

Construction of the GlobalIndex

Methodological Remarks

Based on theoretical considerations we construct an overall index of globalization, consisting of 31 variables, that aims to cover the development of globalization in 116 different countries for the time span from 1970 to 2002.

Given this high number of countries and years, dealing with missing values cannot be avoided. In cases of missing data for a given variable, we estimate the GlobalIndex values by **linear interpolation** between adjacent valid time points and second instead of linear extrapolation, when values were missing at the “endings” of the time series, they were **substituted by the latest data available**. In case of entire data series being unavailable, we substituted the missing values by **regression imputation** based on all other variables. Before imputation we excluded certain countries among two conditions: Countries with more than three missing variables for the entire period and countries where up to a third of the variables within the respective sub-dimensions are missing have been excluded¹. Furthermore, three countries were excluded from the calculation due to an unsatisfactory estimate².

An important aspect at the construction of a single index, integrating 31 variables, is the commensurability of these indicators. Due to different units and scaling, the raw data of the variables are not directly comparable with each other, but need to be converted into a unified form, *e.g.*, a scale ranging from 0 to 100 (Dreher 2007), or from 0 to 10. Caselli (2005: 4) suggests the following formula for a suchlike transformation known as “**panel-normalization**”:

$$V_{\text{standardized}} = 10 * \frac{V_i - V_{\min}}{V_{\max} - V_{\min}}$$

V_{\max} and V_{\min} are the maximal and minimal values of the complete data series, whereas V_i refers to the actual value of a variable. The above transformation results in values on a scale from 0 to 10 (see Dreher 2006; Gwartney and Lawson 2006). However, it only applies if the values of a variable correlate positively with globalization. For variables where the opposite is the case, such as “taxes on international trade” and the “freedom house-index”, we readjusted the above formula accordingly into

$$V_{\text{standardized}} = 10 * \frac{V_{\max} - V_i}{V_{\max} - V_{\min}}$$

This procedure guarantees a unified standardization of all variables prior to the index calculations, and ensures that high index values reflect a high level of globalization.

¹ Thus sub-dimensions A_i , A_{ii} , B_i and C_i were not taken into consideration when lacking more than one variable; C_{ii} when lacking more than two and B_{ii} when lacking more than three variables.

² The countries that needed to be excluded are Bahamas, Bahrain, Barbados, Belize, Benin, Burundi, Central African Republic, Chad, the Democratic Republic of the Congo, the Republic of the Congo, Gabon, Guyana, Togo, Guinea Bissau, the Republic of Haiti, the Islamic Republic of Iran, Luxembourg, the Union of Myanmar, Niger, Panama, Papua New Guinea, the Kingdom of Saudi Arabia, Sierra Leone, Tanzania, Uganda, and the United Arab Emirates

The last step in the calculation of the index is the assignment of proper weights to individual variables and sub-indices. The use of arbitrary weights as done by Kearney/Foreign Policy (2001) carries the risk of either over- or underestimating the influence of individual variables (Lockwood 2001). We therefore follow the alternative methodology employed by both Dreher (2006) and Lockwood (2001) using **principal component analysis** to determine the actual contribution of the variables to their sub-dimension. This procedure is then repeated for each sub-dimension and “main dimension” (socio-technical, cultural, economic, cultural), respectively. This procedure results in an index, which allots comparable influence to all variables and neither over- nor underweights individual indicators.

References:

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