# Assessing Financial Aid Impacts on Time-to-Degree for Nontransfer Undergraduate Students at a Large Urban Public University

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By

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## Abstract

Studying time-to-degree at the baccalaureate level has become an increasingly significant issue for public policy and institutional decision-making. Utilizing institutional data from a large urban public university, this study examines the relationship between the time taken to obtain a baccalaureate degree and the financial aid type received by students. A total of 4,403 undergraduate nontransfer students were included in the study. The analysis of data indicates that not all forms of student financial aid have a positive impact on time-to-degree. Loans helped students to progress faster, but employment worked against students' academic progress toward degree completion.

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## Introduction

Studying time-to-degree at the baccalaureate level has become an increasingly important issue for public policy and institutional decision-making. The *1991 Student Right-to-know and Campus Security Act* requires institutions of higher education to publish six-year graduation rates. Many states are calling for graduation rates as a key performance measurement of efficiency and effectiveness of their public colleges and universities. The public perceives the trend of students taking longer than four years to graduate as the result of poor institutional performance. State legislators also see prolonged time of degree completion as a financial burden to the states. Students and their parents have obvious interest since attending college is expensive and is of little value in career development unless the student is able to persist through completion of degree in a reasonable length of time. However, current statistics on degree attainment and time-to-degree have shown a less than encouraging picture. A recent study on entering freshmen from 365 baccalaureate-granting institutions reveals that only two in five students (39.9 percent) were able to complete a bachelor's degree within four years of entering college. This number rose by about 6 percent (to 45.7 percent) when nine years for degree completion were tracked (Astin, Tsui and Avalos, 1996).

Many campus enrollment management professionals have put forth tremendous efforts to ensure that their students persist and graduate in a timely fashion. Research on student persistence and financial aid have consistently linked “ability to pay” as one of the

significant variables in determining enrollment decision of students. Porter (1991) noted that financial aid is one of the several variables that policymakers must consider in any effort to improve college persistence. He argued "unless the students who make their way into our colleges and universities with the support of student aid persist and complete their programs, all efforts for access and equity are hollow" (p.82). While much research literature (St. John, Kirshstein and Noell, 1991; Cabrera, Stampen, and Hansen, 1990) has been devoted to studying the effects of student financial aid on access and persistence, little research has been conducted on the effects of student financial aid on time-to-degree.

## Statement of the Problem

Student financial aid has been regarded as a mechanism for the financing of higher education. Financial aid is awarded in two basic forms: gift aid and self-help aid. Gift aid includes grants, scholarships and waivers for which recipients carry no obligation to repay. Self-help aid includes loans and employment. Loans are repayable after graduation and employment adds additional duties and time obligations to students. In recent years, there has been a growing emphasis on awarding self-help aids over granting gift aids to students. Indeed, the 1992 reauthorization of the *Higher Education Act* strongly reaffirmed loans as the primary vehicle for awarding aid to students. In addition, most states that traditionally held to the low-tuition, low-student-aid model began to raise tuition rapidly beginning in the early 1980s, with the belief that students should increase their share of responsibility for the cost of education (Fenske, Porter, and Dillon, 1997). The present imbalance between grants and loans causes concern for the level of student indebtedness. It becomes

amplified when recognizing the diverse and demographic changes occurring in socioeconomic background, age, gender, and ethnicity of the college student population.

Existing literature on student financial aid indicates that gift aid is superior to self-help aid. It is certainly true that a loan dollar will cover as much educational expense as a grant dollar. But students generally understand that they face a cost difference between grants and loans. Grants are free while loans must be repaid at a future date and therefore have a cost associated with them. Hence, the role of loans in financing higher education may serve as incentive for students to complete their degrees in a timely fashion. However, there is a lack of empirical evidence to support such an assumption.

With the prospect of rising costs and educational loan indebtedness, increasing numbers of students have resorted to employment to meet unmet financial needs while attending school. It is believed that students hesitate to incur debt for fear of inability to repay. Students who must work while attending school may find that the burden of employment and study is too great. Even if employment does not cause students to drop out, it may have adverse effects on their academic progress. If students lower their academic efforts to accommodate their work schedules, they may take longer than non-working students to complete their degrees.

The problem to be investigated in this study is whether educational loans and employment are helpful or detrimental to students in terms of time-to-degree. By analyzing empirical data, this study attempts to examine the relationship between the time taken to obtain a baccalaureate degree and the financial aid type received by students. This study includes only nontransfer undergraduate students who entered into a large urban

public university as freshmen immediately after high school and subsequently graduated with a bachelor's degree.

The purpose of this study is to provide financial aid researchers with empirical evidence of how different types of financial aid and employment impact time-to-degree. Identifying relationships among types of financial aid and other variables which relate to the time-to-degree process can prove beneficial for both financial aid professionals and institutional decision-makers.

## Review of the Literature

Working and attending school simultaneously could become a major obstacle for students to complete their degree programs in a reasonable length of time. In the study conducted by California's State Postsecondary Education Commission (1988), time-to-degree is associated with the factors concerning a student's financial needs and corresponding needs for extensive employment and a smaller course load. Similarly, a statewide study on time-to-degree by Oklahoma State Regents for Higher Education (1996) identified the factors which may negatively impact time-to-degree including student transfer, small course loads, and changing majors. The state agency recommends the following factors be further studied from the student services perspective: academic advising, extracurricular activities, work, and financial aid.

Gleason (1993) studied the employment rate among traditional students (aged 20 to 24). He found that the employment rate rose from 25 percent in the late 1940s to 44 percent in the late 1950s, 45 percent in the late 1960s, 51 percent in the late 1970s, and 56 percent in the late 1980s. He also found that a small amount of employment did not appear

to slow students down, but heavy involvement in the labor market delayed graduation by about one semester.

A dissertation project on degree completion and type of student aid from a large urban university found that there was no significant difference between aid type and time-to-degree. The study separated degree recipients into three time-to-degree groups; i.e., "Early" (eight semesters or fewer), "Medium" (nine to ten semesters), and "Late" (eleven and twelve semesters). Three financial aid type categories were identified as "Mostly Loans", "Mostly Grants" and "Balanced". The chi-square statistic for the contingency table indicated no bivariate relationship (Fenske, M., 1993). However, by converting actual time-to-degree (continuous variable) into three subgroups (categorical variable), the effect of financial aid type on time continuum might be dampened by the unequal bin width of the time categories.

It is assumed that students hesitate to incur debt for fear of inability to repay. A study by Mortenson (1989) examined the attitudes of Americans toward borrowing to finance educational expenses over the period from 1959 to 1983. The study found that overall Americans have a consistently favorable view toward educational loans. However, not all Americans share this general enthusiasm for borrowing. People from low-income backgrounds, in particular, are less likely to have a positive attitude toward borrowing to finance educational expenses than are people from middle or upper-income backgrounds. Mortenson found that the proportion of those favoring educational loans increases as income increases up to $20,000 per year in household income; after the $20,000 income level, attitudes do not vary much. Also, Hispanics are less likely than whites or blacks from similar income levels to favor borrowing to finance education. In a different study of

loan utilization among low-income family students, Mortenson (1990) explored the relationship between low-income students' participation in higher education and the use of loans versus grants. The study contended that the reliance on loans as the dominant student financial aid vehicle has lowered low-income students' participation in higher education. For those who have entered higher education, loans have decreased the college choice, raised debt burdens and increased the probability of loan default.

## Data Source

While a national database on this subject is difficult to construct, a longitudinal institutional database regarding financial aid and student information at a large urban university has been developed. The data used in this study were extracted from four separate institutional data sets: (1) a longitudinal student master file, (2) the undergraduate student persistence files, (3) the student financial assistance data files, and (4) the university's payroll files. A total of 4,403 undergraduate nontransfer U.S. students who entered the university between Fall 1989 and Fall 1993, and subsequently graduated with a bachelor's degree by Spring 1996 were included in the study. These students were classified into eight subgroups based upon the sources of financial support. These categories include "loan, gift, and work", "gift and work", "loan and work", "loan and gift", "work only", "gift only", "loan only", and "unknown". Students in the "unknown" category had neither financial aid nor payroll records kept by the university.

## Data Definitions

Time-to-degree (dependent variable) was defined as the number of semesters (excluding summer sessions) taken toward graduation. In other words, every two semesters equate to one academic year. Two concepts regarding time-to-degree were further defined, i.e., elapsed time and registered time. Elapsed time was determined to be the total length of time starting from the beginning of the undergraduate study to degree completion. Registered time was determined to be the total number of actual enrolled semesters.

The other data variables (independent variables) were aggregated into demographic, academic, enrollment and financial categories. Demographic variables included gender, ethnicity and residency status. The academic variables included admission test scores and cumulative grade point average at graduation. The enrollment variables included transfer hours from other institutions, number of major changes, number of summer sessions enrolled, and number of semesters enrolled as part-time students. The financial variables included cumulative family contribution, cumulative financial aid dollars received by aid type, and employment flag. Further descriptions are needed to clarify some of the data definitions as follows:

(1) Residency Status

This public institution allows out-of-state students to obtain in-state residency status after initial admission if students are able to establish a claim through employment or relocation to the state. Therefore, the residency status of a student was determined by the status shown in the most recent student record.

(2) Part-time

Students enrolled for fewer than 12 credit hours in the fall or spring semester.

(3) Employment Flag

Employment flag was "yes" if a student was awarded federal work study, held on-campus employment, or reported off-campus work income on the financial aid application.

## Description of the Population

Among the 4,403 students, 56 percent were women, and 38 percent were out-of-state students. Only 14 percent of the population were non-white. It took these students an average of 9.2 semesters (elapsed time) or 8.9 semesters (registered time) to complete their degrees. The average SAT combined score was 986. Throughout the undergraduate study, an average student changed major of studies 1.3 times, enrolled in 1.6 summer sessions, and enrolled for 0.7 semester as a part-time student.

Seven out of ten degree recipients (70.8 percent) received some form of financial assistance. Among the financial aid recipients, the average financial aid dollars received throughout the undergraduate study was $16,272. The average loan indebtedness was $11,927.

Students were classified into eight subgroups based upon the sources of financial support. These categories included "loans, gifts and work" (1,394 students); "gifts and work" (765 students); "loans and work" (218 students); "loans and gifts" (40 students); "work only" (234 students); "gifts only" (428 students); "loans only" (38 students); and "unknown" (1,286 students).

## Methods and Statistics

The objective of this study is to examine the relationship between the time taken to obtain a baccalaureate degree and the financial aid type received by students. It is necessary to generate mean statistics on time-to-degree and other variables for the eight subgroups of students.

In order to identify the variables that had the greatest effect on time-to-degree, the multiple regression technique was used to analyze the data. Two regression models were constructed. In the first model, total elapsed time was used as the dependent variable. In the second model, the dependent variable was the total registered time. Since there were no *a priori* hypotheses regarding the importance of any of the existing variables for time-to-degree, a multiple regression method guided by the stepwise procedure was deemed appropriate. In the stepwise procedure, independent variables are added one by one to the model, and the *F* statistics must be significant for a variable to be added. After a variable is added, the stepwise method looks at all variables already included in the model and deletes any variable that does not produce significant *F* statistics (SAS Institute Inc., 1990). In order to ensure the robustness of the models, all necessary steps were taken to avoid violation of statistical assumptions, including multicollinearity and heteroscedasticity.

The independent variables which were introduced above needed to be modified for model fitting purposes. A new variable "BHN" (Black, Hispanic, and Native American) was created to replace "ethnicity". All categorical variables were converted to dummy variables by creating vectors of ones and zeros. The percentage of the parent's contribution

in relation to the total expected family contribution, and the percentage of loan dollars in relation to the total aid received were generated to replace the actual dollar amounts.

Twelve independent variables were used in this study. They were cumulative grade point average at graduation (GRDGPA), number of major changes (MAJCHG), percent of parent's contribution in relation to the total family contribution (PCTPCTRB), percent of loan dollars in relation to the total aid received (PCTLOAN), employment flag (EMPLOY), gender (WOMEN), minority students (BHN), combined SAT scores (SAT), total transfer hours (GRDTHRS), number of semesters enrolled part-time (PTIME), number of enrolled summer sessions (SUMMER) and in-state residents (INSTATE).

## Results

The mean statistics of elapsed time and registered time to degree completion are presented in Table 1. Some differences existed among various categories of source of financial support. As Table 1 indicates, students in the "loans, gifts, and work" as well as "loans and work" categories took a longer time (both elapsed time and registered time) to complete their degrees than students in other categories. Surprisingly, students in the "loans only" category took the least registered time. On average, these students took about one half semester less to complete their degrees than the "loans, gifts, and work" and the "loans and work" subgroups.

Table 2 presents the mean statistics of the academic variables for the students in each of the eight categories. On average, the students in the "gifts and work" category had relatively higher SAT score and cumulative grade point averages at graduation. The data suggest that students in this subgroup were academically capable, and perhaps could

explain why they were more likely to complete their programs in a relatively shorter time. Surprisingly, the students in the "loans only" category had the lowest average GPA at graduation (2.77); however, they were among the fastest to complete the degree. This may be the result of the students taking heavy course loads in order to progress faster and avoid incurring more debts.

**TABLE 1.**
**Time-to-degree by Source of Financial Support**

| | | Elapsed Time | | Registered Time | |
|---|---|---|---|---|---|
| | N | Mean | SD | Mean | SD |
| Loans, Gifts, and Work | 1,394 | 9.5 | 1.5 | 9.1 | 1.4 |
| Gifts and Work | 765 | 8.9 | 1.3 | 8.7 | 1.2 |
| Loans and Work | 218 | 9.4 | 1.4 | 9.1 | 1.4 |
| Loans and Gifts | 40 | 9.1 | 1.0 | 8.7 | 1.0 |
| Work Only | 234 | 9.1 | 1.3 | 8.8 | 1.3 |
| Gifts Only | 428 | 9.2 | 1.4 | 8.9 | 1.3 |
| Loans Only | 38 | 9.1 | 1.2 | 8.6 | 1.2 |
| Unknown | 1,286 | 9.1 | 1.3 | 8.8 | 1.3 |
| Total | 4,403 | 9.2 | 1.4 | 8.9 | 1.3 |

**TABLE 2.**
**Academic Variables by Source of Financial Support**

| | SAT | | | GRDGPA | | |
|---|---|---|---|---|---|---|
| | N | Mean | SD | N | Mean | SD |
| Loans, Gifts, and Work | 945 | 993 | 159 | 1,394 | 3.06 | 0.44 |
| Gifts and Work | 580 | 1,069 | 161 | 765 | 3.37 | 0.43 |
| Loans and Work | 169 | 956 | 140 | 218 | 2.87 | 0.33 |
| Loans and Gifts | 29 | 984 | 152 | 40 | 2.96 | 0.48 |
| Work Only | 192 | 957 | 155 | 234 | 2.95 | 0.37 |
| Gifts Only | 323 | 1,003 | 155 | 428 | 3.19 | 0.45 |
| Loans Only | 29 | 969 | 157 | 38 | 2.77 | 0.32 |
| Unknown | 1,043 | 938 | 131 | 1,286 | 2.91 | 0.35 |
| Total | 3,310 | 986 | 156 | 4,403 | 3.06 | 0.44 |

Table 3 depicts the enrollment behavior of the students in the various categories of source of financial support. The mean statistics indicate that students in both "gifts and work" and "gifts only" categories changed majors less frequently than any other subgroups. This implies that the students in these two categories were more focused. Perhaps, this was due to the restrictions imposed by the academic scholarships or grants that students received. It is also noteworthy to point out that students who worked attended summer sessions less frequently. The data suggest that students who relied on work income to support their education were more likely to work during the summer months. In regard to part-time enrollment, the data suggest that students who relied on loans and/or work enrolled part-time more frequently than students in other categories.

**TABLE 3.**
**Enrollment Variables by Source of Financial Support**

| | | SUMMER | | PTIME | | MAJCHG | |
|---|---|---|---|---|---|---|---|
| | N | Mean | SD | Mean | SD | Mean | SD |
| Loans, Gifts, and Work | 1,394 | 1.5 | 1.2 | 0.6 | 1.0 | 1.4 | 1.0 |
| Gifts and Work | 765 | 1.3 | 1.1 | 0.4 | 0.8 | 1.2 | 1.0 |
| Loans and Work | 218 | 1.6 | 1.2 | 0.9 | 1.2 | 1.5 | 1.1 |
| Loans and Gifts | 40 | 2.0 | 1.4 | 0.6 | 0.9 | 1.7 | 1.0 |
| Work Only | 234 | 1.7 | 1.1 | 0.7 | 1.0 | 1.3 | 0.9 |
| Gifts Only | 428 | 1.6 | 1.2 | 0.7 | 1.1 | 1.2 | 0.9 |
| Loans Only | 39 | 2.0 | 1.2 | 0.9 | 1.1 | 1.5 | 0.9 |
| Unknown | 1,286 | 1.8 | 1.1 | 0.8 | 1.1 | 1.3 | 0.9 |
| Total | 4,403 | 1.6 | 1.2 | 0.7 | 1.0 | 1.3 | 0.9 |

The results of the stepwise multiple regression analysis are summarized in Table 4 and Table 5. Table 4 shows multiple regression coefficients, *F* ratios and probability of

significance of *F* ratios (used to determine the inclusion of the variable in the equation) for the first model which used total elapsed time as the dependent variable. Table 5 reports the regression analysis results for the second model in which registered time was the dependent variable.

The order of entrance of variables in the two models is not exactly the same. While transfer hours and summer enrollment were excluded from Model I, they appeared to be significant variables in Model II. Both models indicate that women, minorities (BHN) or out-of-state students would take less time to graduate.

**TABLE 4.**
**Multiple Regression Results for the Model I**

Dependent Variable = Total Elapsed Time
($\alpha = 0.05$)

| | Regression Coefficient | *F* | *P* |
|---|---|---|---|
| INTERCEP | 11.2316 | 686.56 | 0.0001 |
| GRDGPA | -0.8686 | 76.54 | 0.0001 |
| MAJCHG | 0.1301 | 10.90 | 0.0010 |
| PCTLOAN | -0.0050 | 9.56 | 0.0020 |
| EMPLOY | 0.4789 | 4.56 | 0.0329 |
| WOMEN | -0.4160 | 28.63 | 0.0001 |
| BHN | -0.2653 | 4.22 | 0.0403 |
| PTIME | 0.5973 | 232.47 | 0.0001 |
| INSTATE | 0.5390 | 37.76 | 0.0001 |

R-square = 0.3191 *F* = 58.46 *P* = 0.0001

**TABLE 5.**
**Multiple Regression Results for the Model II**

Dependent Variable = Total Registered Time
($\alpha = 0.05$)

| | Regression Coefficient | *F* | *P* |
|---|---|---|---|
| INTERCEP | 11.2300 | 776.40 | 0.0001 |
| GRDGPA | -0.7660 | 69.62 | 0.0001 |
| MAJCHG | 0.1022 | 8.48 | 0.0037 |
| PCTLOAN | -0.0059 | 16.77 | 0.0001 |
| EMPLOY | 0.4478 | 5.09 | 0.0243 |
| WOMEN | -0.2743 | 15.68 | 0.0001 |
| BHN | -0.2269 | 3.92 | 0.0479 |
| GRDTHRS | -0.0528 | 185.86 | 0.0001 |
| PTIME | 0.6120 | 291.20 | 0.0001 |
| SUMMER | -0.1003 | 10.08 | 0.0015 |
| INSTATE | 0.4480 | 33.03 | 0.0001 |
| R-square = 0.3693 | *F* = 58.31 | *P* = 0.0001 | |

In regard to financial related variables, percent of loans (PCTLOAN) was significant for both models. The negative values of regression coefficient suggest that loans could help students to progress faster because students would have less need to work. On the other hand, according to both models, employment worked against students' academic progress toward degree completion. If all other variables are held constant, employment alone delays graduation at a rate of about one half semester. In addition, the positive coefficients of the variable INSTATE indicate that out-of-state students were more likely to complete their programs faster. The data suggest that students were sensitive to the cost difference since out-of-state students were required to pay higher tuition.

Variables related to academic performance and enrollment behavior remained the significant variables to determine time-to degree. Both models indicate that frequent changes in major and part-time enrollment worked against degree progression. Not surprisingly, students with high cumulative grade point averages progressed faster than other students.

## Conclusions

Student financial aid has served as a mechanism for the financing of higher education. With the trends of rising tuition and costs coupled with minimal increases in federal grants to students, educational loans have become the primary type of financial assistance offered to students. Unlike grants and scholarships, loans must be repaid at a future date and therefore have a cost associated with them. An assumption was made that the role of loans in financing higher education may serve as incentive for students to complete their degrees in a timely fashion. On the other hand, students may choose employment during the school year to earn money to pay for their expenses. If students lower their academic efforts to accommodate their work schedule, they may take longer than non-working students to complete their degrees. As time-to-degree at the baccalaureate level becomes an increasing concern, it is necessary to identify the significant factors which may have effects on time-to-degree. It is also important to examine if financial aid, particularly loans and employment, has an effect on students' progression toward degree completion.

The results from this study indicate that students who were in the "loans only" subgroup took the least registered time to complete their programs. However, students

who received gift aid and were employed at the same time had the shortest elapsed time-to-degree than any other subgroups. In fact, these students performed better academically, enrolled part-time less frequently, and changed majors less often. Furthermore, the data indicate that students who relied on work income to support their education were more likely to work during the summer months than students in the "loans and gifts" and "loans only" subgroups. As loans can provide needed funds for students to pay educational expenses, it may allow students to attend classes all year round, and thus accelerate the rate of progression toward degree completion.

The stepwise regression analysis provided the evidence that student employment was detrimental to students' timely academic progress. According to the regression models, employment alone delays graduation at a rate of about one half semester if all other variables are held constant. In addition, the negative coefficients of loan variable in the regression models suggest that the educational loans provided positive impacts on academic progression as it might ease the immediate financial burden of students. Nevertheless, variables related to academic performance and enrollment behavior remained the significant variables to determine time-to-degree. While student financial aid provides the needed funds for many students to participate in higher education, academic ability remains the key component to make progress toward degree completion.

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