

Running to Stay in Place: The Stability of *U.S. News*' Ranking System

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Abstract

The ranks of most national universities in the annual *U.S. News* "America's Best Colleges" have not changed significantly during the past eight years. This is true even though most national universities have spent considerable resources and energy trying to improve their ranks. In this paper, we document the stability of the national universities' ranks since 1999, describe how a few private universities have been able to improve their ranks, and discuss whether or not these techniques can be used by other colleges and universities, especially public ones.

Introduction:

In 1983, *U.S. News* published its first rankings of colleges and universities, and except for 1984 and 1986 has ranked colleges and universities every subsequent year.¹ The 1983 and 1985 rankings were based on academic reputation alone, but in 1987 *U.S. News* reduced the weight of academic reputation to 25% of its total score, and introduced a series of other measures which it combined into a single quantitative formula. The formula worked. *U.S. News* rankings have been enormously successful, so much so that they have spawned a whole cottage industry of emulators and competitors – the *Washington Monthly* rankings, TheCenter rankings from the University of Florida, *Maclean's* rankings of Canadian universities, the *TimesHigher Education Supplement's* rankings from London, and from the Institute of Higher Education at Shanghai Jiao Tong University in China a list of the top 500 universities in the world.

¹ *U.S. News* publishes its rankings in late August or early September, but labels them prospectively for the following year. This paper follows the *U.S. News*' convention and use the ranking year to describe the rankings. Thus, 1999 refers to rankings published August 1998; likewise, 2006 refers to rankings that were published August 2005. To add to the confusion, the data *U.S. News* collects for the rankings is retrospective. The 2007 rankings, for example, will be published August 2006, but they will mostly be based on data from fall 2006 and the prior 2004-05 (or earlier) academic years.

Despite this plethora of imitators and competitors, *U.S. News* rankings remain the gold standard of college and university rankings. Not only were they the first, but the *U.S. News* rankings have garnered attention, credibility, and even legitimacy from college administrators, presidents, and trustees across the country who routinely use them as “bragging rights” in their attempts to quantify, justify, consolidate, and enhance the quality of their academic programs. They have the full attention of every college and university president, including those who claim not to pay them much attention.

U.S. News justifies its rankings in terms of helping prospective students learn more about schools they are interested in, and helping them broaden their search to institutions they may never have considered, or even heard of. “Combined with college visits, interviews, and your own intuition, the rankings can be a powerful tool in the college admissions process.” (*U.S. News*, Aug. 29, 2005, p.78). However, studies have shown that only the most competitive students pay much attention to the rankings when deciding where to apply; most students simply disregard them. (McDonough, P., Antonio, A., Walpole, M., & Perez, L., 1997; StudentPoll, 1997). Ironically, the greatest impact of the *U.S. News* rankings may not be upon students (whom they are ostensibly designed to serve), but upon college and university administrators.

The *U.S. News* annual rankings have also had a significant impact on institutional research offices. Institutional researchers at America’s colleges and universities spend seemingly endless hours each year analyzing data from *U.S. News*’ “America’s Best Colleges” issue. The primary purpose of all this hard work is to understand what happened to their college’s rank this year *and* to improve their college’s rank next year. Institutional researchers have analyzed, regressed, and dissected *U.S. News* data in an effort to find the “silver bullet” that will instantly propel their college to higher and higher ranks. Admittedly, there are some year-to-year fluctuations, but the

pattern over the past eight ranking years has been one of great stability, not of great change, in the ranks. For the most part, efforts by institutional researchers to improve their institution's rank have been in vain.

Despite little success, university and college presidents still want to improve their institution's *U.S. News* rank. Presidents of national universities in the top 20 want to become a "top 10" school; those in *U.S. News*' 3rd tier want to become a 2nd tier school; and those in the 4th tier want to move up into the 3rd tier. Across the country, colleges and universities have adopted formalized, and sometimes informal, goals to rise in the college rankings. The president of 3rd tier Virginia Commonwealth University, for example, was reported to carry a card in his briefcase listing his presidential priorities for the next five years. The top one: becoming a tier-two university. The trustees had promised him a \$25,000 raise if Virginia Commonwealth jumped a tier under his watch.² At the University of California, Riverside (UCR), the Chancellor has placed "To enhance UCR's reputational rankings" first in her list of campus goals.³ One of the reputational rankings to be enhanced is UCR's annual ranking in *U.S. News*' publication, "America's Best Colleges."

As mentioned above, the task of developing a strategy to improve the university's *U.S. News* rank is often assigned to the campus institutional research office. This is true at UCR, and the assignment was very specific—to move UCR from the mid-eighties of *U.S. News*' list of national universities and into the "Top 50." To accomplish this task, the Institutional Planning Office staff studied the annual ranks of the top 120 national universities between 1999-2006 in order to identify institutions that had been able to substantially improve their *U.S. News* rank, to

² As described by Nicholas Thompson, "The best, the top, the most," *New York Times*, August 3, 2003, Section 4A, pp.24-27. Virginia Commonwealth University seems not to have succeeded; at least in the 2006 rankings it was still ranked in *U.S. News*' 3rd tier for national universities, where it had been at least since 1998.

³ See < <http://www.chancellor.ucr.edu/goals.html> >.

determine and study the strategies they used, and, if possible, to use those strategies to develop a plan for UCR.

This paper will discuss the steps taken to identify national universities who have improved their *U.S. News* rank, and what they did to improve. Several statistical tests will be described that were conducted to test and look for causal relationships between the actions undertaken by universities and any change their ranks. Lastly, there is a discussion of the implications of those strategies for developing a plan for UCR and other national universities.

Background:

The *U.S. News* ranking scheme is composed of seven major factors – Peer Assessment, Retention, Faculty Resources, Student Selectivity, Financial Resources, Graduation Rate Performance, and Alumni Giving Rate. Three of those variables – Retention, Faculty Resources, and Student Selectivity – are composed of a number of sub-factors. For example, the Retention factor includes six-year graduation rates and freshmen retention rates; the Faculty Resources factor includes undergraduate class size, faculty compensation, percentage of faculty with Ph.D. or other terminal degree, the student/faculty ratio, and the percent of full-time faculty; and the Student Selectivity factor includes SAT or ACT scores, high school class standing, and acceptance rate. The table below documents the fifteen major variables for national universities and national liberal arts as they appeared in the 2006 rankings (published August 29, 2005). While variable definitions and weights differed slightly for comprehensive regional institutions, the basic structure of the ranking system is the same across all four-year colleges and universities.

Weight	Factor
25%	Peer Assessment
20%	Retention <ul style="list-style-type: none"> - Six-Year Graduation Rate (80%) - Freshman Retention Rate (20%)
20%	Faculty Resources <ul style="list-style-type: none"> - Class Size Less than 20 (30%) - Class Size 50 or Greater (10%) - Faculty Compensation (35%) - Percentage of Faculty with Top Terminal Degree (15%) - Student/Faculty Ratio (5%) - Percent of Full-Time Faculty (5%)
15%	Student Selectivity <ul style="list-style-type: none"> - ACT or SAT Scores (50%) - High School Class Standing (40%) - Acceptance Rate (10%)
10%	Financial Resources
5%	Graduation Rate Performance
5%	Alumni Giving Rate

In a paper presented at AIR in 1995, “Changes in College Rankings: How Real Are They,” Machung argued that much of the annual changes *U.S. News* rankings that national universities were experiencing at that time were due not to actual changes in their performance, but rather to changes in the underlying methodology that *U.S. News* was using. One of the most notable characteristics of national universities, she wrote, is that they do not change that much from year to year. Admittedly, they are not static either, but in general, national universities are characterized more by continuity than by discontinuity. Yet up through about 1996 the *U.S. News* rankings of many national universities were changing seemingly almost randomly every year.

Not only did this instability distress many colleges and universities, but it began to undermine the credibility and legitimacy of the rankings themselves. Institutional researchers and college presidents alike were outraged. In September 1996, in a letter to James Fallows, the newly-hired editor of *U.S. News*, Gerhard Caspar, then president of Stanford, wrote that he was “extremely skeptical that the quality of a university can be measured statistically” and argued that such movement itself:

-- while perhaps good for generating attention and sales – corrodes the credibility of these rankings and your magazine itself. Universities change very slowly, in many ways more slowly than even I would like. Yet, the people behind the *U.S. News* rankings lead readers to believe either that university quality pops up and down like politicians in polls, or that last year’s rankings were wrong but this year’s are right (until, of course, next year’s prove them wrong.⁴

Partly in response to Caspar’s letter, in 1997, *U.S. News* commissioned the National Opinion Research Center (NORC) to undertake a critical review of its methodology. Among other issues, NORC recommended that “once *U.S. News* settles on a methodology, it should remain constant unless there is compelling evidence for change.” While NORC did not rule out the need or possibility for changes in the future, it did suggest that “the presumption should be against change unless there is strong evidence of change in validity of the measures.”⁵

Indeed, *U.S. News* seems to have listened to NORC and stabilized its methodology. Admittedly, there have been a few highly publicized changes since the late 1990s, but these have been relatively few and far, especially compared to prior years. However, three significant changes

⁴ The letter, initially private, has since entered the public domain and been widely quoted. See <http://www.topcollegerankings.com/Stanford-usnews.html>.

⁵ The 1997 NORC report, “A review of the methodology for the *U.S. News & World Report*’s ranking of undergraduate colleges and universities,” was regarded as proprietary information by *U.S. News* and was not released publicly. In the course of researching his 2000 article on the rankings for the *Washington Monthly*, reporter Nicholas Thompson received a copy of the report. The NORC report and *U.S. News*’ response to it are available online at: www.washingtonmonthly.com/features/2000/norc.html.

have occurred since 1999. In the 2000 rankings *U.S. News* standardized all variables in its ranking model, a procedure that catapulted CalTech into #1, displacing first-ranked Harvard, Princeton and Yale. The following year, after a hefty dose of criticism from baffled readers, including some from the displaced Ivies themselves, *U.S. News* adjusted each school's research spending according to the ratio of its undergraduate to graduate students and applied a logarithmic adjustor to deal with "so-called statistical outliers." CalTech (the statistical outlier) was pushed back into fourth, and Harvard, Princeton and Yale were back on top.⁶

The last change occurred in the 2004 rankings when *U.S. News* eliminated "yield" as a variable on its Student Selectivity Index, and distributed its weight among the other three variables on this index. *U.S. News* argued that the weight given to "yield" was so small (1.5% of an institution's total score) that eliminating it would have little effect on the overall rankings. Yield had been a controversial variable; critics had charged that schools were adopting early decision programs in order to increase their yield (and thus their standing on the *U.S. News* rankings) to the detriment of low-income students, who needed to be able to compare financial aid offers from multiple institutions and thus could not commit themselves to one institution in November or December, as required by most early decision programs. No longer wanting to be involved in the discussions around the proliferation of early decision programs and its effect on low income students, *U.S. News* dropped yield from its ranking model.

Aside from these three changes – standardization of variables in 2000, adjustments to the computation of research expenditures in 2001, and elimination of yield in 2004 – the basic structure of the *U.S. News* ranking model for national universities has been stable since the late

⁶ See Amy Graham and Nicholas Thompson, "Broken Ranks," *Washington Monthly*, September 2001. Graham and Thompson, in fact, predicted in advance that *U.S. News* might modify its formula in order to drop CalTech back below Harvard, Princeton and Yale. "Morse declined to say how the formula has been changed for the rankings that will be printed on September 4th of this year," he wrote. "But if Caltech's ranking drops and one of the three Ivies recovers its crown, read the small print carefully."

1990s. Accordingly, it is hypothesized that most of the changes that have occurred since this period of time are due *not* to changes in *U.S. News*' methodology, but rather to actual changes in institutional performance, as those are reported to *U.S. News*. Change, of course, can occur for multiple reasons – changes in the methodology used to rank institutions, errors in reporting data, or actual changes in institutional performance. However, once the ranking model is stabilized, the primary cause of institutional changes in rankings will become change in institutional performance on one or more of *U.S. News*' indicators. . Since national universities do not change very rapidly, it is anticipated that there will be little change in the rankings of national universities since the late 1990s.

It is important to distinguish here between annual changes in the rankings due to short-term fluctuations and significant changes over a longer period of time. While schools often do switch places on an annual basis, moving up or down a notch or two, most of these annual changes are, in fact, “blips” that tend to cancel themselves out over time. Errors in reporting data are a prime example of this, since they tend to be found and corrected the following year. Such change is not considered to be significant, since an institution's ranking usually reverts back to its original location.⁷ Given the stability of national universities, significant change, either upward or downward, usually takes multiple years to manifest itself. For purposes of this analysis, “significant change” is defined to be consistent change, either up or down, in the *U.S. News* ranking of a national university between 1999 and 2006. The university whose ranks are significantly changing will see steady, stable, and long-standing changes in its rank in a consistent direction. Small fluctuations of a couple of ranks that do not result in consistent movement upward or downward over time are defined as insignificant. Admittedly, nine years is

⁷ In the 2006 rankings (published August 2005), for example, UC Davis fell six places, from #42 to #48, due to a campus error reporting the percentage of faculty who hold doctorate or professional degrees. The data the campus reported to *U.S. News* indicated that 64% of its faculty held terminal degrees; the correct figure (reported in earlier years) was 98%. We expect that in the 2007 rankings, coming out August 2006, that Davis will bounce back to its previous position, around #42 or #43.

a short period of time in the life of an institution, but it should be long-enough for significant institutional change to manifest itself. Moreover, the 1998-2006 ranking years also correspond with a period of increased methodological stability in the *U.S. News* ranking model, making an analysis of substantial long-term institutional change (or its absence) in the *U.S. News* ranking model feasible for the first time.

Methodology

The data for this study was limited to nine years of data from 1998 through 2006 for national universities ranked in the top 50 and to three years of data from 2004 through 2006 for national universities ranked between 51 and 120. Values were available for all main categories, i.e. Peer Assessment, Graduation Rate Performance, Selectivity Rank, Graduation and Retention Rank, Financial Resources Rank, Faculty Resources Rank, and Alumni Giving Rank, but were unavailable for several sub-categories including Faculty Compensation, Percentage of Faculty with Top Terminal Degree, and Financial Resources.

Limited availability of data, with much of it in rank format, restricted the types of analyses that could be performed and prompted the use of a variety of exploratory analyses. The initial analysis involved performing the runs test to demonstrate stability in the ranks⁸. This procedure was chosen because it measures longterm stability and was compatible with the data.

Results from the runs test were then interpreted with a series of exploratory graphs which displayed performance measures for universities in the top 50. The approach taken to compute the performance measures for this study, mimics *U.S. News*' approach for measuring academic quality, as based on the input factors of peer assessment, graduation and retention rank, faculty

⁸ See, Daniel, Wayne W. (1990). *Applied Nonparametric Statistics*, Boston: PWS-KENT Publishing Company.

resources rank, selectivity rank, financial resources rank, graduation rate performance, and alumni giving. This study, however, measured the extent to which universities' overall academic quality has changed over the years instead of examining how universities compare at a specific point in time as *U.S. News* does annually for its rankings publication.

The decision to mimic *U.S. News*' methodology was not made under the assumption that it is possible to accurately measure academic quality. Rather, summative measures were needed that showed the level of change among universities relative to one another with the computation needing to be consistent with the *U.S. News* ranking scheme. This allowed a connection to be established between stability in the rankings and the computed performance measures. In theory, *U.S. News*' total scores should have been sufficient to provide an explanation but proved inadequate because the values were derived from a series of logarithmic and other transformations that masked true differences.

Ideally, the summative measures computed should have employed performance indicator values in their simplest form, such as each university's raw graduation, retention, and acceptance rates without having undergone any sort of transformation. Because the complete set of data was unavailable, data was used on the seven main performance indicators, including rank data, and the corresponding weights *U.S. News* assigned to them. The performance measures were computed using Equation 1. For instance, the 1999 performance measure for the i^{th} university was estimated by taking each indicator (Peer Assessment Score, Graduation Rank, Faculty Resources Rank, etc.) and computing differences between the 1998 and 1999 values. Once differences were calculated for all universities, indicator values for i^{th} university were standardized and the performance measure computed.

$$P = 0.25*Peer_{((y,y-1),i)} - 0.20*Grad_{((y,y-1),i)} - 0.20*FacRes_{((y,y-1),i)} - 0.15*Selec_{((y,y-1),i)} \\ - 0.10*FinRes_{((y,y-1),i)} + 0.05*Perform_{((y,y-1),i)} - 0.05*AlGiv_{((y,y-1),i)}$$

for $y = 1998, 2000, \dots, 2006$ and $i = 1$ to 50 (1)

A scatter plot of performance measures against change in ranks supported the model as a reasonable indicator of expected change in rank (See Figure 1) and was more consistent than using change in score. The correlation between performance measure and change in rank was higher at $r=-0.598$ than the correlation between change in score and change in rank, $r=-0.298$ (See Figure 2).

Figure 1 Performance Measure and Observed Change in Rank for National Universities in top 50.

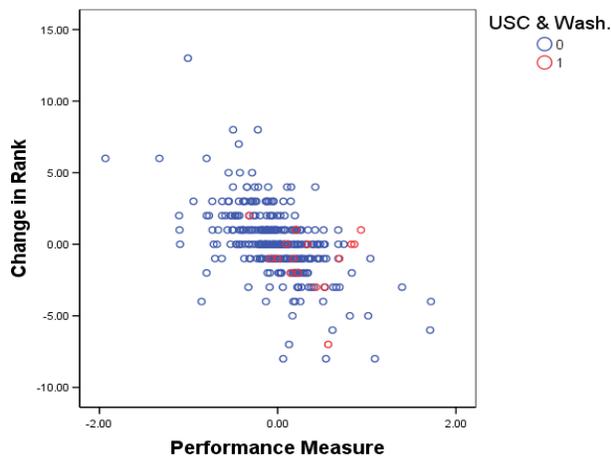
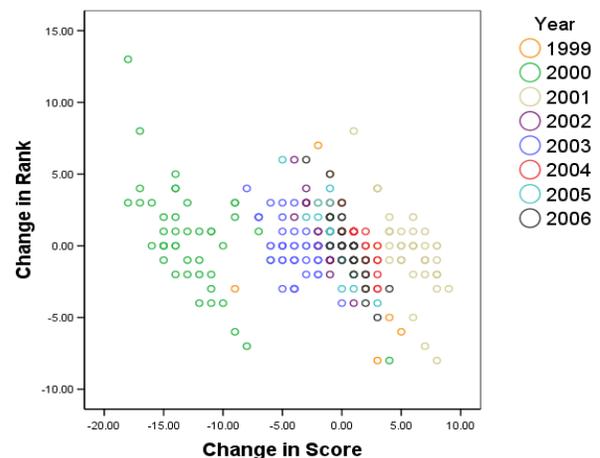


Figure 2 U.S. News Total Score and Corresponding Change in Rank for National Universities in top 50.



Following this series of graphical exploratory measures, a procedure called Dominance Analysis (DA), developed by Azen and Budescu (2003), was used to supplement the findings and determine whether colleges are equally affected by the variables in the *U.S. News* ranking model. For example, DA can be used to determine if Financial and Faculty Resources are as important to predicting score for national universities ranked 51 through 120 as they are for national universities in the top-50.

Using the DA procedure, all possible combinations of pairs of predictor variables were compared one at a time. Regression models were run for all possible subsets of the variables, and a comparison was made of the contribution to total score made by each predictor in each subset, as defined by the squared semi-partial correlation. The predictor variables that contributed the most on their own and in the presence of other predictors were defined as the most important. A comparison was made of all pairs of predictors until a ranking order of importance was established. With each comparison, a bootstrap procedure was used to resample the data and compute the probability that one predictor dominated the other.

There are three levels of dominance – complete, conditional, and general. With complete dominance, one predictor contributes more to each model than does the other predictor, regardless of model size. Conditional dominance refers to situations where a predictor contributes more, on average, to all subset models of similar size. General dominance occurs when additional contributions are averaged over all subset models. If the average contribution to total score is greater for one predictor then it generally dominates the other. Complete is the strongest form of dominance followed by conditional and then general.

Lastly, a regression procedure was used to develop a model for predicting total score using a subset of the indicators; then, the relationship between score and rank was modeled using curve estimation.

Findings

Stability in the Ranks

The runs procedure is used to find a series of consistently increasing or decreasing ranks. A series is considered random if the ranks vary around a constant mean and there is no pattern of

observations trending upwards or downwards. Only the overall ranks for the University of Southern California (USC) ($z=-2.129$, $p=0.033$) and Washington University in St. Louis ($z=-2.129$, $p=0.033$) failed the test, indicating their ranks have been steadily increasing while ranks for all other top 50 universities have been fluctuating in a manner expected under conditions of randomness.

Exceptions

USC's and Washington University's ability to improve their ranks was partially explained by creating a series of performance measures graphs. Figure 3 displays eight-year average performance measures plotted against average rank for each national university in the top 50. Note that USC is an extreme outlier with an average score of 0.58 and an average rank of 35. It can be inferred from the graph that USC's status as an extreme outlier allowed it to significantly improve its rank. Although Washington University's score is much lower at 0.13, it is also somewhat of an outlier given its 8-year average rank of 14. It is important to observe that Washington University's average level of improvement is more than twice that of all other national universities in the top 20.

Yeshiva is also an outlier with an average score of 0.40 and an average rank of 43. Unlike USC and Washington University, Yeshiva's annual performance was inconsistent. It out-performed other national universities of similar rank during two years, 1999 and 2002, but wasn't as successful the other six years. Shifts in its yearly rank cancelled each other out. Rensselaer Polytechnic also displayed a higher than average score at 0.33 and an average rank of 47. Its rank improved by 6 positions between 1999 and 2006. But it failed the runs test due to an insufficient number of observations as its rank fell below 50 in 2000. Ranks were not disclosed for national universities ranked 51 to 120 at that time.

Figure 3 8-year average performance measure by 8-year average rank for top 50 national universities, 1999-2006.

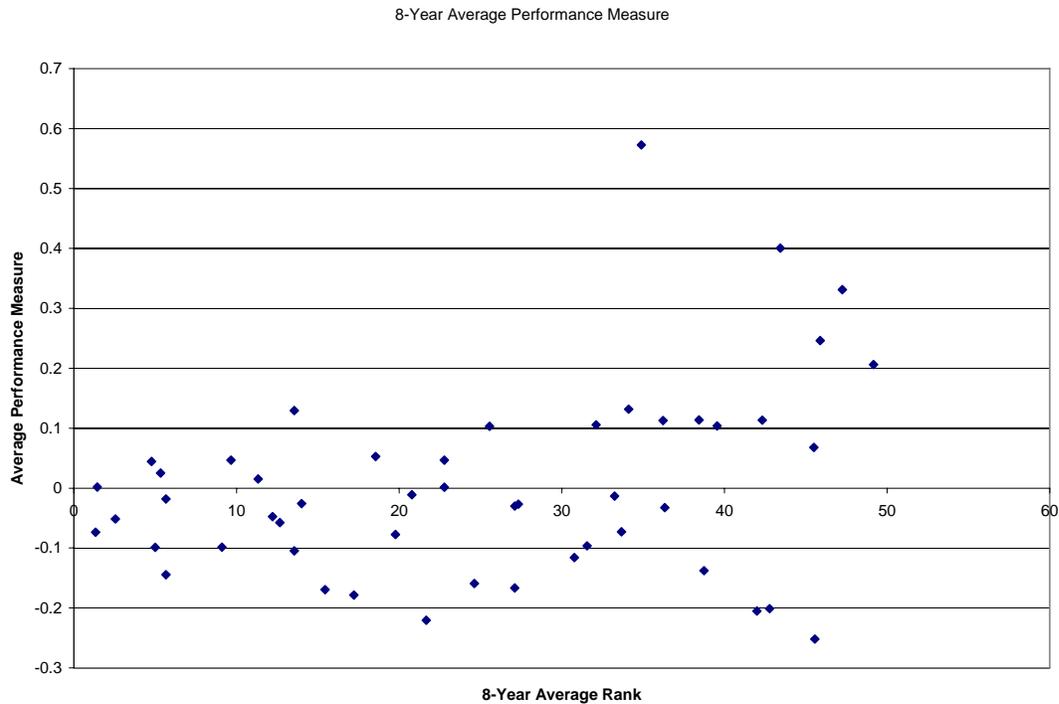
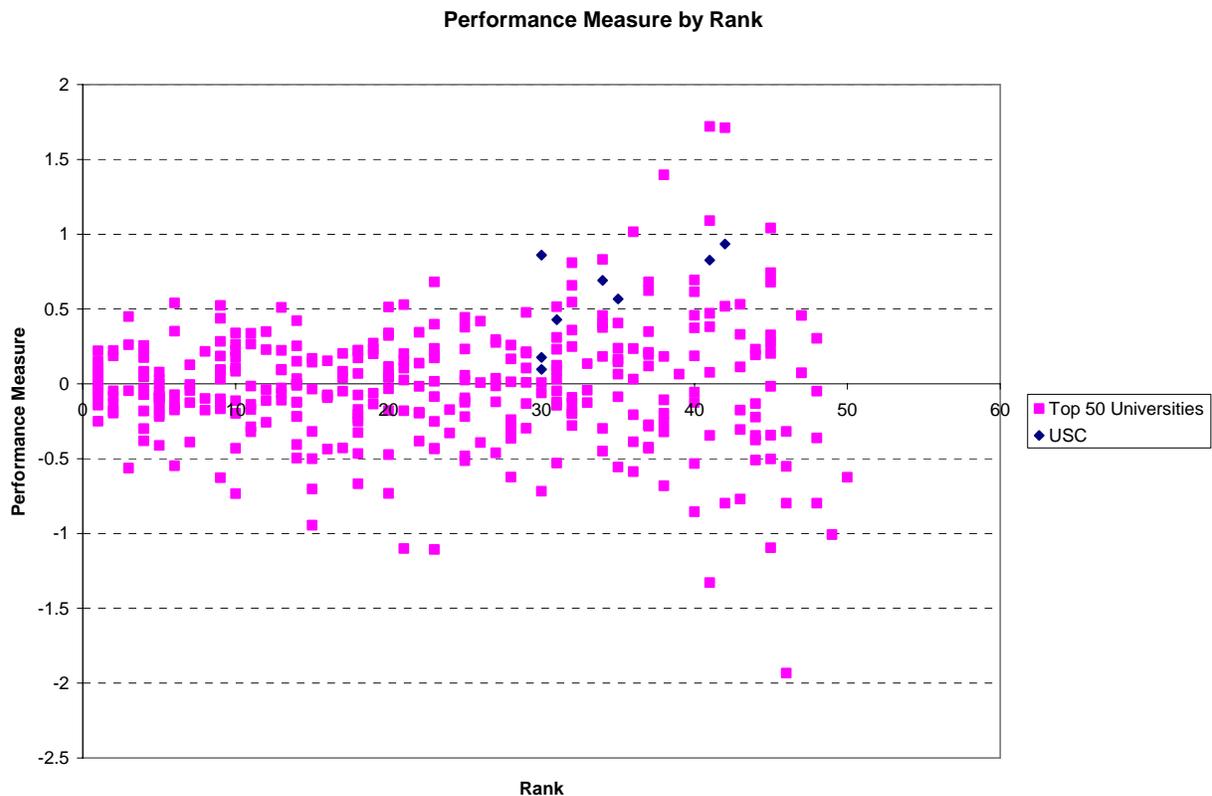


Figure 4 illustrates how national universities ranked 1 to 29 have a smaller performance measure range than national universities ranked 30 to 50. At rank 30, variability between performance measure values increases as overall rank moves toward 50. An investigation of whether annual changes in SAT scores, freshmen retention rate, alumni giving rate, etc. also increase as overall rank increases was conducted with a series of scatter plots. The graphs showed variability in improvement increased with several predictors as well. Further investigation on the relationship between individual predictors and sub-ranks showed alumni rank fell nearly exponentially as alumni giving rate dropped ($R^2=0.992$). Lack of data on individual predictors and unknowns in the *U.S. News* methodology made it impossible to find relationships between other predictors and their corresponding sub-ranks. For instance, the fit between graduation and retention rate with graduation and retention rank appears to be linear but cannot be confirmed without further

knowledge of the *U.S. News* methodology. The findings do suggest, however, that national universities ranked between 1 and 30 have had less relative change in their predictors than national universities ranked 30 to 120, however universities ranked 1 to 30 require more relative change to see a shift in rank.

Figure 4 Annual rank by annual performance measure for top 50, 1999-2006.



A closer examination of USC's changes over the years reveals it first improved Graduation and Retention and Selectivity. As shown in Table 1b, substantial changes were observed in Acceptance Rate, Freshman in the Top 10% of their High School Class, and SAT Scores. With improving graduation rates, USC received one, two, or three extra points from the Graduation Rate Performance component for each year since 1999. Alumni Giving increased slightly in the beginning, then steadily over the years, so that USC is now ranked 13th best among national universities. It appears USC next targeted Faculty Resources, probably by hiring more faculty and increasing faculty salaries. This was followed by moving up the Financial Resources Rank.

All these changes in rank seemed to affect USC's academic reputation as well, since its Peer Assessment score, which is something not directly under an institution's control, also rose from 3.7 (Check this versus Table 1a) to 3.9. In sum, and as shown in Table 1a, USC improved in all areas. Washington University's strategy was similar to USC's in that improving Student Selectivity early was key to its success. In fact, following a successful capital campaign in the 1990s, Washington University substantially increased its merit aid in order to recruit students with higher SAT scores and higher high school GPAs. Not surprisingly, this raised Washington University's rank on *U.S. News*' Selectivity measure from 29 to 6. Since students with higher SAT scores tend to have higher graduation rates, recruiting better students also helped Washington University to improve its graduation and retention rates. This was followed by rising on the Financial Resources and Faculty Resources rank. Washington University's rise on the Faculty Resources rank is interesting. The Faculty Resources rank is composed of four variables: faculty salaries, undergraduate class sizes, percent full-time faculty, and percent faculty with terminal degrees. As shown in Tables 2a and 2b, class size and percent full-time faculty did not change over the 1998 to 2006 time period. Since virtually all faculty members at national universities have terminal degrees, significant increases in faculty salaries must have been responsible for Washington University's rise in the Faculty Resource Rank from 12 to 5 between 2002 and 2006. Increasing faculty salaries and allocating more money into scholarships and fellowships undoubtedly also helped Washington University rise on *U.S. News* Financial Resources rank as well. In sum, like USC, Washington University improved in nearly all areas.

Table 1a. USC Most Significant Changes Overall

	1998 Rank	2006 Rank	Overall Change
Alumni Giving Rank	69	13	56
Selectivity Rank	70	19	51
Graduation and Retention Rank	77	41	36
Faculty Resources Rank	42	30	12
Peer Assessment	3.8	3.9	0.1
Financial Resources Rank (1998-2002)	37	49	-12
(2002-2006)	49	44	5

Table 1b. USC Specific Changes

	1998 Value	2006 Value	Overall Change
SAT25	1050	1260	210
SAT75	1310	1440	130
Acceptance Rate	0.72	0.27	-0.45
Freshman Top 10%	0.43	0.84	0.41
Alumni Giving Rate	0.20	0.36	0.16
Graduation Rate	0.69	0.82	0.13
Class Size Less Than 20	0.50	0.61	0.11
Class Size Greater Than 50	0.17	0.11	-0.06
Freshman Retention	0.90	0.95	0.05
Percent Full Time Faculty	0.82	0.83	0.01
Student Faculty Ratio	13	10	-3

Table 1c. USC Order of Change

Selectivity Rank
Graduation and Retention Rank
Faculty Resources Rank
Alumni Giving Rank
Financial Resources Rank
Peer Assessment

Table 2a. Washington Univ. Most Significant Changes Overall

	1998 Rank	2006 Rank	Overall Change
Selectivity Rank	29	6	23
Alumni Giving Rank	22	9	13
Graduation and Retention Rank	21	17	4
Financial Resources Rank (1998-2000)	3	7	-4
(2000-2006)	7	4	3
Faculty Resources Rank (1998-2002)	8	12	-4
(2002-2006)	12	5	7

Table 2b. Washington University Specific Changes

	1998 Value	2006 Value	Overall Change
SAT25	1200	1350	150
SAT75	1400	1520	120
Acceptance Rate	0.51	0.22	-0.29
Freshman Top 10%	0.66	0.93	0.27
Graduation Rate	0.82	0.92	0.10
Alumni Giving Rate	0.31	0.39	0.08
Freshman Retention	0.95	0.97	0.02
Student Faculty Ratio	9	7	-2
Class Size Greater Than 50	0.08	0.08	0
Class Size Less Than 20	0.76	0.74	-0.02
Percent Full-Time Faculty	0.93	0.92	-0.01

Table 2c. Washington University Order of Change

Selectivity Rank
Alumni Giving Rank
Financial Resources Rank
Faculty Resources Rank
Graduation and Retention Rank

Predictors Most Affecting Rank

While the strategies used by USC and Washington University offer insight into the institutional changes required to produce a positive change in rank, predictors which may have been important to their strategies may be less important or useful to other national universities, particularly those ranked 51 through 120. Dominance Analysis is designed to detect the order of predictor importance and it was found the order differed between the top 50 national universities, and those ranked greater than 50. (See Table 3). The order differs from the weights assigned by *U.S. News* because DA was able to account for correlation between variables by detecting those variables which improve prediction partially due to their correlation with other predictors and ranked them accordingly. The main difference among national universities is the high importance of Peer Assessment to the top 50 national universities, second only to Selectivity, compared to national universities ranked 51 to 120 where Peer Assessment is at the bottom of the list and Graduation and Retention Rate is most important.

Table 3 displays *U.S. News* weights assigned to the predictors and results from the dominance analysis procedure including the average probability a predictor dominates variables of lower importance and the confidence level on that probability. The summary is based on the *general* level of dominance. For universities ranked 51 through 120, the results show Graduation and Retention Rank *conditionally* dominates all predictors; and for the top-50 universities, Peer Assessment conditionally dominates all but Student Selectivity.

Table 3 Predictor importance and the average probability that the predictor dominated each lower ranked variable with 1,000 bootstrap samples.

Order of Predictor Importance Top 50	U.S. News Weight	Ave. Prob. Predictor Dominates Variables of Lower Importance	Confidence Level	Order of Predictor Importance Tiers 2 and 3	U.S. News Weight	Ave. Prob. Predictor Dominates Variables of Lower Importance	Confidence Level
Student Selectivity	15%	0.931	93%	Graduation and Retention Rank	20%	0.897	90%
Peer Assessment	25%	0.999	100%	Student Selectivity	15%	0.924	92%
Graduation and Retention	20%	0.940	94%	Faculty Resources	20%	0.750	75%
Faculty Resources	20%	0.953	95%	Financial Resources	10%	0.801	80%
Financial Resources	10%	1.00	100%	Graduation Rate	5%	0.799	80%
Alumni Giving	5%	1.00	100%	Performance	5%		
Graduation Rate				Peer Assessment	25%		
Performance	5%			Alumni Giving	5%		

Relationship Between Score and Rank

Universities that wish to estimate their total score and rank may do so with regression equations. But there are three precautions in modeling the equations: 1) the procedure operates under the ideal assumptions there will be no changes in the ranking methodology; 2) that other national universities' predictor values have not changed; and 3) that high correlations between variables can cause problems if multicollinearity is not controlled. Taking overall score as the dependent variable and a subset of indicators as the independent variables, models with R-Squared values in the 0.98 to 0.99 range can be achieved with different combinations of predictor variables. The predicted score can then be used to estimate the corresponding rank.

Using 2004 to 2006 data for all national universities, a model was developed to determine the relationship between score and rank with curvilinear regression analysis. An exponential model was adopted for national universities with *U.S. News* total scores less than 70 ($F=360987$, $p<0.001$, $R\text{-sq}=0.993$) and a quadratic curve was adopted for total scores 70 and above ($F=4712$, $p<0.001$, $R\text{-sq}=0.992$). Figures 5 and 6 display the fit.

Figure 5 Exponential fit of scores for national universities ranked 30 or higher

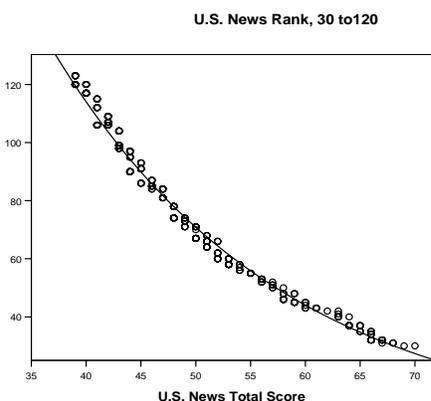
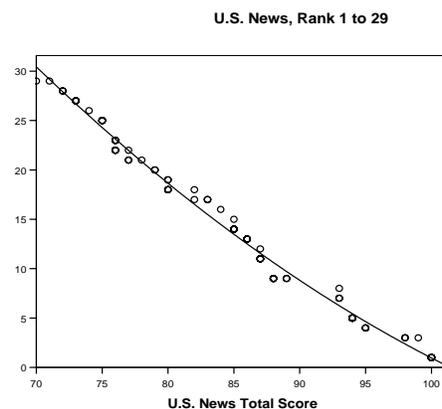


Figure 6 Quadratic fit of scores for national universities ranked lower than 30



The regression models support earlier findings from the performance measures and graphical analyses that top ranked universities improve their scores and ranks less easily than do other universities. Top ranked universities scores are more stable and a fixed amount of change in total score has less effect on their rank than it does for other universities.

Dominance Analysis further showed predictors affect universities differently despite the fixed predictor weights in the *U.S. News* formula. But it's almost irrelevant given the findings which show that despite continual efforts by universities, ranks have remained stable during the past nine years. Given the two exceptions identified, it appears defying the odds requires a long-term strategy with a commitment to improve substantially in all areas determined by *U.S. News* to be the indicators of academic quality.

Discussion:

The *U.S. News* rankings have always been stable at the very top. Mel Elfin, the craggy editor behind the creation of the *U.S. News* rankings, used to argue that, of course, the ranking model was correct since it confirmed what everybody already knew—that Harvard, Yale and Princeton were the best institutions in the country. Change could happen below, but at the very top the

waves were always (or almost always) smooth. But since the late 1990s, as has been shown, the rankings of the top 120 national universities have also become more stable and more predictable as well. Only two institutions—Washington University in St. Louis and the University of Southern California in Los Angeles—stand out as exceptions. Since 1998, Washington University has risen 6 places and USC 11 places.

How did they do it? Statistical analysis of the data can provide some answers, but anecdotal information gleaned from the media also offers insights. Indeed, USC's and Washington University's rise has not gone unnoticed in the national press. In fact, the *Los Angeles Times* (March 19, 2004) linked USC's rise from number 42 in 1998 to number 30 in 2004 to a record-setting \$2.85 billion capital campaign and a "\$100-million hiring spree" designed, in part, to attract top faculty talent. Likewise, the *New York Times* (Dec. 22, 2003) attributed Washington University in St. Louis's rise from number 20 in 1995 to number 10 in 2003 to a "wildly successful" \$1.5 billion fund-raising campaign that enabled it to rise on financial resources and student selectivity. The *New York Times* traced Washington University's rise on student selectivity to additional resources it poured into merit-based aid, which enabled the campus to recruit a higher caliber student body, thereby raising its SAT scores and graduation rates while lowering its admit rate – all significant variables in the *U.S. News* ranking model.

But if the analysis presented here is correct, it takes more than a single change on one or two variables for a school to rise steadily and consistently in the *U.S. News* ranking system. As the analysis has shown, both Washington University and USC improved on virtually *all* ranks. The stories in the media paint only a partial picture of the underlying structural change these institutions seem to have gone through over a period of time. However, they do point out one thing both universities had in common: large endowments coupled with a very large and very successful capital campaigns—campaigns that enabled them to generate significant amounts of

new resources and apply them to specific variables of importance in the *U.S. News* ranking model, especially faculty salaries and merit aid.⁹

Many have noted the resource-driven nature of the *U.S. News* ranking model: faculty salaries, student-faculty ratios, small classes, financial resources, even alumni-giving rates are all a direct function of the financial resources available to an institution. So, it should not be surprising to find that institutions need *substantially more* financial resources – above what they already have – to really rise in the rankings. But while additional resources may be essential, they are not sufficient in themselves, for the funds raised need to be directed into areas where they will promote upward movement on *U.S. News*' variables. For that, institutions also need financial flexibility (often guaranteed by large endowments) as well dedicated, focused, long-term commitment coming from the very top. Washington University and USC seem to have had all three – the resources, the financial flexibility, and the institutional commitment (coming from Chancellor Mark Wrighton and President Steven Sample) to rise in the rankings.

What about institutional commitment alone? Can it work without significantly large infusions of new cash? In two related articles, Ehrenberg (2002, 2000) has described a number of strategies, not all of them resource-driven, that Cornell and other national universities and national liberal arts colleges have tried in order to raise their *U.S. News* ranking – from not requiring SAT scores for admission (to raise average SAT scores), to encouraging applications from students they are not likely to admit (to reduce admit rates), to developing early decision programs (to increase yield), to soliciting small donations from many alumni rather than large donations from a few (to increase alumni giving rates). While any of these strategies might help a little, none of them are

⁹ Ehrenberg (2002) argues that faculty salaries, which counts for 35% of USNWR's faculty resources variable, may provide part of the reason that faculty salaries in the private research and doctoral universities have risen so substantially relative to those in public research universities during the last 20 years: "While salary increases for faculty at public research and doctoral universities have been constrained by limitations on state funding, private institutions have vigorously increased their spending to enhance their activities and their reputations."

likely to promote significant long-term growth. Why? Because they are relatively easy and inexpensive to implement, making it likely that many institutions will implement them, and that nobody will gain the necessary competitive advantage. The rapid proliferation of early decision programs across private institutions during the 1990s illustrates this point especially well.¹⁰

Strategies to improve a national university's rank, then, are a double-edge sword. If all institutions apply these strategies, then each school's rank will not change very much, leading to continued stability in the *U.S. News* ranks. Clearly, the ability of a school to develop a successful strategy for rising in the *U.S. News* rankings is dependent upon a lack of long term commitment or the *inability* of other schools to replicate its success. Hence the importance of wildly successful fundraising campaigns. Few institutions can really replicate that.

The legitimacy of the U.S. News system rests in part upon its stability. While the ranking system may have helped some students and parents make more informed decisions about which college to attend, it has also (perhaps even more importantly) sharpened minute distinctions in institutional prestige and broadcast them widely. Prestige is the coin of the realm in academe, leading to the recruitment of better faculty, better students, more research funding, and more private funding. Monks and Ehrenberg (1999) found that when a top national private university improved in the rankings, it could reduce the amount of institutional grant aid it spent attracting its class, but when its rankings fell, it had to spend more to attract its class. In short, changes in its *U.S. News* ranking even affected its financial aid bill. Thus, colleges and universities pay inordinate amounts of attention to the rankings. But if this analysis is correct – that it is very difficult for national universities to rise significantly in the *U.S. News* rankings – warning flags should be raised about the costs involved in playing this competitive game.

¹⁰ See Machung (1988) for a broader discussion of the issues involved.

But costs are involved in not playing the game as well, for schools can not only rise in the rankings, they can tumble as well. Maybe their performance on a measure declined, maybe they made an error reporting data to *U.S. News*, or maybe *they did nothing to improve*. Since the rankings are constructed *de novo* every year, schools are measured not against their performance last year, but against how they performed vis-à-vis their peers this year. Thus, an institution's rank can drop even if it submitted exactly the same data it had the previous year.¹¹ Despite the large institutional costs involved, it behooves schools to keep improving the data they submit to *U.S. News* – either that, or risk falling behind. In short, given the current stability of the *U.S. News* ranking system and the competitive pressures under which they operate, most national universities are running, just to be able to stay in place.

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¹¹ This is precisely what happened to Hobart and William Smith College. When the 2001 *U.S. News* rankings were published in September 2000, Hobart and William Smith College, a tier-2 college, suddenly found itself ranked in the 3rd tier. A senior administrator at the college had failed to report current year data to *U.S. News* and *U.S. News* had computed the institution's ranking using year-old data. Because other national liberal arts colleges had “improved” in their *U.S. News* categories during the previous year, Hobart and William Smith was pushed down in the 3rd tier, making it look like its performance had actually fallen whereas, in fact, other schools around it in the ranking scheme had actually improved. Needless to say, the college undertook vigorous efforts at damage control, and in the 2002 rankings (published September 17, 2001), it was back in the 2nd tier.

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