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An Analysis of a Need- Based Student Aid Program for Georgia

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Executive Summary

There is a large gap in college enrollment by family income, and there is evidence that this gap is growing. Yet the benefits of a college education, both for the individual and society, are significant. Encouraging college education in general and closing that income gap in enrollment is a long standing policy objective for the United States and Georgia. One policy aimed at closing the income gap in college enrollment is to target student aid to students with less financial ability to attend college. While Georgia has the HOPE Scholarship, which is a merit-based student aid program, Georgia does not have a need-based student aid program for state residents attending state colleges and universities. This report explores issues associated with establishing a need-based student aid program in Georgia.

Social Benefits of College Education

The private benefits of a college education are well known. According to the Bureau of the Census, in 2006, the average full-time year-round worker in the United States with a four-year college degree earned \$67,910 compared to \$38,926 for someone with just a high school degree, or 74.5 percent more.

However, there are also benefits to society. College-educated citizens are more likely to vote, healthier, less likely to be arrested for a crime, less likely to be on welfare, and more productive. Furthermore, a college educated workforce is important for economic development. The College Board (2007) reports that a more educated workforce would lead to higher wages for all workers. Glaeser and Saiz (2003) found that a one percentage point increase in the share of the adult population that is college educated increases local metro growth over a 10-year period by one-half percentage point.

According to the National Association for College Admission Counseling (NACAC, 2008), if the United States is to remain competitive in the global economy, it will have to maintain a highly educated workforce. Currently, the country is experiencing a rapidly growing population of minority, low-income, and first-generation college-qualified high school graduates whose ultimate economic and social success will play an increasingly significant role in boosting the economic

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growth of the country as a whole (Institute for Higher Education Policy, 2004). Therefore, it appears imperative to invest in their education to reap the benefits they would provide to society as part of a highly educated workforce.

Family Income and College Enrollment

While there are many factors that are likely to affect the decision to enroll in college, the ability to finance a college education is a likely determinant of whether to enroll in college. Many authors have pointed out that there is an inverse relationship between college enrollment and family income. For example, the College Board (2005) reports that in 2003, 80 percent of students from families with incomes in the upper quintile enrolled in college immediately after high school, compared to 61 percent for the lowest two quintiles.

A similar pattern is reported by Kane (2004), who finds that within 20 months after high school graduation, 66 percent of students in the highest parental income quartile were enrolled in a 4-year college, while only 28 percent of those in the lowest quartile were enrolled, a difference of 38 percentage points. While other factors are at play, for example, student ability and parent's education, even after controlling for these factors family income is found to play a significant role in determining college enrollment.

The Effect of Aid on College Enrollment

There have been many studies of the effect of student aid and college cost on enrollment and these studies consistently find that the availability of student aid increases enrollment and that increases in the cost of attending college reduces enrollment. For example, St. John et al. (2004) find that enrollment increases by 11.5 percentage points for a \$1,000 increase in need-based aid. Heller (1999) finds that a \$1,000 increase in aid increases enrollment in four-year schools by 5.7 percentage points for whites and by 9.4 percentage points for all races.

The effect of college cost on attendance is obviously related to effect of student aid on college enrollment and college completion since a \$1,000 increase in

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aid is the same as a \$1,000 reduction in the cost of college to the student. Recent studies by Cameron and Heckman (1999), Ellwood and Kane (2000), and Kane (1994) find that a \$1,000 reduction in tuition increases college attendance by 4 to 6 percentage points. These estimates are somewhat lower than those found for need-based aid, as reported above, but are consistent with the findings of Dynarski (2001, 2002). There is some evidence that students from low-income families are much more responsive to changes in tuition than students from high-income families.

Need-Based Aid Programs in Other States

We surveyed nine states that have a significant need-based aid program. All states begin with the family's (parents) adjusted growth income as a basis for the financial aid formula. Most states either use the federal calculation formula for Expected Family Contribution (EFC) or base their own formulas on that formula with minor adjustments – such as tax credits or family demographic information. All states take into consideration if a student is financially independent from their families. Of the states overviewed, almost all take into account whether the family has another child in college and any other type of aid the student receives. States vary the amount of aid by the type of institution the student attends.

When directly comparing the individual state's total need-based allotment, some variation across states becomes evident. The average need-based award across states and institution types is approximately \$1,800. On average, these states serve approximately 24 percent of their population, ranging from 13 percent in Tennessee to 31 percent in Florida. The following table summarizes the programs (New Jersey is not included as public information about enrollments were not available in a comparable format).

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CROSS STATE COMPARISONS

State	Undergraduate Enrollment	# of State Grant Awards	% Receiving Award	Total Amount	Average Award
North Carolina (2005-2006)	287,452	93,035	32%	\$151,531,497	\$1,612
Tennessee (2001-2002)	244,191	29,465	13%	\$42,559,494	\$1,444
Florida (2004-2005)	291,375	90,211	31%	\$92,735,006	\$1,040
Illinois (2005-2006)	805,674	148,651	18%	\$345,797,600	\$2,326
Minnesota (2005-2006)	286,731	60,626	21%	\$124,436,000	\$2,052
Pennsylvania (2005-2006)	434,149	127,644	29%	\$307,012,352	\$2,478
Ohio (2004-2005)	346,445	86,883	25%	\$159,000,000	\$1,279
New York (2001-2002)	1,070,206	305,374	29%	\$619,671,578	\$2,034

Simulations of Alternative Student Aid Programs

We developed estimates of the cost and distribution of various need-based student aid programs by simulating 25 alternative need-based aid programs. Eligibility for the aid programs was restricted to full time undergraduate students who are Georgia residents attending one of the state's public 2-year or 4-year colleges or universities. In the simulations, the level of aid provided to a student depends on the income of the student's family.

There are three basic parameters that define these alternatives:

- the maximum aid;
- the phase-out income, which is the income level at which aid begins to be phased out;
- the maximum income, which is the income level at which no aid is provided.

A fourth factor is the rate at which aid is phased out. For the simulations, the aid programs were all designed so that aid phased out at a constant dollar rate for each dollar increase in income.

The following table presents the parameters, the estimated cost, the estimated number of students who would receive aid, and the aid per student for students receiving aid for each of the 25 alternative program designs.

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ALTERNATIVE NEED-BASED AID PROGRAMS SIMULATION RESULTS

Simulation	Maximum Aid	Phase-out Income	Maximum Income	Total Cost (in millions)	Number Receiving Aid	Aid per Student
1	\$2,500	\$15,000	\$25,000	\$24.4	16,223	\$1,505
2	\$2,500	\$15,000	\$30,000	\$33.6	25,878	\$1,299
3	\$2,500	\$15,000	\$40,000	\$59.4	54,579	\$1,087
4	\$2,500	\$20,000	\$25,000	\$31.5	16,223	\$1,941
5	\$2,500	\$20,000	\$30,000	\$41.7	25,878	\$1,613
6	\$2,500	\$20,000	\$40,000	\$69.9	54,579	\$1,280
7	\$3,000	\$15,000	\$25,000	\$29.3	16,223	\$1,807
8	\$3,000	\$15,000	\$30,000	\$40.3	25,878	\$1,559
9	\$3,000	\$15,000	\$40,000	\$71.3	54,579	\$1,305
10	\$3,000	\$20,000	\$25,000	\$37.8	16,223	\$2,329
11	\$3,000	\$20,000	\$30,000	\$50.1	25,878	\$1,935
12	\$3,000	\$20,000	\$40,000	\$83.9	54,579	\$1,536
13	\$3,500	\$15,000	\$25,000	\$34.2	16,223	\$2,108
14	\$3,500	\$15,000	\$30,000	\$47.1	25,878	\$1,818
15	\$3,500	\$15,000	\$40,000	\$83.1	54,579	\$1,523
16	\$3,500	\$20,000	\$25,000	\$44.1	16,223	\$2,717
17	\$3,500	\$20,000	\$30,000	\$58.4	25,878	\$2,258
18	\$3,500	\$20,000	\$40,000	\$97.8	54,579	\$1,792
19	\$4,000	\$15,000	\$25,000	\$39.1	16,223	\$2,409
20	\$4,000	\$15,000	\$30,000	\$53.8	25,878	\$2,078
21	\$4,000	\$15,000	\$40,000	\$95.0	54,579	\$1,740
22	\$4,000	\$20,000	\$25,000	\$50.4	16,223	\$3,105
23	\$4,000	\$20,000	\$30,000	\$66.8	25,878	\$2,581
24	\$4,000	\$20,000	\$40,000	\$111.8	54,579	\$2,048
25	\$3,000	\$25,000	\$50,000	\$145.7	88,308	\$1,649

Some general observations can be made:

- The number of students who receive aid depends entirely on the maximum income.
- For any given set of phase-out and maximum income, the cost of the program increases by the same percentage as the increase in maximum aid.
- Increasing the maximum income increases the cost significantly.
- Given maximum aid and maximum incomes, increasing phase-out income increases the estimated cost.

These estimates of program cost assume no change in either the number of students who attend college or in the student retention rate. The data that we have do

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not permit us to estimate the magnitude of the effects on enrollment. However, existing studies provide an estimate of the likely magnitude of the effect on enrollment from the aid program. Based on the existing research, we believe that a reasonable estimate of the increase in the enrollment rate for an aid program that provides an average aid of \$1,000 is between 6 and 12 percentage points. We also do not know the enrollment rate for those students who would be eligible for the aid program. Based on Kane (2004), we assume an enrollment rate of 40 percent. The per-recipient aid for most of the alternative programs that we simulated was between \$1,000 and \$2,000.

If the increase in enrollment is 6 percentage points and the enrollment rate is 40 percent, then an increase in aid of \$1,000 will increase the enrollment of students eligible for aid and the program cost by 15 percent. If the increase in enrollment is 12 percentage points and the enrollment rate is 40 percent, then an increase in aid of \$1,000 will increase the enrollment of students eligible for aid and the program cost by 30 percent. An increase in average aid of \$2,000 would, of course, double the percentage increase in enrollment and cost. These calculations should be considered the very rough approximations of what might actually result from an aid program.

Summary and Conclusions

There is a large gap in college enrollment by family income, and this gap appears to be growing. One way to address this income gap in college enrollment is to reduce the cost of college, and the most cost-effective way of doing that is through a need-based student aid program. Existing evidence suggests that \$1,000 in student aid is associated with a 6 to 12 percentage point increase in enrollment, and that this effect is higher for students from lower income families.

We simulated 25 possible aid programs for Georgia in order to determine the cost of alternative aid programs. The cost of the 25 programs we simulated ranged from \$24 million to \$145 million. However, it would seem feasible to provide a significant need-based aid program that would address the needs of students from relatively low-income households for \$30 to \$40 million. Such a program would

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assist about 16 to 26 thousand students and provide average aid of \$1,600 to \$1,800, with a maximum aid of \$3,000. Such a program would be consistent with aid programs in some of the states we surveyed, but would be at the lower end of all of the programs we surveyed.

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I. Introduction

There is a large gap in college enrollment by family income, and there is evidence that this gap is growing. Yet the benefits of a college education, both for the individual and society, are significant. Encouraging college education in general and closing that gap is a long standing policy objective for the United States and Georgia. One policy aimed at closing the income gap in college enrollment is to target student aid to students with less financial ability to attend college. While Georgia has the HOPE Scholarship, which is a merit-based student aid program, Georgia does not have a need-based student aid program for state residents attending state colleges and universities. This report explores issues associated with establishing a need-based student aid program in Georgia.

The report begins in the next section by discussing the individual and social benefits of a college education. In Section III the report presents information on how college enrollment rates vary by income and discusses the relevant research on this topic. One of the objectives of need-based aid is to increase attendance and retention. Thus, in Section IV, we provide a summary of the recent studies that have investigated the effect of need-based student aid on college enrollment, as well as the research on the related question of how the cost of attending college affects attendance rates. Section V provides a review of the need-based aid programs in nine states. In Section VI we present the results of simulations of 25 alternative need-based student aid programs for Georgia. The simulations provide estimates of the cost of the various programs and of the number of students who would receive aid. We also present distributions of aid for a subset of the alternatives considered. Section VII contains a summary and conclusions.

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II. Personal and Social Benefits of Higher Education

The private benefits of a college education are well known. From the individual's perspective, a college education is associated with a significantly higher annual salary. In 2006, the average full-time year-round worker in the United States with a four-year college degree earned \$67,910 compared to \$38,926 for someone with just a high school degree, or 74.5 percent more.¹

However, there are also benefits to society at large. College-educated citizens are healthier, more likely to vote, less likely to be arrested for a crime, less likely to be on welfare, and more productive. Pascarella and Terenzini (1991) provide a summary of the studies that address the noneconomic benefits of a college education.

A more educated workforce reduces the dependency on social service programs. A report published by the College Board (2007) indicated that a population with higher levels of education is associated with lower unemployment and poverty rates. The 3.6 percent poverty rate for bachelor's degree recipients represented about one-third of the 10.8 percent poverty rate for high school graduates in 2005. Considering public assistance programs, six percent of high school graduates lived in households that received food stamps in 2005, compared to 1 percent of bachelor's degree recipients living in such households. In the same year, 19 percent of high school graduates, compared to only 6 percent of bachelor's degree recipients, lived in households that participated in Medicaid.

Because college educated workers are more productive, they also enhance tax revenues. For example, a typical full-time year-round worker in 2005, with a four-year college degree paid on average 134 percent more in federal income taxes and around 80 percent more in total federal, state, and local taxes than the average high school graduate working full-time year-round.

Furthermore, a college educated workforce is important for economic development. For example, the College Board (2007) showed that a more educated

¹ U.S. Bureau of the Census at http://pubdb3.census.gov/macro/032007/perinc/new03_000.htm.

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workforce would lead to higher wages for all workers; especially, a 1 percentage point increase in the proportion of the adult population with a four-year college degree increases the wages of workers without a high school diploma by 1.9 percent and the wages of high school graduates by 1.6 percent.

Glaeser and Saiz (2003), comparing the growth of metropolitan areas over three 10-year periods (1970–1980, 1980–1990, and 1990–2000), found that a one percentage point increase in the share of the adult population that is college educated increases local growth over a 10-year period by one-half percentage point at the MSA level and by one-fifth of a percentage point at the city level.

A report of the Advisory Committee on Student Financial Assistance (2002) (ACSFA) suggested that if we significantly reduce the income gap in college-going rates, it would increase the gross domestic product and tax revenues by approximately \$250 billion and \$80 billion respectively.

According to the National Association for College Admission Counseling (NACAC, 2008), if the United States is to remain competitive in the global economy, it will have to maintain a highly educated workforce. Currently, the country is experiencing a rapidly growing population of minority, low-income, and first-generation college-qualified high school graduates whose economic and social successes will play an increasingly significant role in boosting the economic growth of the country as a whole (Institute for Higher Education Policy, 2004). Therefore, it appears imperative to invest in their education to reap the benefits they would provide to society as part of a highly educated workforce.

Table 1 summarizes a few of the most the widely accepted higher education benefits to both individuals and society according to their economic or social value.

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TABLE 1. THE ARRAY OF HIGHER EDUCATION BENEFITS

	Public	Private
Economic	<ul style="list-style-type: none"> ● Increased Tax Revenues ● Greater Productivity ● Increased Consumption ● Increased Workforce Flexibility ● Decreased Reliance on Government Financial Support 	<ul style="list-style-type: none"> ● Higher Salaries and Benefits ● Employment ● Higher Savings Levels ● Improved Working Conditions ● Personal/Professional Mobility
Social	<ul style="list-style-type: none"> ● Reduced Crime Rates ● Increased Charitable Giving/Community Service ● Increased Quality of Civic Life ● Social Cohesion/Appreciation of Diversity ● Improved Ability to Adapt to and Use Technology 	<ul style="list-style-type: none"> ● Improved Health/Life Expectancy ● Improved Quality of Life for Offspring ● Better Consumer Decision making ● Increased Personal Status ● More Hobbies, Leisure Activities

Source: Institute for Higher Education Policy (1998).

These social benefits are the basis for one of the two economic arguments for public subsidies for higher education. While there are substantial social benefits associated with higher education, an individual does not take these social benefits into consideration in deciding whether to attend college. The decision, either by the student or his or her family, of whether to finance a college education will depend on the costs the student or family bears and the benefits received. If a family or its student has to pay the full cost of a college education, and is sensitive to the price of a college degree, then there will be fewer students enrolled in college than is socially desirable.

A second justification for public support for higher education is that the private capital market under invests in higher education since in the absence of public support students cannot borrow against future earnings. This is manifested in the lower participation in college by children from lower income families.

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III. Income and College Enrollment

While there are many factors that are likely to affect the decision to enroll in college, economists suggest that this decision is positively related to the private returns to education, e.g., the additional earnings one expects if he or she earns a college degree, and negatively related to the cost of obtaining a college degree. The greater the difference between the returns and the cost, the greater the percentage of high school graduates expected to enroll in college.

The ability to finance a college education is also a likely determinant of whether to enroll in college. Many authors have pointed out that there is an inverse relationship between college enrollment and family income. For example, the College Board (2005), using data from the Current Population Reports, reports that in 2003, 80 percent of students from families with incomes in the upper quintile enrolled in college immediately after high school, compared to only 61 percent for the lowest two quintiles.

A similar pattern is reported by Kane (2004). Using data from the High School and Beyond Survey and the National Education Longitudinal Study of 1992, he finds that within 20 months after high school graduation, 66 percent of students in the highest parental income quartile were enrolled in a 4-year college, while only 28 percent of those in the lowest quartile were enrolled, a difference of 38 percentage points. Including 2-year colleges in the calculations changes the percentages to 85 percent and 50 percent, respectively, a difference of 35 percentage points.

Finally, the Advisory Committee on Student Financial Assistance (2002) found the following: among low-income high school graduates with high unmet financial need (unmet need = \$3,800), 67 percent do not attend a four-year college within two years of graduation, and 37 percent do not attend any college at all. Among college-qualified high school graduates with high unmet need, 48 percent were unable to enroll in a four-year college within two-years, and 22 percent unable to enroll in any college at all (High-income: unmet need = \$400, Low-income: unmet need = \$3,800). Unmet need is the portion of college expenses not covered by the expected family contribution (EFC) and student aid, including work-study and loans.

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If low income causes students to not enroll in college, then perhaps providing student aid would increase the probability that a student would enroll in college. However, it is possible that family income is simply a reflection of other factors that might be the underlying reason for the observed relationship between income and college enrollment. For example, academic performance in high school is negatively related to family income. Thus, it is possible that it is low academic performance and not low income that explains the lower rate of college enrollment among students from lower income families.

To address this possible explanation for the observed relationship between income and college enrollment, the College Board (2005) developed tables that show that even when controlling for academic performance prior to college, college enrollment stills differs by the family's socio-economic status (SES). The College Board observed math scores for eighth-graders in 1988 and level of education in 2000. By considering eighth-graders the College Board could minimize the effect of high school dropouts on the results. The College Board found that for students with the highest math scores, 74 percent of the students in the highest SES quartile had earned at least a bachelor's degree, while only 29 percent of these high math-score students in the lowest SES quartile had done so. On the other hand, for the low math-score students, 30 percent of those in the highest SES quartile and 3 percent of those in the lowest quartile had obtained a bachelor's degree.

A similar pattern is reported by Ellwood and Kane (2000). Table 2 is derived from their research and shows how college enrollment within 20 months after high school graduation varies by family income and the 12-grade math test score. For the highest test score group, there is a 16 percentage point difference in the enrollment rate between students in the lowest and highest family income quartile.

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TABLE 2. 4-YEAR COLLEGE ENROLLMENT RATES

Parental Income Quartile	-----Math Test Tertile-----			Overall Average
	Bottom	Middle	Top	
Lowest	15%	33%	68%	30%
Second	14%	37%	69%	39%
Third	21%	47%	78%	52%
Highest	27%	59%	84%	67%
Overall Average	17%	44%	77%	47%

Source: Ellwood and Kane (2000).

There are other possible factors besides academic performance that might explain the lower college enrollment of students from low-income families. For example, family income is associated with the education level of the parents. It may be that it is the parents' education and not income that is the cause of the observed relationship between income and college enrollment. There is a substantial literature that has tried to measure the effect of income, as opposed to other factors, on college enrollment. (Kane [2004] provides a summary of the literature.)

Research that uses more recent data finds that, after controlling for factors such as parents' education, family income is an important factor in explaining differences in college enrollment. Belley and Lochner (2007) use the 1997 National Longitudinal Survey of Youth (NLSY97) to explore the effect of family income on college attendance. They find that income has become a more important determinant of college enrollment over the past two decades, a conclusion also reached by Kane (2007). Controlling for family background and the academic ability of the student, they find that as of age 21 college enrollment rates are 16 percentage points higher for youth from the highest income quartile relative to the lowest income quartile.

Further evidence is provided by Acemoglu and Pischke (2001), who find that a 10 percent increase in family income is associated with a 1.4 percent increase in the probability of attending a 4-year college. Furthermore, their results imply that family income, rather than other family background factors, explains 75 percent of the difference in college enrollment rates for children from the lowest and the highest income quartiles. It should be noted that some researchers do find a larger effect of other factors, e.g., Ellwood and Kane (2000).

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Another factor that might explain the lower enrollment of children from lower income families is the return from a college education that students expect. If the return from a college education is a major determinant of enrolling in college and if students from lower income families have lower expectations of the return to a college education, then we should expect a lower college participation rate for children from lower income families. Rouse (2004) investigated this possibility and found that the expectations regarding the return to a college education among high school seniors did not differ by family income.

IV. The Effect of Student Aid and College Costs on College Enrollment

In this section we first provide a review of recent studies that explore the effect of need-based student financial assistance on college enrollment and persistence. We also touch on the literature that explores the effect of the cost of a college education on enrollment.

Baird (2006) analyzed the effects of factors that are thought to influence state college enrollment rates. He examined state-level public college enrollment data for all 18-25 year old students by race over the period 1990 through 2000. He considered factors such as tuition, federal and state need-based financial aid, merit-based financial aid, and investment in public higher education capacity. Using Ordinary Least Squares (OLS) regression with standardized coefficients, the author found that in 2-year public institutions, for all races, state need-based aid shows a substantial and statistically significant positive relationship with enrollment rates. Specifically, holding all other factors constant, he found that a one standard deviation increase in state need-based aid produces on average a 0.15 standard deviation increase in 2-year enrollment rates among whites.² The standard deviation increase is 0.21 and 0.45 among blacks and Hispanics, respectively. For whites and Hispanics, state need-based aid had a larger effect on enrollment rates than state expenditures on higher education.

In 4-year public institutions, there is some evidence that state need-based financial aid increases enrollment rates among whites and Hispanics, but the result is not as strong as it is for enrollment rates in 2-year public institutions. When 2- and 4-year public institutions were combined, the author found that there is strong evidence that state need-based financial aid increased enrollments rates among young whites

² Since data on non-need-based financial aid are not available for the period between 1994 and 1996, including this variable in the model decreases the number of observations. After determining that the coefficient on non-need-based aid is not statistically nor economically significant, a second regression is estimated that drops this variable.

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and Hispanics. Specifically, holding everything else constant, a one standard deviation increase in state need-based aid produces on average a 0.17 standard deviation increase in public enrollment rates among whites and a 0.60 standard deviation increase in public enrollment rates among Hispanics. For Hispanics in public institutions, state need-based aid had a larger effect on enrollment rates than state expenditures on higher education.

Unfortunately, the magnitude of the effect of a dollar increase in state need-based financial aid on enrollment rates cannot be estimated since the author did not provide the non-standardized values of the variables. One limitation of the study is that it does not account for differences among states in their need-based financial aid eligibility requirements. Holding everything else constant, we would expect a state with stricter need-based financial aid eligibility requirements to experience a smaller impact on enrollments than a state with either more relaxed criteria or more eligible students.

St. John et al. (2004) assessed the impact of need-based financial aid (and public finance strategies in general) on college enrollment rates in states (measured as the percentage of high school graduates enrolled in public institutions in the following fall), controlling for the minimal level of college preparedness (measured by high school graduation rates) and state demographic differences for the 1992, 1994, 1996, 1998, and 2000 fiscal years.

Using fixed effects regression with a state-level data set composed of state indicators, they found that on average, for every \$1,000 of need-based grant aid per student, enrollment rates increased by 11.5 percentage points. Additionally, they found that need-based financial aid had a stronger influence (i.e. larger standardized coefficient) on enrollment rates than any other financial variable, including state-by-state public college tuition cost and state spending on K-12 education. The authors recommended two strategies: first, formulate state policies that better coordinate state need-based grants with public sector tuition so that state need-based aid increases as tuition increases. Second, a joint need-based grant program financed by both the federal government and the states (one-third from the federal government and two-

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thirds funded by state funds) that would provide a maximum need-based aid covering the cost of average public tuition. The authors did not conduct the analysis by race/ethnic group, gender, or income, but did control for state's demographic context, such as the ethnic composition of the state's population and the level of poverty and attained education. One limitation of the study is that the empirical analysis examines the additional impact of state need-based grants that supplement the Federal Pell grant; in other words, if we reduce Pell grants, college access would also be reduced.

Perna and Titus (2004) analyzed the impact of state public policies (state appropriations to higher education institutions, student financial aid, tuition, and state policies related to academic preparation at the elementary and secondary school levels) on the type of college or university attended by high school graduates after controlling for student level predictors of college choice and other state characteristics. The type of institution attended is measured as of October 1992, the fall after high school graduation. State public policies regarding student financial aid are measured by the amount of need-based financial aid in the state per traditional college-age (i.e. 18 to 24 year old) population in 1992-1993.

Using student-level NCES³ data (National Educational Longitudinal Study-NELS:92/94) and a hierarchical linear modeling to account for the difference in units of analysis (student level variables and state level characteristics), Perna and Titus (2004) found that the average likelihood of enrolling in an in-state private 4-year college or university, relative to not enrolling, increases with the amount of state need-based financial aid (the odds-ratio is 1.6).⁴ Similarly, there is a positive and significant relationship between the amounts of state need-based aid per traditional college-age population and the likelihood of enrolling in an in-state public 4-year institution relative to not enrolling (odd-ratio is 1.15). However, the positive effect is smaller in magnitude than that associated with enrolling in an in-state private 4-year

³ The U.S. Department of Education's National Center for Education Statistics.

⁴ An odds-ratio greater than one indicates an increase in the likelihood of enrolling in a particular type of post secondary institution relative to not enrolling, whereas an odds-ratio less than one indicates a decrease in the likelihood of enrolling in that type of post secondary institution.

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college or university. In their analysis, the impact of state need-based financial aid programs on the type of institution in which high school graduates enroll was not decomposed by race/ethnicity and gender. One limitation of the study is the inability to correct for sampling errors, non-response, and the oversampling of some groups at the student level data. Another limitation lies in state differences in terms of the criteria used to award need-based student financial aid.

Hu and St. John (2001) analyzed the impact of changes in the combination of federal and state aid programs on student within-year persistence in Indiana's four-year public institutions; they focused on persistence of blacks and Hispanics, using white students as a comparison group. The data is based on three cohorts of full-time resident undergraduate students enrolled during the academic years 1990-91, 1993-94, and 1996-97. In this study, students receiving financial aid from federal, state, or institutional sources (grants only, loans only, grants and loans, and other packages) within each racial/ethnic group are compared with students in the same racial/ethnic group but who did not receive aid. Grants are mainly composed of need-based aid from federal government, state, or institutions, but also include some merit-based aid.

The results show that in 1993-94 and 1996-97 respectively, black students who received financial aid in the form of grants were 7 and 9 percentage points more likely to persist than average non-recipients. For Hispanic students, in 1993-94, aid recipients of grants were 6.3 percentage points more likely to persist than non-aid recipients; while in 1996-97, aid recipients of grants were 7.3 percentage points more likely to persist than non-aid recipients. For these two groups, the effects of any type of financial aid on student persistence increased across the three years. For white students, the statistically non-significant coefficients for grants only during the three years suggested that those who received grants only persisted as well as non-aid white recipients. The authors concluded that adequate student financial aid could help equalize opportunity to persist, both within groups and among racial/ethnic groups. One limitation of this study is that it focused only on the state of Indiana's postsecondary education system, which differs from other states in that Indiana is not as ethnically diverse as neighboring states or the states in the South.

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Using a panel data composed of public college enrollment rates of all undergraduates, tuition prices, state need-based grant expenditures, and unemployment data for the 50 states during the period from 1976 to 1994, Heller (1999) examined the impact of state financial aid spending on undergraduate enrollment decisions across race/ethnicity groups (all races, Asian American, black, Hispanic, and white students) and types of public postsecondary institutions (all public institutions, four-year only, and community colleges only). Public college enrollment rates for each racial group in each state were calculated as a percentage of the 18-to-24 year old population in each state.

Heller (1999) conducted the analysis using a fixed-effect approach, and found that in all public institutions, both four-year and community colleges combined, a \$1,000 increase in state need-based financial aid spending (per 18 to 24 year-old) was related to an enrollment increase of 12.64 percentage points for all races combined, an enrollment increase of 42.66, 24.95, 12.53, and 9.71 percentage points for Asian Americans, blacks, Hispanics, and whites respectively. In four-year public institutions, only all races combined and white undergraduate students as a group respond positively to increases in state need-based grants. In community colleges however, only black students are affected by changes in state need-based grant expenditures: a \$1,000 increase in state need-based financial aid spending (per 18 to 24 year-old) is related to an enrollment increase of 13 percentage points for black students as a group. In general, he found that for all races, state need-based grant expenditures helped explain public enrollment rates, especially at community colleges since the models of community college enrollment have a far greater explanatory power than those of enrollment at four-year institutions.

Table 3 summarizes the findings from the studies reviewed in this section. Regarding the impact of state need-based aid programs on enrollment, the studies by St. John et al. (2004) and Heller (1999) would be the most relevant to predict the effect of a need-based financial aid program proposal in Georgia. They used state level data and demonstrated state need-based aid effects over a long period of time, controlling for state-specific characteristics. They showed the effects on the enrollment of all students, not just beginning students. They found enrollment gaps

TABLE 3. SUMMARY OF THE RELATIONSHIP BETWEEN NEED-BASED FINANCIAL AID AND ENROLLMENT, PERSISTENCE, AND CHOICE OF COLLEGE

Authors	Data Set	Question Variable	Key Findings
Baird (2006)	CPS 1990-2000		<p>* 2-year enrollment rates: One standard deviation increase in state need-based aid produces: 0.15 standard deviation increase-White 0.21 standard deviation increase-Blacks 0.45 standard deviation increase-Hispanics</p> <p>* 2- and 4-year enrollment rates: One standard deviation increase in state need-based aid produces: 0.17 standard deviation increase-White 0.60 standard deviation increase-Hispanics</p>
St. John et al. (2004)	NCES in IPEDS 1992, 1994, 1996, 1998, and 2000 fiscal years	\$1,000 increase in need-based grant aid	11.5 percentage points increase in enrollment rates
Perna and Titus (2004)	NCES data (NELS:92/94)		<p>Average likelihood of enrolling relative to not enrolling: * in-state private 4-year institutions: increases with the amount of state need-based financial aid (the odd-ratio is 1.6) * in-state public 4-year institutions: increases with the amount of state need-based financial aid (the odd-ratio is 1.15)</p>
Hu and St. John (2001)	The Indiana Commission for Higher Education's Student Information System (ICHE-SIS): academic years 1990-91, 1993-94, and 1996-97		<p>*African American grants-only recipients were 7 and 9 percentage points more likely to persist than average non-recipients in 1993-94 and 1996-97 respectively *Hispanic grants-only recipients were 6.3 and 7.3 percentage points more likely to persist than non-aid recipients in 1993-94 and 1996-97 respectively * White grants-only recipients persisted as well as non-aid White recipients during the three years</p>
Heller (1999)	IPEDS 1976 to 1994	\$1,000 increase in need-based grant aid	<p>* In all public institutions (four-year and community colleges combined): 12.64 percentage points increase in enrollment rates-All races 42.66 percentage points increase in enrollment rates- Asian Americans 24.95 percentage points increase in enrollment rates-Blacks 12.53 percentage points increase in enrollment rates- Hispanics 9.71 percentage points increase in enrollment rates- Whites *In four-year public institutions: 9.35 percentage points increase in enrollment rates- All races 5.66 percentage points increase in enrollment rates- Whites * In community colleges: 13 percentage points increase in enrollment rates-Blacks</p>

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under the current system of aid and suggested that additional financial aid is needed to reduce inequality in college access. St. John et al. (2004) found that enrollment increases by 11.5 percentage points for a \$1,000 increase in need-based aid per student. Heller (1999) found that a \$1,000 increase in aid increases enrollment in four-year schools by 5.7 percentage points for whites and by 9.4 percentage points for all races.

Another literature investigates the effect of college cost on the college enrollment decision, a literature reviewed by Leslie and Brinkman (1987). The effect of college cost on attendance is related to the effect of student aid on college enrollment and college completion since a \$1,000 increase in aid is the same as a \$1,000 reduction in the cost of college to the student. Leslie and Brinkman (1987) suggest that the literature implies that a \$1,000 (2001 dollars) reduction in college costs would increase college enrollment by 4 percentage points. More recent studies by Cameron and Heckman (1999), Ellwood and Kane (2000), and Kane (1994) find that a \$1,000 reduction in tuition increases college attendance by 4 to 6 percentage points. These estimates are somewhat lower than those found for need-based aid, as reported above, but are consistent with the findings of Dynarski (2001, 2002).

There is not much evidence regarding whether students from different income levels respond differently to student aid or college costs. However, Bishop (1977) does find that students from low-income families are much more responsive to changes in tuition than students from high-income families. Manski and Wise (1983) and others obtain results that confirm this pattern.

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V. A Review of State Need-Based Aid Programs

In order to explore the existing designs of need-based programs, we surveyed nine states that have a significant merit-based aid program. This section provides a state-by-state overview of these existing need-based aid systems. It begins with a comparison of the individual state's demographic profile to that for Georgia to provide a context for a need-based aid discussion. This is followed by details of the need-based aid program, including: program description, eligibility levels, aid criteria and funding formulas, and enrollment data. The section ends with a brief cross-state comparison on aid criteria and funding formulas.

Among the states surveyed, there are two primary mechanisms through which the amount of received award is calculated: bracket payments and individual total payments. For states that calculate rewards as individual payments (North Carolina, Tennessee, Florida, Illinois, Minnesota, New Jersey, and Pennsylvania) a single formula is used across all eligible students to generate a student-specific payment amount. Ohio and New York utilize a bracket payment system in which eligible applicants' income is grouped in a set range of payment brackets. All individuals within each income bracket receive the same amount of aid.

A. Individual Payment States

North Carolina

Comparability to Georgia

As shown in Table 4, compared to North Carolina, Georgia has a slightly larger overall population (+507,436) with a larger percentage of that population under 18. However, the percentage of that population graduating from high school (including GED) by the time they are 25 is roughly the same. Georgia has a slightly higher median household income and an equivalent percentage of its population living below the poverty line. The level of need-based aid requirement might be expected to be relatively similar.

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TABLE 4. NORTH CAROLINA/GEORGIA COMPARISON

	North Carolina	Georgia
<i>Census Data State Quick Facts¹</i>		
Population, 2006 estimate	8,856,505	9,363,941
Persons under 18 years old, percent, 2005	24%	26.0%
High school graduates, percent of persons age 25+, 2000	78%	78.6%
Median household income, 2004	\$40,863	\$42,679
Persons below poverty, percent, 2004	13.8%	13.7%
<i>Need Based Aid Comparisons²</i>		
2004-2005 Number of Recipients	93,035	3,162
Average Award per/ recipient	\$1,611	\$480

¹US Census Bureau (2007).

²National Association of State Student Grant and Aid Programs (2007).

Program Descriptions

Across its 16 public institutions of higher education, North Carolina enrolled more than 165,000 undergraduates during the 2007 school year.⁵ Another 80,000 students were enrolled at private institutions and 42,000 in community colleges.⁶ Between federal and state scholarships and grants, loans, and work study programs, undergraduate students in North Carolina have over 31 different types of financial aid available to help them pay for college. Of those, five are designed to serve the needs of low-income students: University of North Carolina Need Based Grant (UNCIG), NC Legislative Tuition Grant (LTG), NC State Contractual Scholarship Fund (SCSF), NC Community College Grant, and the new NC Lottery Scholarship.

Grants for Public Institutions

The University of North Carolina Need Based Grant (UNCIG) is a need-based grant program made available to eligible students attending one of the 16 public institutions of higher education in North Carolina. Students must be enrolled

⁵ Degree Credit Headcount Enrollment in the University of North Carolina by Institution, Residence, Level, and Location, Fall 2007: found at http://www.ncleg.net/fiscalresearch/statistics_and_data/stat_and_data_pdfs/fall_2007_unc_enrollment.pdf.

⁶ http://www.ncleg.net/fiscalresearch/statistics_and_data/stat_and_data_pdfs/fall_2007_unc_enrollment.pdf.

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in at least six credit hours. Prospective students must use the Free Application for Federal Student Aid (FAFSA) to calculate their Expected Family Contribution (EFC). Based on the EFC, financial eligibility is equal to that of the Federal Pell Grant. During the 2005-2006 academic year, 33,929 students received the UNCIG, with an average award of \$1,712. Total expenditures for the program that year were \$58,071,081 (University of North Carolina, 2007).

The NC Community College Grant has the same eligibility requirements as the UNCIG. However, it is to be used at community colleges. In 2005-2006, 13,411 community college students received the Community College Grant, with the average grant at \$781. Total expenditures were \$10,479,100 (University of North Carolina, 2007).

Grants for Private Institutions

The State Contractual Scholarship Fund (SCSF) program was created in 1971 and is designed to help needy students attend a private institution of higher education within North Carolina. Students must be a resident of North Carolina to qualify and document need based on the FAFSA. Each participating North Carolina private college or university receives an allocation of \$1,350 per year for each enrolled North Carolina resident. The institutions divide up the total allocation among their students who qualify for need under FAFSA. Amounts per student vary depending on need and institution. In 2005-2006, the SCSF funded 14,531 students for a total of \$35,148,247. The average grant award was \$2,524 (University of North Carolina, 2007).

The Legislative Tuition Grant (LTG) is not a need-based aid program, however, all North Carolina residents are eligible regardless of academic performance or income. It was created in 1975 by the North Carolina General Assembly to offset the costs of attending a North Carolina independent, nonprofit institution. Eligible applicants must be a full-time resident of North Carolina and be enrolled in an undergraduate full- or part-time degree granting program at an independent, nonprofit institution in North Carolina. The award amount is

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determined by the North Carolina General Assembly and is \$1,535 for the 2007-2008 academic year.⁷ In 2005-2006, 31,672 students received the LTG, for a total cost of \$47,833,069 (Table 5).

TABLE 5. NEED-BASED AID PROGRAMS 2005-2006: NORTH CAROLINA

	Use	Total Program Enrollment	Avg. Per Recipient	Total Dollars
UNCIG	Public 4 year colleges and universities	33,929	\$1,712	\$58,071,081
CC Grant	2 year public community colleges	13,411	\$781	\$10,479,100
SCSF	Private institutions – strictly need based	14,531	\$2,419	\$35,148,247
LTG	Private institutions – not based on financial need	31,164	\$1,535	\$47,833,069

North Carolina Educational Lottery Scholarship (ELS)

The ELS was created by the North Carolina General Assembly in 2005 as a need-based aid program. It may be used at University of North Carolina campuses, community colleges, independent colleges and certain other private colleges. Eligibility is determined based on the same criteria as the Federal Pell Grant with one exception; students not eligible for the Pell Grant with an Expected Family Contribution (EFC) of \$5,000 or less are eligible for the ELS. This allows the need-based program to target a slightly larger proportion of the needy population than the UNCIG. This grant may be combined with other forms of financial aid, including the UNCIG.

As this is the program's first year in operation, it is estimated that for 2007-08 there will be approximately 30,000 grants available. The individual awards will be determined by the FAFSA Grants and will range from \$100 to \$2,500 for the year, based on the student's EFC.⁸

⁷ College Foundation of North Carolina, <http://www.cfnc.org/Gateway?command=GetBasedProgramDetail¬e=no&type=9&vocType=-1&vocational=no&id=27>.

⁸ College Foundation of North Carolina, <http://www.cfnc.org/Gateway?command=GetBasedProgramDetail¬e=no&type=7&vocType=10&vocational=no&id=7>.

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Program Funding

The ELS is funded entirely by the North Carolina Lottery. Of the total lottery revenue, 35 percent is earmarked for education.⁹ Of that amount, the ELS program is guaranteed 10 percent, which for 2007-2008 was approximately \$35 million. Each year, the North Carolina General Assembly appropriates the funding levels based on estimates from the State Budget Office and the Fiscal Research.¹⁰

The remainder of the need based aid programs are appropriated by the General Assembly and are divided among two funds: 1) the General Fund, and 2) the Escheat Fund. For FY 2006-2007, the General Assembly appropriated \$21.6 million from the General Fund to cover need-based aid costs. Also in FY 2006-2007, the General Assembly appropriated \$67.6 million from the Escheat Fund.¹¹ The Escheat Fund is the successive collection of abandoned property to the State. The primary purpose of the Escheat program is to provide a means by which abandoned property can be brought under control of the State and converted into State funds. The funds are invested and income derived from the investment is distributed annually to the State Education Assistance Authority earmarked for loans and grants to needy students who are residents of North Carolina and enrolled in public institutions of higher education.¹² The General Assembly also draws funds from the principal. This must be authorized annually in the budget.

⁹ The state allocation revenues are 50 percent in lottery prize money, 15 percent for administrative costs, and the remaining 35 percent goes to education (Fiscal Research Division, 2008, North Carolina Education Lottery Funding. http://www.ncleg.net/fiscalresearch/topics_of_interest/topics_pdfs/education/2008.1.30%20meeting-education%20lottery.pdf.)

¹⁰ Fiscal Research Division, 2008, North Carolina Education Lottery Funding. http://www.ncleg.net/fiscalresearch/topics_of_interest/topics_pdfs/education/2008.1.30%20meeting-education%20lottery.pdf.

¹¹ Fiscal Research Division, 2008, North Carolina Education Lottery Funding. http://www.ncleg.net/fiscalresearch/topics_of_interest/topics_pdfs/education/2008.1.30%20meeting-education%20lottery.pdf.

¹² The University of North Carolina (2008) “Accounting Policies and Procedures – Escheat Funds. <http://www.northcarolina.edu/content.php/system/index.htm>.

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Tennessee

Comparability to Georgia

As shown in Table 6, relative to Tennessee, Georgia has a larger overall population (+3,325,138) with a larger percentage of that population under 18 and a larger percentage of that population graduating from high school by the time they are 25. Georgia has a higher median household income and a smaller percentage of its population living below the poverty line. However, the level of need-based aid requirement might be expected to be relatively similar.

TABLE 6. TENNESSEE/GEORGIA COMPARISON

	Tennessee	Georgia
<i>Census Data State Quick Facts</i>		
Population, 2006 estimate	6,038,803	9,363,941
Persons under 18 years old, percent, 2005	23.3%	26.0%
High school graduates, percent of persons age 25+, 2000	75.9%	78.6%
Median household income, 2004	\$38,945	\$42,679
Persons below poverty, percent, 2004	15.0%	13.7%

Source: US Census Bureau (2007).

Program Description

The Tennessee Student Assistance Award Program (TSAA) provides need-based tuition assistance to financially needy undergraduate students who are residents of Tennessee. Applicants must be enrolled, or accepted for enrollment, at least half-time at a public or an eligible non-public postsecondary educational institution in Tennessee.

Eligibility Levels

To be eligible for TSAA, students must meet the following qualifications (Tennessee Department of State, 2007):

- Student must be a resident of Tennessee;

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- Must demonstrate financial need that allows for Expected Family Contribution (EFC)¹³ to be less than \$2,100 per year;
- Enrolled (or intends to enroll) in a Tennessee post-secondary institution (private or public) at least part-time

Aid Criteria/Formula

TSAA is not an entitlement program. Funds are distributed on a first-come first-serve basis. For 2004-2005, program funds were capped at \$42 million (Tennessee Higher Education Commission, 2006). The amount provided to an individual student is the result of the need formula. The formula is the institutional cost of education (tuitions and mandatory fees) minus the EFC. The EFC formula is calculated using the same guidelines as those used to calculate EFC under the Federal Pell Grant Program.

Enrollment Population

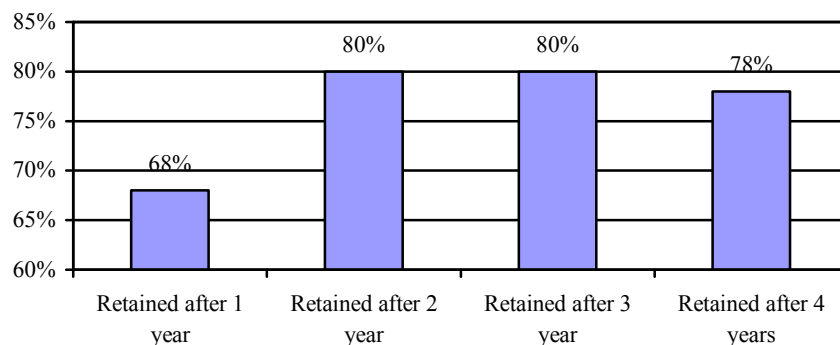
For 2004-2005, \$42 million was expended serving 23,900 students. Of those, 95 percent had total family incomes below \$35,000. Moreover, 59 percent had EFCs equal to zero (Tennessee Higher Education Commission, 2006).

In 2006, the Tennessee Higher Education Commission conducted a retention study for students who received TSAA funds. The study found that 68 percent of students that received the TSAA were retained after one year (Figure 1). Of those 68 percent, 80 percent were retained after two and three years. Comparatively, across all freshmen enrolled in the University in the fall of 2006, approximately 80 percent returned after their first year (Office of the Vice President for Strategic Planning and Operations, 2008).

¹³ The Expected Family Contribution (EFC) is a measure of a student's family's financial strength and indicates how much of a family's financial resources (for dependent students) should be available to help pay for your education. The EFC is calculated according to a formula established by law, and includes a family's income (taxable and untaxed), assets and benefits (i.e., unemployment or Social Security). Family size and the number of family members who will be attending a college or career school are also considered. To determine financial need for federal student aid programs, (except for an unsubsidized Stafford Loan), institutions of higher education subtract the EFC from the cost of attendance (Federal Student Aid Information Center, 2008).

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FIGURE 1. TENNESSEE POST-SECONDARY RETENTION RATES BASED ON TSAA PARTICIPATION



Source: Tennessee Higher Education Commission (2006).

As shown in Table 7, over half (53 percent) of TSAA enrollments were in public four year institutions. Private institutions enrolled 17 percent of TSAA students, though they received nearly 39 percent of total TSAA funding.

TABLE 7. 2000-2001 ENROLLMENT AND DISTRIBUTION OF TSSA FUNDS BY INSTITUTION TYPE: TENNESSEE

Category of Institution	Fall 2000 Undergraduate Enrollment	# of TSAA Awards	% Receiving Awards	% of Total Awards	Total Amount	% of Total Amount	Average Award
Independent	40,274	4,216	10.47%	16.69%	\$15,252,874	38.87%	\$3,618
Public 2 yr.	73,850	8,502	11.51%	23.05%	\$5,720,694	8.94%	\$673
Public 4 yr.	94,968	13,203	13.90%	52.75%	\$18,299,650	47.47%	\$1,381
Technology Centers	35,099	2,017	5.75%	3.21%	\$779,700	0.59%	\$387
Other	N/A	1,527	N/A	4.30%	\$2,576,576	4.13%	\$1,687
Total	244,191	29,465	13%	100%	\$42,559,494	100%	\$1,444

Source: Tennessee Higher Education Commission (2002).

What is important to note, for this same academic year, slightly more than 13,000 students applied for TSAA but were denied due to lack of funding. Of those 13,000 that did not receive funding, an estimated 70 percent had a total family income less than \$20,000. Further, approximately 58 percent of students who were not funded had an EFC of zero (Tennessee Higher Education Commission, 2002).

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Florida

Comparability to Georgia

Florida's total population is nearly twice that of Georgia's. However, Florida has a similar percentage of high school graduates and similar levels of household income and percentage of their populations living below the poverty line. Therefore, the demand for a need-based aid program is similar (Table 8).

TABLE 8. FLORIDA/GEORGIA COMPARISON

	Florida	Georgia
<i>Census Data State Quick Facts</i>		
Population, 2006 estimate	18,089,888	9,363,941
Persons under 18 years old, percent, 2005	22.9%	26.0%
High school graduates, percent of persons age 25+, 2000	79.9%	78.6%
Median household income, 2004	\$40,900	\$42,679
Persons below poverty, percent, 2004	11.9%	13.7%

Source: US Census Bureau (2007).

Program Description

The Florida Student Assistance Grant (FSAG) Program is a need-based grant program available to degree-seeking, resident, undergraduate students who demonstrate substantial financial need and are enrolled in participating postsecondary institutions. In order to keep the grant after the first term of enrollment a student must maintain a 2.0 grade point average.

Eligibility Levels

In order to initially qualify for aid, a student must be a Florida resident, not owe a repayment on any other type of state or federal grant, loan or scholarship, not have a previously earned bachelor's degree; enroll for a minimum of 12 credit hours per term in a Florida public or private college or university, or six credit hours at a state university or community college to participate in the FSAC public part-time program. The student must meet Florida's eligibility requirements for receipt of state aid (Florida Department of Education, Office of Student Financial Assistance. 2007a).

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Aid Criteria/Formula

FSAG is a decentralized program, and each participating institution determines application procedures, deadlines, student eligibility, and award amounts. However, state regulations require that students must demonstrate financial need using the Free Application for Federal Student Aid (FAFSA) form, with at least \$200 in unmet need in order to receive awards. Depending on the availability of funding, the annual minimum and maximum award amount may vary each academic year. For the 2007-08 academic year the minimum annual award amount is \$200 and the maximum is \$1,808 (Florida Department of Education, Office of Student Financial Assistance, 2007a).

Enrollment Population

For the 2005-2006 school year, the average award was \$1,040 and the program served over 290,000 students (Table 9).

TABLE 9. 2005-2006 ENROLLMENT AND FINANCIAL AID: FLORIDA

Category of Institution	Fall 2006 Undergraduate Enrollment	# of FSAG Awards	% Receiving Award	Total Amount	Average Award
Independent	120,981	11,974	10.1%	\$12,671,313	\$1,058
Public 4 yr.	170,394	78,237	45.9%	\$80,063,693	\$1,023
Total	291,375	90,211	31%	\$92,735,006	\$1,040.50

Source: Florida Department of Education, Office of Student Financial Assistance (2007b).

Illinois

Comparability to Georgia

While Illinois is not a southern state, it does have some similar demographic characteristics to Georgia. Both states have a similar percentage of their total population under the age of 18, though Illinois has a slightly higher high school graduation rate. Illinois also has a higher median household income and a smaller percent of its population living below the poverty line (Table 10).

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TABLE 10. ILLINOIS/GEORGIA COMPARISON

	Illinois	Georgia
<i>Census Data State Quick Facts</i>		
Population, 2006 estimate	12,831,970	9,363,941
Persons under 18 years old, percent, 2005	25.4%	26.0%
High school graduates, percent of persons age 25+, 2000	81.4%	78.6%
Median household income, 2004	\$47,711	\$42,679
Persons below poverty, percent, 2004	11.9%	13.7%

Source: US Census Bureau (2007).

Program Description

The Monetary Award Program (MAP) provides need-based grants to Illinois residents to attend an approved Illinois college. Students must demonstrate financial need-based on the FAFSA requirements (College Zone Web Page, 2007).

Eligibility Levels

For initial eligibility a student must be a US citizen, or eligible non-citizen, Illinois resident, demonstrate financial need-based on EFC, not be in default on any student loans, and not have previously received a bachelor's degree. For continued eligibility, students must maintain satisfactory academic progress as determined by the individual colleges.

Aid Criteria/Formula

The actual amount of the individual student award each term depends on the calculation of financial need (the EFC), the cost of tuition and mandatory fees at the college being attended, the number of enrollment hours, and other factors related to the amount of funding provided for the program each year (i.e. availability of funds from the State). Each academic year the maximum annual award will be the lesser of (1) the eligible amount as determined by an analysis of financial circumstances, (2)

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the maximum amount that ISAC allows for tuition and fees at the college, or (3) \$4,968.¹⁴

Enrollment Population

During the 2005-2006 academic year, Illinois expended over \$345 million dollars for MAP. Nearly 20 percent of the college population received MAP assistance. The largest portion (over 58,000) of MAP recipients attended community college, with an average award of \$872. However, over 40,000 students that received MAP were enrolled in a public four-year institution and another 45,000 MAP recipients were enrolled in a private institution. The average award at a private school was over \$3,000 per recipient (Table 11).

TABLE 11. STATE AID GRANTS FY 05-06: ILLINOIS

Category of Institution	Fall 2005 Undergraduate Enrollment	# of MAP Awards	% Receiving Award	Total Amount	Average Award
Independent Institutions	250,615	45,887	18.3%	\$158,694,000	\$3,458.37
Community College	352,824	58,838	16.7%	\$51,358,000	\$872.87
Public 4 yr.	202,235	43,926	21.7%	\$135,745,600	\$3,090.32
Total	805,674	148,651	18.%	345,797,600	\$2,326

Source: Illinois Board of Higher Education (2007).

Minnesota

Comparability to Georgia

Compared to Georgia, Minnesota has a much smaller population living below the poverty line (8.1 percent vs. 13.7 percent). Moreover, Minnesota's overall population is approximately 4 million less than Georgia's. Minnesota's funding needs are clearly different from Georgia's (Table 12).

¹⁴ This is the current number for 2006-2007. This amount changes due to legislative approval.

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TABLE 12. MINNESOTA/GEORGIA COMPARISON

	Minnesota	Georgia
<i>Census Data State Quick Facts</i>		
Population, 2006 estimate	5,167,101	9,363,941
Persons under 18 years old, percent, 2005	24.0%	26.0%
High school graduates, percent of persons age 25+, 2000	87.9%	78.6%
Median household income, 2004	\$51,202	\$42,679
Persons below poverty, percent, 2004	8.1%	13.7%

Source: US Census Bureau (2007).

Program Description

Minnesota operates a *State Grants Program* designed to help students from low- and moderate-income families pay for educational expenses at eligible Minnesota colleges or universities (Minnesota Office of Higher Education, 2007).

Eligibility Levels

The Minnesota State Grants program requires students be residents of Minnesota, be graduates of a secondary school or its equivalent, or at least 17 years of age. Students must be enrolled as undergraduates for at least three credits at one of more than 130 eligible schools in Minnesota. Students may receive State Grants for four consecutive full-time quarters or three consecutive semesters during the course of a single fiscal year.

Aid Criteria/Formula

The Minnesota State Grants program was updated and redesigned to introduce a cost sharing model that distributes the cost of attending college among the student, the student's family and, when appropriate, state and federal taxpayers.

Awards are based on the difference between what students and their families are expected to contribute to pay for the education and the actual price of attending a particular college or university. The price of attending an institution is based on tuition, room and board, books and supplies, personnel and transportation expenses. The State Grants program allows up to \$1,000 per student for personal expenses such as laundry, clothing, recreation, medical care, insurance, etc.

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All applicants are required to contribute at least 46 percent of the price of attendance out of savings, earnings, loans, or other assistance from school or private sources. For dependent students, the remaining 54 percent of the price of attendance is met by a contribution from the parents as determined by the federal need analysis (FAFSA) prorated to 96 percent and by the combination of Federal Pell Grant and State Grants awards. For independent students, the remaining 54 percent of the price of attendance is met by a contribution from the student's income and assets (as determined by the federal need analysis) and by the combination of Pell and State Grant awards (Minnesota Office of Higher Education, 2007).

Enrollment Population

In 2005, Minnesota funded the State Grants program at \$124,436,000 for 73,410 students (Minnesota Office of Higher Education, 2007). Approximately 44 percent of State Grant funds went to students with family incomes below \$20,000, 42 percent went to those with incomes between \$20,000 and \$50,000, and 14 percent went to those with incomes over \$50,000 (Minnesota Office of Higher Education, 2007) (Table 13).

TABLE 13. 2005 STATE GRANTS ENROLLMENTS: MINNESOTA

Category of Institution	Fall 2005 Undergraduate Enrollment	# of State Grant Awards	% Receiving Award	Total Amount	Average Award
Independent Institutions	70,620	11,066	16%	\$55,575,000	\$5,022.14
Public 2 year institutions	112,111	27,487	25%	\$22,014,000	\$800.89
Public 4 yr.	57,877	12,381	21%	\$19,700,000	\$1,591.15
University of Minnesota Campuses	46,123	9,692	21%	\$27,147,000	\$2,800.97
Total	286,731	60,626	21%	\$124,436,000	\$2,052.52

Source: Minnesota Office of Higher Education (2007).

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New Jersey

Comparability to Georgia

Generally speaking, New Jersey has little comparability to Georgia. While similar in total population, the state’s residents—on average—are wealthier, with a median household income more than \$10,000 greater. Moreover, a smaller percentage of the population lives below the poverty line (Table 14).

TABLE 14. NEW JERSEY/ GEORGIA COMPARISON

	New Jersey	Georgia
<i>Census Data State Quick Facts</i>		
Population, 2006 estimate	8,724,560	9,363,941
Persons under 18 years old, percent, 2005	24.8%	26.0%
High school graduates, percent of persons age 25+, 2000	82.1%	78.6%
Median household income, 2004	\$57,338	\$42,679
Persons below poverty, percent, 2004	8.4%	13.7%

Source: US Census Bureau (2007).

Program Description

New Jersey’s Tuition Aid Grant (TAG) program is a need-based financial aid program. Depending on a student’s determined level of need, a TAG award can cover close to the full cost of tuition at a public college or a portion of that cost. The program also offers sizeable awards to attend in-state private institutions, up to \$10,236 of tuition. One in every three full-time New Jersey students receives TAG, and awards may be used at nearly all New Jersey postsecondary institutions including community colleges, state colleges and private schools (New Jersey Higher Education Student Assistance Authority, 2007).

Eligibility Levels

In order to meet eligibility requirements, students must be a full-time, undergraduate student enrolled in an approved degree or certificate program. The student must also demonstrate financial need based on the family’s ability to pay according to the Free Application for Federal Student Aid (FAFSA). The student must also be a resident of the State of New Jersey for at least 12 consecutive months

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immediately prior to receiving an award and enrolled at an approved college, university or degree-granting proprietary institution within the State of New Jersey. In order to continue receiving TAG, each student must continue to meet the minimum standard for academic performance. This minimum level of academic progress is set by the individual institutions (New Jersey Higher Education Student Assistance Authority, 2007).

Aid Criteria/Formula

Student Financial Need is measured by the New Jersey Eligibility Index (NJEI). This formula was developed by the state but is based on the Federal Expected Family Contribution (EFC) calculation. The NJEI is based on family income, family size, the number of children in college, and family assets. This index represents the dollar amount that the family is expected to contribute to educational expenses (New Jersey Higher Education Student Assistance Authority, 2007).

Current Enrollment Population

The approximate maximum full-time TAG Award Values for 2006-07 varies by institutional level (Table 15).

TABLE 15. MAXIMUM AWARDS BY SCHOOL: NEW JERSEY

Institutional Type	Maximum Full-time TAG Award
NJ County Colleges	\$2,238
NJ State Colleges & Universities	\$6,036
NJ Independent Colleges & Universities	\$10,236
Rutgers/UMDNJ	\$7,922
NJIT	\$9,066

Pennsylvania

Comparability to Georgia

Pennsylvania is close to Georgia in their median household income and percentage of population below the poverty line. While Pennsylvania has a larger overall population, the percentage of younger residents is smaller. Therefore, their level of need-based aid requirements for higher education may be expected to be similar (Table 16).

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TABLE 16. PENNSYLVANIA/GEORGIA COMPARISON

	Pennsylvania	Georgia
<i>Census Data State Quick Facts</i>		
Population, 2006 estimate	12,440,621	9,363,941
Persons under 18 years old, percent, 2005	22.7%	26.0%
High school graduates, percent of persons age 25+, 2000	81.9%	78.6%
Median household income, 2004	\$43,714	\$42,679
Persons below poverty, percent, 2004	11.2%	13.7%

Source: US Census Bureau (2007).

Program Description

The Pennsylvania State Grants program allows eligible Pennsylvania residents to obtain financial assistance for undergraduate study at any Pennsylvania Higher Education Assistance Agency (PHEAA)-approved institution of higher education (Pennsylvania Higher Education Assistance Agency, 2007a).

Eligibility Levels

Pennsylvania State Grants are based on financial need. However, an applicant must also:

- be a graduate of an approved high school or have a GED;
- be a Pennsylvania resident for at least twelve months before applying for a State Grant;
- attend a PHEAA-approved school;
- be enrolled in an approved program of study of at least two academic years in duration;
- be enrolled for at least six credits as an undergraduate, and;
- if prior State Grants were received, be maintaining satisfactory academic progress (Pennsylvania Higher Education Assistance Agency, 2007b).

Graduate students and students who have previously completed the requirements for a baccalaureate degree are not eligible for State Grants.

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Aid Criteria/Formula

The awarding formula approved for the 2006-07 processing cycle calculates financial need as a function of total educational costs minus federal EFC, minus 100 percent of the Federal Pell Grant Award.

For student reference, the Pennsylvania Higher Education Assistance Agency (PHEAA) publishes an estimate of grant award totals based on an individual family income (Table 17).

TABLE 17. ESTIMATED STATE GRANT AMOUNT: PENNSYLVANIA

*Average Tuition and Fees 2007-2008		-----Parents Annual Income-----		
		Under \$25,000	\$25,000 - \$49,999	\$50,000 or More
Four-Year Private Schools (\$24,870)*	% of eligible applicants	99%	98%	46%
	Typical Award	\$4350-\$4500	\$4150-\$4500	\$2750-\$4000
State System Schools (\$6,400)*	% of eligible applicants	99%	98%	37%
	Typical Award	\$3550-\$3900	\$3150-\$3850	\$1500-\$2650
State-Related Schools (\$11,360)*	% of eligible applicants	99%	98%	43%
	Typical Award	\$3950-\$4200	\$3700-\$4200	\$2150-\$3450
Junior Colleges (\$11,610)*	% of eligible applicants	99%	98%	50%
	Typical Award	\$3700-\$4150	\$3400-\$4050	\$1950-\$3200
Community Colleges (\$3,120)*	% of eligible applicants	99%	87%	18%
	Typical Award	\$1250-\$1700	\$1000-\$1500	\$650-\$1100
Nursing Schools (\$9,030)*	% of eligible applicants	99%	88%	34%
	Typical Award	\$3350-\$3850	\$3050-\$3750	\$1350-\$2500
Business, Trade or Technical Schools (\$10,860)*	% of eligible applicants	98%	89%	40%
	Typical Award	\$3800-\$4100	\$3500-\$4050	\$2000-\$3200

Current Enrollment Population

For the 2005-2006 school year, Pennsylvania appropriated \$368,198,000 to the Pennsylvania State Grants program. For the academic school year, 159,168 individual students received a grant for a total of \$384,012,972. The maximum award was \$3,500 while the average award was \$2,809 (Pennsylvania Higher Education Assistance Agency, 2007a) (Table 18).

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TABLE 18. 2005 STATE ENROLLMENTS AND AID: PENNSYLVANIA¹

Category of Institution	Fall 2005 Undergraduate Enrollment ²	# of State Grant Awards	% Receiving Award	Total Amount	Average Award
Independent Institutions	50,287	45,014	89.5%	\$130,220,162	\$3,209
Community Colleges	126,937	16,124	12.7%	\$14,113,238	\$1,316
Commonwealth Universities (4)	151,023	35,361	23.4%	\$93,112,918	\$2,940
Comprehensive Universities (14)	105,902	31,145	29.4	\$69,566,034	\$2,446
Total	434,149	127,644	29.4%	\$307,012,352	\$2,478

¹Pennsylvania Higher Education Assistance Agency (2007c).

²Pennsylvania Department of Education (2005).

B. Bracket Payment System

As previously stated, within the bracket payment system applicants eligible income falls within a set range of payment brackets. All individuals within each income bracket receive the same amount of aid.

Ohio

Comparability to Georgia

The population totals of Ohio and Georgia are slightly different. Ohio has nearly 2 million more individuals than Georgia; however, their percentage of poor and potential levels of need-based aid is similar. Both states have nearly identical median household incomes, while Georgia has a slightly higher percentage of its population falling below the poverty line (Table 19).

TABLE 19. OHIO/GEORGIA COMPARISON

	Ohio	Georgia
<i>Census Data State Quick Facts</i>		
Population, 2006 estimate	11,478,006	9,363,941
Persons under 18 years old, percent, 2005	24.1%	26.0%
High school graduates, percent of persons age 25+, 2000	83.0%	78.6%
Median household income, 2004	\$43,371	\$42,679
Persons below poverty, percent, 2004	11.7%	13.7%

Source: US Census Bureau (2007).

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Program Description

The Ohio Instructional Grant Program (OIG) provides need-based tuition assistance to full-time undergraduate students. Awards are based on family income with consideration given to the number of dependents in the family. Benefits are restricted to the student's instructional and general fee charges.

Eligibility Levels

Participants must be Ohio residents whose family income falls below \$40,000 per year. The amount of aid is a factor of total family income (calculations below) and number of family members. The family's income falls into a range. Within any income range the amount per student is based on the number of members in the household. For example, a student living in a household with 2 people whose family income is \$16,500 would receive \$1,974 in aid to be applied toward tuition and fees (Table 20).

TABLE 20. OHIO 2007-2008 PUBLIC SCHOOL AID TABLE FOR DEPENDENT STUDENTS

Number of Family Members	1	2	3	4	5 or more
\$0 - \$15,000	\$ 2,190	\$ 2,190	\$ 2,190	\$ 2,190	\$ 2,190
\$15,001 - \$16,000	\$ 1,974	\$ 2,190	\$ 2,190	\$ 2,190	\$ 2,190
\$16,001 - \$17,000	\$ 1,740	\$ 1,974	\$ 2,190	\$ 2,190	\$ 2,190
\$17,001 - \$18,000	\$ 1,542	\$ 1,740	\$ 1,974	\$ 2,190	\$ 2,190
\$18,001 - \$19,000	\$ 1,320	\$ 1,542	\$ 1,740	\$ 1,974	\$ 2,190
\$19,001 - \$22,000	\$ 1,080	\$ 1,320	\$ 1,542	\$ 1,740	\$ 1,974
\$22,001 - \$25,000	\$ 864	\$ 1,080	\$ 1,320	\$ 1,542	\$ 1,740
\$25,001 - \$28,000	\$ 648	\$ 864	\$ 1,080	\$ 1,320	\$ 1,542
\$28,001 - \$31,000	\$ 522	\$ 648	\$ 864	\$ 1,080	\$ 1,320
\$31,001 - \$32,000	\$ 420	\$ 522	\$ 648	\$ 864	\$ 1,080
\$32,001 - \$33,000	\$ 384	\$ 420	\$ 522	\$ 648	\$ 864
\$33,001 - \$34,000	\$ 354	\$ 384	\$ 420	\$ 522	\$ 648
\$34,001 - \$35,000	\$ 174	\$ 354	\$ 384	\$ 420	\$ 522
\$35,001 - \$36,000		\$ 174	\$ 354	\$ 384	\$ 420
\$36,001 - \$37,000			\$ 174	\$ 354	\$ 384
\$37,001 - \$38,000				\$ 174	\$ 354
\$38,001 - \$39,000					\$ 174

Source: Ohio Board of Regents (2007a).

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Aid Criteria/Formula

To calculate OIG income, both parent and student income is taken into consideration. The parents adjusted gross income, income tax credit and any untaxed income benefits are added to the students adjusted gross income, income tax credit and untaxed income benefits (Ohio Board of Regents, 2007b).

Enrolled Population

For the recent school year, approximately one-third of students enrolled in a two-year community or technical college received Ohio state aid grants. Approximately one quarter of students enrolled in a four-year public school received state aid grants. These numbers represent all eleven of the state administered aid programs, the largest of which is the OIG program. OIG awards totaled \$159 million in FY 2006, with 55 percent of those dollars being distributed to students attending public institutions (Ohio Board of Regents, 2007c) (Table 21).

TABLE 21. STATE AID GRANTS FY 04-05: OHIO

	Total 04-05 Enrollment	Percent on State Aid	Average State Award Amount
Community College	40,769	35%	\$1,283
State Community College	41,374	33%	\$1,149
Technical College	18,430	38%	\$976
University Regional Campus	32,490	22%	\$1,393
University Main Campus	213,382	21%	\$1,595

Source: Ohio Board of Regents (2007c).

New York

Comparability to Georgia

The State of New York has nearly 10 million more residents than Georgia and a slightly higher percentage of their total population living below the poverty line. However, they have a similar high school graduation rate to Georgia and a slightly smaller percentage of their population is under 18 (Table 22).

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TABLE 22. NEW YORK/GEORGIA COMPARISON

	New York	Georgia
<i>Census Data State Quick Facts</i>		
Population, 2006 estimate	19,306,183	9,363,941
Persons under 18 years old, percent, 2005	23.6%	26.0%
High school graduates, percent of persons age 25+, 2000	79.1%	78.6%
Median household income, 2004	\$45,343	\$42,679
Persons below poverty, percent, 2004	14.5%	13.7%

Source: US Census Bureau (2007).

Program Description

The New York State Tuition Assistance Program (TAP) provides need-based student aid at approved schools in New York State. The schools include State University of New York (SUNY) institutions, City University of New York (CUNY) institutions, and not-for-profit independent degree-granting colleges. Undergraduate students enrolled in four-year programs may receive up to four years of assistance for full-time study, and up to five years of assistance in an approved specialized program. Effective for the 2007-08 academic year, TAP will be available for first-year freshman students on a part-time basis.

Eligibility Levels

To be eligible for TAP, students must meet the following criteria:

- Be a United States citizen or eligible noncitizen;
- Be a legal resident of New York State;
- Study at an approved postsecondary institution in New York State;
- Have graduated from high school in the United States, earned a GED, or passed a federally approved "Ability to Benefit" test as defined by the Commissioner of the State Education Department;
- Be enrolled as a full-time student taking 12 or more credits per semester;
- Be matriculated in an approved program of study and be in good academic standing;

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- Have at least a cumulative "C" average after receipt of two annual payments;
- Be charged at least \$200 tuition per year (New York State, Higher Education Services Commission, 2007a).

Aid Criteria/Formula

TAP awards are based on the family's taxable balance as reported on appropriate New York State tax returns after relevant exemptions and deductions (New York State, Higher Education Services Commission, 2007a). The grant is reduced as income increases (Table 23).

The statute governing the TAP program provides that a student's award must be reduced by \$100 per academic year when the student has received the equivalent of four or more semesters of TAP payments. At degree-granting institutions, the maximum award is the lesser of \$3,575 or tuition. The minimum award is \$500.

TABLE 23. UNDERGRADUATE AWARD SCHEDULE: NEW YORK

Net Taxable Balance	Reduction
\$ 7,000 or less	0
7,001 - 11,000	7% of excess over \$ 7,000
11,001 - 18,000	\$ 280 + 10% of excess over \$11,000
18,001 - 80,000	\$ 980 + 12% of excess over \$18,000
80,001 or more	NO AWARD

Source: New York State, Higher Education Services Commission (2007b).

Enrollment Population

In 2001, the last year of available TAP data, over 70 percent of students enrolled in a proprietary institution received TAP aid. Comparatively, slightly more than one-third of students enrolled in a City University or State University institution received TAP aid (Table 24).

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TABLE 24. 2001 ENROLLMENT AND FINANCIAL AID: NEW YORK

	Total 2001 Enrollment	Total Amount of TAP Dollars 2001	% of TAP Grants 2001	Average TAP Award 2001
Proprietary	43,378	\$90,754,732	72%	\$2,890
Independent	427,055	\$235,819,880	25%	\$2,223
CUNY	196,828	\$120,492,237	36%	\$1,716
SUNY	402,945	\$172,604,729	33%	\$1,307

Source: New York State Education Department, Office of Higher Education (2007).

C. Cross State Comparisons

All states begin with the family's (parent's) adjusted gross income as a basis for the financial aid formula. Most states either use the federal calculation formula for Expected Family Contribution (EFC) or base their own formulas on that formula with minor adjustments—such as tax credits or family demographic information. All states take into consideration if a student is financially independent from his or her family. Of the states overviewed, almost all take into account whether the family has another child in college and any other type of aid the student receives. States vary the amount of aid by the type of institution the student attends (Table 25).

TABLE 25. AID CRITERIA/FORMULA

	OH	NY	FL*	IL*	MN	NJ	PN	TN*	NC*
Parent	Adjusted growth income	✓	✓	✓	✓	✓	✓	✓	✓
	Tax Credit	✓							
	Income benefits	✓							
Student	Adjusted growth income	✓	✓		✓				
	Tax Credit	✓							
	Income benefits	✓							
# of family members	✓			✓		✓			
# of siblings in college		✓		✓		✓			
Other aid received		✓	✓		✓	✓	✓		
Type/ level of institution		✓		✓		✓	✓		
Financial independence	✓	✓	✓	✓	✓	✓	✓	✓	

*equal to Federal Pell Grant Program requirements.

Finally, when directly comparing the individual states' total need-based allotment, some variation across states becomes evident. The average need-based award across states and institution types is approximately \$1,800. On average, among

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these states, they serve approximately 24 percent of their student population, ranging from 13 percent in Tennessee to 31 percent in Florida.

Among the states surveyed, Tennessee has the lowest number of enrolled undergraduates in their higher education system. However, they also served the lowest percentage of students within that system and the average need-based award was slightly less than the overall states average (Table 26). Comparatively, North Carolina serves approximately 43,000 more students. It also provides aid to a larger proportion (32 percent) of those students, and its total expenditure on aid programs is approximately 3.5 times the amount for Tennessee.

TABLE 26. CROSS STATE COMPARISONS

State	Undergraduate Enrollment	# of State Grant Awards	% Receiving Award	Total Amount	Average Award
North Carolina (2005-2006)	287,452	93,035	32%	\$151,531,497	\$1,612
Tennessee (2001-2002)	244,191	29,465	13%	\$42,559,494	\$1,444
Florida (2004-2005)	291,375	90,211	31%	\$92,735,006	\$1,040
Illinois (2005-2006)	805,674	148,651	18%	\$345,797,600	\$2,326
Minnesota (2005-2006)	286,731	60,626	21%	\$124,436,000	\$2,052
Pennsylvania (2005-2006)	434,149	127,644	29%	\$307,012,352	\$2,478
Ohio (2004-2005)	346,445	86,883	25%	\$159,000,000	\$1,279
New York (2001-2002)	1,070,206	305,374	29%	\$619,671,578	\$2,034

NOTE: New Jersey is not included in this table as public information about enrollments were not available in a comparable format.

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VI. Simulations of Alternative Need-Based Aid Programs for Georgia

In this section we present estimates of the cost and distribution of various need-based student aid programs. The estimates were developed by simulating alternative need-based aid programs. Eligibility for the aid programs was restricted to full time undergraduate students who are Georgia residents attending one of the state's public 2-year or 4-year colleges or universities. In the simulations, the level of aid provided to a student depends on the income of the student's family, but did not depend on the number of dependents in the family or on the college the student attends.

The data used to estimate the cost and distribution of the various programs come from University System of Georgia (USG) data files and GeoLytics. The USG provided selective information for every student attending a USG school in the fall of 2006. From the data file provided by the USG, we excluded graduate students and nonresident students.

The file that the USG provided contained no information regarding household income, which is the critical variable in determining need. However, the file did contain the home address, which we used in combination with income data from GeoLytics in order to assign a household income to the student. To make this assignment, we geo-coded all of the student home addresses from the USG file in order to identify the census block group containing the address. The block group is the smallest geography for which income data is provided. We were able to successfully geo-code 85.7 percent of the addresses to the block group level. For those addresses for which we were unable to geo-code to the block group level, we geo-coded to the zip code level; we were able to match better than 98 percent of these addresses.

We then assigned a family income level to each student using 2006 income data from GeoLytics. GeoLytics provides updated census data. We took the median household income in the census block group for households that had a 16 or 17 year old present and assigned that income to the student living in that block group (or zip code area). Furthermore, the income assignment was conducted separately by race

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and ethnicity. We used households with a 16 or 17 year old by race in order to identify those households that matched as close as possible the households with a college student.

While this procedure has been used by other researchers, it does have limitations. The main difficulty is that it will under report the number of students from very low and very high income. It is unlikely that a census block group will have median income of, say, \$2,000, even though there are households with that income level. And, given that less than 1 percent of households have an income of over \$500,000, it would be very unlikely to find a census block group with a median income that high.

We compared the demographics of the students for whom we could and could not assign to a census block. There were significant differences in the racial composition of the two groups. In particular, the percentage of white (blacks) was much larger (smaller) in the group for which we identified census block groups. There was also a difference in the distributions across counties. This suggests that the students for which we could not identify a census block are not just a random sample of students. Thus, simply inflating the estimated cost of the programs to account for the 14.3 percent of the students for whom we could not geo-code to a census block group would not be appropriate.

On the other hand, using zip code areas to assign median income is less reliable than using census block groups since there is greater heterogeneity of the population within zip code areas because they are larger than census block groups. Thus, there is a greater likelihood that a student's family income will differ by a large amount from the median income for the zip code.

In considering the two approaches to dealing with the 14.3 percent of the students for whom we could not assign a census block group, we concluded that it would be better to use zip code income rather than simply inflating the cost estimate generated by using the students for whom we assign to census block groups.

The income measure we use is the updated household income from GeoLytics. Income is as defined by the Bureau of the Census. The measure of

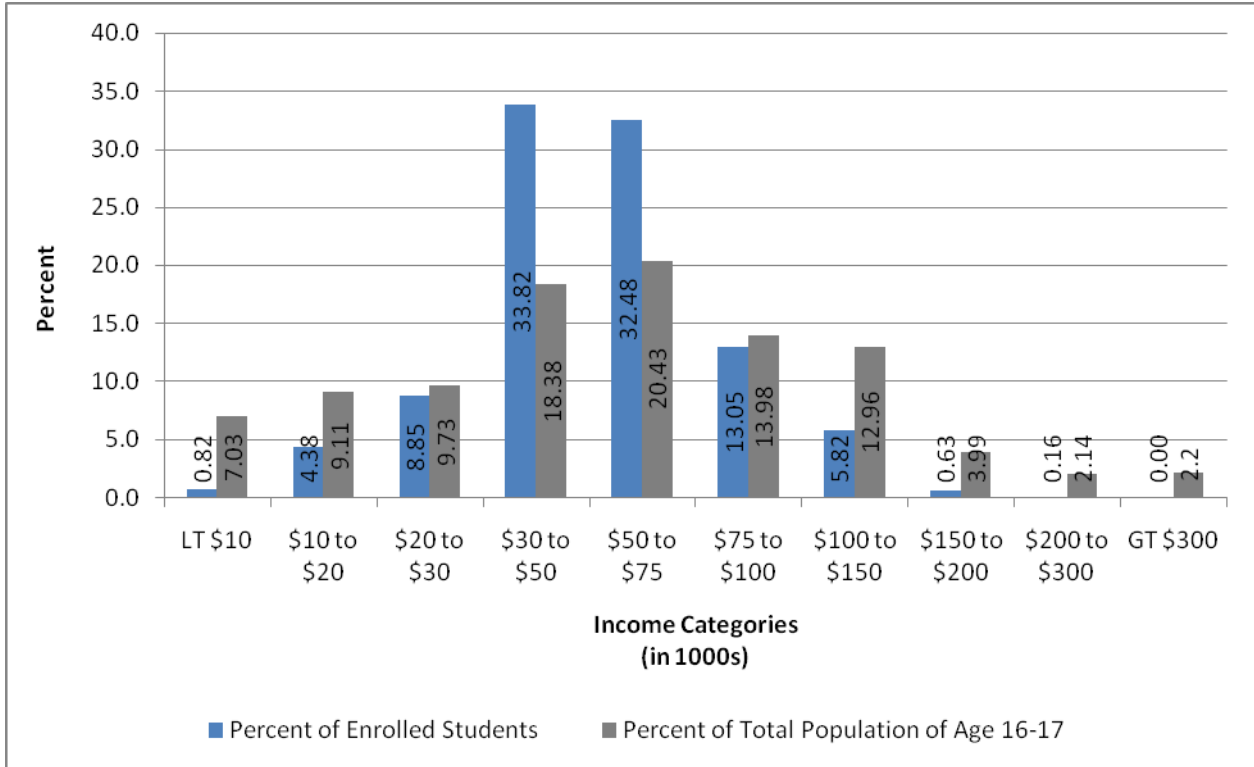
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income that might actually be used in a need-based aid program is likely to differ from Census-defined income. For example, it is expected that a need-based aid program will be based on adjusted gross income from the income tax return. Thus, one concern is whether the use of census-defined income will result in estimated program costs that significantly over- or under-report the likely program cost. However, we believe that the effect on the estimated cost of the aid program of this over- or under-reporting will be very small. For 2005, total household income in Georgia as reported by the Census was about 6 percent greater than total Federal Adjusted Gross Income (AGI). But the difference in the two incomes is likely to be much smaller for the student receiving aid than is implied by the aggregate difference. One of the major differences in the two measures is that the Census includes all social security income while only part of social security is included in AGI. In addition, income from tax exempt bonds is included in the Census income but is not included in AGI. Thus, much of the difference would be among retirees, who are not likely to have students attending college, and higher income households, whose students would not be eligible for aid. Thus, our estimated costs of need-based aid programs are expected to be close to the likely actual cost.

Figure 2 shows the distribution of assigned income for students enrolled in USG institutions and the distribution of Census income for households containing a 16 or 17 year old. The distribution of households with 16 or 17 year olds should reflect the income distribution of all households with college age students. As can be seen in Figure 2, low-income households are less likely to have students attending USG institutions. But recall from the discussion above that using median income within a census block group to represent the student's family income will understate the percent of students in very low and very high income categories.

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FIGURE 2. INCOME DISTRIBUTION OF STUDENTS AND OF HOUSEHOLDS WITH 16- OR 17-YEAR OLDS.



Pell grants, and most need-based aid programs in other states, use Expected Family Contribution (EFC) in determining the magnitude of aid provided. EFC is only calculated for families who complete the Free Application for Federal Student Aid (FAFSA), and in Georgia only those families applying for a Pell grant complete this form. When the HOPE Scholarship program was first started, families receiving a HOPE Scholarship were required to complete the FAFSA. But that requirement was dropped. Thus, the data do not exist that would allow us to base our estimates of program cost on EFC. However, Dynarski and Scott-Clayton (2006) show that using income and family size produces almost the same distribution of aid as using EFC. In other words, the other information that is provided on the FAFSA has very little effect in measuring the need for student aid. It is also the case that some states do not rely on EFC for their need-based aid program. Thus, we are comfortable using income rather than EFC to conduct our simulations.

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Using the assigned incomes, we simulated 25 alternative need-based student aid programs. There are three basic parameters that define these alternatives:

- the maximum aid;
- the phase-out income, which is the income level at which aid begins to be phased out;
- the maximum income, which is the income level at which no aid is provided.

A fourth factor is the rate at which aid is phased out. For the simulations, the aid programs were all designed so that aid phased out at a constant dollar rate for each dollar increase in income.

Figures 3 and 4 illustrate two alternative aid programs; call them Alternatives 12 and Alternative 17, respectively (the numbers refer to two of the 25 alternatives discussed below). For Alternative 12, the maximum aid is \$3,000, and any student with a family income below \$20,000 receives that amount of aid. As income increases, the amount of aid falls by \$150 for every \$1,000 increase in income. Thus, at an income at or above \$40,000 students would not be eligible to receive need-based aid.

For Alternative 17, the maximum aid is \$3,500, and any student with an income below \$15,000 receives this amount of aid. In this alternative, aid fall by \$233.33 for every \$1,000 increase in income. Thus, students with an income of \$30,000 or more would not be eligible for aid under this alternative.

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FIGURE 3. NEED-BASED AID DESIGN: ALTERNATIVE 12

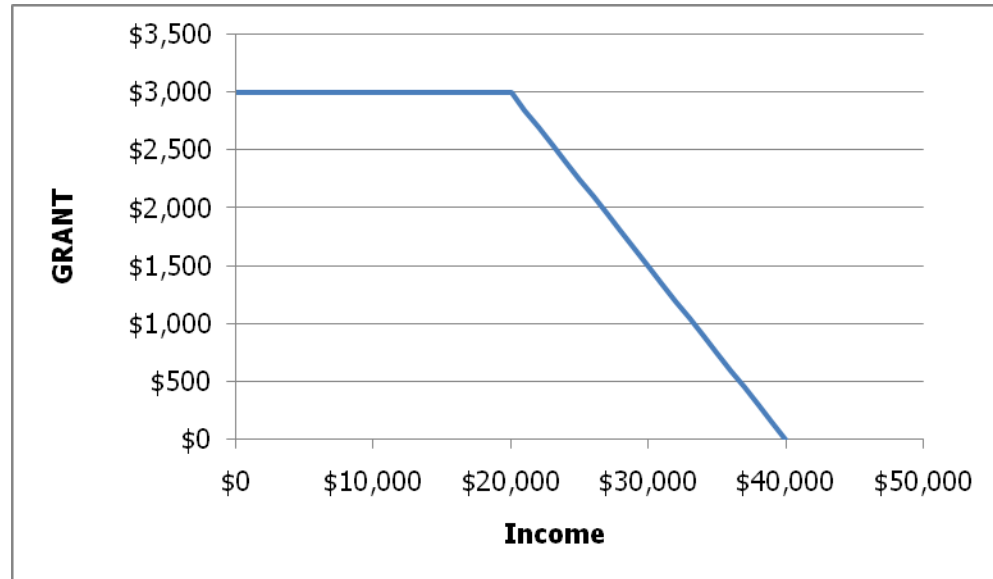
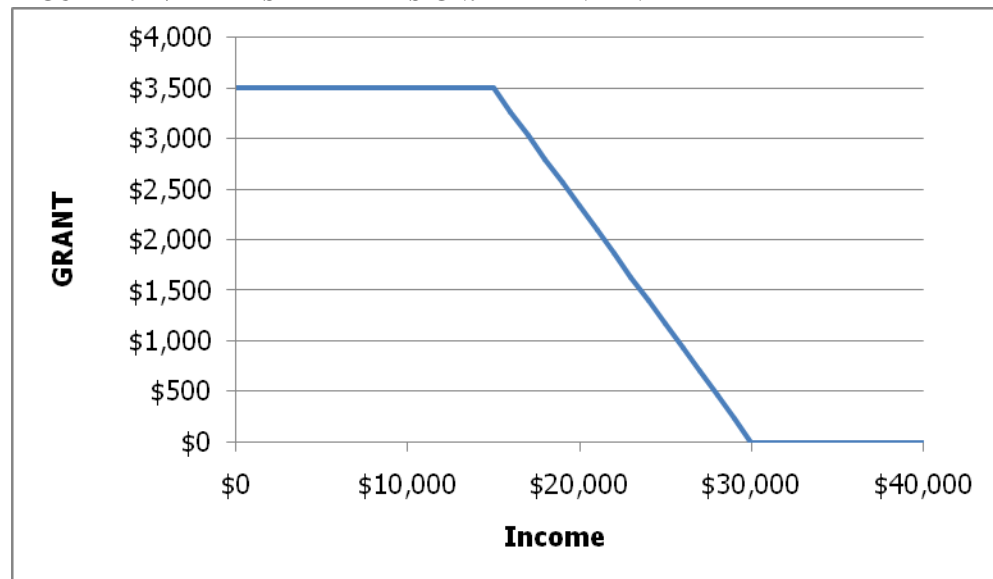


FIGURE 4. NEED-BASED AID DESIGN: ALTERNATIVE 17



For the 25 alternatives aid programs that we simulated we retained the linear phase-out pattern illustrated in Figures 3 and 4. Of course, it is possible to have a non-linear phase-out pattern. If the reduction in aid was slower than implied by the linear pattern, i.e., the reduction in aid was smaller when income first exceeded the income where the phase-out started, the cost of the program would be larger. At the

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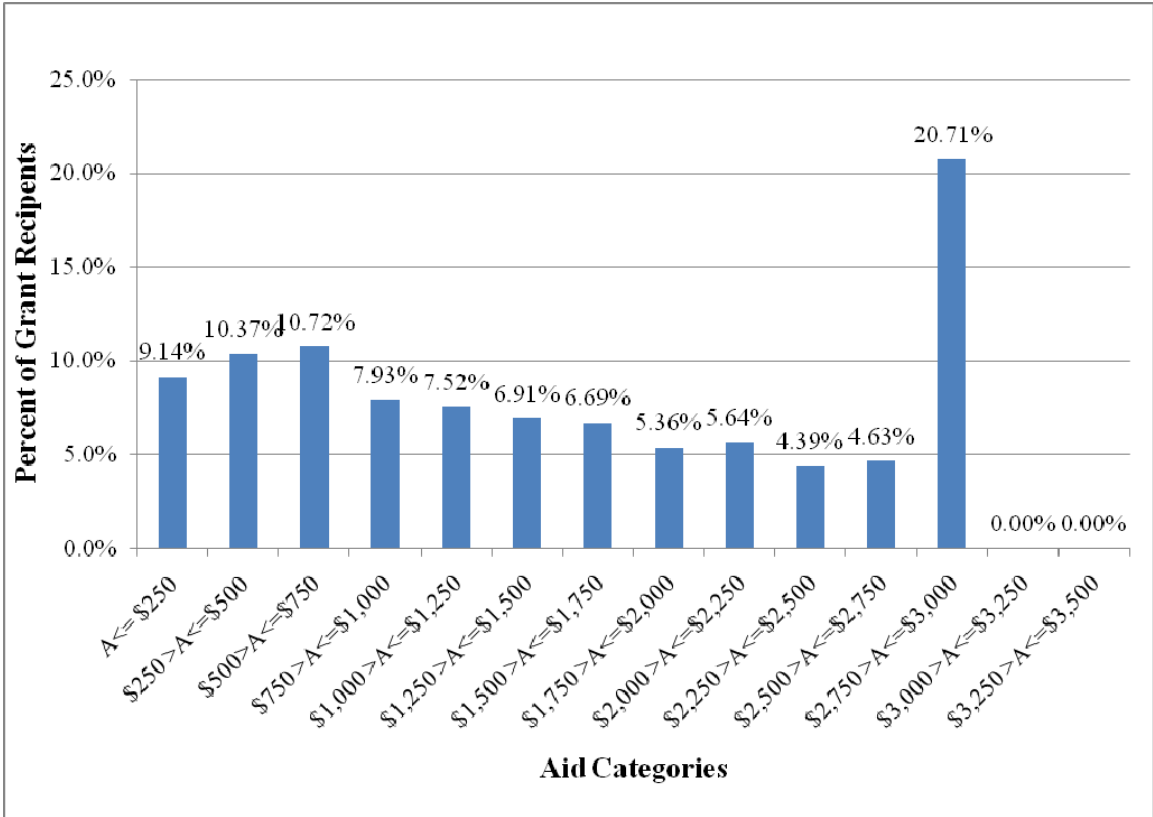
extreme, there could be no reduction in aid until the maximum income is reached, at which point aid would drop to zero. In that case, for Alternative 17 all students with income below \$30,000 would get \$3,500 and all students with an income equal to or greater than \$30,000 would get no aid. We believe it is important to have a gradual phase out, although there is nothing special regarding a linear phase-out schedule.

Given the linear phase-out, the cost of the need-based aid program depends on the values chosen for the three parameters. The cost of the aid program will be greater the larger the maximum aid, the greater the income at which the phase out begins, and the slower the phase out rate. The choice of the income at which the phase out begins and the rate of phase out also determine the distribution of aid levels.

We simulated Alternatives 12 and 17. Alternative 12 would cost an estimated \$83.9 million and would provide aid to 54,579 students, 17.1 percent of whom would receive the full \$3,000. Alternative 17 would cost an estimated \$58.4 million and would provide aid to 25,878 students, 36.0 percent of whom would receive the full \$3,500. Figure 5 shows the distribution of aid for Alternative 12, while Figure 6 shows the distribution for Alternative 17.

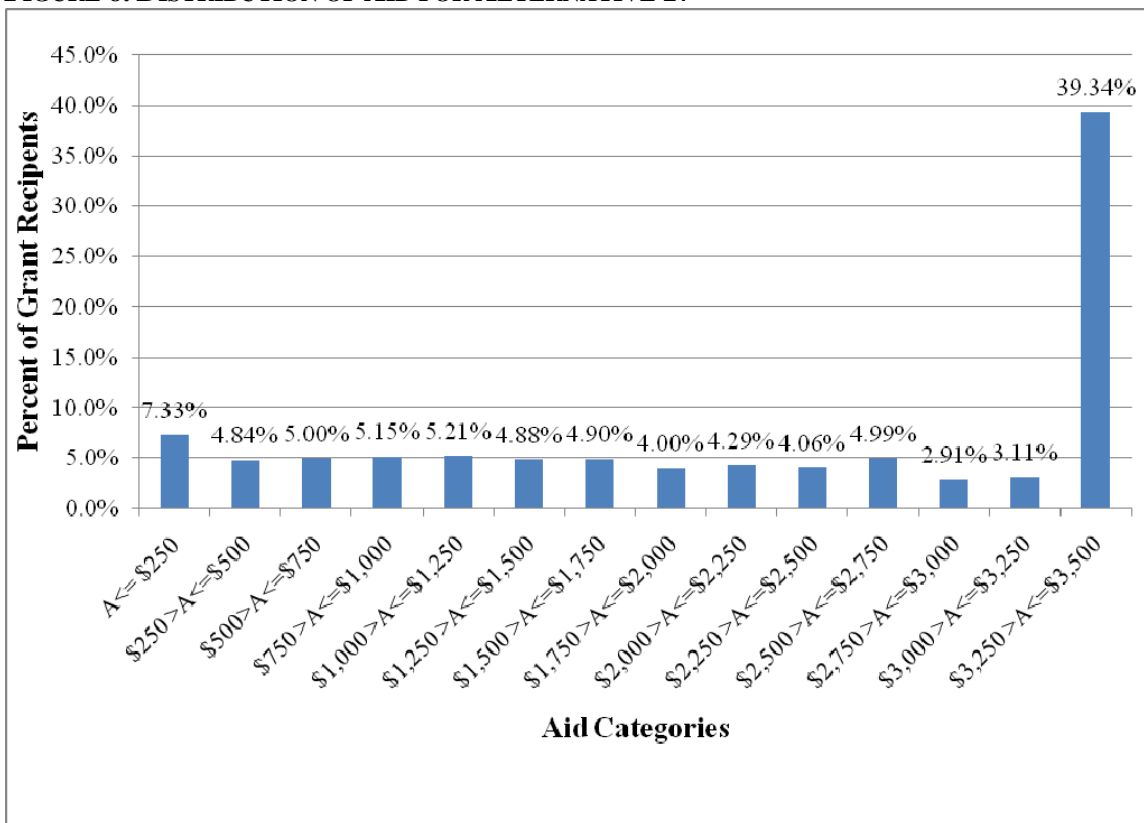
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FIGURE 5. DISTRIBUTION OF AID FOR ALTERNATIVE 12



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FIGURE 6. DISTRIBUTION OF AID FOR ALTERNATIVE 17



The difference in costs for these two programs is largely driven by the higher maximum income for Alternative 12. Alternative 12 allows students with an income of up to \$40,000 to receive aid while Alternative 17 cuts off eligibility at \$30,000. As seen in Figure 2, there are a substantial number of students with assigned incomes between \$30,000 and \$75,000. Thus, as eligibility extends beyond an income of \$30,000 the number of students receiving aid and the cost of the program increases substantially.

The number of choices of the three program parameters is, of course, endless. We selected 25 alternative sets of program variables that illustrate the effect on program cost and distribution of benefits from changes in the three parameters.

Table 27 presents the parameters, the estimated cost, the estimated number of students receiving aid, and the aid per student for students receiving aid for each of the 25 alternative program designs. Table 28 shows the distribution of students by the amount of aid received for selective simulations.

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TABLE 27. ALTERNATIVE NEED-BASED AID PROGRAMS SIMULATION RESULTS

Simulation	Maximum Aid	Phase-out Income	Maximum Income	Total Cost (in millions)	Number Receiving Aid	Aid per Student
1	\$2,500	\$15,000	\$25,000	\$24.4	16,223	\$1,505
2	\$2,500	\$15,000	\$30,000	\$33.6	25,878	\$1,299
3	\$2,500	\$15,000	\$40,000	\$59.4	54,579	\$1,087
4	\$2,500	\$20,000	\$25,000	\$31.5	16,223	\$1,941
5	\$2,500	\$20,000	\$30,000	\$41.7	25,878	\$1,613
6	\$2,500	\$20,000	\$40,000	\$69.9	54,579	\$1,280
7	\$3,000	\$15,000	\$25,000	\$29.3	16,223	\$1,807
8	\$3,000	\$15,000	\$30,000	\$40.3	25,878	\$1,559
9	\$3,000	\$15,000	\$40,000	\$71.3	54,579	\$1,305
10	\$3,000	\$20,000	\$25,000	\$37.8	16,223	\$2,329
11	\$3,000	\$20,000	\$30,000	\$50.1	25,878	\$1,935
12	\$3,000	\$20,000	\$40,000	\$83.9	54,579	\$1,536
13	\$3,500	\$15,000	\$25,000	\$34.2	16,223	\$2,108
14	\$3,500	\$15,000	\$30,000	\$47.1	25,878	\$1,818
15	\$3,500	\$15,000	\$40,000	\$83.1	54,579	\$1,523
16	\$3,500	\$20,000	\$25,000	\$44.1	16,223	\$2,717
17	\$3,500	\$20,000	\$30,000	\$58.4	25,878	\$2,258
18	\$3,500	\$20,000	\$40,000	\$97.8	54,579	\$1,792
19	\$4,000	\$15,000	\$25,000	\$39.1	16,223	\$2,409
20	\$4,000	\$15,000	\$30,000	\$53.8	25,878	\$2,078
21	\$4,000	\$15,000	\$40,000	\$95.0	54,579	\$1,740
22	\$4,000	\$20,000	\$25,000	\$50.4	16,223	\$3,105
23	\$4,000	\$20,000	\$30,000	\$66.8	25,878	\$2,581
24	\$4,000	\$20,000	\$40,000	\$111.8	54,579	\$2,048
25	\$3,000	\$25,000	\$50,000	\$145.7	88,308	\$1,649

Some general observations can be made:

- The number of students who receive aid depends entirely on the maximum income. All students with an assigned income below the maximum receive some aid, regardless of the maximum aid or the phase-out income.
- For any given set of phase-out and maximum incomes, the cost of the program increases by the same percentage as the increase in maximum aid. Note that the estimated cost of Alternative 7 is 20 percent larger than the cost of Alternative 1. The maximum aid increases from \$2,500 for Alternative 2 to \$3,000 for Alternative 7, which is a 20 percent increase.

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- As noted above, increasing the maximum income increases the cost significantly. This is evident by comparing the cost of Alternative 3 to that for Alternative 1.
- Given maximum aid and maximum income, increasing phase-out income increases the estimated cost; compare Alternative 1 to Alternative 4.

Table 28 presents the distribution of aid for 6 of the 25 alternative aid programs that we simulated; the number of the simulation in Table 28 refers to the alternative in Table 27. From the selected alternatives one can see how the distribution is affected by the program parameters. Increasing the phase-out income substantially increases the percentage of recipients who receive the maximum aid; compare the 23.6 percent who get between \$2,250 and \$2,500 in aid for Alternative 2 (with a phase-out income of \$15,000) to the 40.3 percent for Alternative 5 (with a phase-out income of \$20,000). Increasing the maximum income reduces the percentage getting the maximum aid; compare Alternatives 5 and 6.

TABLE 28. DISTRIBUTION OF AID FOR SELECTIVE SIMULATIONS

Aid Category	Simulation Alternatives					
	2	5	6	14	17	18
A ≤ \$250	12.7%	9.3%	11.1%	10.0%	7.3%	7.9%
\$250 > A ≤ \$500	10.8%	6.8%	13.2%	7.2%	4.8%	7.8%
\$500 > A ≤ \$750	10.2%	7.4%	10.7%	7.6%	5.0%	10.5%
\$750 > A ≤ \$1,000	9.6%	6.9%	8.7%	7.6%	5.1%	7.6%
\$1,000 > A ≤ \$1,250	8.6%	6.9%	8.9%	6.8%	5.2%	5.8%
\$1,250 > A ≤ \$1,500	7.8%	5.9%	7.6%	6.4%	4.9%	7.2%
\$1,500 > A ≤ \$1,750	5.8%	5.2%	6.7%	6.2%	4.9%	5.7%
\$1,750 > A ≤ \$2,000	6.2%	6.7%	6.1%	5.7%	4.0%	5.8%
\$2,000 > A ≤ \$2,250	4.7%	4.5%	5.6%	4.3%	4.3%	4.8%
\$2,250 > A ≤ \$2,500	23.6%	40.3%	21.3%	4.5%	4.1%	4.8%
\$2,500 > A ≤ \$2,750	0.00%	0.00%	0.00%	4.6%	5.0%	4.2%
\$2,750 > A ≤ \$3,000	0.00%	0.00%	0.00%	3.5%	2.9%	4.0%
\$3,000 > A ≤ \$3,250	0.00%	0.00%	0.00%	4.5%	3.1%	3.7%
\$3,250 > A ≤ \$3,500	0.00%	0.00%	0.00%	21.0%	39.3%	20.1%

These estimates of program cost assume no change in either the number of students who attend college or in the student retention rate. The data that we have do not permit us to estimate the magnitude of the effects on enrollment of the aid program. However, the existing studies reviewed in Section IV provide an estimate

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of the likely magnitude of the effect on enrollment from the aid program. Based on the research discussed in Section IV, we believe that a reasonable estimate of the increase in the enrollment rate for an aid program that provides an average aid of \$1,000 is between 6 and 12 percentage points. (The first percentage is based on the literature on the effect of an increase in college costs, while the second is based on the research of St. John et al [2004] and Heller [1999]). We also do not know the enrollment rate for those students who would be eligible for the aid program. We assume an enrollment rate of 40 percent, which is the number that Kane (2004) reports for students in the second income quartile. The per-recipient aid for most of the alternative programs that we simulated was between \$1,000 and \$2,000.

If the increase in enrollment is 6 percentage points and the enrollment rate is 40 percent, then an increase in aid of \$1,000 will increase the enrollment of students eligible for aid and the program cost by 15 percent. If the increase in enrollment is 12 percentage points and the enrollment rate is 40 percent, then an increase in aid of \$1,000 will increase the enrollment of students eligible for aid and the program cost by 30 percent. An increase in average aid of \$2,000 would, of course, double the percentage increase in enrollment and cost. We stress that these estimates of the effect on enrollment from student aid should be considered very rough approximations.

The effect of the aid program on attendance and retention rates will differ across recipients since the amount of aid differs across recipients, as seen in Table 24. And, of course the amount of aid provided to any recipient depends on the parameters of the need-based program.

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VII. Summary and Conclusions

In this report, we provide evidence regarding the large gap in college enrollment by family income, and that this gap appears to be growing. One way to address this income gap in college enrollment is to reduce the cost of college. The most cost-effective way of doing that is to target the reduction in the cost of college by developing a need-based student aid program. Existing evidence suggests that \$1,000 in student aid is associated with a 6 to 12 percentage point increase in enrollment of students eligible for aid, and that this effect is higher for students from lower income families.

Many states have a need-based student aid program. We surveyed nine of these programs and find that the average need-based award across states and institution types is approximately \$1,800. On average, these states serve approximately 24 percent of their student population, ranging from 13 percent in Tennessee to 32 percent in North Carolina.

In order to determine the cost of a need-based aid program for Georgia, we simulated 25 alternative aid programs. The programs differ in terms of the maximum aid that can be provided, the income level at which student aid begins to be phased out, and the rate at which aid is phased out. We also determined the number of students that would receive aid and the average level of aid.

Obviously, the cost of the program will depend on the parameters of the program. The cost of the 25 programs we simulated ranged from \$24 million to \$145 million. However, it would seem feasible to provide a significant need-based aid program that would address the needs of students from relatively low-income households for \$30 to \$40 million. Such a program would assist about 16 to 26 thousand students and provide average aid of \$1,600 to \$1,800, with a maximum of \$3,000. Such a program would be consistent with aid programs in some of the states we surveyed, but would be at the low end of the programs we surveyed. Increasing the maximum aid to \$3,500 would increase the cost by about \$5 to \$7 million.

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An Analysis of a Need-Based Student Aid Program for Georgia

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