

## Rediscovering our universities by increasing their level of support

Ramakrishnan<sup>1</sup> points out that a kind of caste system has taken hold of our higher education system in the order: institutes, universities and colleges. Also, it has been briefly mentioned that such a caste system also exists in advanced countries with top-ranking institutions dominating others. In this regard, the present author still remembers the comments of his postdoctoral mentor, late Herbert C. Brown (1979 Chemistry Nobel Laureate, professor at Purdue University, USA) about 'domination of east and west coast institutions in the USA' in a press conference after the announcement of the Chemistry Nobel Prize in October 1979. Things are not much different even today in USA. However, some faculty members from relatively less-endowed universities in the US achieve much more than those from the 'east and west coast institutions', since threshold levels of funding to second and lower-ranking universities in the US are also high.

A similar discriminating system also exists among our higher educational institutions with IISc, Bengaluru dominating the scene followed by the IITs and IISERs, Central Universities and State Universities and colleges. However, thanks to the UGC schemes of support like Special Assistance Programs, University with Potential for Excellence, College with Potential for Excellence, etc. to a few Central Universities like BHU, JNU, University of Hyderabad and Delhi University and a few State Universities like University of Pune, Madurai Kamaraj University and Jadavpur University, achievements of some faculty members from these universities are as good as or better than those from the institutions of 'national importance' like IISc, IITs and IISERs. Such achievements of faculty members from Central and State Universities are important as these universities are inclusive with reservations implemented for SC/ST and OBC sections of our society, both in fac-

ulty recruitment and student admission. Therefore, the new UGC and MHRD schemes of support in the form of increased salaries for achievers among faculty members and enhanced scholarship to achievers among students in the universities and colleges, along with increasing the overall threshold levels of funding for the Central and State Universities and colleges, will go a long way in strengthening our higher education system for the benefit of all sections of our society.

1. Ramakrishnan, T. V., *Curr. Sci.*, 2016, **110**, 1879–1880.

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## Leading Indian higher education institutions and the Leiden 2016 ranking

The Centre for Science and Technology Studies (CWTS) Leiden 2016 ranking (<http://www.leidenranking.com/>) based on Thomson Reuters' *Web of Science* (WoS) data which covers six sliding 4-yr time windows, from 2006–09 to 2011–14 is now available.

This latest ranking (2016) now reports the scientific performance of 842 major universities from 53 countries. Universities are included if they have least 1000 publications in the period 2011–2014 from the WoS database. From India, 19 have made the cut. The Leiden list offers both size-dependent and size-independent indicators of output and impact. The primary size-dependent indicator is the number of publications  $P$  of the university. The list also records the number of highly cited publications of the university, which happens to be a size-dependent indicator. The size-independent indicator

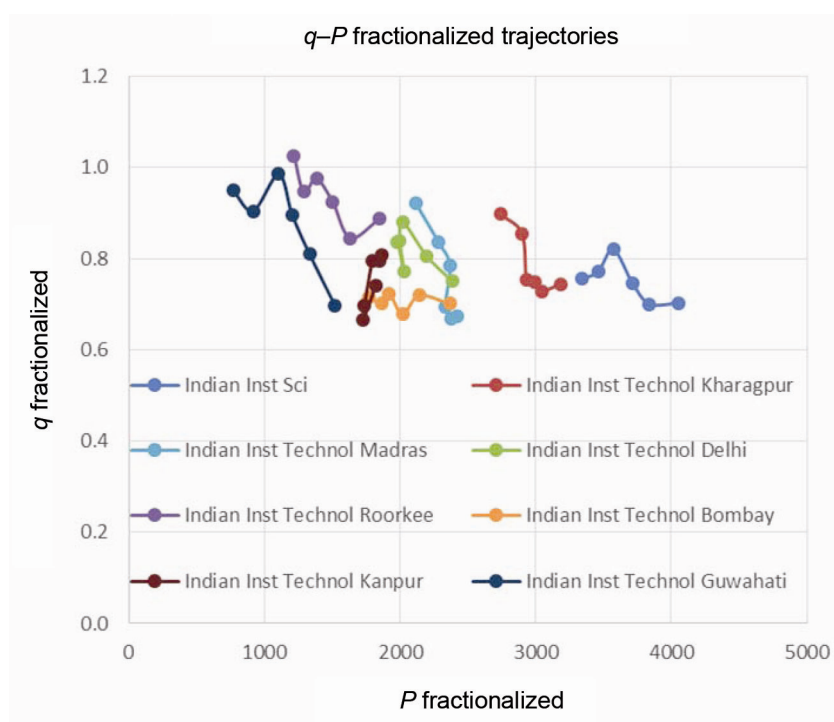
which can be derived from this is the fraction or percentage of the university's highly cited publications. If normalized with the world average, one can compute a figure  $q$  as we shall show below, which is a size-independent proxy for the quality of the university's output.

Although the Leiden ranking scrupulously refrains from aggregating different dimensions of university performance into a single overall indicator, the transparency and rigour of the methodology allows us to independently compute composite indicators of performance, as has been done earlier in these pages<sup>1,2</sup>.

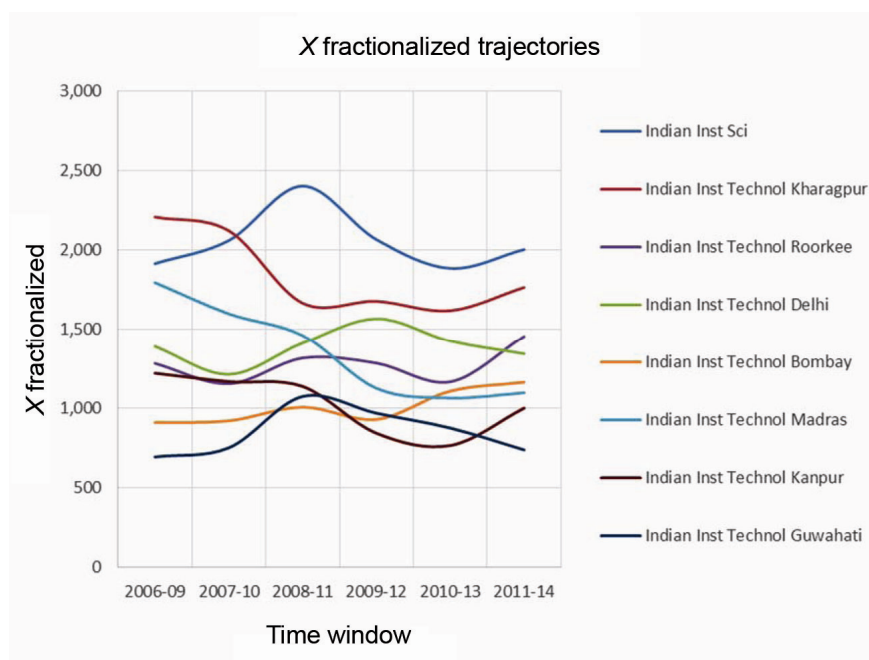
A welcome feature is that the Leiden ranking enables trend analyses, as it offers data based on publications over six sliding 4-yr time windows, namely 2006–09, 2007–10, 2008–11, 2009–12, 2010–13 and 2011–14. The statistics for each time window is presented in a fully

consistent manner, with citations counted until the end of the first year after that period has ended. For instance, in the case of the period 2006–09 citations are counted until the end of 2010, while in the case of the period 2011–14 citations are counted until the end of 2015.

This allows us to revisit our earlier studies<sup>1,2</sup> to see how leading higher educational institutions (HEIs) in India have been faring during this period, i.e. the six moving windows covering 2006–14. We adopt the same methodology used in our earlier studies<sup>1,2</sup>.  $P$  is the number of bibliometrically fractionalized papers published from India during the chosen window (i.e. publications co-authored by multiple institutions are fractionally attributed). The proportion of top 10% publications ( $PP_{\text{top } 10\%}$ ) is arguably the most robust, size-independent proxy or indicator for quality of publications. This



**Figure 1.** Trajectories of eight leading higher educational institutions over six 4-yr time windows from 2006 to 2014.



**Figure 2.** X trajectories of eight leading higher educational institutions over six 4-yr time windows from 2006 to 2014.

is the proportion of the publications of a university that, compared with other similar publications, belongs to the top

10% most frequently cited. The procedure has a normalizing effect across fields, publication year and document

type. The ratio  $q = PP_{\text{top } 10\%}/10$  allows one to normalize this proxy, such that a value of 1.00 is the expected global norm.

Note that  $P$  and  $q$  are primary indicators, one a measure of size of output and the other a proxy for quality of output.  $P$  is then a zeroth-order indicator of performance<sup>3</sup>, and it is possible to combine this to obtain a first-order indicator of performance  $qP$  and a second order indicator of performance  $X = q^2P$ . In this manner, the quantity term ( $P$ ) and the quality term ( $q$ ) in the Leiden datasets can be integrated into a single composite term that serves as the best size-dependent proxy for total performance in the research context.

In the present exercise, we report the results for eight Indian HEIs from the Leiden ranking using only the fractionalized data. Figure 1 shows the  $q$ - $P$  trajectories of the eight leading HEIs over the six 4-yr time windows from 2006 to 2014. We see that all eight institutions have increased their output, but the quality by global standards has been coming down. Except in one instance (IIT Roorkee in 2006–09), all eight institutions have been performing below global expectation ( $q = 1$ ). The overall composite effect of the increase in output and decline in quality is best seen when we see how the  $X$  trajectories change over the six 4-yr time windows from 2006 to 2014. Figure 2 shows that all our major players, IISc, Bengaluru and the seven old IITs, where the greatest investment has taken place, are in relative decline.

1. Prathap, G., *Curr. Sci.*, 2013, **104**, 407–408.
2. Prathap, G., *Curr. Sci.*, 2014, **106**, 1467–1468.
3. Prathap, G., *Curr. Sci.*, 2010, **98**, 995–996.

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