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# The influence of the US News and World Report collegiate rankings on the matriculation decision of high-ability students: 1995–2004

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**Abstract**

The annual US News and World Report (USNWR) Guide to America's Best Colleges is much anticipated by both high-ability high school seniors and college and university administrators. In this paper, we use a decade of Colgate University *Admitted Student Questionnaire* surveys to estimate the influence of changes in a school's USNWR rank on the probability of matriculation. We find that school choice is responsive to changes in rank, that the sensitivity to rank declines at lower ranks, and this sensitivity is independent of other objective measures of quality. The importance of the rankings can also be different for women, minorities, and the highest ability aided students. They have also gotten more important over time for aided students. Our results suggest that it is rational for college administrators to pay attention to their USNWR rank because it is an important factor in yielding accepted students.


*JEL classification:* I2; I21; I22

*Keywords:* School choice; Student financial aid; Demand for schooling

## 1. Introduction

Every fall, college administrators await the arrival of US News and World Report's (USNWR) *America's Best Colleges*. In it they find out where USNWR ranks their school against their competitors. Administrators are caught between not wanting to place public emphasis on their ranking (how can a college experience be represented by a single number?) and privately trying to avoid slipping in the rankings. On the consumer side, high-ability high school seniors also await the arrival of this annual issue. In it they find a wealth of quantitative information packaged for easy comparison across schools. More importantly, all the information is combined into a single rank which proxies for the quality of the school. The coverage in the popular press is evidence of the importance of the annual rankings, not least of which is the significant spike in circulation that occurs with this particular issue. Admissions officers attest to the importance, noting

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how many prospective students carry the issue to their college visits.

While there is a broad literature evaluating students' decisions on whether or not to attend college, there is a small but growing literature about the decision of *where* to attend college. Previous work has used both aggregate and individual data to show that college choice, while crucially depending on monetary factors such as financial aid (e.g., Ehrenberg & Sherman, 1984; McPherson & Schapiro, 1991; Moore, Studenmund, & Slobko, 1991), is significantly related to non-monetary factors such as reputation. For example, Weiler (1996) used data from the College Board's Admitted Student Questionnaire Plus and shows that although the amount and make-up of financial aid packages is important in determining college choice, they are relatively less important than other, non-monetary, factors such as student to faculty ratio and academic reputation. Early work by Spies (1973, 1978) shows that above-average ability students' academic considerations generally outweighed financial considerations in the choice of where to apply. Avery and Hoxby (2003) model how a student's college choice responds to different components of financial aid packages along with the selectivity of the school. While all students in their sample were more likely to attend the most selective school in their choice set, those from high-income families are even more likely to do so.

The USNWR ranking is but one indicator of the academic quality of an institution. However, even though it has been in existence for some time and is very popular, we have little empirical evidence about its influence on college choice. In this study a discrete choice model of college matriculation, conditional upon a student being accepted, as a function of characteristics of the applicant and characteristics of the school, including the school's USNWR rank, is estimated. The results indicate that the USNWR rank is an important factor in the decisions of high-ability students. Section 2 contains background on the USNWR ranking and reviews the relevant literature. Section 3 describes the data and methodology. The results and their implications are presented in Section 4 and 5 concludes.

## 2. Background

While the components and methodology behind the USNWR rank change periodically, the ranking has been in existence since the early 1980s when it began as a simple reputation rank that was voted upon by college presidents. Since then the rank has become formulaic, including many different variables. In fact, the final USNWR rank is a weighted combination of 7 main groups of measures; however, the reputation component of the rank is still one of the most important of these.[1] Schools fill out questionnaires that provide the supporting data behind the USNWR collegiate rankings. In the most recent reporting year (2005), this questionnaire numbered a staggering 598 questions.

There are many potential proxies for the academic quality of a school. The existing literature has used measures such as average SAT scores, graduation rate, or a school's admit rate. Most of these measures are utilized in the USNWR rank but they can differ significantly across schools. For example, in the 2005 Liberal Arts rankings Haverford and Pomona tied for 9th overall yet Haverford ranked 3rd and Pomona 10th in Graduation and Retention. Faculty resources are also quite different with Haverford ranking 24th and Pomona ranking 33rd. While there are many examples of variation across individual measures of quality, the final overall USNWR rank is a single number that high school seniors readily remember. We believe the overall rank is what exerts the influence in the matriculation decision. In fact, given the notoriety of the ranking it is possible that an important component of the school selectivity results found in the literature is the influence of the USNWR rank.

A few recent studies have explicitly used the USNWR rankings to proxy for quality or reputation effects. For example, Parker and Summers (1993) use a sample of liberal arts colleges to estimate an aggregate model of matriculation rates and college costs, which includes a binary variable for whether the school is in the top 25 of the USNWR rankings. Their estimates, although consistent with reputation improving matriculation for aided students, are inconclusive or yield unexpected signs for the relatively small full-pay sample. Prior work has also found that the USNWR rankings are related to the provision of financial aid and yield from the applicant pool. For example, Monks and Ehrenberg (1999) using aggregate 1998 data show

[1] It should be noted that these weights do not correspond closely to the 'net' impact of changes in any particular category on the final rank. These issues are discussed more fully in Webster (2001a, b) and Friedman and Rask (2004). The detailed ranking methodology along with the weights can be found at www.USNews.com.

that as a school moves down in the rankings ('quality' falls) they provide greater financial aid, presumably to attract better students, and have higher admit rates. Our micro matriculation model of the enrollment decisions of accepted students provide further insights into the matriculation decision. In particular, our estimates yield similar results for aided students, but indicate full pay students are more sensitive to the prestige and quality attributes represented in the USNWR rank. We also present new evidence that the influence of the rankings change as your school moves down the rank scale. In addition to explicitly modeling the influence of school rank and testing whether it is more important to higher high-ability students, we also exploit the panel attributes of the data to test whether the rankings themselves have become more or less important over the past decade.

## 3. Data and methodology

Data for this study are obtained from the Colgate Admitted Student Questionnaires (ASQ) for the students admitted for the fall of 1995–2004. This questionnaire is sent to all admitted students in the spring of their high school senior year. Roughly 50% of the admitted students return the questionnaire ($\approx$1200) with the response rate skewed towards those choosing to attend Colgate.[2] Students are asked to list their top three colleges to which they were admitted. They are also asked what types of financial aid, if any, they received from each school as well as demographic and socioeconomic information, such as parental income range, ethnicity/race, and gender. Data on academic ability (SAT scores), financial aid, and parental income were merged to the survey from Colgate institutional records. Characteristics of the schools in the choice set were obtained from the *Integrated Postsecondary Education Data System* (IPEDS)[3] files maintained by the National Center for Education Statistics and from the Annual Survey of Colleges undertaken by the College Board. Finally, past issues of the USNWR are the source for the rankings of each school in each student's choice set. The rankings contained in the fall issue prior to the spring matriculation decision are used.

In this study students are split into two groups, aided and full pay. Given the importance of financial considerations for aided students, the differences in their financial aid packaging, and the extra information available on parental income for aided students, we chose to estimate full pays separate from aided students.[4] Our definition of an aided student is anyone who applied for and was offered need-based aid from any institution to which they were admitted. Financial aid information in the ASQ indicates whether or not a student's financial aid package contains each of four distinct components: need-based grant, non-need-based grant (merit aid), loan, and work study, but not the *amount* of each type of aid given. For a more parsimonious specification all the possible combinations of aid packaging are combined into four primary groups:[5] (1) grant or merit aid only, (2) grant/merit plus any combination of job and loan, (3) only job and loan (no grant or merit) and (4) no aid. Many (3071 of the 12,502) student/school combinations were offered need-based aid from at least one school but were not offered any need-based aid from another school. These 'non-packages' represent the omitted category in the estimation.

A shortcoming of these data is that detailed financial aid *amounts* from each school are not known. To address this data limitation we construct a measure of net cost of each school from Colgate administrative records and IPEDs tuition, room, and board data.[6] From institutional records we know each student's financial contribution based upon two different formulae, Colgate institutional methodology (IM, based largely upon the College Board's Institutional Methodology) and the federal methodology (FM). In our model, the family contribution, as long as it is less than the tuition, room, and board, constitutes the net cost of attendance. If the sum of tuition, room, and board

[2] We do not believe this is an important source of response bias because we are modeling choice among a set of schools, not simply whether they choose to attend Colgate or not. We have a large sample of students who went elsewhere, both to higher and lower ranked schools.

[3] http://nces.ed.gov/ipeds/

[4] In addition, pooling the two groups was rejected with a LR test statistic of $\chi^2_{23} = 424$.

[5] Initially grants and merit-aid were separated; however, there was no statistical difference between their influences. Because they both represent money that need not be repaid they are combined.

[6] Roughly 4% of schools had missing cost data at some point during the sample. In these cases we used simple OLS to estimate their cost in the missing year based upon their costs in the remaining years in the sample.

is less than family contribution, we use that as the net cost of attendance. For the full pay sample, the net cost is measured as the sum of tuition, room, and board.[7] We know the exact net cost from Colgate but we do not observe the exact net cost from the other schools because we lack their exact calculation of family contribution. To test for sensitivity to choice of measure we construct both IM and FM measures. The results are not statistically different from one another at conventional levels of confidence so we use the IM version of net cost for the following reason.[8] Many schools in this sample are members of the 568 *Group*, a group of schools who adopt a consistent financial aid methodology called the *consensus methodology*.[9] That methodology is quite similar to the IM used at Colgate, however there are slight differences in how student assets are treated and how home equity is treated. In some cases Colgate applicants get slightly more favorable treatment under IM, in some cases less favorable; however, it should not systematically bias the results because some schools are ranked above us and some below. Most other schools in the sample use the IM as their basis for determining need, even though there are always subjective decisions being made in particular cases. Given the measurement error in our net cost for schools other than Colgate we are confident in the order of magnitude of our results but are cautious not to interpret them as finely as those reported in Avery and Hoxby (2003), for example.

Personal characteristics of each student are also included in the model. These characteristics are used to determine whether students from different socio-economic backgrounds or students with different academic ability have different sensitivities to the USNWR rankings, to cost, and to distance from the school. We also test for gender or minority differences in responsiveness to rank along with the influence of the proportion of minorities at each school on the matriculation choice. Finally, school fixed effects are included in our model. We include dummy variables for most all of the schools whose USNWR rank has averaged 40 or better in the NU and NLA category. These fixed effects exploit the panel of data to differentiate the within-school effects from the between-school effects. They insure that our USNWR estimate picks up the influence of the rank itself and is not confounded with time-invariant institutional characteristics such as prestige and name recognition.

We also investigate whether the marginal effect of a given change in a rank is the same across the quality spectrum of schools. For example, is a three-unit change in the rank for a highly ranked school (e.g., from 1 to 3) the same as an equivalent drop in the rank for a lower ranked school (e.g., from 10 to 12)? Understanding the potential non-linearity in the impact of rank is important because the variability in the ranks of schools near the top of the rankings is lower than the variability of lower ranked schools.

### 3.1. Descriptive statistics

The financially needy sample consists of 12,361 potential school choices made by 4583 individuals. In the sample, 3195 (70%) listed their top three choices and 1388 listed simply their top two. The full-pay sample is somewhat smaller with 3725 individuals yielding 10,135 ranked college choices, and among those 72% listed three choices with the remaining listing only two. In addition, 141 (116) in the aided (full pay) sample were eliminated prior to estimation because they only listed a single choice. Over 80% of the first choice schools are ranked in the top 25 for either the NU or NLA categories by USNWR. One of the most interesting statistics that highlights the importance of the USNWR ranking is that every year, 50–55% of the students in the sample choose to attend the highest ranked school to which they were admitted (independent of whether it is categorized as a NLA or NU). The high proportion of students who choose the most highly rated school to which they are admitted is suggestive of the potential importance of the rankings to the matriculation decision.

The set of Colgate ASQ information provides a good window into the decision-making process of a wide range of high-ability students. Our average rank over the past decade has been 18th which means that in our admit pool we have a range of students who have been admitted to top 20 schools along with many admitted to schools ranked from 20–40. Colgate's enrollment of approximately 2800 students places it among the largest liberal arts schools and there is significant overlap between its applicant pool and those of smaller private

[7] All net cost amounts are calculated in constant 2005 dollars.

[8] The estimates (and SEs) for the two models are: $\widehat{\beta}^{\mathrm{IM}}_{\ln \mathrm{Cost}} = -0.129(0.032)$ and $\widehat{\beta}^{\mathrm{FM}}_{\ln \mathrm{Cost}} = -0.108(0.033)$.

[9] The *consensus methodology* and the member institutions can be found at http://www.568group.org.

universities such as the Ivy League and mid-sized selective private universities such as Notre Dame, Georgetown, Washington University, and Emory. Colgate also has a Division I athletics program that attracts students (and athletes) who are considering other large universities with Division I programs.

In terms of the overall distribution of schools in the student responses, 16% are ranked in the top 15, 37% in the 16–20 range (the group dominated by the Colgate responses), 13% in the 21–25 range, and the remaining 34% ranked below 25. These proportions are across all the college categories in the rankings. The proportion of NLA (62%) outweighs the proportion of NU (32%) in the sample, but this is expected because Colgate is a part of the NLA category. These characteristics insure that a broad range of school types and USNWR rankings are common in the Colgate pool of ASQ responses. However, because the data is limited to those who are admitted to Colgate, these results only generalize to high-ability students.

Detailed student and school descriptive statistics are contained in Table 1.

As expected, the respondents are more likely to be female and the aided sample is much more diverse than the full pay. The range of high-ability applicants to Colgate is evident in the combined SAT distribution where the 75th percentile is over 1400 and the 25th percentile is under 1300. Finally, the most common types of schools in the choice sets are somewhat different between the aided and full-pay students. The full-pay sample has more small and medium-sized private schools while the aided sample has higher frequencies of larger, regional universities (e.g. SUNY schools, Rochester, Syracuse).

### 3.2. Empirical model

The data described above are used to estimate a model of collegiate choice where characteristics of the college *and* characteristics of the student are allowed to influence the observed school choice. The behavioral model underlying the empirical estimation strategy is a standard random utility model where the utility of the $i$th college to which the $j$th student is admitted is a function of the characteristics of that school along with the characteristics of the particular student. Eq. (1) outlines this general structure.

$$U_{ij} = \alpha X_j + \beta Z_{ij} + \varepsilon_{ij}. \tag{1}$$

Some of the school characteristics are fixed across students (USNWR rank, student–faculty ratio, expenditures per student, and size) and their influence is estimated by the $\alpha$'s. Others are variable across the students themselves (financial aid package, net cost, distance from home) and some are student-invariant characteristics (SATs, race, gender) that enter the model as interactions with particular school characteristics. These student-specific effects are measured by the $\beta$'s. Finally, the collection of school fixed effects are measured by the $\gamma$'s in the model. The dependent variable in the model is a binary variable of choice of institution. Assuming the distribution on the error term is Weibull, the random utility model leads to a conditional logit model for estimation. Eq. (2) represents the empirical formulation of the model for the financial aid sample.

$$\text{Choice}_{ij} = \sum_r \alpha_r R_r + \sum_c \alpha_c C_c + \sum_{t1} \beta_{t1} R S_t + \sum_{t2} \beta_{t2} C S_t + \sum_f \gamma_f F_f + \varepsilon_{ij}. \tag{2}$$

In Eq. (2) the *R's* represent variables related to the USNWR rank and the *C's* represent characteristics of the college (size, student–faculty ratio, expeditures per student). Student characteristics are captured by the *S's* and these enter the model interacted with rank and with college characteristics. The interactions with rank are gender, race, SAT quartiles, and year. The interactions with college characteristics are cost, aid packaging, minority proportion, parental income, and distance to the school. *F* represents the collection of individual school fixed effects. The USNWR ranking enters the equation non-linearly, to allow its impact to change as you move down the scale, and expenditures per student enters log-linearly. We allow for differing impacts across quartiles of the SAT distribution and test for differences across parental income quartiles. We found differences across income quartiles in sensitivity to cost but not to the USNWR rankings. The income quartiles are defined using the entire Colgate acceptance pool in each year. The estimation for the full-pay students is similar, with the exception that the financial aid and parental income variables are omitted, and there is an additional variable that captures the effect of whether a merit aid offer was extended.

Table 1
Sample student and school descriptive statistics

| Financial aid sample | | | Full-pay sample | | |
|---|---|---|---|---|---|
| Variable | | Value | Variable | | Value |
| Combined SAT | | | Combined SAT | | |
| 75th Percentile | | 1420 | 75th Percentile | | 1410 |
| 50th Percentile | | 1350 | 50th Percentile | | 1350 |
| 25th Percentile | | 1290 | 25th Percentile | | 1290 |
| Proportion of women | | 57.5% | Proportion of women | | 53.6% |
| Proportion of minorities | | 19.3% | Proportion of minorities | | 7.8% |
| Most frequent schools in aided choice set[a] | Freq. | Average USNWR Rank | Most frequent schools in full-pay choice set[a] | Freq. | Average USNWR rank |
| University of Rochester | 356 | 32.9 | Colby College | 388 | 18.8 |
| Cornell University | 327 | 12.1 | Middlebury College | 353 | 7.7 |
| Bucknell University | 298 | 28.7 | Bucknell University | 285 | 28.5 |
| Boston College | 262 | 37.9 | Boston College | 269 | 38.0 |
| Hamilton College | 238 | 21.9 | Cornell University | 246 | 12.4 |
| Middlebury College | 194 | 7.6 | Tufts University | 190 | 27.7 |
| Holy Cross | 158 | 27.5 | University of Michigan | 184 | 36.0 |
| Tufts University | 154 | 27.1 | Vanderbilt University | 179 | 20.2 |
| Boston University | 149 | 80.6 | Georgetown University | 171 | 22.4 |
| Colby College | 148 | 19.0 | Bates College | 167 | 20.7 |
| New York University | 143 | 34.9 | Bowdoin College | 164 | 6.8 |
| SUNY Binghamton | 134 | 76.6 | Trinity College, CT | 155 | 38.6 |
| Dartmouth College | 133 | 8.0 | Hamilton College | 152 | 20.3 |
| Lafayette College | 116 | 33.6 | Washington University | 143 | 33.0 |
| Union College, NY | 116 | 34.4 | Emory University | 138 | 15.9 |
| Vassar College | 114 | 15.8 | Dartmouth College | 125 | 8.0 |
| Lehigh University | 105 | 36.9 | Holy Cross | 118 | 27.5 |
| SUNY Geneseo | 104 | 79.5 | Wesleyan University | 100 | 11.2 |
| Williams College | 103 | 2.6 | Williams College | 100 | 2.6 |
| Bowdoin College | 97 | 7.1 | Vassar College | 91 | 15.5 |
| Syracuse University | 97 | 65.6 | University of Pennsylvania | 88 | 8.1 |
| Wesleyan University | 97 | 10.9 | University of Richmond | 86 | 30.3 |
| Franklin & Marshall | 94 | 33.4 | Lafayette College | 83 | 34.3 |
| William & Mary | 92 | 33.2 | Brown University | 81 | 11.8 |
| Georgetown University | 91 | 22.6 | Connecticut College | 78 | 27.1 |
| University of Notre Dame | 91 | 18.5 | Union College, NY | 74 | 34.0 |

[a]Excluding Colgate, which was in 86% (83%) of the aided (full pay) choice sets. Over 340 different schools comprise the overall sample and show up in the choice set of at least one person.

## 4. Results

Eq. (2) is estimated for aided and full-pay applicants separately. The full-pay model is a subset of the aided model described above, as there is no financial aid packaging information to include and the parental income information is not available for the full-pay applicants. Because each individual adds at least 2 observations to the sample, robust standard errors, corrected for clustering, form the basis for the hypothesis tests. In the full-pay sample there were no differences in sensitivity to the USNWR rank by SAT quartiles, so we have omitted this variable. We have also included in the full-pay specification an interaction term of a merit aid offer and a top 25 ranking instead of the general merit aid term.[10] Finally, the set of school fixed

[10]Merit aid from any school was initially included and had no correlation with college choice, so we interact it with a top 25 ranking to test whether the proliferation of merit packages from higher-ranked schools systematically influences the matriculation decision in our sample.

effects for the aided sample (77 schools) is slightly different from the set for the full-pay students (75 schools). This is because of the different frequencies of top 40 schools in each group's choice set. Table 2 contains the parameter estimates from the conditional logit model for both the financial aid and the full-pay samples.

Across both estimations the influence of the USNWR rank on school choice is important *and* the effect is different for lower ranked schools. This result is robust to controlling for the other objective measures of quality. It is also interesting to note that the full-pay sample is more sensitive to the rankings as evidenced by the larger coefficient estimates. The USNWR influence on school choice is somewhat different across aided students from different SAT quartiles. The rankings are slightly less important to students in the highest SAT quartile in the aided sample; however, there was no difference in the full-pay sample across SAT quartiles. Minorities are sensitive to the existing minority population of the school and full-pay minorities are more than twice as sensitive as their aided counterparts. In the aided sample women are slightly less responsive to rank differences than men and in the full-pay sample the school choice of minorities are less responsive to rank differences than non-minorities. Finally, in the aided sample the USNWR ranking itself has become more important to school choice over time.

In terms of monetary factors, the net cost of a school is found to be an important factor in school choice in the aided sample but not for full pays. In addition to the overall influence of net cost, we find consistent correlations between aid packaging and matriculation, suggesting that students are acting rationally in response to aid package offers. Full packaging (grant/merit plus jobs and/or loans) is preferred to grants-only packaging, and both are preferred to job/loan only packaging. As expected, all these packages are preferred to no aid package. The results from our estimation suggest that merit aid is not a tool available to administrators to lure high-income high-ability students away from the most prestigious and highly ranked institutions. This is an interesting area for further work since merit aid for preferred groups has become a more common tool in the admissions process in recent years. We also find evidence that the distance from home is not a factor for students in either sample, although it is likely that this effect is partially being captured in the individual school fixed effects. Expenditures per student is correlated with matriculation across both samples, with students preferring schools that spend more. There is weak evidence that student–faculty ratio is correlated in

Table 2
Conditional logit estimation results: parameter estimates

| Financial aid sample | | Full-pay sample | |
|---|---|---|---|
| Variable | Coefficient | Variable | Coefficient |
| Student–faculty ratio | 0.0149* | Student–faculty ratio | 0.0198 |
| lnExpenditures/student | 0.4443*** | lnExpenditures/student | 0.5643** |
| USNWR rank | −0.0077*** | USNWR rank | −0.0254*** |
| USNWR rank$^2$ | 0.00003*** | USNWR rank$^2$ | 0.0001*** |
| Net cost (thousands '05 $) | −0.1279*** | Net cost (thousands '05 $) | 0.0100 |
| Net cost$^2$ (thousands '05 $) | 0.0007 | Net cost$^2$ (thousands '05 $) | −0.0004 |
| Grant/merit only | 0.9753*** | Merit × top25 | −0.0386 |
| Grant/merit plus | 1.3094*** | | |
| Job and/or loan only | 0.5520*** | | |
| Female × USNWR rank | 0.0044*** | Female × USNWR rank | 0.0018 |
| Minority × USNWR rank | −0.0022 | Minority × USNWR rank | 0.0063* |
| Minority × %minority | 0.0153*** | Minority × minority | 0.0359*** |
| Year × USNWR rank | −0.0008*** | Year × USNWR rank | 0.00004 |
| Size | −0.00001* | Size | 0.00001 |
| SATQ4 × USNWR rank | 0.0030* | | |
| Parent incomeQ3 × net cost | 0.0406** | | |
| Parent incomeQ4 × net cost | 0.0587*** | | |
| Distance from home | −0.0002 | Distance from home | −0.0003 |
| Distance from home$^2$ | 0.0000001 | Distance from home$^2$ | 0.0000001 |

*Note*: ***$p$-value < 0.01, **$p$-value < 0.05, *$p$-value < 0.10.

the aided sample, although in the opposite direction as one would expect, and it is not correlated in the full-pay sample.

The coefficients estimated above are important in determining the overall performance and consistency of the model; however, a key measure of the importance of a change in a school's USNWR rankings is its impact on yield. Monks and Ehrenberg (1999) use aggregate data and are able to estimate the impact of a change in rank on a school's yield. Because the fitted value in our conditional logit is a predicted probability of matriculation, marginal effects or partial probability estimates give insight into the expected change in probability of attendance resulting from a one-unit change in an independent variable. Therefore we estimate the relative importance of the effects highlighted above by evaluating the partial probabilities for each student and averaging them over the sample for the variables of interest. These results are contained in Table 3.

The results of the overall influence of the USNWR rankings are striking. Aided students looking at schools in the top 20 are predicted to experience about a 0.15 percentage point change in probability of attendance for every 1 place difference in their rank. This effect drops to about 0.10 and then lower for schools in the 20–40 range. The effect is much larger for full pays, where rank differences in the top 20 are related to a 0.45 percentage point change per rank, with the effect leveling off around 0.35 as you reach a 40 point rank difference. These results for full-pay students are larger than those estimated by Monks and Ehrenberg (1999). However, their results (−0.17) are quite close to our estimates for aided students. Figs. 1 and 2 illustrate the relative influence of rankings and cost between the aided and full-pay samples. In Fig. 1 the influence of a difference between two USNWR ranks is graphed against the estimated difference in probability of attending the worse ranked of the two schools. For example, the average aided student is about 1.6 percentage points less likely to attend a school ranked 10th vs. a school ranked 1st. This is in contrast to the average full-pay student who is about 4.7 percentage points less likely to make that choice, all else equal.

The sensitivity difference to net cost between the different income quartiles of aided students is illustrated in Fig. 2. It shows the lower probability of attendance with increasing cost differences between two schools. The results of our model suggest that for an aided student with below median family income, a change from no difference to a $1000

Table 3
Partial probabilities ( × 100) of college choice estimates

| Financial aid sample | | Full-pay sample | |
|---|---|---|---|
| Variable | Marginal effect | Variable | Marginal effect |
| Student–faculty ratio | 0.360 | Student–faculty ratio | — |
| lnExpenditures/student | 9.705 | lnExpenditures/student | 12.16 |
| USNWR rank | −0.168 | USNWR rank | −0.490 |
| USNWR rank$^2$ | 0.001 | USNWR rank$^2$ | 0.002 |
| Net cost (thousands '05 $) | −2.849 | Net cost (thousands '05 $) | — |
| Net cost$^2$ (thousands '05 $) | — | Net cost$^2$ (thousands '05 $) | — |
| Grant/merit only | 19.91 | Merit × top25 | |
| Grant/merit plus | 26.97 | | |
| Job and/or loan only | 11.43 | | |
| Female × USNWR rank | 0.087 | Female × USNWR rank | — |
| Minority × USNWR rank | — | Minority × USNWR rank | 0.134 |
| Minority × %minority | 0.311 | Minority × %minority | 0.706 |
| Year × USNWR rank | −0.013 | Year × USNWR rank | — |
| Size | — | Size | — |
| SATQ4 × USNWR rank | 0.053 | | |
| Parent incomeQ3 × net cost | 0.849 | | |
| Parent incomeQ4 × net cost | 1.271 | | |
| Distance from home | — | Distance from home | — |
| Distance from home$^2$ | — | Distance from home$^2$ | — |

*Note*: Marginal effects are evaluated at each observation and averaged over the sample.

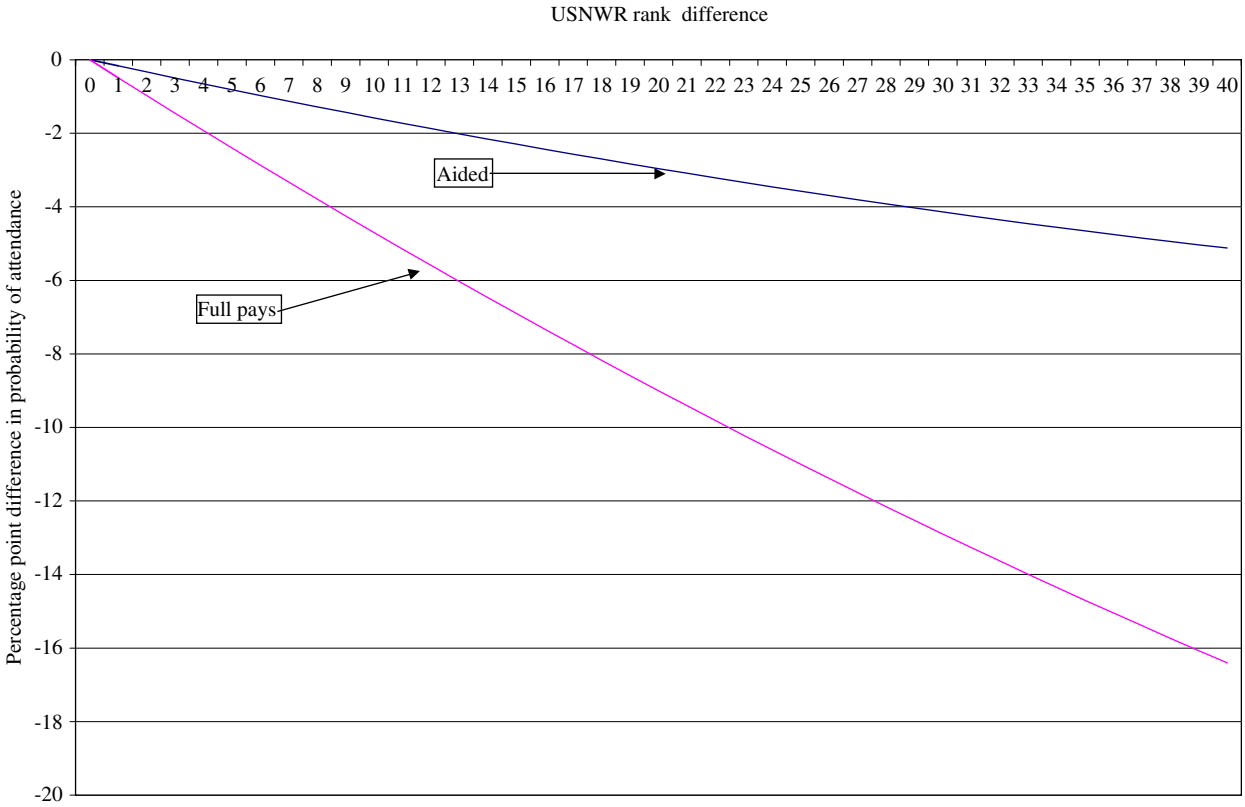


Fig. 1. USNWR rank differences vs. probability of attendance.

difference in cost (all else equal) will lower the average probability of attendance by about 3 percentage points. For those in the 3rd and 4th quartile that sensitivity drops to 2 and 1.5 percentage points, respectively. These estimates for our aided sample should be viewed with some caution given the caveat about the measurement error in the aided net cost variable discussed above. Fig. 2 illustrates these tradeoffs up to a cost difference of $4000.

Finally, most of the school fixed effects estimates for the higher ranked schools are statistically significant and take the expected sign. These estimates are not true fixed effects because every school in the sample is not represented. They can be interpreted as the fixed effect relative to all other schools: (1) not listed as an NU or NLA, and (2) not ranked at or below 40 on average over the sample period. They are presented in Table 4 in order of average rank over the decade of the sample.

Partial probabilities for these fixed effects are calculated at the mean of the data and are presented in parentheses after the estimates. For example, all else equal, a full-pay student is 86% more likely to attend Harvard than a school not listed here. By comparison, that average full-pay student is only 31% more likely to attend Colgate. A few regularities are evident from these estimates. First, full-pay fixed effects are almost always significantly greater than their aided counterparts. As expected, wealthier students place more emphasis on the prestige, quality, physical plant, and other unchanging characteristics that these estimates measure. Second, the magnitude of the fixed effect estimates declines as the rank of the school declines. As a group, it is not surprising that the Ivy League schools have the highest desirability in this sample, but they are especially desirable among the full-pay students. The gap between similarly ranked Ivy League and non-Ivy League schools can be as high as 20 percentage points for full pays as opposed to a few percentage points for aided students. However, across both samples as you move out of the top 20 schools the fixed effects largely disappear. There is another interesting characteristic of this sample that

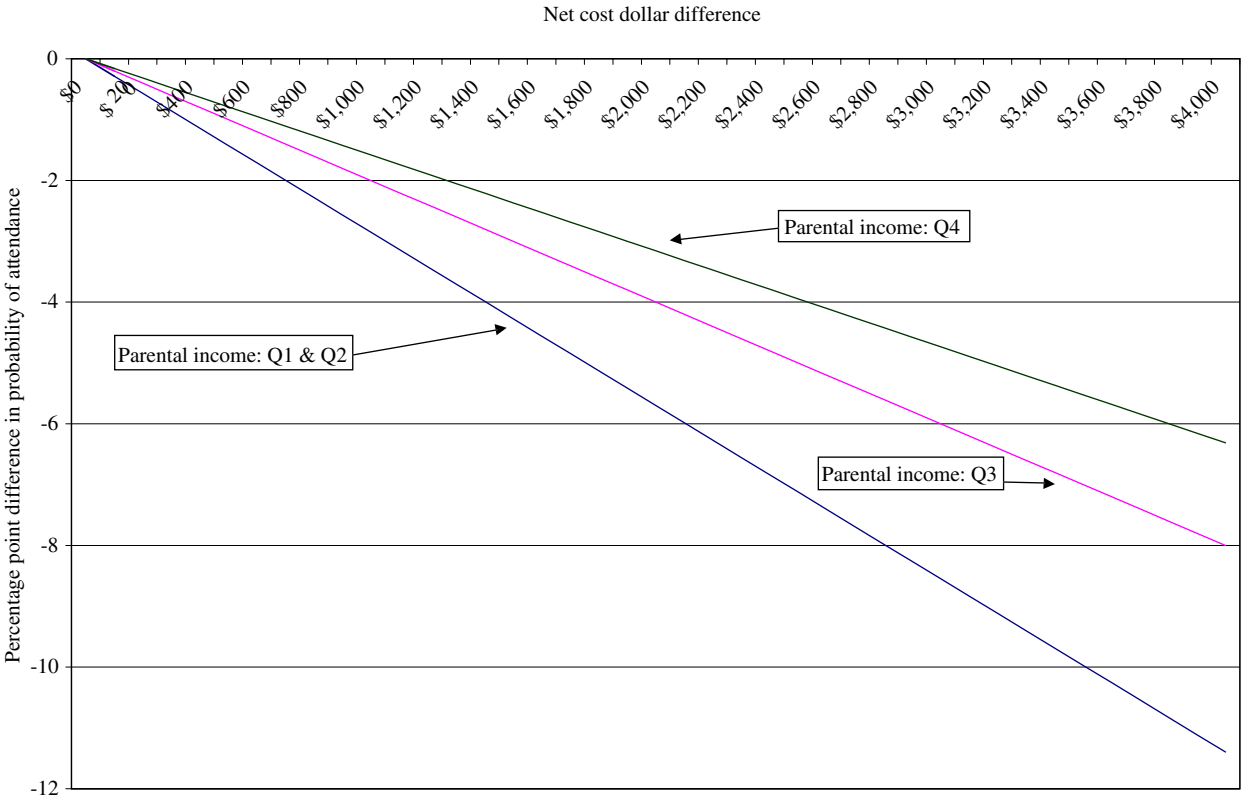


Fig. 2. Net cost differences vs. probability of attendance.

is evident from these estimations. Even though Colgate is classified as a National Liberal Arts college, the applicant pool appears to have a slight preference for larger, often urban institutions. The first piece of evidence for this is the result from above where higher student–faculty ratios are associated with higher probabilities of attendance. It is more evident in the magnitude and significance of the fixed effect estimates. An example of this in the top 20 is the difference between Colby and Notre Dame or University of Virginia's estimates. The bigger schools are often twice as desirable as Colby. For schools ranked in the 20s and 30s, many of the smaller schools fixed effects are not different from the group of omitted schools. However, the desirability of places such as Georgetown, Tufts, Wake Forest, and Boston College are significantly higher than their national liberal arts counterparts in the rankings. These results suggest that schools are not necessarily competing for high-ability students only against other schools like themselves. In the case of Colgate, a large (by liberal arts standards) school in the liberal arts category is competing against much larger schools in the national university category.

## 5. Conclusions

In this paper we investigate the influence of the USNWR rankings on the college choice of high-ability high school seniors conditional on the fact that they have been accepted to the school. Using a micro dataset of school choice from the Colgate University population of admitted students between 1995 and 2004 we estimate a conditional logit model where school choice is modeled as a function of the USNWR rank of each school along with other school and individual characteristics. Because Colgate's applicant and admit populations cover a broad range of high-ability students with choices of highly and less-highly selective colleges and universities, our results are based upon choices made from a wide range of schools. The schools in our applicant choice set cover those ranked from 1st to 50th in both the liberal arts and national university categories. It also includes schools that

Table 4
Conditional logit results: school fixed effect estimates, $\gamma$'s, and (partial probabilities)

| Avg. rank 1–20 | Aided | Full pay | Avg. rank 20–40 | Aided | Full pay |
|---|---|---|---|---|---|
| Amherst | 1.72*** (44) | 2.75*** (65) | Bates | 0.32 | 0.72*** (15) |
| Princeton | 1.92*** (50) | 3.25*** (77) | Hamilton | 0.02 | −.61** (−19) |
| Harvard | 1.88*** (46) | 3.24*** (86) | U.C. Berkeley | 0.49 | 1.25*** (31) |
| Swarthmore | 1.93*** (50) | 1.09*** (20) | Trinity | −0.83** (−18) | 0.11 |
| Yale | 2.48*** (61) | 3.24*** (80) | Georgetown | 1.54*** (36) | 2.60*** (64) |
| Williams | 1.82*** (47) | 2.68*** (63) | Oberlin | −0.14 | 0.50 |
| Wellesley | 1.43*** (36) | 2.39*** (59) | Carnegie Mellon | 0.03 | 0.75 |
| MIT | 1.95** (49) | N/A | Michigan | 0.00 | 0.26 |
| Stanford | 2.05*** (49) | 2.64*** (62) | Tufts | 0.88*** (22) | 1.50*** (35) |
| Pomona | 1.54*** (42) | 2.41*** (57) | U. South | N/A | 1.41* (44) |
| Haverford | 1.20*** (30) | 1.72*** (39) | UCLA | 1.00* | −0.16 |
| Bowdoin | 1.24*** (31) | 1.81*** (42) | UNC | 0.76 | 1.21** (26) |
| Middlebury | 1.30*** (33) | 2.23*** (52) | Macalester | 0.36 | 0.41 |
| Carleton | 0.90** (22) | 0.54 | Colorado College | 0.19 | 0.20 |
| U. Pennsylvania | 1.03*** (23) | 2.04*** (49) | Connecticut College | −0.39 | 0.11 |
| Dartmouth | 1.84*** (46) | 3.08*** (73) | Wake Forest | 0.48 | 0.75** (16) |
| Columbia | 1.53*** (42) | 1.55*** (29) | Holy Cross | 0.24 | 0.74*** (16) |
| Davidson | 1.60*** (44) | 1.82*** (42) | Barnard | 1.24*** (34) | 2.46*** (59) |
| Wesleyan | 0.93*** (25) | 1.72*** (39) | Bucknell | 0.08 | −0.03 |
| Northwestern | 1.21*** (29) | 1.90*** (45) | Brandeis | 0.10 | 0.16 |
| U. Chicago | 1.32*** (32) | 1.47*** (31) | William & Mary | 1.34*** (33) | 2.06*** (47) |
| Cornell | 1.34*** (32) | 1.97*** (46) | Kenyon | 0.50 | 0.74* (16) |
| Brown | 1.81*** (44) | 3.09*** (74) | Rochester | −0.67*** (−17) | −1.00* (−32) |
| Smith | 1.49*** (39) | 0.66 | Lafayette | −0.22 | −0.54 |
| Washington&Lee | 1.19*** (30) | 1.61*** (37) | Franklin&Marshall | −0.44 | 0.07 |
| Grinnell | −0.18 | 0.22 | UCSD | −0.58 | −0.20 |
| Claremont | 1.50** (37) | 1.37*** (32) | NYU | 0.39* | 0.35 |
| Johns Hopkins | 0.81** (19) | 1.14** (23) | Union | −0.04 | −0.76 |
| Bryn Mawr | 0.97** (28) | 1.23* (34) | U.W.-Madison | −0.53 | −0.65 |
| Rice | 1.27** (32) | 1.61 | Lehigh | −0.60** (−14) | 0.06 |
| Vassar | 0.58** (15) | 1.50*** (34) | Whitman | 0.33 | 0.57 |
| Wash. U.-St. Louis | 0.42 | 0.39 | Case Western | −0.25 | N/A |
| Emory | 0.45 | 0.44 | Bard | 0.46 | 0.84 |
| Colgate | 1.11*** (28) | 1.32*** (31) | USC | 0.69 | 0.03 |
| Notre Dame | 1.65*** (39) | 2.87*** (69) | Boston College | 1.03*** (25) | 1.44*** (36) |
| Colby | 0.56*** (12) | 0.95*** (21) | Depauw | −0.51 | N/A |
| Vanderbilt | 0.67** (14) | 0.46 | Occidental | −0.22 | 2.04 |
| Mount Holyoke | 0.63 | 0.40 | Tulane | −0.03 | −1.30 |
| U. Virginia | 1.17*** (27) | 2.64*** (64) | Georgia Tech | −0.15 | 1.09 |

*Note*: ***$p$-value $< 0.01$, **$p$-value $< 0.05$, *$p$-value $< 0.10$.

are unranked and some regional colleges and universities. With such a wide range of schools represented we feel that our results are general to both high-ability students and selective schools.

The importance of the USNWR rankings is a hotly debated topic on college campuses across the country. Will efforts to raise a school's rank increase their yield of the best students and improve their student profile? Our results suggest that there is a benefit to a positive change in a school's USNWR rank. We find that full-pay applicants are more likely to attend a school that is higher ranked by even a few places. Aided applicants are less responsive, but still systematically prefer higher-ranked schools. More importantly, these preferences for the USNWR rank are independent of other measures of quality (student–faculty ratio and expenditures per student), and estimates of school fixed effects themselves. This would be less distressing if the USNWR rank were a widely accepted measure of quality. However, the measures included as components of the rank, especially the weights attached to those components, are somewhat arbitrarily chosen in terms of being measures of

educational quality. There are differences in magnitude of the influence of the USNWR ranking across race and gender, but these are smaller than the overall influence of the rankings themselves. Also important in our results is the finding that minorities are more likely to attend schools that have larger minority populations, suggesting that programs or initiatives to diversify the student population make it easier to attract and yield diversity in the future. Our results suggest that admissions officers and other administrators concerned with the quality of incoming classes have reason to be concerned about their school's USNWR rank because it is shown here to be an important factor in the matriculation decision of high-ability students.

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