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The Impact of Student Financial Aid: A Review of Recent Research

by Edward P. St. John

At the start of the past decade, serious doubts were raised about the effectiveness of student financial aid, which influenced cuts in federal support for student aid in the 1980s. One of the objectives of this review is to determine whether there are reasons for these doubts. Other objectives are to determine whether changes in federal aid policy during the 1980s influenced equal opportunity and to identify unanswered research questions.

The review indicates that student aid is an effective mechanism for promoting equal educational opportunity. However, the erosion in federal grant dollars during the past fifteen years may have influenced an erosion in minority access.

The intent of federal student financial aid programs authorized under Title IV of the Higher Education Act (HEA) is to promote equal educational opportunity. Questions about whether student aid promoted this goal were raised by researchers in the early 1980s (e.g. Hansen, 1985). While it may be too late to recapture the cuts in federal grant programs made in the 1980s, given the current emphasis on reducing the federal budget deficit, it is, nevertheless, an opportune time to reconsider the effectiveness of student aid.

This article reviews prior research on the impact of student financial aid. First, the framework used for the review is discussed briefly. Second, we focus on our knowledge of the impact of student aid on equal opportunity. Research is considered on each of the components of equal opportunity: access (attendance), choice of school, persistence, choice of major, and earnings. Finally, the findings from recent research are summarized and questions that merit further consideration by policy and institutional researchers are identified.

There have been a few recent, reasonably comprehensive reviews of the research literature on the impact of student aid (e.g. Jensen, 1983; Leslie and Brinkman, 1988; St. John, Bye, and Norris, 1987). Unfortunately, most of the research literature examined in these reviews concerned students who entered college in the early 1970s or before. Thus, very little is known from such reviews about the impact of changes in federal student aid policy during the 1980s. Fortunately, a small number of recent studies have considered the influence of student aid in the 1980s, which can be used for comparison with earlier periods.

According to Leslie and Brinkman (1988) there are three possible ways to study the impact of student aid: opinion surveys or studies that ask students if student aid influenced their choices; trend studies that examine the association between funding levels for federal programs and college enrollments; and econometric studies that...
examine the influence of aid on actual choices made by students, controlling for other factors that influence their choices. The focus of this review is on the econometric method, the most sophisticated and appropriate way to assess the impact of student aid.

There is a sequence of student choices that could logically be influenced by student aid: decisions to attend college, choices about which college to attend, decisions to persist, and choices about majors. The factors that need to be controlled to assess the impact of student aid on these outcomes are illustrated in Exhibit 1.2 Research on each of these outcomes would need to control for student background (social economic status in high school, student ability/achievement, and high school experiences). Additional factors that should be considered in research on particular student outcomes are also identified.

This review focuses on three areas of concern.

- Is student aid effective in promoting equal educational opportunity? This question is important because doubts have been raised about the effectiveness of student aid (e.g. Hansen, 1985).
- How has the impact of student aid changed in the 1980s compared to the 1970s and prior decades? Major changes in student aid policy during the 1980s, including a shift in emphasis from grants to loans, could have had an influence on equal opportunity.
- Third, what types of further research are needed to form institutional and government policy on student financial aid?

From earlier literature reviews it is clear that the econometric studies that control for appropriate background factors consistently find that student aid has a positive influence on student decisions to attend college (Jensen, 1983; Leslie and Brinkman, 1988; St. John, Byce, and Norris, 1988). The early student demand studies, mostly conducted before the federal role in student aid developed, consistently found that students were price responsive to tuition increases, that the probability that students would enroll decreased with increases in the amount of tuition that institutions charged (Jackson and Weathersby, 1975; Leslie and Brinkman, 1988; McPherson, 1978). The early demand studies were severely criticized, among other reasons, because they did not have sufficient controls (Dresch, 1975), and therefore only have limited usefulness for public policy. However, the initial studies using the National Longitudinal Study of the High School Class of 1972 (NLS-72) (e.g. Jackson, 1978; Manski and Wise, 1983), which usually had appropriate controls, consistently found that student aid had a positive impact on attendance (Leslie and Brinkman, 1988; St. John, Byce, and Norris, 1988).

There have been a few recent studies, not considered in prior reviews, that compared the influence student aid had on student attendance decisions in the 1970s and 1980s. Jackson (1988) looked at NLS-72 and the High School and Beyond Senior Cohort (HSB-80) and found that student aid had a positive influence on the enrollment
## EXHIBIT 1
A Dynamic Framework for Assessing the Effects of Student Aid on Equal Opportunity

<table>
<thead>
<tr>
<th>Background</th>
<th>Access/Attendance</th>
<th>Choice of College</th>
<th>Persistence</th>
<th>Choice of Major</th>
<th>First Job</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Old Factors</strong></td>
<td>N.A.</td>
<td>1-3</td>
<td>1-4</td>
<td>1-4</td>
<td>1-4, 12, 13</td>
</tr>
<tr>
<td></td>
<td>3. High School Experience</td>
<td>6. Financial Aid Offered</td>
<td>10. Aid Offered by Choice Set</td>
<td>14. Financial Aid • Type • Amount • History</td>
<td>17. Potential Earnings of Other Majors</td>
</tr>
</tbody>
</table>

Source: Adapted from St. John and Noell (1987).
of college applicants in 1972 and 1980 and that the relative impact of aid, the amount of variance explained by student aid, was similar in the two periods.

St. John and Noell (1989) compared the influence that different types of student aid packages had on the enrollment decisions of students in the high school classes of 1972, 1980 and 1982, using NLS-72, HSB-80, and the High School and Beyond Sophomore Cohort (HSB-82). They found that: 1) all types of aid packages were positively associated with attendance decisions when all students were considered; and 2) that packages with loans were less consistently significant for minority applicants than for white applicants in the 1980s.

Two recent price-response studies merit mention. Schwartz (1985) used HSB-80 to examine the influence of grant amounts and loan subsidies on decisions to attend public universities and found that students were responsive to the amount of grants they were likely to receive, but not to the loan amounts they were eligible for. St. John (1990a) used HSB-82 to examine price response to tuition and student aid in enrollment decisions by college applicants in the high school class of 1982. The research revealed that: 1) applicants were more responsive to student aid—all types—than to tuition; 2) that low-income applicants were highly price responsive to grants, but not to loans; and 3) that middle-income applicants were more price responsive to grants than to loans.

In another recent study using HSB-82, (St. John, in press) found that three factors could influence increases in minority attendance: academic preparation (as measured by test scores and grades), postsecondary aspirations, and student aid. He then identified three initiatives that could improve minority student participation rates: 1) early intervention programs for at-risk students, such as accelerated schools for at-risk students (e.g. Levin, 1988); 2) public information programs aimed at middle-school students (e.g. Stage and Hossler, 1989); and 3) increases in student aid, especially grants. Increasing grants is the one action that can have an immediate influence, while the other strategies take more time. In the long term, a comprehensive strategy emphasizing all three methods would seem to be most effective.

In combination, this research helps explain Hansen's finding that student aid was not effective. Hansen (1985) used Current Population Surveys (CPS) to examine college participation rates by different subpopulations in the traditional college-age cohort (eighteen-to-twenty-four-year olds) in 1972, the year before the Pell program was implemented, and in 1978, the year the Middle Income Student Assistant Act (MISAA) was implemented.

Hansen found that the participation rates by upper-middle- and upper-income students increased more during the six-year period than enrollment rates by lower-middle- and low-income students and, based on this finding, concluded that aid was not effective. However, the target population for student aid shifted in the middle 1970s—the percentage of middle-income students receiving federal

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Choice of School

grants and loans increased substantially (St. John and Byce, 1982)—
and therefore increases in participation rates by middle- and lower-
income students could be attributed to aid. The research reviewed
above indicates that the responsiveness to aid offers was similar in
both periods (e.g., Jackson, 1988).

Further, the income cap for guaranteed student loans was re-
moved in the fall of 1978, as a result of MISAA. Thus, given the fact
that lower-middle- and upper-middle-income students were price
responsive to loans (e.g., St. John, 1990a) the growth in participation
rates by those with higher-than-average incomes could be at least
partially attributed to the increased availability of loans in the 1980s.
Therefore, the fact that upper-income enrollment rates increased
faster than lower-income enrollment rates (Hansen’s finding) would
not imply financial aid is ineffective.

The reviews of prior research on student choice of school consist-
tently conclude that student aid is effective in promoting student
choice of school (Jensen, 1983; Leslie and Brinkman, 1988; St. John,
Byce, and Norris, 1988). Two earlier studies are particularly notable.
Jackson (1977), in an analysis of NLS-72, concluded that the amount
of student aid offered had a significant influence on the choice
among the schools students applied to. Tierney (1980a & b) used the
Cooperative Institutional Research Program (CIRP) data to examine
the influence of student aid and tuition charges on choices between
public and private institutions by students who applied to both. He
concluded that both the amount of aid offered—all types—and the
amount of tuition charged influenced student choice of school.

Two recent studies not included in the prior reviews also merit
mention. Grubb (1990) used NLS-72 to examine the causes of enroll-
ment in different types of institutions. He concluded that: 1) higher
tuition charges in community colleges tended to drive more individ-
uals, especially women, into private schools; and 2) higher tuition
charges in public four-year colleges tended to increase enrollment of
both men and women in private research universities and to increase
men’s enrollment at Liberal Arts Colleges. Unfortunately, there is no
more recent research on school choices made by students in the
1980s, although other research on student access also merits re-
consideration.

Another recent study, by McPherson and Schapiro, examined
enrollment trends of middle-income students, comparing enrollment
by income group in 1978 to 1989. They found that there had been
a shift of middle-income students from more expensive to less
expensive institutions. This suggests that shifts in federal student aid
policy influenced middle-income students’ college choices. It seems
they are likely to borrow to attend but not to borrow extra amounts of
money to attend expensive institutions.

Clearly more research is needed to determine the factors that
affect choice of school. At the state and federal levels, there is a need
for research on how shifts in student aid policy influence a student’s
choice of school. If the federal government makes further cuts in
Persistence

student aid in the 1990s, then more institutional research on school choice is warranted, especially that which examines how institutional grants and tuition charges influence student enrollment. Increases in the number of schools that conduct and publish such research can increase our knowledge of how students choose schools.

Until recently most persistence research was conducted by institutions and relatively little was conducted at the national level. There is disagreement, however, about whether institutional research on the impact of student aid concludes that student aid has an influence on persistence. Tinto (1990), for example, based on his review of sociological research on year-to-year persistence, concluded that student aid had little influence on persistence. At the other extreme Leslie and Brinkman (1988), in their review of all persistence research, concluded that student aid does have a positive influence on persistence. There are institutional studies of persistence using Tinto’s model that conclude financial aid has no influence on persistence (e.g. Moline, 1987), as well as studies using Tinto’s model that conclude financial aid has had a positive influence on persistence (e.g. Voorhees, 1985). Certainly more investigation is needed on: 1) whether student aid, when measured at the institutional level, has an influence on persistence; and 2) under what conditions student aid has an influence.

One possible explanation for the discrepancies in findings from institutional studies is that students in the same institutions are subject to the same tuition charges and the same aid packaging philosophies; therefore there might not be sufficient variation for aid awards to be statistically significant when the influence of student aid is examined at the institutional level. Another possibility is that there are differences in logical and statistical models used at the institutional levels that result in discrepancies in the effects of student aid when institutional studies are compared. However, these ambiguities about whether aid is effective in promoting persistence at the institutional level do not mean that student aid cannot have an influence on persistence when measured at the national level.

Most national studies of student persistence find that financial aid has a positive influence (Astin, 1975; Carroll, 1987; Terkla, 1985; St. John, 1989 & 1990b; St. John and Kirshstein, 1987, in press). However there are some differences in the impact of different types of student aid at different points in time. Astin (1975), who used Cooperative Institutional Research Program data to follow the college freshman class of 1968, found a negative association between the receipt of loans and persistence during the first two years of college and a positive association between loans and four-year persistence. He concluded that loans have a negative influence on persistence and that the positive association with long-term persistence was due to the fact that students who persist were more likely to receive loans. Astin found that most other forms of student aid had a positive affect on persistence. However, his conclusions about the
effectiveness of loans have raised doubts that have lingered until recently. There were two subsequent studies of persistence using NLS-72 that added to our knowledge about the influence of student aid (e.g. Peng and Fetters, 1978; Terkla, 1985), but did not clarify our understanding of how loans influenced persistence.

To examine the influence of different types of aid packages on persistence, St. John, Kirshstein, and Noell (1987, in press) developed a new logical model for examining year-to-year persistence using national data. The year-to-year approach to examining persistence made it possible to control for the issue identified by Astin: that students who persist are more likely to take out loans. They concluded that all forms of aid were positively associated with year-to-year persistence by students in the 1980s (using HSB-80).

In a subsequent study, St. John (1989) compared the influence of different types of student aid packages on year-to-year persistence by college students who graduated from high school in 1972, 1980, and 1982, using NLS-72, HSB-80 and HSB-82. He found that: 1) loans as the only form of aid had a negative association with first-to-second-year persistence for the 1972 cohort, but a positive association for students in the 1980s; 2) loans as the only form of aid were negatively associated with fourth-to-fifth year persistence for students in the 1980 cohort; and 3) with these exceptions, all forms of student aid were consistently and positively associated with year-to-year persistence for all three cohorts. From these findings St. John concluded that attitudes toward loans held by college freshman had apparently changed between the early 1970s and the early 1980s.9

The explanation that freshmen in prior decades did have a negative attitude toward loans would help explain why Astin found that loans had a negative association with persistence during the first two years in college but not with long-term persistence.

In another recent study, St. John (1990b) examined student price responsiveness in year-to-year persistence decisions.10 He found that students were more price responsive to all forms of student aid than to tuition. He concluded that institutions need to consider student aid when they increase tuition charges each year because students were so price responsive to student aid. However, he suggested that caution be exercised when using price-response measures for loans, since his earlier study found that enrollment decisions by low-income students were responsive to grants but not to loans (i.e. St. John, 1990a).

One further study merits consideration. Carroll (1987) examined the influence of different types of aid on within-year persistence by students in the high school class of 1980 (using HSB-80) and concluded that grants and not loans were positively associated with persistence. His conclusion casts new doubts on the effectiveness of loans. Future researchers may want to compare the influence of student aid on within-year and year-to-year persistence for the same cohort of students to help explain why there are still discrepancies about the influence of loans on persistence.
Choice of Major

Student choice of major is becoming a topic of increasing interest in higher education. Choice of major is important to public and institutional policy on student aid for two possible reasons: 1) growing levels of debt could have an influence on student choice of major (Kramer and Van Dusen, 1986; Newman, 1985) and 2) states may want to use loan forgiveness or other forms of aid to encourage students to select majors in certain high need areas (Arfin, 1987). Research in this area has been quite limited.

One recent study (St. John and Noell, 1987) examined the influence that debt burden had on student decisions to change to majors with higher or lower expected earnings using HSB-80. This research surprisingly found that:

- family income, college grades, and attending public colleges are positively associated with changing to majors with higher expected earnings;
- mother's education and attending private colleges were negatively associated with changing to majors with higher expected earnings; and
- blacks were more likely to change to majors with higher expected returns when students with any postsecondary education were considered, but were not significantly different when college persisters were considered, suggesting that some blacks with high expectations may drop out of college.

However, debt burden did not have a significant influence on major choice.

This preliminary research suggests that debt burden has not yet reached the level where it has an influence on student choice of major. However, this topic merits monitoring in future national and institutional research.

Returns to Education

In their review of prior research, Leslie and Brinkman (1988) concluded that educational attainment does have a substantial influence on earnings. They concluded that the monetary returns of private investment in education are substantial and merit continued investment. However, few studies have examined returns to education in the 1980s. Two recent studies merit some additional consideration.

First, Pascarella and Smart (1990) examined the influence of college grades and educational attainment on early career earnings (1980 earnings) by a Cooperative Institutional Research Program sample of students who entered college in 1971. They found that each grade point had a direct effect of $432 in annual income for black women, $230 for white women, $59 for black men, and $86 for white men. In addition, they found that educational attainment had a positive influence on early career earnings for black and white women, but not for men. In combination, these first two studies indicate that the returns to education are now higher for women than for men.
In another recent study, St. John and Masten (1990) estimated the tax revenue returns attributable to the federal student aid programs. First, they estimated the gains in postsecondary attainment that were attributable to student aid using NLS-72; then they used U.S. Census estimates of lifetime earnings and current tax law to estimate the tax revenue returns attributable to these gains. Under reasonable future economic assumptions, the net present value of the tax revenue returns to the federal government were estimated to be $4.30 for each student aid dollar spent on the high school class of 1972. Thus, from a federal policy perspective, the returns on the federal investment in student aid are substantial. Therefore, modest reductions in current funding for student aid could substantially reduce future tax revenues.

The preponderance of evidence from econometric studies supports the conclusion that student financial aid is an effective means of promoting equal opportunity. First, virtually all studies on the influence of student aid on college applicants' attendance decisions conclude that aid increases the probability that applicants will attend. Additionally, price-response research on college applicants in the 1980s reveals that college applicants were more price responsive to the amount of student aid offered than to the amount of tuition charged. However, given the fact that low-income students were price responsive to grants, but not to loans, it appears that not all forms of aid were equally effective in promoting access for the historically disadvantaged.

Second, the amount of student aid offered and the amount of tuition charged have an influence on student choice of school. Changes in either amount can influence the decision of which type of school students attend. Therefore, it is desirable that institutions and government agencies closely monitor the impact of changes in tuition charges and aid policy on student choice.

Third, student aid is also effective in promoting persistence in higher education. While institutional research on the impact of student aid has ambiguous results—some studies conclude that aid is effective, others conclude that it has no significance—national studies consistently find that student aid has a positive influence on persistence. Further, this research demonstrates that loans, in addition to grants and work, are effective in promoting persistence. However, it is possible that large levels of debt could have a detrimental influence on persistence to degree completion and, therefore, the impact of the growing emphasis on loans merits scrutiny.

Fourth, there is no evidence that a student's debt has an influence on a student's choice of academic major. However, this remains a possibility and, therefore, the influence of debt on major choice should be routinely monitored.

Finally, student aid is a "profitable" program for the federal government. The net present value of tax revenue returns attributable to student aid—resulting from its impact on attendance and persistence—is far in excess of the level expended on aid. Therefore,
Research Needed to Forge Policy

changes in federal student aid policy can influence the government's ability to collect taxes and to reduce future debt.

The 1980s brought major changes in federal student aid policy, including an increased emphasis on loans and cutbacks in the constant-dollar value of grants. The influence this shift in policy had on equal opportunity was subtle, but nonetheless present. All types of packages were positively associated with attendance by applicants in the 1980s. Financial aid offers with grants and loans were effective in promoting access for minorities, as well as whites, in the 1980s, as was the case in prior decades.

However, decreases in the amount of federal grant dollars available apparently did influence minority participation rates. Low-income students are price responsive to grants but not to loans, while middle-income students are more price responsive to loans than to grants. Given the decline in constant federal grant dollars between 1976 and 1984 (Lewis, 1989), it is little wonder that minority student participant rates also declined during this period (Mingle, 1987; Pelavin and Kane, 1988; St. John, and Noell, 1989). Further, the growth in loans may help explain why total enrollments remained higher than projected in the 1980s, in spite of the decline in minority participation rates. Apparently the increased availability of loans helped promote access for the middle-income students as well as for independent, returning students.

There is also evidence that the increased emphasis on loans has influenced some middle-income students to choose less expensive colleges and universities. It appears that attendance decisions by middle-income applicants are responsive to loans, but that these students may not be willing to finance the higher cost of expensive institutions with loans. Therefore, recent research suggests that student choice has been impaired by the increased emphasis on loans and increases in institutional prices.

There were also changes in the influence of loans on persistence during the 1980s. The negative association between loans and persistence during the first few years of college disappeared in the 1980s. However, loans as the only form of aid were negatively associated with fourth-to-fifth-year persistence (or persistence to degree completion) in the 1980s, but not in the 1970s. Thus debt burden could be problematic for long-term persistence, especially for students who do not receive other forms of aid. Therefore, the influence of debt on persistence merits more scrutiny in the future.

There is a need for research to help forge both institutional and government policy. First, ongoing national research is needed to assess the impact of different types of aid on access. Such research will help us to understand the impact of policy changes on equal opportunity. Also, the type of student aid has distinct influences on different populations. In the 1980s there was an increased emphasis on loans. There were also high default rates, especially in institutions that serve predominantly low-income and minority populations. Now, in the 1990s, there is a move to eliminate institutions with high default rates from the GSL Program. Given the fact that student back-
ground appears to have a larger influence on defaults than institutional loan management practices (Wilms, Moore, and Bolus, 1987), one is left to wonder whether efforts to restrict institutional eligibility for the GSL Program will further reduce minority participation. Certainly the impact of these new strategies needs to be closely monitored. The influence of growing debt levels should also be routinely monitored for the same reasons.

Even more importantly there is a need for better information on how scarce federal aid dollars can best be targeted to promote equal opportunity. There is a need for more simulations that consider the impact of different financing strategies on enrollment by low-income students. Given the fact that student aid is a highly profitable area of public investment (St. John and Masten, 1988), caution should be used whenever budget reduction strategies are considered to be sure that the selected strategies do not seriously impair access or persistence by low-income populations.

Second, there are also a number of federal policy issues that merit more basic research. How did different forms of student aid influence student choice in the 1980s compared to the 1970s? And why are loans effective in studies of year-to-year persistence, but not in studies considering within-year persistence? Research on these questions can inform institutional packaging philosophies, as well as federal program revisions.

Third, given the fact that federal support for student financial aid is likely to further erode in the next decade, institutions need to investigate the impact of student aid on their enrollment and persistence. They can then refine their financing and enrollment management strategies. Viable models are needed for institutional research on the impact of student aid. In particular, institutional research is needed that considers price response in enrollment and persistence decisions. Viable models for investigating the impact of student aid can be developed from extant data sources in most institutions—records stored in admissions, financial aid, and student record systems. Financial aid professionals may need to be a critical part of institutional research teams investigating the impact of student aid because they have the program expertise needed for such inquiry. Institutional research on retention may also help resolve ambiguities about whether aid actually promotes persistence.

Finally, there is a need to develop models that examine the influence of student aid on graduate student access and persistence. There has been relatively little research (Malaney, 1987) on graduate students and virtually no research on graduate student persistence. Yet graduate student persistence is important from a public policy perspective, because there are high returns to graduate education (St. John and Masten, 1988, 1990). Further, given the fact that loans are the main source of federal aid available for graduate study, we are left to wonder if more diversified approaches, including more grants, might not encourage graduate attainment by the historically disadvantaged. For institutions, the issues of graduate student access and
persistence are also important since it costs more to educate graduate students.

In conclusion, research on the impact of student aid has made substantial progress during the past two decades. We have reached the point where it is possible to cast off lingering doubts about the effectiveness of student aid. It is not only evident that student aid is effective in promoting equal opportunity, but that shifts in student aid policy also influence student outcomes. The challenge remains to make better use of research in the formulation of public and institutional student aid policies.

Notes

1 An earlier version of this paper was presented at the Mid South Educational Research Association Annual Meeting, November 1990.

2 This conceptual framework was originally developed at the start of a series of studies by the author on the impact of student financial aid. This article summarizes the findings of the author's research along with other research on the impact of student aid.

3 The term attendance as used here refers to the initial decision to attend college. Participation refers to the percentage of a population who attend. Enrollment refers to the number who attend. Access, in contrast, is a broader measure that refers to the percentage of a population who are currently or were previously enrolled.

4 Schwartz (1985) was included in the demand studies reviewed by Leslie and Brinkman (1988).

5 The lack of significance of loan subsidies in Schwartz's study may be attributable to the fact that he examined the influence of aid on attendance at public universities. It is possible that loans facilitate the choice of more expensive schools, which would help explain why the amount of loans was significant in St. John (1990a).

6 Hansen's (1988) trend study was reviewed by Leslie and Brinkman (1988) in a section on enrollment trend studies.

7 This research was reviewed by Karen Grassmuck (1990), and is forthcoming in a book, Keeping College Affordable to be published by Brookings.

8 This is a trend analysis. From the data presented, it is not evident whether overall enrollment rates for the middle-income cohort increased or decreased.

9 It is also possible that the distribution of loans has changed. If a higher percentage of loan recipients were low-income students in the 1970s, then it is possible that differences in attitudes about loans by the low-income students would help explain the discrepancy.

10 In their extensive review of prior research, Leslie and Brinkman (1988) found no prior studies that examined price responsiveness to student aid in persistence.
References


