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4 Financial Aid and Public Policy

"Is higher education in the United States to be limited to those with wealth?" So begins a 1946 report sponsored by the American Council on Education (Sharpe et al. 1946, iii). Such a statement sounds quaint today, in light of the tremendous increase in college enrollment that has taken place over the four and a half decades since it was written. But the sentiment underlying it has surely not disappeared. Although over half of all high school graduates now attend college and over one-fourth receive bachelor's degrees, there has continued to be widespread concern about the role of higher education in promoting the long-held social goal of equal opportunity. Disparities in average enrollment rates of different income and racial groups such as those documented in Chapter 2 serve as a reminder that, here as elsewhere, equality remains elusive. Many would agree with Behrman, Pollak, and Taubman (1989, 416) that a principal reason for these disparities is unequal access to the means of financing a college education. The concerns about equity that underlie the question quoted above still exist, but they are expressed in an idiom that reflects the expansion of college attendance. The widely accepted policy aim of "access" provides an unequivocally negative answer. The companion aim, "choice," is equally bold, suggesting that a student's financial position should not stand in the way of entering any college to which he or she can be admitted.

This chapter examines these policies and programs and assesses their effect on undergraduate enrollment. The issue of public support for college students has assumed unusual importance in recent years. Among the reasons for this increased importance are the unprecedented increase in college costs during the 1980s, the restrictions on domestic spending in federal budgets, the growing importance of student loans relative to grants, the widespread perception that some financial aid programs, especially loans, are not working well, and an apparent increase in colleges' use of scholarships not based on financial

need. These conditions raised concerns that the middle class might find it impossible to afford many private colleges and universities and that many low-income students might find it impossible to attend college at all.

Section 4.1 describes existing financial aid programs in the United States, including the system by which the financial need of students is determined as well as the process by which various forms of aid are combined. Section 4.2 examines the recent history of financial aid programs. It describes how the composition of aid has changed over time, with loans assuming an increasingly important role. A change of smaller proportions has been an increase in scholarships not based on financial need. Section 4.3 examines the distribution of the benefits of these programs and their effect on behavior. Of particular importance is how the different forms of aid affect enrollment and completion. Section 4.4 deals with the incidence and effects of state higher education, particularly the policy of setting low tuitions at state institutions. Section 4.5 summarizes the chapter and discusses recent financial aid proposals.

4.1 The Financial Aid System

Financial assistance to undergraduates comes in several different forms: as explicit payments, which may be gifts, grants, loans, or guaranteed work, or as subsidies that take the form of reduced tuition costs. "Financial aid" usually refers to explicit payments that come from outside a student's family, and by far the most important source of such aid is the federal government. There are dozens of separate federal programs that provide student aid to college students. Housed in a variety of agencies and operated according to different sets of criteria, these programs have been likened to a Rube Goldberg contraption. In 1985, David Stockman's Office of Management and Budget described federal financial aid as "a shotgun approach that has indiscriminantly sprayed assistance at students regardless of income" (Doyle and Hartle 1985, 8, 9). Whether or not this is so, the array of federal programs does appear bewildering at first glance. Thus, an important first step in understanding how financial aid works is to describe the current system. It is also important to examine in some detail the operation of and rationale behind the method of financial need assessment that is a central part of that system.

4.1.1 Sources of Aid

Perhaps it is easiest to visualize the operation of the current financial aid system from the perspective of a financial aid officer on a college campus. On the basis of information provided by an applicant or a current student, this officer first calculates the student's financial "need" and then puts together a "package" of financial aid sources in an effort to meet that calculated need. "Need" is defined as the difference between (1) the total costs of attending that institution (principally, tuition, fees, room, board, books, and transportation)

and (2) an amount representing the expected contribution from the student and the student's parents, which is calculated using a standardized formula based on the family's financial resources (financial aid officers are given the discretion to adjust this calculation on the basis of other information). For a student who is financially independent, the calculation must be modified.[1] One straightforward but important implication of this method of calculation is that, for any given student, the calculated amount of need rises with college cost. The methodology employed in this calculation and its implications are discussed in more detail below.

The second step after determining the amount of aid that is required to cover the student's costs is to assemble a package consisting of one or more sources of financial aid. The administrator begins by assigning grant funds from any federal and state entitlement programs for which the student is eligible. The most important of these are Pell grants (formerly Basic Educational Opportunity Grants [BEOG]), a federal program aimed at lower-income students. This program was the largest source of federal grants in 1988–89. In order to limit the program's costs, Pell grants are limited to a percentage of total costs or to a maximum dollar amount (in 1988–89, 60 percent or $2,200) (Mortenson 1988b, 28).

If costs exceed both the grants to which the student is entitled and the calculated amounts for family contributions, the financial aid officer then turns to other sources of aid. Three of the largest federal programs, together referred to as campus-based aid because they are awarded by the campus financial aid officer, are Supplemental Educational Opportunity Grants (SEOG), College Work Study (CWS), and Perkins loans (formerly National Direct Student Loans [NDSL]). Each is intended to provide a different form of aid for financially needy students. Unlike Pell grants, the SEOG program can cover all costs, including the full amount of tuition; thus, the amount awarded under the SEOG program is more sensitive to tuition differences among institutions than is the amount under the Pell program. Perkins loans, drawing on revolving funds assigned to institutions, are heavily subsidized, carrying a very low interest rate (5 percent in 1990) and a repayment that is deferred until after a student has graduated. The CWS program provides subsidies for student employment.

Measured by the dollar amount of aid offered, the largest federal student aid program is the Stafford Student Loans (formerly Guaranteed Student Loans [GSL]). These loans, guaranteed by the government but issued by banks, also allow students to defer repayment until after graduation, and they carry favorable interest rates, though higher than the Perkins loans. Originally

1. In general, for a student to be classified as independent, he or she must live with parents no more than six weeks out of the year, must not be claimed as a dependent on parents' tax returns, and must not receive more than $750 a year from parents. As with other aspects of the need calculation, however, the ultimate determination lies with the financial aid official (Johnstone 1986, 134).

devised as an unsubsidized loan program for middle-income students, these loans have become a major source of federal subsidy for many low-income students. Of the remaining federal programs, State Student Incentive Grants (SSIG) involve a one-to-one match of state need-based grants, and the remaining general loan programs involve considerably less subsidy than the Perkins and Stafford programs. There also exist special programs to aid certain students, including assistance for veterans and Reserve Officer Training Corps scholarships.[2]

It is important to point out the sources of the subsidies implicit in these loan programs. Because it must eventually be repaid, a loan of $1,000 is not worth as much to a borrower as a grant of the same amount. But loans such as those offered in the major federal student loan programs do contain subsidies that are worth something. They carry below-market interest rates and allow students to postpone repayment while they are in school, thus making the real cost of repayment (the present monetary value of payments) less than the original amount of the loan. This difference is the loan's implicit subsidy, and the size of the subsidy depends on the terms of the loan.[3] On the basis of these terms, the subsidy implicit in the major student loan programs has been calculated to be in the range of 30–50 percent of the face value of the loan.[4]

If the various federal and state sources that have been added to the student's package do not cover costs, the difference can be made up with institutionally awarded aid. A college itself can offer a student financial aid—the source might be endowed scholarship funds, earmarked gifts, or current fund revenue. When the source is the last of these, a college ends up effectively offering a price discount to the student. Though they are typically not employed in public institutions, discounts account for up to one-third of gross tuition revenue in private institutions (McPherson, Schapiro, and Winston 1989b, 254). Such price discounting raises at least two relevant issues. When the price discounts are part of a need-based financial aid calculation such as that described here, they have been likened to a Robin Hood form of redistribution, with the wealthy paying a high price and the needy paying a low price. Not only can this use of internal funds present a public relations challenge for colleges, but

2. For discussions of financial aid programs, see, e.g., Hauptman (1982), St. John and Byce (1982), Lee (1985), Gladieux and Lewis (1987), or Gladieux (1989).

3. The present monetary value is defined as the sum of $M_t/(1 + r)^t$, where M_t is the repayment in year t, and r is the market interest rate (as opposed to the interest rate specified on the loan). This sum is roughly equivalent to the loan amount that a bank would pay in exchange for a commitment to receive the same future repayments on the same schedule. The lower the loan's interest rate, and the more distant the repayments, the less the present value is.

4. On the basis of the assumption of one and a half years in college plus the half-year grace period after graduation, a ten-year repayment, and a discount rate of 10 percent, Johnstone (1986, 124) calculates that the present value of the loan obligation is about 75 percent of the face value of the loan, for a subsidy of 25 percent. A discount rate of 12 percent yields a subsidy rate of 33 percent. Lengthening the period before repayment begins significantly increases the subsidy, however. On the basis of a 10 percent interest rate and three years in school, Hauptman (1982, 29–30) calculates subsidy rates of over 50 percent. After August 1988, Stafford Loans carried an interest rate of 8 percent for loans of up to four years and 10 percent for those of five or more years.

it will also affect the institution's ability to raise general revenue since a portion of any tuition increase must be recycled back to students receiving financial aid. One way an institution could cut these costs would be to reduce the number of students receiving aid. Though it has occasionally been adopted, this policy is frowned on in the higher education community, and the most prestigious colleges and universities make "need-blind" admission standard policy.[5] Another, more likely response to budget restrictions is simply to reduce the amount of need covered, allowing students to fend for themselves for the remaining unmet need.

Institutional price discounting raises a second issue in connection with scholarships that are not based on financial need. Concern has been raised that no-need scholarships will take away funds that would otherwise have been used for need-based financial aid. There is some evidence that no-need scholarships are being used increasingly by colleges who see them as a tool for recruiting good students.[6] One fear is that, instead of digging into general revenues to support needy students, private institutions will deal with the scarcity of financial aid funds by denying admission to at least some of their applicants who require aid.

A survey of public and private colleges in 1984 gives a useful picture of how the various sources of financial aid were utilized in the 1980s. On the basis of several hundred thousand student records, Miller and Hexter (1985a, 1985b) identified the most common financial aid packages at public and private colleges for several income classes. Table 4.1 illustrates their findings for students in the $7,000-$15,000 income class; it shows that the most common package in 1984–85 at both public and private colleges was one that included a Pell grant, some form of federal campus-based aid (SEOG, CWS, or Perkins loan), and a state grant as well as a family contribution. For each of the sources shown, the average amount awarded to students in private colleges exceeded that to those in public colleges, with the percentage difference being the least in the case of the Pell grant. Perhaps the most striking aspect of these two typical packages is that neither one covers all the estimated costs of attendance; in the case of the private college, the aid package covers only 65 percent. This lack of full coverage in fact characterizes the two most common packages at private colleges in both the low-income groups studied. Under these circumstances, it is not clear how these students make ends meet, as the

5. According to Sharpe (1933, 696), Yale deviated from this policy during the depression, announcing that it would admit only as many needy applicants as existing financial aid funds would allow for. A survey of financial aid officers in 1983 showed that almost all institutions follow a need-blind approach in admissions (Van Dusen and Higginbotham 1984, 35).

6. See, e.g., Haines (1984). The 1983 survey of financial aid officers revealed that most institutions, public and private, award some scholarships without regard to need. The percentage of institutions offering such scholarships ranged from 72 for two-year private colleges to 85 for four-year private institutions. Among the latter group, 51 percent of those who offered no-need scholarships said that their main justification was as recruitment rather than as a reward for previous achievement (Van Dusen and Higginbotham 1984, 31, 33), although institutions could certainly have a combination of motives in making these awards.

Table 4.1 **The Most Common Financial Aid Packages at Public and Private Colleges, 1984–85, Students with Family Incomes from $7,500 to $15,000 (figures in dollars)**

Public colleges:	
Average cost	4,572
Source of aid (average award):	
Family contribution	864
Pell grant	1,187
Federal campus-based aid	1,138
State grant	587
Aid total	3,776
Private colleges:	
Average cost	8,379
Source of aid (average award):	
Family contribution	1,163
Pell grant	1,273
Federal campus-based aid	1,510
State grant	1,487
Aid total	5,433

Source: Miller and Hexter (1985, 22–23).

Note: Aid packages are the most common for students surveyed. Cost of attendance includes tuition, fees, books, room, and board and other expenses allowed by the institutions; average cost is for students with this package.

authors note.[7] Possibilities include cutting costs, obtaining additional assistance from family members, or working for more hours or at a higher rate of pay than is assumed in the financial aid package. Stampen, Reeves, and Hansen (1988, 122), examining a sample of public college students, show that the last of these, additional student earnings, had the effect of reducing by about half the percentage of working students with unmet need.

To give an idea of how often various sources of financial aid are used, Table 4.2 shows the percentage of freshmen in each of three incomes classes who received assistance from each of twelve different funding sources. The great majority of these students relied on earnings or family resources for at lest some portion of their college expenses. Among the grant categories listed, Pell grants were utilized most by students with family incomes under $22,000, but students with higher family incomes were most likely to receive a grant made by their college. At all income levels, the most commonly used loan program was the GSL/Stafford federal guaranteed loan program. A curious aspect of this table is that, with the exception of Pell grants, the students in the second income category showed higher rates of utilization of every

7. As Miller and Hexter note, the students receiving these packages did not have GSL/Stafford loans to make up the uncovered amount. Among the eight packages for low-income students that were summarized in the study, the percentage of total costs covered ranged from 65 to 75 for students in private colleges and from 83 to 101 for those in public colleges (see Miller and Hexter 1985a, 22–24 and app. B).

Table 4.2 **Percentage of Freshmen Receiving Aid by Source and Parents' Income, 1986**

Source	Parents' Income[a]		
	Under $11,000	$11,001–$22,000	Over $22,000
Parent	52	72	76
Own savings	39	57	54
Employment	37	51	34
Any family	70	88	87
BEOG/Pell grant	34	28	9
SEOG	9	11	3
State grant	15	20	10
Institutional grant	15	24	16
Other private grant	5	8	6
Any grant	45	55	32
GSL/Stafford	21	36	21
NDSL/Perkins loan	7	11	5
College loan	3	5	4
Other loan	3	5	4
Any loan	27	45	28

Source: Unpublished tabulations by Thomas G. Mortenson based on data from surveys of freshmen conducted by the Cooperative Institutional Research Program.

[a]Tabulations were based on income as a percentage of the poverty threshold. In 1988 dollars, the 1986 poverty threshold for a family of four was $11,000. See Congressional Budget Office, *Trends in Family Income: 1970–1986* (Washington, D.C., February 1986), table B-3, p. 104; and U.S. Council of Economic Advisors (1990, 359).

other form of aid. Assuming that these self-reported rates are to be believed, there are at least three possible explanations for the difference: the tendency of low-income students to attend low-cost colleges reduces their calculated need, criteria other than need result in fewer low-income students being awarded aid, or low-income students are simply less likely to apply for aid for which they would be eligible.

4.1.2 Assessment of Need

In 1987, Congress mandated the use of a standardized method for determining how much a student or a student's parents would be expected to contribute toward total college costs.[8] Now referred to as the Congressional Methodology, it was merely an updated version of the so-called uniform methodology that had been developed and used over the previous 30 years by the College Scholarship Service, an arm of an association of colleges and universities

8. The methodology is used for GSL/Stafford loans, CWS, and NDSL/Perkins loans. Eligibility for Pell grants is based on a separate formula, and SSIG funds are awarded according to rules determined by each state (College Scholarship Service, *CSS Need Analysis: Theory and Computation Procedures* [New York: College Board, 1989], p. 3.1; and Lee 1985, 13).

called the College Board. Before 1950, the financial aid that was awarded by colleges was distributed largely on an ad hoc, case-by-case basis. Those with need applied for aid, but colleges seldom collected financial data on a systematic basis. In particular, it was quite exceptional for a college to collect and use information on family income in determining awards. It was not unusual for academic merit to figure into such awards as well.[9] Not only did this system lack a mechanism for determining aid to needy students, but there was growing concern among private institutions that the awarding of financial aid sometimes turned into a bidding war for attractive applicants.

It was therefore perhaps not surprising that the established private colleges and universities who led the movement to standardize need assessment would also favor coordination among institutions in determining financial aid packages.[10] Thus, in the early 1950s, the institutions in the College Board decided to adopt a standardized methodology for calculating financial aid offers. This system entailed four basic components: (1) the centralized collection of personal financial information from applicants and their families; (2) a standard formula that would calculate expected family contribution as a function of income, net worth, and other family characteristics; (3) the pointed omission of academic merit as an acceptable criterion for financial aid awards; and (4) the sharing of information among institutions about financial aid packages. The last function was accomplished in part by regular meetings of college officials to compare the packages being offered to individual students, such as the group of representatives from selective colleges known as the Overlap Group.[11] It was this effort to coordinate the awarding of financial aid that became the focus of an antitrust investigation in 1989.[12]

Although it has changed in its particulars, the formula for calculating a family's expected contribution has retained the basic shape it took when it was created in the 1950s. It resembles a progressive tax on income and wealth. Included in the concept of discretionary income that is the "tax base" for this calculation is after-tax income that exceeds a specified set of necessary expenditures and a percentage of net worth beyond a specified allowance for retirement. Table 4.3 illustrates the calculation of the expected contribution

9. Sharpe et al. (1946, 24) summarize the philosophy of financial aid this way: "Colleges should attempt to select from the admitted group those students who need aid and who, according to the criteria applied at admission, are superior to the admitted group as a whole. The selection factors should be those used at admission plus relative financial need."

10. According to Sharpe et al. (1946, 29), "The award of financial assistance should be, in so far as possible, a coordinated enterprise among colleges of similar type and of similar student clientele. . . . deliberate 'competitive bidding' for students—also undue 'shopping-around' by candidates—should be discouraged."

11. For a brief history of the creation of the College Scholarship Service and the origins of the Overlap Group, see College Scholarship Service, *CSS Need Analysis: Theory and Computation Procedures* (New York: College Board, 1986), 4–7.

12. See, e.g., Gary Putka, "Do Colleges Collude on Financial Aid?" *Wall Street Journal*, 2 May 1989, p. B1; and Scott Jaschik, "Investigation into Tuition Fixing Spreads; 55 Institutions Now Say They Are Targets," *Chronicle of Higher Education*, 4 October 1989, p. A1.

Table 4.3 **Calculation of Parents' Contribution under Congressional Methodology, 1989–90: Three Hypothetical Families (in dollars)**

	Family		
	A	B	C
Income before taxes	15,000	30,000	60,000
Net Worth	5,000	60,000	200,000
Other children in college	0	0	0
Parents' contribution for student	0	2,454	15,901
Change in parents' contribution caused by:			
$1000 increase in income	0	+ 290	+ 470
$1000 increase in net worth	0	+ 35	+ 56
Another child in college	0	−1,227	−7,950

Source: Author's calculations and College Scholarship Service, *CSS Need Analysis: Theory and Computation Procedures* (New York: College Board, 1989).

Note: The table embodies the following assumptions. Average tax rates, including federal income, federal payroll, and state income for the three families, are 25, 28, and 42 percent , respectively. Each family has four members. Age of older parent is 45.

by the parents of a dependent student, using hypothetical families at three income levels. On the basis of the specified assumptions regarding net worth, the family making the near-median income of $30,000 would be expected to contribute $2,454 toward a child's college costs. This amount is of course an arbitrary determination, and many parents doubtless believe that it is excessively burdensome. According to the formula, a family making twice that income is expected to contribute over $15,000, while a family with half that income is expected to contribute nothing. The table also shows the effect of incremental increases in income or net worth. In family B's case, additional income is "taxed" at a rate of 29 percent, and additional net worth faces a rate of 3.5 percent.[13] The last line in the table shows the effect of having a second child in college: the expected contribution is divided between the two. Although the assessment of need is complicated by other issues, such a the evaluation of independent students and contributions from dependent students, the basic message to be taken from this table is that the uniform methodology embodies a sharply progressive tax on a family's income and net worth.[14]

This uniform methodology is now a basic part of federal financial aid policy. Its use has had at least two important effects on the shape of student aid subsidies. First, among institutions of similar cost, it causes subsidies to favor

13. The tax on net worth is the product of a 12 percent conversion rate for net worth into available income followed by the 29 percent tax on adjusted available income that is part of a progressive rate schedule. For such a family, the disincentive working against saving that exists in the income tax is added to by this implicit tax. In addition, because consumer durables are not counted as assets in the calculation of net worth, there is an incentive to purchase such durables before applying for aid.

14. Largely because it is an amalgam of both stock and flow concepts, Barnes (1977, 23) calls the uniform methodology "haphazard, inequitable, and logically indefensible."

the poor, owing to the progressive nature of the need-assessment formula. Second, because calculated need increases with the cost of attendance, the methodology guarantees that students attending expensive institutions will receive more aid than similar students attending inexpensive institutions. Devised by relatively high-price private institutions, this methodology has the effect of channeling a significant portion of federal student aid towards expensive private institutions. According to Johnstone (1986, 116), the existence of this system makes it possible for private institutions to raise tuition without fear of pricing out its needy students. Whether, as some have suggested, financial aid programs actually encourage tuition increases is unclear.[15] In any case, by helping students have the "choice" of attending high-price institutions, existing federal financial aid can be seen as part of a political compromise in which public policies encourage the continued existence of both private and public institutions.[16]

4.2 The Changing Composition of Student Aid

Between the early 1960s and the late 1970s, the nature and scope of student financial aid were significantly altered. The total amount of student aid in constant dollars increased tenfold between 1963 and 1980. Such evidence as exists also suggests that there was a corresponding increase in the proportion of students receiving some form of financial aid, particularly during the 1970s. For example, two national surveys showed that the portion of high school seniors who received some form of financial aid offer from a college or university increased from 24 percent in 1972 to 36 percent in 1980 (Jackson 1988, 19). A survey of private institutions indicated a similar increase among enrolled students: from 44 percent in 1970 to 53 percent in 1980 and 59 percent in 1987.[17]

The driving force behind this transformation was the creation and expansion of federal financial aid initiatives. Most of the existing federal programs are products of the last 25 years. The Higher Education Act of 1965, passed in the heady days of the Great Society, created two major programs that have constituted the backbone of federal student aid—the Basic Educational Opportunity Grants (now Pell grants) and the Guaranteed Student Loans (now Stafford loans)—and expanded two more existing programs—College Work-Study and National Direct Student Loans (now Perkins loans).[18]

Table 4.4 provides an overview of the changing composition of student aid from the 1963–64 school year to 1988–89. Loans are measured by the dollar

15. For a discussion of the "Bennett hypothesis" that increases in aid lead to increases in tuition, see McPherson (1988) and McPherson, Schapiro, and Winston (1989a, 1989b).

16. Doyle and Hartle (1985, 8) suggest this in arguing that the cuts in student financial aid proposed by the Reagan administration threatened to undermine this compromise.

17. Survey of 1,069 private institutions by the National Institute of Independent Colleges and Universities (Jean Evangelauf, "Private-College Spending of Student Aid Found Up Sharply in 1980's," *Chronicle of Higher Education*, 16 May 1990, p. A1).

18. For a description of this legislation, see Hearn and Wilford (1985).

Table 4.4 Student Financial Aid (constant 1988 dollars)

	1963–64	1970–71	1975–76	1977–78	1979–80	1980–81	1981–82	1982–83	1983–84	1984–85	1985–86	1986–87	1987–88	1988–89
Federally supported programs:														
Generally available aid:														
BEOG/Pell grants	0	0	2,060	3,100	4,082	3,427	2,992	2,964	3,316	3,453	3,922	3,716	3,894	4,460
SEOG	0	409	442	476	543	528	471	420	429	426	451	432	436	393
SSIS	0	0	44	117	124	111	100	91	71	87	84	79	78	73
CWS	0	692	649	916	970	948	812	754	811	734	721	679	661	706
NDSL/Perkins loans	441	735	1,011	1,201	1,053	996	755	732	810	771	773	824	838	859
Income-contingent loans						0	0	0	0	0	0	0	5	4
GSL/Stafford loans	0	3,095	2,786	3,391	6,397	8,901	9,305	7,965	8,623	9,272	9,156	8,991	9,482	9,168
Supplemental loans for students						0	21	96	172	252	291	499	1,851	2,071
Parent loans for undergraduate students						4	74	150	203	278	270	331	523	635
Subtotal	441	4,930	6,990	9,199	13,168	14,914	14,529	13,171	14,437	15,273	15,668	15,551	17,769	18,369
Specially directed aid:														
Social security	0	1,521	2,403	2,674	2,586	2,703	2,598	899	261	40	0	0	0	0
Veterans	259	3,418	9,191	5,271	2,967	2,464	1,758	1,662	1,364	1,141	933	842	795	743
Military	162	195	213	203	269	291	306	330	358	379	380	393	375	372
Other grants	35	49	139	160	186	175	138	104	74	68	74	72	77	80
Other loans	0	128	99	82	68	89	142	265	312	372	409	340	305	300
Subtotal	456	5,314	12,045	8,392	6,076	5,721	4,940	3,260	2,367	2,001	1,796	1,647	1,553	1,494
Total federal aid	893	10,241	19,036	17,591	19,244	20,635	19,468	16,430	16,803	17,272	17,466	17,198	19,322	19,863
State grant programs	216	720	1,077	1,322	1,284	1,150	1,199	1,233	1,314	1,391	1,441	1,546	1,565	1,642
Institutionally awarded aid	1,160	2,942	3,155	3,116	3,076	2,958	2,924	3,073	3,422	3,667	4,039	4,378	4,750	5,156
Total federal, state, and institutional aid	2,269	13,903	23,269	22,028	23,605	24,741	23,591	20,736	21,539	22,331	22,945	23,122	25,638	26,661

Sources: College Entrance Examination Board (1989, 6, 13); Gillespie and Carlson (1983); and *Chronicle of Higher Education,* 6 September 1989, p. A31.

Note: Conversion to constant dollars is based on the consumer price index for the calendar year in which the school year began.

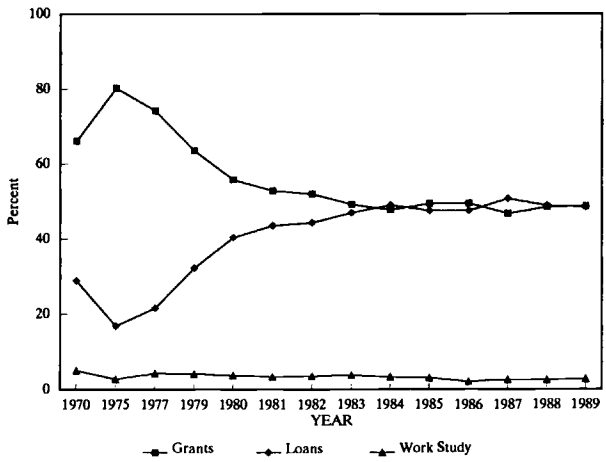

Figure 4.1 Percentage distribution of student aid, 1970–71 to 1989–90.
Sources: Gillespie and Carlson (1983, table 6); and *Trends in Student Aid* (1989, table 4).

amount of loan commitments, and all dollar amounts in the table are expressed in 1988 dollars. In 1963–64, half of all aid was provided by colleges and universities, 40 percent came from federal programs, and the rest came from states. The federal role grew markedly thereafter, with federal programs accounting for 74 percent of all aid in 1970–71 and 82 percent in 1975–76. Federal aid reached a peak, in both share and absolute amount, in 1980–81, after which it tended to decline.

Probably the most important development over this period—and one that has been noted often by those who analyze student financial aid—is the change in the composition of federal aid. Grants have been declining in importance while loans have been increasing. The most prominent reason for this shift has been the rapid growth in the federal government's biggest guaranteed loan program, the GSL/Stafford loans. Because of the dominance of federal aid, this shift has resulted in a redistribution of all student financial aid, as illustrated in Figure 4.1. All loans, again measured by the face value of loan commitments, increased as a share of all aid from 29 percent in 1970–71 to 49 percent in 1988–89. Because work-study funds decreased only slightly, virtually all the increased significance of loans came at the expense of grants, whose share fell from about two-thirds to a half.

As noted above, the actual subsidy value of loans is less than their face value. Therefore, actual value of federal aid programs has declined much more than the totals shown in Table 4.4 would indicate. The small 3.7 percent decline in total federal aid between 1980–81 and 1988–89 shown in the table resulted from the combination of a 30.5 percent increase in loans and a 35.9 percent decline in grants and college work-study. If loans were valued at half their face value, the total amount of federal aid would have declined by 14.7

percent.[19] Applying this correction to the total aid distribution shown in Figure 4.1 results in a less precipitous rise in the importance of loans. By that method of calculation, the share of loan aid increased from 17 percent in 1970–71 to 32 percent in 1988–89.

Lying behind these broad trends were the demise of one major program and changes in others. A major source of federal grant aid was the provision in 1965 for grants to dependents of social security recipients. At its peak, this source supplied almost as much grant aid as the Pell program, but it has since been eliminated. Another major grant program, GI Bill benefits for veterans, declined in the late 1970s as the number of eligible Vietnam veterans diminished. While these two major programs were shrinking, other sources of federal grant aid taken together experienced only modest growth. In particular, the growth of Pell grants was constrained by annual adjustments in the formula used for determining awards. Although the formula was briefly liberalized following the 1978 Middle Income Student Assistance Act (MISAA), the long-term effect of these adjustments was to keep individual grant amounts from growing as fast as college costs.[20] One reason for the tightening of the Pell formula was a significant increase in the share of Pell grants going to students in proprietary vocational schools. Between 1980–81 and 1985–86, the share of total Pell funds going to such students rose from 12 to 22 percent. Even though total Pell funding increased by 14 percent over that period, as reflected in Table 4.4, the amount received by college and university students increased by less than 1 percent.[21] At the same time as funding for grants was stagnating, there was a boom in federal guaranteed loans, especially the GSL/Stafford program. This increase appears to be the result both of the 1978 MISAA legislation and the sharp increase in market interest rates from 1979 to 1981, which made the program's low rates very attractive.[22]

In order to get a fuller appreciation of the effect of these changes, it is necessary to look at how they affected students in different income classes.

19. From Table 4.4, grants plus college work-study (measured in millions of 1988 dollars) totaled $10,644 and $6,827, respectively, in 1980–81 and 1988–89, while loans were $9,991 and $13,036.

20. Mortenson (1988b) provides a detailed analysis of changes in the Pell formula and illustrates their effects by calculations for students in eight hypothetical sets of circumstances over the period 1973–74 to 1986–87.

21. In 1980–81 and 195–86, respectively, the percentage of Pell funds going to students by sector was 29 and 22 for private nonprofit colleges and universities, 19 and 19 for public two-year, 41 and 37 for public four-year, and 12 and 22 for proprietary. By contrast, the percentage distribution of federal campus-based funding by sector remained essentially the same, with a 1 point increase in the percentage going to private nonprofit institutions and a 1 point decrease in the percentage going to public four-year institutions (*Trends in Student Aid* 1989, 12). McPherson (1988a, 14) attributes the increase in the proprietary share to a supply response by that industry.

22. The interest rate on GSL loans was 7 percent until 1980, when it was increased to 9 percent (Hauptman 1982). The prime rate rose from 6.8 percent in 1977, to 9.1 in 1978, to 12.7 in 1979, to 15.3 in 1980, to 18.9 in 1981 (U.S. Council of Economic Advisers 1977–81). For a discussion of MISAA, see Gladieux and Lewis (1987, 4–7).

Tables 4.5 and 4.6 provide two complementary views of the recent period. Table 4.5 shows average amounts of federal aid that college freshmen reported receiving for the school years beginning in 1974, 1980, and 1984 (on the basis of information presented in McPherson 1988a). Students were divided into five constant-dollar income classes on the basis of their reports of parents' income. In all income classes but the lowest, total federal aid increased sharply between 1974 and 1980, showing the effect of the 1978 MISAA legislation, and then declined again between 1980 and 1984. Average Pell grants, which were largest in the lowest two income classes, peaked in 1980 and then declined sharply over the next four years. Federal loans, by contrast, increased at the two lowest income levels over both years. In the second income class, for example, the share of loans (counted at face value) rose from 64 percent of all federal aid in 1974 to 77 percent in 1984. For students with incomes above $36,280, loans grew from 1974 to 1980 but then declined over the succeeding four years.[23]

Table 4.6, based on the same annual survey, shows the percentage of freshmen who reported receiving any support from various sources. In this table, students were divided by parents' income into classes defined in terms of percentages of the government-defined poverty threshold. Expressed in 1988 dollars, that threshold was $11,000 in 1982, making the income class limits $11,000 and $22,000. Like the previous table, Table 4.6 indicates a surge in the utilization of federal aid between 1978 and 1980. The jump in utilization is especially sharp for Pell grants by the second income class and for GSL/Stafford loans by all income classes. Table 4.6 also shows a decline in the percentage of students with Pell grants after 1980, reflecting the tightened eligibility requirements and also an increase in the use of GSL/Stafford loans for those in the lowest two income classes. Between 1978 and 1986, the proportion of students with below-poverty incomes who received any grant changed little, while the proportion among those with higher incomes increased. The explanation for this divergence appears to be in the increase in grants by institutions to those above the poverty threshold. Remarkably, these data suggest that those in the lowest income class were less likely to receive any grant than those in the next higher class, a fact that may be explained by cost differences in the institutions attended by these two groups. In contrast to grants, the proportion with loans increased markedly over the period for all income classes, approximately doubling. These data support the general conclusion that an increasing proportion of college students are borrowing to finance their educations.[24]

23. These survey data suggest that the average college student received 11 percent less in loans in 1984 than in 1980, which would seem to be consistent with the increase in aggregate federal loans shown in Table 4.4 of 10 percent (from $9,991 to $10,944 million) only if the proprietary share of such loans also increased significantly.

24. For a review of the evidence on the increase in borrowing and in loan burdens, see Hansen (1987).

Table 4.5 **Federal Aid per Student, Freshmen in Higher Education, by Income, 1974, 1980, and 1984 (amounts in 1988 dollars)**

	Year		
Income and Aid Source	1974	1980	1984
18,140 or less:			
Pell	1,025	1,072	775
Loans	628	720	1,083
Other	238	241	149
Total	1,890	2,033	2,006
18,140–36,280:			
Pell	305	484	270
Loans	651	1,038	1,150
Other	69	123	80
Total	1,023	1,645	1,500
36,280–54,420:			
Pell	105	172	60
Loans	437	1,056	811
Other	16	45	29
Total	559	1,273	900
54,420–90,700:			
Pell	78	78	24
Loans	325	931	448
Other	13	16	7
Total	415	1,025	479
90,700 or more:			
Pell	27	31	15
Loans	136	740	258
Other	5	7	5
Total	169	778	278
All:			
Pell	294	394	241
Loans	513	945	844
Other	65	94	62
Total	873	1,433	1,146

Source: McPherson (1988a, table 2, p. 6).

Note: Amounts shown for loans are face value. Base for calculations includes students with and without aid.

Table 4.6 **Percentage of Freshmen Receiving Aid from Selected Sources, 1978–86**

Aid Category and Parents' Income as % of Poverty Threshold[a]	Year				
	1978	1980	1982	1984	1986
Pell grants:					
0–100	37	49	37	33	34
101–200	24	44	32	28	28
200+	7	14	10	6	9
Institutional grants:					
0–100	11	13	12	15	15
101–200	16	17	16	22	24
200+	8	10	10	15	16
Any grant:					
0–100	48	60	49	45	45
101–200	47	63	53	52	55
200+	23	32	28	29	32
GSL/Stafford loan:					
0–100	6	14	19	21	21
100–200	9	21	29	33	36
200+	6	21	17	20	21
Any loan:					
0–100	14	25	28	28	27
101–200	22	37	40	43	45
200+	12	31	25	27	28

Source: Unpublished tabulations by Thomas G. Mortenson based on data from surveys of freshmen conducted by the Cooperative Institutional Research Program.

[a]Expressed is 1988 dollars, the income class intervals implied by the poverty threshold for a family of four in 1982 ($11,000 in 1988 dollars) were $11,000 or less, $11,001–$22,000, and over $22,000. The intervals are roughly the same for the other years (Congressional Budget Office, *Trends in Family Income: 1970–1986* (Washington, D.C., February 1988), table B-3, p. 104; and U.S. Council of Economic Advisers (1990, 359).

One other trend worth noting is the increase in aid given by colleges and universities out of their own funds. Table 4.4 shows that such aid increased by a factor of two and a half between 1963–64 and 1970–71 and has since increased at an annual rate of about 3 percent in real terms. As noted above, the growth in this form of aid has raised fears that it may represent a shift of resources away from need-based financial aid.[25] In order to examine the effect of institutional aid in recent years, Table 4.7 presents data comparing average grants received by freshmen at different income levels. Grants are divided into federal and all other, the most important source of which is institutional. Like the previous two tables, Table 4.7 exhibits an increase in federal aid in 1980 resulting from MISAA, followed by a decline in the next four years. What is striking about this table is the pervasive increase in average grants from other

25. Baum and Schwartz (1988c, 127) cite survey evidence showing that one-fifth of institutional discretionary aid awarded by colleges is not based on need.

Table 4.7 **Average Grant Aid per Student by Type, Freshmen at Private Institutions, by Income, 1974, 1980, and 1984 (in 1988 dollars)**

Income	Year		
	1974	1980	1984
18,140 or less:			
Federal	1,618	1,649	1,108
Other	922	1,384	1,413
18,140–36,280:			
Federal	590	887	483
Other	795	1,428	1,486
36,280–54,420:			
Federal	207	368	152
Other	388	1,139	1,166
54,420–90,700:			
Federal	143	147	51
Other	267	639	711
90,700–more:			
Federal	33	49	25
Other	87	285	412
All:			
Federal	490	640	365
Other	551	1,056	1,096

Source: McPherson (1988a, table 3, p. 12).

Note: Base for calculations includes students with and without aid. Federal grants are sum of BEOG/Pell and SEOG grants. Other grants include state, external, and institutionally funded grants.

sources and, especially, the large percentage increases of such grants in the higher income classes. Between 1980 and 1984, for example, the average grant from nonfederal sources received by a student in the highest income class increased by 45 percent, compared to an increase of 11 percent for the next highest class and increases of 4 percent or less for the bottom three classes. Such findings are consistent with an increase in the importance of no-need scholarships.

4.3 The Effect of Financial Aid

What effect does financial aid have on students? One effect is distributional: student financial aid clearly makes a difference in the financial situations of many students and their parents. The $27 billion of student financial aid distributed in 1988–89 undoubtedly made it possible for many families to spend less of their own resources for college expenses and for many students to enjoy a higher standard of living than they would have otherwise. A second kind of effect, probably more important than the first, is behavioral. Does financial aid increase the probability that a student will enroll in college and,

once enrolled, graduate? Does aid affect applicants' choices among colleges? Do different forms of aid have different effects? An assessment of the effect of financial aid on the demand for undergraduate college places requires considering both these effects. Regarding distribution, it is important to be clear about what the actual incidence of financial aid programs has been, particularly in light of the evidence noted above that changes in federal aid programs in the 1970s had the effect of shifting aid from low- to middle-income classes. Recently, Newman (1985) has warned of deleterious effects of increased reliance on loans and has advocated aid programs that carry a requirement to perform service. According to Newman, loans are undesirable because of what he sees as their harmful effects on persistence, student career choices, and values. In this section, the distributional and behavioral effects of student aid are considered in turn.

4.3.1 The Incidence of Aid

As previous discussion has made clear, the bulk of student financial aid comes from programs whose aim is to provide assistance on the basis of financial need. A basic question to start with is whether the actual distribution of aid is consistent with this need-based objective. The available evidence points to an affirmative answer: actual aid packages decrease with a student's financial well-being and increase with college costs.[26] It is important to note that this definition of need does not guarantee that more aid will be directed toward low-income students. If more affluent students attend more expensive colleges, as they do on average, calculated "need" does not necessarily fall with income. In fact, the amount of aid does tend to fall with a student's family income. Data from freshmen surveys, such as are presented in Table 4.5, show this negative correlation with income, as do tabulations for 1980 and 1983 based on the High School and Beyond survey (Lee 1987, 13). But there are exceptions to this general rule, as shown, for example, in Table 4.2 above.

Criteria besides need also shape the distribution of financial aid. In particular, aid awards tend to increase with ability. Tabulations based on the High School and Beyond sample for 1983 by Lee (1987, 18) showed, for example, that college students in the top quartile of measured ability received aid that averaged more than double that reported by students in the bottom quartile.[27] Although federal formulas admit no criteria besides need, the positive association between aid and ability probably arises as a result of the tendency of high-ability students to attend more expensive colleges and of the inclusion of achievement as an explicit criterion in many nonfederal aid programs.

Despite its generally redistributive nature, student aid has undergone significant changes in recent years, and these certainly affect its incidence. As noted

26. See, e.g., Schwartz (1986, 110), Lee (1987, 13), or Stampen and Cabrera (1988, 41). In accordance with the uniform methodology, Schwartz finds that aid also rises with the number of siblings an applicant has.

27. Schwartz (1986, 110) finds a similar relation for public grants.

above, aid, especially at the federal level, has changed in distribution and in composition. For several years following MISAA in 1978, there was a marked but temporary increase in aid to middle-income students. The composition of federal aid changed after 1980, with loans increasing and grants declining. The 20 years between 1970 and 1990 offer several turning points in the shape of federal financial aid policy—a surge in aid to the poor, followed by a redistribution to the middle class, followed in turn by a return toward previous patterns but with an increasing reliance on loans rather than grants.

4.3.2 Effects on Enrollment

One need look no further than the post–World War II GI Bill for clear evidence that financial aid programs can have a large effect on college enrollments. Largely as a result of the college benefits offered by this program, male enrollments in the United States doubled between 1945 and 1947, and, by the 1947–48 academic year, payments under the program accounted for one-quarter of all educational and general income received by colleges and universities.[28] Current financial aid programs, by contrast, have aims as well as effects that are surely more diffuse than those of the postwar GI Bill, and thus it is not surprising that discerning the effect of these newer programs has not been a simple matter. Numerous statistical studies, most of them employing cross-sectional data on individual students, have been undertaken to assess the effect of various student aid programs on enrollment rates, choice of college, and persistence toward completion of degree requirements. Such studies typically control for variables such as parents' education and income, ability, sex, and race, among other characteristics. Leslie and Brinkman (1988) undertook an extensive survey of these statistical studies. They found that the general conclusion arising from this body of research is that financial aid has a significant effect on college enrollments and that this effect is strongest at low income levels. But, conclude the authors, "In all likelihood, the aid effects are relatively weak compared to factors known to be important, such as parents' education" (p. 136).

Several studies in this literature are particularly noteworthy. Each employs cross-sectional data based on massive surveys of students, and each produces estimates of behavioral models that imply that student financial aid programs have a large effect on college enrollment decisions. In their study based on the 1972 National Longitudinal Survey, Manski and Wise (1983) focus specifically on the effect of the BEOG/Pell grant program on college enrollments, presenting a simulation indicating what enrollments would have been in 1979 had the program not existed. This simulation suggests that the program made the greatest difference for students in the lowest income group (less than

28. Rivlin (1961, 64–70) provides a description of the Servicemen's Readjustment Act of 1944, the "GI Bill of Rights." For discussions of the effect of the GI Bill on the demand for higher education, see Galper and Dunn (1969) or Bishop (1977). For commentary on its importance in opening opportunities for education, see Berhman, Pollak, and Taubman (1989).

$27,500 in 1988 dollars). Without the program, college enrollments in that income class would have been some 27 percent less, according to the estimated model. The program made less difference in the middle and upper income classes—enrollments would have been 9 and 2 percent less, respectively. Virtually all these increases were in two-year institutions.[29] Using the same data, Blakemore and Low (1985) examined the likely effects of several policy changes, including a 30 percent cut in all scholarships. Again, the simulated enrollment effects are rather large, with predicted declines on the order of 5 percent. Schwartz (1986), employing the more recent High School and Beyond data, found that government grants significantly affected college enrollments, but only at low and middle incomes. For students whose parents had incomes of $21,500 (in 1988 dollars), for example, his estimates imply that the elimination of such grants would lower the probability of enrollment from 0.63 to 0.57; grants have little effect at income levels above $36,000, in 1988 dollars (Schwartz 1986, table 3, p. 113).

In apparent contradiction to research findings such as these, Hansen's (1984) examination of trends in aggregate enrollment rates suggested that financial aid had little effect. Reasoning that the federal initiatives in student financial aid during the 1970s should have stimulated the enrollment of low-income students relative to that of more affluent students, he compared the relative college enrollment rates by income group at the beginning of the decade and then again near the end of it. Specifically, he calculated enrollment rates for those below the median income and for those above it; the comparisons were based on computations of averages for 1970 and 1971 and for 1978 and 1979. Since the major federal aid programs of the 1970s were directed toward needy students, he reasoned, their expansion should have raised the enrollment rates of the low-income students relative to the high-income students. However, he found no evidence of this. Instead, the college enrollment rates of those below the median changed little or declined in comparison to the rates for those above the median. These findings appeared to pour cold water on hopes that financial aid programs would be able to erase some of the income-related disparities in college enrollment rates.

Owing in large part to its policy implications, this study has generated a great deal of debate,[30] so it is worth briefly considering the findings and their interpretation. One question that arises is whether these findings represent the facts fairly or whether they are merely the result of some statistical quirk. Although some have suggested modification in Hansen's methodology, his findings have been generally confirmed by subsequent research.[31] A second

29. In fact, the simulations suggest that enrollments in four-year institutions are slightly higher in the absence of the program. The largest effects are seen to be in two-year colleges and vocational schools (see Manski and Wise 1983, 124). In 1988 dollars, the threshold for their highest income class is about $35,400.

30. Hearn and Wilford (1985, 4–2) and McPherson (1988a, 5n), e.g., refer to the controversy surrounding Hansen's study.

31. On this point, see McPherson (1988a, 5n).

question is whether the empirical comparisons represent a good test of the effect of student aid on needy students. McPherson (1988a) points out that Hansen's second point of observation comes during the shift of federal aid toward middle-income students resulting from MISAA in 1978.

In light of these two points, it is instructive to plot the trend in enrollment rates throughout the 1970s and into the 1980s to see if the 1978/1979 observation was an aberration. Table 4.8 presents calculations based on Hansen's methodology for the years 1970–88.[32] The first three columns are based on data for families with dependents 18 to 24 years old. The next three columns present calculations for individuals in the same age group who were not married with a spouse present; most but not all of these are dependents, so data on income generally reflect family income of parents.[33] The third and sixth columns present ratios of enrollment rates for those below the median income to those above, and the movements in these ratios are quite similar over the period shown. During the 1970s, these rates showed little trend, which is consistent with Hansen's comparison of 1970/71 and 1978/79. After that period, however, the table shows a decline in both ratios between 1978 and 1983. This period witnessed the simultaneous deterioration in rates at low incomes and an improvement at above-median incomes, possibly reflecting the redistribution of student aid funds that accompanied the passage of MISAA in 1978. Since 1983, the rate based on families changed little, while that based on dependents increased slightly. Similar findings were obtained by Mortenson and Wu (1990), who calculated enrollment rates by income quartile over time. They concluded that the difference in rates between low- and high-income young adults has increased over time. By showing a relative deterioration in the enrollment rates among lower-income young people over the same period when grants were being cut and increased aid was directed to the middle class, these data are at least consistent with the hypothesis that student aid has had an effect, albeit a perverse one, on college enrollments.

A third question that arises in connection with Hansen's finding has to do with the interpretation of the statistical studies whose results appear to be contradicted. Based as they are on models that are estimated from cross-sectional data, the simulations of policy effects such as those discussed above embody the important implicit assumption "other things equal." These models would predict that an infusion of new funds into financial aid such as occurred in the 1970s would increase college enrollments, assuming that other influences on demand did not change. Needless to say, this assumption is hardly ever satisfied in real life. As we have seen, the demand for college places is

32. There is one minor difference in methodology. Whereas Hansen divided his samples in half, using the median income for the families of dependents 18 to 24 years old, the figures in Table 4.8 are based on dividing each year's sample by the median family income in that year.

33. Over this period, the percentage of financial aid recipients who were classified as financially independent of their parents was increasing. How this change affects the figures in Table 4.8 or their interpretation is not clear, but this is a trend that seems likely to affect the distributional effect of these aid programs as well as the measurement of their effect.

Table 4.8 **College Enrollment Rates, Above and Below the Median Family Income, 1970–88**

	% of Families with Members Aged 18–24 with One or More Enrolled in College Full-Time			% of Dependents Aged 18–24 Enrolled in College[a]		
	Below Median Income	Above Median Income	Ratio	Below Median Income	Above Median Income	Ratio
1970	27.9	52.4	.53	27.5	51.8	.53
1971	26.9	50.4	.53	26.8	49.9	.54
1972	26.8	49.3	.54	26.9	47.6	.57
1973	25.0	47.8	.52	24.8	46.4	.53
1974	23.7	45.4	.52	25.1	45.4	.55
1975	26.5	48.9	.54	27.6	48.5	.57
1976	25.8	49.7	.52	26.9	50.5	.53
1977	25.1	47.7	.53	26.2	48.5	.54
1978	25.1	44.7	.56	25.8	45.4	.57
1979	23.7	44.3	.53	25.1	45.0	.56
1980	23.8	46.0	.52	24.9	46.7	.53
1981	24.2	46.7	.52	24.9	46.6	.53
1982	22.2	46.3	.48	23.0	46.7	.49
1983	22.0	46.9	.47	22.4	47.3	.47
1984	23.1	48.4	.48	23.7	48.8	.49
1985	22.7	47.8	.47	23.9	48.1	.50
1986	22.9	48.3	.47	25.0	49.0	.51
1987	[b]	[b]	[b]	27.2	52.0	.52
1988	[b]	[b]	[b]	26.7	51.3	.52

Source: Calculations based on data in U.S. Bureau of the Census, *Current Population Reports*, Series P-20, *School Enrollment—Social and Economic Characteristics of Students* (various years). Columns 1 and 2 are based on tables entitled "College Attendance of Primary Family Members 18 to 24 Years Old by Family Income, Race and Hispanic Origin" (table 12 in the 1986 report). Columns 4 and 5 are based on tables entitled "Enrollment Status of Primary Family Members 18 to 24 Years Old" (table 15 in the 1988 report).

Note: Percentages in this table have standard errors of about 1 percentage point or less. For example, the estimated standard errors for the percentages in 1986 in columns 1 and 2 are 0.8 and 1.1, respectively. For columns 4 and 5, they are 0.7 and 0.9.

[a]Includes all primary family members aged 18–24, other than those who were married with a spouse present. In 1988, 93 percent of these were dependents.

[b]Not available. In 1987 and 1988, questions referred to dependent family members only.

affected not only by financial aid but also but such factors as the relative earnings advantage of college graduates, the family incomes of prospective students, and tuitions. Only a statistical study that accounted for the effects of influences such as these would be satisfactory in assessing the independent effect of financial aid. A step in this direction is an analysis by McPherson and Schapiro (1991) of variations both over time and among groups within the population. They analyze highly aggregated data on enrollments by sex of students in three income groups for a period of 10 years, divided into public

and private institutions. Their estimated equations support the hypothesis that net costs exert a negative effect on the enrollment of low-income students but not on that of affluent students. Given the highly aggregated nature of the data and the omission of measures of economic return to college, however, these results remain suggestive rather than conclusive.

4.3.3 Other Effects

Besides its effect on overall enrollments, financial aid may influence the choice of institution enrolled in and whether a student already enrolled drops out. Research on choice of institution generally shows that the amount of grant aid has similar but opposite effects from those of tuition: increasing aid will raise the probability of enrolling a given student.[34] While these results are probably most useful for institutions considering how to structure their tuition and financial aid packages, research on choice of institution does have a significant implication for public policy. If aid is an effective demand-generating device, then need-based aid has the potential of encouraging needy students to apply to expensive colleges, thus blunting the existing tendency toward income homogeneity in college choice. In a study that examined whether high school students applied to one of a group of 63 highly selective institutions, Spies (1978) found evidence consistent with this effect. For students who were not seeking financial aid, the probability of applying to one of these colleges increased with income; for those seeking aid, however, there was little variation with income.[35]

As for the decision to stay in college, among the factors that have been found to be important are gender, race, age, and academic performance, both in high school and in college.[36] In addition, most research indicates that financial aid increases the chance of continuing in college. By removing or minimizing the financial reasons why a student might drop out, financial aid appears to put aid recipients on an equal footing with nonrecipients. A study by Stampen and Cabrera (1986) illustrates this finding. When several background

34. For a review of statistical studies on this question, see Leslie and Brinkman (1988, 156–63). For a study focusing on the effect of tuition and financial aid on enrollment at one institution, see Ehrenberg and Sherman (1984). In their study of the higher education benefit that existed as part of the social security program, Ehrenberg and Luzadis (1986) look at several dimensions of behavior, including choice of institution as measured by cost. Their findings suggest that this benefit induced families sending their children to private institutions to spend more, to contribute more, and to have the student work less.

35. See Spies (1978, 37–38). It is possible, however, that this result may arise from simultaneity, in that low-income students not planning to apply to an expensive college would be less likely to apply for aid in the first place.

36. See, e.g., Stampen and Cabrera (1986, 1988), Moline (1987), and Leslie and Brinkman (1988, 173ff.). As an extension of this research, I examined the college completion (by 1986) of a sample of about 3,000 students who had been enrolled full-time in the fall of 1980. Completion rates rose with income and measured ability. They were high for students originally enrolled in selective colleges or other private colleges and lower for those who started off in two-year colleges. Blacks had lower graduation rates than whites, although they were more likely to have finished at least two years of college.

variables were held constant, the neediest financial aid recipients experienced dropout rates similar to those receiving no aid (p. 32).

An important question is whether the form of the aid matters in the decision to drop out of or remain in college. Most studies appear to suggest that grants and work-study are more favorable to continued enrollment than loans.[37] However, Ehrenberg and Sherman (1987) found that college students who were employed, especially in jobs off campus, had higher dropout rates. Using the High School and Beyond sample, I examined a sample of 3,008 students who were full-time freshmen in 1980 to see if their initial financial aid packages were associated with whether they graduated within five and a half years. Separate equations were estimated by race and family income level. Three variables measured the financial aid packages: the logarithm of grants, the logarithm of loans, and whether the student received college work-study. Grants were associated with higher graduation rates for three groups of students: high-income (family incomes of $25,000 or more in 1980) whites, low-income blacks, and high-income other nonwhites. Loans were associated with higher graduation rates for low-income whites. College work-study was not significant in any of the equations. The positive effects estimated for loans agree with other findings and seem especially noteworthy in the case of low-income blacks. It is also interesting that loans did not have a significant negative effect in any of the equations. Results such as these may be subject to sample selection bias, however, in that students themselves applied for and accepted aid of different types.[38]

Of the types of aid whose effects on students are important for the consideration of student aid policy, none has received the degree of scrutiny that loans have. The growing importance of loan finance during the 1980s has been a source of intense concern among those interested in higher education policy. Not only is there a fear that the use of loans may "overburden a generation," but there is also concern about the effect of loans on enrollment and persistence rates, especially among minority students, on career choices, and on student attitudes (see Hansen 1987; and Newman 1985). That borrowing increased during the 1980s is widely recognized. Certainly, the aggregate amount of loan commitments shown in Table 4.4 indicates a substantial increase. The number of students taking out loans also rose sharply. The number of loans to undergraduates in Illinois, for example, more than doubled between 1975 and 1985. The number of GSL borrowers in Pennsylvania colleges and universities tripled between 1974–75 and 1983–84 (Hansen 1987, 9–10). By 1983, 59 percent of all full-time college seniors, and two-thirds of those in private institutions, had accumulated some debt (Hansen and Rhodes 1988, 107). Yet it is not clear that the magnitude of the accumulated debt is "excessive." In 1986, the average indebtedness after four years, among those

37. For statements on the superiority of loans and work-study, see Jensen (1984, 124), Leslie and Brinkman (1988, 174), and Stampen and Cabrera (1988, 31).

38. For a description of this estimation, see the appendix to this chapter.

at four-year institutions who borrowed anything, was $6,685 for students in public institutions and $8,950 for those in private. Despite the sharp rise in borrowing, the resulting loan burdens still do not appear to be excessive, except in a very small percentage of cases (Hansen 1987, 6, 37; Hansen and Rhodes 1988). Nor is there persuasive evidence that loan finance adversely affects persistence or significantly influences career plans (Voorhees 1985, 26; Hansen 1987, 33).

There is concern, however, about the effect of loan finance on the enrollment behavior of low-income students. Household surveys indicate that people's expressed willingness to borrow for educational expenses rises with income. A Federal Reserve Board survey in 1983, for example, found that the percentage of respondents who said they would be willing to borrow for educational expenses was over 80 percent in every income class over $14,300 (in 1988 dollars), while the percentage willing to do so was less than 80 percent in every income class below $12,000.[39] A survey of parents of high school seniors in 1980 asked whether the family was unwilling to go into debt to pay for schooling. Among parents with incomes over $43,000 (in 1988 dollars), 29 percent said they would be unwilling; among those with incomes below that, 40 percent expressed unwillingness (Olson and Rosenfeld 1984, 465). It has been argued that such reluctance is rational for minority groups that have historically been the object of discrimination, given the uncertainties that such circumstances lend to the calculation of the economic return to education (Mortenson 1990; Hauser 1990, 30–31). Whatever the rationale, such reluctance appears to be a factor worth considering in any assessment of the effect of financial aid on undergraduate enrollments. Adding to the importance of this consideration is the apparent high rate of growth in loan burdens among low-income students. Data collected for GSL indebtedness among undergraduates in Pennsylvania colleges showed the largest increases in debt in lower income classes. As a result, whereas average debt burdens generally increased with income in 1984, they actually tended to decrease with income in 1989 (Mortenson 1990, 19–22).

4.4 State Policies

As important as the role of the federal government has been in providing financial assistance to college students, it would be impossible to gain a fair impression of U.S. public policy to encourage college attendance without considering the role of the states. State policies directly affect the demand for undergraduate places in two ways—through their institutional support of public institutions and through state student aid programs. The most visible manifestation of the first is the vast infrastructure of colleges and universities that the states, and to a lesser extent local governments, have built up. As was

39. A similar survey in 1977 produced the same pattern, with the cutoff income at $9,000 rather than $12,000 (see Mortenson 1988a, 16–17).

noted in the previous chapter, the proximity of colleges influences enrollment; thus, the rapid expansion of state systems of higher education during the 1960s and 1970s, featuring the construction of hundreds of new two-year colleges, had an undeniable effect on college going. But a more significant aspect of this institutional support is the ongoing low-tuition policy followed in all the states. To compensate for the relatively small tuition revenues, the states provide direct appropriations to public institutions. Thus, institutional aid is directly tied to the price faced by students.

States also pursue a second set of policies—student aid programs closely resembling the federal programs discussed above. Partly as a result of the State Student Incentive Grant (SSIG) program, under which the federal government matches state need-based grants on a one-to-one basis, all the states operate at least some grant program. Recipients may include students at private as well as public institutions. All together, state grant programs amounted to $1.6 billion in 1988–89, or about one-quarter of the amount of federal grants awarded in that year (see Table 4.4). A number of states have also developed college savings plans using tax-exempt bonds, and a few states offer a form of prepaid tuition. The success of the latter appears to rest largely on whether the interest earned on funds deposited by parents into state accounts will be subject to federal income tax.[40]

Of these two types of state policies, the first is clearly the more important. The rest of this section examines the size, incidence, and effects of the states' institutional support of public colleges and universities.

The subsidy to students in the form of low tuitions at public colleges and universities appears to be larger than all federal student aid even when federal loans are valued at their face value. One rough measure of the aggregate amount of state subsidies to students is the difference between state appropriations to public institutions ($28.1 billion in 1985–86) and tuition received ($9.4 billion)—$18.6 billion. The total for federal student aid in that year was $15.9 billion (U.S. Department of Education 1989, 293, 302; *Trends in Student Aid* 1989, 6). As a result of state subsidies, the tuition paid by students in public colleges and universities usually covers a much smaller share of total costs than is the case in private institutions. To see just how much smaller a share, consider as a measure of spending on items directly related to students total educational and general expenditures minus expenditures on research and public service. At private institutions in 1985–86, tuition payments covered 44 percent of these costs, while at public institutions they covered only 22 percent.[41] The extent of public subsidies differs among states, as suggested by the variation in tuition levels. As shown in Table 4.9, tuition for in-state

40. For descriptions of state plans, see McGuinness and Paulson (1990); James Barron, "Pay-now, Learn-Later Plan Proves Popular in Michigan," *New York Times*, 12 August 1988, sec. 1, p. 8; and Andi Rierden, "Tax-Exempt College Bonds Planned," *New York Times*, 2 April 1989, sec. 23, p. 4.

41. Totals for 1985–86 from U.S. Department of Education (1989, 293–94, 302–3).

Table 4.9 **Average Undergraduate In-State Tuition at Public Four-Year Institutions: Highest, Lowest, and National Average, 1986–87($)**

National average	1,414
Highest five states:	
Vermont	2,942
Pennsylvania	2,496
New Hampshire	2,190
Virginia	2,070
Ohio	1,982
Lowest five states:	
Texas	885
North Carolina	818
Wyoming	778
Oklahoma	757
District of Columbia	634

Source: U.S. Department of Education (1989, table 259, p. 283).

students ranged from $634 in the District of Columbia and $757 in Oklahoma to $2,496 in Pennsylvania and $2,942 in Vermont.

From the perspective of college students, the subsidy implicit in low tuitions combines with explicit financial aid assistance to reduce the cost of attendance. Using information on individual students from the High School and Beyond survey, Lee (1987) estimated the average size of these components of subsidy for three types of institutions in 1983, as shown in Table 4.10. An institutional subsidy was calculated for each student as the difference between the per-student expenditures at that student's college (calculated from separate financial data for individual institutions) and the amount of tuition paid. The total subsidy enjoyed by a student is the sum of this institutional component and the amount of financial aid received. The table's first row shows the average expenditure per student for the institutions attended by those in the sample in 1983. Looking first at four-year institutions, the figures show that average expenditure at private institutions was about $2,200 more than that at public institutions but that the difference in average tuitions was about $3,200. While students at both types of institution received a subsidy—measured by the difference between average expenditures and tuition—the size of this subsidy was substantially greater in public four-year institutions.

When information on students' sources of financial aid is considered, however, this advantage disappears. Where loans are valued at 30 percent of their face value, the average student at a private institution received over twice that received by the average student at a public institution. It is interesting to note, however, that average financial aid in the public institutions is very close to their average tuition. Adding financial aid to the subsidies provided by institutions yields total subsidies of about $5,600 for private and $5,100 for public four-year institutions. The third column of the table gives corresponding information for public two-year colleges, showing much lower per-student ex-

Table 4.10 Sources of Subsidy by Type of Institution, 1983($)

	Type of Institution		
	Private Four-Year	Public Four-Year	Public Two-Year
A. Instructional and educational expenditures per student[a]	7,292	5,073	2,448
B. Tuition	4,394	1,230	584
C. Institutional subsidy (A − B)	2,898	3,843	1,856
D. Financial aid per student[b]	2,707	1,226	538
E. Total subsidy (C + D)	5,605	5,069	2,394

Source: Lee (1987, pp. 4–5, 6, and table 13).

[a]Includes expenditures for instruction, public service, academic support, student services, institutional support, operation and maintenance of plant, and transfers. Excludes expenditures on research, scholarships, and auxiliaries.

[b]The subsidy value of loans is assumed to be equal to 30 percent of face value.

penditure levels, tuitions, and financial aid.[42] The resulting institutional subsidy and total subsidy are only about half those offered by four-year public institutions. As the figures in this table make clear, the subsidies offered by state and local governments in the form of low tuitions have a substantial effect on the net cost of college attendance. While average financial aid at public colleges virtually matched average tuition in 1983, there remained a sizable tuition-aid gap in the private sector.[43]

What is the distributional incidence of these state subsidies? In a widely cited study of the public higher education system in California, Hansen and Weisbrod (1969) concluded that they were decidedly weighted toward upper-income households. This conclusion results from two basic facts concerning the pattern of subsidies offered by states and the relation of college attendance to income. First, as discussed above, states offer a subsidy in the form of education whose value exceeds the price charged, and the value of this subsidy is greater for four-year institutions than for two-year colleges. Hansen and Weisbrod found a similar pattern for California in the 1960s. The second fact leading to this result is that college attendance rises with income, and attendance at four-year institutions is especially concentrated among high-income households. Data presented by Hansen and Weisbrod (1969, table 5) for 1964 show, for example, that families with incomes over $20,000 ($76,400 in 1988 dollars) accounted for about 4 percent of all families in the

42. As Lee (1987, 20) notes, however, the subsidies for two-year institutions are most likely understated relative to those for four-year institutions because total enrollments, rather than full-time equivalent enrollments, were used for calculations.

43. Lee (1987, table 13) performed similar calculations for 1980 and found that average aid in that year exceeded tuition for those enrolled in public institutions. Similarly, using aggregate data, Hansen and Stampen (1987, table 5) find that financial aid exceeded tuition payments in 1980–81 but not in 1984–85.

state, 7 percent of those with children in two-year colleges, 8 percent of those with children in four-year state colleges, and 18 percent of those with children in the University of California. Although some portion of differences such as these result from differences in family life cycle—families with college-age children are typically near their peak lifetime earnings—the utilization of state subsidies for higher education clearly rises with income level.[44] Despite the egalitarian notions and rhetoric that are often associated with low public tuitions, therefore, they do not actually favor the poor.

Besides these distributional consequences, what effect do state subsidies of higher education have? One obvious consequence of the long-standing state policies of construction and subsidy has been to create a public sector of higher education. What is not obvious is whether this active public role has increased total enrollments and resources in higher education compared to what they would have been otherwise. Peltzman (1973) addressed this issue by viewing public higher education as an in-kind subsidy. State governments in effect provide a certain amount of higher education at a below-market price, but in this model consumers can obtain more than this amount (college education of higher quality) only by going to the private alternative and paying the higher price. Such a subsidy results in an increase in overall enrollment, but the effect on aggregate expenditures on higher education is not obvious. Faced with the two available alternatives, a consumer in theory might choose to purchase either more or less higher education. Peltzman's empirical work suggests that state subsidies increase the total expenditures on higher education but that most government spending simply substitutes for expenditures that would have been made otherwise in the private sector.[45]

State subsidies to public institutions constitute the single most important public policy affecting undergraduate student enrollment. Their aggregate value exceeds that of all federal student aid programs. By lowering the cost of college, in terms of both reduced tuitions and lower average transportation costs, the policy has had the effect of increasing college enrollments. Although the size of average subsidies increases with income, it seems likely that the largest effect on enrollments has been at middle and lower income levels, for it is students in these income classes who have participated most in the boom in community college enrollments. Beyond these aggregate effects on enrollment, there appears to be little research on the effects of state subsidies on specific behavior such as continuation of enrollment. This may simply be the result of the pervasiveness of the policy itself and the difficulty in linking variations in it to specific behaviors.

44. For further discussion of Hansen and Weisbrod's study, see, e.g., Pechman (1970) and Hartman (1970).

45. Peltzman's (1973, 19) estimates, based on two-stage least squares regressions explaining public and private expenditures on higher education in each state, imply that, in the absence of state subsidies, "expenditures would be three-fourths to five-sixths those of present total expenditures, and enrollment would be two-thirds to three-fourths of the present total."

4.5 Summary and Policy Options

In concluding this discussion of public policies affecting college enrollment, it is useful to summarize existing policy and to note some of the proposals for change that have been discussed in recent years.

Current public policy in this area consists of two major parts, one not obviously more important than the other. There is a state part consisting of across-the-board subsidies made available to college students attending publicly supported institutions, most of them on the state level, and there is a federal part composed of the major student financial aid programs. By all appearances, state policies have a pervasive effect on both the allocation of resources in higher education and the distribution of benefits. Because of these policies, a substantial percentage of undergraduates in the United States attend colleges operated by a state or local government. The largest subsidies made available in this way go to the middle class, although state and local construction and support of two-year colleges have greatly expanded college opportunities for low-income students in the past 30 years. As a result of state subsidies, high school seniors have the choice of applying to colleges in either of two distinct sectors—a generally high-priced private one and a lower-cost public one. The coexistence of these two sectors sets the stage for federal student aid policy, serving as both precondition and objective.

The array of federal aid programs is often denigrated for its complexity and apparent haphazard construction, with programs working at cross-purposes and with unintended consequences. While these descriptions could probably be used to characterize public policy in any number of areas, contradictions do not appear to be especially numerous in the area of student financial aid. Not only has the basic structure of federal student aid programs enjoyed rather widespread and sustained support, but existing policies appear to be consistent with two basic objectives that are by no means necessarily incompatible. One, arising out of widespread support for the ideal of equal opportunity, is to provide financial support for low-income students who are willing to work and borrow and who otherwise qualify for admission. This is the aim of "access" and is embodied in such programs as the BEOG/Pell and the SEOG grants, work-study, and the heavily subsidized NDSL/Perkins loans.

The second aim, "choice," is inextricably bound up with the existing two-sector structure of U.S. higher education. As in other federal programs touching higher education, student aid policy pays special attention to the requirements of high-cost college and universities. By basing awards on need, aid formulas have a built-in escalator clause that produces bigger awards for those who enroll in high-cost colleges. Although federal aid for students comes largely in the form of direct financial assistance to the students themselves rather than institutional support, the design of the aid has very important implications for the well-being of institutions. "Evenhandedness" is achieved in federal aid programs by offsetting state subsidies. As a further manifestation of this choice objective, the federal government has been sensitive to the pre-

dicament of middle-class students, and this sensitivity appears to have been the original motivation in creating the major student loan program, the GSL/ Stafford loans.

What might have remained a neat access/choice policy of grants for the poor and loans for the middle class was undermined in the 1980s by reductions in congressional appropriations. In the best budget tradition of putting off outlays to the "out-years," Congress reduced grant programs and substituted loans in their place so that, by 1988–89, 49 percent of the federal student aid dollars awarded was in the form of loans. This shift has raised concerns about debt burdens, loan defaults, and adverse enrollment effects, especially among minority students.

Proposals to reform federal financial aid extend from marginal modifications of existing programs to the creation of altogether new programs.[46] Starting at the modest end, one obvious possibility is to increase the funding of the federal grant programs so that they would cover a greater portion of the college costs now being met with borrowing. One way of doing this would be to reduce or eliminate the grant funds going to students at proprietary schools, but such a remedy would obviously be opposed vigorously. Another way of increasing the amount of aid given to the poor, without increasing total expenditures, would be to change the formula used for needs analysis, making the implicit tax schedule more progressive. Among those students currently receiving aid, this change would increase calculated need for those with lower incomes and decrease it for those with higher incomes. However, this increase in implicit marginal tax rates would tend to worsen any existing incentive problems now associated with financial aid.

Another idea that would involve a relatively incremental modification of the current system is to change the way aid is packaged over a student's college career. The idea would be to front-load grants into a student's early years of study, allowing loans to finance the bulk of need after that. It is thought that this approach might overcome reluctance especially among minority students to borrow for college before they are confident that they will obtain a degree. However, it is unclear what effect a policy change of this kind would have on the already lower completion rates of minority students. A further argument for the approach is that it would reduce the loan default rate by reducing loans to those most likely to default, those just starting college.[47] A related idea is to restrict grants to students in the traditional college-going age group, letting

46. For discussion of policy options in student aid, see Charles F. Manski, "the Coming Debate on Postsecondary Student Aid Policy," *Focus* 2 (Winter 1988–89): 1–5; Janet S. Hansen, "Student Financial Aid: Old Commitment, New Challenges," *College Board Review* 152 (Summer 1989): 26–31; Thomas J. DeLoughry, "1991 Reauthorization of Higher Education Act Is Viewed as Opportunity for Major Change in Federal Student Aid," *Chronicle of Higher Education*, 2 May 1990, p. A21; and Hauptman (1990b, esp. chaps. 2, 3).

47. See Edward Fiske, "Are Colleges Winning—or Even Fighting—the Battle to Recruit More Minority Students?" *New York Times*, 25 April 1990; Thomas DeLoughry, "1991 Reauthorization of Higher Education Act Is Viewed as Opportunity for Major Change in Federal Student Aid," *Chronicle of Higher Education*, 2 May 1990. p. A21; and Hansen (1987).

older students, who presumably have better employment possibilities, rely on loans.

A second broad class of possible reforms seeks to increase the amount of grant money available to students, especially those with low incomes, by creating new programs that carry new conditions. One proposal with numerous variants is to institute some sort of volunteer or national service requirement as a condition for receipt of aid. This would be in effect a nonmilitary version of the GI Bill program. Whether such a program would take the place of all existing grant programs, effectively making service a precondition for receiving federal grant aid, or whether this would be an add-on to existing programs would be one of the questions that such a proposal would face if it were to be considered seriously.[48] Another direction for new grant programs has been suggested by the example of a philanthropist who promised an entire class of inner-city school children that he would finance their college educations if they would finish high school. A New York State program patterned after this approach provides scholarship funds to supplement Pell grants.[49] Proposals for similar programs include other requirements, such as not using drugs and avoiding criminal conviction. Still other proposals suggest that loans might be forgiven under certain conditions, such as graduation or taking a teaching position.[50]

Another idea for providing low-income students a new source of finance for college goes instead in the direction of fewer conditions. As proposed by Haveman (1989), the government would provide all young people with personal capital accounts that could be drawn on for a limited number of uses, including education expenses, the purchase of a house, or medical bills, at the discretion of the individual.

Finally, there has also been discussion of various means by which students and their families could more easily finance their own college expenses. One set of ideas focuses on family saving before a child enters college, by means of tax-sheltered accounts similar to Individual Retirement Accounts. While such savings plans appear to be popular with taxpayers, they are expensive and would be of little help to low-income families.[51] A way that college costs could be pushed into the future would be through income-contingent loans. Similar to a plan initiated by Yale during the 1970s, such loans would require a student to pay a fixed percentage of his or her future income for a certain

48. For a discussion of youth service proposals, see Goldie Blumenstyk, "State Leaders Are Wary of Federal Efforts to Link Student Aid to Volunteer Service," *Chronicle of Higher Education*, 22 March 1989, pp. A1, A20.

49. Ibid.

50. For descriptions of programs modeled after Eugene Lang's philanthropy, see Susan Diesenhouse, "Harvest of Diplomas for Boston Poor," *New York Times*, 24 May 1989; Goldie Blumenstyk, "State Leaders Are Wary of Federal Efforts to Link Student Aid to Volunteer Service," *Chronicle of Higher Education*, 22 March 1989, pp. A1, A20; and "Proposal Seeks to Help Needy Pay for College," *Raleigh News and Observer*, 26 June 1990, p. 2B.

51. See Scott Jaschik, "Higher-Education Officials Applaud Federal Efforts to Use Tax Code to Encourage Families to Save Money," *Chronicle of Higher Education*, 3 January 1990, p. A17.

number of years. Depending on their incomes, some students would end up paying more than they would under a conventional loan, and others would pay less.[52] If the reluctance of low-income families to undertake debt is the fear that repayment might be impossible, the shift to income-contingent repayment might well induce a higher percentage of such students to enroll in college.

There appears to be, unfortunately, little hard evidence on the likely effect of proposals such as these. This is hardly surprising in light of the difficulty of assessing the effects even of currently operating financial aid programs. In addition, we know little about how colleges and universities respond to financial aid programs—for example, by modifying their admissions standards, recruiting strategies, or financial aid packaging. However, the body of empirical research that already exists on the demand for undergraduate places provides a reasonable first step in the evaluation of proposals. If the sum total of grant aid continues to decline in real terms as it has during the past decade, the net cost of college is likely to keep increasing, pushing down the demand for places.

Appendix
Analysis of Financial Aid and College Completion

An analysis of the effect of financial aid on college completion was undertaken using a sample, taken from the High School and Beyond survey, consisting of those who were full-time college students in the fall of 1980. Those reporting unusually high tuitions (more than twice the average tuition at private universities) or financial aid amounts (more than twice the average tuition and fees at private universities) were dropped from the sample. Tuition and fees figures for 1980–81 were based on U.S. Department of Education (1989, table 258, p. 282).

Table 4A.1 gives the full set of estimated coefficients for probit equations explaining the completion of two and four years of college. These equations show clearly the strong effect of both income and measured ability. In addition, those who were initially enrolled in selective institutions or other private four-year institutions had higher completion rates than those in public four-year institutions, whose students in turn had higher rates than those who began in two-year colleges. Three variables were used to measure the form of financial aid: the logarithm of grants, the logarithm of loans, and whether the student received college work-study. In the aggregated equations in Table

52. Income-contingent loans were proposed by Friedman (1962). For discussions of such programs, see Gladieux and Lewis (1987, 8); and Robert D. Reischauer, "The Bizarre War on 'Stars,'" *New York Times*, 17 October 1988.

Table 4A.1 **Probit Regressions Explaining Completion of Two and Four Years of College by Spring 1986 among Those Who Were Enrolled Full-Time in Fall 1980 (*t*-statistics in parentheses)**

Independent Variable	Equation and Dependent Variable: 4.1, Completed Two Years	4.2, Completed Four Years
Family income, 1980:		
$7,000–$11,999	.073	.007
	(.8)	(.1)
12,000–15,999	.034	−.012
	(.4)	(.1)
16,000–19,999	.058	.077
	(.7)	(.8)
20,000–24,999	.291	.330
	(3.4)	(3.7)
25,000–37,999	.417	.352
	(4.5)	(3.7)
38,000 or more	.479	.587
	(4.8)	(5.8)
Ability quartile:		
Second	.266	.247
	(3.5)	(2.9)
Third	.505	.437
	(6.9)	(5.5)
Highest	.700	.664
	(9.2)	(8.3)
Race/ethnicity:		
Hispanic	.072	.007
	(1.1)	(.1)
Black	.159	−.167
	(2.3)	(2.3)
Other nonwhite	.775	.179
	(6.5)	(1.6)
Male	.143	−.026
	(2.9)	(.5)
Type of college, fall 1980:		
Selective	.699	.454
	(3.3)	(2.6)
Other private four-year	.436	.333
	(6.1)	(4.9)
Two-year	−.265	−.486
	(4.6)	(7.7)
Financial aid, fall 1980		
Log of grant amount	.021	.029
	(2.6)	(3.3)
Log of loan amount	−.009	.0003
	(.9)	(.0)
= 1 if college work-study	.076	.064
	(.9)	(.8)
Intercept	−.714	−.995
	(7.5)	(9.7)
Sample size	3,008	3,009
Mean of dependent variable	.550	.365
Log of likelihood function	−1,871.2	−1,756.8

(continued)

Source: Sample was High School and Beyond.

4A.1, the grant variable is positive and significant, and the other two variables are statistically insignificant.

To see how these financial aid effects might differ among groups within the population, separate equations of the same form were estimated for twelve income and racial/ethnic groups. The estimated coefficients of the aid variables from these equations are shown in Table 4A.2. Grants were associated with higher graduation rates for three groups of students: high-income (family

Table 4A.2 **Estimated Effects of Freshman Financial Aid on Probability of College Gradution by Spring 1986 among Those Who Were Full-Time Students in Fall 1980**

Racial/Ethnic Group and Family Income[a]	*N*	% Graduating	Financial Aid Variable: Logarithm of Grant Amount	Financial Aid Variable: Logarithm of Loan Amount	Financial Aid Variable: = 1 if College Work-Study
White:					
Low	420	33	.030	.055*	.077
Middle	564	41	−.014	.006	.247
High	545	51	.070*	−.014	−.475
Black:					
Low	285	25	.092*	−.019	−.061
Middle	163	25	.048	.003	.158
High	68	43	.072	−.050	−.763
Hispanic:					
Low	267	25	−.017	.029	.524
Middle	188	37	.008	−.054	.667
High	106	37	.020	−.172	−2.079
Other nonwhites:					
Low	46	30	.045	−.127	1.484
Middle	52	37	.037	−.432	2.940
High	48	52	.217*	−.267	.054

Source: Sample was High School and Beyond.

[a]Income classes, in 1980 dollars, were as follows: low: under $16,000; middle: $16,000—$24,999; high: $25,000 and over.

*Significantly different from zero at the 5 percent level.

income $25,000 or more in 1980) whites, low-income (under $16,000) blacks, and high-income other nonwhites. Loans were associated with higher graduation rates for low-income whites. College work-study was not significant in any of the equations. The positive effects estimated for loans agree with other findings and seem especially noteworthy in the case of low-income blacks. It is interesting that loans do not have a significantly negative effect in any equation.[53] Estimates such as these suggest that the form of aid does matter and that cuts in grants, especially for those at lower income levels, could well have had the effect of discouraging continuation in school. The declines in four-year completion among blacks might well have resulted in part from the cuts in grant funds. Combined with evidence that aid affects initial enrollment choices, estimates such as these point to the retrenchment in financial aid as one likely culprit in explaining the divergent enrollment trends cited above.

53. Results such as these may be subject to sample selection bias in that students themselves applied for and accepted aid of different types.