

Geographic distribution of Indian academic research

How are the various States and Union Territories of India performing relative to each other in academic research? A simple way to find an answer is to see the percentage of papers each state pub-

lishes in the *Web of Science* journals and relate it to its percentage share of GDP.

The scientific output is measured in terms of the number of articles published from the various states of India as regis-

tered by the *Web of Science* over a 3-year period (2007–2009)¹. The GDP of each state was measured in billions of dollars in 2009 (<http://www.economist.com/content/indian-summary>, accessed on 22 July 2011).

Table 1 presents the results of the output from various Indian States from the *Web of Science* during 2007–2009 (ref. 1). Tamil Nadu (TN) accounts for the largest number of publications, i.e. 14.05% share of the Indian scientific output during this period. At the same time, it had only a 7.4% share of Indian GDP in 2009. One can think in terms of a leverage ratio of these two percentages: from Table 1, this leverage term for TN is 1.90. The Union Territory of Chandigarh, which has many top national research and academic institutes, ranks first among the Indian States for academic scientific research on this leverage basis; it is 5.59 times more effective than the Indian average. Delhi, which has a privileged status as the National Capital Region, ranks second and the erstwhile Union Territory of Puducherry ranks third on this leverage basis. This is not surprising as a large number of premier research and academic institutes are based in Delhi. Similarly, for its size, Puducherry has a good share of leading central institutes devoted to higher education and research. Among the larger states, Karnataka, TN, West Bengal and Uttar Pradesh perform above this average. Two large states, both in size and from GDP considerations, which are poorly leveraged are Maharashtra and Gujarat. The same information is conveyed graphically in Figure 1. Andhra Pradesh and Kerala are delicately poised at the average leverage line (shown by a dotted line in Figure 1).

Table 1. Percentage shares of scientific output and GDP for various Indian States

State	Total 2007–2009		GDP US\$ billion	Percentage share of GDP	Leverage
	Number of papers	Percentage share of papers			
Tamil Nadu	17,507	14.051	80	7.40	1.90
Maharashtra	16,577	13.305	175.3	16.20	0.82
Uttar Pradesh	15,843	12.715	103.5	9.57	1.33
Karnataka	15,156	12.164	62.9	5.81	2.09
West Bengal	14,471	11.614	76.9	7.11	1.63
Delhi	14,157	11.362	36.1	3.34	3.40
Andhra Pradesh	9494	7.620	85.7	7.92	0.96
Kerala	4559	3.659	41.2	3.81	0.96
Gujarat	4094	3.286	80.1	7.40	0.44
Madhya Pradesh	3835	3.078	37.3	3.45	0.89
Punjab	3151	2.529	40.5	3.74	0.68
Rajasthan	2814	2.258	46.3	4.28	0.53
Chandigarh	2640	2.119	4.1	0.38	5.59
Haryana	2555	2.051	44.2	4.09	0.50
Assam	2210	1.774	18.6	1.72	1.03
Orissa	2105	1.689	31.8	2.94	0.57
Uttarakhand	1223	0.982	9.9	0.92	1.07
Himachal Pradesh	1137	0.913	8.9	0.82	1.11
Bihar	1019	0.818	32.7	3.02	0.27
Jammu and Kashmir	988	0.793	7.6	0.70	1.13
Puducherry	875	0.702	2.8	0.26	2.71
Jharkhand	698	0.560	17.5	1.62	0.35
Goa	626	0.502	4.2	0.39	1.29
Meghalaya	364	0.292	2.1	0.19	1.50
Chhattisgarh	238	0.191	22.7	2.10	0.09
Arunachal Pradesh	195	0.157	1	0.09	1.70
Manipur	156	0.125	1.4	0.13	0.97
Sikkim	124	0.100	0.6	0.06	1.80
Tripura	96	0.077	2.6	0.24	0.32
Mizoram	84	0.067	0.8	0.07	0.91
Andaman and Nicobar	77	0.062	0.5	0.05	1.34
Nagaland	68	0.055	1.5	0.14	0.40
Lakshadweep	2	0.002	0.3	0.03	0.07
Dadra and Nagar Haveli	1	0.001	0.1	0.01	0.11
Total	125,619	100.000	1081.8	100.00	1.00

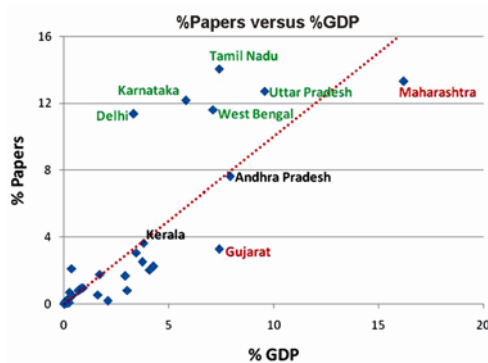


Figure 1. Percentage shares of papers and GDP for the various Indian States and Union Territories.

1. Garg, K. C. and Kumar, S., India S&T Report, CSIR National Institute for Science, Technology and Development Studies, New Delhi, 2011.

GANGAN PRATHAP

CSIR National Institute of Science,
Communication and Information
Resources,
New Delhi 110 012, India
e-mail: gp@niscair.res.in