Academic Rankings: A Trivial Contest?

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In 1983, *U.S. News & World Report* declared Stanford University America's Best University (Solarzano 41); in 2004 Harvard and Princeton Universities were tied for this distinction (*USNWR* 82). Over the last twenty years, there have been numerous changes in institutions' rankings. Thus, there is a question of why have the rankings changed so much. A study of the 1983, 1988, 1993, 1998, and 2004 rankings indicates that changes in the methodology, including the weights and measures, is a significant factor in determining an institution's rank. Comparisons of the methodology indicate that the inclusion of institutional characteristics, have been advantageous to the rankings of small, private universities at the expense of large, public ones. Additionally, several factors used in the rankings significantly impact an institution's rank more than others; and many that are included are neither individually nor jointly significant at a conventional level of significance. However, the rankings have become more consistent over time, as the methodology has become more invariable.

HISTORY

Over the last twenty years, there has been a proliferation of publications ranking the quality of undergraduate education in America with *U.S. News & World Report (USNWR*) leading the way with over 2.3 million in sales of its America's Best Colleges and Universities edition (McDonough 514). Yet, the concept of academic rankings extends back to the late 1880's where the U.S. Bureau of Education ranked institutions "based solely on the performance of each institution's graduates after they entered the nation's best-regarded graduate schools" (Webster 503). These rankings were to be used by American Universities in order "to evaluate the colleges from which students applied to graduate school. From this information the graduate schools could supposedly predict how well prepared these students, based on their undergraduate records, were likely to be; whether they should be admitted; and if admitted to graduate school, whether under regular or probationary status" (Webster 501). However, these rankings went unpublished.

In 1910, James McKeen Cattell published the first academic quality rankings based on the alma maters of individuals in the Who's Who in Scientific America (Cattell 425). This was later refined and rankings were then based upon the institutions where prominent academics were employed. As Cattell "equated a school's proportion of starred scientists with its 'quality,' [as] 'students should certainly use every effort to attend institutions having large proportions of men of distinction among their instructors'" (Webster 116).

Table 1-Cattell's Leading Academic Institutions, 1910

1	Harvard University	9	University of Michigan
2	University of Chicago	10	University of California-Berkeley
3	Columbia University	11	Stanford University
4	Johns Hopkins University	12	Princeton University
5	Yale University	13	University of Illinois
6	Cornell University	14	University of Pennsylvania
7	University of Wisconsin	15	Clark University
8	Massachusetts Institute of Technology		

From Cattell's "Man of Science" p. 468

Following in Cattell's footsteps, other academic rankings began being published. In 1925, Raymond H. Hughes published *A Study of the Graduate Schools of America*. He solicited the advice of faculty from his institution for a list of raters and universities and selected twenty disciplines at thirty-six institutions. [T]he raters chose all departments that 'they thought were adequately equipped for graduate work and to 'star' approximately the best 20 of them" (Stuart

15). In 1959 Hayward Keniston published a "reputational ranking of 25 leading universities" through a survey of department chairs and a compilation of Hughes's data (Stuart 15). *An Assessment of Quality in Graduate Education* published by Allan M. Cartter in 1966 "evaluat[ed] 106 institutions [and] ranked departments on two separate criteria: quality of the graduate faculty and rating the doctoral training…The Cartter Report sold some 26,000 copies and was reviewed far more widely than any previous reputational ranking" (Stuart 15). In 1969, George W. Pierson published a comprehensive listing of the best universities from 1865-1965 by academic subject by evaluating "where…our leaders, movers, and shakers c[a]me from" (Pierson 24). According to David Webster, these early "academic quality rankings wee read mostly by professors and academic administrators. They usually appeared in publications far too obscure, with circulations far too tiny, for many college students, prospective college students, and their parents to find them, much less read them" (20).

USNWR

Beginning in 1983, *USNWR* began ranking America's best colleges with annual editions commencing in 1987. Early on, these rankings were based solely on reputation, surveying the opinions of college presidents. Over time these rankings have become more mathematical, and in 2003 the rankings were based upon a total of fifteen main criteria with fourteen of them being self-reported by the individual institutions. According to the 2004 edition of *USNWR,* "[e]ach factor is assigned a weight that reflects our judgment about how much a measure matters (Morse 80) [;]" whereby, the weights were published beginning in 1996 (Morse 106).

Recently, other publications, such as *Money*, *Business Week*, and *The Atlantic Monthly* have started their own academic rankings to appraise different characteristics; best buys in education, most selective, and one publication even assesses "Great Ski Colleges" (Stuart 17). Yet, the outcomes of all the rankings evaluating the best and most selective universities in America have largely produced similar results, despite utilizing differing methodologies.

Critics and academics alike have denounced the rankings by *USNWR*, believing that they are an over-simplification of the academic experience and "the measures used to define quality are relatively far removed from the tangible educational experiences of students" (McGuire 47). As Lee C. Bollinger, president of Columbia, stated, "Rankings give a false sense of the world and an inauthentic view of what a college education really is" (Thompson 24). And several institutions including Stanford, University of Pennsylvania, Rice, Michigan, MIT, and Wesleyan have gone as far as "pass[ing] resolutions condemning the ratings" (Garigliano 19). Another problem that has rankled academics is that the methodology and therefore the rankings change annually. As Nanette Tarbouni, Director of Admissions at Washington University, states, "[Y]ou can't be in the same place every year--being in the same spot each year does not sell magazines" (Tarbouni). Despite these denunciations, "[t]he *U.S. News* issues that rank colleges sell so many more copies than an average issue that James Whalen, president of Ithaca College, calls them, in a reference to *Sports Illustrated*, the 'swimsuit' issue" (Webster 20).

In accordance with this sentiment, the purpose of this research study is to:
(1) Determine how changes in the methodology utilized by *USNWR* affect the rankings.
(2) Determine how changes in the variables, through the addition and removal of factors, affect the rankings.
(3) Determine the robustness of the weights assigned to variables by *USNWR*.

This research will attempt to determine the stability of the *USNWR* model for determining America's best colleges and universities. The focus of this study will be to reconstruct

USNWR's rankings utilizing their methodology from 1983, 1988, 1993, 1998, and 2004 with data from 2004 and determine the implications of changes in methodology on rank. These years were selected as they represent five year intervals from the first *USNWR* ranking to the most recent. Assessments will be made as to whether the changes in "America's Best University" are simply based on changes in the model, including both the re-weighting of factors and the factors themselves. Further, additional variables will be added and removed to determine the most relevant factors and determine if the substitution of certain variables affects the model. Finally, sensitivity analysis will be utilized to determine the stability of the weights on a school's rank. Only the top fifty national universities-doctoral, as classified by the Carnegie Foundation for the Advancement of Teaching, for 2004 will be included in this study, as these schools receive the most attention. The implications of this research will help to answer other social questions as to the value of quantifying something that is intangible or does not have an operationalized definition.

The data set will contain factors from the seven general categories (peer assessment, retention, faculty resources, student selectivity, financial resources, graduation rate performance, and alumni giving rate) that *USNWR* utilizes and the additional eleven sub ffactors. Statistics will be taken directly from *USNWR*'s 2004 "Americas Best Colleges" publication, with unpublished data supplemented from other sources as needed. Three additional general categories will be included: age, type of institution (public or private), and the amount of research expenditures. A few additional variables will be included in the sub factors: endowment, number of National Achievement and Merit Scholars, number of faculty that are members of the National Academies, and feeder scores, as determined by the *Wall Street Journal*, for attendance in top graduate school programs. The factors that *USNWR* utilizes are either institutional characteristics or characteristics of the student body. The inclusions of the additional institutional characteristics are intended to serve as a proxy for other possible institutional characteristics. While, the inclusion of Merit Scholars, Members of National Academies, and feeder scores are intended to be measures of quality.

USNWR FACTORS

The following are the categories and weights used by *USNWR* in 2004 in determining the best universities in America:

(A) Peer Assessment (weighted 25%). *USNWR* sends surveys to high ranking academics; presidents, provosts, and deans of admission, at this nation's colleges and universities asking them to rank their peer schools academic programs on a scale of 1 to 5, allowing for a don't know. An opinion-research firm then collects the responses and calculates an institution's reputation score (Morse 81). In the *USNWR* assessment, reputation accounts for a quarter of a university's score. "[Reputation] allows the top academics to account for intangibles. [Further], a degree from a distinguished college so clearly helps graduates get good jobs or gain admission to top graduate programs" (Gater 5). Thus, "[r]eputation essentially has been viewed as synonymous with quality" (Stuart 19). But this score may be viewed as a popularity contest. The subjective nature of the score might reflect an academic's limited knowledge or scope. Top ranking academics are probably very aware of their immediate peers' general reputation, but might only be able to accurately assess the academic quality of their alma maters or current employers. Among this nation's top-tier universities, the average score was 4.1, with the lowest score being a 3 and the highest a 4.9.

      (B) Retention (weighted 20%). The sub factors are six year graduation rate (80%) and freshman retention rate (20%). This category, formerly referred to as student satisfaction, was utilized so incoming students can check on the success of a school at offering classes and services and so "potential students can…learn how hard schools work to keep new students from dropping out" (Gater 6). Despite the objective nature of these statistics, criticisms have been noted, as "[g]raduation rates and retention rates are reported for only the subset of full-time students who began as freshman, although many public institutions have missions to serve a fairly large proportion of part-time students as well as community college transfer students enrolled via education agreements in states such as Florida" (Gater 6). Further, these rates do not account for incoming transfer students. Additionally, Gater notes that "grade inflation can indirectly become a factor in an institution's graduation rate" (6). "[A] 2002 UCLA Higher Education Research Institute study found that on average, 34.4 percent of freshman at public community colleges maintained A averages, compared to 53 percent at public four-year universities and 69.6 percent at private four-year universities, including the Ivy League" (Morgan). If students can more easily pass courses, they might be more apt to take on a larger course-load and hence, graduate more quickly. Additionally, the most selective institutions typically have hard working and motivated students, who are likely to succeed no matter the additional services rendered by the university. Approximately 94 percent of students at these institutions return for their sophomore year and almost 84 percent of entering freshman graduate in six years.

      (C) Faculty Resources (weighted 20%). The sub factors are proportion of classes under 20 (30%), proportion of classes with 50 or more (10%), faculty salary (35%), proportion of faculty with the highest degrees in their field (15%), student-faculty ratio (5%), and proportion of faculty who are full-time (5%). *USNWR* states, "Research shows that the more satisfied students are about their contact with professors, the more they will learn and the more likely it is they will graduate…us[ing] six factors…to assess a school's commitment to instruction" (81). The functional guidelines that *USNWR* uses in defining an undergraduate course are "any course in which an undergraduate was enrolled. [T]his definition is idiosyncratic since no campus defines undergraduate and graduate level courses by random patterns of student enrollment" (Machung 63). The categorization of class size would tend to favor small, private universities over their large, public counterparts. While it is intuitive that smaller class sizes would lead to better learning, the actual number might not be appropriate and the size of the class might be a function of the type of class. In general the top institutions have small classes, over 55 percent of classes have fewer than twenty students and less than 13 percent have more than fifty. Over 91 percent of the faculty at these schools are full-time professors, with an average student-to-faculty ratio of approximately 11 to 1.

      Alexander Astin, director of UCLA's Higher Education Research Institute has found "average faculty salary actually has a negative correlation with student satisfaction and learning. It's largely a proxy for the emphasis the institution puts on research; and unfortunately, research and teaching appear to be fairly exclusive. The more that a school emphasizes publishing papers, or searching out patentable technology, the less it emphasizes access and commitment to students" (Graham 10). Additionally, assessments will need to be made as to the inclusion of faculty salary in the model; only the ordinal ranking of average faculty salary is available, which does not reflect absolute quantity, but relative position. Further, because none of the variables utilized by USNWR indicate the actual quality of the faculty, the additional sub factor of

percentage of the faculty belonging to National Academies (Sciences, Engineering, and Institute of Medicine) will be added.

(D) Student Selectivity (weighted 15%). Entrance examination scores (50%), proportion of incoming freshman who graduated in the top ten percent of their high school graduating class (40%), and the ratio of students admitted to applicants (10%). *USNWR* assesses these categories, as they believe that "[a] school's academic atmosphere is determined in part by the abilities and ambitions of the student body" (Morse 81). Many academics have questioned *USNWR* in their assessment as to the greater importance of SAT scores over high school rank. As these scores are self-reported by the universities, many have tended to exclude SAT scores for certain demographic populations thereby over-inflating scores. For example, some universities have excluded scores for students that are economically challenged, those with learning disabilities, and international students (Stecklow A1). Additionally, B. Ann Wright, the dean of enrollment at Smith College, believes that "high school performance is the very best indicator of college success" (9). Thus, the overall quality of the student body might be more accurately reflected by weighting the proportion of students that graduate in the top ten percent of their high school class more than SAT scores. In general, the students that attend the nation's top fifty universities are among the best and the brightest; approximately 79 percent were in the top ten percent of their high school class with an average SAT score of 1338. An additional sub factor that will be utilized in assessing the quality of the student body will be the number of percentage of students that are National Merit Scholars. This number is less subject to manipulation than SAT scores, as a school will want to report all students in this category. Further, the high school ranking of every incoming freshman may or may not be provided to universities.

The ratio of students admitted to applicants, the yield, has been subject to manipulation. These numbers have been manipulated through early decision programs, as "[i]f schools admit more incoming freshman under a binding Early Decision plan, they can improve their acceptance as well as yield rates" (Gater 10). But, yield rates might not be a reflection of the quality of the student body, as "Emory's admissions dean estimates that between 50 and 60 percent of the applicants that Emory rejected [in 2002] were statistically as strong as those offered admission" (Peck 128). This is because applicants typically only apply to universities for which they have a chance of gaining admission to. Further, acceptance rates might not be a reflection of the student body, as only a select group of students apply to this nation's most elite universities. As a result, an additional sub factor will be added, feeder scores, which will be used as an indicator of the academic abilities of the universities' graduates. Feeder scores, as computed by the *Wall Street Journal*, are the based upon the placement of students in top graduate school programs in the fields of law, medicine, and business. Scores were based upon placement of over five thousand students in fifteen high-ranking graduate programs in 2002 (Bernstein W12). As these scores are computed by an outside source, they are verifiable and less likely to be subject to manipulation.

(E) Financial Resources (weighted 10 %). This factor of expenditures per student is based upon the assumption that "[g]enerous per-student spending indicates that a college is able to offer a wide variety of programs and services" (Morse 81). According to Denise Gater, "[t]he financial resources measure is based on data from the IPEDS [Integrated Postsecondary Education Data System]; however, because public and private university reporting rules are different, the calculations differ slightly. Education expenses are adjusted for research and public service by the percentage of enrollment that is undergraduate" (Gater 11). According to Bob Morse, the Director of Data Research at *U.S. News*, the adjustment is made because "it is not reasonable to give full credit for research dollars to schools with large research and graduate

programs because mainly research benefits graduate students, not undergraduates – particularly in institutions with medical schools" (Gater 12). The flaw that Gater points out is that the "data do not accurately reflect an institution's spending in the specified categories of research and instruction" (Gater 12). Questions then arise as to what percentage of a faculty member's salary is related to instruction and what portion is related to research, whereby the entire salary is considered as an instructional expense. Further, assessments will need to be made as to the inclusion of expenditures per student in the model. Beginning in 1998, *USNWR* stopped publishing the actual expenditure amount in dollars and began publishing the ordinal rankings. The expenditure amounts from 1997 might not be reflective of current expenditures. Further, the differences in the intervals for the 1997 statistics indicate that the relative intervals for the ordinal rankings are indeterminate. For example, in 1997 California Institute of Technology spent the most per student at $73,967 and Massachusetts Inst. of Technology was eighth at $37,376, for a difference of $36,591 per student. The university that spent the sixteenth most per student was Northwestern at $29,760, which is $7,616 less than MIT (*USNWR* 111).

One additional sub factor will be added to this category, university endowment; for the top institutions, the range for this factor is between 44.2 million dollars and 18.3 billion. This figure represents the financial resources of an institution. A large portion of a university's operational budget may be from the income generated by the endowment. Further, this portion of funds may be allocated towards capital expenditures and new faculty, which can lead to improvements to the institution.

(F) Graduation Rate Performance (weighted 5%). "This indicator of 'value added' was developed to include the effect of the college's programs and policies on the graduation rate after controlling for spending and student aptitude" (Morse 81). The graduation performance rate is calculated by dividing the actual rate by the predicted rate. One problem with this factor is in the consideration of the actual graduation rate; schools can be awarded for graduating more students than expected and penalized for having consistently high actual graduation rates. Further, a portion of this score is already considered in the retention category, which considers the six-year graduation rate.

(G) Alumni Giving Rate (weighted 5%). This category was added as a barometer for alumni satisfaction; the more satisfied the student body is, the more the number of undergraduate alumni that give back. However, there are a few considerations with this factor. This variable might not be a reflection of satisfaction, but rather ability to give, as some alumni may be generous in donating their time to university's activities, which would not be reflected in the score. Further, this might be a reflection of the university's fundraising efforts, as Princeton University is known for holding large, annual events for its alumni. At Princeton, 61 percent of alumni donate, whereas at the University of California at San Diego, only 8 percent donate.

ADDITIONAL FACTORS
USNWR has added factors to its model over time in an effort to better explain an institution's quality. The seven categories that *USNWR* utilizes in its 2004 ranking are not all inclusive; there are other potential factors that impact an institution and thus its overall score and rank. As such, additional categories are to be added in order to assess their impact on rank. The categories are as follows:

(A) Age. Scanning the list of the top national universities, one would notice that all of them have a few shared characteristics, one being that they are all old. As Don Peck notes, "One of the more striking characteristics of the top-fifty list is how chronological it turns out to be.

That is, one good predictor of a school's selectivity rank is nothing more complicated than the date of its founding. The average founding years of the top five, ten, twenty-five, fifty, and 100 most selective schools in the nation are 1767, 1785, 1822, 1839, and 1850, respectively" (Peck 130). This will be used to test an alternative model based upon the presumption that the highest ranking schools in the nation are simply the oldest and the richest.

      (B) Type of governance. For this category, a "dummy variable" will be utilized indicating whether the institution is a private university, 0, or a public university, 1. Higher education is an industry for which the state tries to match the caliber and quality of the private sector. The type of governing body affects the amount of control the board of directors and the president of the university have over the institution; including finance, budgetary matters, expenditures of capital improvement projects, curriculum and programming, and the hiring and termination of employees. Further, the selection of students can vary. Private universities, which constitute an overwhelming majority of the top institutions, are less restricted in their acceptance procedures, as some states have agreements as to the acceptance of transfer students from community colleges and in-state high school graduates. Alternatively, ownership of assets and funding can vary for public and private universities. Private universities typically own all of the property of the institution, whereas public universities may have a portion of the assets owned by the state. Further, the amount of state funding and the annual operating budget may vary depending on whether the school is a public or private institution.

      (C) Amount of Research Money. Including an additional added value variable, such as research dollars, will assist in indicating the strength and success of the university. The stronger the university's faculty, facilities, and students, the more large grants the university will receive in conducting research. For the tier one institutions, the research expenditures ranged from a low 25.5 million dollars in a year to over 900 million.

Table 2-Description of Variables

Description	Mean	Low	High	Std Dev
2004 *USNWR* Score	75.54	58	100	12.89
2004 Institutional Ranking by Score	24.92	1	48	14.49
Year Institution was Founded	1843	1636	1965	65.95
Equal to 1 if Institution is a Public University	0.32	0	1	0.47
Peer Institutions' Assessment of Academic Reputation on a scale of 1-5	4.1	3	4.9	0.50
Rate of Freshman who Return for Sophomore Year	94.28	85	98	3.06
Graduation Rate Predicted by *USNWR*	83.7	64	93	7.56
Actual 6-Year Graduation Rate for Incoming Freshman	85.36	68	98	7.57
Proportion of Classes with Less than 20 Students	55.66	30	77	13.96
Proportion of Classes with More than 50 Students	12.64	1	29	6.55
Student to Faculty Ratio	10.92/1	3/1	21/1	4.44
Proportion of Full-Time Faculty	91.38	72	99	5.51
Proportion of Incoming Freshman Class in the Top 10% of their HS Class*	78.92	41	99	15.36
Acceptance Rate of Students Admitted to Applicants	38.28	11	78	18.11
Percent of Alumni who Donate to their Alma Mater	28.82	8	61	11.90
2003-2004 Endowment of the University in Dollars	2.37B	44.2M	18.3B	3.11E+09
Percent of National Merit Scholars in 2002 Freshman Class	1.44	.064	6.25	1.69
Percent of 2002 Faculty who are Members of National Academies	5.42	.27	37.86	7.54
No. of Full-Time Undergraduate Students	10,898	939	33,290	8620.24
2002 Research Expenditures in Dollars	261.6M	25.5M	901.2M	1.86E+08
25th SAT Score Percentile	1243	1060	1470	93.94
50th SAT Score Percentile	1338	1170	1525	86.49
75th SAT Score Percentile	1432	1580	1280	80.50

		21.03	17.6	23.63	1.09
Natural Logarithm of Endowment		21.03	17.6	23.63	1.09
* Missing score for Yeshiva University					

ANNUAL RANKING METHODOLOGY

   U.S. News & World Report states, "While no one would say it's a good idea to choose your undergraduate institution by a single number, the *U.S. News* ranking can help you learn a lot about a school. And about schools you didn't even know were there" (Morse 80). However, the annual rankings might not be analogous from year-to-year. Marguerite Clarke of Boston College, tracked the changes in formulas from 1995-2000, and noted four types of changes: "changes in the weight assigned to an indicator; the removal of an indicator from a formula; the addition of an indicator to a formula; and, changes in an indicator's definition or methodology" (4). Eight changes were noted over this six-year period; including four changes in definition/methodology, two weight changes, one addition, and one removal of an indicator (Clarke 5). As a result, "yearly formula changes make it almost impossible to interpret shifts in a school's rank in terms of change in its relative academic quality: a college that is ranked 4th one year and 7th the next may have had no change in its performance relative to other schools, yet still have moved because of changes in the ranking methodology" (Clarke 3).

   Over the years, *USNWR* has changed its ranking methodology for academic institutions multiple times. Their first ranking in 1983 was based only on one component; twenty years later the rankings on based upon fifteen components. Further, initially the rankings for only the top few institutions in each academic classification, based upon a standardized categorical assessment of size and degree granting type of institution, were reported in the pages of *USNWR* and the rankings were reassessed every two years. Starting in 1990, a stand-alone publication of the annual rankings of America's Best Colleges was available (Stuart 17). The assessment here will present the various methods used by *USNWR* over the course of the years, commencing in 1983 and ending in the most recent publication of the 2003-2004 academic year with additional evaluations made at five year intervals, for a total of five different valuations.

Table 3-*USNWR* Tier One Institutions

	1983 Rank	1988 Rank	1993 Rank	1998 Rank	2004 Rank
Harvard University	2	4	1	1	1
Princeton University	4	2	2	1	1
Yale University	3	1	3	3	3
Massachusetts Inst. of Technology	10	5	5	3	4
California Inst. of Technology	12	3	5	5	5
Duke University		12	7	6	5
Stanford University	1	6	4	7	5
University of Pennsylvania		15	14	7	5
Dartmouth College	10	7	7	9	9
Washington University in St. Louis		19	20	9	9
Columbia University		8	10	9	11
Northwestern University		16	13	9	11
University of Chicago	6	10	9	9	13
Cornell University	8	14	11	14	14
Johns Hopkins University		11	15	14	14
Rice University		9	12	14	16

Brown University		13	18	17	17
Emory University		22	21	17	18
University of Notre Dame		18		19	19
Vanderbilt University			25	19	19
University of California-Berkeley	5	24	16	23	21
University of Virginia		20	22	21	21
Carnegie Mellon University	13		19	23	23
Georgetown University		17	17	21	23
University of Michigan-Ann Arbor	7	25	24	23	25
Univ. of California-Los Angeles		21	23	28	26
Tufts University				23	27
Wake Forest University				28	28
Univ of North Carolina-Chapel Hill		23		27	29
Univ of Southern California				41	30
College of William and Mary				32	31
Brandeis University				28	32
Univ of California-San Diego				33	32
Univ of Wisconsin-Madison	13			38	32
New York University				34	35
Univ of Rochester				31	35
Case Western Reserve				37	37
Georgia Inst of Technology				41	37
Lehigh University				34	37
Boston College				38	40
Univ of Illinois-Champaign	8			45	40
Yeshiva University				48	40
University of California-Davis				41	43
Tulane University				34	44
Univ of California-Santa Barbara				47	45
University of California-Irvine				41	45
Pennsylvania State Univ-University Park				45	48
Rensselaer Polytechnic Inst				48	48
Syracuse University				40	55
Worcester Polytechnic				48	55
From *USNWR* Rankings					

1983

 In 1983, rankings were based on survey results sent to presidents of all four-year colleges and universities in the nation that offer a liberal-arts program as part of their undergraduate education…Each of the presidents was asked to pick the five best undergraduate schools from a list of institutions most similar to his or her own in terms of enrollment and the range of academic degrees and programs offered. The educators were asked to base their judgments on the quality of academic courses, professors, student bodies and general atmosphere of learning provided. (Solorzano 41)

USNWR only provided the rankings for the fourteen institutions that received the most votes in the National Universities-Doctoral category, with an honorable mention given to five other institutions. Thus, the rankings were based only on academic reputation, as assessed by

college administrators. In 1983 Stanford University was ranked on top, while Harvard and Yale Universities were ranked numbers 2 and 3 respectively. Only four public institutions made the rankings: University of California-Berkeley, at 5; the University of Michigan-Ann Arbor, at 7; the University of Illinois-Champaign Urbana, at 8; and the University of Wisconsin-Madison, at 13. [See Table 3 for complete listing].

1988

By 1988, *USNWR*'s methodology expanded and became much more mathematical than the original one in 1983. Further, the rankings for the top twenty-five institutions were published. The 1988 approach accounted for student selectivity, faculty quality, academic resources, and retention rankings, in addition to the 1983 factor of academic reputation. The weights of each component were not given by *USNWR* in their explanation of the ranking methodology. In 1988 student selectivity was based upon acceptance rate, average of SAT or ACT score, and the percentage of the entering freshman class that graduated in the top ten percent of their high school class. Assessments of faculty quality were measured by the percentage of full-time professors with terminal degrees, the student-to-faculty ratio, and per-student instructional budget, including faculty salaries. Resource scores were based on endowment and library budget per student. Retention scores were based upon those freshmen that returned for their sophomore year and the percentage of entering freshman who graduate with a baccalaureate degree within four years, with each factor having equal weighting. Thus, transfer students are not accounted for in this measure. The scores in each category "were converted to percentiles and then averaged to produce rankings for each of the four attributes. Each school's attribute scores were then averaged in a formula developed by U.S. News…Because the quality of the student body and the faculty is considered the key to educational excellence, the attributes of these measures counted more heavily in the final formula" (*USNWR* C5). In addition, the overall score for the institution included an additional peer assessment category, which surveyed academics and had them "place schools in their respective group into quartiles based on reputation for academic excellence…Reputation scores also were converted to percentiles and given extra weighting in the overall rankings" (*USNWR* C5).

Under this ranking system, Yale University was ranked number 1. Princeton University, California Institute of Technology, Harvard University, and Massachusetts Institute of Technology were regarded as the 2nd, 3rd, 4th, and 5th best institutions. The tip ranked institution in 1983, Stanford University, fell to number 6 in 1988. While the ranks of the University of Wisconsin-Madison, the University of Illinois-Champaign Urbana, and Carnegie Mellon University were unpublished. The University of California-Berkeley and University of Michigan-Ann Arbor, the two other public institutions that were ranked in 1983, fell to 24 and 25 respectively. [See Table 3 for complete listing].

1993

The ranking methodology utilized in 1993 is very similar to the formulation used for the 1988 rankings. The five component categories were the same as those from the 1988 ranking, however there were some slight changes to the constituents of four of them. The only component that experienced no changes was academic reputation. One slight modification was made to the student selectivity component. In 1993, *USNWR* added yield, the percentage admitted to those students that enrolled at the institution, sub-factor. Next, the

faculty quality factor was modified in the degree to which the school expends in order to support a high-quality, full-time faculty. Student-to-faculty ratio, portion of full-time faculty, faculty with terminal degrees, and faculty salaries all remained a part of this component. The actual instructional budget per student was eliminated, except for faculty salary, and the portion of part-time faculty was added. Some changes were made to the financial resources component between 1988 and 1993. The expenditures component was expanded to include not only instructional budget, formerly in faculty quality, but also student services and academic services. Academic services consisted of not only library expenditures, but also computer expenses and administration expenses. Further, all other spending was added, including research, scholarships, operation, and maintenance per student. Finally, for national universities, the level of student satisfaction consisted solely of five year graduation rates for incoming freshman. This categorical change eliminated the retention component and modified the years to graduate from four to five.

In 1993, *USNWR* ranked Harvard University as America's Best University. Princeton University, Yale University, Cal Tech, and MIT rounded out the top five. The Universities of Notre Dame and North Carolina-Chapel Hill fell out of the top twenty-five, while Vanderbilt University made its first appearance on the *USNWR* ranking. Carnegie Mellon University also re-entered the rankings at 19. The highest ranked public institution was the University of California-Berkeley at 16. [See Table 3 for complete listing].

1998

A few modifications were made by *USNWR* between the 1993 survey and the one in 1998. One change is that the weights for each overall component were provided in the detailed explanation of their methodology. The most significant change to the 1998 ranking was that "each ranked school was rounded to the nearest whole number, which created more ties in the rankings" (Gater 2). Twenty-five percent of an institution's overall score was based on overall academic reputation. The scoring methodology consisted of evaluations based on quartiles, with the top fifty institutions being in the first quartile, those ranked 51 through 116 being in quartile two, those ranked through 174 in quartile three, and the remaining fifty-four universities in quartile four. The actual numerical rankings were only published for those in the first quartile. The university's retention accounted for twenty-five percent of the overall score. This factor was composed of eighty percent graduation rate and twenty percent freshman retention rate. At this juncture, graduation rates were based on a term of six years. In 1998, twenty percent of an institution's score was attributed to faculty resources, with class size contributing forty percent, faculty salaries contributing thirty five percent, faculty degrees contributing fifteen percent, student-to-faculty ratio contributing five percent, and proportion of full-time faculty also contributing five percent. The student selectivity category contributed fifteen percent towards each university's overall score. The components of student selectivity were comprised of 40 percent test scores, the 25th and 75th percentiles of either SAT or ACT scores; thirty-five percent high school class standing, proportion of incoming freshman that graduated within the top ten percent; fifteen percent acceptance rate; and ten percent yield.

Another modification that was made was in the financial resources category, which only contributed to ten percent of a university's overall ranking score. Eighty percent of this factor was comprised of educational expenditures and twenty percent was for other expenditures. By

this time, a new category was introduced, "added value." This is to be indicative of graduation rate performance. This category, which accounts for five percent of an institution's overall score, is based upon the difference between the actual six-year graduation rate and a predicted rate for that particular class. This was "to include the effect of the college's programs and policies on the graduation rate of students after controlling for spending and student aptitude" (Morse 81). Also appearing at this juncture was another category, alumni giving rate, which accounted for a modest five percent of an institution's overall score. This factor is determined by the percentage of undergraduate students that donate money to their alma mater.

In 1998, Harvard University was again on top, with Princeton University, MIT, Yale, and Cal Tech rounding out the top five. In 1988, the University of Virginia was the highest ranking public institution at 21. Further, the University of Wisconsin-Madison, University of Illinois-Champaign Urbana, the University of North Carolina-Chapel Hill, and the University of Notre Dame all re-entered the rankings. [See Table 3 for complete listing].

Through all of the methodological changes there are some factors that have remained consistent. Despite changes in the measurement of peer assessment, it has consistently remained the one of the largest contributing factors to an institution's overall score. Another factor that has been consistently present in the scoring since 1988, the year the mathematical formula was introduced, whereby previously only opinions were assessed, is graduation rates. However, the time frame for measuring graduation increased from four to six years. Another change is the alternative calculations that have been made with the graduation rate. Upon the introduction of this component, only the actual rate was used; however, in an attempt to determine the effects of the school's programs while controlling for set factors, a value added aspect was added. Thus, there have been manipulations to already established criteria. The student selectivity component has also remained relatively consistent; test scores, high school class standing, and acceptance rates have consistently been incorporated. Further, since its introduction, the faculty resources category has at least been constituted of faculty salaries, student-to-faculty ratio, percentage with terminal degrees, and percent that are full-time.

The evaluation of university finances and resources has also changed over time. When the resource components were introduced, a primary component was the university endowment per student. However, this aspect was modified. The 1998 explanation of methodologies states, "We consider how much each school spends per student for these components based upon an average of its fiscal 1995 and 1996 expenditures. For the educational part, a small total per student may mean that a school has little to spend beyond tuition, while a high figure means that tuition is probably supplemented by a large endowment" (Thompson 68). Thus, there is a rationalization to no longer include endowment directly. However, this may not be the case of a state university, which receives a large share of its funding from the state, which is also typically used to defray tuition charges.

The number of components has increased over time, from one to fifteen, as a result the impact that each has on the overall score and therefore rank has also changed. Early on the actual weights assigned to each categorical component were not disclosed, however that has changed. Originally, peer assessment comprised one hundred percent of an institution's score; currently, it comprises twenty-five percent. Additionally, because the expansion in the number of categories, the weights of most have decreased over time. Besides the modifications to the components, there have been additional changes to other aspects to the process. In the initial ranking, only the fourteen highest vote getting doctoral granting institutions were ranked. By

2004, the rankings of 126 universities were published with information provided on another 122. Through 1993, only the rankings of the top twenty-five schools were ranked and the remaining were divided into quartiles and listed alphabetically. By 1998, fifty were ranked and the remaining were also divided into quartiles and listed alphabetically. Not only are the ranks of more schools being supplied, but more institutions are evaluated.

Thus, there is a need for this analysis. Determinations will be made as to whether the changes in ranking are actually related to changes in the institutions themselves or whether they are simply related to changes in the methodology that *USNWR* utilizes. Further, comparisons will be made across a spectrum of the top institutions, with considerations given to those in the second and third tier.

RE-RANKING

Changes in the methodology used by *USNWR* can lead to drastic differences in an institution's ranking. This assessment was based upon the recomputations of each institution's ranking utilizing five different *USNWR* methodologies. Using data from the 2004 edition of *America's Best Colleges* for each institution, supplemented with additional resources when needed, each institution's ranking was determined under the 1983, 1988, 1993, and 1998 methods. This evaluation determined whether changes in rank are due to actual changes in the university or are due to methodological changes. If the method of ranking used in 1983 was still used twenty years later in 2004, the 2004 rankings would be considerably different, despite the fact that peer assessment accounts for one quarter of an institution's 2004 score. To begin, the basis and units of measure used in 1983 to evaluate peer assessment are considerably different than those made for the 2004 rankings. In 2004, *USNWR* rated all institutions on a scale ranging from 1-5 (rounded to the nearest tenth of a point), based on average scores, for each. In order to assess rankings under the 1983 method, the peer assessment scores were sorted in descending order and then ranked.

In 1983, of the fourteen that were ranked, only four were public institutions. These four, the University of California-Berkeley, the University of Michigan-Ann Arbor, the University of Wisconsin-Madison, and the University of Illinois-Champaign Urbana were the same four public universities ranked by Cattell in 1910 to be among the leading in the nation. However, when considerations using this methodology are made for a larger number of institutions, largest changes in ranking occur to large public universities; most of which gained significantly. [See Table A1]. However, the largest change in ranking would occur to Wake Forest University, if only the schools that are in the 2004 top fifty are evaluated. Its ranking would have declines nineteen places if the 1983 methodology was utilized in 2004. Further, some of the institutions in the top fifty would no longer remain in the top tier. The institutions ranked 44 through 50 in 2004 would drop out of the top fifty and eight universities from the second tier would enter the ranks of tier one schools. The University of Arizona would have moved up an astonishing fifty-three places if rankings were solely based on peer assessment. Further, even more astonishing is that three tier three schools, Arizona State University, University of Illinois-Chicago, and SUNY-Buffalo, are assessed higher than Yeshiva University, a tier one university. Additional shifts between many of the rankings would also occur.

The 1988 methodology used by *USNWR* does not result in as drastic changes in rank when applied to the 2004 tier one institutions, as compared to the 1983 methodology. [See Table A1]. This is because the methodology in 2004 is more similar to that of 1988, which was much more comprehensive than the original in 1983. In order to determine an institution's overall

score, and thus rank, computations had to be made. In the student selectivity category, each measure was weighted equally. For institutions that reported ACT scores to *USNWR* in 2004, they were converted to SAT scores using standard conversion tables, as used by the National Collegiate Athletic Association (ivywest 1). Further, the 25th and 75th percentiles were given by *USNWR*, for calculations using the 1988 methodology these were averaged to give a 50th percentile. For these calculations, it was deemed that a low acceptance rate is better than a higher one. Therefore, the contribution of acceptance rate to Total Student Selectivity is equal to 1/3(100-acceptance rate). One problem that was noted is that Yeshiva University does not report the percentage of students that graduate in the top ten percent of their high school class (USNWR, 2004 83). As a result, an estimation was made. An average was taken of the percentage of students that graduated in the top ten percent of their high school class for private universities with similar SAT score profiles.

In order to assess the faculty quality some adjustments needed to made. In the 2004 publication only the percentage of a university's full-time professors and student-to-faculty ratio were given, therefore these were the factors that were used; whereby each contributed equally to the total calculation of faculty quality. The lower the student-to-faculty ratio, the more accessible and attention the student can receive. The calculation was made as follows: ½(100-student/faculty ratio). If data was available for the instructional budget per student, these figures would have been incorporated into the calculation of faculty quality. However, the problem with this data is that there are regional cost of living adjustments that would need to be made; faculty salaries at Columbia University in New York City might tend to be higher those of faculty at the University of North Carolina-Chapel Hill because it is more expensive to reside in the greater New York metropolitan area. Further, the instructional budget might be a function of the size of the university, the number of classes held during a session, and the size of those classes.

The assessment of the resource measures for the 1988 computation was not garnered from data provided by *USNWR*, as it is unpublished. However, data was obtained for per student endowment. The 2003 information for each university's endowment was retrieved from Petersons.com. This source was utilized, as data was readily available for all the universities being evaluated with figures reported for the same time period. Peterson's gathers its data through survey responses from the institutions themselves, which are typically provided by the university's institutional research department or admissions office. Peterson's then reviews the information and performs analysis to verify the data, primarily ensuring that it is consistent with prior years and current trends (Margolin). Further, the number of full-time equivalent undergraduate students is based on head-count from 2000 obtained from The Center's publication *The Top American Research Universities*, as data was available for the top fifty universities in this study (The Center 108-112). It is assumed that the size of the student body has remained relatively constant over the past few years. This information allowed for the computation of each university's endowment per student. In order to make comparisons for percentiles and rankings some additional computations were made. An average of the endowment per student for the 2004 top fifty institutions was taken, as well as the standard deviation of the per student endowments. Each institution's per student endowment was then compared to the average endowment per student plus one-half of the standard deviation. A percentage was then calculated for each institution with a maximum possible score of one hundred.

Assessments were then made in the retention component. One major change between 1988 and 2004 is in the reporting of graduation rates. In 2004 graduation rates were computed over a six year period, whereas in 1988 they were calculated over a four year period.

In order to standardize the peer assessment component, a systematic numerical valuation was created. Each institution was placed into quartile based upon academic reputation. For this computation, the peer assessment scores of each university were evaluated, including those considered tier two in 2004. Those schools that were ranked in the top fifty according to peer assessment were given a score of 100 and those that were ranked 51 and below were given a score of 75. Despite the fact that *USNWR* gives extra weight to peer assessment, this category was averaged with the other four categories to determine an overall score. From these scores, each school's overall ranking was determined. All of the institutions in the tier one in 2004 that would have been assessed academically as tier two, based upon academic reputation alone, would have suffered in their rankings. Further, all universities with smaller endowments or large student populations had their rank adversely affected.

The institution that experienced the largest change in ranking that would have remained in the top tier was Case Western Reserve, which would have risen nineteen places under the 1988 methodology. This is partially a result of its higher than average endowment per student. The largest fall incurred was fourteen places to the University of Wisconsin-Madison, most likely resulting from its low endowment per student. Additionally, Tulane University, Yeshiva University, and the University of California-Irvine would have also fallen in the ranks to tier two schools, with ranks of 51, 52, and 53 respectively, all of which have academic reputations that are considered to be in the second tier. The institutions that would have replaced those above are Pepperdine University, the University of Maryland-College Park, and the University of Texas-Austin. Both the University of Maryland-College Park and the University of Texas-Austin have high academic reputations and Pepperdine has a per student endowment that is significantly larger than most tier two institutions.

The methodology in 1993 would have also resulted in a different set of rankings as compared to the 2004 methodology. Those universities with large endowments per student and heavy research expenditures per student gained the most in the rankings. [See Table A1]. Because the exact weights for each module were not provided by *USNWR* nor could they accurately be determined for all categories, they were all weighted equally in order to derive the university's overall score and each element within the module was also given an equal weighting in determining the individual factor's overall score, as was done with the 1988 rankings. Most of the recomputations were the same as those under the 1988 methodology, either because the *USNWR* method was the same or there was a lack of data.

The overall student selectivity scores under the 1993 methodology remained the same as those in 1988. This is because the data for the yield statistics were not readily available and therefore not incorporated into the recalculation of 1993 rankings. Similar circumstances led to no changes in the score of faculty resources between 1988 and 1993. For recalculations of 1993 score, the share of part-time faculty was not included, as it is assumed that those faculty members which are not full-time are part-time and thus the sub-factor would be equal to 100-full-time faculty. Further, because the data for faculty salaries and terminal degrees was not available computations for these sub-factors were not incorporated into the overall score.

Because *USNWR* does not publish any data related to financial resources in its reports, an alternative resource was utilized. As a result the same procedure used 1988 was utilized for ranking recomputation; endowment per student served as a proxy for overall expenditures.

However, one addition was made; 2000 research expenditures were published in The Center's report *The Top American Research Universities* for all of the top fifty universities in the *USNWR* survey (The Center 48-52). The Center, a research enterprise at the University of Florida, is devoted to the study of "the competitive national context for major research universities" (The Center 1). From this information, each university's research expenditures per student were computed. In order to make comparisons for percentiles and rankings some additional computations were made. An average of the expenditures per student for the 2004 top fifty institutions was taken, as well as the standard deviation of the per student expenditures. Each institution's per student research expenditures was then compared to the average expenditures per student plus one-half of the standard deviation. A percentage was then calculated for each institution with a maximum possible score of one hundred. Despite the fact that all of these institutions are considered some of the largest research universities, a select few spend a large portion of all of America's Universities research expenditures. As a result, the financial resources component was computed by fifty percent of endowment per student and fifty percent research expenditures per student.

The only university that would have fallen out of the top fifty was Lehigh University, which has both low per student endowment and research expenditures. Moving up to the top tier would have been the University of Delaware, which has larger than average per student research expenditures. The largest rise, nineteen places, would have been incurred by Case Western Reserve, which has high research expenditures per student, while the largest fall, eighteen places, was to Wake Forest University, which suffers from a lower than average academic reputation and a low financial resources ranking.

The overall result of the rankings as computed under the 1998 methodology are much more similar to those under the 2004 system, than any of the other methodologies, with the largest change being that of fifteen spots. [See Table A1]. Six institutions had no change in rank. In order to calculate the contribution of peer assessment towards overall score all schools were ranked and those that remained in the top fifty were given a score of 25, whereas those that fell to tier two were given a score of 18.75, as peer assessment counts toward twenty-five percent of an institution's overall score. For the retention component, eighty percent of the actual graduation rate, as provided by *USNWR* was added to twenty percent of the retention rate and then this overall score was divided by four. This fraction of overall retention was then added into the equation to derive a university's overall score. Judgments were made in order to compute the faculty resources component. Because only information related to class size, both fewer than twenty and over fifty, student-to-faculty ratio, and full-time faculty were known their contributions to faculty resources were pro-rated based upon the weights given by *USNWR*. As a result, student-to-faculty ratio and percent of full-time faculty each contributed to ten percent of the overall resource score. Further, classes under twenty were seen as a positive and those over fifty were seen as a negative, as the smaller the class the greater the interaction between students and faculty. Thus, forty percent of the percent of classes under twenty contributed to faculty resources and forty percent of 100 less the percent of classes over fifty were used in the recalculation of faculty resources. A similar method was used to the ones shown in earlier computations, except a different weighting was used. Once the overall faculty resource score was determined from its component sub-factors, twenty percent was utilized to determine the university's overall ranking.

Additional appraisals were made in order to compute the contribution of two of the remaining three components, student selectivity and financial resources. In the recalculation, the

value added component was not included as no logical methodology to include it could be found. Further, actual graduation rate accounts for sixteen percent of an institution's overall score. Because of the unavailability of yield statistics, all other factors in the student selectivity category were pro-rated. Thus, test scores, fifty percentile SAT scores, contributed forty-four percent of overall score, high school class standing was reassessed at thirty-nine percent, and acceptance rate was readjusted to seventeen percent. For the re-computations of financial resources a format similar to that used in the 1993 was devised. However, for the 1998 calculations, eighty percent of the per student endowment base, average endowment per student plus one half of the standard deviation of the per student endowments, was used and twenty percent of the research expenditures base, average per student research expenditures plus one half of the standard deviation of the per student expenditures, was used. It was assessed that the alumni giving rate component has little effect on an institution's overall score, as most institutions have modest donation rates and it only constitutes five percent of an institution's overall score.

Similar to the changes in the 1988 recalculations, Tulane University and the University of California-Irvine rankings would have been assessed in the second tier. [See Table A1]. Ranking 52 and 54 respectively. Both universities have lower than average academic reputations, which accounts for twenty-five percent of the overall score, and low per student endowments, which accounts for eight percent of overall score. Entering the first tier, co-ranked at 46, would have been the University of Maryland-College Park and Pepperdine University.

Changes in the methodology can significantly impact an institution's ranking. As Marguerite Clarke has found, the "indicators are contributing fairly similar information to the estimation of the overall score (10)" and therefore, "a slight change in the set of indicators on the stability of the overall score and subsequent ranking (9)" does not drive the score. But, "when the overall score for a school is compared to that of every other school in its ranking (top-fifty schools only), three groups emerge: schools that score significantly higher, schools that score significantly lower, and schools with scores that are not significantly different" (Clarke 11). Thus, schools might be better compared in groupings, rather than individually. Most of the changes in rankings, using the different methodologies, are only within a limited range. There are few changes greater than ten places. Additionally, the changes in ranking have become smaller over time, as the methodologies have become more and more consistent and inclusive of more factors. The rankings of large, public universities have been very consistent over time, other than when the sole consideration was academic reputation; large student bodies, large class sizes, and less stringent admission standards have adversely affected their scores over time. When the only criteria was academic assessment more public universities were ranked in the top 50 and some small, private universities, with lower peer assessment scores and considerable resources fell in the rankings. However, this trend has reversed over time and more wealthy, private universities are rising in the ranks. The expansion of factors has lead to less reliance on a single defining characteristic in favor of an overall balance and mix of characteristics; thus, there is less vulnerability to having a weaker trait. Further, the rankings will probably remain relatively stable, as there is less potential to incorporate additional institutional characteristics.

WEIGHTING

USNWR assess the weights for each factor in accordance with its own determinations as to which matter most. In 1992, Michael C. McGuire, PhD, conducted a survey of "presidents, academic deans, and admission directors of fifty-five national liberal arts colleges that were

members of the Higher Education Data Sharing consortium. Participants received the following instruction: 'Even if you do not agree that these are necessarily the best variables for defining educational quality, please assign weights to indicate the relative importance of each one'" (McGuire 52). McGuire found that the academics placed more emphasis on faculty and financial resources and *USNWR* weighted reputation much more heavily (McGuire 53). [See Table A2]. Further, the largest single factor in the *USNWR* ranking is reputation, which academics believe should be weighted approximately half the amount that *USNWR* does. As there might not be an optimal level for the weighting of factors, McGuire's research was to emphasize "that empirically derived weights are better than arbitrarily chosen ones and that research on the topic can and should be done" (McGuire 53).

      Evaluations were then conducted by McGuire to determine the rankings sensitivity to changes in weighting. It is noted that "[i]f the model is relatively stable, then disagreements about the value of the different weights become trivial. If, on the other hand, institutions change rank and even quartile when weights change, the danger of misrepresenting institutions to the public increases significantly" (McGuire 55). Tests were conducted utilizing various weights, including the averages of the weightings preferred by the academics polled in his questionnaire. It was found that "88 percent of the colleges on average changed rank under the alternative schemes. Some institutions improved rank by as many as twenty-four places; others declined in rank by as many as twenty-two places (the average shift was approximately five places). [T]he greatest amount of movement was noted around the middle of the distribution (second and third quartiles), although even among the elite top twenty-five, 77 percent of the colleges changed rank by as many as five places" (McGuire 55). "These results indicate that weights do matter, and that changes in weights produce changes in rankings independently of any changes in the institutions ranked. This suggests that a rational rather than arbitrary weighting scheme should be implemented" (McGuire 57).

SENSITIVITY ANALYSIS
      Micheal C. McGuire's tests were reconstructed in order to determine the effects of re-weighting variables on the latest set of *USNWR* rankings. The basis for the new weights was McGuire's survey of academics. [See Table A2]. Modifications were made to these weights because of missing information. In the student selectivity category, yield information was unavailable, as a result, the weight all other components was increased by their pro-rata share. Thus, the percentage of students that graduate in the top ten percent of their high school class composed forty-eight percent of the category, while the acceptance rate was eighteen percent and SAT score accounted for twenty-nine percent of the category. The same was done within the faculty resources component due to a lack of information related to faculty compensation and percentage of faculty with terminal degrees. Therefore, the percentage of part-time faculty accounted for twenty-eight percent of the faculty score and the student-to-faculty ratio was seventy-two. The same procedures as the annual rankings were utilized for recomputing acceptance percentages, SAT score percentages, student-to-faculty ratio, and financial resources (endowment). Reputation was based upon actual peer assessment score instead of quartiles. Further, instead of using the part-time faculty percentage as a negative score, the full-time faculty was used as a positive. Scores were not rounded; therefore, there were no ties. [See Table A3]. Under this methodology, two large, public institutions, Pennsylvania State University-College Park and the University of Washington, both in the top fifty under the 2004 *USNWR* ranking, would have fell to 54 and 55 respectively. They would have been replaced by

Pepperdine University, at 41, and George Washington University, at 50. The weights that academics believe to be a better reflection of an academic institution place less reliance on academic reputation and more on faculty. Accordingly, many of the large, public universities suffer under this methodology and some smaller, private ones have jumps in their rankings. Only two public universities experienced increased rankings, the College of William and Mary, three places, and University of California-Davis, one place. The largest fall in score, sixteen places, was to the University of Wisconsin-Madison, while the largest increase in score was seventeen places, from thirty-seven to twenty, for Case Western Reserve, a small private university. The institutions that are regarded as the most elite, within the top four, did not experience significant changes in rank under the new weighting methodology.

The methodology that McGuire utilized to conduct his study does not include some of the variables that the current *USNWR* does. Freshman retention rate is not a component of the retention score nor is class size, either under twenty students per class or over fifty, a component of faculty resources. Combined, these three factors account for twelve percent of an institution's 2004 *USNWR* score. Further, for these calculations, endowment was utilized as a proxy for financial resources; whereas, *USNWR* bases resources on university expenditures.

Another weighting methodology was utilized in order to further evaluate the robustness of the weights. In this sensitivity analysis, ten factors were weighted equally. The factors that were included were peer assessment scores, freshman retention percentage, graduation rates, student-to-faculty ratio, percentage of full-time faculty, the percentage of students that graduate from the top ten percent of their high school class, alumni giving percentage, SAT scores, endowment, and research expenditures. These factors were selected as they were determined to be significant and consistently present in various ranking methodologies. The scores for each categorical factor were determined using the same methods as for the annual rankings, except actual peer assessments were used instead of quartiles. Scores were not rounded and therefore there were no ties. Under this methodology there were only five institutions that were among the top fifty that experienced changes of greater than or equal to ten places. [See Table A3]. For the remaining top fifty institutions, the average change in their rankings was less than three places. Case Western Reserve, again experienced the largest change. Its ranking increased twenty places, while New York University's rankings fell the most, twenty places, thus placing it out of the top tier. Additionally, the University of Illinois fell eleven places to 51, thus placing it out of the top tier and the University of Delaware jumped twenty-six places and entered the top tier at 41.

A similar recomputation was performed to the one described above, but this time class size, both classes under twenty students and over fifty, and acceptance rates were included. When all thirteen factors that *USNWR* utilizes are equally weighted there are shifts in the rankings. [See Table A3]. Seven institutions in the top fifty experienced shifts of greater than ten places; the most staggering of which is the University of Delaware entering the top fifty, at 45, twenty-two places higher than ranked by *USNWR* in 2004. Among those considered tier one institutions in 2004 by *USNWR*, Case Western Reserve again experienced the greatest shift in rank. Its rank increased seventeen places from number thirty-seven to twenty. Except for the University of Delaware and the Universities of California-Davis and Santa Barbara, whose rankings each increased two places, all of the other public universities in the top tier fell in the rankings using this methodology. Further, four institutions fell out of the top tier and into the second tier, the lowest one ranked at 58. The average number of place changes for *USNWR*'s top fifty universities was less than four places.

The methodology utilized can have a significant impact on a school's rank. Some institutions' ranks have changed upwards of twenty-two places, but on average rankings change approximately four places. Thus, most changes in rank are only within a limited range. Most large, public institutions experience a fall in rank when factors other than academic reputations are more heavily considered. The universities that are the most elite experience some of the fewest changes in rank and in tend to remain at the top of the ranks no matter the methodology.

REGRESSION ANALYSIS

In accordance with these findings, regression analysis was used to determine the stability of the weights and variables. Originally the regression was run with all of the potential independent variables, except 25th SAT percentile, 75th SAT percentile, the number of full-time undergraduate students, and *USNWR*'s predicted graduation rate due to multicollinearity, on the dependent variable score. The 25th and 75th SAT percentiles are averaged to determine 50th SAT percentile, which was used in recalculations of rank. If the number of full-time undergraduate students were included in the model there would be problems of heavy collinearity between the variables student-to-faculty ratio and the percentage of full-time faculty. Finally, predicted graduation rate was omitted from the model because of heavy collinearity with actual graduation rate. Thus, the regression results of the original model are as follows:

Table 4-OLS Regression Estimates of Institutional Characteristics on Overall Score

Independent Variable	OLS Regression
Year Founded	.52
	(0.0081)
Public (1=Yes)	-1.14
	(1.64)
Assess	6.77***
	(1.64)
Retention	-1.05
	(0.23)
Graduation Rate	4.45***
	(0.082)
Classes Under 20 Students	2.38*
	(0.058)
Classes Over 50 Students	-1.17
	(0.11)
Student-to-faculty Ratio	-1.50
	(0.16)
Percent of Full-Time Faculty	1.17
	(0.072)
Graduate Top 10% of HS	4.58***
	(0.035)
Acceptance Rate	.11
	(0.044)
Percent of Alumni who Give	4.83***
	(0.053)
Endowment	-0.78
	(5.77E-10)
Percent of National Merit Scholars	0.41
	(0.41)
Percent of Members of National Academies	.29
	(0.081)
Research Money	2.22**

	(2.79E-09)
50th SAT Percentile	-.49
	(0.014)
Endowment Squared	0.69
	(2.77E-20)
Natural Log of Endowment	0.91
	(0.77)
R^2	0.9865

*p<.05   **p<.01   ***p<.001

Note: N=50; *USNWR*'s 2004 tier one institutions; standard errors are in parentheses

The full model regression indicates that only six variables are statistically significant at the .05 level of significance. From this model, a stepwise regression was run in Stata using a significance level of .05. A backward selection process was utilized, whereby variables with probabilities that are statistically insignificant are removed. Only those factors that do not harm the overall predictive value of the model are kept. All of the independent variables that were included in the original regression model were also included in the stepwise regression model as potential factors. The results of the stepwise regression are as follows:

Table 5-Stepwise and OLS Regression of Institutional Characteristics on Score

Independent Variable	SW Regression	OLS Regression
Assess	9.96***	16.46***
	(1.00)	(0.78)
Graduation Rate	5.52***	3.94***
	(0.059)	(0.066)
Classes Under 20 Students	5.52***	8.94***
	(0.034)	(0.030)
Graduate Top 10% of HS	5.320 ***	3.53***
	(0.023)	(0.025)
Percent of Alumni who Give	6.64***	6.80***
	(0.038)	(0.038)
Student-to-faculty Ratio	-3.36***	-
	(0.11)	
Research Money	3.01***	-
	(2.10E-09)	
R^2	0.9825	0.9754

*p<.05   **p<.01   ***p<.001

Note: N=50; *USNWR*'s 2004 tier one institutions; standard errors are in parentheses

The stepwise regression indicates that seven variables are statistically significant at the .01 level. This includes the six from the original model, which were statistically significant at the .05 level, plus the student-to-faculty ratio. Additionally, the adjusted R^2 in the seven variable model increases slightly. An F-test for joint significance was run on the twelve variables that were individually insignificant to determine whether they collectively impact overall score. The p-value for $F=.75_{(12,30)}=.693$, is not significant at any conventional level of significance and therefore the variables year founded, public, retention, percentage of classes over 50, percentage of full-time faculty, acceptance rate, the endowment, percent of national merit scholars, percent of faculty that are members of national academies, the 50th percentile SAT score, the endowment squared, and the natural log of endowment do not individually or collectively statistically contribute to the model. Further, the coefficients on the acceptance rate and 50th SAT percentile

are counterintuitive. In *USNWR*'s rankings, those institutions that accept fewer students have higher overall scores as do those that have students with high SAT scores. Additionally, five of the variables that were found not to significantly contribute to the model are included in *USNWR*'s methodology; with SAT scores accounting for seven and a half percent of an institution's overall score.

The coefficients from the regression run in Stata on the seven variable model, were used to predict 2004 scores for each institution. [See Table A4]. From these scores, ranks were created for each university. Comparisons between the Stata model and the *USNWR* model were then made on rank. It was found that the seven variable model is a good predictor. Both Rensselear Polytechnic Institute and the University of Florida fell out of the top fifty; they were ranked 51 and 54 respectively, while George Washington University and Pepperdine University, co-ranked at 51 under *USNWR*'s 2004 ranking, would have entered at 46 and 48 respectively. The average change in ranking was approximately 1.7 places, with eleven institutions' rankings remaining unchanged.

The results of the seven variable model clearly indicate that the 2004 *USNWR* model is sensitive to changes in variables and weights. Utilizing only seven of *USNWR*'s variables, in proportions that minimize the sum of squared residuals, produces results similar to using fifteen. Thus, it can be concluded that many of the variables in *USNWR*'s do not significantly contribute to the rank of an institution. Further, the ranks do change slightly with changes in weights. From this model, it was determined, that the factors research and student-to-faculty ratio are not practically significant, despite being statistically significant. Research only helped Johns Hopkins Ranking significantly, as its expenditures were more than three times the average top 50's. Research only contributed approximately 1.65 points to the top 50 institutions' overall scores and the student-to-faculty ratios only detracted about 4 points. [See Table A5]. As a result, another model was created using only five variables. [See Table 5above]. [See Table A4]. Similar conclusions were drawn from the five variable model as from the seven variable one. The average institution's rank changed just 2 places when considering only tier one institutions. Despite the minimal changes in rank, four institutions fell out of the top 50. They include Rensselaer Polytechnic Institute, the University of Washington, the University of California-Santa Barbara, and the University of Florida. They fell to numbers 51 through 54. Four institutions entered the top tier, George Washington University, 45; Pepperdine University, 46; Syracuse University, 47; and the University of Texas-Austin, 50. Syracuse experienced the largest jump, eight places. When only the original tier one institutions are considered, Brown University experienced the largest change in rank, at six places. Further, eleven institutions had no change in ranking as a result of the new model.

Thus, when utilizing the combination of weights and variables that minimize the sum of squared residuals, many variables can be eliminated from the model and the rankings will remain relatively unchanged. It is also noted that some variables that were perceived to be reflections of the quality of an institution or its students, number of National Merit Scholars, feeder scores, Members of National Academies, had little impact on the overall model. These variables might be captured in other factors. For instance, the number of national merit scholars would likely be captured by high SAT scores. The National Merit Scholar competition is based upon PSAT scores, the precursor to the SAT. Thus, students with high PSAT scores are likely to have high SAT scores. The higher the institution's average SAT score, the greater the likelihood of having a large number of National Merit Scholars. Feeder scores did not provide a great deal of information, as a select few had very high scores, but an overwhelming majority have low or no

scores provided. Finally, as determined from the bi-variate regression with score as the dependent variable, the number of faculty that are Members of National Academies, has little impact or explanatory power in describing an institution's overall score [See Table A6].

Surprisingly the endowment of an institution had little significant impact in determining an institution's overall score; and when added to a model with other statistically significant variables became statistically insignificant. Further, the natural log of endowment had little explanatory power when added to a model with more than a couple of other variables. Overall, these models did not have high degrees of explanatory power, as compared to those models without endowment, the endowment squared, or the natural log of endowment as variables. Despite the fact that a university's endowment can be viewed as a single number that indicates wealth and ability to spend. Therefore it might have been considered a proxy for a large proportion of the collective variables included in the *USNWR* ranking model. Faculty and student resources rank are a function of money, as the more an institution has, the more it can spend. Variables such as class size, student-to-faculty ratio, percentage of full-time faculty, and those related to selectivity can also all be a function of wealth. The overall quality of the student body might also be a reflection of economics. Because many universities have admission-blind, need-blind policies, the university has to have a large amount of funds available in order to be able to offer large financial aid packages in order to attract top students. Therefore, having incoming freshman with high SAT scores and at the top of their high school graduating classes might also be a function of endowment (Levine). Thus, a large portion of the variables in the model might be a function of endowment and confound the variable itself.

CONCLUSION

In 1997, the National Opinion Research Center (NORC) was commissioned by *USNWR* to review their ranking methodology for undergraduate colleges and universities. In their findings NORC found some significant weaknesses, including the following:

(1) Weights "lack any defensible empirical or theoretical basis" (NORC 4).
(2) Little information is provided "about the statistical properties of the measures or how knowledge of these properties might be used in creating measures" (NORC 5). For example, the graduation rate is directly used in the computation and is used in the graduation rate performance.
(3) Some of the variables might not be a reflection of what they are intended on measuring, as in the case of alumni giving rate (NORC 5).
(4) No variables account for student experiences and curriculum (NORC 6).

In addition to remedies for these weaknesses, a few other suggestions for refinement were made. One such suggestion is to use of three year moving-averages to smooth out noise in measures such as alumni giving and reputation. Further, NORC believes that *USNWR* should settle on a methodology that would be reviewed every five to seven years (NORC 7).

Over the last twenty years the methodology that *USNWR* has utilized to evaluate "America's Best Colleges and Universities" has changed significantly, which in turn has affected the institutional rankings. In 1983 the rankings were based on one factor, while in 2004 there were fifteen. The inclusion of more and more institutional characteristics has adversely affected the rankings of large, public universities and increased the rankings of small, private institutions. However, while the number of factors has increased, there have been less significant contributions of each factor and an inclusion of statistically insignificant factors. Stepwise regression analysis indicates that a model with seven factors can explain over ninety-eight

percent of the variation in score and thus rank. It was also determined that a five variable model could be created which would explain over ninety-seven percent of the variation in an institution's score. And a model that just includes the university's 75th SAT percentile explains almost eighty percent of the variation in an institution's score. Regression analysis futher indicates that many of the variables that *USNWR* includes in their model are neither individually nor jointly statistically significant. An institution's rank can vary by as much as twenty-two places depending upon the weighting of each factor, when multiple factors are included in the model. Thus, the methodology, both variables and weights, do matter.

Despite the changes in methodology, the core set of institutions that have been considered to be among the top fifty, tier one, has remained consistent over the last few rankings, as the methodology itself has become more invariable. Further, the rankings of those institutions at the upper most echelon have remained even more stable. Over the course of the rankings, when the scores of institutions are compared, grouping patterns have emerged. Further, the ranks of institutions tend to fluctuate within a limited range. Thus, comparisons of institutions within divisions of groupings rather than individually might allow for more accurate assessments.

The ranking of colleges and universities by *USNWR* has turned academia into a contest the way the Bowl Championship Series has college football programs. In order to win this contest "the perfect school [will be] rich, hard to get into, harder to flunk out of, and [have] an impressive name" (Thompson 10). The problem with this is that there is no perfect school; there may be the perfect school for each individual, but there is no one size fits all. One has to find the school that is right for them. Rankings do not account for actual education or the college experience, two of the most important aspects to college life. Despite all of the problems and concerns with the rankings there are two benefits to the publication of the rankings: the standardization of terminology across universities, and the publication of hard data about universities. Prior to *USNWR*'s rankings, each school publicized very little hard data about their institution, and for whatever little they did, the terminology and statistics provided might not have been useful for cross-school comparisons. Now schools such as Stanford University provide this data on their web-site.   However, it might be as Albert Einstein noted, "Not everything that counts can be counted, and not everything that can be counted counts" (Thompson 24).

APPENDIX

Table A1-Re-ranked Tier One Institutions Under *USNWR* Methodology

	2004 Rank	1998 Rank	1993 Rank	1988 Rank	1983 Rank
Harvard University	1	1	5	5	1
Princeton University	1	1	9	2	1
Yale University	3	1	2	3	5
Massachusetts Inst. of Technology	4	4	1	7	1
California Inst. of Technology	5	5	3	6	6
Duke University	5	10	13	14	13
Stanford University	5	5	6	1	1
University of Pennsylvania	5	13	8	13	13
Dartmouth College	9	13	11	12	15
Washington University in St. Louis	9	8	7	10	22
Columbia University	11	5	4	4	9
Northwestern University	11	15	16	16	15
University of Chicago	13	10	10	11	6
Cornell University	14	22	17	20	9
Johns Hopkins University	14	16	12	15	9
Rice University	16	10	15	9	22
Brown University	17	16	22	17	15
Emory University	18	9	14	8	25
University of Notre Dame	19	18	31	19	32
Vanderbilt University	19	19	20	21	25
University of California-Berkeley	21	28	26	27	6
University of Virginia	21	25	33	24	15
Carnegie Mellon University	23	25	21	32	21
Georgetown University	23	19	27	28	30
University of Michigan-Ann Arbor	25	28	29	26	9
Univ. of California-Los Angeles	26	33	24	33	19
Tufts University	27	19	32	25	42
Wake Forest University	28	37	46	40	58
Univ of North Carolina-Chapel Hill	29	35	25	34	22
Univ of Southern California	30	28	28	23	35
College of William and Mary	31	28	36	29	35
Brandeis University	32	25	38	30	46
Univ of California-San Diego	32	35	23	31	32
Univ of Wisconsin-Madison	32	41	34	46	19
New York University	35	34	39	39	35
Univ of Rochester	35	22	19	22	58
Case Western Reserve	37	22	18	18	52
Georgia Inst of Technology	37	41	30	35	25
Lehigh University	37	50	52	43	75
Boston College	40	46	48	44	52
Univ of Illinois-Champaign	40	41	40	36	25
Yeshiva University	40	28	44	52	92
University of California-Davis	43	38	35	42	35
Tulane University	44	52	49	51	52

University of California-Irvine	45	54	50	53	52
Univ of California-Santa Barbara	45	38	43	37	46
University of Washington	45	41	37	50	30
Pennsylvania State Univ-University Park	48	46	45	45	32
Rensselaer Polytechnic Inst	48	38	41	38	46
University of Florida	48	41	42	41	46
Tier 2 Universities that enter the top 50					
Pepperdine University	51	46	74	49	83
University of Maryland-College Park	53	46	56	47	42
University of Texas-Austin	53	50	62	48	25
University of Iowa	57	54	83	60	42
Purdue University-W Lafyette	58	57	59	54	35
Ohio State University-Columbus	60	57	90	57	42
University of Minnesota-Twin Cities	60	62	95	64	35
Indiana University-Bloomington	67	57	96	61	35
University of Delaware	67	62	47	67	83
University of Colorado-Boulder	78	88	115	103	46
University of Arizona	99	114	116	104	46

Table A3-Institutional Rankings Under Re-weighting (Sensitivity Analysis)

Tier 1 Universities	2004 Rank	McGuire	10 Variables	13 Variables
Harvard University	1	2	3	2
Princeton University	1	1	6	7
Yale University	3	3	2	1
Massachusetts Inst. of Technology	4	5	4	2
California Inst. of Technology	5	4	1	5
Duke University	5	13	8	9
Stanford University	5	6	5	4
University of Pennsylvania	5	14	11	10
Dartmouth College	9	10	13	13
Washington University in St. Louis	9	11	7	8
Columbia University	11	7	9	6
Northwestern University	11	15	16	15
University of Chicago	13	8	10	12
Cornell University	14	19	18	18
Johns Hopkins University	14	17	14	16
Rice University	16	9	15	14
Brown University	17	16	19	17
Emory University	18	12	12	11
University of Notre Dame	19	18	21	26
Vanderbilt University	19	21	22	19
University of California-Berkeley	21	26	28	23
University of Virginia	21	22	24	27
Carnegie Mellon University	23	31	26	25
Georgetown University	23	23	27	21
University of Michigan-Ann Arbor	25	25	25	28
Univ. of California-Los Angeles	26	32	31	30
Tufts University	27	27	30	22
Wake Forest University	28	30	29	31
Univ of North Carolina-Chapel Hill	29	34	37	33
Univ of Southern California	30	29	35	29
College of William and Mary	31	28	33	35
Brandeis University	32	33	32	32
Univ of California-San Diego	32	36	34	34
Univ of Wisconsin-Madison	32	48	42	47
New York University	35	44	55	36
Univ of Rochester	35	24	20	23
Case Western Reserve	37	20	17	20
Georgia Inst of Technology	37	38	36	40
Lehigh University	37	37	39	44
Boston College	40	35	40	37
Univ of Illinois-Champaign	40	47	51	51
Yeshiva University	40	39	23	39
University of California-Davis	43	42	38	41

Tulane University	44	43	44	42
Univ of California-Santa Barbara	45	45	45	43
University of California-Irvine	45	46	46	49
University of Washington	45	55	48	46
Pennsylvania State Univ-University Park	48	54	49	58
Rensselaer Polytechnic Inst	48	40	43	55
University of Florida	48	49	47	53
Tier 2 Universities				
George Washington University	51	50	54	50
Pepperdine University	51	41	53	38
University of Maryland-College Park	53	52	50	52
University of Delaware	67	64	41	45
University of Miami	60	59	62	48

Table A4-Predicted Rankings based on Regression

Universities	2004 Rank	Rank via SW 7 Variables	Rank via SW 5 Variables
Harvard University	1	2	2
Princeton University	1	1	1
Yale University	3	3	3
Massachusetts Inst. of Technology	4	4	4
California Inst. of Technology	5	8	8
Duke University	5	7	6
Stanford University	5	5	5
University of Pennsylvania	5	6	7
Dartmouth College	9	10	10
Washington University in St. Louis	9	11	14
Columbia University	11	9	9
Northwestern University	11	13	12
University of Chicago	13	12	13
Cornell University	14	17	17
Johns Hopkins University	14	14	16
Rice University	16	16	15
Brown University	17	15	11
Emory University	18	18	20
University of Notre Dame	19	19	19
Vanderbilt University	19	24	23
University of California-Berkeley	21	20	18
University of Virginia	21	22	21
Carnegie Mellon University	23	26	24
Georgetown University	23	21	22
University of Michigan-Ann Arbor	25	23	25
Univ. of California-Los Angeles	26	27	27
Tufts University	27	25	26

Wake Forest University	28	32	32
Univ of North Carolina-Chapel Hill	29	31	30
Univ of Southern California	30	28	28
College of William and Mary	31	30	31
Brandeis University	32	29	29
Univ of California-San Diego	32	35	35
Univ of Wisconsin-Madison	32	34	33
New York University	35	36	34
Univ of Rochester	35	33	36
Case Western Reserve	37	37	39
Georgia Inst of Technology	37	39	37
Lehigh University	37	38	38
Boston College	40	40	40
Univ of Illinois-Champaign	40	41	43
Yeshiva University	40	43	42
University of California-Davis	43	44	49
Tulane University	44	42	41
Univ of California-Santa Barbara	45	50	53
University of California-Irvine	45	47	44
University of Washington	45	45	52
Pennsylvania State Univ-University Park	48	49	48
Rensselaer Polytechnic Inst	48	52	51
University of Florida	48	53	54

Table A6-Results of Bi-Variate Regression on Score

Variable	β	Std. Error	t-statistic	p-value	R^2	Adjusted R^2
Yrfounded	-0.083865	0.0254753	-3.29	0.002	0.1842	0.1672
Public1	-14.02941	3.388683	-4.14	0	0.2631	0.2478
Assess	21.45275	2.12324	10.1	0	0.6802	0.6735
Retention	3.194726	0.3968653	8.05	0	0.5745	0.5656
Predict	1.418055	0.1364051	10.4	0	0.6925	0.686
Gradrate	1.368567	0.1461889	9.36	0	0.6461	0.6388
Under20	0.6780919	0.0904834	7.49	0	0.5392	0.5296
Over50	-0.7526863	0.2625908	-2.87	0.006	0.1462	0.1284
Stud/Fac	-2.0212808	0.3007759	-6.72	0	0.4847	0.474
FTFaculty	0.1781825	0.3368293	0.53	0.599	0.0058	-0.0149
Top10	0.4804244	0.1014201	4.74	0	0.3231	0.3087
Accept	-0.5795816	0.0595585	-9.73	0	0.6636	0.6566
Giving	0.8057371	0.1044877	7.71	0	0.5533	0.544
Endow	2.88E-09	4.28E-10	6.73	0	0.4858	0.4751
Endowsq	1.23E-19	3.28E-20	3.75	0	0.2263	0.2102
Merit	5.524926	0.7565759	7.30	0	0.5263	0.5164
Natlacad	0.9975596	0.2002134	4.98	0	0.3409	0.3272
FTUnder	-0.0007098	0.0001899	-3.74	0	0.2254	0.2092
Research	1.19E-08	9.88E-09	1.2	0.236	0.0291	0.0089
SAT25	0.1177375	0.0101649	11.58	0	0.7365	0.731
SAT50	0.1313238	0.010168	12.92	0	0.7768	0.7721
SAT75	0.1428771	0.0104263	13.7	0	0.7964	0.7922
				0	0.6479	0.6406

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