

PRELIMINARY DRAFT
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The Consequences of Merit Aid

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Merit aid, a discount to college costs contingent upon academic performance, is not new. Colleges and private organizations have long rewarded high-achieving high school students with scholarships and tuition waivers. The privately-funded National Merit Scholarship program, established in 1955, awards grants to entering college freshmen according to performance on the PSAT. Colleges, especially private schools, have long used scholarships to capture students with strong academic credentials.

While merit aid has a long history at private colleges and foundations, it has not played a major role in the public sector. Historically, federal aid for college has been strongly focused on low-income students. Eligibility for the two largest federal aid programs, the Pell Grant and Stafford Loan, is determined by a complex formula that defines financial need on the basis of income, assets and family size. The formula is quite progressive: 90 percent of dependent students who receive federal grants grew up in families with incomes less than \$40,000.¹ Merit aid has played a similarly minor role at the state level. The vast bulk of state spending on higher education is delivered to students in the form of low tuition at public colleges and universities. These low sticker prices are made possible by the \$50 billion in subsidies that states annually provide their post-secondary institutions/. While most states have long had *some* form of merit aid program, it is generally offered to only the very highest-performing students. For example, the New York Scholarship for Academic Excellence gives \$1,500 to the top scorer on the Regents exam in each of the state's high schools, and the University of Massachusetts at Amherst offers valedictorians a free ride if they perform well on an achievement test.

¹ Calculated from data in National Center for Education Statistics (1998), Table 314.

The once-limited role of the public sector in awarding merit aid has expanded dramatically over the last decade. Since the early Nineties, more than a dozen states have established broad-based merit aid programs. Unlike the older state scholarships, the new merit programs require relatively modest academic performance in high school and provide scholarships to hundreds of thousands of students. Many require a high school grade-point average of 3.0 or above, not a particularly high threshold: in 1999, 40 percent of high school seniors met this standard.²

This new breed of merit aid differs from the old style in both its breadth and, plausibly, its effect on students' decisions. The old style of merit aid, aimed at top students whose decision to attend college is not likely contingent upon the receipt of a scholarship. By design, if not by intent, this elite form of merit aid goes to students whose operative decision is not whether to attend college, but which high-quality, four-year college to choose. By contrast, the new, broad-based merit aid programs are open to students with solid if not exemplary academic performance. Such students may be uncertain about whether to go to college at all. When offered a well-publicized, generous scholarship – the typical program pays full tuition and fees at public colleges – some of these students may decide to give college a try. For those who would have gone to college even without the scholarship, some may choose a four-year school over a two-year school, or a private school over a public school.

A typical example of this new breed of merit aid is Georgia's HOPE (Helping Outstanding Pupils Educationally) Scholarship. The HOPE Scholarship waives tuition and fees at Georgia's public colleges and universities for those residents who have recently graduated

² Author's calculations from the 1997 National Longitudinal Survey of Youth. As I will discuss later in the paper, this figure varies quite dramatically by race and ethnicity.

high school with a GPA of 3.0 or higher. Seventy-five thousand scholarships were awarded in the academic year 2000-2001. To get a sense of the breadth of HOPE's impact, note that almost all freshmen at the University of Georgia receive a HOPE Scholarship.

How does this new breed of student aid affect schooling decisions? Does merit aid increase college attendance or do the new programs simply transfer funds to students who would have attended college anyway? Further, does merit aid affect the choice of college? We have little evidence with which to answer these questions. In this chapter, I study the impact of merit aid by evaluating the Georgia HOPE Scholarship, the namesake and inspiration of many of the new state programs. I then extend the analysis to the other dozen states that also have broad-based, HOPE-like programs.

I particularly focus on how the effect of merit aid has varied by race and income. I focus on this distributional impact of merit aid for two reasons. First, merit aid is awarded based upon performance in the classroom and on standardized tests. For both of these outcomes, low-income, Black and Hispanic students have traditionally fared relatively poorly. For example, only 15 percent of Blacks and Hispanic high school students have at least a 3.0 GPA, while 40 percent of all students meet this standard. Similarly, racial and ethnic gaps in standardized tests scores are well-documented (insert cite – Jencks?). As a result, fewer Black and Hispanic students are eligible for the new merit aid programs. Second, provisions that govern the distribution of some states' merit aid programs intensify this distributional impact. Until recently, for example, Georgia reduced each student's HOPE Scholarship dollar-for-dollar by any need-based aid that she received. Many low-income students that managed to clear the requisite academic hurdles therefore found their efforts unrewarded by additional aid.

State Merit Aid: A Primer

Broad-based state merit aid became common in a very short span of time. In 1993, just two states, Arkansas and Georgia, had such programs in place. By 2002, thirteen states had introduced large merit aid programs. Most of this growth has occurred quite recently, with six programs starting up since 1999. As is clear from the map in Figure 1, merit aid is heavily concentrated in the southern region of the United States. Of the thirteen states with broad-based merit aid programs, eleven are in the South.

Table 1 summarizes the characteristics of the thirteen broad-based merit programs. As was discussed earlier, dozens of states have some form of merit aid in place. The thirteen state programs detailed in Table 1 have eligibility criteria sufficiently lenient that at least thirty percent of high school students are eligible for the award upon graduation. The Arkansas award requires a GPA of 2.5, a standard met by 60 percent of high school students nationwide.³ The state also requires a minimum on the ACT of 19. This score is exceeded by 60 percent of test-takers nationwide and is well below the Arkansas state average of 20.4.

Five other states (Louisiana, Mississippi, Nevada, South Carolina, and West Virginia) also condition eligibility on a minimum GPA and test score. Six states use only GPA to determine eligibility. Four states require a GPA of 3.0 or higher, while two make awards to those with a GPA of 2.5, a quite-low standard met by 60 percent of high school seniors nationwide.

³ Estimates of those meeting GPA thresholds are from NLSY97. There does not appear to be any substantial variation across geographic regions in student GPA, so the national data appear to provide a reasonable approximation of eligibility at the state level. These GPA estimates are used only for descriptive purposes and not in any of the paper's regression analyses.

Several of the states consider the GPA only in college preparatory classes, with Georgia imposing such a standard for the high school class of 2000.

Only one state – Michigan – bases eligibility solely on standardized test performance. Students who score sufficiently high on four subject tests receive a one-time award of \$2,500 if they choose to attend a Michigan college. For the class of 2000, 31 percent of Michigan students had scores sufficiently high to merit an award. However, this overall eligibility rate masks substantial heterogeneity: just 7.9 percent of African American students met the Michigan requirement. The Michigan program is now the subject of a lawsuit by civil rights groups. A similar suit was filed against the Arkansas program, which initially was based only on performance on standardized tests but was amended to include academic performance in high school.

The Michigan and Arkansas court cases point to a key characteristic of merit aid: it tends to channel dollars toward white, upper-income students. For merit programs that are based on standardized test performance, it is unsurprising to see, as in Michigan, a large gap in the eligibility rates of whites and African-Americans, since the correlation between standardized test performance and race is well-documented. However, even those programs with only a GPA cutoff are likely to produce large racial differences in eligibility. As discussed earlier, 40 percent of high school seniors have a 3.0 GPA or higher. However, only 15 percent of African Americans and Hispanics meet this standard. This suggests that the introduction of merit aid programs may have little impact on the schooling choices of African Americans and Hispanics. Further, if the new merit aid crowds out state spending on need-based aid or leads to higher tuition prices, the programs may actually *decrease* low-income, non-white college attendance,

since these populations will face the resulting cost increases but will be disproportionately ineligible for the new merit scholarships..

How might students respond to merit aid?

A subsidy to schooling costs is likely to affect not only who goes to college but where they choose to go. Some youth do not plan to attend college at all. Merit aid may push them into college, most likely into two-year schools. Others are set on attending a two-year school. HOPE may push them toward a four-year college, by driving down its relative cost.⁴ Still others are set on attending a four-year school out of state, and merit aid may push them to attend college within the state.⁵ The net impact of merit aid on the share of college-going youth attending two-year schools is theoretically ambiguous, since students are being both pushed into and out of two-year schools by the scholarship. By contrast, it is clear that HOPE should produce an increase in the share of students at four-year schools.⁶

Case Study: The Georgia Hope Scholarship

In 1991, Georgia Governor Zell Miller requested that the state's General Assembly consider the establishment of a state-run lottery, with the proceeds to be devoted to education.

⁴ Two-year colleges are generally cheaper than four-year colleges. The HOPE Scholarship makes them both free.

⁵ Students at four-year colleges, as compared to those at two-year schools, are more likely to be on the margin of attending out of state. Nationwide, about 25 percent of four-year college students go to school outside their home state, while only about 3 percent of two-year college students do so.

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The Georgia General Assembly passed lottery-enabling legislation during its 1992 session and forwarded the issue to voters, who approved the required amendment to the state's constitution in November of 1992. The first lottery tickets were sold in June of 1993. \$2.5 billion in lottery revenue has flowed into Georgia's educational institutions since 1993. The legislation and amendment enabling the lottery specified that the new funds were not to crowd out spending from traditional sources. While it is not possible to establish conclusively that such crowd-out has not occurred, spending on education has risen substantially since the lottery was initiated, both in absolute dollars and as a share of total state spending. Roughly equal shares of lottery funds have gone to four programs: the HOPE Scholarship, educational technology for primary and secondary schools, a new pre-kindergarten program, and school construction.

Residents who have graduated since 1993 from Georgia high schools with at least a 3.0 grade point average are eligible for HOPE.⁷ The first scholarships were disbursed in the fall of 1993. Participation in HOPE during its first year was limited to those with family incomes below \$66,000; the income cap was raised to \$100,000 in 1994 and eliminated in 1995. HOPE pays for tuition and required fees at Georgia's public colleges and universities. Those attending private colleges are eligible for an annual grant, which was \$500 in 1993 and had increased to \$3,000 by 1996. These amounts are offset by other sources of aid. A student who receives the maximum Pell Grant gets no HOPE Scholarship but receives a yearly book allowance of \$400.⁸ A \$500

⁷ The high school GPA requirement is waived for those enrolled in certificate programs at technical institutes. For high school seniors graduating after 2000, only courses in English, math, social studies, science and foreign languages will count toward the GPA requirement. More than 40 percent of those who currently receive the HOPE Scholarship would be ineligible under this definition.

⁸ As a result of this provision and the scaling back of the state's need-based State Student Incentive Grants (SSIGs), some low-income students have actually seen their state aid reduced slightly since HOPE was introduced (Jaffe, 1997). This contemporaneous shift in SSIG spending has the potential to contaminate the paper's estimates, especially the specifications in which low-income youth are used as a

education voucher is available to those who complete a General Education Diploma (GED). Public college students must maintain a GPA of 3.0 to keep the scholarship; a similar requirement was introduced for private school students in 1996.

Georgia education officials, concerned that students would forgo applying for federal aid once the HOPE Scholarship was available, created an application process designed to prevent this outcome. Those from families with adjusted gross incomes lower than \$50,000 must complete the Free Application for Federal Student Aid (FAFSA) in order to apply for HOPE; the rationale for the \$50,000 income threshold is that few students above that cutoff are eligible for need-based federal aid.⁹ The four-page FAFSA requests detailed income, expense, asset and tax data from the family. Those with family incomes above \$50,000 fill out a short, one-page form that requires no information about finances other than a confirmation that family income is indeed above the cutoff.

In 2000-2001, 75,000 students received \$277 million in HOPE Scholarships. Georgia politicians have deemed HOPE a great success, pointing to the steady rise in the number of college students receiving HOPE. The key question is whether the program is actually increasing college attendance or simply subsidizing students who would have attended college even in the absence of HOPE. In the next sections, I discuss the data and empirical strategy I will use to answer this question.

control group for upper-income youth. However, SSIG spending was so miniscule – \$5.2 million in 1995, before the program was scaled back – that the impact of its elimination on the estimates is likely inconsequential.

⁹ In 1995, only 3.7 percent of dependent students from families with incomes over \$40,000 received federal grant aid, while 57 percent of those from families with income under \$20,000 did so (National Center for Education Statistics, 1998a).

Data

Any empirical analysis of state financial aid policy quickly comes face to face with frustrating data limitations. Eligibility for merit aid is determined by a short list of characteristics: state of residence at the time of high school graduation, high school grade point average, standardized test score and, in some states, parental income. In order to determine the effect of the offering a merit scholarship, we need information on all of these attributes in order to impute merit aid eligibility. We would want these characteristics for repeated cohorts of high school students, both before and after merit aid is introduced in their state, so that schooling decisions of eligible and ineligible cohorts can be compared. Finally, we need a dataset with state-level samples large enough to allow for informative analysis.

No dataset meets all of these requirements, unfortunately. Surveys that are limited to college students, by their nature, do not allow us to examine the college attendance margin. For example, the National Postsecondary Student Aid Survey (NPSAS) surveys college students about their aid packages and contains detailed information from students' aid applications. By design, this dataset cannot inform us about those students who did *not* decide to go to college and the aid packages that they faced. Without making strong assumptions about how those who do not go to college differ from those who do, we cannot use NPSAS to examine how aid affects the college attendance margin.

NPSAS can be used to answer other questions of interest, however. For example, we might be interested in whether merit aid leads to higher tuition, or more or less government spending on other forms of aid. Or, we might be interested in how the racial composition of a state's schools changes, if at all, after the introduction of a merit aid program. NPSAS, as well as data that institutions gather about their students and report to the government through the

Integrated Postsecondary Data System (IPEDS), can answer questions of this type.¹⁰ Later in the paper, I use data from both IPEDS and the University System of Georgia to examine how HOPE has affected tuition policy and the student composition of Georgia's postsecondary schools.

The National Longitudinal Surveys of Youth of 1979 and 1997 are particularly rich sources of data, containing information about academic performance on standardized tests, grades, parental income, and schooling decisions.¹¹ In a few years, the NLSY97 will be a useful resource for evaluating the newer merit aid programs, in particular those that have been introduced since the late Nineties. The only weakness of the NLSY97 is that it is unlikely to interview enough youth in any one state to allow for detailed examination of a single merit aid program. Observations from multiple merit states could be pooled, however, as is done in some analyses in this paper, using a different data set, the Current Population Survey.

The CPS has sufficient observations within a given state to allow informative analysis of state-specific policies, at least for the larger states. The CPS is a national household survey that each October gathers detailed information about schooling enrollment. The CPS, while the best available resource for the purposes of this paper, has its weaknesses. First, it lacks information about academic performance. We therefore cannot narrow the analysis to those whose academic performance makes them eligible, and thereby measure the effect of offering a scholarship to those who are eligible. From a policy perspective, the question we *can* answer is quite interesting: How does a merit aid program affect the schooling decisions of a state's youth? The

¹⁰ Papers that use college-based surveys in this way include Long (2002) and Cornwell, Mustard and Sridhar (2002), both of which evaluate the Georgia HOPE Scholarship.

¹¹ The US Department of Education's longitudinal surveys of the high school cohorts of 1972, 1982 and 1992 contain similarly rich data. But because each survey contains a single cohort, we cannot use these data observe the schooling decisions of youth in a given state both before and after merit aid is introduced.

program's effect will be the product of two factors: 1) the responsiveness to the offer of aid of youth who are eligible, and 2) the proportion of youth who are eligible. As a specification check, however, it certainly would be useful to be able to examine whether the observed changes in schooling decisions are occurring among those who actually meet the merit aid eligibility criteria.

A second weakness of the CPS is that information about a youth's family background is not consistently available. Variables such as parental income are available only for those youth that appear on their parents' CPS record. A youth appears on her family's record for one of two reasons: she lives with her family or she is away at college. The probability that a youth has family background information available is therefore a function of her propensity to attend college. This form of sample selection will produce bias in analyses where college attendance is an outcome of interest.¹²

A third weakness of the CPS is that it explicitly identifies neither the state in which a person attended high school nor the state in which she attends college. In this paper, I proxy for state of origin using current state of residence. I will mis-measure state of origin for those who migrate out of state after college. This should not cause substantial problems, for two reasons. First, in a population this young, migration across state lines for reasons other than college is minimal. Second, when a youth *does* go out of state to college, CPS coding standards are that she is recorded as a resident of her state of origin, rather than the state in which she attends college. The question is whether these standards are followed in practice. We are confident that this protocol has been followed for those youth (78% of the sample) who appear on their parents'

¹² Cameron and Heckman (1999) discuss this point.

record.¹³ Whether the CPS adequately captures the correct state of residence for the other 22% is an important question.

If state of residence is simply a noisy measure of state of origin for these 22% of youth, then the paper's estimates will be biased toward zero. But consider the following scenario, which leads to a positive bias in the estimates. Say that HOPE has had no effect on the college entry margin, but only on whether students go to college in-state or out-of-state. If the CPS codes the state of residence as the state in which one is attending college, rather than the state in which one attended high school, then the drop in the migration of Georgia youth to out-of-state colleges will mechanically induce an increase in the observed share of Georgia residents attending to college, and the paper's estimates will be biased toward finding a positive effect of the HOPE Scholarship.

We do not need to give up on the CPS, however, as a few simple tabulations can give us a sense of whether this is a problem. If the scenario laid out in the previous paragraph holds, then we should observe a growth in the population of college-age Georgians after HOPE is introduced. The share of 18- to 19-year-olds from the Southeastern US who were identified as being from Georgia did grow by 1.7 percentage points after HOPE was introduced, from a base of 10.7 percentage points. But the same growth occurred among those who are too young for college: the share of 16- to 17-year-olds who were from Georgia grew 0.7 percentage points, from a base of 11.5. At worst, then, one percentage point ($=1.7-0.7$) of the estimates in the paper can be attributed to systematic error in the measurement of state of origin.¹⁴

¹³ We cannot restrict the analytical sample to this subset, however, because whether a youth is on her parents' record is correlated with whether she is in college, our outcome of interest.

¹⁴ Note that if there is mis-reporting of state of origin that is not systematic, then the estimates of the paper will simply be biased toward zero.

Georgia HOPE Results

I begin by examining how the college attendance rate has changed in Georgia since HOPE was introduced, compared to how it has evolved in the other southeastern states. The outcome of interest is whether an 18- to 19-year-old is currently enrolled in college. I start with a parsimonious specification, in which an indicator variable for being enrolled in college is regressed against a set of state, year and age effects, along with a variable, *HOPE*, that is set to one in survey years 1993 through 2000 for those who are from Georgia. In this equation, the *HOPE* variable therefore indicates that a young person of college age resides in Georgia after HOPE is in operation.

The estimating equation is as follows:

$$(1) \quad y_{iast} = \beta_0 + \beta_1 HOPE_{st} + \delta_s + \delta_t + \delta_a + \varepsilon_{iast}$$

y_{iast} is a indicator of whether person i of age a living in state s in year t is enrolled in college. δ_s, δ_t , and δ_a denote state, year and age fixed effects, respectively. ε_{iast} is an idiosyncratic error term. I use Ordinary Least Squares (OLS) to estimate this equation, correcting standard errors for heteroskedasticity and correlation of the error terms within state cells.

Column 1 of Table 2 show the results. The estimate indicates that the college attendance rate in Georgia rose 7.1 percentage points relative to the other Southeastern states after HOPE was introduced. The estimate is highly significant, with a standard error of 0.9 percentage points. This estimate is quite close to the estimate in Dynarski (2000), which was based on CPS data for 1989 through 1997.¹⁵

¹⁵ The standard error is substantially smaller, however. In Dynarski (2000), standard errors were conservatively corrected for correlation at the state-year level. Bertrand, Duflo, and Mullainathan (2001) conclude that, in this type of application, the appropriate correction is for correlation at the state level.

I next probe the robustness of this result by adding a set of covariates to this regression. For reasons discussed earlier, I limit myself to covariates that are available for the entire sample and exclude any that require that a youth and her parents appear on the same survey record, such as parental education and income. Control variables indicate whether a youth lives in a metropolitan area, is African-American, or is Hispanic. These three variables are each interacted with a full set of year effects, so that the effect of these attributes on schooling decisions is allowed to vary flexibly over time. I also include the state's unemployment rate and the median income of families with children who are near college age. These two variables are intended to capture any Georgia-specific economic shocks that may have affected college attendance decisions.

Finally, I interact the *HOPE* variable with measures of whether a state bordering Georgia has a merit program of its own. During the years after Georgia introduced the HOPE program, two neighboring states – Florida and South Carolina – started their merit aid programs. If these programs tend to keep students in their home states, then the introduction of a program in Florida, for example, should reduce the competition for positions in schools in Georgia and increase the competition for positions in Florida. Both of these effects will plausibly affect the and thereby affect the schooling decisions of Georgians.

The estimating equation is as follows:

$$(2) \quad y_{iast} = \beta_0 + \beta_1 HOPE_{st} + \beta_2 HOPE_{st} \times one_border_{st} + \beta_3 HOPE_{st} \times two_border_{st} + \beta_4 X_{st} + \beta_5 X_i + \delta_s + \delta_t + \delta_a + \varepsilon_{iast}$$

Here, β_1 is intended to capture the effect of HOPE when no neighboring states have their own merit aid programs, while β_2 and β_3 capture the additive effect of having a merit program in one and two neighboring states, respectively. Note that since the border state variables are simply linear functions of time (*one_border* and *two_border* are indicator variables set to one in survey years after 1997 and 1998 respectively), these estimates confound the effect of having

merit programs on one's border with any other variation over time in the effect of HOPE on schooling decisions.

The estimate of the effect of HOPE when no border programs are in place is 7.5 percentage points, with a standard error of 1.5 percentage points. After Florida's program was introduced in 1997, the effect appears to have dropped moderately, by 3.5 percentage points. This estimate is quite imprecise, however. There is no discernible effect after the introduction of South Carolina's program.

I next examine more closely the timing of the relative rise in Georgia's attendance rate. A sharp relative increase in attendance rates in Georgia in the years after 1993 is consistent with the hypothesis that HOPE induced the increase in college-going that the previous regressions have picked up. By contrast, a slow relative rise in Georgia's attendance rates that begins before HOPE was introduced suggests that HOPE is not responsible for this increased attendance. It should be said at the outset that the small size of the year-state cells in the CPS sample makes this a suggestive exercise, as it is quite difficult to differentiate within-state changes in attendance rates that are due to a program change and those that are due to random noise.

In Column 3, I loosen the specification by allowing the effect of HOPE to vary by year, rather than constraining the effect to change only at the introduction of a program in a border state. Instead of including the *HOPE* dummy, along with its interactions with the border state variables, I include a Georgia dummy interacted with a set of time effects. These time dummies indicate whether the HOPE Scholarship has been in place for one to two years, three to four years, or five or more years. A symmetric set of interactions that indicate the years *before* HOPE's introduction are also included. The omitted interaction is that of the Georgia dummy with the year 1992.

The strongest case for a causal effect of HOPE on college attendance decisions could be made if the coefficients indicating the years before HOPE were small and insignificant. This would suggest that Georgia and the rest of the southeast were moving together in their college attendance rates before HOPE was introduced, thereby making the southeast a suitable

comparison group for the analysis. This, however, is not the case. The results do indicate that, in the three to four years prior to HOPE's introduction (1988 and 1989), the difference between the college attendance rate in Georgia and that in the rest of the Southeast was about the same as it was in 1992, the last year before HOPE's introduction. However, in the next two years (1990 and 1991), there was a pronounced relative dip of about six percentage points in Georgia's college-going rate. In the last year before HOPE was introduced, Georgia recovered from this dip, and then attendance continued to rise, by 2 percentage points in the first two years of the program, and by another 4.6 [=6.6-2.0] percentage points in the next two years. The effect fell substantially, by 3.8 percentage points [=2.8-6.6] during the last three years of the sample, which correspond to the years in which Florida and South Carolina introduced their own programs.

The largest increase in this series is in 1992, a year *before* HOPE was introduced. A benign explanation is that this is noise induced by the relatively small state-year cells. A less benign interpretation is that in 1992 an upward trend in attendance began in Georgia, and that the subsequent years' growth is attributable to this pre-existing trend rather than to HOPE.

A conservative approach is to exclude these two years from the data, using the remaining pre-HOPE years as our baseline. The result (not shown) is that the estimated effect of HOPE is diminished, but not erased, dropping to 4.0 percentage points (with a standard error of 1.6).

Effect of HOPE on School Choice

I next examine whether HOPE has affected decisions other than college entry. In particular, I examine the type of college that a student chooses to attend. The October CPS contains information about whether a student attends a public or private college, and whether it is a two- or four-year institution. I use this information to construct four variables that indicate whether a person attends a two-year private school, a two-year public school, a four-year private school, or a four-year public school. I then run a series of four regressions in which these are the outcomes, using the specification of the previous table. The results are shown in Table 3.

HOPE appears to increase the probability of attendance at four-year public institutions by about three percentage points, and that of attendance at four-year private schools by about two percentage points. There is a somewhat smaller rise in the probability of attendance at two-year private schools (1.6 percentage points) and a drop of about the same size at two-year public schools, though the last estimate is not statistically significant. These shifts are all in the expected direction. HOPE appears to push some students into college, most likely to two-year institutions. Others are induced to go to a four-year school, rather than a two-year school. The net effect of movement along these various margins is an overall increase in the attendance rate between 4.0 and 7.0 percentage points.¹⁶

We might expect that HOPE would also affect whether students choose to attend college in their home state. Data from both the data from the University System of Georgia (USG) and the Department of Education's Residence and Migration Survey suggest that HOPE has had the effect of encouraging Georgia residents who would have attended a four-year college out of state to stay in Georgia instead. Data from the Residence and Migration Survey indicate that in 1992 about 5,000 Georgians were freshmen at two- and four-year colleges in the states that border Georgia. This represented an average of 3.4 percent of the border states' freshmen enrollment. By 1998, just 4,500 Georgians crossed state lines to enter college in the border states, accounting for an average of 2.9 percent of freshmen enrollment in those states. This drop in migration was concentrated in a group of border schools that have traditionally drawn large numbers of Georgians. At the ten border schools drawing the most Georgia freshmen in 1992, students from Georgia numbered 1,900 and averaged 17 percent of the freshman class. By 1998, the ten top

¹⁶ Note that the coefficients for the four schooling regressions do not add to seven percentage points, the overall attendance effect. This is because the type of school is unknown for some student, and they therefore do not appear as attending any type of school.

destinations enrolled 1,700 Georgians, who represented nine percent of freshman enrollment. Jacksonville State College in Florida, for example, drew 189 Georgian freshmen in 1992 and only 89 in 1998; the share of the freshman class from Georgia dropped from 17 to 11 percent.

Further supporting the conclusion that Georgia's four-year college students are now more likely to attend college in state is a shift in the composition of Georgia's four-year colleges. In Figure 4 shows data from the USG on the share of freshmen enrollees that are Georgia residents at Georgia's two- and four-year public colleges. The data are separately plotted for the two-year, four-year and the elite four-year colleges in the state. Here we see a definite shift toward Georgia residents since HOPE was introduced, with the effect most pronounced at four-year colleges (especially the top schools) and least evident at the two-year schools. This pattern fits with our understanding that four-year students are most mobile when making college attendance decisions.

The Effect of Broad-Based Merit Aid in Other States

The Georgia program was one of the first, largest, and most well-publicized merit aid programs. I now turn to whether the experience in Georgia is distinct from that in other states. I do so by pooling data from all fifty states and the District of Columbia and conducting an analysis analogous to that done for Georgia. I create a variable that indicates whether a merit program is in place in a given state and a given year, and run regressions that include the same set of covariates used in the previous section. I focus on the states, including Georgia, that are listed in Table 1. West Virginia is excluded from the analysis because their first cohort of award recipients did not enter college until the fall of 2002, which is too recent for the CPS survey data to detect.

The approach is that of the Georgia analysis, except that the entire US is included in the analysis and rather than a HOPE dummy, a merit dummy indicates a state and survey year in which a merit program is in place. The college attendance results are in Table 4. In the first column is a regression which includes only state and year fixed effects, plus an indicator variable for whether a merit program is in place in that state and year. The coefficient on this variable is 3.4 percentage points with a standard error of 1.5, indicating a moderate overall effect of these programs on college attendance. Adding covariates, as in Column (2), does not alter this conclusion. As was the case in Georgia, there is a pre-program dip in the attendance rate in merit aid states. Column (3) indicates that in the years preceding the introduction of a merit aid program, relative attendance is two percentage points below its level immediately preceding introduction. Attendance does not recover until the third and fourth years after the program has been introduced.

We may be concerned that the rest of the US does not provide a valid counterfactual for the merit states. Perhaps the merit states are on a very different trajectory from that of the rest of the US, which would bias the estimates. In order to address this concern, I next limit the analysis to those states that have introduced a merit program by the fall of 2000, the last survey year in my data.

In this analysis, the effect of merit aid is identified from the timing of the introduction of each state's program. The staggered rollout of merit aid across the states makes this approach possible. Figure 5 graphically illustrates the identification strategy. During the first years of the sample (1988-90), before the first merit state is introduced, all of the states are in the control group. In 1991, Arkansas moves into the treatment group, followed in 1993 by Georgia. By 2000, all of the states are in the treatment group. This approach assumes that the states that

eventually have a merit program are on similar trends in the schooling outcomes of young people. The assumption is that the year in which each state's merit program begins is quasi-random, uncorrelated with any state-specific trends in or shocks to schooling decisions.

Results are in Table 4B. They are not substantially different from those of Table 4A, in which all of the US states were included. In Table 5, I examine the effect of the merit programs on school choice. Results are shown for the two identification strategies, one using the entire US and the other limited to the merit states. The table reveals that the small impact of the merit programs on overall attendance masks substantial shifts in the type of college attended. As was true in Georgia, attendance at two-year public institutions drops, while attendance at four-year public schools rises substantially. Private school attendance appears to be relatively unaffected.

The Differential Impact of Merit Aid on African Americans

The effect of merit programs may vary by race for a number of reasons. First, as was discussed earlier, academic performance in high school and race are strongly correlated. A far smaller proportion of African Americans than whites will be eligible for HOPE, for example, since only 15% have a GPA of 3.0 or above. Second, the rules of the programs are sometimes such that they are likely to have a lesser impact on low-income youth. Until recently, Georgia did not offer the grant to those youth who had substantial Pell Grants and low college costs. Mechanically, then, the program would have had a lower impact on African Americans, who tend to have lower incomes. In Georgia, 94 percent of African-American and 62 percent of white 16- to 17-year-olds live in families with incomes less than \$50,000.¹⁷ The numbers for the rest of the United

¹⁷ Note that this refers to the nominal income distribution. This is appropriate, since the Georgia rules are written in nominal rather than real terms.

States are similar.¹⁸ Third, states that have merit programs may shift funds away from need-based aid or appropriations to colleges, which hold down tuition prices. Both of these effects would tend to make college more expensive, especially for those who don't qualify for the merit programs to which the money is being channeled.

To explore how the effect of merit aid programs varies by race, I repeat the analysis of the preceding sections, but now allowing the effect of merit aid to differ across racial and ethnic groups. I divide the population into three, mutually exclusive categories: Hispanics (of any race), Black non-Hispanics, and white non-Hispanics and estimate the effect of merit aid separately for each one. The estimating equation is:

$$(3) \quad y_{iast} = \beta_0 + \beta_1 Merit_{st} \times whitenh_i + \beta_2 Merit_{st} \times blacknh_i + \beta_3 Merit_{st} \times hisp_i + \beta_4 X_{st} + \beta_5 X_i + \delta_s + \delta_t + \delta_a + \varepsilon_{iast}$$

Note that there is no merit main effect, nor excluded racial/ethnic group. The estimates are directly interpretable as the effect of merit aid on each of the three groups.

Results are in Table 6. The estimated effect of HOPE on the white attendance rates is 9.0 percentage points, while that on African Americans is 3.5 percentage points and Hispanics -3.9 percentage points, though this last estimate is quite imprecise. Whites appear to shift toward four-year public schools and away from two years schools, while Blacks shift toward private schools, especially four-year private schools. For Hispanics, the only significant coefficient indicates movement away from two-year public schools. HOPE does appear to have increased racial and ethnic gaps in college attendance. The Georgia program's unusual impact is likely traceable to its aid crowd-out provision, now eliminated, which excluded low-income students from eligibility for HOPE. In the last panel of Table 6, I examine racial heterogeneity in the

¹⁸ These figures for the share with income below \$50,000 may appear high. This is because the unit of observation is not the family but the child. Since lower-income families have more children, the distribution of family income within a sample of children has a lower mean than the distribution of family income within a sample of families.

effect of all of the merit programs *but* HOPE, in order to get a sense of whether HOPE is unique in its distributional effects. Indeed, I find that other merit programs have had the same small and insignificant effect on attendance of Blacks and whites (0.7 and 0.9 percentage points, respectively). The effect on Hispanics is positive and large but imprecise. In states other than Georgia, the effect of merit aid on choice is also less heterogeneous across groups, with all groups seeing an increase in the probability of attending a four-year public school.

The weakness of this comparison is that the various, non-HOPE programs differ along many dimensions, so we don't know what aspect of HOPE drives its differential effect. A case-study approach might be more instructive in this instance. Florida's Bright Futures program is fairly similar to HOPE, and so comparing the effects of the two programs may be illuminating.

Bright Futures is close to HOPE in scale and design, with some key differences. First, it does not have the aid crowd-out provision that characterized HOPE during the period under analysis. The program would therefore be expected to have a greater impact low-income youth, among whom Blacks and Hispanics are heavily represented. Second, Florida's college GPA required for scholarship renewal is lower than the high school GPA required for initial eligibility. In Georgia, one needs a 3.0 in high school to qualify for HOPE and a 3.0 in college to keep it. Florida's GPA requirement is 0.25 lower for high school than college. This provision may increase persistence among marginal students.

Finally, Florida requires a minimum performance on the ACT or SAT in order to qualify for Bright Futures. For purposes of comparison with Georgia, this is unfortunate, since it makes it more difficult to pinpoint the reasons for any divergence between the effects of the two states' programs. However, the test score cutoff is relatively low: 20 on the ACT or 970 on the SAT to qualify for a Merit award. This is below the Florida ACT mean (20.4) but above the national

ACT mean for Blacks of 16.9. I estimate that roughly 60% of whites and 25% of Blacks score above the Bright Futures ACT cutoff of 20.¹⁹

The middle panel of Table 6 shows the estimated effect of Bright Futures. Here we see a zero impact on the attendance of whites but large, positive and highly significant effects on the attendance of Blacks and Hispanics. All groups, but especially Blacks and Hispanics, move toward four-year public schools in Florida after Bright Futures is introduced

Discussion

Three findings emerge from the empirical analysis. First, Georgia HOPE's large and positive impact on the college attendance rate appears to be exceptional. Overall, the other state programs have had no discernible impact on the college attendance rate. Second, HOPE's distributional impact, too, appears to be exceptional. The other merit programs have not expanded their states' racial gap in college attendance. Third, all of the programs have had a significant impact on college choice, with students, on net, moving toward four-year public schools and away from two-year public schools.

Before I discuss the implications of these findings, a disclaimer is in order. In the interests of statistical power, the analysis has lumped together quite disparate programs. The various programs differ in their eligibility criteria, their generosity, and their age. Ideally, the empirical analysis would allow us to separately identify, for example, the effect of a program with test-based eligibility criteria from the effect of one with grade-based eligibility. The state-

¹⁹ Estimate of share of group j whose ACT exceeds 20 = $\Phi\left(\frac{20 - \bar{X}_{FL}^j}{\sigma_{US}}\right)$. While ACT means by race and state are readily available, standard deviations only appear to be available at the national level.

year cells, however, are too small to allow for any statistical precision in such an analysis.²⁰ This lack of precision is quite frustrating, as it limits the paper's usefulness for policymakers seeking to design a merit aid program given a certain set of goals.

That said, the results support some plausible hypotheses about how merit aid operates. Merit aid does not, by its nature, widen racial gaps in college-going. It appears that a program can actually close racial and ethnic gaps in college attendance, as has occurred in Florida. [more discussion...]

The Future of Merit Aid

How will the effect of merit aid evolve over time?

Ten states now have these programs; they are especially prevalent in the Southeast (see Figure 1). The Georgia HOPE results give us the effect of merit aid program for a "first mover." What is the effect when a new merit program is introduced by a state whose neighbors already have such programs? Relatively muted. The Georgia program, for example, has left less room for out-of-state students at Georgia's top public universities. As a result, students in neighboring states were forced to either stay in their home states or a state other than Georgia. As an increasing number of states put in place programs that encourage in-state attendance, even students in non-merit states will find themselves induced to stay at home by the curtailment of available seats in merit states for out-of-state students.

²⁰ I have tested specifications that replace the merit aid dummy with various measures of its eligibility requirements, including continuous and discrete measures of the required high school GPA, test score, and college GPA. Standard errors in these specifications are too large to allow for any clear conclusions.

How will the recession affect merit aid?

State merit aid programs have grown rapidly over the past decade, a period characterized by strong economic growth and overflowing state coffers. Recently, merit programs have begun to feel the pinch of the economic downturn. As state legislators struggle to balance their budgets, merit aid programs dependent upon legislative appropriations (Arkansas, California, Louisiana, Maryland and Mississippi) find themselves in direct competition with other state priorities such as elementary and secondary education and health care. Arkansas, the first state to introduce a broad-based merit aid program, has temporarily closed the program to new enrollees. While current scholarship recipients can renew their awards, no new students are being admitted to the program. Funding for Louisiana's program barely avoided the chopping block during the state's last legislative session.

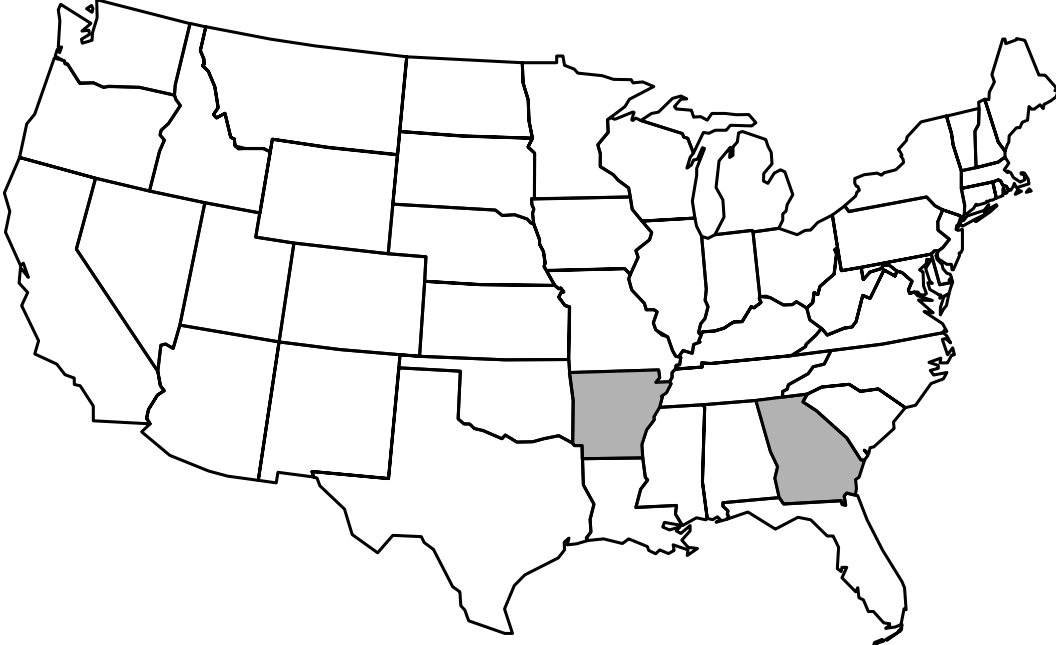
Those merit programs with committed revenue streams have been relatively buffered from the economic and political effects of the recession. Six states (Florida, Georgia, New Mexico, West Virginia, South Carolina and Kentucky) fund their programs with revenues from a state lottery, while two (Nevada and Michigan) use funds from the tobacco litigation settlement. With their dedicated funding sources, merit aid in these states is not vulnerable to legislators seeking to cut spending in the face of sinking tax revenues. This puts merit aid in a unique position, since other sources of funding for higher education at the state level are not protected in the same way. Public universities are experiencing leaner times this fiscal year as their state appropriations are reduced. Aid for low-income students is also vulnerable. West Virginia's need-based aid program could not deliver scholarships to all those low-income students who were eligible during the 2002-2003 academic year. The same year, the state's new merit program, which has no income cap, was launched with full funding.

A similar pattern has emerged at the federal level. The fastest-growing subsidies for college students – tax credits, savings tax incentives, and loans – are open to families with quite high incomes. All of these are also entitlement programs, which, like merit aid programs with dedicated funding streams, are not contingent upon legislative appropriations. By contrast,

spending on the need-based Pell Grant program, which funds the most needy students, is determined by annual legislative appropriation. At both the state and federal level, then, there has emerged a set of policies that put subsidies for the well-off on a firmer footing than aid for those with low incomes.

Figure 1: States with Broad-Based Merit Aid Programs

1993



2002

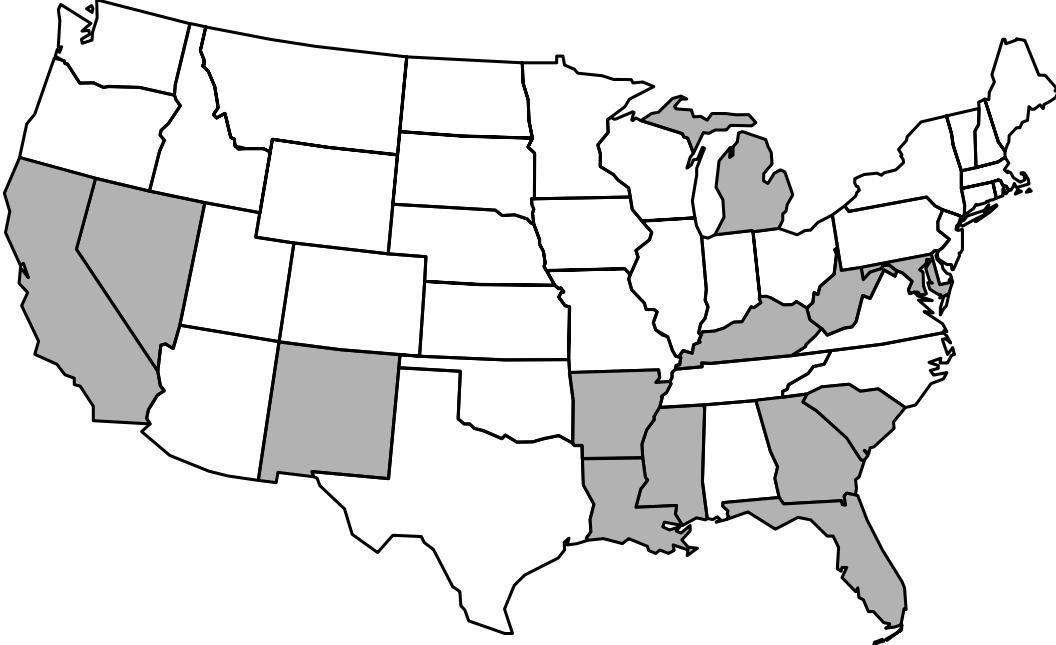
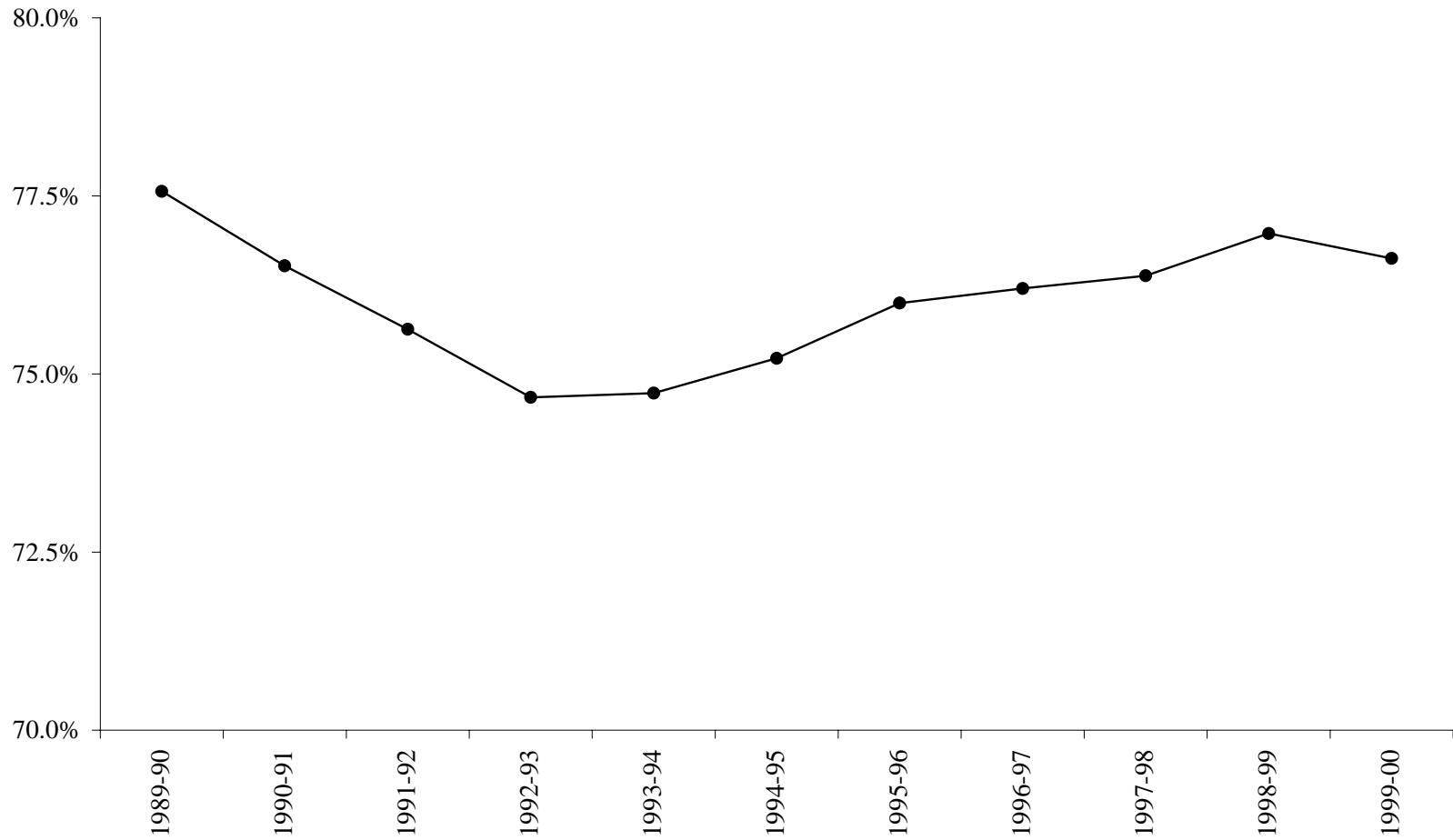


Figure 3:
University System of Georgia Students
Share of Georgia Residents Enrolled in Four-Year Colleges



Graphed is the share of USG students from Georgia who are enrolled in four-year colleges. Source: University System of Georgia Ten-Year Enrollment Report, various years.

Figure 4:
University System of Georgia Students
Georgia Residents as Share of Total Enrollment

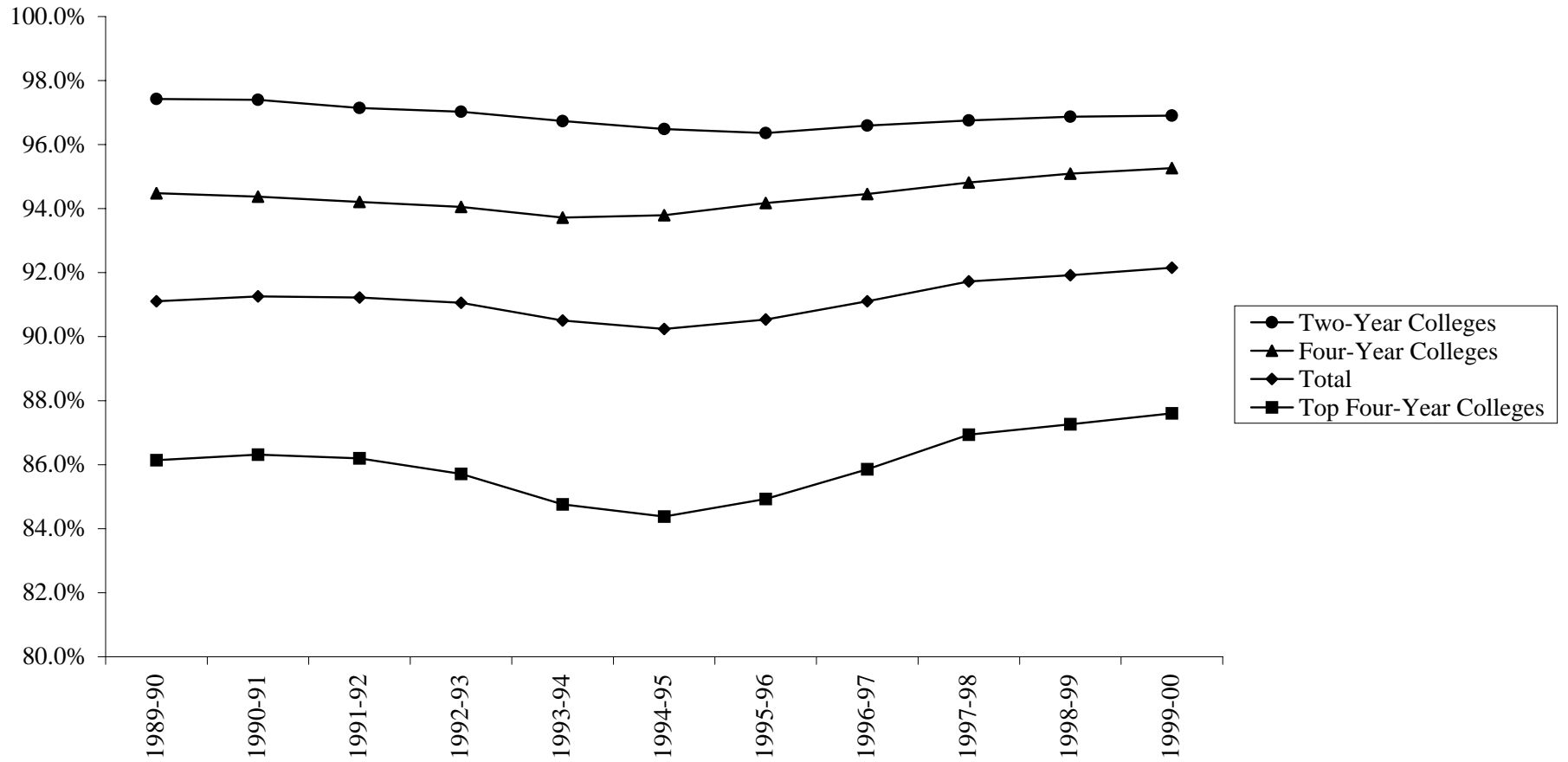


Table 1: Merit Aid Program Characteristics, 2002

State	Start	Eligibility	Award <i>in-state attendance only, exceptions noted</i>
Arkansas	1991	initial: 2.5 GPA in HS core & 19 ACT renew: 2.75 college GPA	public: \$2,500 private: same
Florida	1997	initial: 3.0-3.5 HS GPA & 970-1270 SAT/20-28 ACT renew: 2.75-3.0 college GPA	public: 75-100% tuition/fees* private: 75-100% avg public tuition/fees*
Georgia	1993	initial: 3.0 HS GPA renew: 3.0 college GPA	public: tuition/fees private: \$3,000
Kentucky	1999	initial: 2.5 HS GPA renew: 2.5-3.0 college GPA	public: \$500-3,000* private: same
Louisiana	1998	initial: 2.5-3.5 HS GPA & ACT > state mean renew: 2.3 college GPA	public: tuition/fees + \$400-800* private: avg public tuition/fees*
Maryland	2002	initial: 3.0 HS GPA in core renew: 3.0 college GPA	2-yr school - \$1,000 4-yr school - \$3,000
Michigan	2000	initial: level 2 of MEAP or 75 th pctile of SAT/ACT renew: NA	in-state: \$2,500 once out-of-state: \$1,000 once
Mississippi	1996	initial: 2.5 GPA & 15 ACT renew: 2.5 college GPA	public fresh/soph: \$500 public jr/sr: \$1,000 private: same
Nevada	2000	initial: 3.0 GPA & pass Nevada HS exam renew: 2.0 college GPA	public 4 yr: tuition/fees (max \$2,500) public 2-yr: tuition/fees (max \$1,900) private: none
New Mexico	1997	initial: 2.5 GPA 1 st semester of college renew: 2.5 college GPA	public: tuition/fees private: none
S. Carolina	1998	initial: 3.0 GPA & 1100 SAT/24 ACT renew: 3.0 college GPA	2-yr school - \$1,000 4-yr school - \$2,000
W. Virginia	2002	initial: 3.0 HS GPA in core & 1000 SAT/21 ACT renew: 2.75-3.0 college GPA	public: tuition/fees private: avg public tuition/fees

*Amount of award rises with GPA and/or test score.

Table 2:
Estimated Effect of Georgia Hope Scholarship
on College Attendance of 18-19-Year-Olds
 October CPS, 1988-2000
Southeastern States

	(1)	(2)	(3)
HOPE Scholarship	.071 (.009)	.075 (.015)	
HOPE*Merit Program in 1 Border State		-0.035 (.021)	
HOPE*Merit Program in 2 Border States		-.001 (.020)	
Georgia*1988-89			-.005 (.025)
Georgia*1990-91			-.067 (.021)
Georgia*1992 (last pre-HOPE year)			.00 omitted year
Georgia*1993-94			.020 (.021)
Georgia*1995-96			.066 (.017)
Georgia*1997-00			.028 (.020)
Median Family Income		Y	Y
Unemployment Rate		Y	Y
Interactions of Year Effects w/: Black, Metro, Hispanic		Y	Y
R ²	.015	.042	.040
N	9,677	9,677	9,677

Note: Regressions are weighted by CPS sample weights. Standard errors are adjusted for heteroskedasticity and correlation within state cells. The southeastern states consist of the South Atlantic and East South Central Census Divisions: Alabama, Delaware, District of Columbia, Florida, Kentucky, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Virginia and West Virginia. All regressions include year and state effects.

Table 3:
Estimated Effect of Georgia Hope Scholarship
on School Choice of 18-19-Year-Olds
 October CPS, 1988-2000
Southeastern States

	(1) College Attendance	(2) 2-year Public	(3) 2-year Private	(4) 4-year Public	(5) 4-year Private
Hope Scholarship	.075 (.015)	-.004 (.009)	.018 (.002)	.033 (.012)	.024 (.003)
Hope*Merit in 1 Border State	-0.035 (.021)	-.026 (.015)	-.003 (.003)	-.015 (.016)	-.029 (.011)
Hope*Merit in 2 Border States	-.001 (.020)	-.026 (.013)	-.004 (.004)	-.011 (.021)	.004 (.011)
R ²	.042	.033	.012	.027	.025
N	9,677	9,677	9,677	9,677	9,677

Note: Specification is that of Column (2) in Table 2.

Table 4A:
Estimated Effect of All Merit Programs
on College Attendance of 18-19-Year-Olds
 October CPS, 1988-2000
United States

	(1)	(2)	(3)
Merit Aid	.034 (.015)	.027 (.017)	
Merit Aid*Merit Program in 1 Border State		-0.013 (.015)	
Merit Aid *Merit Program in 2 Border States		.021 (.013)	
Merit Aid State, > 5 Years Pre-Introduction			-.005 (.023)
Merit Aid State, 4-5 Years Pre-Introduction			.011 (.020)
Merit Aid State, 2-3 Years Pre-Introduction			-.019 (.022)
Merit Aid State, Last Year Pre-Introduction			.00 omitted year
Merit Aid, 1 st & 2 nd Years			.006 (.016)
Merit Aid, 3 rd & 4 th Years			.036 (.025)
Merit Aid, 5 th & 6 th Years			.043 (.018)
Median Family Income		Y	Y
Unemployment Rate		Y	Y
Interactions of Year Effects w/: Black, Metro, Hispanic		Y	Y
R ²	.017	.060	.055
N	46,100	46,100	46,100

Note: Regressions are weighted by CPS sample weights. Standard errors are adjusted for heteroskedasticity and correlation within state cells.

Table 4B:
Estimated Effect of All Merit Programs
on College Attendance of 18-19-Year-Olds
 October CPS, 1988-2000
Merit States Only

	(1)	(3)
Merit Aid	.030 (.024)	
Merit Aid*Merit Program in 1 Border State	-0.006 (.024)	
Merit Aid *Merit Program in 2 Border States	-.003 (.012)	
> 5 Years Pre-Introduction		-.040 (.045)
4-5 Years Pre-Introduction		-.004 (.035)
2-3 Years Pre-Introduction		-.038 (.027)
Last Year Pre-Introduction		.00 omitted year
1 st & 2 nd Years		.008 (.021)
3 rd & 4 th Years		.049 (.029)
5 th & 6 th Years		.052 (.042)
Median Family Income	Y	Y
Unemployment Rate	Y	Y
Interactions of Year Effects w/: Black, Metro, Hispanic	Y	Y
R ²	.044	.043
N	8,682	8,682

Note: Regressions are weighted by CPS sample weights. Standard errors are adjusted for heteroskedasticity and correlation within state cells.

**Table 5: Estimated Effect of Merit Programs
on Schooling Decisions of 18-19-Year-Olds**
October CPS, 1988-2000
United States

	(1) College Attendance	(2) 2-year Public	(3) 2-year Private	(4) 4-year Public	(5) 4-year Private
Merit Program	.027 (.017)	-.011 (.011)	.007 (.003)	.039 (.009)	-.004 (.006)
Merit * Merit in 1 Border State	-.013 (.015)	-.010 (.012)	-.013 (.003)	.002 (.015)	.002 (.006)
Merit * Merit in 2 Border States	-.021 (.013)	-.021 (.014)	-.008 (.003)	.006 (.010)	.028 (.006)
R ²	.060	.040	.005	.029	.045
N	46,100	46,100	46,100	46,100	46,100
<i>Merit States Only</i>					
Merit Program	.030 (.024)	-.006 (.011)	.009 (.002)	.041 (.018)	-.011 (.012)
Merit * Merit in 1 Border State	-.006 (.024)	-.003 (.014)	-.012 (.003)	.026 (.023)	.005 (.012)
Merit * Merit in 2 Border States	-.003 (.012)	-.045 (.015)	.005 (.004)	.000 (.017)	-.001 (.010)
R ²	.044	.036	.010	.038	.016
N	8,682	8,682	8,682	8,682	8,682

Note: Regressions are weighted by CPS sample weights. Standard errors are adjusted for heteroskedasticity and correlation within state cells. Specification is that of Column (2) in Table 4.

Table 6: Effect of Merit Aid on Schooling Decisions
Analysis by Race
 October CPS, 1988-2000

	(1) Any College	(2) 2-year Public	(3) 2-year Private	(4) 4-year Public	(5) 4-year Private
<i>Georgia HOPE</i>					
<i>Southeastern States</i>					
Whites	.090 (.014)	-.019 (.009)	.015 (.001)	.056 (.014)	.009 (.005)
Blacks	.035 (.021)	-.009 (.012)	.018 (.004)	-.020 (.025)	.046 (.006)
Hispanics	-.039 (.037)	-.075 (.017)	.001 (.008)	.028 (.030)	.004 (.010)
R ²	.042	.033	.010	.028	.025
N	9,677	9,677	9,677	9,677	9,677
<i>Florida Bright Futures</i>					
<i>Southeastern States</i>					
Whites	-.004 (.022)	-.028 (.017)	-.004 (.004)	.058 (.030)	-.024 (.014)
Blacks	.120 (.024)	-.006 (.024)	-.011 (.006)	.148 (.020)	-.008 (.010)
Hispanics	.138 (.068)	.003 (.026)	-.031 (.026)	.116 (.038)	.043 (.035)
R ²	.042	.033	.012	.029	.025
N	9,677	9,677	9,677	9,677	9,677
<i>All Merit Programs but HOPE</i>					
<i>Merit States Only (GA excluded)</i>					
Whites	.009 (.025)	.003 (.013)	-.001 (.003)	.027 (.028)	-.021 (.007)
Blacks	.007 (.032)	-.038 (.027)	.001 (.003)	.045 (.019)	.000 (.017)
Hispanics	.056 (.045)	-.051 (.022)	-.001 (.002)	.112 (.025)	-.011 (.053)
R ²	.045	.037	.009	.039	.016
N	8,008	8,008	8,008	8,008	8,008

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