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Tracking the Impact of Academic "Merit" on Need-based and Non-need-based Financial Aid Grants

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I. Introduction

The phenomenon of “merit aid” or “non-need-based” aid has come in for increasing commentary in American higher education. A number of observers (including the authors) have argued that the growing significance of merit aid is an indicator of the rising competitive pressures on colleges and universities, and is one factor undermining the commitment to the principle of pricing a college education according to family ability to pay.

The distinction between “need-based” and “non-need-based” student aid grants is, however, a slippery one. Many students who receive need-based assistance from a college will also receive a “merit award” which is included in the student’s overall aid package. Sometimes such a merit award will boost that student’s total grant dollars above those of another student with similar means who didn’t get any “merit” award, but in other cases the school may simply be putting a different “merit” label on dollars the student would have gotten anyway. By the same token, two students at the same college, both receiving only need-based aid, may receive quite different aid packages. The more desirable student may receive either a larger total aid package or a similar total aid package with a larger component of grant aid and lower amounts of loan and work. And this can happen without any of the dollars being labeled “merit” dollars.

Our aim in this paper is to look beyond the “merit” and “need” labels to provide empirical evidence on the sensitivity of aid awards to both “need” and “merit”, understood as evidence of academic achievement or potential. As we will show, a focus simply on dollars labeled as “merit” scholarships misses a good deal of the action regarding the responsiveness of grant awards to indicators of merit. Relatively few students receive awards that are explicitly labeled as “non-need-based” or “merit” awards (in the restricted sample we report on below, for example, only 4% of undergraduates at public colleges and 15% at private colleges receive such awards from institutional funds - these figures exclude athletic scholarships), while many more receive “need-based” awards (22% at public colleges and 52% at private colleges). If these need-based grant awards are even moderately sensitive to “merit”, the impact on the overall distribution of aid may be considerable.

II. Descriptive analysis

That this is the case is suggested by the data reported in Table 1. This table examines the distribution of grant aid among full-time dependent undergraduate students in the National Postsecondary Student Aid Survey in 1995-96. The table examines the joint impact of parents’ income and students’ SAT scores on grant awards. (Here and throughout this paper, SAT scores are used as a convenient and measurable proxy for observable measures of academic achievement and promise.) It is clear that at both public and private colleges and universities, family income has a significant impact on need-based aid grants, as one would expect in a system built around family ability to pay. Thus, among high SAT students, institutionally awarded need-based grants range from $1,255 for the lowest income students at public colleges to $330 for the highest income students. At private colleges the range is from $7,123 to $1,364. (Note that these averages include both recipients and non-recipients of aid.)

Yet even when focusing on need-based grants, it is clear that SAT scores have a significant impact on the size of grants. Among low-income students, high-SAT students at public colleges receive on average much more in need-based grants ($1,255) than do either middle- ($904) or low- ($565) SAT students. The relationship to SAT is just as strong in the other income bands. A similarly consistent relationship exists among students at private colleges. High-SAT students consistently receive from their institutions on average more than twice as much in need-based grants as do low-SAT students, with middle-SAT students receiving an intermediate amount.

Obviously, including "non-need-based" grants in the mix increases the influence of SAT on award levels. (Here and throughout, athletic scholarships are excluded from the data on grants.) But because relatively few students receive such awards, their impact on the overall grant distribution is dominated by that of need-based awards. For example, for low-income students at private colleges, the difference between average need-based awards going to high- and low- SAT students is $4,741 while the comparable difference for non-need-based awards is only $1,028.

This tabular analysis clearly indicates the importance of examining the overall distribution of grants. Yet a great many sources of variation underlie the findings in Table 1. The table reflects variation both within and between institutions and includes differences in the fraction of students receiving awards as well as in the average size of awards.

It is likely, for example, that part of the difference in institutional grants between higher and lower SAT students comes from the fact that high SAT students probably attend more expensive institutions. This possibility is confirmed by the data reported in Tables 1a and 1b, which look at the relation among SAT, income and aid awards separately for students at high tuition and low tuition institutions respectively. For private institutions, a positive relationship between SAT and need-based grant levels continues to be observed, but the magnitude of the relationship is considerably reduced when higher- and lower- tuition institutions are examined separately. At public institutions, the relationship between SAT and need-based aid remains about as strong within the higher- and lower- tuition sub-groups as it is in the whole group of institutions. Presumably this reflects the fact that there is not nearly as strong a relationship between average SAT at an institution and the tuition level in public universities as there is in private universities. Much of the variation in public tuition is explained by variation in state tuition policies rather than by differences in prestige or "quality".

Finally, the tabular analysis is incomplete because overall outcomes are shaped by the award of grant aid by state and federal governments as well as by institutions.

III. Multivariate Analysis

In this section we examine variation among individual students in the student aid grants they receive. We consider grants from federal sources (Pell and SEOG), state sources (need-based and non-need based), and institutions themselves (need-based and non-need-based). We explain variation in these dependent variables through measures of family ability to pay (measured by the "expected family contribution" (EFC)[1]), tuition level, student academic potential (SAT), student's race and student's gender. Also included in the analysis is a series of dummy variables for different "Carnegie classifications" of institutions, which classify institutions as research universities, liberal arts colleges, and so on.

The findings reported below must be interpreted with caution. They are the outcome of a complex choice process in which institutions make offers of admission and aid based on various facts they know about students, and students in turn choose institutions in light of the admission and aid offers they receive. The outcomes we analyze are the joint product of both these "supply" and "demand" factors. We are tracking the features of a market "equilibrium" here, and the equations reported on below do not aim to capture this structure; they are instead a "reduced form".

Our analysis needs to allow for the fact that many students do not receive certain forms of grant aid, and some may receive no grant aid at all. Thus, there are many observations for which some of the dependent variables are zero. This introduces a non-linearity which will cause a standard linear regression to produce biased estimates. We respond to this difficulty by employing "Tobit" analysis, which provides an unbiased and

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[1] The "expected family contribution" is an estimate of a family's ability to pay for college, computed according to a formula that takes into account the family's assets, income, number of children, and unusual expenses (as for medical problems). In the NPSAS data set, this variable is calculated from underlying data gathered from the family and from the institution where the student attends.

efficient estimate of the relationship between the dependent variable and the independent variables taking account that the range of variation of the dependent variable is limited.

In Table 2 we illustrate the method we employ by reporting one of our equations in detail, a TOBIT equation explaining need-based grants provided by the institution. (Key coefficients for the full range of equations are reported in Table 3, discussed below.) In both public and private schools, higher expected family contribution is associated with smaller need-based grants, as we would expect - with the award declining on average 19 cents in public schools and 35 cents in private school for every dollar increase in parents' expected family contribution. As expected, higher SAT scores are associated with higher need-based grant awards, with a TOBIT coefficient of 3.33 for private institutions and 3.25 for public institutions.[2]

Interestingly, Hispanics receive significantly larger need-based grant awards than Whites (the omitted category) at both public and private institutions, even after controlling for parental ability to pay. Two factors may contribute to this phenomenon.

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[2] As McDonald and Moffitt (1980) point out, one must be cautious in interpreting Tobit coefficients. Tobit analysis assumes there is a "latent" variable with unlimited range which is truncated at 0 in the observed data. Thus, the analysis in effect assumes that students with certain characteristics might receive negative grants, which are not observed. The TOBIT coefficients are, in effect, partial regression lines fitted to data that allow for attribution of negative values to the dependent variable. The Tobit coefficient can be interpreted as the partial effect of the independent variable on the dependent variable, given that the value of the dependent variable is greater than 0.

First, it is possible that schools adjust the calculated EFC in ways that allow for the likelihood that Hispanics have on average less access to capital markets and lower levels of available income than standard need analysis may indicate. Second, competition among schools for students who add diversity may result in larger grant awards for students with comparable test scores and incomes.

We have performed TOBIT analyses with the same independent variables for a variety of grant measures. The coefficients on SAT and EFC for these dependent variables, the relationship of greatest interest for this paper, are summarized in Table 3. As expected, institutional grant awards, both need-based and non-need based, are positively associated with SAT scores. The effects are not only statistically significant but appear to be substantial as well. Focusing on the coefficients on total grants (combining need-based and non-need-based), the TOBIT coefficient applied to a one hundred point difference in SAT at public institutions (among the 25% of students who receive such grants) corresponds to a change of $443, almost a fifth of the size of the average grant. At private institutions, where 59% of students receive an institutional grant, the comparable measure is $765, and equals more than a tenth of the average grant.

SAT scores are also strongly positively related to state non-need-based awards, although in 1995-96 these were awarded to rather few students. (This category of state awards has been growing rapidly in the last several years, however.) Other state and federal grant awards are not positively sensitive to SAT’s, and indeed in several cases show statistically significant (though small) negative partial correlations with SAT.

Looking at all grant awards to students, there is clearly a substantial net positive relationship between SAT scores and grant awards. On balance, a 100 point increase in SAT is associated with a $124 increase in aid at public institutions, and a $580 increase at private institutions. And these effects apply, on average, to the 58% of public college students who receive student aid grants and to the more than two-thirds of private college students.

Table 3 also reports estimates of the association between differences in grant awards of various types and differences in expected family contribution. As we would expect, higher EFC is associated with lower need-based grant awards. Given that many more students receive need-based than receive non-need-based grants, it is also not surprising that combined award amounts, for institutional, state, federal and overall grants are also negatively related to family ability to pay. After controlling for SAT's, non-need-based grant amounts are, at most, only weakly correlated with EFC, as we might expect.

It is further clear that federal grant awards are more sensitive to EFC than are other categories of need-based awards.[3] Indeed, the coefficient of EFC in the equations for Pell at both public and private institutions is very close to -1, which is the value that

[3] In 1995, federal law limited the maximum Pell grant to $2,300 and the maximum SEOG to $4,000. We therefore use "two-sided" TOBITS in estimating these relationships, recognizing that the values for these grants are limited at both lower and upper ends. We are indebted to Tom Kane and David Zimmerman for recommending this formulation.

one would theoretically expect. For institutional grant awards, the evidence is that observed "taxing rates" on income and assets are below those that the pure application of needs analysis principles would lead us to expect. To the extent that institutions try to maximize the enrollment "payoff" from their student aid dollars, they are likely to be relatively more generous to lower-need (and therefore lower-cost) students and relatively less generous to high-need students. This can be accomplished in any of three ways: (1) by introducing a larger "gap" between the total aid package and the level of demonstrated need for high-need than for lower-need students; (2) by assessing need more stringently for higher-need students than for lower-need students, or (3) by expanding the loan and work component of the aid package for higher need students.

IV. Implications

The empirical analysis presented here underscores a theme that is familiar in our own work and that of a number of other researchers: the principle of awarding financial aid according to demonstrated need is, in significant measure, honored in the breach. Our contribution here is to show that even need-based grant awards are measurably sensitive to students' academic promise (as measured here by SAT scores), while the responsiveness of award levels to income is less than a purely need-based system would produce. On average, our TOBIT coefficients would imply that institution-based grants to students (combining need-based and non-need-based grants) at public institutions decline by only $170 for every $1,000 increase in expected family contribution; at private institutions the decline is $310.

Our analysis makes clear that a focus solely on so-called “non-need” or “merit” aid significantly understates the role that academic promise and achievement play in the distribution of institutional grant aid. It is important to remember, as noted earlier, that our analysis only characterizes the net results of the existing admissions and aid system, as reflected in the choices made by both students and institutions through offers made and offers accepted. We cannot produce from these data a complete picture of the distribution of aid offers institutions make to applicants. Nonetheless, given our ability to control for cross-institutional variation through the use of “Carnegie classification” dummy variables, we believe that these results point to an important merit component in the award of need-based grants as well as explicit merit grants.

Of course, we know that “average” behavior in this arena hides substantial institutional variation. Certainly there are institutions who award all (or almost all) of their aid on the basis of need, measure all applicants’ need in the same way, and assemble aid packages without regard to the desirability of individual students, and thus (thanks to large endowments and affluent applicant pools) are able to operate near the “ideal” of a need-based aid system. There are also institutions whose aid policies are publicly and openly aimed at maximizing institutional advantage through recruiting the highest achieving students at the lowest price, and thus view aid policies in purely instrumental terms. Most institutions operate somewhere in the middle.

What these data suggest is that this great middle may be rather further along toward the instrumental end than we are inclined to recognize. We hope in further work to replicate this analysis for dates both earlier and later in time than 1995-96. Our conjecture, based on the growing importance of aid explicitly given on the basis of "merit" and on the increasingly competitive environment for students, is that we will find a trend away from need and toward "merit" or academic promise in the awarding of aid.[4]

This analysis raises several points that are in our view relevant to policy discussions. First, there is a persistent tendency in state and to some extent in federal policy discussions to argue for introduction of more "merit-based" aid programs on the grounds that existing programs don't give students significant incentives to perform well in high school. At least to the extent that SAT scores serve as a useful proxy for achievement in high school, the evidence is that there are considerable financial awards to achievement.[5] If we take the TOBIT coefficients at face value, for those students who receive financial aid at public institutions, a 100 point difference in SAT scores translates into an increase in grant aid equal to nearly $500 over the course of an undergraduate career. At private institutions, a 100 point SAT increase translates into more than $2,300 in added grants over the course of a college career. These appear to be significant incentives. When one recognizes the additional benefits of an improved probability of attending a more selective college with a better high school record, the fact that our

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[4] The earliest date for which comparable data are available in NSAS is 1989-90; NPSAS 2000 is expected to be available before long. Preliminary reports on the NPSAS 2000 data set indicate that there has been quite a large increase in the use of explicit merit aid at both public and private institutions.

[5] Our data set does not include information on high school GPA or other measures of scholastic achievement before college.

admissions and aid system as it exists does indeed reward high school achievement is clear.

The other side of the coin is the question whether the existing admissions-aid system provides adequate opportunities to high-need students. As Table 1A shows, a high-income student with high SAT's attending a public institution can expect to receive $371 in *need*-based grant aid, more than half as much as the amount received by a low-income student with low SAT's ($692). Middle-income students with low SAT's do worse in total institution-based grant aid ($322) than do upper-middle or high-income students who have high SAT's ($746 and $558 respectively).

Analogous patterns prevail at private institutions. While low-income, high-SAT students certainly do well (with total institutional grants averaging $8,853), a high-SAT student from an upper-middle income family receives more than half as much in *need*-based grants ($3,507) as a low-income student with a low SAT ($5,978).

These data thus make it natural to reflect on whether this kind of distribution of institution-based aid serves the public interest and, if not, what factors might influence institutions to make different choices in how they distribute aid. We have argued elsewhere that an increasing focus on institutions' use of the aid system to attract desirable students is one of several factors promoting increased stratification in American higher education.[6]

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[6] McPherson and Schapiro (1999). See also Kane (1999).

Now, there may well be cases where an institution's decision to offer more aid to more attractive students is educationally productive. This would occur if a student's presence in a school with less talented classmates brought educational stimulus to those students which outweighed the loss of her contribution to more talented classmates elsewhere, in addition to whatever loss she might experience through being educated with less rather than more talented colleagues. However, once competition for students through differential student aid offers is widespread, it is likely that much spending will go to offset the spending of others, and relatively little net movement of students will result.

In the latter case, the effect of competing for more able students is either to divert resources from the educational program or from needier students who would otherwise receive grant support. When these circumstances prevail, curtailing the competition for students through merit-sensitive offers of aid may be in the social interest.

Although it may seem somewhat pedantic, it is helpful to think of five dimensions along which agreement might occur within a broadly need-based framework of financial aid awards. These levels can be described by these terms: common standards of ability to pay; common standards of aid packaging; commitment to need-only aid awards; commitment to full-need funding of aid; and commitment to need-blind admission. These different dimensions of aid policy are often conflated with one another, and that is a main reason why they are worth sorting out. It's also important to appreciate that agreement can exist on some aspects of aid policy and not others.

"Common standards of ability to pay" are simply agreed ground-rules for measuring family resources. A number of difficult judgments must be made in assessing a family's financial capacity – familiar examples include the treatment of home equity, of divorced parents, of siblings in college, of retirement savings and so on. A big issue in the current system is that two overall systems of need measurement exist: "the federal methodology" instantiated by Congress and the "institutional methodology" developed by the College Board. In most circumstances the federal methodology yields a lower estimate of family ability to pay. By strategically selecting which methodology to use in particular cases, a financial aid officer can be more or less generous to particular students, according to how attractive the students are to the school. In addition, financial aid officers have the ability to exercise "professional judgment" to deviate from the standard methodology in particular cases. The idea is to use such judgment when unusual circumstances warrant; in practice the unusual circumstance may not lie in the family's financial circumstances but in the student's desirability for the school.

"Common standards of aid packaging" are agreed groundrules on how the components of an aid package will be determined: how much loan, how much grant, how much work-study. "Preferential packaging" is a policy of offering a larger grant in the package of a more desirable student.

"Commitment to need-only aid awards" implies an agreement to award aid only to needy students and only to the extent of their need.

"Commitment to full-need funding of aid" is an agreement to meet the demonstrated need of all admitted students.

"Commitment to need-blind admission" is an agreement to admit students (who may be only first-year students, or only US students) without regard to their ability to pay.

It's quite clear that a school can commit to some of these practices without committing to others. Many schools, for example, fund full need for admitted students but are "need-aware" in admission. Conversely, some schools that are proud to proclaim themselves "need-blind" in admission don't offer all admitted students enough aid to meet their needs, or don't include wait-listed students in the need-blind group. Similarly, a school might say that all their aid is need-based, but if they define need in eccentric ways, they may give themselves great latitude in awarding aid to students they want. The whole idea of being "need-blind" becomes highly elusive when the aid package for a needy student may include many thousands of dollars of loans, much of it unsubsidized loan, or when a wait-listed student is being judged by ability to pay, perhaps without being so informed.

In principle, competition for students on the basis of aid awards could be eliminated if schools entered binding agreements on all five dimensions. It is very unlikely that such agreements could pass legal muster, nor is it likely that schools would be willing to give up so much freedom of action. Even in the heyday of "admissions overlap", when schools compared in advance the need assessments they had prepared on individual students, agreements on packaging were rare, and agreements to eliminate merit scholarships were difficult to sustain.

In considering the potential for future agreement, we would make two main points. First, there is a very strong case in principle for arriving at agreement on common standards of ability to pay. It is important to appreciate that agreement on such calculations, even when enforced through some agreement with a third party to monitor schools' compliance with the agreement, imposes no absolute limitations on the awards that schools can make.[7] The main thing an agreement on standards for measuring ability to pay does is enforce a rule of transparency on the school's aid offer.

Thus suppose that a college has two students (Sarah and Jane) in similar economic circumstances, and finds Sarah much more desirable. Without an agreement on how to measure need, the college can do one of two things:

(a) determine that both students have the same need level, and then offer Sarah a better mix of grant and loan (or a grant above need recognizing her "merit"); or

(b) fiddle with the need analysis to declare Sarah more needy, thus justifying a larger grant award to the more attractive student.

Although either practice may result in similar bottom lines, the two ways of proceeding are quite different. Suppose, for example, that Sarah applied to several colleges with the

[7] Because of federal "overaward" rules, agreement on standards of need measurement does impose some constraints on schools' discretion in awarding aid. See footnote 8 below.

same tuition, and one wanted her more than others. If the schools abided by an agreement on need measurement, the difference would be clear: she would have the same need level at all three schools and one would offer her more grant and less loan than the others. In the absence of such an agreement, the student might well receive instead different assessments of her ability to pay, still resulting in a larger grant from the school that favored her, but with less clarity about the reason.[8]

The greater transparency that results from common measurement of ability to pay has a deeper significance as well. When a school declares that it is awarding (all or some) aid on the basis of need, it is asserting that its aid awards will be constrained by some external standard of measurement. It would plainly be absurd for a college to declare that it would award need-based aid and then, like the Red Queen, declare in the same breath that "need" meant whatever the college said it meant. This is more than a rhetorical point, because when colleges ask families to fill out financial aid forms, they are implicitly, and sometimes, explicitly declaring that they will use the forms the families turn in to determine what they can afford to pay. The whole premise of encouraging families voluntarily to provide extensive information on their finances is that this information will be used to help them. Manipulating the use of such information in the institution's interest has the twin defects of undermining families' willingness to

[8] By declaring the student to have more need, the school can increase the total award of grant and loan while staying within the limits of need. For a student with any federal aid in her package, the school is required by law to limit the total aid award to the extent of need, so there can be a real advantage for schools in manipulating the measurement of need.

comply honestly with the system and of casting in doubt the implicit contract the school made with the family in soliciting the information.

The first implication we would draw from this analysis, then, is that colleges have good reason to seek agreement on standards for measuring ability to pay, for the sake of preserving a system that serves them well collectively. Moreover, the federal government, we would argue, has an interest in allowing such agreements to be arrived at and enforced. Doing so increases the transparency of the system, makes more meaningful the enforcement of the 'overaward' rules the Congress adopted, and helps to sustain a system of financial aid that has on the whole served the country well.

At the same time, the prevalence of "merit within need" documented here – the considerable influence of academic promise on even need-based grant awards – leads to the second implication we would draw: even agreement on standards of ability to pay would leave room for great variation among schools in the aid offers they make to students of comparable financial need. The sources of variation would still include explicit merit aid offers, differences in the grant component of aid that meets need, differences in the extent to which need is met, and differences among schools in the extent to which they admit students without regard to need.

It's reasonable to feel ambivalent about this second implication. On one hand, it is reassuring for those who worry about "restraint of trade" among colleges to see that even agreement on how to measure need would leave great room for variation in the offers that schools make to students of comparable need. On the other hand, if one judges, as we do, that unrestricted competition for students has on balance negative effects on the quality and accessibility of higher education in the United States, it is regrettable to recognize that agreement on need measurement – or even on confining aid to needy students, as measured by common standards – would still leave enormous scope for competition in aid awards.

Our own conclusion is that the greater transparency provided by common standards of need measurement is a considerable virtue, and is also probably about as far as the anti-trust laws might properly allow cooperation on aid policy to go.[9] Agreements at this level would still allow for a considerable amount of competition in the form of merit aid as well as "merit within need". It would, however, make it considerably easier for families to understand the differences in offers from different schools, and would make schools' assertions about "meeting full need" or being "need-blind" more meaningful. To move further in the direction of a truly need-based system, as we think would be desirable, would probably require incentives by the federal government to reward schools and state systems for orienting their systems in that direction.

[9] Currently, enforceable agreements about common standards of need measurement are protected from anti-trust prosecution only for schools that meet the standard set in Section 568 of the Education Amendments. That standard requires that schools be need-blind in admission of all U. S. freshmen, including those placed on the waiting list. We see no reason of policy or principle why this exemption should not be broadened considerably.

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Table 1. Average institution-based grants by sector and type of grant, 1995-96 (dollars)

Public Institutions

		Income: High	Upper Middle	Middle	Low
Need-based grants					
SAT:	**High**	$330	$439	$744	$1,255
	Middle	$272	$203	$413	$904
	Low	*$0*	$66	$224	$565
Non-need-based grants					
SAT:	**High**	$143	$192	$155	$37
	Middle	*$0*	$51	$70	$119
	Low	*$0*	*$15*	$61	*$12*
Sum of need and non-need based grants					
SAT:	**High**	$473	$631	$899	$1,292
	Middle	$272	$254	$483	$1,023
	Low	*$0*	$81	$285	$577

Private Institutions

		Income: High	Upper Middle	Middle	Low
Need-based grants					
SAT:	**High**	$1,364	$3,118	$5,997	$7,123
	Middle	$830	$1,988	$3,773	$4,244
	Low	$604	$1,629	$2,130	$2,382
Non-need-based grants					
SAT:	**High**	$609	$1,005	$1,430	$1,248
	Middle	$426	$809	$741	$604
	Low	$38	$247	$175	$220
Sum of need and non-need based grants					
SAT:	**High**	$1,973	$4,123	$7,427	$8,371
	Middle	$1,256	$2,797	$4,514	$4,848
	Low	$642	$1,876	$2,305	$2,602

Notes: Cell sizes below 20 are italicized
Athletic scholarships excluded. Averages include both recipients and non-recipients of aid.
Sample restricted to full-time, dependent undergraduate students who reported SAT scores.
SAT ranges: High: greater than 1100; Middle: 900 - 1100; Low: below 900
Income ranges: High: greater than $100,000; Upper middle: $100,000 - $60,000;
Middle: $60,000-$30,000; Low: below $30,000
Source: NPSAS 1996

Table 1A. Average institution-based grants by sector and type of grant, 1995-96 (dollars) for institutions with tuition above the median

Public Institutions

Tuition at or above $3,128

		Income: High	Upper Middle	Middle	Low
Need-based grants					
SAT:	**High**	$371	$498	$1,040	$1,847
	Middle	$318	$292	$640	$1,358
	Low	*$0*	$123	$250	$692
Non-need-based grants					
SAT:	**High**	$187	$248	$146	*$0*
	Middle	*$0*	$65	$98	$302
	Low	*$0*	$35	$72	$28
Sum of need and non-need based grants					
SAT:	**High**	$558	$746	$1,186	$1,847
	Middle	$318	$357	$738	$1,660
	Low	*$0*	$158	$322	$720

Private Institutions

Tuition at or above $14,666

		Income: High	Upper Middle	Middle	Low
Need-based grants					
SAT:	**High**	$1,337	$3,507	$7,443	$7,700
	Middle	$1,286	$2,862	$6,004	$6,809
	Low	$1,363	$2,930	$3,834	$5,978
Non-need-based grants					
SAT:	**High**	$459	$757	$1,118	$1,153
	Middle	$281	$575	$740	$527
	Low	*$0*	$378	$134	$516
Sum of need and non-need based grants					
SAT:	**High**	$1,796	$4,264	$8,561	$8,853
	Middle	$1,567	$3,437	$6,744	$7,336
	Low	$1,363	$3,308	$3,968	$6,494

Notes: Cell sizes below 20 are italicized
Athletic scholarships excluded. Averages include both recipients and non-recipients of aid.
Sample restricted to full-time, dependent undergraduate students who reported SAT scores.
SAT ranges: High: greater than 1100; Middle: 900 - 1100; Low: below 900
Income ranges: High: greater than $100,000; Upper middle: $100,000 - $60,000;
Middle: $60,000-$30,000; Low: below $30,000
Source: NPSAS 1996

Table 1B. Average institution-based grants by sector and type of grant, 1995-96 (dollars) for institutions with tuition below the median

Public Institutions

Tuition below $3,128

		Income:			
		High	**Upper Middle**	**Middle**	**Low**
Need-based grants					
SAT:	**High**	$272	$344	$455	$663
	Middle	$224	$84	$206	$471
	Low	*$0*	$21	$196	$472
Non-need-based grants					
SAT:	**High**	$79	$104	$164	$75
	Middle	*$0*	$33	$43	$39
	Low	*$0*	*$0*	$51	*$0*
Sum of need and non-need based grants					
SAT:	**High**	$351	$448	$619	$738
	Middle	$224	$117	$249	$510
	Low	*$0*	$21	$247	$472

Private Institutions

Tuition below $14,666

		Income:			
		High	**Upper Middle**	**Middle**	**Low**
Need-based grants					
SAT:	**High**	$1,469	$1,974	$2,976	$2,828
	Middle	$422	$1,340	$2,259	$2,218
	Low	$335	$1,348	$1,754	$1,701
Non-need-based grants					
SAT:	**High**	$1,209	$1,735	$2,083	$1,460
	Middle	$556	$983	$742	$664
	Low	$51	$219	$185	$159
Sum of need and non-need based grants					
SAT:	**High**	$2,678	$3,709	$5,059	$4,288
	Middle	$978	$2,323	$3,001	$2,882
	Low	$386	$1,567	$1,939	$1,860

Notes: Cell sizes below 20 are italicized
Athletic scholarships excluded. Averages include both recipients and non-recipients of aid.
Sample restricted to full-time, dependent undergraduate students who reported SAT scores.
SAT ranges: High: greater than 1100; Middle: 900 - 1100; Low: below 900
Income ranges: High: greater than $100,000; Upper middle: $100,000 - $60,000;
Middle: $60,000-$30,000; Low: below $30,000
Source: NPSAS 1996

Table 2. Tobit Coefficients with Need-based Institutional Aid as Dependent Variable

	Public	Private
Expected family contribution	**-.189**	**-.345**
Total SAT	**3.251**	**3.328**
Tuition	**.248**	**.496**
Black	375.4	786.3
Hispanic	**2545.1**	**939.3**
Asian	**1366.7**	**-852.0**
American Indian	2491.0	1100.3
Other Race	-752.0	-1475.6
Female	**589.0**	153.0
Research University II	**712.1**	-516.7
Doctoral I	-281.7	51.2
Doctoral II	**-1085.7**	251.6
Masters I	**-1584.1**	**2014.6**
Masters II	-19974.1	**-1313.5**
Bac I	**-3804.7**	**1245.9**
Bac II	**-1996.2**	**1091.7**
Seminary	---	**3119.2**
Engineering	---	-421.8
Business	---	**1574.0**
Associate	**-4549.8**	---
Art	-21491.3	630.6
Constant	**-5873.5**	**-7644.3**
Number of observations	2832	4362

Values in bold are significant at the 5% level.
Omitted categories are Whites, Males, and Research University I

TABLE 3. Percent of Students Receiving Grants, Average Grant per Recipient, and Tobit Coefficient for SAT and Expected Family Contribution by Sector and Type of Grant, 1995-96

	Public				Private			
	% receiving grant type	**Avg. Award per recipient**	**Tobit coefficient on SATTOTAL**	**Tobit coefficient on EFC**	**% receiving grant type**	**Avg. Award per recipient**	**Tobit coefficient on SATTOTAL**	**Tobit coefficient on EFC**
Institutional grants								
Need-based	22%	$2,298	**3.25**	**-0.19**	52%	$6,120	**3.33**	**-0.35**
Non-need-based	4%	$2,242	**10.33**	-0.02	15%	$4,880	**17.6**	**-0.11**
All	25%	$2,354	**4.43**	**-0.17**	59%	$6,592	**7.65**	**-0.31**
State grants								
Need-based	26%	$1,843	-0.67	**-0.35**	24%	$2,281	**-2.05**	**-0.25**
Non-need-based	8%	$1,902	**2.34**	**0.05**	2%	$1,411	**6.42**	-0.02
All	33%	$1,942	-0.52	**-0.13**	25%	$2,362	**-1.6**	**-0.23**
Federal grants								
Pell	32%	$1,631	**-0.54**	**-0.95**	21%	$1,588	**-0.94**	**-0.87**
SEOG	10%	$889	-0.51	**-0.48**	14%	$1,293	**-0.96**	**-0.55**
All	32%	$1,875	-0.34	**-0.84**	23%	$2,262	**-0.9**	**-1**
All grants	58%	$3,179	**1.24**	**-0.27**	67%	$7,516	**5.8**	**-0.41**

*Figures in bold are significant at 95% confidence level.
Note: All data are for full-time, dependent, undergraduate students with SAT scores.
SATTOTAL is the combined score on the SAT math and verbal sections
EFC3 is an estimate of expected family contribution given dependent income, assets, etc.
Source: NPSAS 96