

Some lessons about Rankings

“Rankings and University Systems”

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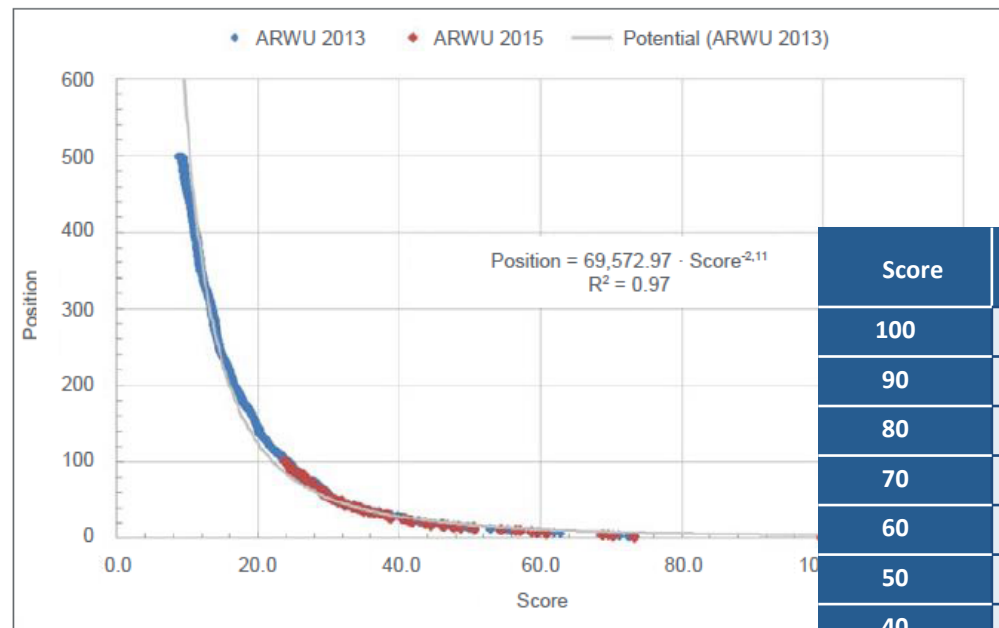


What rankings?

Table 1. Internet entries for global rankings (Google search engine)

Search term (30-09-2015)	Approximate entries	Ranking	Highest value
Times Higher Education World University Rankings	7,080,000	THE	83,500,000
THE World University Rankings	83,500,000		
Times Higher Education World Rankings	54,100,000		
Academic Ranking of World Universities	16,900,000	ARWU	17,600,000
Shanghai Ranking	17,600,000		
ARWU	476,000		
QS World University Rankings	2,760,000	QS	7,450,000
QS Ranking	3,960,000		
QS Top Universities	7,450,000		
Quacquarelli-Symonds rankings	160,000		
University Ranking by Academic Performance	3,000,000	URAP	3,000,000
URAP	500,000		
National Taiwan University Ranking	1,480,000	NTU	1,480,000
NTU Ranking	438,000		
CWTS Leiden Ranking	28,400	LEIDEN	534,000
Leiden Ranking	534,000		
Webometrics	445,000	WEBOMETRICS	445,000
Scimago Institutions Ranking	49,000	SIR	22,100,000
SIR Ranking	22,100,000		

Figure 2. Relation between Position and Score in ARWU

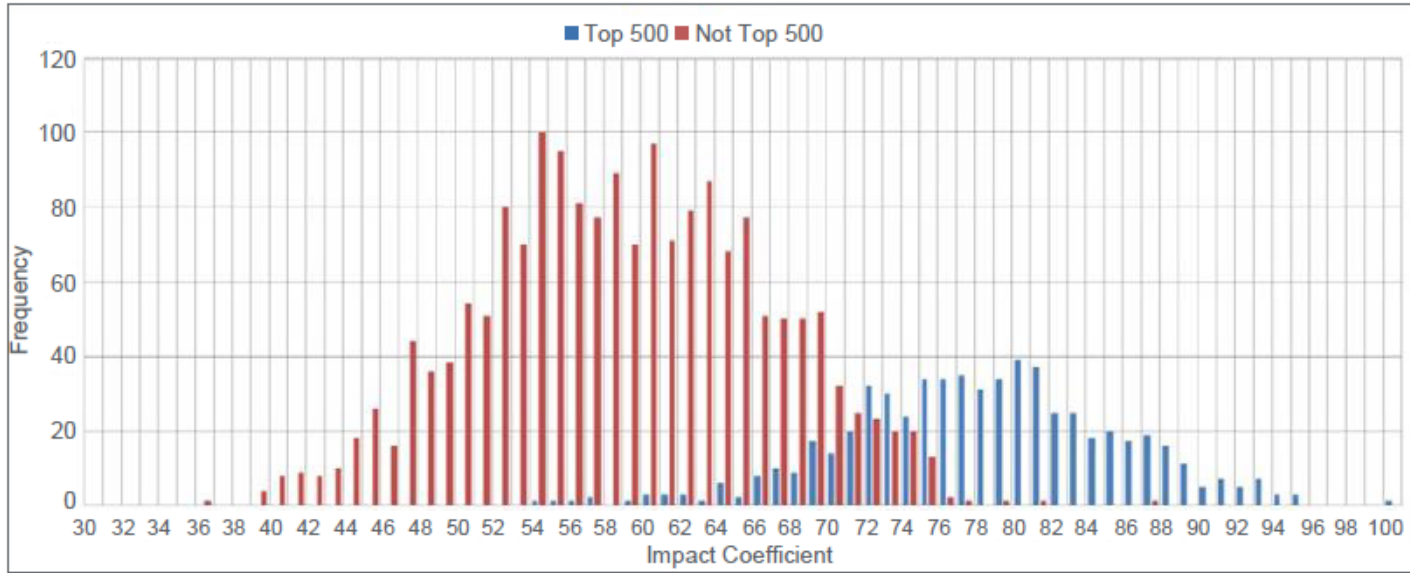


Accuracy and Precision

Score	Estimated position	Error in scoring				
		1	2	3	4	5
100	4	0	0	0	0	0
90	5	0	0	0	0	1
80	6	0	0	1	1	1
70	8	0	1	1	1	1
60	12	0	1	1	2	2
50	17	1	2	2	3	4
40	28	2	3	5	6	8
30	51	4	7	11	15	19
20	121	13	26	39	53	66
10	525	114	227	341	454	568

UNIVERSITY	ARWU	THE	QS	SCORE	O	NI	IMPACT	COUNTRY
Harvard University	1	2	2	2,997	80.467	2,40	193.121	USA
Massachusetts Institute of Technology (MIT)	4	5	1	2,991	32.581	2,45	79.823	USA
Stanford University	2	4	7	2,987	41.284	2,33	96.192	USA
University of Cambridge	5	7	3	2,984	36.393	2,03	73.878	UK
California Institute of Technology	6	1	10	2,982	20.646	2,09	43.150	USA
University of Princeton	=(SI(B2>0;(768-B2)/767;0)+SI(C2>0;(768-C2)/767;0)+SI(D2>0;(768-D2)/767;0))							7
								1
University of Chicago	9	9	9	2,969	20.203	2,21	44.649	USA
Yale University	11	11	8	2,965	29.658	2,02	59.909	USA
Columbia University	8	13	14	2,958	35.494	2,20	78.087	USA
University of California, Berkeley	3	8	25	2,957	34.725	2,20	76.395	USA
The Imperial College of Science, Technology and Medicine	24	10	5	2,953	33.006	2,03	67.002	UK
University of Pennsylvania	15	16	13	2,947	37.042	2,13	78.899	USA
Swiss Federal Institute of Technology Zurich	20	14	12	2,944	25.228	1,86	46.924	SWI
University of Barcelona	203	238	178	2,197	16.913	1,49	25.200	ESP
Autonomous University of Barcelona	272	238	177	2,108	14.624	1,43	20.912	ESP
Autonomous University of Madrid	248	325	195	2,003	11.610	1,30	15.093	ESP
University of Pompeu Fabra	364	164	281	1,949	4.002	1,50	6.003	ESP
Polytechnic University of Valencia	349	375	383	1,561	9.699	1,19	11.542	ESP
University of Valencia	308	375	475	1,494	11.911	1,30	15.484	ESP
Complutense University of Madrid	294		216	1,338	14.499	1,07	15.514	ESP
University of Navarra		375	315	1,103	4.870	1,16	5.649	ESP
University of Granada	383		525	0,819	10.239	1,19	12.184	ESP
University of Zaragoza	473		485	0,754	8.568	1,23	10.539	ESP
Universidad Carlos III de Madrid			317	0,588	4.552	1,01	4.598	ESP
Universitat Politècnica de Catalunya			345	0,551	12.302	1,20	14.762	ESP
University of Vigo		375		0,512	5.061	1,18	5.972	ESP
University of Rovira i Virgili		375		0,512	4.188	1,40	5.863	ESP

Figure 5. Distribution of frequencies for the TIC of Top500 and Not Top 500 universities



Rankings and Scientific Impact

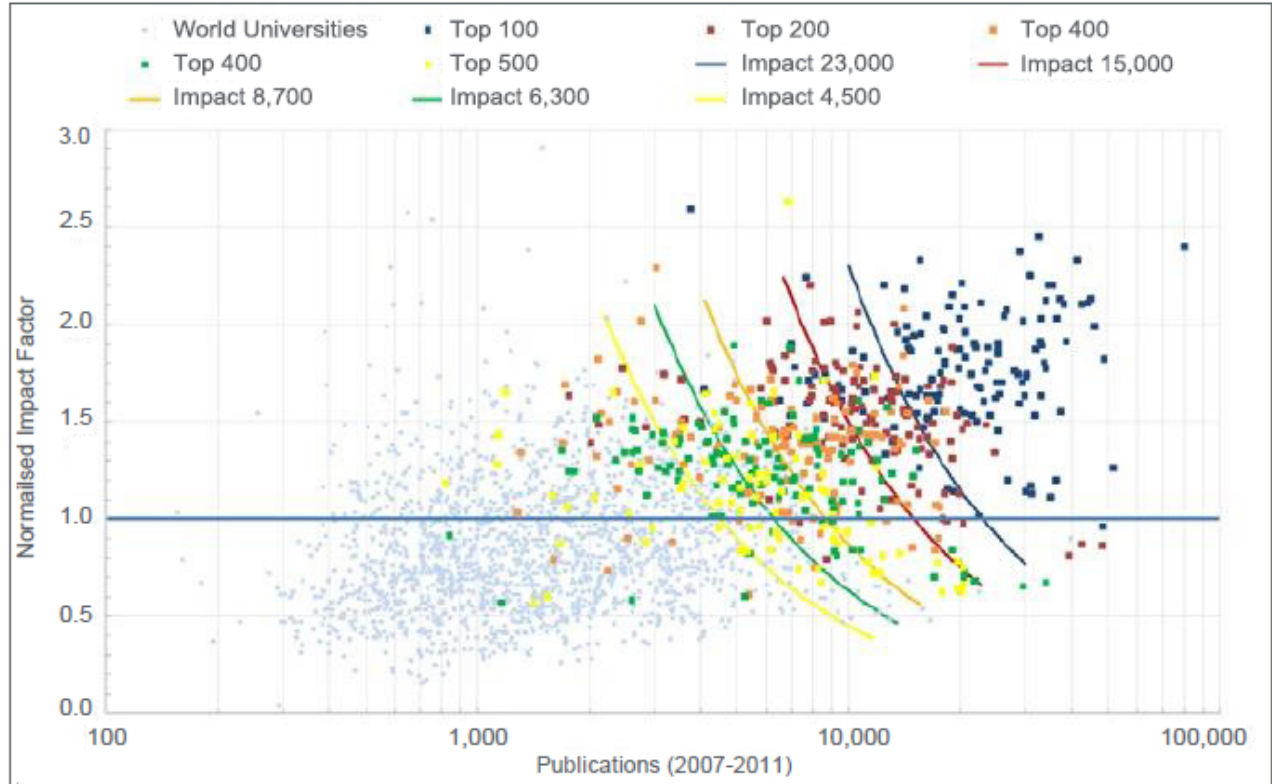
Table 6. Position and threshold total impact for the 80th percentile of each class of universities

Threshold Position	Total Impact	Total Impact (2 significant figures)	% Top100	% Top200	% Top300	% Top400	% Top500	% Not Top500
140	23,217	23,000	80.0	95.7	99.3	99.3	99.3	0.7
272	14,694	15,000	49.3	80.1	91.2	97.1	99.3	0.7
417	8,743	8,700	35.0	62.4	80.1	91.4	97.4	2.6
546	6,294	6,300	26.9	48.4	65.8	80.0	88.6	11.4
681	4,520	4,500	21.6	39.4	55.5	70.3	80.0	20.0



Rankings and Scientific Impact

Figure 8. SIR universities and their classification according to the lowest position in ARWU, THE or QS



Rankings and Excellence

UNIVERSIDAD	ARWU	THE	QS	O	NI	IMPACTO	IDEX 1 (2008-12)	IDEX 2 (2015)	I-SITE (REG, 2015)	TOTAL
Pierre and Marie Curie University - Paris 6	37	96	112	37.363	1,55	57.913	SORBONNE-UNIVERSITÉS			1
University of Paris Diderot (Paris 7)	113	178	205	19.024	1,70	32.341	PARIS-SORBONNE			1
Joseph Fourier University (Grenoble 1)	143	155	220	21.014	1,49	31.311		GRENOBLE		1
University of Paris Sud (Paris 11)	39	114	189	20.070	1,56	31.309	PARIS SACLAY			1
Paul Sabatier University (Toulouse 3)	262		390	17.150	1,39	23.839	TOULOUSE			1
University of Paris Descartes (Paris 5)	166		274	13.051	1,65	21.534	PARIS-SORBONNE			1
Institut Polytechnique de Grenoble				12.982	1,38	17.915		GRENOBLE		1
University of Strasbourg	97	213	226	11.541	1,51	17.427	STRASBOURG (3)			1
University of Montpellier 2	244	263	385	11.852	1,43	16.948			MONTPELLIER	1
Claude Bernard University Lyon 1	238	325	415	11.463	1,42	16.277				0
Ecole Normale Supérieure - Paris	71	65	28	7.746	1,59	12.316	PARIS SCIENCES LETTRES			1
University of Bordeaux	208		309	8.320	1,39	11.565	BORDEAUX (3: I, II, IV)			1
Ecole Polytechnique	299	70	41	6.995	1,53	10.702	PARIS SACLAY			1
Université Lille 1, Sciences et Technologies			405	8.700	1,14	9.918		LILLE		1
Université Montpellier 1			475	6.266	1,42	8.898			MONTPELLIER	1
Université de Versailles Saint Quentin en Yvelines				4.953	1,72	8.519	PARIS SACLAY			1
University of Nice Sophia Antipolis	400		495	6.454	1,31	8.455		NICE		1
Université de Nantes			625	6.352	1,29	8.194				0
Université de Savoie				4.183	1,84	7.697				0
Université Victor Segalen, Bordeaux 2				4.972	1,49	7.408				0
Institut National Polytechnique de Toulouse				5.931	1,18	6.999	TOULOUSE			1
University of Rennes 1	421		525	5.427	1,21	6.567				0
Université Blaise Pascal, Clermont-Ferrand II				4.115	1,51	6.214			CLERMONT AUVERGNE	1
Université de Bourgogne				5.056	1,22	6.168			BOURGOGNE FRANCHE C	1
Collège de France				3.071	1,75	5.374	PARIS SCIENCES LETTRES			1
AgroParisTech, Institut des Sciences et Industries du Vivant et de l'Environnement				3.750	1,42	5.325	PARIS SACLAY			1
Université Paris-Est Créteil				3.462	1,38	4.778			PARIS EST	1
Université de Franche-Comté				4.159	1,11	4.616			BOURGOGNE FRANCHE C	1
Université de Caen Basse-Normandie			767	4.217	1,05	4.428				0
Ecole Centrale de Lille				3.443	1,28	4.407		LILLE		1

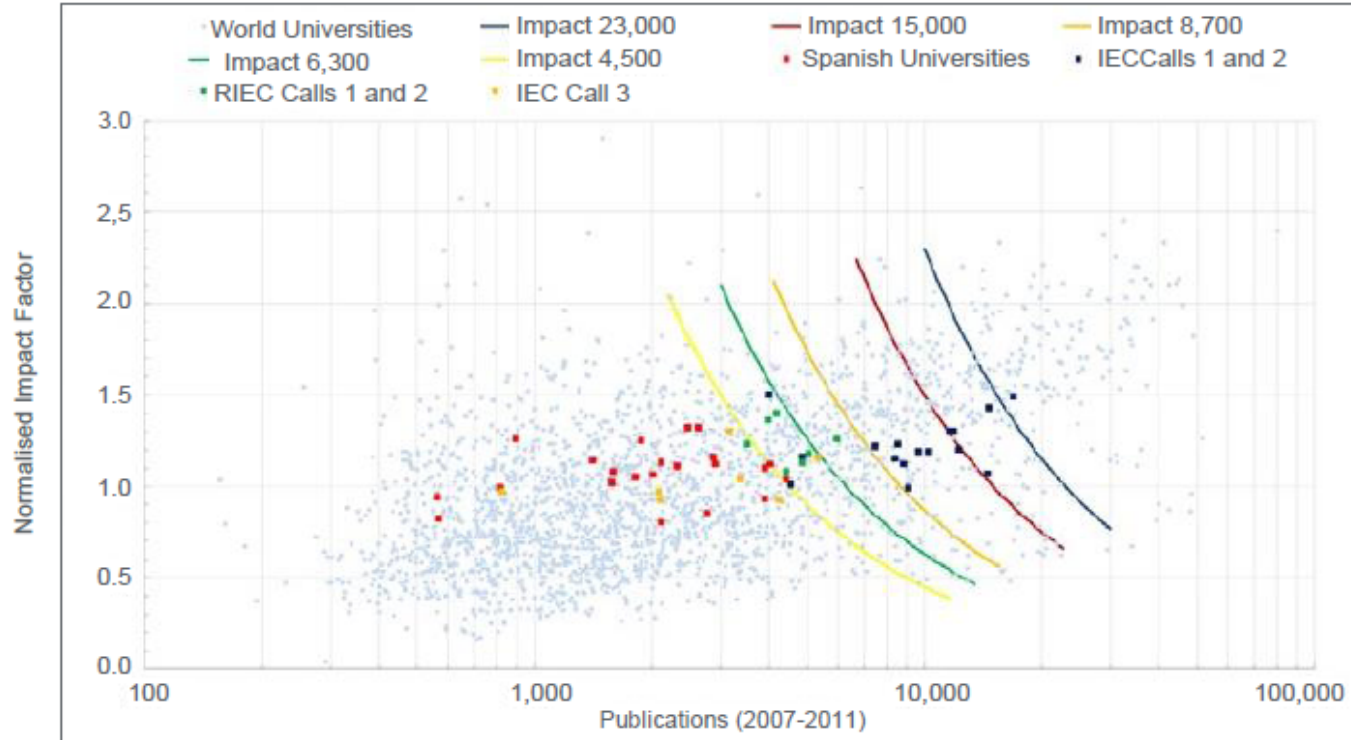
Rankings and Excellence

UNIVERSITY	ARWU	THE	QS	O	NI	IMPACTO	INICIATIVA DE EXCELENCIA 1	INICIATIVA DE EXCELENCIA 2	ESTRATEGIA INSTITUCIONAL	TOTAL
University of Munich	63	55	65	25.161	1,70	42.774	5	2	1	8
Technical University Munich	50	87	53	22.641	1,67	37.810	4	1	1	6
University of Heidelberg	55	68	50	22.304	1,68	37.471	6	1	1	8
University of Erlangen-Nuremberg	206	238	278	16.489	1,61	26.547	2	1		3
RWTH Aachen University	279	129	147	16.768	1,49	24.984	5	1	1	7
University of Freiburg	100	152	102	14.631	1,64	23.995	3	1		4
University of Frankfurt	120	213	208	13.420	1,73	23.217	2	1		3
University of Bonn	104	181	163	14.666	1,54	22.586	3	1		4
Karlsruhe Institute of Technology	283	154	116	15.320	1,47	22.520	3	1		4
Dresden University of Technology	273	263	262	14.494	1,54	22.321	2	1	1	4
University of Tuebingen	152	213	134	14.402	1,53	22.035	1	1	1	3
University of Hamburg	177		186	14.084	1,56	21.971	1	1		2
University of Muenster	147	238	236	13.109	1,60	20.974	1	1		2
University of Goettingen	106	63	128	13.292	1,47	19.539	3	1		4
University of Mainz	183		297	11.718	1,66	19.452	1	1		2
University of Koeln	194	263	243	11.481	1,52	17.451	1	1	1	3
University of Duisburg-Essen	413	375	485	10.705	1,61	17.235				
University of Wuerzburg	156	238	325	10.890	1,58	17.206	1	1		2
University of Bochum	309	375	366	12.101	1,30	15.731	1	1		2
University of Jena	448		363	10.663	1,45	15.461	1	1		2
University of Leipzig	259		311	10.436	1,45	15.132	1			1
University of Ulm	373	213	258	9.343	1,59	14.855	1			1
University of Duesseldorf	270		394	9.119	1,62	14.773		1		1
Hannover Medical School	492			8.636	1,71	14.768	2	1		3
University of Kiel	191	238	293	7.973	1,68	13.395	3	1		4
Humboldt-Universität zu Berlin		94	126	8.640	1,52	13.133	4	2	1	7
Technical University of Berlin	290		183	9.812	1,31	12.854	2	1		3
University of Marburg	249		435	9.026	1,35	12.185				
University of Regensburg	375		405	8.235	1,46	12.023		1		1
University of Stuttgart	271		248	8.556	1,36	11.636	2	1		3



Rankings and Excellence

Figure 9. Spanish universities in SIR identified as IEC or RIEC



Lesson 1: Read appropriately. A specific position is more uncertain as you move forward in a ranking

Lesson 2: The impact of scientific production is the most important factor

Lesson 3: Impact and ranking position correlate with excellence

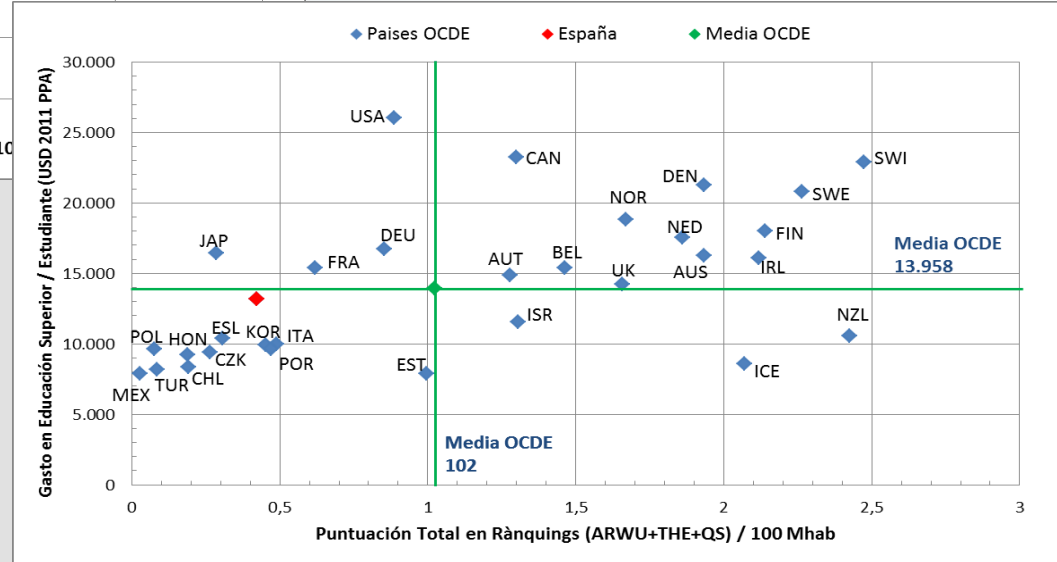
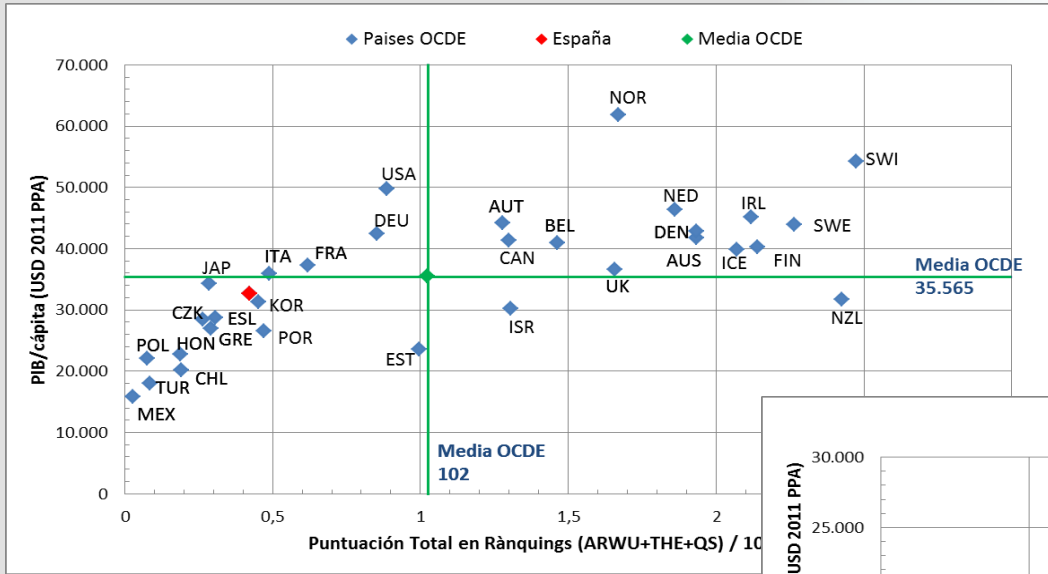
Lesson 4: In spite of some biases and limitations, the rankings provide consistent information about a university ↔ First presentation card

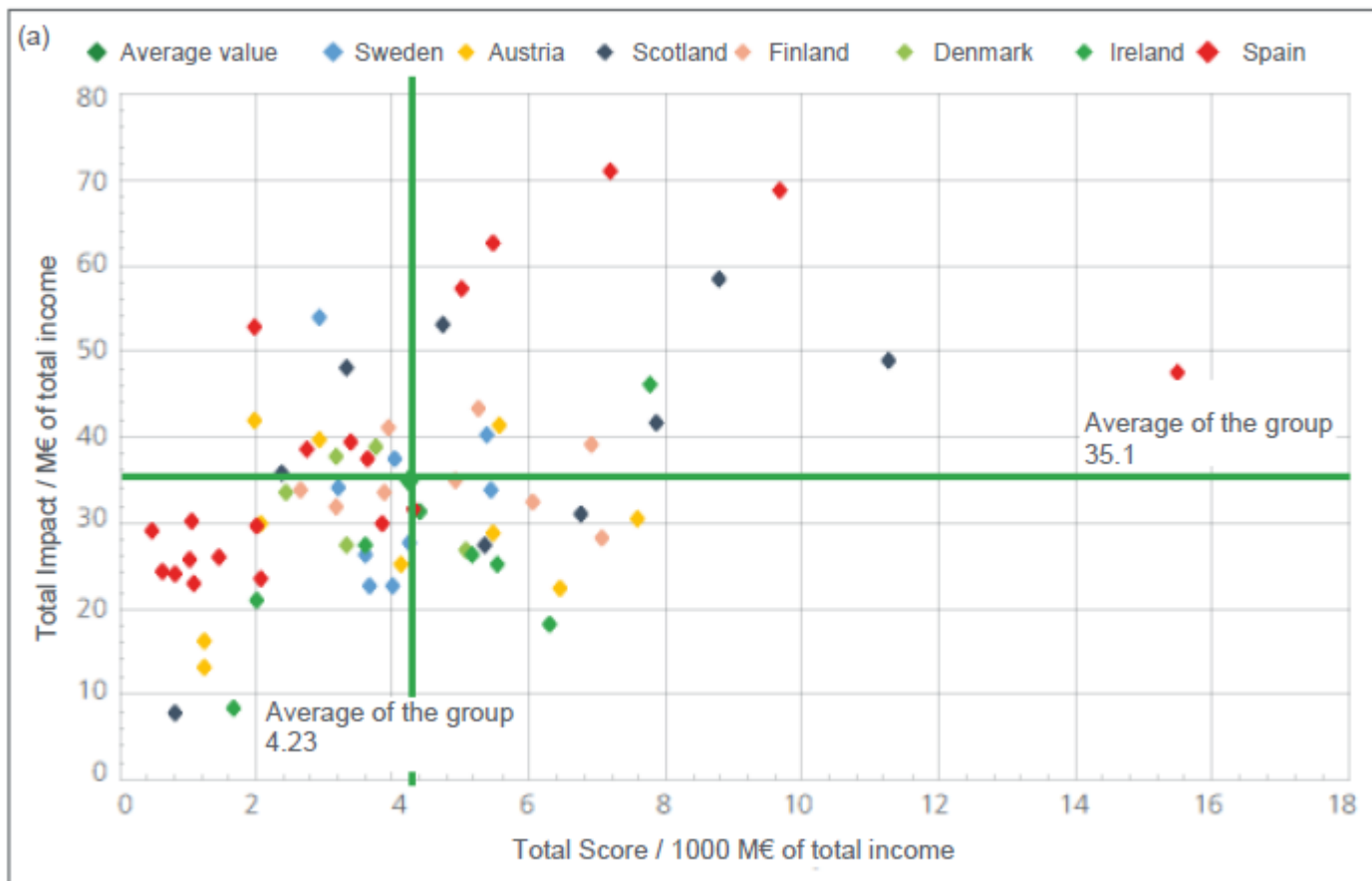
List of countries according to Score in rankings, Number of publications, Normalised impact and Total impact

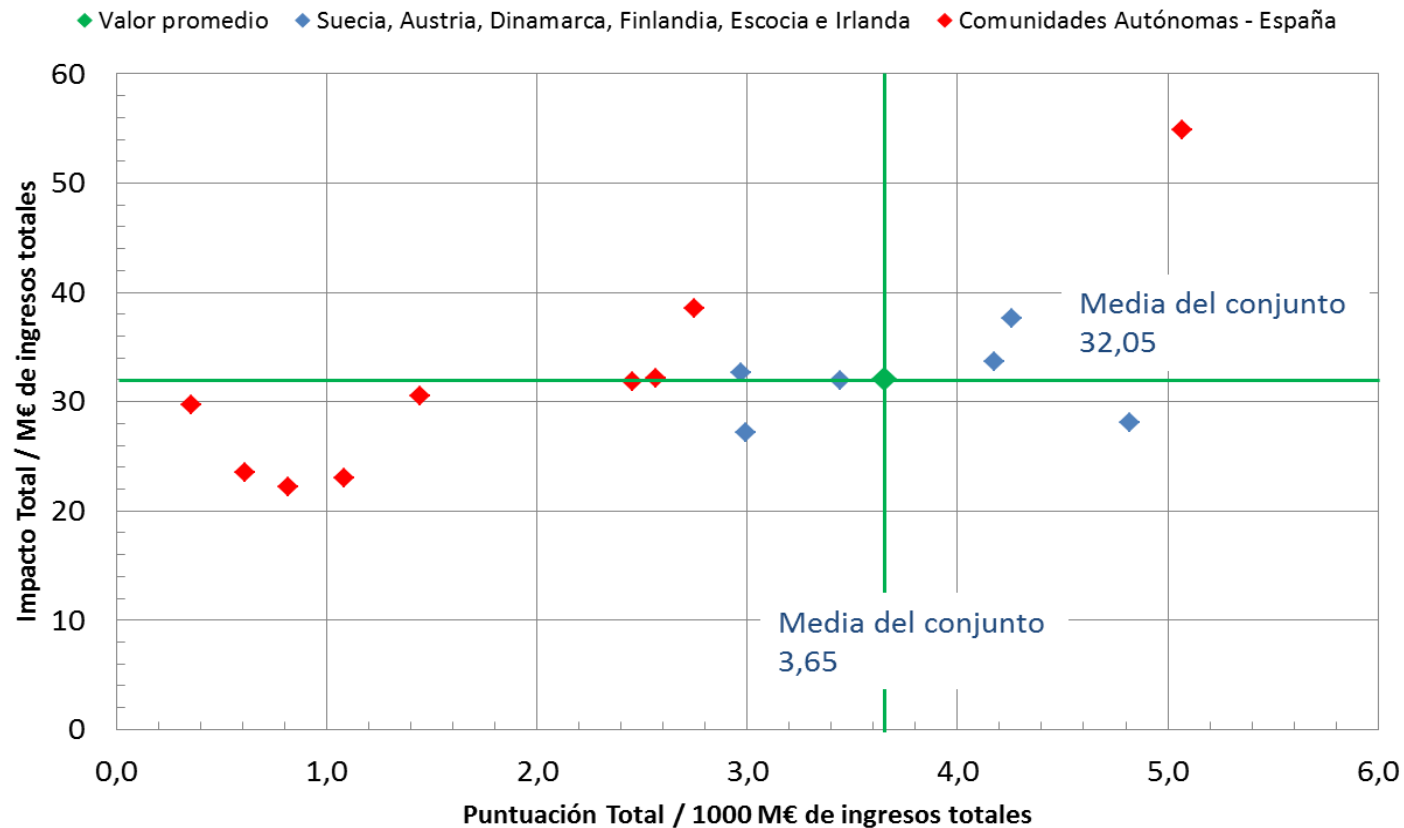
	Score in rankings	ORDER		Total Public.	ORDER		TotalNI	ORDER		Total Impact	ORDER
Country			Country			Country			Country		
United States of America	276.62	1	United States of America	2,590,901	1	Switzerland	1.85	1	United States of America	4,579,638	1
United Kingdom	104.80	2	China	1,399,574	2	Netherlands	1.82	2	United Kingdom	1,113,701	2
Germany	69.83	3	United Kingdom	654,938	3	United States of America	1.77	3	China	999,920	3
Canada	44.84	4	Japan	623,011	4	Denmark	1.71	4	Germany	799,507	4
Australia	43.17	5	Germany	537,410	5	United Kingdom	1.70	5	Japan	627,143	5
France	39.12	6	France	441,816	6	Sweden	1.59	6	France	603,697	6
Japan	36.68	7	Canada	387,524	7	Belgium	1.59	7	Canada	583,853	7
China	34.61	8	Italy	369,192	8	Singapore	1.56	8	Italy	515,132	8
Netherlands	31.06	9	South Korea	287,415	9	Canada	1.51	9	Australia	417,228	9
Italy	29.72	10	Australia	284,196	10	Iceland	1.49	10	Netherlands	352,584	10
South Korea	22.49	11	Spain	260,536	11	Germany	1.49	11	Spain	310,879	11
Sweden	21.40	12	Brazil	246,798	12	Luxembourg	1.48	12	South Korea	295,261	12
Switzerland	19.57	13	Taiwan	198,039	13	Norway	1.47	13	Taiwan	206,174	13
Spain	19.55	14	Netherlands	193,667	14	Australia	1.47	14	Sweden	193,064	14
Taiwan	16.47	15	India	166,491	15	Austria	1.44	15	Brazil	191,254	15
Belgium	16.18	16	Turkey	146,725	16	Finland	1.44	16	Switzerland	180,908	16
Hong-Kong	13.43	17	Iran	136,827	17	Ireland	1.43	17	Belgium	151,706	17
Finland	11.53	18	Sweden	121,527	18	New Zealand	1.40	18	India	147,511	18
Denmark	10.77	19	Poland	110,348	19	Italy	1.40	19	Turkey	122,164	19
Austria	10.73	20	Switzerland	97,724	20	Hong-Kong	1.37	20	Denmark	115,657	20
New Zealand	10.68	21	Belgium	95,695	21	France	1.37	21	Iran	109,199	21
Brazil	10.31	22	Hong-Kong	74,917	22	Israel	1.32	22	Hong-Kong	102,739	22
Israel	10.13	23	Israel	73,390	23	Spain	1.19	23	Austria	99,927	23
Ireland	9.69	24	Austria	69,218	24	Portugal	1.18	24	Israel	97,009	24
Norway	8.27	25	Denmark	67,506	25	Estonia	1.17	25	Finland	92,857	25

List of countries according to universities in rankings, universities in all three rankings, their ratio, and average score per university.

	3R Universities	ORDER		3R+ Universities	ORDER		3R+/ 3RRatio	ORDER		Score / N3R	ORDER
Country			Country			Country			Country		
United States of America	183	1	United States of America	93	1	Belgium	100.00	1	Singapore	2.63	1
United Kingdom	74	2	United Kingdom	34	2	Norway	100.00	2	Netherlands	2.39	2
Germany	43	3	Germany	24	3	Singapore	100.00	3	Belgium	2.31	3
France	43	4	Canada	19	4	Netherlands	92.31	4	Switzerland	2.17	4
Japan	39	5	Australia	14	5	Denmark	80.00	5	Denmark	2.15	5
China	31	6	Netherlands	12	6	Switzerland	77.78	6	Norway	2.07	6
Australia	31	7	France	10	7	Canada	73.08	7	Sweden	1.95	7
Italy	30	8	Japan	10	8	Sweden	72.73	8	Hong-Kong	1.92	8
Canada	26	9	Italy	10	9	Hong-Kong	71.43	9	Canada	1.72	9
South Korea	24	10	China	9	10	Germany	55.81	10	Germany	1.62	10
Brazil	22	11	Sweden	8	11	United States of America	50.82	11	United States of America	1.51	11
Spain	21	12	South Korea	7	12	New Zealand	50.00	12	Israel	1.45	12
Russia	18	13	Taiwan	7	13	Taiwan	46.67	13	United Kingdom	1.42	13
Argentina	16	14	Switzerland	7	14	United Kingdom	45.95	14	Australia	1.39	14
Taiwan	15	15	Belgium	7	15	Australia	45.16	15	New Zealand	1.34	15
Netherlands	13	16	Spain	6	16	Austria	40.00	16	Finland	1.28	16
India	13	17	Hong-Kong	5	17	Italy	33.33	17	China	1.12	17
Mexico	12	18	Austria	4	18	Finland	33.33	18	Taiwan	1.10	18
Sweden	11	19	New Zealand	4	19	Ireland	33.33	19	Ireland	1.08	19
Austria	10	20	Denmark	4	20	South Korea	29.17	20	Austria	1.07	20
Switzerland	9	21	Norway	4	21	China	29.03	21	Italy	0.99	21
Turkey	9	22	Finland	3	22	Spain	28.57	22	South Africa	0.98	22
Finland	9	23	Ireland	3	23	Israel	28.57	23	Japan	0.94	23
Ireland	9	24	Brazil	2	24	South Africa	28.57	24	South Korea	0.94	24
Chile	9	25	Saudi Arabia	2	25	Japan	25.64	25	Spain	0.93	25







Lesson 5: Rankings also inform about university systems

Lesson 6: When resources are taken into account, rankings also inform about the efficiency of universities

Lesson 7: Rankings can inform about the efficiency of university systems!



Computers & Fluids

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Don't suppress the wiggles—They're telling you something! ☆

Philip M. Gresho, Robert L. Lee

Even with defaults and limitations,

Don't suppress the rankings, they're telling you something (consistent)!