CARNEGIE SENSITIVITY ANALYSIS: MOVING FROM R2 TO R1

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ABSTRACT

Carnegie Institutional Rankings have been a very strong influence in higher education. Many institutions have prioritized obtaining R1 status, or very high research, in order to obtain prestige and respect. The University of Idaho has established a goal of obtaining R1 Carnegie status within its strategic plan. There are limitations to a static analysis of a dynamic process. However, by recreating the 2015 analysis, we can find selected inputs that would have merited an R1 status in 2015. This is no guarantee of future R1 status - these values would change in upcoming Carnegie rankings and would be dependent on other institutions’ actions, since the rankings, rather than the absolute values, are used. However, it is instructive to determine how the UI might reach this status, and to identify the most cost-effective and sensitive inputs that go into the rankings.

In the 2015 rankings, the UI had a distance from the origin of ≈0.32. To obtain R1 status, the UI would have to obtain a distance of ≈0.28. R1 schools with a minimum distance are included below.

METHODS

The Carnegie Rankings are the result of two weighted means that establish a Cartesian plane.

Distance from the origin produces cutoffs between R1, R2, and R3 classifications and weights are established from a principal component analysis. In order to reproduce the analysis:

1. Download the data from the Carnegie website and identify the eight data input fields you need: STEM_RSD, HUM_RSD, STEM_RSD, OTHER_RSD, NONS_ER_D, PDNFRSTAFF, FACTNUM.
2. Divide SE_R, D, NONS_ER_D, and PDNFRSTAFF by FACTNUM to make them per capita.
3. Rank aggregate and per capita inputs (omitting FACTNUM).
4. Multiply seven ranked inputs by provided weights (from PCA) and sum. Standardize to create Capita_Index_STD (Y-axis in Carnegie plot).
5. Create distance from origin using the Euclidean distance formula.
6. Plot, adjust values, and compare resulting and original distances from origin.

CONCLUSIONS

Carnegie Classifications are intended for classification rather than ranking. However, many institutions of higher learning are interested in obtaining a “better” classification. Since Carnegie provides the data and the weights from their PCA, recreating the procedure and adjusting the inputs to see their corresponding impact is a useful exercise. The steepness of the curve indicates the ease by which an increase in the input improves an institution’s distance from the origin. For many institutions, it may be impossible to increase a specific measure, e.g., if there is no social science program, it would be very expensive to increase the number of social science Ph.D.s produced. However, if an institution has such programs and could easily increase the number of Ph.D.s, this cost would be minimal. The sensitivity analysis provides an agnostic view of the impacts of such changes in a process where many stakeholders have an inherent interest in increasing a specific measure.

While the results are contingent on the circumstances of the institution, in the UI’s case, it is clear that an increase in “Postdoctorates and non-faculty research staff with doctorates” would contribute significantly towards R1 status at a relatively low cost. Similarly, increases in “Humanities research/scholarship doctoral degrees” would provide efficient increases in the UI’s distance from the origin. It is difficult to ascertain the availability of additional funds for the two expenditure inputs and it is left to senior administration to determine the efficiency of increasing these measures.

LEGEND

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