The Revenue Implications of Transfer Students

at American Colleges and Universities

by

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I. Introduction

Students transferring between institutions of higher learning are an important part of the higher education system for a variety of reasons. First, they are important simply because of their large numbers. Recent work estimates, using a sample of students who began postsecondary education in the fall of 1989, that approximately one in three students transfer to another institution within 5 years (McCormick and Carroll, 1997).[1] Besides its sheer size, the transfer route is also significant because it provides many potential benefits to students. By strategically transferring between institutions, students can lower their overall tuition costs, graduate from a more prestigious institution than allowed by their high school record, and resolve uncertainty about their success in higher education at a relatively low cost. The transfer route can also benefit institutions of higher learning because many transfer students possess characteristics that are advantageous to colleges and universities. As discussed in more detail later in the paper, transfer students can potentially benefit institutions with high attrition rates, departmental enrollment imbalances, student diversity concerns, financial aid shortages, and freshman class quality concerns.

A large body of research has focused on the transfer route from the student's perspective. This work primarily focuses on individuals who start at a less prestigious and less costly school, usually a two-year institution, and then transfer to a more prestigious school. This enrollment pattern can allow a student to enjoy the benefits discussed in the previous paragraph. Researchers focus on whether students are able to

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[1] More specifically, about one out of four students (28 percent) who begin at a four-year institution transfer while 43 percent of students entering two-year institutions transfer. In calculating these figures, McCormick and Carroll define a transfer as a student who moves from one institution to another without returning to the initial institution (McCormick and Carroll, 1997).

reap these benefits without unintended effects, such as a decrease in their probability of obtaining a bachelor degree.[2]

Past research has not devoted similar attention to the four-year institution's role in the transfer route, and consequently, we know little about the determinants of an institution's transfer student enrollment. This lack of knowledge is troubling for three reasons. First, this knowledge is required to predict transfer students' access to four-year institutions, which in turn helps determine the potential benefit of the transfer route for a student. Second, a better understanding of the determinants of transfer enrollment provides insights into general differences in enrollment policies across institutions and over time. One would expect differences in enrollment management between public and private institutions, between research universities and liberal arts colleges, and between selective and non-selective institutions. In addition, one might expect overall enrollments as well as differences across institutional types to change over time as tuition levels and other factors vary.

The final reason why it is important to understand the determinants of an institution's transfer enrollment is that such knowledge provides insights into the degree to which institutions of higher learning profit from the characteristics of transfers. These students can potentially benefit an institution in several ways such as filling unused upper-level course space or alleviating the need to increase student housing. These productivity gains are important to both individual institutions and state systems of higher

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[2] For example, Rouse (1995, 1998) investigates whether starting at a community college decreases a student's probability of obtaining a bachelor degree, while Hilmer (1997) examines whether community college attendance provides a strategic path to a higher quality education. In another paper, Hilmer (2000a) studies whether transfer students incur an earnings penalty relative to direct attendees.

education with the latter entities especially able to realize these benefits because they can partially control the supply of transfer students.

Many state systems will find potential increases in efficiency especially appealing in the near future as the children of the "baby boom" reach the traditional college age.[3] Because it is unlikely these systems will be provided with a corresponding increase in resources to educate these additional students, they will need to find ways to make the same funds stretch further.[4] One possible response to this problem is to increase the number of students starting at two-year institutions which will result in more transfers within the system.[5] The state will enjoy cost savings from this policy to the extent that four-year institutions can realize the benefits of transfers and to the extent the state spends less on a student attending a community college than on a student attending a four-year institution.

This paper endeavors to improve our understanding of the determinants of an institution's transfer enrollment. After outlining the probable determinants in Section II, I use data for a national sample of institutions from 1984 to 1997 to examine whether

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[3] Projections by the U.S. Department of Education predict that the number of high school graduates will increase from 2.820 million in 2000 to 3.153 million in 2008 and then will slowly decrease (The Chronicle of Higher Education Almanac Issue, p. 25). These changes, however, will not uniformly affect individual states; for example, thirteen states are projected to have a decrease in the number of high school graduates between 2000 and 2010. These states are primarily located in the northern central part of the country (such as North Dakota, Wyoming, and Iowa). On the other hand, some states in the southwestern (Arizona, Nevada, California) and southeastern (Florida, Georgia, North Carolina) parts of the country are expected to experience increases in the vicinity of twenty percent (The Chronicle of Higher Education Almanac Issue, p. 8). These latter states are the focus of the following discussion.

[4] See Hovey (1998, 1999) for a thorough discussion of why state appropriations to higher education are unlikely to increase.

[5] The University of California is an example of a state system increasing the number of transfer students in response to increases in enrollment. General campus enrollments are projected to grow to 210,000 full time equivalent students by 2010, which is a forty percent increase over 1998-99 enrollment levels (Hayward, 1999). Consequently, the system is planning to increase the number of community college transfers to 15,300 by the year 2005, an increase of 50 percent. This goal partially motivated the recent proposal to offer admission at a four-year institution to students who are in the top 12.5 percent of their high-school graduating class and who successfully complete two years at a California community college (Selingo, 2000).

these factors do explain the composition of a school's enrollment. In section III, I examine the variation in enrollments across institutional type and find three big differences. The first difference is that the transfer enrollment rate, the percentage of an institution's incoming students who are transfers, is larger at publics than at privates. This gap increased over the period. Second, the transfer enrollment rate falls for privates as institutions become more selective, but the relationship between selectivity and transfer enrollment share is more complex for public institutions. The final difference is that private liberal arts I colleges have lower transfer enrollment rates than other schools even when comparisons within the same selectivity group are made.

In section IV, I investigate factors besides institutional type that determine the composition of a school's new student enrollment. The regression results indicate that transfer enrollment rates are higher at institutions with more student attrition, less resources, less freshmen in campus housing, and lower tuition and fees. Similar analyses performed separately by institutional type demonstrate that these results are comparable for most types of institutions, but some important differences are noted.

II. Possible Determinants of an Institution's Transfer Enrollment

An institution's transfer enrollment rate is determined by two factors: the institution's demand for the characteristics of transfer students and direct attendees, and the number of students of each type desiring enrollment. The former influences recruitment efforts and the criteria by which applicants are accepted, while the latter determines the number of transfers and direct attendees produced by a particular

enrollment policy. I discuss both factors in greater detail in this section, providing motivation for the subsequent empirical analysis.

From the perspective of a four-year institution, the distinguishing feature of transfer students is that they arrive on campus at a later stage of the educational process than direct attendees. Approximately two-thirds of transfers attend their first institution for at least 11 months while one-third are enrolled for a minimum of 21 months (McCormick and Carroll, 1997). Because approximately 90 percent of these students transfer credit between institutions, they often enter four-year institutions as sophomores or juniors. During their enrollment, this characteristic causes transfers, relative to direct attendees, to consume less of those resources disproportionately used by freshmen (such as student housing) and more of those resources disproportionately used by upperclassmen (such as upper-level courses). Two types of institutions will find this trait especially useful: institutions with high attrition rates and institutions with numerous majors or departments.

To maintain a certain enrollment level, institutions with high attrition rates must enroll more new students each year than "normal". Using direct attendees to replace students who leave early requires large quantities of those resources disproportionately used by freshmen. In addition, this response causes upperclassmen to be a smaller percentage of the student body, which increases the number of upper-class courses run below capacity and restricts the ability of an institution to offer a curriculum of a wide breadth. On the other hand, increasing transfer enrollment in response to student attrition diminishes these problems for the reasons discussed above.

Institutions that offer a wide variety of majors and upper-level courses may find transfers attractive even if they do not have high attrition rates. The expanded curriculum in these schools increases the possibility of departmental enrollment imbalances or unused upper-level class space. Both problems are moderated by a higher transfer student share because transfers spend a greater proportion of their time on campus in upper-level courses and because their prior experience is likely to increase the probability they know their major upon application.

In addition to entering at a different stage of the educational process, transfers may differ from direct attendees in several other characteristics that are important to four-year schools. For example, the financial aid needs of an institution's pool of transfer students may be different than those of direct attendees. Transfers may require less aid because they are likely to attend a less expensive institution for part of college which lowers their total educational costs. In this case, the institution might determine that the transfer requires less institutional aid than a direct attendee possessing similar financial resources. Transfers, however, may have fewer financial resources because the lower potential cost of the transfer route could attract poorer students.[6] If this "financial resources" effect outweighs the "lower costs" effect, transfers will require more aid than direct attendees. These differences are important to an institution that lacks the resources to provide extensive aid packages.

Another student characteristic that is important to institutions of higher learning is the student's race and ethnicity. Many institutions believe that a diverse student body is an important input into their "production function" and adjust their enrollment policies to

generate larger levels of diversity. Therefore, a school's transfer student share may depend on the extent to which their pool of transfers are more or less diverse than their pool of direct attendees. National data suggest that an institution's pool of possible transfer students is comparable in diversity to their freshmen pool, but this aggregate national data might conceal great variation across institutions.[7]

A recent change in the higher education landscape is the increasing importance of institutional rankings by popular magazines. These magazines, such as the *U.S. News & World Report*, rank institutions by a number of criteria believed to be correlated with institutional quality. Because freshmen test scores are included in the ranking methodology while transfer test scores are not, an institution wishing to improve their rankings can increase the percentage of new students who are transfers to create a more selective freshmen class with higher average test scores. The importance of these rankings to selective institutions and the extent to which these rankings have caused institutions to alter their behavior in other areas suggest that this response is not inconceivable.[8]

Even if they could benefit in many of the ways just described, some institutions will not enroll many transfer students for philosophical reasons. For example, some faculty and administrators might feel it is essential that a student complete all of his or

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[6] From the Baccalaureate and Beyond survey that contains individuals who complete their degree in 1993, Hilmer (2000a) finds that the average family income of non-transfers is $54,256, as compared to average family income of transfers of $40,809.

[7] Descriptive statistics in Hilmer (1999, 2000a) and computations performed later in this paper using transfer rates taken from McCormick and Carroll (1997) suggest that the diversity of the national pool of transfer students is slightly less than or equal to the diversity of the pool of direct attendees.

[8] Ehrenberg (2000) and Reisburg (2000) discuss instances in which these rankings have caused institutions to alter their behavior. Monks and Ehrenberg (1999) demonstrate the importance of these rankings. Using a sample of very selective private institutions, they find that a less favorable ranking in the *U.S. News & World Report* leads an institution to accept more of its applicants, to have less of its admitted applicants matriculate, to enroll a freshman class of lower quality, and to offer more generous financial aid packages.

her post-secondary education within the same program. These beliefs are likely to vary by institutional type and could lead some institutions to limit transfer enrollment through a variety of mechanisms such as acceptance criteria, recruiting and marketing efforts, and course requirements.

While the institution's demand for transfer students and direct attendees is an important determinant of the composition of its enrollment, the number of students from each group desiring enrollment could be even more crucial. For example, in a study of 16 liberal arts colleges in Ohio and Massachusetts, Duffy and Goldberg (1998) find that several institutions during the 1970s wished to increase their transfer student enrollment in order to replace students lost through attrition, but were unable to attract a sufficient number of qualified transfer applicants. Certainly, the range of enrollment levels available to other institutions is also constrained by the degree to which they possess characteristics that appeal to transfers and direct attendees.

Transfers differ from direct attendees in several attributes suggesting these two groups of students may be attracted to different institutional characteristics. For example, the potentially lower costs available in the transfer route might disproportionately attract individuals with fewer financial resources who seek four-year institutions that require fewer outlays for tuition, housing, or travel from home. The transfer route may also attract individuals who performed poorly in high school because transferring between institutions may allow a student to eventually graduate from an institution to which they would not have gained admission with just their high school credentials.[9] In addition,

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[9] In fact, evidence suggests that transfers do have worse high school records than direct attendees. Using the Baccalaureate and Beyond survey, Hilmer (2000a) finds that the average SAT score of a direct attendee is 1,034 while for transfers it is 1,006. In addition, Hilmer (1999) finds that the average high school GPA

community colleges, by providing a low-cost opportunity for students to resolve uncertainty about their ability to succeed in higher education, may appeal most to those who performed poorly in high school. While students who use the transfer route for these reasons improve their credentials at their initial institution, their improvements are often unlikely to qualify them for admission to the more selective institutions.

Some final differences between transfers and direct attendees is that transfers are more likely to be older, married, in a family with children, and in a job during college.[10] Individuals with these traits are likely to be attracted to the lower costs of the transfer route and the convenient location of many community colleges. Substantial work and family obligations would lead transfers to choose four-year institutions close to their home from which they can easily commute.

The discussion in this section theorizes that the percentage of an institution's incoming class that is transfer students depends on the institution's selectivity level, Carnegie classification, type (public or private), attrition rate, number of majors, financial resources, tuition level, proximity to potential transfer students and direct attendees, and convenience for non-traditional students (e.g., location). The following sections will analyze institutional enrollment data to investigate whether these determinants do indeed influence an institution's transfer enrollment rate in the expected manner.

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of direct attendees is 3.32 while it is 3.10 for transfers. This later analysis focuses on college graduates from the High School and Beyond survey that follows students who graduated high school in 1982.

[10] Hilmer (2000a) finds that upon graduation transfers (direct attendees), on average, are 27 (23) years old, married 38% (20%) of the time, worked during college 52% (43%) of the time, and have 0.52 (0.15) children.

III. Enrollment Levels by Institutional Type

As outlined in the previous section, the enrollment of transfer students might vary considerably between public and private institutions and between institutions of different selectivity levels or Carnegie classifications. To analyze enrollment levels across these various groups, I use the College Board's *Annual Survey of Colleges* that contains data on the number of transfers and first-time freshmen at each school. From this data set, I drop all proprietary institutions, branch campuses, schools missing necessary data, and all institutions who report total undergraduate enrollment under 1,000 students for any year in the period. In addition, I only keep institutions meeting these restrictions that are labeled as Research, Doctoral, Comprehensive or Liberal Arts in the 1994 Carnegie classification scheme.[11] The data for these institutions span the years 1984 to 1997 which is a period of rapidly increasing tuition levels, increasing between-college variation in observable student quality, and varying levels of economic growth and governmental fiscal austerity.

The summary statistics in Table 1 provide evidence that transfers are a smaller percentage of the student body at private institutions than at publics; on average, around 23% of a private institution's new student class consists of transfers while the corresponding figure for publics is close to 36%. Separating institutions by their selectivity rankings from *Barron's Profiles of American Colleges* brings to light additional differences between publics and privates.[12] For private institutions, there is almost a monotonic relationship between selectivity and transfer enrollment with more

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[11] I use the Carnegie classifications reported in the CASPAR database. CASPAR uses the Carnegie Foundation's copyrighted, "A Classification of Institutions of Higher Education" to create this variable using the 1994 classifications.

selective institutions enrolling proportionately fewer transfer students. The relationship differs at publics where moderately selective institutions enroll the highest proportion of transfer students. The dissimilarities between publics and privates could be due to several factors such as different "tastes" for transfer students, higher tuition levels at privates, or incentives created by many state higher education systems.

While transfer enrollment rates have mostly remained stable over the period, two discernable patterns exist. First, transfer enrollment rates have fallen over time for private institutions with the more selective privates experiencing the largest decreases. The percentage of transfers in the incoming student class during the last three years of the sample (1995-97), as compared to the first three years (1984-86), was 18% lower for most competitive and very competitive privates and 33% lower for highly competitive privates. Meanwhile, the transfer enrollment rate did not decline among public institutions overall and actually increased for the less selective public schools. The rate at publics fluctuated during the period, peaking in the early 1990s after a sharp increase from the low rates of the late 1980s.

By presenting total enrollment levels of first-time freshmen and transfers, Table 2 allows closer examination of the changes in transfer enrollment rates over the period. The results indicate that the falling transfer rate for private institutions is due to a reduction in the number of transfer students combined with an increase in first-time freshmen. This change in enrollment levels could be due to a variety of trends from this period such as the increasing selectivity among the more competitive privates or their

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[12] The rankings are based on the average rankings from the 1983, 1991, and 1997 editions of *Barron's Profiles of American Colleges*.

rapidly increasing tuition levels.[13] The increasing importance of the *U.S. News & World Report* rankings is not a potential explanation because these rankings provide incentives for the highest ranked institutions to increase transfer student enrollment in order to create a smaller and more selective freshman class.[14] Finally, Table 2 demonstrates that the fall in the transfer enrollment rate for highly selective privates had only a small effect on the total number of transfers in higher education because these institutions historically enroll very few transfer students.

Tables 3, 4, and 5 provides rough insights into whether variation in the transfer enrollment rate of private institutions over time are due to changes in the desires of students or to changes in institutional enrollment policies (or both).[15] The results in Table 3, which summarizes total application levels, suggest that part of the reduction in the transfer enrollment rate for privates was due to changes in the desires of students.[16] The number of freshman applicants rose quickly over this period while the corresponding figure for transfers only increased slightly and actually fell for some of the more selective Barron's categories. The figures for acceptance rates in Table 4 indicate that institutional enrollment policies were also partially responsible for the decline in the transfer

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[13] The average "sticker price" at four-year private institutions grew from $8,186 for the academic year 1984-85 to $14,581 in 1997-98 (College Board, 2000). These figures are adjusted to year 2000 dollars.

[14] Top ranked institutions are given a numerical ranking in the *U.S. News & World Report* while other schools are simply put into a group with institutions of similar quality. Therefore, slight changes in an institution's performance as measured by the ranking criteria are more transparent to potential students for the top ranked institutions than other schools.

[15] The analyses in these three tables use a smaller sample than used in Tables 1 and 2. In addition, the data are only available for the years between 1987 and 1997. The reduction in observations is due to a smaller number of institutions providing application and acceptance data and is more severe among less selective institutions. This smaller sample may not be overly problematic, however, because replication of the first two tables with this smaller sample produces the same trends discussed so far.

[16] The summary statistics in Table 6 on yield rates, the percentage of an institution's accepted applicants who decide to enroll, does not provide any further evidence on changes in the desires of students because the rates decreased by similar amounts for both transfers and freshmen over the period. These decreases are probably mostly due to students increasing the number of institutions to which they apply than to reductions in the number of accepted applicants who actually enroll in a college.

enrollment rate because the acceptance rate for transfers fell over the period while the corresponding rate for freshmen grew. The most selective privates, who experienced the largest drop in transfer applicants, were the only selectivity category to increase their transfer acceptance rate relative to their freshman acceptance rate. Overall, the evidence on acceptance rates suggests that private institutions respond to increases in the number of applicants by decreasing the percentage of incoming students who are transfers.[17]

Turning to public institutions, Table 2 suggests that the upturn in the transfer enrollment rate for publics in the early 1990s was mostly caused by sharp decreases in the number of first-time freshmen. Relative to the second period (1987-90), the number of new freshmen declined in the third period (1991-94) by 12% for competitive publics and by 8% for very competitive publics. The economic stagnation, less than generous state governments, and resulting higher tuition levels of the early 1990s may have caused students to avoid post-secondary education or seek less expensive educational paths.[18]

For publics, Tables 3 and 4 suggest that much of the fluctuation in the transfer enrollment rate was due to changes in the desires of students as opposed to institutional enrollment policies. In periods where the transfer enrollment rate is rising, the number of transfer applicants is increasing relative to the number of freshman applicants, while the acceptance rate of transfers is falling relative to the corresponding rate for freshmen. In

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[17] Examination of yearly changes in application levels and acceptance rates over time for each institution provides further evidence that less selective privates follow this enrollment strategy. On average, the transfer acceptance rate for institutions in the bottom three selectivity categories is more negatively correlated than the freshman acceptance rate with both the number of freshman and transfer applicants. This result suggests that these institutions respond to any increase in applications by decreasing the transfer acceptance rate more than the freshman acceptance rate. Correlations for the more selective privates were different as the number of freshman applicants is more negatively correlated with the freshman acceptance rate than the corresponding rate for transfers while transfer application levels experience the opposite relationship.

[18] Tuition levels from this period suggest that state systems were not increasing incentives for students to initially enroll at two-year institutions in their path towards a bachelors degree. The "sticker price" of two-year and four-year institutions increased at similar rates between 1987 and 1994 (College Board, 2000).

addition, the opposite scenario occurs in periods when the transfer enrollment rate decreases. This evidence is consistent with public institutions not treating freshmen and transfers as perfect substitutes or having a strong preference for either group. Instead, it appears publics ease (toughen) their acceptance criteria more for those groups of students who become increasingly scarce (abundant).[19]

In addition to selectivity levels, the composition of an institution's enrollment might also vary by institutional type. To test this hypothesis, Table 6 summarizes transfer enrollment rates for different Carnegie classifications. The percentage of transfers in the new student class is much lower at liberal arts I colleges and research universities than at other privates, illustrating that enrollments vary across Carnegie types for private institutions. The transfer enrollment rate at liberal arts I colleges is between one-third and two-fifths, while the rate at research universities is between one-half and three-fifths, of the level found at doctoral, comprehensive, or liberal arts II institutions. For public institutions, there is little variation across Carnegie classifications: research universities who have the smallest transfer enrollment rate at 0.320 are close to doctoral universities who have the highest rate at 0.396.

Because the selectivity level of institutions is not evenly distributed across Carnegie classifications, it is impossible to infer from Tables 1 and 6 whether the differences across Carnegie types are due to systematic differences between these institutional types or due to differences in their selectivity. A similar problem occurs in interpreting the differences across selectivity groups. To help resolve these competing

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[19] Again, examination of yearly changes in application levels and acceptance rates over time for each institution provides further evidence that public institutions follow this enrollment strategy. On average, the number of freshman applicants is more negatively correlated with the acceptance rate for freshmen than

explanations, Table 7 presents transfer enrollment rates by selectivity level for each

Carnegie category. While the sample size is quite small in some cells, some conclusions

can be drawn. Within each Carnegie category, the relationship between selectivity levels

and transfer enrollment rates observed in Table 1 continues to exist for both publics and

privates. In addition, much of the differences and similarities across Carnegie

classifications remain within each selectivity level. One exception is the lower transfer

enrollment rates of private research universities. While their rates are still lower within

each selectivity level, much of the difference found in Table 7 disappears.

IV. Multivariate Analysis

I now turn to more complex analyses and investigate the determinants of transfer

enrollment beyond selectivity level and institutional type. In this section, I use additional

data from the College Board's *Annual Survey of Colleges* as well as data from CASPAR,

which contains information gathered by the U.S. Department of Education in its Higher

Education General Information System (HEGIS) and Integrated Postsecondary Education

Data System (IPEDS) surveys.

The combined data set contains a number of variables that are good proxies for

the concepts discussed in section II. The percentage of freshmen that do not return for

their sophomore year is included to represent total student attrition because other data on

attrition levels are not available and most students who leave an institution do so after

their first year. To measure the financial resources of an institution, I use the level of

the corresponding rate for transfers while transfer application levels experience the opposite relationship.
This result holds for both less, moderately, and more selective public institutions.

non-tuition current fund revenue, and to gauge the number of majors, I use the number of four-digit Classification of Instruction Programs (CIP) with at least five graduates.[20]

Data are available on the percentage of minorities in an institution's freshman class, but unfortunately, no data exist on the racial and ethnic composition of each institution's transfer students. Therefore, to test whether institutions increase transfer enrollment to compensate for a lack of diversity in their freshman class, I create a state-level variable that equals the percentage of minorities in the pool of transfer students divided by the percentage of minorities in the direct attendee pool.[21] When this variable is greater than one, the institution resides in a state that should have more diversity among transfers than direct attendees, while the opposite situation occurs when the ratio is less than one.

To examine whether differences in selectivity and institutional type persist when controls for additional determinants are included, the data set contains dummy variables for different rankings from the *Barron's Profiles of American Colleges* and for different

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[20] For both determinants, other variables were examined to ensure that results were robust to the particular proxy. For financial resources, I also used endowment assets, non-tuition education and general revenue, and the percentage of current fund revenue that is tuition and fee revenue. Education and general revenue is defined as those non-tuition revenues that are intended for operating the educational, research, and public missions of the institution. For the number of majors, I experimented with changes in the digit level of the CIP codes and the requirement of the number of students who graduate. In addition, I used the number of majors offered at the institutions. In the discussion below, I note whether or not similar results are found with these alternative proxies.

[21] This variable is computed in several steps. First for both whites and non-whites, I estimate the number of students in the incoming class from two years ago who later transfer by multiplying the number of incoming two-year students by the propensity of students to transfer from two-year institutions to four-year schools and adding that to the number of incoming four-year students multiplied by the propensity of students to transfer from four-year institutions to another four-year institution. I then divide the number for non-whites by the total for whites plus non-whites to get the percentage of the transfer pool who are minorities. This percentage is used in the numerator of the final variable. For the denominator, I divide the number of non-whites in that year's incoming freshman class by the number of students in the freshman class whose race is known. The transfer propensity rates used in the numerator were taken from McCormick and Carroll (1997) and were 0.224 for those starting at two-year institutions and 0.156 for those starting at four-year institutions. McCormick and Carroll only provide limited evidence on differences in these rates by racial groups, but that evidence suggests the rates vary little across groups.

Carnegie classifications. The percentage of an institution's total applicants who are accepted is also included to measure selectivity.

Finally, the data set contains information representing the attractiveness of the institution to transfer students and direct attendees. Variables included are a rural dummy variable, the ratio of students attending two-year institutions to students attending four-year institutions in the school's state, the percentage of freshmen who live on campus, and the level of tuition and fees. The location, housing, and state enrollment variables are included to capture the desire of transfers for a conveniently located institution to which they can commute, and the tuition level of an institution is added because transfers may be more price sensitive than direct attendees.

Table 8 contains summary statistics for all the variables used in the subsequent analysis for both the entire sample and different selectivity groups.[22] These tabulations indicate that more selective institutions have lower attrition rates, more majors, more non-tuition revenue, higher tuition, more freshmen in campus housing, and a lower acceptance rate. Controlling for the level of selectivity, privates have fewer majors, more freshmen in campus housing, and higher tuition and fees.

To investigate the effect of these variables on the transfer enrollment rate, I first examine differences across institutions at a point in time. Because the transfer rate is an aggregate measure that takes values only between 0 and 1, I estimate regression models specified as:

$$\ln\left[\frac{p_i}{1-p_i}\right] = \alpha + \beta X_i + \varepsilon_i \qquad (1)$$

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[22] I group institutions into three categories according to the following scheme: "less selective" includes schools rated as non-competitive or less competitive by Barron's; "selective" includes those rated as

where p_i is the percentage of new students who are transfers for institution *i*, X_i is a vector of the explanatory variables, and ε_i is the error term.

Table 9 reports results for three years in the sample: 1985, 1990, and 1995. Turning first to those variables representing the attractiveness of an institution to transfer students, all have the anticipated sign. Specifically, the results suggest that transfer enrollment rates are higher at institutions with less freshmen living on campus, lower tuition and fees, and more community college students in their state. Schools also appear to enroll fewer transfers when located in rural areas, but this result is often not statistically significant at conventional levels.

The results for variables representing the selectivity level and Carnegie classification of an institution demonstrate that some of the results found in the previous section are altered when controls for other determinants are added. In general, however, selective private institutions continue to enroll less transfer students. Institutions with lower acceptance rates are found to enroll fewer transfer students, and moderately selective public and private institutions and more selective publics enroll fewer transfers than more selective privates. The difference between these selectivity groups rose considerably in 1995, suggesting that the drop in transfer enrollment rates for more selective privates in the mid-1990s cannot be fully explained by changes in the other enrollment determinants included in the analysis.

One interesting change in the results from the previous section is that less selective privates and publics are no longer found to have a higher transfer enrollment

competitive; and "more selective" includes the remainder of institutions ranked by Barron's as very competitive, highly competitive, and most competitive.

rate than more selective privates.[23] Though not statistically significant, the coefficient for

these dummy variables is actually negative for most years. The results for the Carnegie

classification dummies also show differences from the earlier analysis. When controls

are added, research universities have the largest transfer student share followed in order

by doctoral universities, comprehensive universities, liberal arts II colleges, and liberal

arts I colleges.

Turning to other institutional characteristics, it appears that institutions do use

transfers to replace students who leave early. The results indicate that for an institution

that has a transfer student enrollment rate close to the mean for this sample, a ten

percentage point increase in the number of freshmen not returning for their sophomore

year leads to a two point increase in the percentage of new students that are transfers.[24]

Table 9 also provides evidence that institutions with less financial resources enroll more

transfer students, but an institution's transfer enrollment rate does not appear to be

affected by the number of majors it offers. Similar results are obtained in regressions

using alternative measures of an institution's financial resources or quantity of majors.

Tables 10 and 11 present results of similar analyses for each selectivity group for

publics and privates, respectively. This approach is needed because one would expect

institutions to differ by selectivity and type in how they adjust their enrollments to certain

determinants. An institution that has a queue of students from which it selects for

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[23] To check that these different results for selectivity groups are not due to the inclusion of the acceptance rate which also measures selectivity, the same specifications were run without the acceptance rate. Results were surprisingly similar for all selectivity dummies in this alternative specification.

admission would act quite differently than an institution that accepts almost all students who apply. To increase enrollment levels of a certain group, the latter institution must increase the number of applicants from that group while the former institution simply has to enroll more students from their queue. Similarly, one would expect public institutions to differ from privates in their ability to adjust their transfer enrollment as publics may be hurt by restrictive outside mandates or helped by better coordination with public community colleges.

The results do indicate differences by selectivity and type for a number of determinants. For example, the coefficient on the acceptance rate of applicants is only statistically significant for moderately and more selective private institutions which provides more evidence that increased selectivity decreases the transfer student share for privates and not for publics. In contrast, the results for the state ratio of two-year versus four-year enrollment vary by selectivity level more than by type. The coefficient on this variable is large and significant for all schools except for more selective institutions that probably draw students from a national rather than a local pool of students.

The relationship between attrition and enrollment composition varies by selectivity and institutional type in two distinct ways. First, the coefficient for the percentage of freshmen not returning is usually larger for more selective institutions whose large number of applicants may make strategic enrollment decisions easier. Second, the coefficients for publics were much smaller than the private coefficients in

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[24] Following Ramanathon (1995), to understand how the marginal effect is obtained, note that if you solve equation (1) for P you get: $P = \dfrac{1}{1 + e^{-(\alpha + \beta X + \varepsilon)}}$. To derive the marginal effect of X on P, one must calculate the partial derivative of P with respect to X: $\dfrac{\partial \hat{P}}{\partial X} = \dfrac{\hat{\beta} e^{-(\hat{\alpha} + \hat{\beta} X)}}{[1 + e^{-(\hat{\alpha} + \hat{\beta} X)}]^2} = \hat{\beta}\hat{P}(1 - \hat{P})$.

1985 and 1990, but grew to a similar level in 1995 suggesting that public institutions may have adjusted their enrollment practices over this period.

Interestingly, the relationship between non-tuition current fund revenues per student and transfer enrollment rates is strongest for the least selective schools which might indicate that these institutions are most sensitive to financial considerations when setting their enrollments. This result, however, is sensitive to how one measures financial resources. Much of the difference is eliminated if non-tuition education and general revenues per student is instead used as the measure of financial resources. Additionally, if endowment assets are used, more selective institutions now exhibit the stronger negative relationship between financial resources and the transfer enrollment rate. This finding may be misleading, however, as more selective institutions rely more on endowment assets to provide resources.

Finally, a greater number of majors is only associated with a higher transfer student enrollment share for more selective private institutions. This finding is robust to alternative measurements of the number of majors and is not surprising in that the large number of applicants at more selective privates make strategic enrollment plans easier to implement.

To examine how diversity considerations affect an institution's transfer enrollment rate, Table 12 presents results for a regression (pooling institutions by selectivity and type) that includes variables representing the percentage of minorities in an institution's freshman class, the diversity of the state's transfer students relative to their direct attendees, and the interaction of these two variables. This specification tests whether institutions with low diversity in their freshman class increase their transfer

student share when their pool of transfer students is relatively more diverse. The positive coefficient on the interaction term in Table 12 suggests that institutions do not increase their transfer student share in this situation. This result may simply reflect that institutions that do not attract minority freshmen may find it difficult to attract a diverse transfer class.

In the analysis performed to this point, the results indicate that institutions respond to high attrition rates by increasing transfer enrollment. The discussion in Section II suggests that such behavior is not surprising because using transfers as opposed to freshmen to replace lost students has several advantages. Increasing the transfer enrollment rate may alleviate several problems that high attrition creates such as fewer upperclassmen in the institution's student body and constrained levels of student housing. To examine whether these benefits are driving the relationship between attrition rates and transfer enrollment, Table 13 presents results for regressions that investigate whether institutions are more responsive to high attrition when the above problems have more severe consequences.

The first three columns of the table test whether institutions that have more majors increase transfer student enrollment rates in response to attrition more than institutions with less complexity. An institution with more majors would be hurt most by a shortage of upperclassmen because they need enough students to offer an expanded curriculum. While the positive coefficient on the interaction term between the number of majors and the percentage of freshmen not returning (for two of the years) is consistent with a stronger enrollment response by institutions with more majors, the results are not statistically significant. In addition, alternative measures of an institution's quantity of

majors are just as likely to have a negative coefficient as a positive one. The last three columns of Table 13 test whether an institution's transfer enrollment rate is more responsive to increased attrition when a greater percentage of freshmen live on campus, and consequently, housing constraints are more problematic. The coefficient for the interaction term between freshmen housing levels and attrition is large and positive, suggesting that housing constraints may be partially driving institutions' enrollment response to high attrition.

To better utilize the longitudinal nature of the data set, I now turn to an analysis of changes over time at each institution as opposed to the above cross-sectional approach examining differences across institutions at a point in time. Specifically, in the rest of this section I use fixed effects models to examine changes in enrollments over five year periods. Changes over one or two year periods are not analyzed because of a lack of variation for several key variables and the difficulty of correctly specifying the precise timing of the effect of certain determinants on enrollment.

Using data from the years 1985, 1990, and 1995, the following model is estimated[25]:

$$\ln\left[\frac{p_{it}}{1 - p_{it}}\right] = \alpha + \beta X_{it} + \gamma D_i + \delta Y_t + \varepsilon_{it} \qquad (2)$$

where p_{it} is the percentage of new students who are transfers for institution i in year t, X_{it} is a vector of the explanatory variables, D_i is a vector of institutional dummy variables, Y_t represents a vector of year dummy variables, and ε_{it} is the error term.

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[25] A similar analysis was performed with four-year differences using the years 1984, 1988, 1992, and 1996. The results are not significantly different from those reported in the text.

The results for this model for both private and public institutions are presented in Table 14. There are some similarities to the cross-section results; for example, the transfer enrollment rate continues to be positively associated with higher attrition, and this result is much stronger for privates than for publics.[26] In addition, changes in financial resources are negatively associated with changes in transfer enrollment, but this result is only statistically significant for public institutions. Surprisingly, among the other four variables included in the analysis, the only strong result in the expected direction was for the percentage of freshmen living in campus housing for privates.

The discussion throughout this paper conjectures that institutions respond to higher attrition not only by increasing the transfer enrollment rate, but also by increasing the number of new students enrolled each year to maintain enrollment levels. The last two columns of Table 14 test this hypothesis by estimating the following model:

$$\ln(Sit) = \alpha + \beta X_{it} + \gamma D_i + \delta Y_t + \varepsilon_{it} \qquad (3)$$

where S_{it} is the number of students in the incoming class for institution i in year t, and X_{it}, D_i, Y_t, and ε_{it} are the same as equation (2).

The results indicate that institutions do not respond to higher attrition by increasing new student enrollment and suggest that the problems causing higher attrition may also limit the ability of institutions to attract additional qualified students. Among the other explanatory variables, the most interesting result is the negative coefficient on tuition and fees which is consistent with students' enrollment decisions being negatively affected by higher tuition. The large negative result for non-tuition current fund revenues

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[26] For private institutions, this result was much stronger for less selective privates than for moderately and more selective privates; this is quite different than the results found in the cross-section. The other results discussed for these fixed effects models are quite similar across selectivity groups for each institutional type.

per student must be interpreted carefully as it appears to be due to the relationship between the change in the size of an institution's new student class and the change in total enrollment. If non-tuition current fund revenue is used instead, a positive relationship is found.[27]

VI. Conclusion

By analyzing the enrollment data for a national sample of four-year institutions, this paper provides evidence on the primary determinants of an institution's transfer enrollment share. As discussed in the introduction, this improved understanding of enrollment levels is important for several reasons. First, to the extent that such determinants change in the future, subsequent changes in enrollments can be inferred. For example, the evidence in this paper suggests that private institutions respond to an increased number of applicants (i.e. increased selectivity) by decreasing the share of transfers in their incoming student class while publics do not exhibit similar behavior. Therefore, a surge in the population of students and the subsequent increase in applicants may lead to reductions in the transfer enrollment rates for privates but not for publics.

A second reason why the analyses in this paper are important is that they provide insights into differences in enrollment polices across institutional types and through time. For instance, the results indicate that high levels of selectivity allow institutions to be more strategic in their enrollment plans. For both publics and privates, the transfer enrollment rates are most sensitive to the level of attrition for the more selective

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[27] In all of the analyses examining transfer enrollment rates, the results for all financial resource variables are very similar whether the variable used is revenues per students, total revenues, or total revenues with enrollment levels entered separately.

institutions. In addition, an increased number of majors is only associated with higher transfer enrollment rates for more selective privates.

While the results indicate strategic enrollment behavior by more selective institutions, they also suggest that some institutions may not be reaping the full benefit of transfer students. The lack of an association between the number of majors and transfer student share for most groups may indicate that institutions are not utilizing the ability of transfers to diminish restrictions on their capacity to offer a curriculum of a wide breadth. Furthermore, the lack of a relationship between attrition rates and transfer enrollment rates for publics for much of the period suggests that improved planning by state higher education systems could lead to productivity increases. Definitive claims about possible productivity increases, however, cannot be confidently made without examination of more detailed and precisely measured data on individual institutions or state systems of higher education. Hopefully, future research will address this fact and develop a deeper understanding of institutional behavior.

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Table 1: Mean Transfer Enrollment Rate
by Barron's Selectivity Ranking

		Private Institutions						Public Institutions			
	n	84-97	84-86	87-90	91-94	95-97	n	84-97	84-86	87-90	91-94	95-97
Non Comp.	3	0.441	0.463	0.411	0.451	0.444	35	0.294	0.287	0.284	0.299	0.310
		(0.137)	(0.158)	(0.088)	(0.164)	(0.156)		(0.092)	(0.105)	(0.091)	(0.098)	(0.096)
Less Comp.	60	0.282	0.288	0.269	0.287	0.278	122	0.337	0.318	0.322	0.359	0.343
		(0.159)	(0.190)	(0.169)	(0.149)	(0.163)		(0.123)	(0.125)	(0.130)	(0.135)	(0.128)
Comp.	191	0.282	0.292	0.280	0.289	0.271	186	0.398	0.395	0.381	0.416	0.401
		(0.146)	(0.149)	(0.152)	(0.158)	(0.154)		(0.137)	(0.153)	(0.142)	(0.142)	(0.139)
Very Comp.	91	0.189	0.205	0.190	0.192	0.169	48	0.340	0.342	0.335	0.352	0.328
		(0.123)	(0.129)	(0.125)	(0.129)	(0.118)		(0.139)	(0.146)	(0.152)	(0.136)	(0.134)
Highly Comp.	41	0.126	0.147	0.130	0.127	0.099	11	0.218	0.208	0.221	0.222	0.222
		(0.102)	(0.140)	(0.104)	(0.098)	(0.073)		(0.078)	(0.068)	(0.078)	(0.092)	(0.091)
Most Comp.	28	0.072	0.077	0.074	0.072	0.063	2	0.142	0.157	0.132	0.138	0.143
		(0.040)	(0.047)	(0.037)	(0.043)	(0.040)		(0.044)	(0.069)	(0.050)	(0.023)	(0.040)
Total	414	0.226	0.238	0.224	0.230	0.213	404	0.359	0.353	0.346	0.375	0.360
		(0.152)	(0.162)	(0.155)	(0.158)	(0.155)		(0.137)	(0.148)	(0.142)	(0.143)	(0.139)

Notes: The transfer enrollment rate is measured by transfer enrollment / (transfer enrollment + first-time freshman enrollment).

Data are weighted by the total undergraduate enrollment. Standard deviations are in parenthesis.

**Table 2: Mean Transfer and Freshman Enrollment
by Barron's Selectivity Ranking**

	n	Transfer Enrollment					Freshman Enrollment				
		84-97	84-86	87-90	91-94	95-97	84-97	84-86	87-90	91-94	95-97
Private											
Non Competitive	3	493	455	494	501	514	631	544	715	613	636
Less Competitive	60	229	254	225	213	216	587	623	637	531	562
Competitive	191	217	225	215	225	204	549	545	550	539	558
Very Competitive	91	151	165	153	150	134	649	650	658	629	665
Highly Competitive	41	110	128	112	112	88	765	747	748	770	801
Most Competitive	28	82	86	82	83	74	1051	1016	1031	1066	1089
Total	414	186	199	186	188	172	632	631	640	617	643
Public											
Non Competitive	35	493	474	474	512	516	1200	1147	1193	1233	1192
Less Competitive	122	643	596	644	686	625	1274	1306	1332	1243	1216
Competitive	186	1074	1141	1046	1069	1049	1625	1699	1716	1510	1589
Very Competitive	48	1287	1284	1265	1293	1302	2499	2513	2547	2347	2622
Highly Competitive	11	832	807	827	836	865	2984	3028	2912	2951	3091
Most Competitive	2	329	369	293	316	354	1963	1907	1903	1957	2107
Total	404	908	922	892	922	896	1625	1667	1687	1546	1608

Table 3: Mean Transfer and Freshman Applicants
by Barron's Selectivity Ranking

	n	Transfer Applicants				Freshman Applicants			
		87-97	87-90	91-94	95-97	87-97	87-90	91-94	95-97
Private									
Non Competitive	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Less Competitive	33	458	440	449	491	1,901	1,990	1,751	1,953
Competitive	152	468	440	489	471	1,924	1,824	1,869	2,095
Very Competitive	78	359	358	369	342	2,901	2,845	2,766	3,116
Highly Competitive	41	366	343	380	381	4,314	3,970	4,116	5,017
Most Competitive	26	532	549	542	498	7,957	7,622	7,666	8,841
Total	330	434	417	447	433	2,925	2,805	2,805	3,216
Public									
Non Competitive	6	678	534	699	766	2,008	1,899	2,004	2,169
Less Competitive	73	1,229	1,225	1,281	1,156	3,172	3,241	3,142	3,179
Competitive	141	2,161	2,074	2,277	2,108	5,298	5,461	5,067	5,363
Very Competitive	42	3,234	3,148	3,396	3,144	9,665	9,627	9,315	10,208
Highly Competitive	11	3,018	2,883	3,043	3,083	14,522	13,690	14,203	15,756
Most Competitive	2	1,482	1,508	1,622	1,261	11,800	12,105	11,705	11,522
Total	275	2,074	2,007	2,175	2,017	5,745	5,808	5,552	5,914

**Table 4: Mean Transfer and Freshman Acceptance Rate
by Barron's Selectivity Ranking**

	n	Transfer Acceptance Rate				Freshman Acceptance Rate			
		87-97	87-90	91-94	95-97	87-97	87-90	91-94	95-97
Private									
Non Competitive	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Less Competitive	33	0.727	0.751	0.742	0.687	0.766	0.715	0.788	0.794
Competitive	152	0.720	0.724	0.721	0.713	0.766	0.746	0.773	0.779
Very Competitive	78	0.638	0.620	0.652	0.643	0.711	0.674	0.739	0.723
Highly Competitive	41	0.479	0.478	0.493	0.456	0.587	0.568	0.623	0.566
Most Competitive	26	0.252	0.234	0.259	0.260	0.322	0.314	0.340	0.306
Total	330	0.618	0.616	0.626	0.610	0.680	0.655	0.698	0.687
Public									
Non Competitive	6	0.862	0.933	0.839	0.819	0.889	0.941	0.903	0.836
Less Competitive	73	0.808	0.793	0.803	0.829	0.797	0.798	0.798	0.797
Competitive	141	0.735	0.723	0.728	0.758	0.732	0.715	0.734	0.750
Very Competitive	42	0.609	0.596	0.598	0.639	0.664	0.632	0.668	0.700
Highly Competitive	11	0.473	0.466	0.478	0.472	0.540	0.505	0.571	0.539
Most Competitive	2	0.351	0.289	0.322	0.472	0.347	0.306	0.357	0.389
Total	275	0.704	0.692	0.697	0.727	0.717	0.700	0.722	0.734

Notes: The acceptance rate is the number of accepted applicants divided by the number of applicants.

Table 5: Mean Transfer and Freshman Yield Rate
by Barron's Selectivity Ranking

	n	Transfer Yield Rate				Freshman Yield Rate			
		87-97	87-90	91-94	95-97	87-97	87-90	91-94	95-97
Private									
Non Competitive	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Less Competitive	33	0.435	0.463	0.436	0.402	0.618	0.656	0.609	0.585
Competitive	152	0.436	0.472	0.430	0.402	0.613	0.642	0.606	0.592
Very Competitive	78	0.346	0.375	0.337	0.324	0.562	0.602	0.546	0.534
Highly Competitive	41	0.339	0.371	0.327	0.312	0.575	0.629	0.561	0.525
Most Competitive	26	0.469	0.485	0.460	0.460	0.658	0.692	0.643	0.629
Total	330	0.407	0.438	0.400	0.379	0.602	0.638	0.591	0.574
Public									
Non Competitive	6	0.728	0.721	0.727	0.709	0.765	0.821	0.746	0.726
Less Competitive	73	0.564	0.586	0.555	0.548	0.690	0.680	0.693	0.692
Competitive	141	0.459	0.504	0.443	0.426	0.654	0.672	0.646	0.649
Very Competitive	42	0.446	0.470	0.438	0.424	0.648	0.663	0.635	0.639
Highly Competitive	11	0.424	0.464	0.406	0.403	0.677	0.696	0.658	0.696
Most Competitive	2	0.495	0.527	0.475	0.477	0.634	0.658	0.635	0.601
Total	275	0.478	0.513	0.465	0.452	0.662	0.674	0.655	0.659

Notes: The yield rate is the number of enrolled students divided by the number of accepted applicatns.

Table 6: Mean Transfer Enrollment Rate
by Carnegie Classifications

		Private Institutions					Public Institutions			
	n	84-97	84-86	87-90	91-94	95-97	n	84-97	84-86	87-90	91-94	95-97
Research	36	0.155	0.179	0.156	0.154	0.134	80	0.320	0.321	0.316	0.332	0.308
		(0.099)	(0.135)	(0.101)	(0.096)	(0.081)		(0.117)	(0.129)	(0.123)	(0.121)	(0.116)
Doctoral	36	0.259	0.263	0.252	0.268	0.252	56	0.396	0.391	0.378	0.414	0.399
		(0.125)	(0.129)	(0.123)	(0.132)	(0.138)		(0.162)	(0.172)	(0.173)	(0.163)	(0.154)
Comprehensive	151	0.296	0.307	0.293	0.304	0.276	221	0.381	0.368	0.361	0.400	0.393
		(0.164)	(0.170)	(0.171)	(0.173)	(0.169)		(0.135)	(0.147)	(0.139)	(0.142)	(0.138)
Liberal Arts I	98	0.095	0.101	0.097	0.096	0.083	6	0.320	0.285	0.315	0.342	0.332
		(0.066)	(0.070)	(0.066)	(0.069)	(0.067)		(0.137)	(0.109)	(0.135)	(0.152)	(0.163)
Liberal Arts II	93	0.267	0.272	0.263	0.268	0.269	41	0.351	0.335	0.345	0.362	0.364
		(0.150)	(0.163)	(0.156)	(0.153)	(0.159)		(0.153)	(0.171)	(0.168)	(0.164)	(0.136)
Total	414	0.226	0.238	0.224	0.230	0.213	404	0.359	0.353	0.346	0.375	0.360
		(0.152)	(0.162)	(0.155)	(0.158)	(0.155)		(0.137)	(0.148)	(0.142)	(0.143)	(0.139)

Notes: Data are weighted by the total undergraduate enrollment. Standard deviations are in parenthesis.

Table 7: Mean Transfer Enrollment Rate by Barron's Selectivity Rankings
For Each Carnegie Classification

	Research		Doctoral		Comprehensive		Lib. Arts I		Lib. Arts II	
	n	% trnsf	n	% trnsf.	n	% trnsf.	n	% trnsf.	n	% trnsf.
Private										
Non Competitive	0	n/a	0	n/a	1	0.251	0	n/a	2	0.476
Less Competitive	1	0.145	2	0.287	27	0.309	3	0.107	27	0.310
Competitive	4	0.249	19	0.293	103	0.312	16	0.107	49	0.260
Very Competitive	6	0.165	11	0.264	17	0.229	43	0.122	14	0.167
Highly Competitive	10	0.181	2	0.098	3	0.180	25	0.066	1	0.068
Most Competitive	15	0.079	2	0.052	0	n/a	11	0.045	0	n/a
Total	36	0.155	36	0.259	151	0.296	98	0.095	93	0.267
Public										
Non Competitive	0	n/a	4	0.338	20	0.286	0	n/a	11	0.245
Less Competitive	9	0.327	18	0.330	72	0.341	1	0.080	22	0.363
Competitive	34	0.359	21	0.437	121	0.411	2	0.275	8	0.456
Very Competitive	29	0.300	9	0.526	7	0.396	3	0.372	0	n/a
Highly Competitive	7	0.227	3	0.180	1	0.182	0	n/a	0	n/a
Most Competitive	1	0.163	1	0.096	0	n/a	0	n/a	0	n/a
Total	80	0.320	56	0.396	221	0.381	6	0.320	41	0.351

Notes: Data are weighted by the total undergraduate enrollment of the institutions.

Table 8: Summary Statistics

	All Institutions			1990 by Selectivity Level					
				Public			Private		
	1985	1990	1995	Less	Selective	More	Less	Selective	More
log (trnsf rate /	-1.132	-1.052	-1.106	-0.802	-0.521	-0.806	-1.096	-0.999	-2.061
(1 - trnsf rate))	(1.003)	(0.958)	(1.024)	(0.666)	(0.686)	(0.773)	(0.919)	(0.866)	(0.921)
% Freshmen Not	0.241	0.224	0.234	0.343	0.261	0.146	0.265	0.208	0.105
Returning	(0.122)	(0.117)	(0.111)	(0.100)	(0.083)	(0.065)	(0.105)	(0.088)	(0.065)
# Majors	40.2	40.2	40.2	41.0	51.3	62.7	26.7	30.7	34.6
	(18.7)	(18.7)	(18.7)	(17.9)	(19.0)	(24.2)	(10.7)	(9.6)	(11.0)
Log (Non-Tuition CFR	1.914	1.960	2.094	1.875	2.023	2.691	1.453	1.504	2.426
per Student)	(0.707)	(0.728)	(0.726)	(0.411)	(0.474)	(0.597)	(0.588)	(0.631)	(0.876)
Rural	0.258	0.258	0.258	0.432	0.308	0.197	0.159	0.137	0.231
	(0.438)	(0.438)	(0.438)	(0.497)	(0.463)	(0.401)	(0.368)	(0.344)	(0.423)
State 2-yr st /	0.664	0.712	0.748	0.525	0.812	0.912	0.679	0.748	0.673
4-yr st	(0.480)	(0.477)	(0.478)	(0.329)	(0.531)	(0.545)	(0.334)	(0.513)	(0.448)
% Freshmen in Campus	0.631	0.671	0.699	0.481	0.587	0.695	0.647	0.699	0.917
Housing	(0.312)	(0.307)	(0.294)	(0.305)	(0.313)	(0.301)	(0.279)	(0.271)	(0.148)
Tuition & Fee Level	5.054	6.554	8.223	1.861	2.101	2.435	7.844	9.766	13.735
(in 1000s)	(3.934)	(5.241)	(6.586)	(0.558)	(0.721)	(0.946)	(1.982)	(2.697)	(3.669)
% Applicants	0.712	0.718	0.734	0.824	0.702	0.612	0.770	0.771	0.626
Accepted	(0.170)	(0.159)	(0.155)	(0.123)	(0.127)	(0.137)	(0.151)	(0.106)	(0.190)

Table 8: (continued).

	All Institutions			1990 by Selectivity Level					
				Public			Private		
	1985	1990	1995	Less	Selective	More	Less	Selective	More
State % Minority Trnsf.	1.040	0.860	0.976	0.901	0.858	0.840	0.839	0.846	0.852
/ % Min. Direct Attend.	(0.196)	(0.111)	(0.127)	(0.147)	(0.101)	(0.082)	(0.082)	(0.109)	(0.094)
% Minority Freshmen	0.155	0.193	0.221	0.243	0.191	0.235	0.289	0.144	0.152
	(0.204)	(0.211)	(0.226)	(0.284)	(0.204)	(0.154)	(0.314)	(0.161)	(0.111)
Number of Obs.	800	800	800	155	182	61	63	183	156

Notes: Standard Deviations are in parenthesis. Tuition and revenue variables are in 1996 dollars. Less
Selective indicates a ranking of non or less competitive, Selective indicates a ranking of competitive, and
Most Selective indicates a ranking of very competitive, more competitive, and most competitive.

**Table 9: Determinants of the Transfer
Enrollment Rate, Logistic Model**

Explanatory Variables	1985	1990	1995
% Freshmen Not Returning	0.987	0.870	1.177
	(0.284)	(0.295)	(0.322)
# Majors	0.001	-0.001	-0.001
	(0.002)	(0.002)	(0.002)
Log (Non-Tuition CFR per Student)	-0.275	-0.346	-0.338
	(0.052)	(0.050)	(0.050)
Rural	-0.037	-0.042	-0.108
	(0.060)	(0.058)	(0.055)
State 2-yr st / 4-yr st.	0.484	0.452	0.527
	(0.051)	(0.048)	(0.047)
% Freshmen in Campus Housing	-0.804	-0.747	-0.818
	(0.105)	(0.101)	(0.103)
Tuition & Fee Level (in 1000s)	-0.059	-0.045	-0.031
	(0.016)	(0.012)	(0.007)
% Applicants Accepted	0.864	0.570	0.554
	(0.185)	(0.180)	(0.176)
Less Selective Private	-0.016	-0.064	-0.008
	(0.120)	(0.115)	(0.110)
Selective Private	0.117	0.140	0.215
	(0.090)	(0.086)	(0.082)
Less Selective Public	-0.167	-0.101	0.038
	(0.153)	(0.149)	(0.128)
Selective Public	0.235	0.263	0.446
	(0.150)	(0.146)	(0.120)
Very Selective Public	0.232	0.255	0.481
	(0.170)	(0.166)	(0.133)
Doctoral University	-0.081	-0.201	-0.054
	(0.113)	(0.107)	(0.104)
Comprehensive University	-0.239	-0.335	-0.299
	(0.115)	(0.111)	(0.108)

Table 9 (continued).

Explanatory Variables	1985	1990	1995
Liberal Arts I	-0.626	-0.689	-0.784
	(0.126)	(0.121)	(0.117)
Liberal Arts II	-0.374	-0.520	-0.337
	(0.136)	(0.130)	(0.126)
Intercept	-0.805	-0.180	-0.470
	(0.297)	(0.290)	(0.275)
R^2	0.5945	0.5939	0.6633
n	800	800	800

Notes: All regressions also include three dummy variables for
missing data for % freshmen not returning, % freshmen in
campus housing, and % applicants accepted. Coefficients
and standard errors (in parenthesis) are reported.

Table 10: Determinants of the Transfer Enrollment Rate for each
Selectivity Group for Public Institutions, Logistic Model

Explanatory Variables	Less Selective			Selective			More Selective		
	1985	1990	1995	1985	1990	1995	1985	1990	1995
% Freshmen Not	-0.274	0.374	0.832	0.098	-0.307	1.119	1.362	1.988	4.689
Returning	(0.478)	(0.547)	(0.644)	(0.543)	(0.551)	(0.532)	(1.248)	(1.632)	(1.272)
# Majors	0.002	0.005	0.000	-0.003	-0.004	-0.001	-0.003	-0.001	-0.001
	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Log (Non-Tuition CFR	-0.417	-0.332	-0.249	-0.171	-0.185	-0.293	-0.232	-0.069	-0.121
per Student)	(0.112)	(0.140)	(0.143)	(0.118)	(0.096)	(0.098)	(0.161)	(0.165)	(0.137)
State 2-yr st /	0.632	0.498	0.754	0.648	0.583	0.614	0.010	-0.107	0.213
4-yr st	(0.151)	(0.160)	(0.145)	(0.095)	(0.082)	(0.078)	(0.157)	(0.162)	(0.121)
% Freshmen in Campus	-0.332	-0.357	-0.211	-0.887	-0.940	-0.786	-1.143	-1.590	-1.268
Housing	(0.193)	(0.206)	(0.202)	(0.173)	(0.165)	(0.153)	(0.400)	(0.402)	(0.295)
Tuition & Fee Level	-0.068	-0.283	-0.093	-0.120	-0.034	0.042	-0.295	-0.268	-0.103
(in 1000s)	(0.099)	(0.093)	(0.062)	(0.094)	(0.066)	(0.046)	(0.114)	(0.078)	(0.054)
% Applicants	0.443	0.250	0.261	-0.112	0.237	-0.305	0.073	-0.020	-1.203
Accepted	(0.457)	(0.512)	(0.449)	(0.391)	(0.352)	(0.377)	(0.469)	(0.600)	(0.561)
Intercept	-0.356	-0.162	-0.679	0.461	0.319	0.179	1.183	1.093	0.868
	(0.631)	(0.722)	(0.690)	(0.507)	(0.472)	(0.499)	(0.716)	(0.670)	(0.641)
R^2	0.2910	0.3162	0.2658	0.4919	0.5173	0.5349	0.6607	0.6942	0.6873
n	155	155	155	182	182	182	61	61	61

Notes: All regressions also include a rural dummy, comprehensive and liberal arts dummy variables, and three dummies for missing data for

% freshmen not returning, % freshmen in campus housing, and % applicants accepted. Coefficients and standard errors (in parenthesis) are reported.

Table 11: Determinants of the Transfer Enrollment Rate for each
Selectivity Group for Private Institutions, Logistic Model

	Less Selective			Selective			More Selective		
Explanatory Variables	1985	1990	1995	1985	1990	1995	1985	1990	1995
% Freshmen Not	3.159	1.808	0.959	1.239	1.362	1.363	4.330	3.459	3.818
Returning	(1.062)	(1.152)	(1.371)	(0.596)	(0.578)	(0.675)	(0.962)	(1.165)	(1.158)
# Majors	0.004	0.000	-0.007	0.000	-0.010	-0.007	0.010	0.009	0.014
	(0.012)	(0.013)	(0.014)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Log (Non-Tuition CFR	-0.817	-0.998	-0.691	-0.035	-0.060	-0.192	-0.029	-0.234	-0.184
per Student)	(0.234)	(0.252)	(0.273)	(0.107)	(0.096)	(0.108)	(0.096)	(0.096)	(0.089)
State 2-yr st /	0.765	0.693	0.642	0.449	0.423	0.546	0.238	0.140	0.292
4-yr st	(0.291)	(0.301)	(0.359)	(0.096)	(0.091)	(0.095)	(0.131)	(0.126)	(0.116)
% Freshmen in Campus	-0.796	-0.155	-0.249	-1.271	-1.088	-1.591	-1.450	-1.307	-1.203
Housing	(0.493)	(0.529)	(0.623)	(0.246)	(0.220)	(0.252)	(0.407)	(0.437)	(0.449)
Tuition & Fee Level	0.155	0.049	-0.010	-0.056	-0.053	-0.045	-0.029	-0.022	-0.045
(in 1000s)	(0.065)	(0.063)	(0.013)	(0.028)	(0.021)	(0.018)	(0.028)	(0.020)	(0.017)
% Applicants	-0.791	-0.362	0.194	1.639	1.237	1.052	1.683	1.036	0.997
Accepted	(0.963)	(0.883)	(0.967)	(0.513)	(0.458)	(0.457)	(0.373)	(0.373)	(0.360)
Intercept	-2.312	-1.072	-0.407	-1.558	-0.716	-0.106	-2.451	-1.153	-1.388
	(1.138)	(1.073)	(1.309)	(0.525)	(0.518)	(0.503)	(0.578)	(0.596)	(0.640)
R^2	0.5784	0.498	0.4240	0.4857	0.5487	0.6006	0.6224	0.5512	0.6250
n	63	63	63	183	183	183	156	156	156

Notes: All regressions also include a rural dummy, comprehensive and liberal arts dummy variables, and three dummies for missing data for
% freshmen not returning, % freshmen in campus housing, and % applicants accepted. Coefficients and standard errors (in parenthesis) are reported.

**Table 12: The Effect of Race Variables on the
Transfer Enrollment Rate, Logistic Model**

Explanatory Variables	1985	1990	1995
% Minority Freshmen	-2.130	-1.456	-0.179
	(0.822)	(1.059)	(1.496)
St. % Minority Transfers /	-0.356	-0.207	0.101
% Min. Direct Attend.	(0.148)	(0.246)	(0.224)
Interaction Term	1.846	1.219	0.077
	(0.818)	(1.216)	(1.538)
R^2	0.6007	0.6007	0.6639
n	800	800	800

Notes: All regressions included all variables used in Table 9. Standard Errors
are in parenthesis. The interaction term equals the first two variables multiplied
by each other. Coefficients and standard errors (in parenthesis) are reported.

Table 13: The Effect of Attrition Interacted with other Explanatory Variables on the Transfer Enrollment Rate, Logistic Model

Explanatory Variables	(1)			(2)		
	1985	1990	1995	1985	1990	1995
% Freshmen Not Returning	1.056	0.302	0.565	-0.134	-0.454	-1.658
	(0.501)	(0.520)	(0.528)	(0.411)	(0.440)	(0.536)
# Majors	0.001	-0.005	-0.006			
	(0.003)	(0.003)	(0.003)			
% Freshmen in Campus Housing				-1.391	-1.403	-2.133
				(0.192)	(0.190)	(0.227)
Interaction Term	-0.002	0.016	0.018	2.287	2.579	4.771
	(0.011)	(0.012)	(0.012)	(0.623)	(0.639)	(0.739)
R^2	0.5945	0.5948	0.6642	0.6023	0.6023	0.6817
N	800	800	800	800	800	800

Notes: All regressions included all variables used in Table 9. Standard errors are in parenthesis.
The interaction term equals the two variables reported in that column multiplied together.
Coefficients and standard errors (in parenthesis) are reported.

**Table 14: Determinants of the Transfer
Enrollment Rate, Fixed Effects Model**

Explanatory Variables	Transfer Rate – Logistic Model		Log (New Students)	
	Public	Private	Public	Private
% Freshmen Not Returning	0.078	0.726	-0.135	-0.033
	(0.182)	(0.295)	(0.102)	(0.146)
Log (Non-Tuition CFR per student)	-0.172	-0.049	-0.364	-0.174
	(0.078)	(0.074)	(0.044)	(0.037)
State 2-yr st / 4-yr st.	-0.217	0.066	0.155	0.204
	(0.179)	(0.254)	(0.101)	(0.126)
% Freshmen in Campus Housing	-0.080	-0.381	0.010	0.005
	(0.107)	(0.187)	(0.060)	(0.092)
Tuition & Fee Level (in 1000s)	0.035	-0.007	-0.044	-0.002
	(0.032)	(0.007)	(0.018)	(0.004)
% Applicants Accepted	-0.156	0.162	-0.022	-0.074
	(0.141)	(0.189)	(0.079)	(0.093)
Intercept	-0.165	-1.385	8.336	6.735
	(0.231)	(0.288)	(0.130)	(0.143)
n	800	800	800	800

Notes: All regressions also include year dummy variables and three dummy variables
for missing data for % freshmen not returning, % freshmen in campus housing, and
% applicants accepted. Coefficients and standard errors (in parenthesis) are reported.