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How Money Helps Keep Students in College: The Relationship between Family Finances, Merit-based Aid, and Retention in Higher Education

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Cover Page Footnote

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How Money Helps Keep Students in College: The Relationship between Family Finances, Merit-based Aid, and Retention in Higher Education

By Alexandre M. Olbrecht, Christopher Romano, and Jeremy Teigen

In this paper, we leverage detailed, individual-level student data to understand the relationships between family finances, merit-based aid, and first-year student retention. With three cohorts of student data that comprise family financial status, institutional merit scholarships, and many of the other known correlates of student retention, we regress sophomore retention of first-time, full-time students on the financial variables with controls. We find that an increase in a family's ability to contribute to educational costs improves a student's chances of retention. Additionally, our data show that institutional financial assistance also bolsters the likelihood that students return for their sophomore year.

Keywords: *student retention, persistence, financial aid, family finance*

The factors that influence the retention rate between the first and second years of college have long been the focus of research, but the topic has increasingly become more important for colleges and universities, both financially and from a reputational perspective. At a time when the level of state investment in higher education and the number of high school students going to college (particularly in the Northeast) are both declining, the tuition gained from retaining a student has become a more regular consideration in budget conversations. McPherson and Shapiro's (1998) conclusion is as applicable (if not more so) nearly two decades later. "Universities, beset by their own fiscal problems and by intense competition for highly qualified, fee-paying students, have ceased to think of their financial aid efforts principally as a noble charitable opportunity and have instead come to focus on the financial aid operation as a key strategic weapon both in recruiting students and in maximizing institutional revenues" (p. 1).

Today, higher education institutions are beginning to see retention as the uncovered stone of stability. At least a quarter of students who begin college still fail to return the following year. As Bryan Matthews, director of athletics and associate vice president at Washington College, questions in *Inside Higher Education*, "What other industry do we know that successfully recruits 25 percent new clients each year, plans for an average loss of 25 percent of those new clients, and accepts this as business as usual?" (Matthews, 2009).

In addition to the financial incentives schools have to keep their students enrolled, retention rates also form relatively large components of academic rankings by third parties, such as *US News and World Report*. Because many stakeholders use these rankings, whether by students and parents comparing different schools, or employers making hiring and compensation decisions for recent graduates, colleges' focus on improving their rankings has become increasingly important. In addition to the rankings issues, public

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institutions are facing legislatures that are starting to consider retention and graduation rates when determining funding allocations, or are specifically tying funding to performance in the area of retention and persistence. The federal government's recent plans to allocate federal dollars to institutions by using a "college scorecard," comprised of benchmarks in graduation and transfer rates, further shows how these issues are salient to enrollment managers at colleges and universities (Lewin, January 2013). This shift in the conversation to state funding to institutions by based on measurable outcomes, otherwise known as *performance funding in higher education*, marks a change in the structure of higher education. Now the focus is less on the quantity of students entering or enrolled in a college or university and more about the quality of the experience, or the college's ability to retain and graduate those students.

In the case of retention rates, there is an opportunity for colleges to improve their statistics and thus their rankings.¹ One such method is to understand the factors that contribute to student retention (or the factors that contribute to students leaving) and to focus on institutional activities that build upon positive factors. In fact, much research has focused on the programmatic initiatives that an institution can pursue to create the essential academic and social integration Tinto (1994) cites or what Kuh (2008) has coined as "high impact practices." In many instances, an organization can improve its rankings without improving the quality of education it provides. It can do this by selecting students more carefully, changing the distribution of a limited amount of resources, or even by circuitous methods such as pressuring faculty to flunk fewer students. Or, an institution can take a more positive educational approach, and after identifying factors that contribute to students leaving and corresponding policies that reinforce or enable those departures, can make commensurate policy reforms, which would be consistent with the approach of Tinto (1994) and Kuh (2008). Additionally, retention rates, and ultimately graduation rates, are of particular importance to parents and students when making their college choices due to the investment nature of that choice and the abundance of competition from other institutions. From a strategic perspective, parents and students could use the retention rate as a perception of an institution's value to students who previously attended the school. If too many students leave after the first year, parents and potential students may think twice about attending.

Our statistical work sets out to estimate quantitatively the role that individual-level financial realities play in influencing students' decisions to stay in college, because retaining students into the second year increases the likelihood of a student to persist and earn a degree.² In an ideal world, students who leave an institution would communicate their reasons for leaving, whether they felt dissatisfied with the institution, experienced financial hardship, or transferred to a different institution. All too often, however, institutions are unable to communicate with students who do not return. A common method institutions use to try to bridge this information gap is to send a survey via mail or attempt to call the phone number associated with a former student's file, but this method suffers from poor response rates and probably an unknown amount of social desirability bias.

A significant percentage of research on retention has focused on the programmatic and student service side of higher education, including academic advising, student success strategies, and student affairs programming. Additionally, there is clear evidence showing that merit-based aid not only meets its initial intended outcome of influencing college choice (Cornwell, Mustard, and Sridhar, 2006), but also increases the likelihood of student persistence and retention by its recipients (Kuh et al., 2008).

Our work also builds upon that of Hochstein and Butler (1983), who reported that the distribution of the types of student aid affects persistence. Other work that may be of interest is that of Gross, Hossler, and Ziskin (2007), who investigated some of our research questions using data from three large doctoral degree granting institutions, which is a very different focus than that of our study. Interestingly, they found a positive correlation between types of institutional financial aid and retention, just as in our study, although

we do not imply that comparing across these two studies would be appropriate given the differences in the institutions studied.

In this paper, we propose an econometric model that provides some statistical evidence on the factors correlated with student retention between the first and second years at a college in New Jersey. We use data from five cohorts of incoming freshmen at only one institution to minimize the effects that institutional differences may play on retention decisions.

A strong focus on financial variables within one institution during a stable enrollment period characterizes our work and provides for policy implications. We highlight three financial variables—expected family contribution (hereafter EFC), institutional monetary support not based on need (merit-based aid), and unmet need—which we in this paper define as the difference between the cost of attendance less EFC and need-based aid.³ Economic theory would hypothesize that greater contribution from the family, more institutional aid, and less unmet need would all tend to support retention. From a competitive standpoint, once a particular student is admitted, colleges and universities compete for those students based partially on the ultimate cost of attendance to the individual student and the perceived value of the education the institutions provide, which is a mixture of cost and quality. Further, if financial variables are important, then higher education institutions may be able to affect their retention rates, and ultimately their rankings, by adjusting the financial aid packages of prospective students.

It is important to note that different types of financial aid may influence choices made by students while enrolled. Cornwell, Lee, and Mustard (2005) found that Georgia HOPE Scholarship recipients near the performance benchmark to retain funding chose to decrease their full-time enrollment credits, had higher withdraw rates, and were more likely to enroll in a higher number of summer class credits. Additionally, Ishitani and DesJardins (2003) found that the type and timing of financial aid is correlated with dropout rates, and switching between types of aid over a student's career is also a significant factor (see DesJardins, Ahlburg, & McCall, 2002b).

However, as mentioned in all research on the correlation between aid and retention, increasing funds in one pot of funding (merit-based aid) often leads to decreased funding in other areas, which may impact other institutional goals. Some schools may do this to change the distribution of the pool of grant funds awarded; for other institutions it may serve as a data-driven decision to increase the allocation of funds to certain types of financial aid.

Given that our model plays a significant role in the data-driven process in this college's department of enrollment management, the results and methodology we present in this paper may be of value to other institutions facing a similar problem of low response rates by students once they have left the institution. In an integrated enrollment management model, admissions and retention, or more simply, access and success in higher education, cannot be siloed. It is not enough to look at the impact of financial aid packaging only in increasing an institution's academic profile or meeting admissions targets; data on financial aid must be used as a tool to inform true Strategic Enrollment Management (SEM) planning. SEM, as defined by Dolence (1993), is "a comprehensive process designed to help an institution achieve and maintain optimum enrolment, retention, and graduation rates, where optimum is defined within the academic context of the institution" (p. 8). Financial aid packaging allocations, particularly the use of merit-based aid, play a large role in the context of any institution and its enrollment models.

In essence, this paper describes a model already used in policy making. While many school enrollment management departments may have an intuitive understanding of what factors influence retention, our empirical model provides estimates of the relative impacts of particular variables of interest in a methodology addressing the data shortcomings that many schools face. In this paper we focus specifically

on first-to-second year retention, but other studies such as DesJardins, Ahlburg, and McCall (1999) suggest this type of econometric study would be appropriate during other times while students are in college.

We organize the paper as follows. First, we discuss the general background of the institutional data we use, including its strengths and weaknesses. Next, we identify the statistical methodology we apply, and then discuss the results. Finally, the conclusion discusses the implications of these findings in the context of higher education and family finances.

Data

This study pooled data from five first-year cohorts from a highly selective public liberal arts college in New Jersey, identified by the state as its official public liberal arts college. This data comprised first-time, full-time students entering as freshmen in fall 2010, 2011, 2012, 2013, and 2014. During this period, the institution committed to stabilizing its incoming class. Additionally, the college's staff of admissions counselors remained relatively unchanged during this time, as did the general parameters of selectivity in recruitment. No substantial year-to-year differences appeared in the resulting student cohorts.

To contextualize, on average this college had a retention rate of 87.9%, which is consistent with the college's most recent ten-year (2004 to 2014) average retention rate of 87.9%. During the 2010-11 to 2014-15 academic years, retention rates were 88.2%, 86.0%, 88.1%, 87.8%, and 87.7%, respectively. Full-time in-state tuition at this institution was relatively stable during the examined periods, at \$11,873, \$12,758, \$13,144, \$13,387, and \$13,387, respectively. Full-time out-of-state tuition during these periods was \$19,678, \$20,945, \$21,624, \$22,037, and \$22,037, respectively.

This paper uses many of the established variables and demographic factors used by other research on retention, persistence, and graduation. Like Herzog (2005), we use ethnicity, state residency (in-state versus out-of-state), on-campus living, standardized entrance exam scores, and the financial variables we previously mentioned.

With detailed, individual-level measures of family financial resources and institutional aid, this study differs from the previous research that has relied on more conventionally used national surveys. Much of what we know about student retention stems from broad survey data comprising the impressions of college administrators and school-level data. By focusing directly on the retention propensity of students rather than average retention rates, we leverage family financial data and institutionally allocated grant information in an innovative way. The advantage to the one school approach is that it removes the heterogeneity concerns of first year experiences across different institutions with different academic qualities. Further, it eliminates many self-selection effects because all the students chose the same school, mitigating this type of bias. The disadvantage of using data from a single school may be lowered generalizability for understanding retention at large universities or private selective colleges. This bias is not unique to our study; past work on finances and retention has also used data from a single institution to infer conclusions (Singell and Stone, 2002; Singell, 2004). Our results will likely inform understanding of retention patterns for similarly situated schools, including public liberal arts colleges (particularly the Council of Public Liberal Arts Colleges (COPLAC) schools), and others.

Table 1 summarizes the data, characterizing the attributes of first-time, full-time students who returned for their sophomore year against those that did not return. Some of the variables we employ are hypothesized to be associated with a more inelastic demand for attendance at the college in this data. Students who live on campus are generally assumed to be more integrated with the campus community and thus would face a bigger lifestyle change should they switch to another college, as opposed to commuter

Table 1. Summary Statistics by Retention

	Unretained Students (<i>n</i> = 585)				Retained Students (<i>n</i> = 3,938)			
	Mean	S(x)	Min	Max	Mean	S(x)	Min	Max
Unmet Need (\$10K)	0.65	0.78	0	3.26	0.69	0.78	0	3.96
Expected Family Contribution (\$10K)	3.15	3.53	0	10.00	3.29	3.49	0	10.00
Merit-based Aid (\$10K)	0.10	0.34	0	2.6	0.26	0.55	0	2.6
SAT (and ACT equivalents)	1071.16	134.04	680	1500	1105.32	138.39	520	1550
Campus resident	0.74	0.44	0	1	0.79	0.41	0	1
EOF program member	0.11	0.32	0	1	0.10	0.30	0	1
In-state resident	0.92	0.27	0	1	0.96	0.20	0	1
Special admit	0.12	0.32	0	1	0.09	0.29	0	1
Undecided major	0.25	0.44	0	1	0.20	0.40	0	1
Race/ethnic minority	0.36	0.48	0	1	0.33	0.47	0	1

Boldfaced variables indicate statistically significant difference of means test ($p \leq 0.05$) between retained and non-retained students. campus resident, EOF, in-state residency, special admit, undecided, and race/ethnic minority variables are dichotomously measured.

students who spend significantly less time on campus (Herndon, 1984). Thus we expect that on-campus living would be positively associated with retention. We also control for a student's home state because in-state students, who pay less in tuition than out-of-state students, would find it more expensive to transfer to an out-of-state college (DesJardins, Ahlburg, & McCall, 2002a). In addition, in-state students have already revealed their preference toward this college when faced with other in-state alternatives. Alternatively, in certain cases depending on financial aid, it could be possible that out-of-state students pay a lower net tuition than in-state students.

Our central emphasis is upon the family financial variables atop the list. These economic variables help explain the variance of student retention. We include a family's expected ability to pay as defined by the EFC, the amount of financial aid awarded to the student, and the difference between the total cost of attendance, EFC, and financial aid provided, which we define as unmet need. The EFC variable is top-coded at \$100,000 because of the way the federal financial aid forms consider family income and college cost. We use EFC as a proxy for family financial resources. It is the best available proxy for family wealth, but it is not ideal because EFC depends not only on a family's adjusted gross income and net assets but also on the number of dependent children in the home and the number of other dependent children attending college. Further, limiting all values to no more than \$100,000 homogenizes the top end of the variable. In the case of the unmet financial need, tuition cost is based upon a student's housing status, and in-state or

out-of-state primary residence determine the costs. Thus the cost of tuition and living expenses differs among observations.

Students at this college receive federal and state need-based aid based on FAFSA information (for federal aid) and a combination of FAFSA and other tax information (for state need-based aid). The college follows the tables set forth by the federal government when making need-based aid offers. In the case of merit-based aid (hereafter “institutional aid”), those dollar valuations are determined by the admissions office and the awards are based primarily on SAT/GPA combinations. The criteria have remained relatively consistent across the years in our data.

One could anticipate that the higher a family’s contribution to a student’s attendance, the less likely the student would be to drop out given the relatively large investment made by his or her family. On the other hand, students with higher family contributions might be more motivated to leave for a better school to improve their perceived return on their educational investment. Therefore we are neutral as to what sign we would expect for the coefficient for this variable. In terms of the other variables, we hypothesize that the less costly it is for a student to attend, the more likely they are to be retained, *ceteris paribus*. In other words, if an institution uses institutional aid as an incentive to persist to the next academic period, we expect a higher propensity for retention.

For the most part, the aggregate summary statistics in our study conform to our expectations. Retained students received on average significantly more institutional financial aid (which is mostly grants) and possessed slightly less unmet need. In the case of EFC, the average among retained students was higher than non-retained students, but the difference was not significant. This may indicate that how much a student’s family can financially contribute to the student’s education does not strongly influence the likelihood of the student remaining at a particular college.

We held a neutral hypothesis on the academic variables, i.e., grades and SAT scores, in that we did not have a prediction for the direction of significance.⁴ In one scenario, students seeking to transfer might view this college as a springboard to a better and more expensive college. They may not have been accepted at their preferred school, or they may have chosen this school for a lower tuition rate with the expectation of transferring after a year. Or, it might be that students who are doing well at this college become more confident of their chances for graduation and thus are more likely to stay, other things being equal. Conversely, students with weak grades may not achieve grades sufficiently high enough to continue at the college, may transfer to a less challenging academic environment, or may leave higher education altogether. Overall, the average combined math and verbal SAT scores of this college’s last five freshman classes is approximately 1,100, making this college relatively selective in its academic entry requirements.

The remaining variables pertain to student attributes once they start at the college. We include them because past higher educational research identified their correlation with retention. They are less theoretically central for our study than the financial variables above, but they serve as important control variables and substantive predictors of retention in their own right. All of them are dichotomous variables where zero indicates a “no” and one equals “yes.”

We expected that students who live on campus enjoy higher retention due to the higher integration with the institution as a whole, despite its higher costs. This expectation conforms with Tinto’s (1994) social integration theory and its connection to student retention. We anticipated that students participating in the Educational Opportunity Fund (EOF) would be more likely to return. (EOF provides students from economically and educationally disadvantaged backgrounds with state-supported access to higher education programs with lower student-advisor ratios and increased academic support services.) We expected in-state residents to have higher retention than students from out-of-state.

A “special admit” flag on a student’s record generally indicates students joining collegiate athletics or students who come with alumni legacy incentives. In the case of athletes, Long and Caudill (1991) found that college athletes are more likely to graduate than non-athletes. Given the ambiguity of “special admit,” we held no expectations either way toward retention. We also included a variable as to whether a student has declared a major or not. Most research that included this variable, including Drew (1990) found that undeclared majors feel less attached to a college curricular environment and are thereby more likely to depart or dropout. A variable for students identifying as a racial or ethnic minority (non-white) is also included as a control.

The aggregate differences between retained and non-retained students among these post-matriculation variables also appear in Table 1. Commuters were more likely to be among the unretained students, potentially due to costly commuting burdens faced by those living off campus. Aggregate data also reveals that in-state students are more likely to be in the retained population than out-of-state students, while those granted “special” admission are less likely to return. There is also a large and statistically significant difference between students with a declared major versus the undeclared. Twenty percent of the returning sophomores started undeclared while 25% of the unretained students originally matriculated without a declared major.

Methodology and Results

The aggregate comparison between retained and non-retained students above is suggestive but lacks the ability to control for the covariates. Regression analysis provides more probative means to understand how financial issues influence student retention. In order to understand how each factor relates to retention *ceteris paribus*, multivariate methods are necessary. We decided to use a theoretically informed model specification and did not compare models based on goodness of fit, but rather used previous scholarly literature to populate the right hand side of the equation. In addition, our choices on model design were limited by the availability of data at the institution.

To identify the influence of these variables of interest on first year retention, we use a logistical model approach, which is consistent with the work of Gillespie and Noble (1992), Hosmer and Lemeshow (2000), and Menard (2001). Logistic, or “logit” models are the appropriate maximum likelihood method when explaining dichotomous outcomes such as student retention. Logit models rest on the usual assumption that independent variables do not highly covary. As most studies of retention acknowledge (e.g., Herzog, 2005), we find a strong correlation between independent variables of interest. In particular, the multicollinearity problems are acute when considering including both unmet need and EFC as factors in a model. Unmet need is by definition a function of EFC (as well as cost of attendance and aid), and hence unmet need and EFC are perfectly collinear for many cases with higher EFCs. To hedge against methodological inference errors potentially stemming from that collinearity problem, we calculate unmet need both with and without EFC. On Table 2, “Unmet Need A” is cost of attendance less EFC and aid while “Unmet Need B” is cost of attendance less aid.

Given that most of the known complications for this type of data and empirical questions are not otherwise serious concerns, we estimate the model in Table 2. For our primary variables of interest, i.e., the financial factors, we see that higher EFC and higher levels of institutionally allocated financial assistance each significantly predict higher retention when controlling for the other covariates. The significant and positive coefficient for EFC suggests that students with higher EFCs are more likely to remain at this college, other things being equal. This result may suggest that when families make an investment at a particular school, that commitment is stronger than the desire to use the school as a stepping stone to a different institution providing a better return on investment.

Table 2. Multivariate Student Retention Model Results

	Unmet Need A	(SE)	Unmet Need B	(SE)
Unmet need A (\$10K)	0.431 **	(0.08)		
Unmet need B (\$10K)			0.520 **	(0.06)
Expected Family Contribution (\$10K)	0.082 **	(0.02)	0.112 **	(0.02)
Merit-based aid (\$10K)	1.118 **	(0.17)	1.322 **	(0.17)
SAT (and ACT equivalents)	0.000	(0.00)	-0.000	(0.00)
Campus resident	0.140	(0.11)	-0.083	(0.11)
EOF program member	0.381 **	(0.19)	1.115 **	(0.21)
In-state resident	1.403 **	(0.20)	1.529 **	(0.20)
Special admit	-0.136	(0.16)	-0.079	(0.16)
Undecided	-0.220 **	(0.11)	-0.183 *	(0.11)
Race/ethnicity minority	-0.170 *	(0.10)	-0.071	(0.10)
Cohort 2011	0.179	(0.14)	0.113	(0.14)
Cohort 2012	0.107	(0.14)	0.060	(0.14)
Cohort 2013	0.150	(0.14)	0.037	(0.15)
Cohort 2014	-0.028	(0.14)	-0.100	(0.14)
Constant	-0.399	(0.60)	-0.935	(0.61)
Observations	4,523		4,523	

Logit model with standard errors in parentheses (* $p \leq 0.10$, ** $p \leq 0.05$).
Cohort 2010 variable omitted from model to avoid perfect multicollinearity.

The second financial hypothesis test evaluates the relationship between final assistance and retention. The evidence indicates, at statistically significant levels, that increases in institutional grants that are not based on need help to retain students. This result provides the most salient admission policy implications given that colleges ultimately make allocation decisions of this type of aid based on internal criteria. These results suggest that colleges can increase their retention rates by providing more “free” money to students in general, or more strategically, colleges can allocate more funds to those desirable students that are at the margin between leaving or staying. Models such as the one described in this research could be used for predictive purposes to identify such possible students.

The third variable related to a family’s financial ability to underwrite college, unmet need, has a positive influence on the likelihood of student retention, regardless of which way it was calculated. Further, we see that the parameter estimates for EFC and merit-based aid remain stable across the two models, lending support for our inferences about the two variables. This result suggests that those who are committed to cover unmet need by finding additional funding to attend an institution, and thus are financially invested in the institution, are more likely to be retained. This suggests that colleges can increase their retention by

finding ways—potentially through allocation of on-campus jobs through sources other than Federal Work Study—for students to gain additional income to offset their unmet need.

The results of academic and other contextual factors also appear in Table 2. Unsurprisingly, better academic performance as measured by a combined SAT or composite ACT is well-associated with retention, Living on campus is statistically significant in predicting retention while EOF participation, after controlling for family finances and students' race and ethnicity, is not statistically significant. In-state residents are more likely to return for their sophomore years even when controlling for the lower cost of college. While the average retained student is less likely to be a “special admit” than a non-retained student, without delving deeper into the difference between special admit types, it is difficult to draw conclusions for administrative implications. A strong predictor of retention is whether a student has declared a major, with undeclared students substantially less likely to return than students with declared majors.

The logit coefficients and their standard errors reveal the presence of statistically significant relationships with student retention through a hypothesis test that controls for the influence of the other variables in the model. These results are similar in nature to those of Gansemer-Topf and Schuh (2005), who also found a positive statistical relationship between institutional grants and retention in schools that were very highly selective. Their study was very different in methodology and in the types of schools included however, but nonetheless our general results are relatively consistent. One concern with the work of Gansemer-Topf and Schuh (2005) and our results is that these coefficients and their standard errors reveal little about the substantive magnitude of their influence on first-year retention. Thus we add additional analysis of the impact of our variables of interest to retention.

To convey the influence of a family's financial resources on their child's likelihood of remaining in college and the institution's financial assistance in the form of institutional aid, we calculated post-estimation predicted probabilities of student retention for each value of our two significant financial variables of interest, EFC and institutional aid. Figures 1 and 2 visualize the substantive influence of EFC and institutional aid on retention. What these figures convey is the likelihood of retention for each value of the independent variable after controlling for the influence of the other independent variables. This practice reveals more about the influence of a variable than merely the coefficient and its standard errors because it demonstrates the shape of the relationship across all values of the independent variables while quantifying the uncertainty with confidence intervals (King, Tomz, & Wittenberg, 2000).

Figure 1 shows that as a family's EFC increases, the likelihood of retention rises monotonically. For example, at the average value of EFC (approximately \$34,000), a typical student enjoys approximately a 90% probability of retention. In this context, “typical” in this way means that we calculated the probabilities based upon a student with a mean level of aid, unmet need, standardized test scores, and modal values of the remaining categorical variables. Hence, Figure 1 displays the probability of retention across all values of EFC assuming the student lives on campus, is not in EOF, does not identify as a racial or ethnic minority, is an in-state resident, was not a special admit, and has declared a major. The change in retention likelihood from the lowest to the highest value of EFC may not appear large in absolute terms, because retention is quite high on average for the college in question.

Figure 2 visualizes the predicted retention rate for every value of institutional financial assistance, assuming a typical student with mean values of EFC and academic performance and modal values of the contextual variables. As the level of institutional financial assistance from the college to a student rises, the chance of retention for that student increases. The increase in retention likelihood across the span of institutional aid is greater than that of EFC. We scaled identically the y-axes of both figures for comparability. The increasing retention rate that corresponds with more institutional financial assistance is also less linear than the relationship between EFC and retention, with a sharp increase in retention even

Figure 1. Expected Family Contribution and Retention

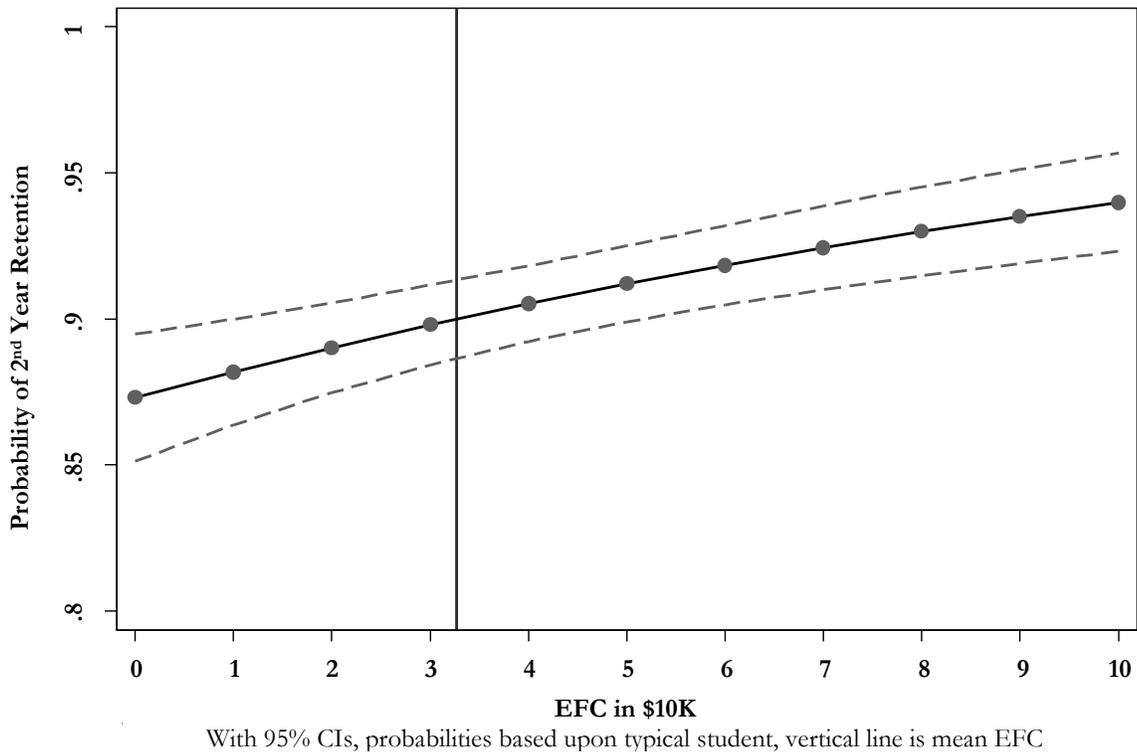
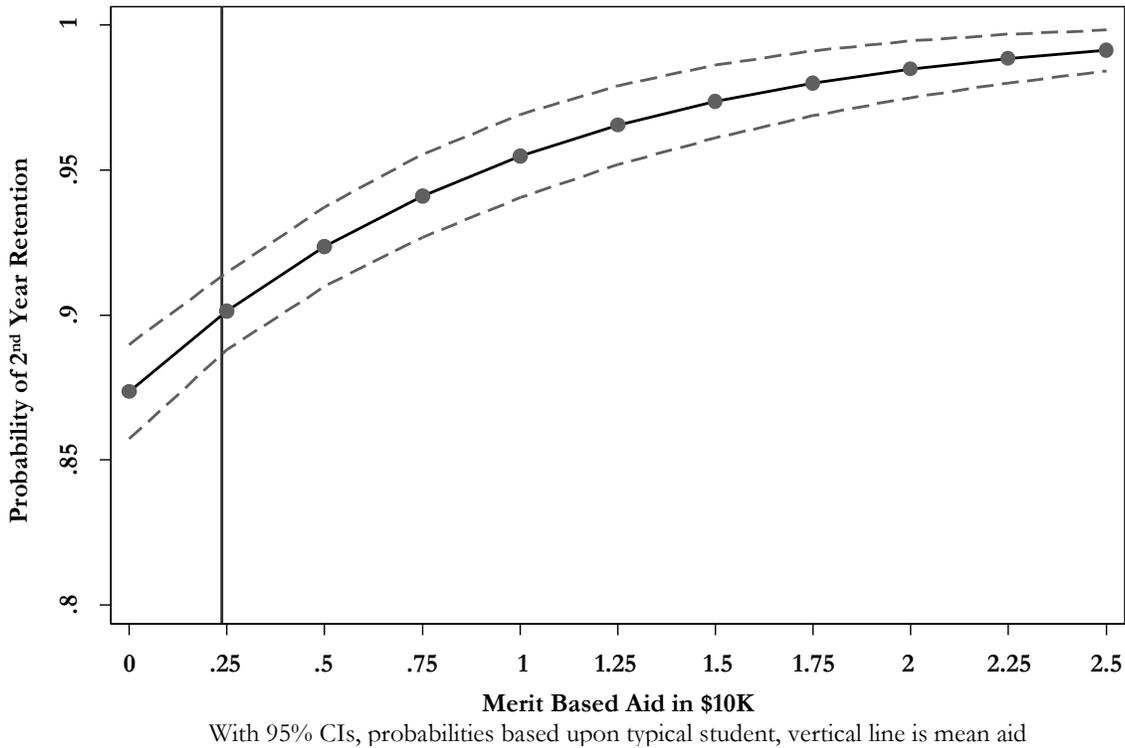


Figure 2. Institutional Aid and Retention



given a relatively low increase from zero in institutional aid. In other words, the retention difference between an otherwise identical student with no aid and another with \$5,000 of aid is 90% to 94%. In contrast, as previously shown in Figure 1, comparing two otherwise identical students, with one having zero EFC and one with an EFC of \$40,000 (near the mean), the difference in their likelihood of retention is more modest: 90% versus 92%.

The implications of this finding could lead to an interesting dilemma for colleges and universities, as enrollment management administrators could start to admit students from wealthier families to improve retention. This strategy could become more prevalent at institutions where retention is highly weighted in the job performance of these administrators. For public colleges, this strategy poses a serious conundrum. On one hand, the mission of public institutions of higher learning is to provide a low-cost education to those least able to afford private school tuitions. At the same time, these institutions are facing increasing pressure, at both the federal and state government level, to increase student retention. By moving the EFC needle in this way, college affordability will become more problematic for lower-income families. Navigating this dilemma involves issues that are beyond the scope of this paper and we encourage other researchers to carefully consider the implications of these empirical findings.

Conclusion

To better understand the correlates of student persistence in higher education, we estimated models describing the variance in first-year student retention for a highly selective public college in New Jersey. Although this study confirmed academic performance and contextual variables related with retention (e.g., GPA, SATs, residency), found in past research, we find that family finances and institutional aid matters too. Specifically, a family's financial contribution to collegiate expenses (EFC) helps the likelihood of first-year retention. When families have more capacity to contribute to educational expenses, the chance that students will persist to the sophomore year improves. The retention benefit of a family's ability to contribute financially appears to be linear in nature, with a roughly constant increase in retention likelihood across the range of EFCs.

Interestingly, our results also show that as unmet need increases, so does the likelihood of retention. This presents an opportunity for financial aid professionals to shape the conversation around how limited institutional aid gets allocated. While creating packages that reduce unmet need is the ultimate goal, there is a takeaway that students who must contribute to college costs, and thus are financially invested in their education, may be more likely to be retained.

Our results also quantify the important relationship between the amount of institutional aid a college offers to a student and that student's likelihood of retention. Schools operating in a competitive environment may strategically use aid to increase the enrollment of particular students. Naturally, there are limits to the amount of resources a public institution has to allocate to institutional aid efforts. Our empirical results suggest that the power of merit-based financial aid to buoy retention is nonlinear, with relatively large gains in retention likely with even small amounts of aid. In short, offering students merit-based financial aid—even in small amounts—helps keep them in college.

For those working in financial aid, these results demonstrate the importance of connecting financial aid to larger institutional conversations, particularly those about retention and persistence. Often, financial aid is seen as a recruitment tool without much attention paid to its impact on student retention. However, financial aid has a significant impact on students' ability to attend and complete college, so financial aid administrators need to be more actively involved in the conversation about retention. Further, packaging

philosophies—specifically how and to whom institutional aid is allocated—can play as important a role in achieving the desired institutional outcomes as it can for shaping an incoming class.

It is important to be circumspect about the ability of our results to extend to every higher education setting. This study examined a regionally narrow student population attending a small, public, liberal arts institution. The accepted students performed roughly in the 65th percentile on the SAT. Hence, these findings hold the most potential external validity for similar institutional settings; the relationship between family resources and institutional aid is likely to be quite different at private colleges. While adding data from a few more institutions would strengthen these findings, we found it impossible to acquire necessary data given the sensitivity inherent with institutions sharing this type of data with one of their competitors. We strongly encourage researchers to pursue this line of research.

Overall, colleges and universities are increasingly focused on improving first-year-student retention for a variety of reasons. For many schools, ranking pressures serve as motivation for the administration to carefully consider ways to improve retention rates. Public institutions feel increasingly stronger budgetary pressures as state governments begin to consider retention in their funding allocation decisions, and the decline in state funding for higher education forces these institutions to become more tuition dependent. With the federal government and many state legislatures wielding both positive and negative incentives, improving institutional statistics, such as retention and graduation rates, becomes of paramount importance. For enrollment managers it is becoming significantly more important to understand where to strategically allocate funds to not only help meet overall recruitment goals, but also to further facilitate attainment of retention goals. This study provides an empirical estimate of the correlations between different factors and students' retention decisions.

Nexus: Connecting Research to Practice

- Campus enrollment managers and financial aid administrators should reframe conversations about aid as a recruitment tool to the role of financial aid variables in impacting first-to-second-year retention rates. Financial aid professionals should be involved in campus conversations on retention.
- Campus enrollment managers and financial aid administrators should evaluate the impact of their financial aid awarding policies on retention. Colleges may find that greater institutional aid contributes to a higher retention rate, holding all else constant.
- Enrollment managers at public liberal arts colleges should consider the role that starting as an undeclared major has on the likelihood of retention. At the institution in this study, undeclared majors are at greater risk for leaving school before completing their academic program.

Endnotes

¹ In the case of *US News and World Report*, student retention rates account for 20% of the rankings methodology for national universities and 25% for liberal arts colleges, and first-to-second-year retention is one of 11 categories included in the annual publication. (Morse and Flanigan, 2012).

² Numerous studies have examined persistence towards graduation in a general approach, such as Bound, Lovenheim, and Turner (2010), while others were more focused, such as Eagen et al. (2011) and Bettinger (2010), which focused on STEM majors.

³ The 2016 Free Application for Federal Student Aid (FAFSA) defines Expected Family Contribution (EFC) as “a measure of [a] family’s financial strength ... calculated according to a formula established by law. [A] family’s taxed and untaxed income, assets, and benefits (such as unemployment or Social Security) are all considered in the formula. Also considered are ... family size and the number of family members who will attend college during the year” (U.S. Department of Education, 2015).

⁴ While it may seem intuitive to include high school GPA in the model, we opted to include only those incoming variables that were standard within the admissions process. Per a reviewer’s suggestion, we re-ran the models with high school GPA and found no substantive changes to our inferences.

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