

Max-min procedure to convert indicators into indices

In order to construct indices whose values can range between 0 and 100, the minimum and maximum admissible values—also known as lower and upper bounds—must first be determined. The CDP bases these bounds on the distribution of indicator values among all developing countries (see tables III.1 and III.4 in the *Handbook on the Least Developed Country Category* explaining the calculations of HAI and EVI for the exact bound values). However, in order to reduce the impact of extreme outliers on the distribution of index values, the bounds may be set higher (lower) than the actual minimum (maximum) value of the indicator's data set. The bounds are generally kept constant across triennial reviews. Additionally, for a few indicators (population and victims of natural disasters) the values are transformed using the natural logarithm in order to address possible distortions caused by highly skewed distributions of indicator values, or to account for the fact that the associated impediments are clearly non-linear in indicator values.

The basic formula for converting an indicator value (V) into an index score (I) is:

$$I = 100 \times \frac{V - \text{min_value}}{\text{max_value} - \text{min_value}},$$

where

min_value is the minimum admissible value (lower bound) and,
 max_value is the maximum admissible value (upper bound).

For countries with indicator values below (above) the lower (upper) bound, the actual indicator value is replaced with the lower (upper) bound resulting in an index score of 0 (100).

In a few cases, indicator and criteria point in opposite directions. For example, a high under-five mortality rate signifies a low (rather than high) level of human assets. In these cases, the following alternative formula is used.

$$I^* = 100 - I = 100 \times \frac{\text{max_value} - V}{\text{max_value} - \text{min_value}}$$

Again, actual indicator values are replaced with lower or upper bounds, if necessary.