57.498)	(39.910)	(42.171)
% Black Baptist				-77.373***	-61.669***	-65.090***
				(22.583)	(16.369)	(17.296)
% Southern Baptist				47.064***	61.654***	39.161***
				(16.360)	(11.356)	(11.999)
Population Variables (P)						
% Black	413.697***	-87.538	81.536	240.226*	-189.810**	85.211
	(123.639)	(84.009)	(86.026)	(127.281)	(88.347)	(93.352)
% Neither W nor B	-20.936	-74.500***	0.510	-6.635	-18.304	48.633***
	(14.002)	(9.514)	(9.743)	(23.309)	(16.179)	(17.095)
% Male	-1075.760***	-107.130	-60.273	-873.290***	-115.110	-202.621*
	(148.631)	(100.990)	(103.414)	(150.063)	(104.160)	(110.061)
Intercept	68978***	7345.592	12948	80368***	19264	30194**
	(20448.53)	(13894.10)	(14227.71)	(20309.37)	(14097.01)	(14895.58)
Border Variables	Yes	Yes	Yes	Yes	Yes	Yes
Age Variables	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.5497	0.4620	0.2938	0.6154	0.5090	0.3011
Sample Size	954	954	954	858	858	858

*** designates significant at 0.01
** designates significant at 0.05
* designates significant at 0.10

Figure 1: Percent African American by County

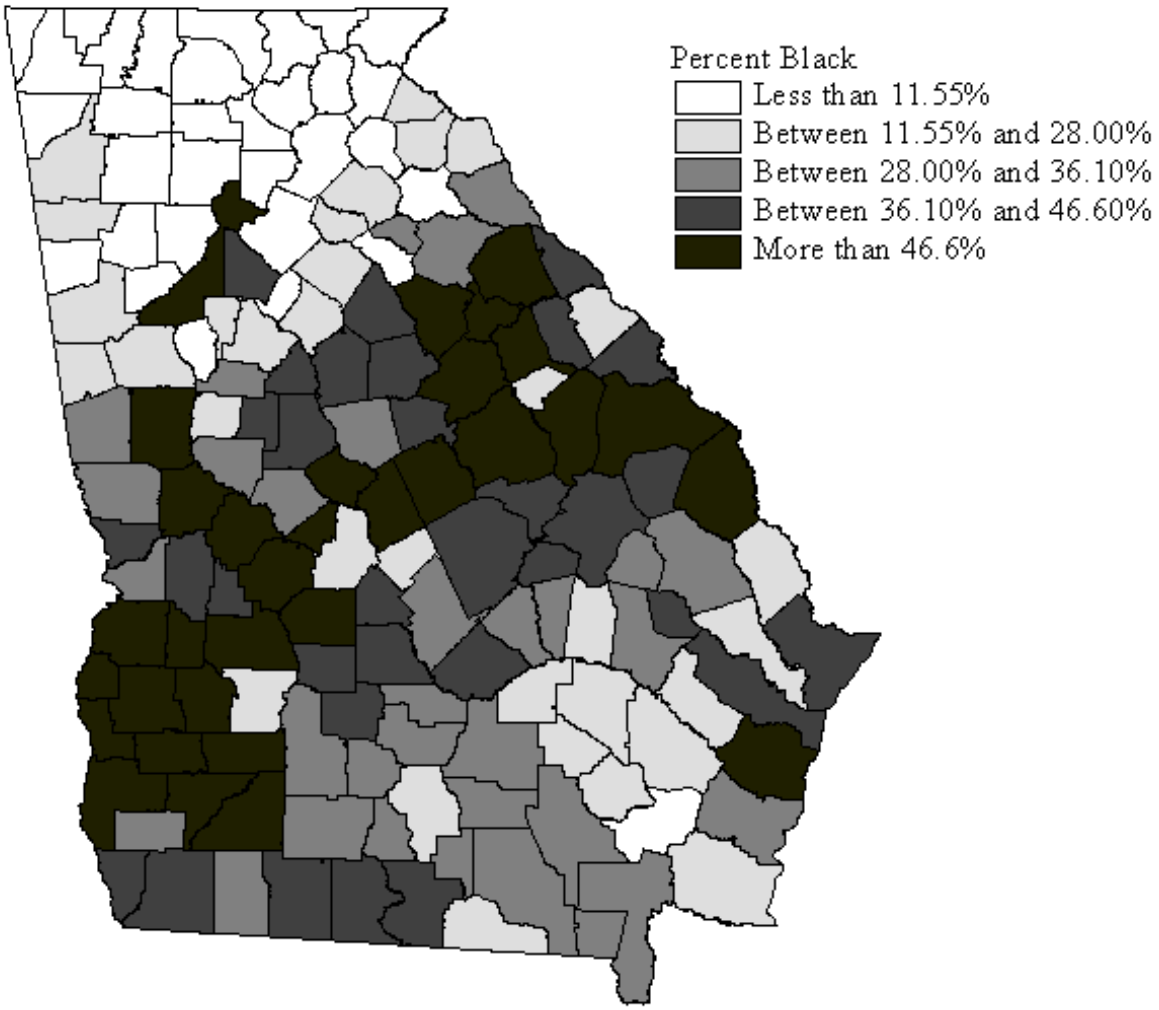

Figure 2: Per Capita Personal Income by County

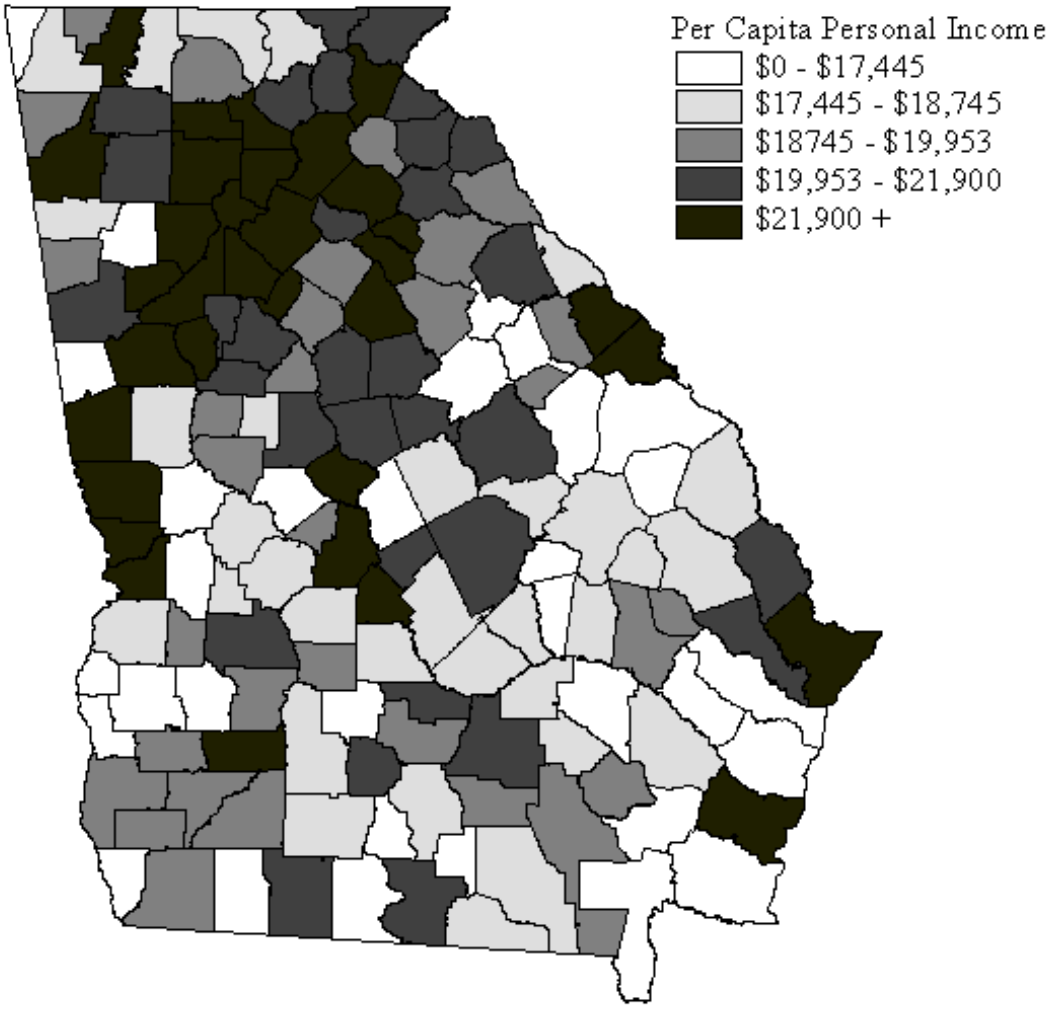

Figure 3: Lottery Sales as a Percentage of Income by County

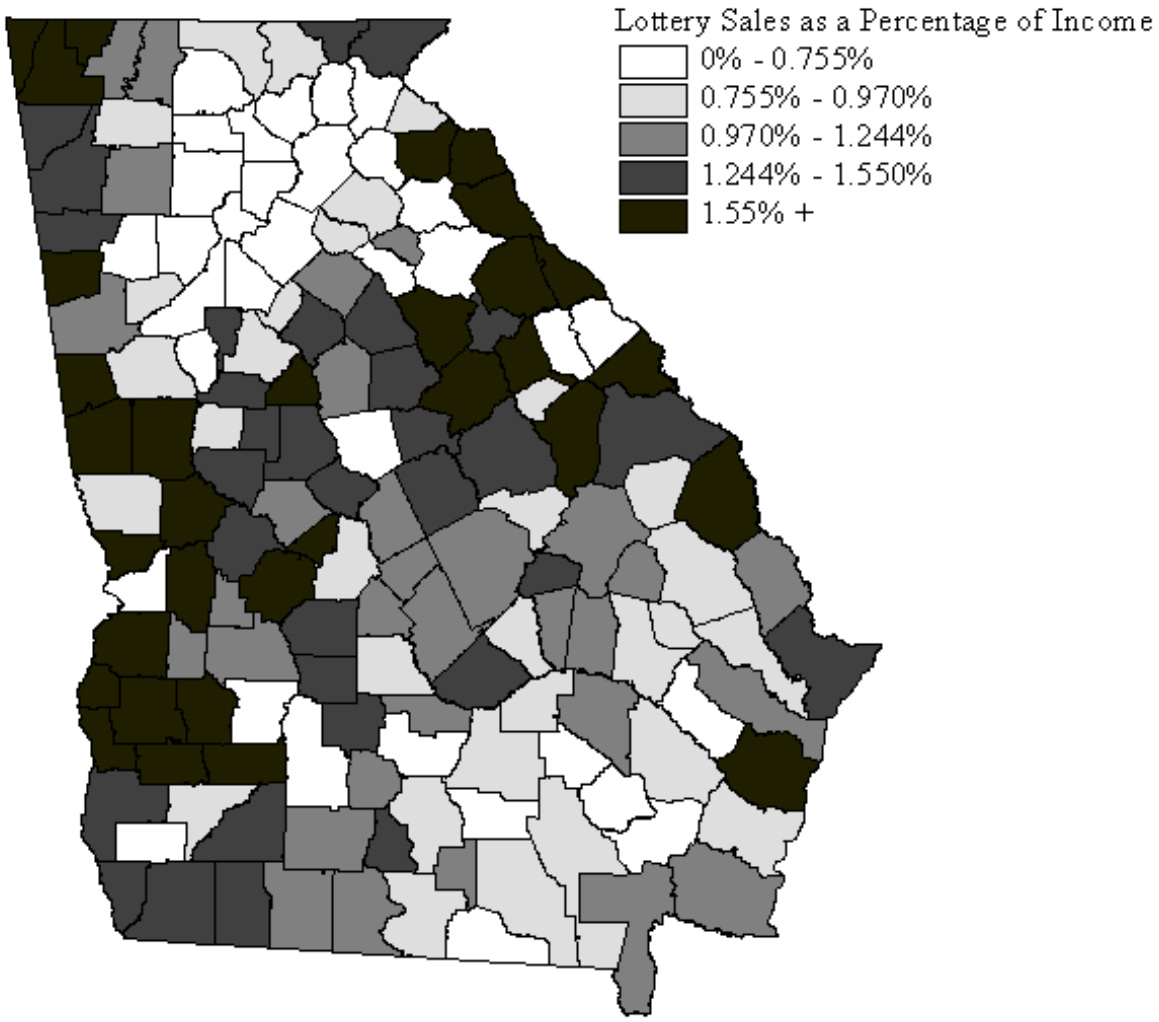

Figure 4: Real Dollars of HOPE Scholarships to Four-Year Public Institutions
per Thousand Residents by County