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Keeping Public Colleges Affordable: A Study of Persistence in Indiana's Public Colleges and Universities

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It is important for states to assess periodically the effects of student aid on persistence in the public systems of higher education. Recently, a workable persistence model has emerged that can be used for this purpose. This paper uses the model to examine the influence of student aid on persistence by full-time resident undergraduates enrolled in Indiana's public system of higher education during the 1997-98 academic year. The analysis reveals that student financial aid was adequate, largely due to a substantial state investment in need-based grants.

Given the important role state grant programs play in keeping public colleges affordable (Mumper, 1996), it is important periodically to assess the impact of these programs on student postsecondary opportunities. There is evidence that in the 1980s, student financial aid ceased being adequate to promote continuous enrollment in public higher education nationally (St. John, Oescher, & Andrieu, 1992; Paulsen & St. John, 1997), due to the erosion in federal need-based grants. In this context, a substantial state investment in grants is needed to keep public colleges affordable. Therefore, it is important for states to assess whether student aid is adequate to promote persistence within their public systems of higher education.

During the 1990s, a methodology evolved for assessing the adequacy of state grant programs as a supplement to federal student aid in promoting student persistence in postsecondary education. This approach was based on studies of the impact of federal student aid programs on persistence. Initially, persistence models were developed to assess the impact of student aid on persistence using national survey data (Cabrera, Stampen, & Hansen, 1990; St. John, Kirshstein, & Noell, 1991; St. John, Andrieu, Oescher, & Starkey, 1994). Then, based on these national models, a workable approach for assessing the impact of student aid on persistence within institutions was proposed (St. John, 1992) and tested (Somers, 1992; Somers & St. John, 1997). More recently, a new set of studies extended the workable-models approach to examine cross-institutional data collected by state commissions of higher education (St. John, 1999; St. John, Hu, & Weber, in press).

Indiana is one of the few states that has maintained a commitment to state grant programs for in-state students through the past decades (Hossler, Schmit, & Vesper, 1999), a

Research Approach

period when the federal commitment to need-based grant programs has been inadequate. This paper examines the influence of state grants and other forms of financial aid on within-year persistence by full-time in-state undergraduates enrolled in public higher education in Indiana during the 1997-98 academic year. It builds on another recent study that examined the impact of state grants during the early 1990s (St. John, Hu, & Weber, in press).

The Indiana Commission for Higher Education's Student Information System (ICHE-SIS) was used to select a random sample of full-time in-state students enrolled in the public postsecondary system in the 1997-98 academic year. ICHE-SIS includes information on student background, academic experiences, and student financial aid for all students enrolled in the state public postsecondary system.¹ The population of full-time in-state undergraduate students was chosen for this study because of the state's interest in keeping public college affordable for its residents.

Model Specifications

This study used the workable persistence model (St. John, 1992; Somers, 1992) to assess the effects of financial aid on student persistence within the state postsecondary system. We focused on whether students continued to enroll in (or graduate from) any institution within the state system. This may mask the migration of students among different institutions. However, from a state policy perspective, this approach is appropriate in assessing the effects of financial aid in promoting in-state students' persistence in state public institutions.

In this study, the outcome variable was whether students persisted through the academic year. That is, for those who enrolled in the fall semester, if they re-enrolled in the spring semester or in the fall received the degree they intended to earn, they were counted as persisters; otherwise, they were counted as non-persisters.

The ability to persist within the academic year is an indicator that merits periodic consideration. There are strong theoretical arguments that the ability to afford continuous enrollment is best measured within-year (Carroll, 1987; Dresch, 1975). Because students are more likely to reflect on the academic and social aspects between years, when they return home, some researchers consider between-year persistence from an integration perspective (Pascarella & Terenzini, 1991). Past research has demonstrated that within-year persistence is an appropriate outcome measure in assessing the direct effects of prices and price subsidies (Somers, 1992; St. John, 1999). The model assumes persistence is a function of student background char-

¹ ICHE-SIS also includes information on students enrolled in some private colleges in the state. However, private colleges were not included in this study.

Past research has demonstrated that within-year persistence is an appropriate outcome measure in assessing the direct effects of prices and price subsidies.

acteristics, college experience, and student aid. The specification of variables related to each of these factors is presented in the left column of Table 1.

Student background variables were included to control for socioeconomic and demographic differences. Males were compared to females. Age was included as an ordinal variable. Ethnicity was recoded into a set of design variables that compared African-Americans and other minorities to Caucasians. Self-supporting aid applicants were compared to others (non-aid applicants and dependent aid applicants). Further, income was recoded into a set of design variables that compared low-income (less than \$13,241), lower-middle income (\$13,241-\$30,862), upper-middle income (\$30,863-\$55,916), and upper-income aid applicants (more than \$55,916) to non-aid applicants.

College-experience variables included measures related to grades in college, type of institution attended, year in college, and housing status. College grades were recoded into a set of design variables. Students with A-average, C-average, and below C-average grades were compared to students with B-average grades. A set of design variables was also used to compare students enrolled in two-year colleges and research universities to students enrolled in other four-year colleges. Further, year in college was recoded to compare certificate students, sophomores, juniors, and seniors to freshmen. Students who lived on campus were compared to students living off campus or at home.

A student aid packages approach was used to assess the effects of aid. Information on the types of aid students received was recoded into four package types: grants only, loans only, grants and loans, and other packages. In the logistic model, students receiving each of these types of packages were compared to students who did not receive any type of student aid.

Statistical Methods

Logistic regressions were used to assess the effects of student aid on student within-year persistence. Logistic regression is a desirable statistical method to study a dichotomous outcome such as student persistence (Hosmer & Lemeshow, 1989).

A three-step sequential logistic regression analysis was used to examine how background and college experiences interact with student aid in the persistence process. In the first step, we considered the effects of background only. In the second step, we considered the effects of college experiences as well as background. In the final step, we added the financial aid variables.

Sequential logistic regression analysis was selected because it provides insights into the interactions among different sets of variables (Cabrera, 1994). This paper examines how student background, college experiences, and student aid interact in the persistence process. Change in probability measures (Delta-P statistics) were imputed for the predictor variables,

TABLE 1
Students' Characteristics and Financial Aid Packages
in 1997-98

Variable	Percent **	Mean
Gender		
Male	46.2	
Female *	53.8	
Age		
Age (years)		22.03
Ethnicity		
African-American	6.8	
Other ethnicity	5.5	
Caucasian *	87.7	
Dependency		
Self-supporting	18.0	
Dependent and/or non-aid applicant *	82.0	
Income		
Low	13.9	
Lower-middle	13.1	
Upper-middle	15.5	
Upper	17.7	
Non-aid applicant *	39.8	
College GPA		
Below C	16.6	
C-average	19.8	
B-average *	50.9	
A-average	12.7	
Institution type		
Two-year college	8.9	
Research university	45.4	
Other four-year *	45.8	
Housing Status		
On-campus	25.8	
Other *	74.2	
Student Level		
Freshman *	30.8	
Sophomore	27.3	
Junior	15.3	
Senior	23.6	
Certificate	3.1	
Financial Aid Packages		
Grants only	19.9	
Loans only	17.1	
Grants and loans	22.9	
Other package	4.8	
No aid *	35.3	
Percentage of Students Persisting	89.7	

n=3,940

* Indicates the uncoded in the sets of design variables used in the logistic regression models.

** Figures may not add up to 100% due to rounding.

using a method developed by Petersen (1985) and recommended by Cabrera (1994). Three model indicators are also presented that provide an indication of the quality of the logistic models.

Limitations

The workable-models approach to persistence analysis has a few limitations. First, this model lacks measures of social integration that can have an influence on persistence. However, this deficiency does not detract from the model's viability to assess the direct effects of student aid on persistence (St. John, Cabrera, Nora, & Asker, in press).

Second, this model has only limited measures of academic integration. Specifically, we consider grade point average (GPA), a measure of student cognitive achievement. Including this measure is necessary in a financial impact model of this type (St. John, Cabrera, Nora, & Asker, in press). More complete models might also include measures related to interaction between students and faculty. However, these additional measures are not necessary to examine the direct effects of student financial aid on persistence.

Third, the statistical model did not include a measure of achievement in high school, such as high school GPA or SAT scores. SAT scores were available only for first-time students in our data set. A recent analysis used a sample of freshmen to examine the consequences of excluding student SAT scores from the persistence analysis. The results suggested that a logistic model with college grades and without SAT scores predicted student within-year persistence as well as models that included SAT scores along with college grades (St. John, Hu, Simmons, & Musoba, 1999). Thus, excluding SAT scores does not substantially influence the model's viability to predict persistence.

Fourth, ICHE-SIS includes information of financial aid amounts of most types of aid *received* by the students, and the amounts of only one type of aid *awarded* to the students. The 21st Century Scholars program is a state grant program that guarantees grant aid for low-income students who make a pledge, while in middle school, to remain drug-free. This was the only program that had amount of aid *awarded* reported rather than amounts *received*.

To develop an accurate estimate of financial aid awards, we assumed that students would enroll through the entire academic year. We estimated the full-year awards for all programs for students who were non-persisters. We realize that the aid amounts imputed may not be a completely accurate reflection of the original aid award;² therefore, we did not include aid

² Indeed, given the unpredictable schedules that some students have in applying for aid, it may not be possible to estimate the amount of a package a student would have received if they had continued their enrollment. However, we do know the types of aid students received in the fall term, so the packages model is an accurate approach to use in persistence studies.

Given the substantial state investment in grants—an average amount almost equal to the federal grants—it is apparent that Indiana provided a substantial supplement to federal need-based grants.

amounts in our logistic regression analyses. However, supplemental analyses of prior years' databases suggest that the aid amounts imputed were reasonably accurate and that results from the aid amounts model were consistent with those from the aid package model (St. John, Hu, & Weber, in press). In this study, we include the descriptive information about financial aid amounts to help illustrate the types and amounts of financial aid from different sources.

Findings

The in-state full-time student population in Indiana public higher education in 1997-98 (Table 1) was similar to the early 1990s (St. John, Hu, & Weber, in press). In 1997-98 most undergraduate students were Caucasian (88%). African-Americans comprised the largest minority group (6.8%). The percentage of minorities had increased slightly over time. Sixty percent of full-time in-state undergraduate students had applied for student aid; 55% of undergraduate students had received some type of aid. About 9% of the students attended two-year institutions, 45.4% were enrolled in research universities, and 45.8% were enrolled in other four-year colleges. While more students received grants (47.3%) than loans (43.5%) (Table 2), the average loans were substantially higher than the average grants. Indeed, this continued the trend toward increased use of loans in Indiana (St. John, Hu, & Weber, 1999).

Changes in the amounts of different types of aid awarded from various sources are also pertinent to this study (Table 2). The average tuition charge was \$3,051, while the average net tuition was \$1,688. Net tuition actually decreased by about \$200 compared to 1996-97 (St. John, Hu, & Weber, 1999). The average federal grant amount (\$2,075 per recipient) was only slightly higher than the average state grants amount (\$1,998) and the average amount for other, mostly institutional, grants (\$1,559). In fact, federal grants increased by about \$100 over the prior year.³ Given the substantial state investment in grants—an average amount almost equal to the federal grants—it is apparent that Indiana provided a substantial supplement to federal need-based grants.

The sequential logistic regression analysis (Table 3) added variables related to student background characteristics, college experiences, and student aid packages in three steps; the first step considered the effects of student background on persistence. However, to understand how background variables interacted with college experience and student aid, the reader should also consider changes in the significance of background variables across the three steps.

Consider the example of income. In the first step, upper-middle income and upper-income aid applicants were more likely

³ The percentage of students who enrolled in two-year colleges also increased compared to the prior year, which helps explain the reduction in net prices.

TABLE 2
Average Amounts of Financial Aid Awarded
by Type and Source of Aid in 1997-98

Variable	Percent of Recipients	Mean
Financial Aid Amounts (by type)		
Grant amount—all students		\$1,430
Grant amount—aid recipients	47.3	3,023
Loan amount—all students		2,083
Loan amount—aid recipients	43.5	4,793
Work-study amount—all students		60
Work-study amount—aid recipients	4.8	1,244
Financial Aid Amounts (by source)		
Federal grant amount—all students		\$ 630
Federal grant amount—aid recipients	28.7	2,197
State grant amount—all students		438
State grant amount—aid recipients	24.8	1,767
Other grant amount—all students		362
Other grant amount—aid recipients	22.5	1,608
Need-based loan amount—all students		1,276
Need-based loan amount—aid recipients	36.5	3,490
Other loan amount—all students		807
Other loan amount—aid recipients	20.5	3,941
Tuition		
Full-time tuition amount		\$3,051
Net-tuition amount		1,754
Percentage of Students Persisting	89.7	

n=3,940

to persist. In the second step, which added college experience to the analysis, students from each of the income groups were more likely to persist than students in the reference group, who did not have their incomes reported and probably did not apply for student aid. In combination, these findings suggest that college experience may suppress some of the positive effects of aid for the lower-middle income and low-income aid applicants.

Further, when financial aid packages were added in the third step, all of the income variables ceased being significant, indicating an interaction between aid packages and income. Indeed, the positive effects of income noted in the first two models were essentially attributable to the effects of receiving aid. Most students who applied for aid received some type of aid package. When aid was included in the model, income was no longer significant, indicating that income was significant because most of those who reported their income received some type of aid packages.

TABLE 3
Analysis of Persistence by Full-Time Indiana-Resident Undergraduate Students in 1997-98

Variable	Background		College Experiences		Financial Aid Package	
	Delta-P	Sig	Delta-P	Sig	Delta-P	Sig
Gender						
Male	-0.001		0.009		0.010	
Age						
Age	0.001		-0.002		-0.002	
Race/ethnicity						
African-American	-0.035		0.008		0.011	
Other	-0.002		0.010		0.012	
Dependency						
Self-supporting	-0.039		-0.064 *		-0.072 *	
Income						
Low	0.024		0.050 **		0.025	
Lower Middle	0.020		0.032 *		-0.002	
Upper Middle	0.032 *		0.036 **		0.000	
Upper	0.036 **		0.028 *		-0.008	
College GPA						
Below C			-0.390 ***		-0.396 ***	
C-average			-0.084 ***		-0.088 ***	
A-average			0.010		0.013	
Institution Type						
Two-year college			0.030		0.037 *	
Research university			-0.002		-0.007	
Housing Status						
On-campus			0.036 ***		0.036 **	
Student Level						
Certificate			-0.027		-0.024	
Sophomore			0.034 **		0.034 **	
Junior			0.054 ***		0.054 ***	
Senior			0.059 ***		0.058 ***	
Package						
Grants only					0.013	
Loans only					0.038	
Grants and loans					0.052 *	
Other package					0.043	
Baseline P (%)	89.7		89.7		89.7	
-2 Log L	2596.5		2173.6		2163.1	
R2	0.004		0.106		0.108	
Percent Correctly Predicted	89.7		89.7		89.7	

* Beta significant at .05, ** Beta significant at .01, *** Beta significant at .001

Students receiving grants and loans were 5 percentage points more likely to persist than students who did not receive aid.

In the second step, college-experience variables were added. By examining these variables across the two steps in which they were included, it was possible to discern whether there were interactions between variables related to college experience and student aid packages. Several of the college-experience variables were significant in steps two and three, indicating they had effects on student persistence that were independent of the effects of student aid. Having low grades was consistently and negatively associated with the probability of student persistence. Students with below-C average grades were about 40 percentage points less likely to persist compared to otherwise average students with B-averages, while students with C-averages were about 9 percentage points less likely to persist. Further, sophomores, juniors, and seniors were consistently more likely to persist than freshmen. Living on campus was also positively associated with probability to persist across two steps in the model.

However, one college-experience variable did interact with student aid. Attending a two-year college was positively associated with probability to persist when aid packages were included, but it was not significant in the previous step. This suggests that the lower costs of attending two-year colleges had a positive influence on persistence after controlling for other factors.

In addition, one background variable became significant in the second step. Self-supporting students were less likely to persist when college experiences were controlled for. Another recent analysis revealed that independent students were more likely to be older and more advanced in college (higher percentages were juniors and seniors) and that more advanced students received higher grades on average (Hu & St. John, 1999). Thus, there is evidence to suggest that independent students were more likely to persist in the second step because they were more advanced in college and because they received higher grades.

In the third step, when the complete aid-packages model was included, one financial aid package was significant and positively associated with persistence. The positive coefficient for a financial aid package with both grants and loans indicates that students who had this form of aid package were more likely to persist than students who did not receive financial aid. Students receiving both grants and loans were 5 percentage points more likely to persist than students who did not receive aid.

The coefficients of other types of aid packages, however, were not statistically significant. This finding also has an important meaning that merits attention. To understand the significance of this finding, the reader needs to recall the meaning of a significant and negative coefficient for an aid variable in a persistence model. Consider the fact that in many national studies, the coefficients for grants frequently have been negative (e.g., St. John, Oescher, & Andrieu, 1992; Somers & St. John, 1997).

When coefficients for grants are negative, it means that students receiving this type of aid are less likely to persist. Two recent studies have demonstrated that a negative coefficient for grants means that grants are inadequate (Paulsen & St. John, 1997; Somers & St. John, 1997). Thus, the neutral coefficients for aid packages in this analysis indicate that, controlling for other factors that influence persistence, students receiving aid had the same probability of persisting as those who did not receive student aid.

Therefore, when viewed in relation to the findings on income noted above, these findings indicate that the aid packages Indiana students received in 1997-98 were adequate to equalize the opportunity to persist across income groups. This means that aid was essentially adequate in Indiana in 1997-98. Given the substantial state investment in need-based grants, the state of Indiana merits credit for keeping its public colleges affordable for state residents.

Conclusions

This study has three important conclusions. First, this study reinforces the conclusion that state-provided need-based financial aid programs are important in keeping public colleges affordable for state residents. The additional aid provided by states can equalize opportunity for persistence by low-income state residents compared to more affluent residents. In Indiana, in 1997-98, student aid was generally adequate to equalize the opportunity for in-state students to persist. Given that state grants comprised a substantial portion of total grants in the aid packages for low-income in-state students in Indiana, this study confirms that state grants helped to keep Indiana's public colleges affordable.

Second, the analysis of state data systems can also provide insight into whether there is adequate aid to equalize the opportunity for persistence by diverse groups in the state, even if it is not possible to make direct attributions about the role of state aid in ensuring equal opportunity. This study provides further evidence that when student aid is adequate relative to tuition, it can equalize opportunity across income groups and ethnic groups. Specifically, this study found that, controlling for the other factors that may influence persistence, African-American and other minority in-state students had the same probability of persisting as Caucasian students in Indiana in the 1997-98 academic year.

Had financial aid been inadequate, it is possible that there would have been a disparity in the opportunity to persist for minorities compared to Caucasians. For example, a recent study of the effects of state grants in the state of Washington (St. John, 1999) indicated that when state grants were increased, the disparities in persistence for Caucasians and students of color were reduced. In other words, providing adequate aid may be necessary for states to maintain equal opportunity for di-

verse groups to persist in public systems of higher education. However, it is not possible to make attributions about the direct effects of aid on the relative rates of persistence of diverse groups from a cross-sectional study of this type. Rather, it is only possible to point to the relationship and to suggest that further inquiry is needed.

Third, it is increasingly evident that systematic and routine assessments of the impact of student aid can provide states with useful information about college affordability. Indeed, the state-level financial aid studies concluded to date (St. John, 1999; St. John, Hu, & Webber, in press) illustrate that the effects of financial aid can be measured using the systematic analysis of student records. When this type of analysis is undertaken for residents enrolled within a state system, it provides an indication of affordability. If this method were used along with analyses of postsecondary participation rates within states, then this type of persistence analysis could provide a way of assessing the affordability of public systems. If enough states conducted studies using this methodology, it would be possible to compare affordability across states. Given the uncertain future of federal grant programs, it is increasingly important for states to conduct persistence studies as a means of assessing whether their financial aid systems are adequate given the costs of attending their public institutions. Indeed, more states should routinely engage in the assessment and reporting of this type of analysis, along with analyses of college enrollment rates by high school graduates. This combination of indicators would provide citizens and legislators information about whether state funding strategies are sufficiently coordinated to ensure affordability in public systems of higher education.

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References

- Cabrera, A. F. (1994). Logistic regression analysis in higher education: An applied perspective. In J. C. Smart (Ed.), *Higher education handbook of theory and research*, Vol. 10 (pp. 225-256). New York: Agathon.
- Cabrera, A. F., Stampen, J. O., & Hansen, W. L. (1990). Exploring the effects of ability to pay on persistence in college. *Review of Higher Education*, 13, 303-356.
- Carroll, C. D. (1987, April). *Student financial aid and its consequences*. Paper presented at the 147th Meeting of the American Statistical Association, San Francisco, CA.

- Dresch, S. P. (1975). A critique of the planning models for postsecondary education: Current feasibility, potential relevance, and a prospectus for future research. Journal of Higher Education, 46, 246-286.
- Hosmer, D. W., & Lemeshow, G. S. (1989). Applied logistic regression. New York: Wiley.
- Hossler, D., Schmit, J., & Vesper, N. (1999). Going to college: How social, economic, and educational factors influence the decisions students make. Baltimore, MD: The Johns Hopkins University Press.
- Hu, S., & St. John, E. P. (1999, November). Does money matter across four critical years? The effects of financial aid on persistence in a public university system. Paper presented at the Annual Meeting of the Association for the Study of Higher Education, San Antonio, Texas.
- Mumper, M. (1996). Removing college price barriers: What government has done and why it hasn't worked. Albany: SUNY Press.
- Pascarella, E. T., & Terenzini, P. T. (1991). How college affects students: Findings and insights from twenty years of research. San Francisco: Jossey-Bass.
- Påulsen, M. B., & St. John, E. P. (1997). The financial nexus between college choice and persistence. In R. A. Voorhees (Ed.), Researching student aid: Creating an action agenda (pp. 65-82). San Francisco: Jossey-Bass.
- Petersen, T. (1985). A comment on presenting results from logit and probit models. American Sociological Review, 50, 130-131.
- St. John, E. P. (1992). Workable models for institutional research on impact of student financial aid. Journal of Student Financial Aid, 22(3), 13-26.
- St. John, E. P. (1998). The effects of changes in student aid policy on persistence: A case study of a private university. Journal of Student Financial Aid, 28(1), 7-18.
- St. John, E. P. (1999). Evaluating state grant programs: A case study of Washington's grant program. Research in Higher Education, 40, 149-170.
- St. John, E. P., Andrieu, S. C., Oescher, J., & Starkey, J. B. (1994). The influence of student aid on persistence by traditional college-age students in four-year colleges. Research in Higher Education, 35, 455-480.
- St. John, E. P., Cabrera, A. F., Nora, A., & Asker, E. H. (in press). Economic influences on persistence reconsidered: How can finance research inform the reconceptualization of persistence research. In J. M. Braxton (Ed.), Rethinking the departure puzzle: New theory and research on college student retention. Nashville: Vanderbilt University Press.
- St. John, E. P., Oescher, J., & Andrieu, S. C. (1992). The influence of student financial aid on within-year persistence by traditional-age students in four-year institutions. Journal of Student Financial Aid, 22 (1), 22-38.
- St. John, E. P., Hu, S., & Weber, J. (in press). State Policy and affordability in public colleges and universities: The influence of student aid on persistence in Indiana public higher education. Research in Higher Education.
- St. John, E. P., Hu, S., Simmons, A., & Musoba, G. D. (1999). Aptitude versus merit: What matters is persistence. Policy Research Report # 99-1, Bloomington, IN: Indiana Education Policy Center.
- St. John, E. P., Kirshstein, R. J., & Noell, J. (1991). The impact of student financial aid on persistence: A sequential analysis. Review of Higher Education, 14, 383-406.
- Somers, P. (1992). A dynamic analysis of student matriculation decisions in urban public universities. University of New Orleans. Unpublished Ph.D. Dissertation.
- Somers, P., & St. John, E. P. (1997). Interpreting price response in enrollment decisions: A comparative institutional study. Journal of Student Financial Aid, 27(3), 15-37.