Research Activity Index – Methodology Details

The following step-by-step instructions are provided for those who wish to examine in more detail the place of an institution within the Research University spectrum as reflected through the research activity index that is used to determine the cutoff point between R1 and R2 institutions. Please note that this measure of **level** of research activity is not intended as a measure of the quality, impact or productivity of a university's research activity.

Input Data

You can find the data for the 277 institutions that were included in the analysis within the public file (http://carnegieclassifications.iu.edu/downloads/CCIHE2021-PublicData.xlsx) specifically, the columns labeled: S&ER&D, NONS&ER&D, PDNFRSTAFF, FACNUM (used for per capita index calculation), HUM_RSD, SOCSC_RSD, STEM_RSD, OTHER_RSD. The 277 institutions are those that have numeric values (including 0) in **black font** for all seven variables. Data shown in a red font should not be included

Steps

1. Calculate the three per capita measures by dividing each of the three research measures (S&ER&D, NONS&ER&D, PDNFRSTAFF) by the number of full-time ladder-rank faculty (FACNUM).
2. Convert all ten measures (the 7 raw measures and 3 per capita ones) to ranks from low = 1 to high = 270 (i.e., ascending order). We used "RANK.AVG" function within Excel, where ties all receive the average value of the group followed by the next available number. For example, the seven numbers 10, 8, 8, 4, 4, 4, 2 would be ranked 7, 5.5, 5.5, 3, 3, 3, 1.
3. For each institution, calculate the aggregate index score and the per capita index score by multiplying the appropriate ranks (first seven measures for aggregate; 3 per capita measures for the per capita index) by the "PCA Coefficients" that are provided in the Research Activity Index file (http://carnegieclassifications.iu.edu/downloads/CCIHE2021-Research_Activity_Index.xlsx) and summing the weighted ranks for each index (resulting in two indexes). Make sure to copy the values from the spreadsheet rather than retyping what appears in the cells (full precision).
4. Create new versions of those two indices by subtracting the minimum value from each score (so the resulting minimum value is 0).
5. For each institution, use the zero adjusted versions of the two index scores created in step 4 to calculate the distance to the origin (0, 0) of the two index score using the standardized Euclidean Distance formula (Square root of sum of squared index).
6. Convert the resulting raw distance score to a standardized value but subtracting the overall mean and dividing by the standard deviation (we used population standard deviation).
7. That resulting score can be compared to the cutoffs to determine in which category the institution falls. The cutoffs are noted in the "Descriptives" tab of the Research Activity Index file.

NOTE: The scatter plot is based on raw scores with the axes then relabeled to the standardized values. That is why the scales of X and Y are not the same.

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