



CWTS Leiden Ranking 2011/2012
Meaningful metrics

Methodology



Universiteit
Leiden

Methodology

The CWTS Leiden Ranking 2011/2012 is based on publications in Thomson Reuters' Web of Science database in the period 2005-2009. Only publications in the sciences and the social sciences are included. Publications in the arts and humanities are excluded because in these domains the bibliometric indicators of the Leiden Ranking do not have sufficient accuracy. Furthermore, only publications of the Web of Science document types *article*, *letter*, and *review* are considered in the Leiden Ranking.

Impact indicators

The CWTS Leiden Ranking 2011/2012 offers the following indicators of the scientific impact of a university:

- *Mean citation score (MCS)*. The average number of citations of the publications of a university.
- *Mean normalized citation score (MNCS)*. The average number of citations of the publications of a university, normalized for field differences, publication year, and document type. An MNCS value of two for instance means that the publications of a university have been cited twice above world average.
- *Proportion top 10% publications ($PP_{top\ 10\%}$)*. The proportion of the publications of a university that, compared with other similar publications, belong to the top 10% most frequently cited. Publications are considered similar if they were published in the same field and the same publication year and if they have the same document type.

Citations are counted until the end of 2010 in the above indicators. Author self citations are excluded. The $PP_{top\ 10\%}$ indicator is more stable than the MNCS indicator, and we therefore regard the $PP_{top\ 10\%}$ indicator as the most important impact indicator of the Leiden Ranking.

Collaboration indicators

The following indicators of scientific collaboration are provided in the CWTS Leiden Ranking 2011/2012:

- *Proportion collaborative publications (PP_{collab})*. The proportion of the publications of a university that have been co-authored with one or more other organizations.

- *Proportion international collaborative publications* ($PP_{int\ collab}$). The proportion of the publications of a university that have been co-authored by two or more countries.
- *Mean geographical collaboration distance* (MGCD). The average geographical collaboration distance of the publications of a university, where the geographical collaboration distance of a publication equals the largest geographical distance between two addresses mentioned in the publication's address list.
- *Proportion long distance collaborative publications* ($PP_{>1000\ km}$). The proportion of the publications of a university that have a geographical collaboration distance of more than 1000 km.

Counting method

The CWTS Leiden Ranking 2011/2012 supports two counting methods: Full counting and fractional counting. The full counting method gives equal weight to all publications of a university. The fractional counting method gives less weight to collaborative publications than to non-collaborative ones. For instance, if the address list of a publication contains five addresses and two of these addresses belong to a particular university, then the publication has a weight of 0.4 in the calculation of the bibliometric indicators for this university. The fractional counting method leads to a more proper normalization of indicators and to fairer comparisons between universities active in different scientific fields. Fractional counting is therefore regarded as the preferred counting method in the Leiden Ranking.

Non-English language publications

Comparing the impact of non-English language publications with the impact of publications written in English may not be considered fair. Non-English language publications can be read only by a small part of the scientific community, and therefore these publications cannot be expected to receive similar numbers of citations as publications written in English. Because of this, the CWTS Leiden Ranking 2011/2012 offers the possibility of excluding non-English language publications from the calculation of the bibliometric indicators.

Stability intervals

A stability interval indicates a range of values of a bibliometric indicator that are likely to be observed when the underlying set of publications changes. For instance,

the MNCS indicator may be equal to 1.50 for a particular university, with a stability interval from 1.40 to 1.65. This means that the true value of the MNCS indicator equals 1.50 for this university, but that changes in the set of publications of the university may relatively easily lead to MNCS values in the range from 1.40 to 1.65. The Leiden Ranking employs 95% stability intervals constructed using a statistical technique known as bootstrapping.