

Ranking Universities : How to Take Better Account of Diversity

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Abstract

In order to rank universities, rather than aggregating the indicators used by the *Times Higher Education Supplement* (THES) – using weightings which, though reasonable, are at the same time arbitrary and inflexible – one can compare universities in terms of dominance and hence deduce various partial or complete rankings. The resultant **dominance ranking method** is presented in this note. Data are recalled in Appendix 1. Appendix 2 provides full details of the dominance analysis for each university. From this analysis two listings are derived: (i) a *front runners list* consisting of 34 “non-dominated” universities, (Table 4) and (ii) a (new) *ranking of the 200 universities* surveyed by the THES, based on their respective ‘active-passive dominance’ scores (Table 5). Concluding remarks bear on limits of the data and of the exercise.

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Appendices 1 and 2 are available from the author at tulkens@core.ucl.ac.be

¹ I wish to acknowledge the work of Mr Antoine Dandois, bachelor degree student at IAG, the Louvain Business School at Louvain-la-Neuve, who developed the computer tools (in Excel) needed to obtain the results presented here. The details of the program are available upon request addressed to the author.

I - The THES criteria and their weights

This note does not aim to evaluate the *Times Higher Educational Supplement* (THES) ranking of universities as a whole. It rather seeks to highlight a problem raised by one component of the methodology, namely the aggregation of criteria². A comparison method that avoids aggregation is presented, leading to a different ranking of the institutions. A by-product of the method is to provide each institution with some guidance in selecting those with which to compare itself.

Let us recall the 6 criteria (or 'scores') and their respective weights used in the THES 2006 ranking³:

1. the 'Peer review' score (weight: 40%)
2. the 'Recruiters' review' score (weight: 10%)
3. the 'International faculty' score (weight: 5%)
4. the 'International students' score (weight: 5%)
5. the 'Faculty /students' score (weight: 20%)
6. the 'Citations /Faculty member' score (weight: 20%)

I do not wish to discuss here whether these are the right criteria to use. The ranking of each university results from aggregating (according to an unfortunately unspecified formula) the (normalised) index numbers that represent the score of that university for each of the six criteria. Data and the aggregated results are reproduced in Appendix 1.

To anyone with any degree of experience and knowledge of the role of the university sector in all societies today, the weights used in the aggregation are both meaningful and reasonable. Yet, one might differ on the question of whether 60% of the attention should really be devoted to faculty research and reputation (the sum of criteria 1 and 6), 30% to teaching and education (criteria 2 and 5), and 10% to international openness. And when we say 'SHOULD be devoted...', to whom are we referring: the university authorities, the faculty, the political authorities ... *or the analyst?* Whatever our reply, the obvious feature is that in surveys using fixed aggregation weights, they are *the same for all universities*: weights used are thus *imposed* from the outside and uniformly.

² Or **indicators**. I will employ the two terms indiscriminately.

³ I confine myself here to the 2006 version of the THES rankings. Changes in the data themselves as well as in the method of obtaining and presenting them have occurred between the 2004, 2005 and 2006 versions. The results obtained for the two earlier years with the methodology presently advocated can be provided by the author upon request.

Yet it is surely the case that institutions, by the choice of their authorities, their members and/or their supporters, often take different approaches to the relative importance of teaching, research and international openness. They may have different objectives in these respects, and are therefore likely to diverge with regard to the emphasis they seek to place on each of these roles of the university. The fixed weights in question prevent us from recognising this legitimate diversity.

II – Comparing without weighting: the notion of dominance ranking (DR)

A simple remedy can be found for this inflexibility by proceeding as follows⁴: one can consider each university not in terms of the single aggregate number which we have just discussed, but directly in terms of the *vector* of six components which constitute the basic data in the survey. The point then will be to rank these vectors, rather than the scalars resulting from weighted totals. To do this, we need to come up with a **ranking rule**, which could be as follows:

- a university will be said to 'dominate' another if its six indicators are **all** greater than the other's.
- Conversely,
- a university will be said to 'be dominated' by another if its six indicators are **all** less than the other's.

We will call the order between these two universities which results from this simple rule the 'dominance ranking'. It can be applied to any pair of universities.

Naturally, the reader will already be entertaining the following objection: what if, when two universities are compared, some indicators are higher in one and others are higher in the other? The answer is that the rule does not allow them to be ranked relative to one another. This therefore implies that some pairs of universities will be 'rankable', while others will be 'unrankable', and thus, the ranking will not be complete, but will be partial. However, it will turn out that this does not matter for our present purposes since, as we will see, careful examination of the number of cases of dominance does in fact make it possible to rank the unrankables.

In the following Section III, we will confine ourselves to the rankable pairs — involving a preliminary sort-through of the mass of data which, due to its considerable size, is in any case difficult to keep under control. This will enable some initial relevant conclusions to be drawn.

⁴ The logic behind the method described here is inspired by a recent development in the measurement of efficiency in production economics, described in general terms in TULKENS 2006 (chapter 18) and applied to the ranking of the performance of developing countries in section 5.2 'Evaluation with multidimensional indicators' of TULKENS, MORANT and LERUTH 2004.

Section IV will then make use of these dominance results to generate the two announced lists of “front runners” and “complete ranking by active-passive dominance”.

III - The procedure ('DR method')

(1) Identification and analysis of dominance relations

Starting with the file containing the THES data (columns B to G in Appendix 1), we take the universities one after another and *for each one* we consider:

Step (i) Whether, anywhere in the file, there are one or more universities *which are dominated by it* when one applies the rule set out above. If so, a list of these dominated universities is drawn up.

This is done in Appendix 2, where all the universities appear in alphabetical order (in bold font, with their indicators highlighted in red)⁵. An excerpt of that appendix is presented as Table 1 below, where I take AMSTERDAM UNIVERSITY as an example. This university dominates a list of five other universities (Nanjing, Jawaharlal Nehru, La Sapienza, China Science & Technology and Malaya), whose indicators are highlighted in yellow. Comparing the vector of figures on the red line relating to Amsterdam with that of the figures on each yellow line, we find that the rule applies, on five occasions in this case. Hence the statement that Amsterdam '*DOMINATES...*'. I record as *IAD(k)* (standing for “**Index of Active Dominances exercised by k**”) the number of universities (5) which are thus dominated by university *k*, in the present instance AMSTERDAM UNIVERSITY (see this on the top line column L in Table 1).

Step (ii) Whether, anywhere in the file, there are one or more universities *by which it is dominated* when one applies the rule set out above. If so, a list of these dominant universities is drawn up.

In the example, pursuing with AMSTERDAM UNIVERSITY, there is a list of four universities (Oxford, Cambridge, ETH and Yale) by which it is dominated, as is shown in the case of each of these by their vector of indicators (highlighted in green) compared with that of Amsterdam (on the red line). Hence the statement that Amsterdam '*IS DOMINATED BY...*'. I record as *IPD(k)* (standing for “**Index of Passive Dominances experienced by k**”; see column M in Table 1, top line) the number of universities (4) which thus dominate university *k*, in the present instance again, AMSTERDAM UNIVERSITY.

⁵ This is a 58 pages long document, accessible from the author upon request.

For each university in the THES survey, *i.e.* for each red line in Appendix 2, the two lists of universities – those which are ‘dominated by it’ (in yellow) and those ‘by which it is dominated’ (in green) are given. These lists contain, in addition to the six indicators, the THES overall score (column H) and the position this gives the university in the ranking published in 2006 (column I) as well as a reminder of the position in the 2005 ranking (column J).

Returning to the example of AMSTERDAM and commenting in greater detail, we thus obtain a comparison in terms of dominance between this university and nine others. This comparison is significant and informative: *significant* because it is very useful for Amsterdam to know that Oxford, Cambridge, ETH and Yale are doing better than it *in every respect*, and not just in terms of an aggregate number: Amsterdam is ranked 69th by the THES, with an aggregate score of 41.3, but what does this mean compared with the others? My answer to this would be: firstly, out of the 68 universities which are ahead of it, first consider the four which *dominate* Amsterdam. In the case of these, there is no dispute: they are better in every respect! Looking at the five universities that AMSTERDAM *dominates* is also meaningful, especially for them, so as to locate the criteria in which they are weakest compared with their “model”.

The comparison is also *informative*: Amsterdam’s profile of indicators can be seen as a *configuration of pursued objectives*, one which is in fact close to that of the other institutions whose profiles are highlighted, whether in yellow or in green: these institutions take a similar approach — but respectively less or more effectively— in terms of the mix of criteria they seek to satisfy.

In the same spirit, as far as the other universities are concerned, *i.e.* those which are not in the list of nine, one can interpret the fact that they neither dominate nor are dominated by AMSTERDAM by saying that they are doing different things: in respect of at least one of the criteria they are doing better, and in respect of at least one they are doing less well. We can say that they have different objectives, in the sense that, for the five criteria under consideration, they are focused more on some of them and less on others. It follows that, in examining its position, Amsterdam may legitimately ignore these other cases and focus its attention on those universities which, with the same configuration of objectives, are indisputably doing better than it.

Table 1

	A	B	C	D	E	F	G	H	I	J	K	L	M
62	Amsterdam University	42	20	30	10	28	15	41.3	69	58	Netherlands	5	4
63													
64	<i>DOMINATES:</i>												
65													
66	Nanjing University	35	20	24	2	16	3	29.6	180	150	China	0	28
67	Jawaharlal Nehru University	32	14	2	6	27	4	29.3	183=	192	India	0	47
68	La Sapienza University, Rome	37	15	2	6	11	5	28.1	197	125	Italy	0	51
69	China University of Sci & Technol	36	14	3	1	24	5	30.5	165=	93	China	0	39
70	Malaya University	33	14	10	7	24	1	28.6	192=	169	Malaysia	0	41
71													
72	<i>is DOMINATED BY:</i>												
73													
74	Oxford University	97	76	54	39	61	15	92.7	3	4	UK	101	1
75	Cambridge University	100	79	58	43	64	17	96.8	2	3	UK	119	0
76	ETH Zurich	51	25	84	45	44	23	59.7	24	21	Switzerland	65	0
77	Yale University	72	81	45	26	93	24	89.2	4=	7	US	114	0

To illustrate this point, let us look in Tables 2 and 3 at two cases of universities which each dominate a number of others (taken small for the sake of clarity): the group of six universities that GENEVA UNIVERSITY dominates (taken from p. 16 in Appendix 2) is completely different from that of the five that HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY dominates (p. 19). This suggests a difference in policy options; but only a detailed analysis by the universities themselves of the figures and their sources can reveal what those policies are.

Table 2

	A	B	C	D	E	F	G	H	I	J	K	L	M
1426	Geneva University	26	13	69	58	81	7	49.9	39	88	Switzerland	6	0
1427													
1428	<i>DOMINATES:</i>												
1429													
1430	Aberdeen University	20	9	37	25	33	7	28.3	195	267	UK	0	14
1431	Nijmegen University	21	9	33	10	55	7	33.5	137	177	Netherlands	0	6
1432	Queen Mary, University of London	26	9	44	40	47	4	36.3	99=	112	UK	0	4
1433	Korea University	25	8	5	19	55	1	32.2	150=	184	South Korea	0	14
1434	Royal Institute of Technology	24	11	17	12	43	4	30.2	172=	196	Sweden	0	20
1435	Innsbruck University	23	1	30	48	32	6	29.1	186	165	Austria	0	4
1436													
1437	<i>is DOMINATED BY:</i>												
1438													
1439	none												
1440													

Table 3

	A	B	C	D	E	F	G	H	I	J	K	L	M
1743	Hong Kong University Sci & Technol	40	41	74	21	17	16	44.3	58=	43	Hong Kong	5	0
1744													
1745	<i>DOMINATES:</i>												
1746													
1747	Texas A&M University	30	39	12	13	16	13	32.2	150=	125	US	0	12
1748	Nanjing University	35	20	24	2	16	3	29.6	180	150	China	0	28
1749	La Sapienza University, Rome	37	15	2	6	11	5	28.1	197	125	Italy	0	51
1750	Queensland University of Technology	33	8	51	19	13	2	28.6	192=	118	Australia	0	15
1751	Université de Montréal	25	25	48	11	13	14	29.4	181=	132	Canada	0	4
1752													
1753	<i>is DOMINATED BY:</i>												
1754													
1755	none												
1756													

* * *

The use of alphabetical order in the table in Appendix 2 prevents us from taking the comparisons very far. Instead, it is by making further use of the notion of dominance that we can derive from it the two types of lists which follow.

(2) *The front runners list: the non-dominated universities*

The principle of ranking by dominance implies the possibility that for one (or more) universities, step (ii) of the procedure be such that *no university dominates it*. This was the case, for example,

with GENEVA UNIVERSITY that we just considered. There are many other universities in this situation: 34 in the THES 2006 data set. They are collected in Table 4.

Here, we might be said to be at the top in the dominance sense, as for each of these universities, no other university does better *in every respect*. *In my view, this list is an accurate list of the best universities, which recognises diversity independently of weighting of criteria.*

The list is NOT a ranking; it is rather an excerpt of units in the data set that meet the “non domination” criterion. As there are many, they are presented here in alphabetical order.

Two sub-groups are singled out, however:

— firstly, at the top of the table, those universities which are characterised by the fact that one of their indicators is the highest in its category (100 in the present case, due to the normalisation). If a university has the maximum score for one indicator *it logically follows* that it will be non-dominated overall. A typical case is the LONDON SCHOOL OF ECONOMICS, which is non-dominated because scoring 100 in international students indicator - although it only scores ‘1’ for the citations indicator⁶;

— secondly, the bottom of the table groups together seven universities which we will call ‘non-dominated by default’: they are not dominated, but nor do they dominate any other university. In a sense, they are therefore *sui generis*⁷.

The other universities on this list, without being the best of all for any of the six criteria taken individually, are all characterised by the fact that no university outdoes them in all six criteria.

For the purposes of comparison, column H in this appendix gives the THES 2006 score and column I the rank that this score confers for all the universities in this list. Out of the 34 non-dominated universities according to the DR method, 20 have a THES rank of 34 or better. The other 14 have THES ranks which in some cases are very low (for example LEIDEN, which is non-dominated here but ranks 90th for the THES). One senses here the effect both of the aggregation itself and of the weights it uses.

⁶ A hardly believable figure. It was also only 1 in 2005 and 6 in 2004... There must be a problem with the way in which citations for works in the social sciences are recorded. Note that an implication is that LSE can only dominate institutions which also perform very poorly in citations. The table shows that there are just 9 of them. This will severely affect the ranking constructed in Table 5 below. A similar surprise affects PARIS IV SORBONNE...

⁷ The fact that there are three Dutch universities in this group (and LEIDEN is very close to it) raises questions which I feel hard to answer.

Table 4 - Non-dominated universities

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Undominated UNIVERSITIES THES 2006	Peer review score (40%)	Recruiter review - 10%	Int'l faculty score (5%)	Int'l students score (5%)	Faculty / student score (20%)	Citations / faculty score (20%)	Overall THES score	THES 2006 rank	2005 rank	Country	Nber univ Dd by	Nber Obs Dg = IPD(k,Y)
2													
3	UNDOMINATED BECAUSE OF MAXIMAL SCORE IN ONE CRITERION												
4													
5	California Institute of Technology	53	21	24	40	67	100	83.8	7	8	US	47	0
6	Cambridge University	100	79	58	43	64	17	96.8	2	3	UK	119	0
7	Duke University	39	78	11	21	100	19	68.3	13	11	US	39	0
8	Harvard University	93	100	15	25	56	55	100.0	1	1	US	60	0
9	London School of Economics	42	85	89	100	53	1	63.9	17	11	UK	9	0
10	Macquarie University	32	40	100	51	10	5	38.3	82=	67	Australia	0	0
11													
12	SIMPLY UNDOMINATED												
13													
14	Chinese University of Hong Kong	39	38	62	24	41	7	46.4	50=	51	Hong Kong	18	0
15	Columbia University	57	64	9	32	74	17	69.0	12	20	US	34	0
16	Ecole Normale Supérieure, Paris	46	30	22	28	69	37	63.3	18	24	France	54	0
17	Ecole Polytech. Féd. de Lausanne	28	13	70	66	47	11	43.2	64=	34	Switzerland	8	0
18	ETH Zurich	51	25	84	45	44	23	59.7	24	21	Switzerland	65	0
19	Geneva University	26	13	69	58	81	7	49.9	39	88	Switzerland	6	0
20	Hong Kong University Sci & Technol	40	41	74	21	17	16	44.3	58=	43	Hong Kong	5	0
21	Imperial College London	65	44	55	56	88	12	78.6	9	13	UK	90	0
22	Johns Hopkins University	49	37	15	20	65	29	61.3	23	27	US	42	0
23	Leiden University	33	21	33	11	20	26	37.2	90=	138	Netherlands	2	0
24	Massachusetts Institute of Technol	81	93	11	39	42	54	89.2	4=	2	US	40	0
25	Monash University	57	40	61	51	21	5	52.6	38	33	Australia	5	0
26	Nanyang Technological University	40	37	77	56	21	3	43.7	61=	48	Singapore	4	0
27	National University of Singapore	70	44	82	47	22	8	63.1	19=	22	Singapore	9	0
28	Princeton University	68	61	21	29	53	34	74.2	10	9	US	71	0
29	Stanford University	82	85	9	34	32	55	85.4	6	5	US	23	0
30	University of Chicago	57	67	19	30	73	17	69.8	11	17	US	63	0
31	University of Hong Kong	48	40	84	27	46	6	54.8	33=	41	Hong Kong	25	0
32	University of Texas at Austin	44	56	24	14	19	53	55.0	32	26	US	9	0
33	University of Toronto	63	51	37	17	15	25	57.7	27	29	Canada	2	0
34	Yale University	72	81	45	26	93	24	89.2	4=	7	US	114	0
35													
36	UNDOMINATED BY DEFAULT :												
37													
38	Basel University	21	1	76	28	63	10	39.7	75	127	Switzerland	0	0
39	Cranfield University	14	26	31	62	52	2	33.0	140	234	UK	0	0
40	Erasmus University Rotterdam	22	49	24	31	11	38	37.1	92	57	Netherlands	0	0
41	Maastricht University	18	28	34	46	24	13	30.2	172=	157	Netherlands	0	0
42	Otago University	26	17	94	20	45	3	38.5	79=	186	New Zealand	0	0
43	School of Oriental & Afr. Studies	23	9	48	74	64	1	40.4	70=	103	UK	0	0
44	Wageningen University	16	9	16	45	61	17	36.5	97	108	Netherlands	0	0

(3) *A complete ranking, based on the number of cases of active-passive dominance*

Another way of presenting the results of the dominance analysis contained in Appendix 2 is inspired by the idea that if one university dominates another, it can serve as a 'model' for it. And if one university dominates several others, it can serve as a model for them all – an additional merit.

On that basis the entire group of universities surveyed in Appendix 2 can be ranked, as is done in Table 5: here, the 200 universities are listed in decreasing order of their IAD indexes, *i.e.* the number of universities each university *dominates*); and at the point where this index reaches zero, the ranking continues in increasing order of the IPD indexes, that is, on the basis of the number of universities *by which* each university *is dominated*). I call this the “**active-passive (A-P) dominance ranking**”.

I believe this ranking is the most reasonable and the most justified one, due to its resting on the hardly disputable notion of “domination”, and to the corollary of model roles that it invites to give to dominating universities *vis-à-vis* the dominated ones.

It is interesting to note that on this basis, it becomes possible to rank the unrankables, such as, for instance, the non-dominated universities of Table 4. It will be seen that, as a result, the somewhat dubious cases of ‘dominance by default’⁸, as well as of dominance by maximum score in a single criterion⁹ are moved to possibly quite different positions.

Note also that about half of the total, *i.e.* the bottom part of Table 5, are universities which do not dominate any other while they are dominated by many; the 15 last ones in this group are dominated by 25 or more universities.

⁸ The seven universities identified in this category earlier are now half-way down the ranking (positions 98 to 105).

⁹ LONDON SCHOOL OF ECONOMICS is now in 37th place.

Table 5 The Active-Passive Dominance ranking of the 200 THES universities

UNIVERSITIES	Country	Peer review score (40%)	Recruiter review (10%)	Int'l faculty score (5%)	Int'l students score (5%)	Faculty / student score (20%)	Citations / faculty score (20%)	Overall THES score	2006 THES rank	Nb. Act. Dom. (IAD)	Active Dominance Rank	Nb Pass. Dom. (IPD)
Cambridge University	UK	100	79	58	43	64	17	96.8	2	119	1	0
Yale University	US	72	81	45	26	93	24	89.2	4	114	2	0
Oxford University	UK	97	76	54	39	61	15	92.7	3	101	3	1
Imperial College London	UK	65	44	55	56	88	12	78.6	9	90	4	0
Princeton University	US	68	61	21	29	53	34	74.2	10	71	5	0
ETH Zurich	Switzerl	51	25	84	45	44	23	59.7	24	65	6	0
University of Chicago	US	57	67	19	30	73	17	69.8	11	63	7	0
Harvard University	US	93	100	15	25	56	55	100.0	1	60	8	0
University College London	UK	46	28	39	47	70	12	58.7	25	56	9	1
Ecole Normale Supérieure, Paris	France	46	30	22	28	69	37	63.3	18	54	10	0
Pennsylvania University	US	45	64	17	26	52	22	57.8	26	52	11	1
California Institute of Technology	US	53	21	24	40	67	100	83.8	7	47	12	0
McGill University	Canada	57	61	31	33	52	10	62.3	21	46	13	2
Carnegie Mellon University	US	44	64	28	40	48	11	54.6	35	45	14	1
Johns Hopkins University	US	49	37	15	20	65	29	61.3	23	42	15	0
Ecole Polytechnique	France	37	40	18	40	64	17	53.0	37	41	16	1
Mass. Institute of Technology	US	81	93	11	39	42	54	89.2	4	40	17	0
Duke University	US	39	78	11	21	100	19	68.3	13	39	18	0
Columbia University	US	57	64	9	32	74	17	69.0	12	34	19	0
Cornell University	US	60	74	10	25	44	26	65.9	15	34	20	1
Australian National University	Australia	72	30	48	33	38	13	64.8	16	34	21	2
Edinburgh University	UK	54	42	28	29	42	11	54.8	33	30	22	3
University of Hong Kong	Hong Kong	48	40	84	27	46	6	54.8	33	25	23	0
Brown University	US	32	32	34	20	50	18	45.0	54	24	24	1
Stanford University	US	82	85	9	34	32	55	85.4	6	23	25	0
King's College London	UK	42	28	42	30	44	7	46.8	46	23	26	3
Manchester University	UK	44	50	42	29	38	6	49.0	40	22	27	2
University of Michigan	US	50	61	15	19	46	15	56.0	29	22	28	6
Bristol University	UK	36	44	37	26	34	10	43.2	64	20	29	4
Chinese University of Hong Kong	Hong Kong	39	38	62	24	41	7	46.4	50	18	30	0
Northwestern University	US	32	71	12	20	44	19	47.9	42	18	31	2
Tokyo University	Japan	72	29	8	10	35	27	63.1	19	13	32	2
Melbourne University	Australia	72	44	51	36	25	7	61.6	22	12	33	2
Kyoto University	Japan	61	20	15	7	44	18	56.0	29	10	34	3
Catholic University of Louvain (French)	Belgium	37	25	29	25	29	11	39.4	76	10	35	7
Heidelberg University	Germany	43	28	17	28	36	11	44.3	58	10	36	10
London School of Economics	UK	42	85	89	100	53	1	63.9	17	9	37	0

UNIVERSITIES	Country	Peer review score (40%)	Recruiter review (10%)	Int'l faculty score (5%)	Int'l students score (5%)	Faculty / student score (20%)	Citations / faculty score (20%)	Overall THES score	2006 THES rank	Nb. Act. Dom. (IAD)	Active Dominance Rank	Nb Pass. Dom. (IPD)
National University of Singapore	Singapore	70	44	82	47	22	8	63.1	19	9	38	0
University of Texas at Austin	US	44	56	24	14	19	53	55.0	32	9	39	0
Univ. of California, Los Angeles	US	58	42	2	12	34	25	55.9	31	9	40	4
Copenhagen University	Denmark	44	21	12	13	51	5	45.0	54	9	41	13
Ecole Polytech Féd. de Lausanne	Switzerland	28	13	70	66	47	11	43.2	64	8	42	0
New York University	US	39	51	8	16	55	6	47.6	43	8	43	7
Nottingham University	UK	34	37	34	29	28	6	38.1	85	7	44	4
Geneva University	Switzerland	26	13	69	58	81	7	49.9	39	6	45	0
Technical University Munich	Germany	30	26	22	30	42	10	38.3	82	6	46	6
Glasgow University	UK	35	33	17	16	35	9	38.4	81	6	47	11
Boston University	US	35	38	9	21	47	10	42.9	66	6	48	13
University of Illinois	US	39	31	10	16	32	9	39.3	77	6	49	16
Hong Kong Univ. Of Sci & Technology	Hong Kong	40	41	74	21	17	16	44.3	58	5	50	0
Monash University	Australia	57	40	61	51	21	5	52.6	38	5	51	0
Tsing Hua University	China	45	34	22	9	84	1	56.1	28	5	52	2
Amsterdam University	Netherlands	42	20	30	10	28	15	41.3	69	5	53	4
Birmingham University	UK	34	27	34	29	28	9	37.2	90	5	54	5
Nanyang Technological Univ.	Singapore	40	37	77	56	21	3	43.7	61	4	55	0
Sydney University	Australia	65	26	56	31	23	8	54.6	35	4	56	1
Trinity College Dublin	Ireland	37	34	58	29	17	9	39.1	78	4	57	1
University of California, Berkeley	US	92	75	6	13	22	39	80.4	8	4	58	1
Washington University	US	31	23	13	10	38	20	38.2	84	4	59	7
Munich University	Germany	35	23	19	21	29	9	36.4	98	4	60	15
Beijing University	China	70	55	5	11	69	2	67.9	14	3	61	1
St Andrews University	UK	26	20	40	53	33	9	35.7	109	3	62	1
Warwick University	UK	39	40	38	41	22	4	40.0	73	3	63	3
Queensland University	Australia	52	26	51	31	18	12	47.2	45	3	64	3
University of New South Wales	Australia	56	36	23	37	20	7	48.2	41	3	65	4
Sheffield University	UK	31	22	32	28	33	8	36.1	102	3	66	6
Humboldt University Berlin	Germany	32	15	18	18	43	5	35.9	105	3	67	16
Leiden University	Netherlands	33	21	33	11	20	26	37.2	90	2	68	0
University of Toronto	Canada	63	51	37	17	15	25	57.7	27	2	69	0
Rochester University	US	21	26	8	23	91	12	46.7	48	2	70	1
Washington University, St Louis	US	25	32	5	18	73	22	46.7	48	2	71	1
University of British Columbia	Canada	51	38	23	15	19	16	46.4	50	2	72	2
Dartmouth College	US	22	56	13	17	59	16	43.7	61	2	73	3
Univ. of California, San Diego	US	46	16	3	9	26	42	47.5	44	2	74	4
Maryland University	US	27	33	16	15	35	14	35.6	111	2	75	7
Leeds University	UK	32	33	28	25	25	7	35.0	121	2	76	9
Case Western Reserve University	US	19	34	3	24	77	19	44.2	60	1	77	1

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Sciences Po	France	21	29	22	53	86	1	45.6	52	1	78	1
University of Western Australia	Australia	34	11	61	28	19	13	35.6	111	1	79	1
Vanderbilt University	US	22	37	2	14	81	14	45.3	53	1	80	2
Lausanne University	Switzerland	20	21	54	33	53	9	37.3	89	1	81	3
Pierre and Marie Curie University	France	31	1	29	35	49	6	37.0	93	1	82	4
Delft University of Technology	Netherlands	34	13	52	18	37	7	38.0	86	1	83	5
Pittsburgh University	US	22	19	20	10	62	11	37.6	88	1	84	6
Auckland University	New Zealand	51	17	44	21	38	2	46.8	46	1	85	6
Newcastle upon Tyne University	UK	25	24	33	32	36	7	33.6	133	1	86	6
Sussex University	UK	27	18	42	27	41	6	35.9	105	1	87	6
Indian Institutes of Management	India	31	46	1	10	60	2	41.6	68	1	88	7
Rice University	US	20	31	12	23	50	15	36.1	102	1	89	8
Southampton University	UK	26	16	38	25	34	7	32.9	141	1	90	8
Seoul National University	South Korea	43	13	2	7	57	4	43.6	63	1	91	10
Lund University	Sweden	35	1	26	9	36	10	34.8	122	1	92	10
Catholic Univ. of Leuven (Flemish)	Belgium	37	35	11	20	18	13	36.6	96	1	93	11
Osaka University	Japan	39	1	4	9	45	17	40.4	70	1	94	11
Purdue University	US	32	42	20	15	21	6	34.2	127	1	95	12
Pennsylvania State University	US	33	43	7	8	31	6	36.3	99	1	96	19
Basel University	Switzerland	21	1	76	28	63	10	39.7	75	0	97	0
Cranfield University	UK	14	26	31	62	52	2	33.0	140	0	98	0
Erasmus University Rotterdam	Netherlands	22	49	24	31	11	38	37.1	92	0	99	0
Maastricht University	Netherlands	18	28	34	46	24	13	30.2	172	0	100	0
Macquarie University	Australia	32	40	100	51	10	5	38.3	82	0	101	0
Otago University	New Zealand	26	17	94	20	45	3	38.5	79	0	102	0
School of Oriental and African Studies	UK	23	9	48	74	64	1	40.4	70	0	103	0
Wageningen University	Netherlands	16	9	16	45	61	17	36.5	97	0	104	0
Curtin University of Technology	Australia	28	18	71	70	12	1	31.5	156	0	105	1
Eindhoven Univ. of Technology	Netherlands	19	18	21	11	92	3	42.1	67	0	106	1
RMIT University	Australia	34	26	31	65	9	1	32.5	146	0	107	1
University of Adelaide	Australia	38	1	47	44	14	14	35.9	105	0	108	1
University of Wollongong	Australia	23	8	69	64	15	3	28.2	196	0	109	1
Yeshiva University	US	7	1	9	6	70	20	30.2	172	0	110	1
City University of Hong Kong	Hong Kong	28	11	75	14	25	5	31.7	154	0	111	2
Emory University	US	19	38	1	14	84	15	44.9	56	0	112	2
University of Alberta	Canada	32	11	40	21	17	18	33.6	133	0	113	2
Zurich University	Switzerland	26	1	69	23	41	11	35.7	109	0	114	2
Utrecht University	Netherlands	37	12	24	9	25	18	36.7	95	0	115	3
Bath University	UK	21	36	34	35	32	5	31.8	153	0	116	3
Brussels Free Univ. (Flemish)	Belgium	16	15	21	17	72	1	33.6	133	0	117	3

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University of Ulm	Germany	12	1	22	16	70	9	31.4	158	0	118	3
Ecole Normale Supérieure, Lyon	France	21	18	15	19	50	34	40.1	72	0	119	4
Queen Mary, Univ. of London	UK	26	9	44	40	47	4	36.3	99	0	120	4
Durham University	UK	25	41	43	25	23	10	33.8	132	0	121	4
Innsbruck University	Austria	23	1	30	48	32	6	29.1	186	0	122	4
Université de Montréal	Canada	25	25	48	11	13	14	29.4	181	0	123	4
Vienna University	Austria	43	22	23	26	10	15	37.8	87	0	124	4
Wake Forest University	US	10	32	2	6	80	10	35.6	111	0	125	4
Queen's University	Canada	21	36	38	8	28	7	30.0	176	0	126	5
Tufts University	US	17	31	12	17	42	22	33.9	130	0	127	5
University of Twente	Netherlands	23	15	29	16	59	3	35.5	115	0	128	5
Nijmegen University	Netherlands	21	9	33	10	55	7	33.5	137	0	129	6
University Louis Pasteur Strasbourg	France	25	15	22	34	28	12	31.2	161	0	130	6
Vienna Technical University	Austria	29	17	27	34	36	3	33.3	138	0	131	6
Brussels Free University (French)	Belgium	30	19	15	39	13	12	30.5	165	0	132	7
National Autonomo. Univ of Mexico	Mexico	29	36	3	1	65	1	39.8	74	0	133	7
Aarhus University	Denmark	30	15	38	13	33	9	34.4	126	0	134	7
Liverpool University	UK	26	26	32	21	32	8	33.2	139	0	135	7
York University	UK	28	22	31	30	33	8	34.5	124	0	136	7
Georgia Institute of Technology	US	30	36	2	27	19	13	32.8	145	0	137	8
Technical University of Denmark	Denmark	25	1	19	19	25	17	28.5	194	0	138	8
University of North Carolina	US	23	38	7	8	36	19	34.6	123	0	139	8
Indian Institutes of Technology	India	45	34	1	1	27	24	44.5	57	0	140	8
Notre Dame University	US	19	51	17	14	35	9	32.0	152	0	141	8
Georgetown University	US	19	65	6	17	41	11	36.1	102	0	142	9
Univ. of California, Santa Barbara	US	31	11	7	8	22	24	32.9	141	0	143	10
Hebrew University of Jerusalem	Israel	41	1	14	5	22	16	35.2	119	0	144	11
Univ of Mass. at Amherst	US	32	28	1	10	20	23	34.5	124	0	145	11
University of Southern California	US	27	28	7	28	45	9	36.2	101	0	146	11
Tohoku University	Japan	26	1	8	7	31	21	30.4	168	0	147	12
Keio University	Japan	28	25	18	4	48	2	35.1	120	0	148	12
Texas A&M University	US	30	39	12	13	16	13	32.2	150	0	149	12
Aachen RWT	Germany	23	37	24	24	28	4	30.2	172	0	150	12
Helsinki University	Finland	38	20	7	5	16	20	35.4	116	0	151	13
McMaster University	Canada	29	24	9	13	18	19	31.6	155	0	152	13
Virginia University	US	20	57	6	11	34	14	33.9	130	0	153	13
Korea University	South Korea	25	8	5	19	55	1	32.2	150	0	154	14
University of Wisconsin	US	39	11	1	14	35	16	38.5	79	0	155	14
Cardiff University	UK	29	13	27	23	36	4	32.9	141	0	156	14
Fudan University	China	39	47	11	8	18	2	35.4	116	0	157	14

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Ghent University	Belgium	29	9	20	10	43	4	32.9	141	0	158	14
Aberdeen University	UK	20	9	37	25	33	7	28.3	195	0	159	14
Reading University	UK	21	19	32	25	30	6	28.9	190	0	160	14
Brandeis University	US	19	23	7	23	34	13	29.0	187	0	161	15
Kyushu University	Japan	21	17	8	8	59	7	34.1	128	0	162	15
Queensland Univ. of Technology	Australia	33	8	51	19	13	2	28.6	192	0	163	15
Tel Aviv University	Israel	35	22	1	3	13	21	32.4	147	0	164	15
Uppsala University	Sweden	36	1	17	8	41	9	35.6	111	0	165	15
University of Tübingen	Germany	21	21	21	19	37	9	30.3	170	0	166	15
Chalmers University of Technology	Sweden	27	9	17	8	46	5	32.4	147	0	167	16
Hokkaido University	Japan	29	1	8	6	52	8	33.6	133	0	168	16
Free University Berlin	Germany	37	1	27	17	25	6	32.3	148	0	169	16
Tokyo Institute of Technology	Japan	29	18	3	14	39	16	35.3	118	0	170	17
University of Bern	Switzerland	17	9	1	16	54	9	29.8	178	0	171	17
University of California, Irvine	US	24	16	2	10	19	21	28.0	198	0	172	17
Free University of Amsterdam	Netherlands	25	9	19	8	36	8	29.3	183	0	173	17
George Washington University	US	24	46	3	13	30	5	30.4	168	0	174	18
Michigan State University	US	28	39	10	12	21	9	31.1	163	0	175	18
Korea Advanced Inst Science & Technol	South Korea	24	11	14	6	29	12	28.0	198	0	176	19
Nagoya University	Japan	29	11	4	9	41	13	34.1	128	0	177	19
Göttingen University	Germany	32	1	17	17	31	8	31.5	156	0	178	19
Royal Institute of Technology	Sweden	24	11	17	12	43	4	30.2	172	0	179	20
State Univ of New York, Stony Brook	US	26	16	6	15	30	14	30.5	165	0	180	21
Technion — Israel Inst of Technology	Israel	31	17	6	6	23	16	31.4	158	0	181	21
University of Minnesota	US	26	20	8	10	20	16	29.0	187	0	182	21
University of California, Davis	US	30	1	2	8	30	17	30.3	170	0	183	22
National Taiwan University	Taiwan	40	1	1	1	43	4	35.8	108	0	184	23
U. of Paris-Sorbonne (Paris IV)	France	32	29	6	29	13	1	27.9	200	0	185	23
Frankfurt University	Germany	30	17	22	17	19	7	29.0	187	0	186	25
Saint Petersburg State University	Russia	26	18	1	9	47	1	30.7	164	0	187	25
Lomonosov Moscow State University	Russia	42	28	1	7	30	3	37.0	93	0	188	26
Waseda University	Japan	27	24	11	6	42	1	31.4	158	0	189	26
Nanjing University	China	35	20	24	2	16	3	29.6	180	0	190	28
Shanghai Jiao Tong University	China	31	37	13	5	19	1	29.7	179	0	191	28
Oslo University	Norway	30	1	17	9	34	5	29.9	177	0	192	29
Chulalongkorn University	Thailand	33	18	9	1	33	1	31.2	161	0	193	35
Kobe University	Japan	25	17	8	7	38	5	29.4	181	0	194	36
China University of Sci & Technol	China	36	14	3	1	24	5	30.5	165	0	195	39
Malaya University	Malaysia	33	14	10	7	24	1	28.6	192	0	196	41
Univ. of Kebangsaan Malaysia	Malaysia	32	22	9	6	25	1	29.2	185	0	197	42

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University of Barcelona	Spain	31	16	2	11	26	4	28.9	190	0	198	43
Jawaharial Nehru University	India	32	14	2	6	27	4	29.3	183	0	199	47
La Sapienza University, Rome	Italy	37	15	2	6	11	5	28.1	197	0	200	51

IV – Comparing the THES and Active-Passive Dominance rankings

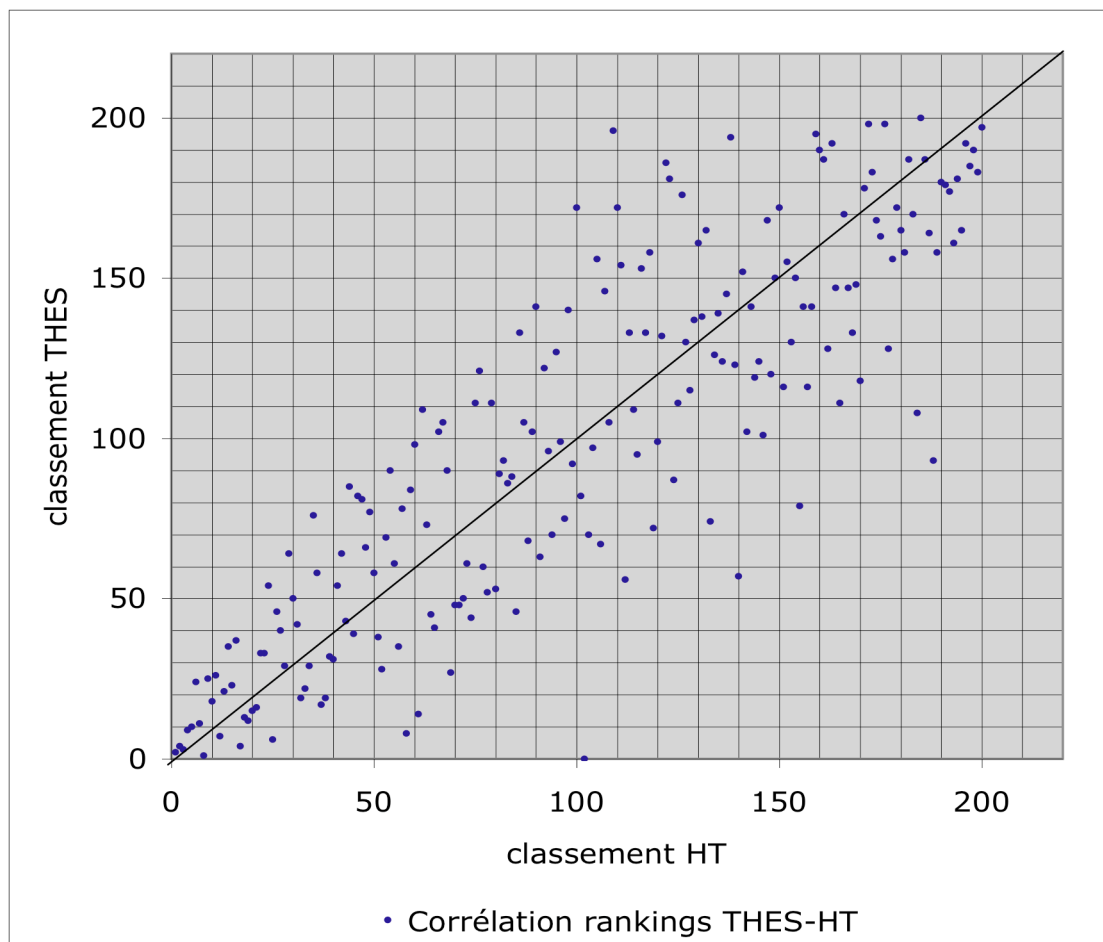
Figure 1 plots the relation between the original THES ranking and the one proposed here. Each university being represented by a point in this diagram, those lying on the straight line issued from the origin are such that their position is the same in the two rankings. Being above the line means receiving a more favourable ranking in the A-P Dominance ranking than in the THES one; being below the line means the reverse.

While there are obvious discrepancies, some of which are important, the overall picture of what top and bottom groups are is fairly much the same. For instance, one may observe from the second half of Table 5 that out of the 104 universities in the “never dominating” class, 88 have a THES rank of 100 or above. Thus either method is able to similarly identify weaker cases.

Among the dissimilarities, one may point out for instance that with the A-P Dominance ranking, the differences between Belgian universities are widened compared with those in the THES ranking: Catholic University of Louvain (French) is pushed up to 35th place as opposed to 76th in the THES ranking. Surprisingly, Catholic University of Leuven (Flemish) remains in virtually the same position (93rd as against 96th in the THES 2006 ranking). Brussels Free University (Flemish) climbs to 117th place (as against 133rd in the THES 2006 ranking); Brussels Free University (French) is in 132nd place in this ranking (compared with 165th in the TES 2006 ranking¹⁰); finally, Ghent is in 158th place (compared with 141st in the THES 2006 ranking).

¹⁰ In the 2005 and 2004 editions of the THES study, this university was ranked ... and ... respectively. Such a dramatic change in the ranking (and in the underlying data) in such a short time is not plausible and can only be attributed to measurement errors.

Figure 1



V - Concluding remarks

(1) *The exclusively ordinal numerical values of the indicators*

The data published by the THES are numbers resulting from various forms of 'normalisation'. While this preserves the *order* of the data, it removes much of their significance from the resultant absolute figures.

This point is particularly important for what we are considering here. It means that, in our evaluations of dominance using those figures, we are evaluating *relative performance*, in terms of ranking only, and not absolute performance, in terms of what has actually been accomplished. Yet if we wish to draw inspiration from these studies to define a policy, we will find it hard to accept that the fundamental objective should relate to the institution's position *relative to others*, rather than the actual substance, in absolute figures, of what it does: in the case of the citations criterion, for example, the goal is not to generate more academic citations than the rest, but to

generate citations! Unfortunately, the data published by the THES do not make it possible to get back to the absolute data.

(2) *Ignorance of the resources*

The THES rankings take no account of the *resources* used and/or available to achieve what is being measured. But Harvard has income at its disposal from an endowment worth several billion dollars, not to mention other sources. What does it mean to compare its performance with that of institutions which lack such resources? We are measuring outcomes of activity — outputs, blithely ignoring inputs, contrary to basic realities of production ... although what we are considering is an instance of production – production of services in this case.

The answer to such a consideration is simply that the rankings we are dealing with are NOT measures of efficiency (a term whose full meaning is one that bears on the relation between outputs and inputs) -- they are instead just rankings of the outputs only, that is, of the achievements, irrespective of how they are obtained. To evaluate efficiency, with data available on resources, dominance analysis could similarly be used, as was done elsewhere¹¹ under the name of “efficiency dominance analysis”.

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¹¹ In the TULKENS, MORANT and LERUTH 2004 reference already mentioned.

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