

The Importance of Aid and Institutional Expenditures for the Matriculation Decision of High-Ability Students

Amanda L. Griffith*
Wake Forest University
Department of Economics
Box 7505
Winston-Salem, NC 27109

Kevin N. Rask
Colorado College
Department of Economics and Business
14 E Cache La Poudre St
Colorado Springs, CO 80903

Abstract:

As the demand for the most talented students has increased, selective colleges and universities have been engaged in an arms race of non-educational amenities over the past decade. The recent economic downturn has also shifted the focus to the fast-rising cost of higher education. We use data on the matriculation decisions of high-ability students from 2007 to 2010 to estimate the influence of non-academic amenities, academic characteristics, cost, and reputation on school choice. Descriptive analysis shows that prospective students report an increasing concern with cost over the sample period; however, the importance they put on amenities has remained relatively high over the whole time period. The econometric results suggest that full-pay students have become significantly more sensitive to cost and less sensitive to both educational and non-educational amenities over time. In general they have been changing their preferences during the economic downturn more than aided students. The higher-education arms race has become less effective at attracting high-ability students who are now focusing more on costs than ever before.

Keywords: school choice, financial aid, educational expenditures

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* Contact Author – Phone: (336) 758-4523; Email: Griffial@wfu.edu

I. Introduction

Each year many parents spend thousands of dollars on college prep to ensure that their child gets into the best college possible. At the same time many colleges are spending thousands of dollars per student to recruit the best possible class. When students choose which college to attend, they are making an investment decision that has consequences for their own future, as well as for the futures of the colleges themselves. Fully understanding this process, and how it is impacted by the changing economic environment is essential.

In recent decades colleges and universities have become more and more competitive as students have searched more nationally for higher education, resulting in an escalation of spending on increasing educational quality, amenities, and financial aid (Hoxby, 2009; Frank 2012). This has led to an arms race of sorts; the only way to attract and capture the best students is to hire one more Nobel Laureate, or to build that new dormitory with the gym and smoothie bar inside (Frank, 2012). To attract top students, one can offer merit aid to lure them away from a competitor (Griffith, 2011). All of these improvements and new amenities bring with them an increase in the cost of educating each student.

On the heels of this arms race, the U.S. has suffered a serious economic downturn that has turned the focus of families, politicians, and policymakers to the rising cost of higher education. The severity of the financial crisis has meant that it is not only the lower-income students that are primarily concerned with cost, but rather that middle and higher-income students are also more concerned than ever about rising costs. (Simon & Barry, 2012). Has this economic shift changed the way that students choose colleges? Is a continued arms race still the way to attract top students? (Supiano, 2008).

This paper will build upon the substantial college choice literature with a unique data set that allows us to answer many important questions. What factors are important in students' college choice decision? It is necessary that we understand how the importance of these factors changed over time, particularly during the most recent economic downturn. How important are different types of aid (grant, loan, job) in relation to non-academic amenities? Are students rational in their decision-making? Importantly, the results of this study help us understand the

trends in the higher education market, and what colleges and universities should be concerned with.

II. Background

A significant literature on college choice has developed in recent years, identifying many important factors in the decision of where to attend college. Financial factors can play a large role in students' decisions. Long (2004) using national data from the early 70's, 80's and 90's found that college costs have a significant impact on students' decisions of where to enroll, but that the effect was decreasing over the time period studied. Avery and Hoxby (2004) using more recent survey data found that increases in grants, work study, and loans, had a significant positive impact on whether a student enrolled at a college, while increased tuition and room and board had the opposite impact. There was also some evidence that high-income students responded less strongly to grant aid than their lower-income counterparts. Other studies like Ehrenberg and Sherman (1984) and Singell and Stone (2002) have used institutional data to examine this question and, similarly, have found that increased aid, both merit and need-based, increases the probability of enrolling at the institution in question.

Studies examining the importance of distance from a student's home to an institution in their choice set, another measure of cost or convenience, have found little evidence of an effect. Its importance appears to have declined over time, with more recent studies finding no significant impact at all (Hoxby, 2009; Long, 2004; Griffith & Rask, 2007).

Although important, cost and aid are only one part of the picture. Other studies have examined the importance of institutional quality and reputation, finding strong evidence that both matter. Quality measures, such as educational expenditures and student to faculty ratio, have been found to have a significant impact, and perhaps play an even stronger role in impacting enrollment decisions than financial concerns, particularly for higher ability and higher-income students (Spies, 1973; Spies, 1978; Weiler, 1996; Avery & Hoxby, 2004; McDuff, 2007). Reputation itself can play a large role, above and beyond traditional quality measures (Weiler, 1996). Griffith and Rask (2007) found that holding quality constant, students were significantly more likely to enroll at an institution as their US News and World Report ranking improves, and that higher income students were much more responsive to these reputation improvements.

Non-academic considerations have also been found to be significant in the enrollment process. Weiler (1996), used data from the College Board's Admitted Student Questionnaire Plus, and found that students took into account college characteristics such as housing and availability of social activities and recreational facilities when choosing where to enroll. Sports programs can also benefit admissions; Pope and Pope (2008, 2009) documented an increase in applications following school sports success. In a 2011 study, Jacob, McCall, and Stange, focused on the trade-off between more typical educational expenditures such as on instruction, and non-academic amenities like housing and student activities. Their results showed that students were more responsive in their enrollment decisions to increases in spending in these non-academic categories than the academic ones, but that the strength of these differences depended somewhat on students' backgrounds.

Overall, the literature has identified many factors that significantly impact students' choices of where to go to college. These studies also have provided evidence that perhaps the arms race for better amenities and lower costs that so many colleges find themselves engaged in may be a successful strategy. However, none of the aforementioned studies have covered the most recent financial crisis and its impact on college-choice behavior. Anecdotal evidence suggests that college-going students may be shifting their behavior in response to the economic downturn. This paper builds upon the significant literature with a current and unique data set that allows us to examine these questions. In addition to focusing on a more recent time period, the data used in this paper are unique in that they contain all of the above mentioned characteristics, studied separately by other researchers, in one dataset. This allows us to simultaneously examine the importance of cost, aid, reputation, academic quality, non-academic measures, and student opinions of these measures.

III. Data & Methods

The data used in this paper are from College A's Admitted Student Questionnaire (ASQ) for cohorts entering in the fall of 2007 through the fall of 2010. College A is a highly selective liberal arts college. Within each cohort, at least 50% of admitted students complete this

questionnaire (~1200-1500 per year).¹ The survey asks students to report up to three colleges at the top of their choice set to which they were admitted, and which school they will attend that coming fall. For each college listed, students are asked to report whether they received need-based grant aid, non-need based grant aid, work-study aid, or a loan, and if so the dollar amount for each. Students are also asked how important a number of college characteristics such as reputation, academic facilities, availability of majors, recreational facilities, etc., are in their enrollment decision. Additionally, students report subjective ratings of each school listed in their choice set for all of these categories.

Demographics such as gender and race/ethnicity are collected in the survey. Other individual characteristics, including SAT scores, and family income, are obtained from institutional records and merged to the survey data. College characteristics, including location, institutional expenditures by type, and student to faculty ratio are obtained from the *Integrated Post-Secondary Data System (IPEDS)*, and merged into the survey data as well. The student's home address and the location of each college in the choice set are used to calculate the distance from home. Last, the US News and World Report (USNWR) rankings from the fall of the previous year (the most current issue when they are choosing where to enroll) are used to measure reputation.

These data address some of the problems encountered in past studies. Students are asked for the top three colleges in their choice set, therefore the choice set does not need to be modeled as by Jacob, McCall and Stange (2011). Although students only report their top two or three choices, if these dominate all other choices in the set of schools to which they were accepted, the results should be unbiased.² This means that our results will be determined by differences in enrollment choices, not by differences in admissions. We also have access to many consecutive, recent years of student choice data. This allows us to capture differences across time and also limits the possibility of omitted variables bias.

We split our data into two sub-samples determined by financial aid status. This is because we cannot estimate the effect of the financial aid variables for the students not receiving

¹ Although the responses are weighted towards those choosing to attend College A, a significant portion of responders indicate that they will be attending a different institution. Of these students, the types and qualities of the alternate institution differ substantially. Therefore, we do not feel that these data will bias our results.

² See Avery and Hoxby (2004) for a detailed discussion of this point.

any aid offers. Therefore, we define aided students as those that received any kind of need-based aid (this excludes merit aid awards) from any of the colleges listed in their choice set. All other students are considered full-pay, although they may receive a non-need based award that reduces their cost below full price.

Descriptive statistics for the students and colleges captured in our sample are displayed by aid status in Table 1. Both the aided and full-pay samples lean more heavily toward female students (55% in the full-pay, 62% in the aided sample) but this is roughly equivalent to the full admitted sample; female students make up roughly 55% of the admitted student group in each year, with this percentage increasing over time. The students in this data set are of high-ability, with average total verbal and math SAT scores of roughly 1400. Therefore, the results of this paper are most applicable to high-ability students and the institutions to which they apply. However, the trends identified in the results may be indicative of general trends for the college-going population overall. Unsurprisingly, the aided sample has a higher representation of minority students (Black or Hispanic).

The aid packages reported by the students in the sample vary quite a bit. On average, aided students received a need-based grant of roughly \$10,000, a loan package equaling \$1,700, and work-study compensation for roughly \$675. Merit aid amounts varied substantially for both sub-samples. Of the needy students in the dataset, 27% received what they reported as a non-need based award, which was on average \$16,000. Fewer full-pay students reported receiving a merit award, but of those that did, the average size was slightly smaller at \$15,000.

The colleges and universities that appear in the choice sets of the aided and full-pay sub-samples overlap quite a bit, but vary substantially by type and characteristics. The second panel of Table 1 displays the top 20 most frequently observed institutions in the aided and full-pay samples separately. Unsurprisingly, College A is the most frequent, as it appears in almost all students' choice sets. Below this, there is significant variation between the two sub-samples. Both contain institutions from different regions of the country, with the full-pay sample frequently listing southern colleges in addition to northeastern and Midwestern. Although not in the top 20, several west-coast institutions appear frequently in both samples, such as UC Berkeley and the University of Southern California. There is also a good mix of public, private, university and liberal arts institutions in both sub-samples. Therefore, although College A is

over-sampled, the dataset represents a good slice of elite colleges and universities across the United States.

In Table 2 the descriptive statistics for the ratings given by students regarding how important various college attributes and amenities were in their college enrollment choice are shown. The ratings were given on a 1-3 point scale where 3 is “very important” and 1 is “not important.” Measures representing academic quality and reputation have the highest average rating, close to 3. Interestingly, the importance of cost is rated fairly low, with a mean of 1.86 by the students matriculating in the fall of 2007, higher than only the importance of a strong Greek life. However this rating increases steadily and significantly in 2008 and 2009, staying firm at a much higher level in 2010. When the sample is broken down by aid status, cost appears to matter more to the aided students in all years, but the significant increase is driven by the responses of the full-pay students. Therefore, over this time period, higher income students are reporting a much stronger influence of the cost of higher education on their choice of where to enroll.

However, while the importance of cost has increased over time, there has not been a corresponding decrease in the importance of any amenities. The only small decrease in importance pertains to the surroundings of the college, which may not be an aspect under the control of the institution. These descriptive statistics tell us two important things. First, full-pay students are responding more to cost and may be considering cost in a much more significant way when choosing colleges than in the past. And second, students still appear to be demanding, at least by self-report, all of the expensive academic investments and non-academic amenities which make it difficult for colleges to both offer these amenities and keep costs down. An empirical analysis will reveal both whether students are actually acting on these reported preferences, and the relative importance of each in the enrollment process.

Empirical Model

To empirically model college choice we use a model where characteristics of both the school and the student have an impact on the observed school choice. We assume that students have J schools to which they were admitted and can choose from. Students receive utility from both school specific and match specific characteristics, as shown in Equation (1).

$$(1) U_{ij} = \alpha X_j + \beta Z_{ij} + \varepsilon_{ij}$$

Student i attends the school j that maximizes her utility. The vector X contains the school specific characteristics such as student to faculty ratio, educational expenditures and USNWR ranking. Other characteristics that are specific to each student at each institution, such as financial aid, distance from home, and any interactions of student characteristics and school characteristics are found in Z , and their influence on the choice made is captured by the β s. If we assume that the random errors in (1) are independent and identically distributed across individuals and schools with the extreme value distribution, the conditional logit model can be used to model the choice decision, as shown in equation (2).

$$(2) \text{Pr}(\text{Choice}_{ij}=1) = \frac{\exp(\alpha X_j + \beta Z_{ij})}{\sum_{k=1}^J \exp(\alpha X_k + \beta Z_{ik})}$$

As a note, individual characteristics do not enter this equation on their own, as the coefficients are identified by variation within each student's choice set, and individual characteristics do not vary on this level. However, any heterogeneity in the effect of school-specific characteristics for students of different characteristics can be captured with interaction terms contained in the Z vector.

IV. Results

Odds ratios from conditional logit estimations for observed college choice are displayed in Table 3. Columns (1) and (2) provide baseline estimates very similar to those seen in the recent literature, broken down by aid status. An improved student to faculty ratio is associated with a higher probability of matriculating at a school, although this is not significant for the full-pay sample. Increasing expenditures per student has a large positive impact on matriculation probabilities, especially for full-pay students. As seen in the literature, an improvement in the USNWR rank has a positive impact on the probability of choosing that college for both sub-samples, although this effect starts to dwindle as we get outside of the top ranked schools. Full-pay students have a stronger response to the ranking, with a 6.3% increase in their prior probability of matriculating for a one point change in the rank, as compared to a 3.4% change for aided students. Within the aided sample, there is a gender difference in the response to ranking;

similar to the recent literature, women respond less to a change in ranking than do men. However, there is no impact of race with respect to a change in ranking.

The effect of college costs also appear to mimic that of the recent literature. In the baseline estimates we have not included a measure of the amount of financial aid received by each student from each institution in their choice set. Instead, we have included a set of dummy variables that capture whether the financial aid package consisted of grants only (need or non-need based in nature), grants plus job and/or loan, or job and/or loan only. The omitted category is no aid offer at that school at all. For full-pay students, there is only a merit aid indicator for whether they received any form of non-need based grant aid. To capture the differences in net cost, we have calculated the expected family contribution using the federal methodology. For full-pay students this is the full tuition, fees, room and board, and expected cost of books. For aided students this is that total amount minus any amount of need that is deemed necessary to meet. Similar to the literature, net cost does not appear to have a significant impact on the probability of matriculating. However, all types of financial aid have a positive impact on the probability of choosing a college for the aided students. Similar to Griffith and Rask (2007), non-need based aid does not have a significant impact on matriculation probabilities for full-pay students.

Columns (3) and (4) separate the institutional expenditures into the relevant categories for prospective students. For both aided and full-pay students, an increase in spending on instruction has a negative impact on matriculation probabilities. However, an increase in spending on research has a strong positive impact for both sub-samples. Similarly, an increase in auxiliary spending, such as on dormitories, cafeterias, and possibly athletic facilities, has a strong positive impact on the probability of choosing a school. Only aided students respond to an increase in spending on academic support, which may reflect an increase in spending on offices related to recruitment or financial aid. Surprisingly, an increase in spending on student services has no significant impact on matriculation probabilities. These results suggest that although institutions appear to be greatly increasing their spending on non-academic amenities, as would be reflected by increases in student service spending, these increases do not necessarily increase the institutions' yields of high-ability students as seen here. However, as spending on research has a

large impact, perhaps investing in high-profile faculty members that result in a high-profile research agenda could have a positive payoff in terms of student yield.

The importance of these measures does appear to be changing over the time period sampled (2007-2010), as can be seen from the results in columns (5) and (6). The effect of a low student/faculty ratio has declined over time for both aided and full-pay students. The large negative impact of instructional spending appears to be reversing in both samples as well. In contrast, the strong positive impact of research spending remains robust across the years in the sample. Full-pay students appear to be adjusting their preferences more than aided students during this time period. The impact of increased academic support spending is becoming less important over time for full-pay students, as has the effect of auxiliary spending. These results support the hypothesis that the arms race involving non-academic amenities may no longer be as effective in attracting high-ability, high-income students. We saw this descriptively; the full-pay students are reporting a stronger importance of cost in their college choice decision. The results in column (6) provide suggestive evidence that full-pay students are also acting on this concern, as the effect of college cost appears to be getting stronger over time for full-pay students, although this trend is not significant.

In columns (7) and (8) of Table 3, the aid type dummies are replaced with the actual amounts of each type of aid received. For needy students, a \$1000 increase in need-based grant increases the prior probability of matriculating by roughly 9%. The same increase in merit aid has a similar but slightly larger impact of roughly 11% increase in probability of choosing that college. Although an increase in work-study funds does not significantly affect the choice of college, an increase of \$1000 in loan money has a large impact on matriculation, with a 19% increase. These results are similar to those found in studies by Avery and Hoxby (2004), and Singell and Stone (2002). Although merit aid has a strong impact on the college chosen by aided students, it does not have a significant impact on the choices of full-pay students, similar to results found in Griffith and Rask (2007).

These results indicate that although many of the same factors are still important to students when they are picking a college, the weighting of different factors, educational, financial and non-educational, has been changing. However, the descriptive results showed that while full-pay students were becoming more concerned with the cost of attendance, there was

not a general decline in the reported importance of any other amenities, despite the observed difference in reaction to these amenities. It may be the case that students are reporting that dormitories are very important to them when they choose a college, but when the time comes to make a decision, this factor doesn't play as large of a role as stated. For example, students that respond with 'very important' to the question of whether personal attention is important in their college choice should also be much more likely to choose a college with a low student to faculty ratio. To test whether students are rational in their response to college characteristics we have interacted a dummy variable for whether a student reported a particular amenity as 'very important' to their decision, with the objective measure for that amenity at the college itself. These results are shown in Table 4 for the aided and full-pay samples separately. Some of the reported preferences match with what we observe in the data, but many do not. Students that reported a desire for personal attention are significantly more likely to attend an institution with lower student to faculty ratios. However, interactions between preferences for non-educational amenities like housing and recreational facilities, and the objective measure of spending on these auxiliaries are not significant. Similarly, students who put a lot of weight on the availability of extracurricular opportunities do not respond more to an increase in spending on student services. So although both aided and full-pay students claim to be looking at these amenities in their decisions, they don't appear to be doing so any more than students that do not report a preference for them.

What students do appear to be rational about is their preference for a good academic reputation and a lower cost. Students that find reputation to be very important respond more to changes in USNWR ranking and also to increased spending on research. Additionally, aided students in this category respond less to an improvement in the student to faculty ratio than students who care less about reputation. All students who reported that the cost of attendance played an important role in their choice of college are more sensitive to net cost, including full-pay students.

So why the gap between what students are saying is important in their choice of college and what we actually observe as being important? Students could be mis-representing their preferences, or they may not fully understand what was important in their choice. It might also be the case that students are unaware of the actual objective measures of these amenities.

Therefore, students might think that a particular school has a high level of personal attention due to their limited experience with the college up to that point, when in fact they have a relatively high student to faculty ratio. To examine this further, we estimated a model including both objective and subjective measures of the relevant amenities. The objective measures are as before, spending by category, student to faculty ratio, rank, and cost. The subjective measures are the reported ratings given by the students themselves in the ASQ. These rankings are from 0 to 4, with 4 reflecting the highest rating for an amenity. If these matched up perfectly, students would rate colleges with the lowest student to faculty ratio with a 4, and those with the highest a 0.

The results of this test are shown in Table 5. Almost all of the subjective ratings are highly significant, indicating that the way students rate colleges in each of the categories has a very strong influence on their choice. However, the objective measures also remain significant as before with the exception of USNWR rank. So students are responding to the actual differences in college amenities, but they are also responding to how they *perceive* these differences, holding constant the actual college characteristics. This finding indicates that whether it is the actual level of a college amenity or the student's perception of that amenity at a college, ultimately it still matters when that student is making a choice. In particular, student's perceptions are quite influential, above and beyond the actual college measures. This shows that information can play an important role in attracting students. The better a college is able to show-off their amenities, educational quality, or low cost, the more attractive they will be to all students.

V. Conclusions

This paper uses College A's Admitted Student Questionnaire (ASQ) from 2007-2010 to examine the role college amenities and cost play in the college choice decision of high-ability students, and how this has changed during the recent financial crisis. Elite colleges and universities have invested significant amounts of money in attracting students to enroll by spending on dormitories, cafeterias and other non-educational amenities. However, the recent financial crisis has made the rising cost of education a point of discussion and concern for all students.

Our results show that although institutions are smart to spend on all types of amenities, educational and non-educational, the importance of these amenities in the choice of a college is decreasing over the last half a decade. In particular, students are less concerned with the student to faculty ratio and auxiliary spending. At the same time, students are becoming more responsive to cost. Full-pay students are feeling the pinch, and are now much more likely to report that the cost of attendance is an important factor in their choice of a college, whereas aided students have seen no increase in this measure. With the high cost of higher education and the recent economic downturn, it is likely that cost is becoming far more salient for full-pay students. Aided students are also affected by the downturn, but with most top colleges continuing to offer high levels of financial aid to fully meet family need, this likely means a higher aid package for needy students and perhaps more loans. For full-pay students there is no aid to bring the rising cost of college down, making it more important as assets and incomes fell with the economy for most.

These results suggest that the arms race in which top colleges are currently involved may not be as effective at attracting students as it once was. The focus appears to be shifting to cost, which will continue to rise as expenditures rise. Institutions may want to increase their aid programs and keep tuition increases to a minimum in order to continue attracting both aided and full-pay students.

In addition, while actual spending and cost measures have a strong influence on students' college choices, their perceptions of these measures are just as, if not more, important. Therefore, colleges need to be aware of how their prospective students see them, and focus attention most effectively on the amenities shown above to influence students' decisions.

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Table 1: Descriptive Statistics for Students and Colleges in ASQ 2007-2010, by aid status

	<u>Aided</u>	<u>Full-Pay</u>
SAT	1414	1434
	(108)	(72)
Female	0.62	0.55
Minority	0.30	0.11
Need-Based Grant (2012\$)	9992	
	(16156)	
Loan (2012\$)	1659	
	(3658)	
Work-Study (2012\$)	676	
	(1121)	
Percent receiving Merit	0.27	0.21
Merit Aid for those that received it (\$2012)	16333	15046
	(13485)	(16822)
Observations	1302	1002

<i>Aided</i>		<i>Full-Pay</i>	
<u>Most Frequent Schools in Choice Set</u>	<u>Freq.</u>	<u>Most Frequent Schools in Choice Set</u>	<u>Freq.</u>
College A	1,014	College A	704
Cornell University	102	Boston College	120
Boston College	99	Middlebury College	84
Tufts University	65	Hamilton College	80
University of Rochester	55	Cornell University	78
Hamilton College	54	Georgetown University	78
Middlebury College	51	Tufts University	78
University of Notre Dame	49	Dartmouth College	74
Dartmouth College	47	Washington University in St. Louis	64
Bucknell University	45	Bowdoin College	54
Bowdoin College	40	Northwestern University	50
Georgetown University	39	University of Virginia	50
Northwestern University	39	Bucknell University	47
New York University	38	Colby College	47
Vassar College	36	University of Michigan Ann Arbor	45
Colby College	35	Wake Forest University	41
College of William and mary	35	Emory University	38
Washington University in St. Louis	34	Johns Hopkins University	38
Williams College	34	Vanderbilt University	38
University of Michigan Ann Arbor	32	Duke University	35

Table 2: Average Ratings on 1-3 scale in ASQ 2007-2010 for Importance of College Amenities in College Decision

	<u>2007</u>		<u>2008</u>		<u>2009</u>		<u>2010</u>	
		<i>1-yr diff</i>		<i>1-yr diff</i>		<i>1-yr diff</i>		<i>3-yr diff</i>
Academic Reputation	2.868709	*	2.821267	*	2.86134		2.844203	
	(0.3380885)		(0.406523)		(0.3558553)		(0.3824685)	
Majors of Interest	2.701754	*	2.762443		2.732627		2.740942	
	(0.5036975)		(0.4667069)		(0.4661998)		(0.4893692)	
Special Programs	2.16849		2.19457		2.150411		2.186933	
	(0.6523007)		(0.6231857)		(0.6368557)		(0.6406615)	
Personal Attention	2.742358	**	2.811791		2.780259		2.764493	
	(0.4476984)		(0.3970879)		(0.4310157)		(0.4414628)	
Academic Facilities	2.707424		2.722727		2.706856		2.685353	
	(0.4696355)		(0.4631592)		(0.4657503)		(0.487621)	
Recreational Facilities	2.39738		2.368778		2.400705		2.427536	
	(0.6057291)		(0.6114722)		(0.5824488)		(0.58583)	
Housing	2.344978		2.382353		2.396005		2.363472	
	(0.583308)		(0.5682099)		(0.5483091)		(0.5957916)	
Surroundings	2.431072		2.418552	**	2.348288	**	2.414105	
	(0.5736899)		(0.5939374)		(0.6016673)		(0.5649323)	
Campus Activities	2.49453		2.511312		2.462722		2.472727	
	(0.5303018)		(0.5562334)		(0.5760584)		(0.5615015)	
Cost of Attendance	1.857456	***	2.0181	*	2.102594		2.041591	***
	(0.8303774)		(0.8489759)		(0.8160682)		(0.8362739)	
Social Life	2.555799		2.579186		2.571765		2.600726	
	(0.5477769)		(0.5339463)		(0.5384206)		(0.5362491)	
Off Campus Activities	2.155702		2.113122		2.14841		2.142857	
	(0.6562383)		(0.5992132)		(0.6325491)		(0.6251294)	
Extracurriculars	2.665939		2.659864		2.63722		2.638336	
	(0.5078996)		(0.4930877)		(0.500311)		(0.5344428)	
Environment of Academic Excellence	2.733624		2.747153		2.702002		2.688406	
	(0.4712806)		(0.4556443)		(0.5042351)		(0.490205)	
Region	2.209607		2.244898		2.210341		2.24774	
	(0.7153792)		(0.6458803)		(0.6905658)		(0.6824132)	
Greek Life	1.329694		1.338636		1.394118	*	1.456364	***
	(0.5790208)		(0.6009544)		(0.5973741)		(0.6534938)	
Observations	458		442		851		553	

Table 3: Odds Ratios from Conditional Logit estimation of college choice equation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	aided	full-pay	aided	full-pay	aided	full-pay	aided	full-pay
student/faculty ratio	0.907*** [0.0188]	0.985 [0.0258]	0.898*** [0.0204]	0.979 [0.0296]	0.715*** [0.0696]	0.703*** [0.0943]	0.852*** [0.0277]	1.087 [0.0637]
Year * student/faculty ratio					1.087** [0.0368]	1.121*** [0.0494]		
Ln(Expenditures/fte)	1.382*** [0.119]	2.100*** [0.214]						
Ln(Instruction expenditure/fte)			0.372*** [0.0737]	0.268*** [0.0667]	0.341 [0.231]	0.0539*** [0.0439]	0.392*** [0.121]	0.225*** [0.0893]
Year * Ln(instruction)					1.027 [0.234]	1.716** [0.448]		
Ln(Research expenditure/fte)			1.413*** [0.0858]	2.073*** [0.200]	1.122 [0.203]	2.191*** [0.612]	1.488*** [0.138]	2.009*** [0.317]
Year * Ln(Research)					1.075 [0.0636]	0.971 [0.0862]		
Ln(Academic Support Expenditure/fte)			1.187* [0.124]	1.151 [0.135]	1.947* [0.696]	2.310** [0.853]	0.925 [0.136]	1.024 [0.188]
Year * Ln(Academic Support)					0.839 [0.0988]	0.786** [0.0941]		
Ln(Student Services expenditure/fte)			0.839 [0.108]	1.169 [0.216]	0.964 [0.383]	1.729 [0.930]	0.735 [0.148]	1.136 [0.379]
Year * Ln(Student services)					0.960 [0.126]	0.889 [0.158]		
Ln (Auxiliary Expenditure/fte)			2.448*** [0.412]	2.539*** [0.518]	2.414 [1.339]	8.974*** [5.949]	2.181*** [0.520]	2.481*** [0.864]
Year * Ln(Auxiliary)					1.018	0.660*		

					[0.187]	[0.142]		
USNWR Rank	0.968***	0.937***	0.967***	0.940**	0.987	0.962	0.965*	0.793***
	[0.0106]	[0.0207]	[0.0119]	[0.0240]	[0.0149]	[0.0285]	[0.0185]	[0.0633]
USNWR Rank squared	1.000***	1.001***	1.000***	1.000***	1.000***	1.001***	1.000**	1.000
	[7.82e-05]	[0.000149]	[8.76e-05]	[0.000173]	[8.83e-05]	[0.000178]	[0.000138]	[0.000689]
Net Cost (thousands '12\$)	1.051	0.886	0.897	0.787	0.841	0.710**		
	[0.174]	[0.125]	[0.149]	[0.120]	[0.147]	[0.116]		
Year * Net Cost					1.014	1.006		
					[0.0205]	[0.0257]		
Net Cost squared	0.999	1.002	1.001	1.003*	1.001	1.004**		
(thousands '12\$)	[0.00189]	[0.00152]	[0.00191]	[0.00169]	[0.00191]	[0.00179]		
Grant/merit only	2.274***		2.614***		2.673***			
	[0.325]		[0.398]		[0.411]			
Grant/Merit plus	3.366***		3.241***		3.358***			
	[0.570]		[0.573]		[0.604]			
Job and/or Loan only	2.973***		2.513***		2.571***			
	[0.618]		[0.540]		[0.554]			
Merit Only		1.029		0.901		0.926		
		[0.389]		[0.381]		[0.419]		
Female * USNWR rank	1.012***	1.012	1.011**	1.010	1.012**	1.007	1.006	0.996
	[0.00452]	[0.00966]	[0.00479]	[0.0103]	[0.00482]	[0.0104]	[0.00664]	[0.0209]
Minority * USNWR rank	1.001	1.024	1.003	1.034**	1.003	1.031**	0.991	1.007
	[0.00521]	[0.0148]	[0.00554]	[0.0155]	[0.00554]	[0.0158]	[0.00778]	[0.0269]
Year * USNWR rank	0.999	0.995	0.997	0.992	0.990***	0.983**	0.996	1.050**
	[0.00238]	[0.00592]	[0.00256]	[0.00657]	[0.00378]	[0.00801]	[0.00387]	[0.0229]
Size	1.025***	1.038***	0.990	0.989	0.983	0.983	0.998	1.002
	[0.00900]	[0.0125]	[0.0110]	[0.0145]	[0.0116]	[0.0150]	[0.0163]	[0.0236]
Distance from Home	1.000	0.999**	1.000	0.999**	1.000	0.999*	1.000	1.000
	[0.000205]	[0.000373]	[0.000222]	[0.000392]	[0.000224]	[0.000405]	[0.000318]	[0.000488]

Squared Distance from Home	1.000	1.000**	1.000	1.000**	1.000	1.000*	1.000	1.000
	[7.25e-08]	[1.46e-07]	[7.85e-08]	[1.54e-07]	[7.87e-08]	[1.59e-07]	[1.13e-07]	[1.76e-07]
Total Cost (thousands '12\$)							1.027	0.607
							[0.126]	[0.197]
Total Cost squared							0.999	1.006*
							[0.00141]	[0.00347]
Need-Based grant (thousands '12\$)							1.085***	
							[0.0146]	
Merit aid (thousands '12\$)							1.110***	308,096
							[0.0203]	[3.949e+08]
Work-Study (thousands '12\$)							0.870	
							[0.0768]	
Loan (thousands '12\$)							1.194***	
							[0.0635]	
Observations	2628	1904	2501	1841	2501	1841	1947	829

Standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 4: Odds Ratios from Conditional Logit estimation of college choice equation

	(1)	(2)
	Aided	Full-Pay
Student/Faculty Ratio	0.871** [0.0545]	1.071 [0.0773]
Attention Imp * Stud/Fac	0.917** [0.0347]	0.844*** [0.0426]
Reputation Imp. * Stud/Fac	1.116* [0.0661]	1.030 [0.0743]
Ln(Instruction expenditure/fte)	0.376*** [0.0756]	0.247*** [0.0634]
Ln (Research expenditure/fte)	1.342*** [0.120]	1.901*** [0.231]
Reputation Imp. * Ln(Research)	1.064 [0.0803]	1.171* [0.104]
Ln (Academic Support Expenditure/fte)	1.637*** [0.308]	1.397 [0.308]
Attention Imp. * Ln(Acad. Support)	0.660** [0.132]	0.767 [0.176]
Ln (Student Services Expenditures/fte)	0.896 [0.147]	0.976 [0.238]
Extracurric. Imp. * Ln(Stud. Services)	0.883 [0.140]	1.275 [0.289]
Ln (Auxiliary Expenditures/fte)	2.758*** [0.601]	2.540*** [0.699]
Recreat. Fac. Imp. * Ln(Auxiliary)	1.065 [0.305]	0.797 [0.287]
Housing Imp. * Ln(Auxiliary)	0.728 [0.209]	1.326 [0.478]
USNWR Rank	0.985 [0.0145]	0.993 [0.0321]
Reputation Imp. * USNWR Rank	0.976*** [0.00729]	0.947*** [0.0155]
Environ. Of Acad. Excell. Imp. * USNWR rank	1.003 [0.00536]	1.018 [0.0130]
USNWR Rank Squared	1.000** [9.07e-05]	1.000 [0.000194]
Net Cost (thousands '12\$)	0.939 [0.186]	0.808 [0.141]
Cost Important * Net Cost	0.885***	0.870***

	[0.0354]	[0.0340]
Net Cost Squared	1.001	1.003
	[0.00219]	[0.00189]
Grant/Merit Only	2.663***	
	[0.415]	
Grant/Merit Plus	3.246***	
	[0.588]	
Job and/or Loan only	2.535***	
	[0.554]	
Merit Only		1.077
		[0.473]
Female * Rank	1.011**	1.011
	[0.00497]	[0.0115]
Minority * Rank	1.004	1.032*
	[0.00573]	[0.0176]
Year * Rank	0.997	0.986**
	[0.00268]	[0.00693]
Size	0.991	0.990
	[0.0113]	[0.0152]
Distance from Home	1.000	0.999**
	[0.000229]	[0.000419]
Distance from Home Squared	1.000	1.000**
	[8.20e-08]	[1.65e-07]
Observations	2501	1841

Standard Errors in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 5: Odds Ratios from Conditional Logit estimation of college choice equation

	(1)	(2)
	<u>Aided</u>	<u>Full-Pay</u>
Student/Faculty Ratio	0.882**	1.025
	[0.0469]	[0.135]
Ln(Instruction Expenditures/fte)	0.296***	0.135*
	[0.134]	[0.155]
Ln(Research Expenditures/fte)	1.562***	3.138**
	[0.212]	[1.676]
Ln(Academic Support Expenditures/fte)	0.887	0.440
	[0.198]	[0.246]
Ln(Student Services Expenditures/fte)	0.920	1.280
	[0.254]	[1.053]
Ln(Auxiliary Expenditures/fte)	2.469***	4.268*
	[0.848]	[3.715]
USNWR Rank	0.969	0.972
	[0.0258]	[0.145]
Squared USNWR rank	1.000*	1.001
	[0.000186]	[0.00167]
Net Cost (thousands '12\$)	0.679	1.295
	[0.276]	[0.964]
Net Cost squared	1.004	1.000
	[0.00460]	[0.00836]
Grant/Merit only	1.744	
	[0.724]	
Grant/Merit plus	1.669	
	[0.711]	
Job and/or Loan only	1.366	
	[0.606]	
Merit Only		1.165
		[1.705]
Female * Rank	0.994	0.984
	[0.0102]	[0.0669]
Minority * Rank	1.007	1.021
	[0.0134]	[0.0907]
Year * Rank	1.000	0.974
	[0.00585]	[0.0348]
Size	1.002	1.151*
	[0.0300]	[0.0908]
Distance From Home	0.999	1.000
	[0.000597]	[0.00113]

Squared Distance from Home	1.000	1.000
	[2.17e-07]	[3.79e-07]
Academic Reputation Rating	2.494***	4.280*
	[0.676]	[3.750]
Majors Rating	2.287***	4.148*
	[0.508]	[3.265]
Special Programs Rating	1.093	2.303
	[0.277]	[1.732]
Personal Attention Rating	2.991***	3.681**
	[0.637]	[2.118]
Academic Facilities Rating	1.363	7.218**
	[0.329]	[6.487]
Recreational Facilities Rating	1.895***	0.690
	[0.406]	[0.447]
Housing Rating	1.002	2.488
	[0.169]	[1.433]
Surroundings Rating	1.381**	0.951
	[0.197]	[0.428]
Campus Activities Rating	1.509**	0.753
	[0.292]	[0.498]
Cost of Attendance Rating	1.989***	1.909
	[0.267]	[0.955]
Social Life Rating	2.700***	8.137***
	[0.557]	[5.534]
Off-Campus Activities Rating	1.612***	1.100
	[0.282]	[0.566]
Extracurriculars Rating	1.805**	3.242*
	[0.528]	[2.096]
Environment of Academic Excellence Rating	1.496	19.16***
	[0.379]	[20.61]
Region Rating	1.280	1.291
	[0.195]	[0.588]
Observations	1273	464

Standard Errors in brackets. *** p<0.01, ** p<0.05, * p<0.1