Title	Profiling universities, not only ranking them: Maximising the information of predictors
Author	Kay Cheng Soh
Source	*Higher Education Review, 44*(2), 27-41
Published by	Tyrrell Burgess Associates

Profiling universities, not only ranking them: maximising the information of predictors

Kay Cheng Soh

Three university ranking systems in vogue have been shown in the previous issue of Higher Education Review *to be capable of modifications to make them more parsimonious by using only about half of the number of predictors currently in use. This makes some of the predictors 'redundant' as they contributed little to the overall ranking. It is suggested that these 'redundant' predictors should be used for profiling the universities for useful information that aids improvement. Thus, a combination of ranking and profiling is recommended to maximise the information provided by the data.*

Key words: University ranking, spurious precision, profiling

As reported in my article in the previous issue of *Higher Education Review* (Soh, 2011a) university ranking started in 2003 at the Shanghai Jiaotong University, the People's Republic of China. They gathered data from a huge number of universities the world over (Liu and Cheng, 2005) and used what they considered as a *scientometric* approach (Liu, Cheng, and Liu, 2005) which is quantitative in essence to study the characteristics of universities as a scientific phenomenon. Thus, the *Academic Ranking of World University* (ARWU) was born and began a practice of treating university ranking like football league tables, although the nature of the two types of ranking are basically different (Soh, 2011b).

Soon after the appearance of the ARWU, a new player came to the scene. The *Quacquarelli Symonds World University Rankings* (QSWUR) was purportedly conceived as a follow-up of the 2003 review of the collaborative relationship between British universities and industries. The results of QSWUR ranking were published in collaboration with *Times Higher Education*. However, the QSWUR was criticised for favouring natural and physical sciences and thus having a bias against

humanities. More recently, QSWUR was criticised on methodological grounds regarding the reliability of the ranking (Wali, 2011).

The *Times Higher Education* then decided to change partner and produced its own rankings in 2009 in collaboration with Thomson Reuters, with input from more than 50 leading figures in the sector from 15 countries and through 10 months of extensive consultation.

So, at this point of time, there are these three world-wide university ranking systems, the *Academic Ranking of World Universities* (ARWU), the (QSWUR) and the *Times Higher Education World University Rankings* (THEWUR), each with its own set of predictors the scores for which are weighted *a priori* and then combined to derive overall scores based on which the participating universities are ranked, supposed to show their relative strengths or superiority. Shown in Table 1 are the predictors and their weights for the three ranking systems.

TABLE 1
Indicators of the three university ranking systems

ARWU	QSWUR	THEWUR
Alumni winning Nobel Prizes and Fields Medals (10 per cent) Staff winning Nobel Prizes and Fields Medals (20 per cent) Highly-cited researchers (20 per cent) Articles published in *Nature* and *Science* (20 per cent) Sciences Citation Index and Social Sciences Citation Index (20 per cent) Per capita academic performance on the above (10 per cent)	Academic Peer Review (40 per cent) Employer/Recruiter Review (10 per cent) Citation per Faculty Member (20 per cent) Student Faculty Ratio (20 per cent) International Students (5 per cent) International Faculty (5 per cent)	Teaching (30 per cent) Research (30 per cent) Citation (32.5 per cent) Industry income (2.5 per cent) International mix (5 per cent)

As pointed in Soh (2011b), the current methods of ranking did not take into account the fallibility of the data and assigned different rankings to different universities based on very small difference (sometime in the decimal) in the overall scores, giving the erroneous impression of high accuracy. This problem of spurious precision is not to be dismissed lightly as it can be very misleading to rank-users. It was suggested that, to avoid misleading, the universities could be grouped with due consideration for the measurement error which is inherent and unavoidable in this kind of highly fallible data. Also pointed out in my earlier article in this journal (Soh, 2011a), from the measurement (and hence statistical) viewpoint, the relative weights assigned *a priori* to the predictors send the message that the systems consider some predictors more importance than other. For instance, in the QSWUR system, the implicit message is that having international staff and international students is equally important (both weighted 5 per cent) but these are

worth only one-eighth of academic peer review (weighted 40 per cent). Such indications of relative importance of the predictors may have a motivational effect on the rank-users but may not be actualised in the final rankings. It was further pointed out that, if ranking universities is the only purpose, two or three of the five or six predictors suffice, as they will produce rankings which are very close to the original ranking reported by the three systems. Thus, there are two issues: first, the discrepancy between intended and actualised weights; secondly, the question of parsimony.

This article is, therefore, an attempt to demonstrate with evidence based on the three systems' data available in the public domain that the systems can be modified for greater parsimony which is a hallmark of good science research. A related question is that whether those predictors found to be 'redundant' may yield information which is useful for a better understanding of the universities, *qualitatively* through the use of profiling. In other words, while ranking may serve the purpose (hopefully not the only purpose) of competition, using all predictors to profile the universities may have greater utility value for improvement planning (for the university administrators and academics) and university choice (for prospective students and their parents). Incidentally, it is also believed that the latter purpose should be a more useful one than just encouraging competitiveness.

Ranking and grouping the universities

It was pointed out that university ranking based on the total (Overall) scores capitalising on spurious precision where universities with small differences were given different ranks which are not substantively meaningful (Soh, 2011a). Using the top 10 universities to illustrate, re-grouping to take into consider the effect of variability was demonstrated. It was further pointed out that the total (Overall) scores used for ranking universities were derived by combining several indicator scores which were different in nature of measurement from football goals scored or games won and hence academic ranking should not be read like football leagues tables (Soh, 2011a).

Moreover, since the same overall scores can be arrived at by different combinations of predictor scores, universities with the same rank, because they have the same total score, may not be of the same qualities. However, it is quite natural for rank-users to assume that the same Overall denotes the same quality. For example, as shown in Table 2, in ARWU rankings, California (Berkeley) and Stanford both have a Overall score of 72 (ignoring the decimal value) and belong to the highest groupings (9), but California (Berkeley) scored much higher than

TABLE 2

Universities with same Overall but different constituent scores (Example from ARWU)

	Alumni	Award	HiCi	NS	PUB	PCP	Overall
California, (Berkeley)	67.6 (9)	79.3 (8)	69.0 (9)	70.9 (9)	70.6 (8)	54.2 (8)	72.4 (9)
Stanford	40.2 (6)	78.4 (8)	87.6 (9)	68.4 (9)	69.7 (8)	50.1 (7)	72.1 (9)

TABLE 3

Universities with same Overall but different constituent scores (Example from QSWUR)

	Peer	Employer	Staff-Std	Citation	InterStaff	InterStd	Overall
Geneva	69.0 (4)	36.0 (2)	58.0 (5)	98.0 (9)	97.0 (9)	100.0 (9)	73.9 (4)
Warwick	83.0 (6)	100.0 (9)	60.0 (5)	38.0 (2)	92.0 (8)	97.0 (8)	73.8 (4)
Texas at Austin	95.0 (8)	95.0 (8)	26.0 (2)	69.0 (5)	60.0 (5)	43.0 (5)	73.3 (4)

TABLE 4

Universities with same Overall but different constituent scores (Example from THEWUR)

	Teaching	InterMix	Industry	Research	Citation	Overall
MIT	61.3 (5)	22.6 (2)	53.9 (4)	72.6 (6)	67.9 (4)	64.7 (3)
Kyoto	78.9 (7)	18.4 (2)	67.1 (5)	77.7 (6)	46.3 (1)	64.6 (3)
Tsinghua	74.9 (7)	43.0 (4)	97.8 (9)	66.6 (5)	57.7 (3)	64.2 (3)
Boston	53.6 (4)	38.1 (3)	29.6 (1)	51.9 (4)	91.4 (7)	64.0 (3)

Stanford on Alumni and Stanford out-scored in HiCi. (The figures in parentheses are semi-SD groupings when the universities were distributed in to nine groups each with an interval of half a standard deviation of the predictor; more about this in the Profiling section below.)

An even more glaring example from QSWUR is shown in Table 3. The same Overall (again, ignore the decimal values) gives three universities in three countries the same grouping (4). But, who is to say they are the same kind of universities?

What about THEWUR? The four universities in Table 4 have the same Overall (decimal values ignored) and get the same grouping (3). One must be highly imaginative and prepared to overlook the important qualitative differences to consider them as the same kind of universities simply because they have the same total score (rank, or grouping).

As reported (Soh, 2011a), it was found that in all the three university ranking systems, two or three of the five or six predictors of each system predicted more than 90 per cent of the total variances of the original Overall scores used by the systems to rank the universities. This means the systems can be modified for greater parsimony by dropping the redundant predictors since these contributed very little to the predictions. That being the case, for the three systems, the predictors which contributed much more than the redundant ones were used to derived a new overall scores (Overall2).

ARWU

For ARWU 2010 top 100 universities data, stepwise regression analysis showed NS and Alumni predicted 86 per cent and 8 per cent, respectively, of the original Overall scores, with a total of 94 per cent predicted. These two predictors were used to derive the new Overall2 after being weighted for the variance predicted, that is, 91 per cent and 9 per cent, respectively for NS and Alumni. This resulted in a correlation of 0.95 between the Overall and Overall2 scores, indicating that the more parsimonious model with two predictors was a reasonably good substitute of the original system which has six predictors. This also means that, besides NS and Alumni, the other four predictors of ARWU were redundant to the rankings.

Using the means and standard deviations for the original Overall and new Overall2 separately, the top 100 universities as listed in the ARWU 2010 ranking results were then grouped at half standard deviation interval. This resulted in nine groups, each with a width of half standard deviation. In the absence of a conventional name, this will be referred to as the semi-SD scale to reflect the way it was formed. Table 5 shows two sets of nine groupings of the top 10 universities in the original ARWU

ranking. As Table 5 shows, the universities were distributed in top four groups in the original ranking but now in six groups, in the new raking. This suggests that the new Overall2 is more discriminating or differentiating. Comparison shows six universities retain their original groupings but four dropped by two groupings.

TABLE 5
Top 10 universities in two groupings in ARWU

	Grouping based on original Overall	Grouping based on new Overall2	Difference
Harvard University	9	9	0
University of California, Berkeley	8	8	0
Stanford University	8	8	0
Massachusetts Institute of Technology (MIT)	8	8	0
University of Cambridge	8	6	-2
California Institute of Technology	7	7	0
Princeton University	7	5	-2
Columbia University	7	5	-2
University of Chicago	6	4	-2
University of Oxford	6	6	0

QSWUR

For this system, Peers, Staff/Std, and Citation predicted 59 per cent, 22 per cent, and 10 per cent, respectively, of the original Overall scores, with 91 per cent variance predicted. These three predictors were used to calculate the new Overall2 scores after being weighted for the variance explained, that is, 65 per cent, 24 per cent, and 11 per cent, respectively. A correlation of 0.92 between the original Overall and the new Overall2 scores was obtained, indicating that the more parsimonious model with three predictors predicted the original rankings of six predictors reasonably well. Thus, besides Peers, Staff/Std and Citation, the other predictors were considered redundant.

TABLE 6
Top 10 universities in two groupings in QSWUR

	Grouping based on original Overall	Grouping based on new Overall2	Difference
Harvard University	8	8	0
Yale University	8	9	1
University of Cambridge	8	8	0
University of Oxford	8	8	0
California Institute of Technology	8	8	0
Imperial College London	8	8	0
University College London	8	8	0
University of Chicago	8	8	0
Massachusetts Institute of Technology	7	8	1
Columbia University	7	8	1

Similar to what was done for the ARWU data, the 100 universities of the QSWUR list were distributed on a semi-SD scale of nine groupings based on the original Overall scores and then on the new Overall2 scores. Table 6 shows the top 10 universities of the original QSWUR ranking result in two sets of nine groupings. It can be seen therein that seven of the 10 universities retained their original groupings but three gained one grouping. However, the 10 universities spanned two groupings in both sets.

THEWUR

For this system, Teaching and Citation predicted 73 per cent and 21 per cent, respectively of the original Overall variance, totalling 94 per cent. These two predictors were weighted for the variance explained (78 per cent for Teaching and 22 per cent for Citation) to obtain the new Overall2 scores. The correlation between the two sets of overall scores is 0.94, high enough to suggest that the new systems of two predictors is more parsimonious than the original model which has five predictors. This renders predictors other than Teaching and Citation redundant.

The 100 universities were then distributed on the semi-SD scale for Overall and then Overall2 scores. As shown in Table 7, the top 10 universities as ranked by THEWUR system spanned two groupings in the original ranking but now spanned three groupings, suggesting that the new Overall2 is more differentiating or discriminating. Of these eight universities retained their original groupings, one gained in one grouping and one lost one.

TABLE 7

Top 10 universities in two groupings in THEWUR

	Grouping based on original Overall	Grouping based on new Overall2	Difference
Harvard University	9	9	0
California Institute of Technology	9	9	0
Massachusetts Institute of Technology	9	9	0
Stanford University	8	9	1
Princeton University	8	8	0
University of Cambridge	8	8	0
University of Oxford	8	8	0
University of California Berkeley	8	7	-1
Imperial College London	8	8	0
Yale University	8	8	0

Comparisons across systems

Table 8 shows the twelve universities which fall within the top 10 rankings in two or three ranking systems. Of these, Harvard, MIT,

Cambridge, California IT, and Princeton appeared in all three lists, while California (Berkeley), Stanford, Columbia, Chicago, Oxford, Yale, and London (Imperial) appear in two of the three lists. Thus, in spite of the differences in the predictors used, the rankings are reasonably consistent across the three systems, at least where the top 10 (12) universities are concerned.

TABLE 8
Top universities in two or more ranking systems

	ARWU 2010	QSWUR 2008	THEWUR 2010
Harvard University	+	+	+
University of California, Berkeley	+		+
Stanford University	+		+
Massachusetts Institute of Technology	+	+	+
University of Cambridge	+	+	+
California Institute of Technology	+	+	+
Princeton University	+	+	+
Columbia University	+	+	
University of Chicago	+	+	
University of Oxford	+		+
Yale University		+	+
Imperial College London		+	+

Profiling the universities

Although, as shown above, some of the predictors were found to be redundant in the stepwise regression analyses, this does not necessarily mean those predictors are of no use at all. They are redundant in the sense that after using those predictors which predicted much of the variance, the predictors found to be redundant would add very little to the prediction had they been included, and hence they can be excluded from the regression equations.

However, stepwise regression is a non-theoretical approach as it leaves the choice of predictors for entering the equation to the data in terms of the variance as a predictor compared with that of another potential candidate. This being the case, those predictors found to be redundant in prediction still can provide useful information to guide decisions other than deciding on ranking (which is already covered by the non-redundant predictors).

AWRU

As Table 9 shows, with two exceptions, 13 of the 15 correlations among the ARWU's six predictors correlate with statistical significance. This is not unexpected as this system emphasised awards, citations, and publications which are different aspects of research outcomes, especially in the fields of natural sciences. In a sense, this is a sign of

multi-co-linearity among the predictors. Therefore, in spite of being redundant in the prediction equation (which involves only Alumni and NS), Award, HiCi, PUB, and PCP still show strong correlations with the Overall2 as they do with the original Overall.

TABLE 9
Correlations of AWRU Measures

	Alumni	Award	HiCi	NS	PUB	PCP	Overall	Overall2
Alumni	1.00	.763	.476	.586	.354	.666	**.775**	**.657**
Award		1.00	.558	.680	(.193)	.740	.841	.718
HiCi			1.00	.871	.637	.508	.867	.864
NS				1.00	.610	.652	**.929**	**.996**
PUB					1.00	(.141)	.610	.607
PCP						1.00	.736	.681
Overall							1.00	.951
Overall2								1.00

Note: All correlation coefficients are statistically significant (p<.05) except those in parenthes

When the original predictor scores were distributed to the semi-SD scale (as was done for Overall and Overall2), the universities were assigned to the nine groupings. Table 10 below shows the groupings for the six ARWU predictors for the top 10 universities. As can be seen, Harvard which is at the top of the 100 universities is in the top grouping (9) for all predictors, as would be expected in view of the sizeable correlations among the predictors as reported above. Oxford, being the 10th has generally lower groupings in all six predictors, particularly for Award, NS, and PRCP. Thus, the implication for Oxford to catch up with Harvard is to find ways and means to raise the standings in all, especially Award, NS, and PRCP.

This illustrates that the semi-SD scale profiles of the two universities are different and they present in a vivid and concrete manner the areas

TABLE 10
Ranks in ARWU predictors of top 10 universities

	Alumni	Award	HiCi	NS	PUB	PRCP
Harvard University	9	9	9	9	9	9
University of California, Berkeley	9	8	9	9	8	7
Stanford University	6	8	9	9	8	6
Massachusetts Inst. Technology	9	8	9	9	6	9
University of Cambridge	9	9	7	7	7	7
California Institute of Technology	7	7	8	8	4	9
Princeton University	7	8	8	5	3	9
Columbia University	9	7	8	6	8	3
University of Chicago	8	8	7	5	4	5
University of Oxford	7	6	7	6	7	5

for improvement that need more attention. For universities beyond the top 10, their predictor scores can be conveniently converted to semi-SD scale grouping by using Appendix Table A1.

QSWUR

In contrast with the ARWU situation, Table 11 shows that the correlations among the six QSWUR predictors are generally low and in many cases non-significant. Specifically, of the 15 correlations, seven are non-significant, two are statistically significant but negative, and six are statistically significant but generally low in magnitude. This indicates, of course, that the six predictors are relatively independent one of the other, since they covered different aspects of the characteristics of a university. Of special interest is the moderate correlation of 0.630 between international staff (InterStf) and International students (InterStd). This could well be a reflection of the international outlook of the universities. However, it is of note that these two predictors are redundant in that they did not enter the prediction equation for Overall2.

TABLE 11
Correlations of QSWUR measures

	Peer	Employer	Sta/std	Cita	InterStf	InterStd	Overall	Overall2
Peer	1.00	.399	(-.002)	(.083)	(.011)	(.064)	**.667**	**.808**
Employer		1.00	.207	(-.160)	.253	.472	.572	.394
Sta/Std			1.00	(.006)	(-.095)	**.245**	**.566**	**.546**
Cita				1.00	-.289	**-.224**	**.372**	**.286**
InterStf					1.00	.630	(.125)	(-.106)
InterStd						1.00	.396	(.136)
Overall							1.00	.918
Overall2								1.00

Note: All correlation coefficients are statistically significant ($p<.05$) except those in parentheses.

Semi-SD scale groupings for the top 10 universities in the QSWUR ranking are shown in Table 12. As pointed out above, the predictors did not correlate as closely as those of the AWRU, and hence consistencies among the predictor grouping can be expected to be lower. Nonetheless, the top 10 universities still generally have high groupings. Notably, Harvard at the top of the list has grouping from 7 to 9 (the top three groupings) for Peer, Employer, Staff/Std, and citation, but has middle ranking (6) for InterStf and InterStd. This suggests that although Harvard fared far better than the other universities in the first four predictors, it has a mediocre standing for international outlook which it may wish to strengthen in the future, if building up international relationships is on its agenda. MIT and Columbia both have high groupings for most predictors, but the very low grouping of 2 for

InterStf suggests an area for improvement. Similarly, Chicago may wish to consider improving on InterStf and InterStd. The same can be said of Yale where international outlook is concerned.

Conversion can be done using Appendix Table A2 for other universities interested in finding out their standings in the predictors.

TABLE 12
Ranks in QSWUR predictors of top 10 universities

	Peer	Employer	Staff/Std	Citation	InterStaff	InterStd
Harvard University	8	9	7	9	6	6
Yale University	8	9	8	8	6	5
University of Cambridge	8	9	8	7	6	7
University of Oxford	8	9	8	7	6	7
California Inst. of Techn.	8	6	8	9	7	7
Imperial College London	8	9	8	7	6	8
University College London	7	9	8	7	6	8
University of Chicago	8	9	8	8	5	6
Massachusetts Inst. of Tech.	8	9	7	9	2	7
Columbia University	8	9	8	8	2	7

THEWUR

For the five predictors of THEWUR, only three of the 10 inter-correlations are statistically significant while the remaining seven are non-significant statistically. The independence of the predictors here is even more visible than those in the QSWUR, obviously because each of the predictor tapped on something different from the other predictors. From the perspective of regression analysis, this is a preferred situation where predictors are relatively independent of one another but have sizable correlation with the criterion (here, Overall and Overall2).

However, as shown in Table 13, only Teaching and Citation were entered into the prediction equation. The high correlation of 0.821 between Research and Overall as well as Overall2 may lead to the expectation that this predictor will be part of the prediction. The fact that it is not could be understood in term of its high correlation of 0.850 with Teaching (which is already in the equation); in other words, Teaching has a very high correlations of 0.961 with Overall and of 0.964 with Overall2; this left with Research very little variance to predict the criteria scores. Moreover, the high correlation between Teaching and Research is interesting as it shows that universities where staff taught well are also those where good research was accomplished; these understandably are the two main functions of universities which cannot and should not be separated as is done in some campuses in the recent years by having two career tracks, one for research-based staff and the other almost exclusive for only teaching.

TABLE 13
Correlations of THEWUR measures

	Teaching	InterMix	Industry	Research	Citation	Overall	Overall2
Teaching	1.00	(-.021)	.384	.850	(.122)	**.861**	**.964**
InterMix		1.00	(-.087)	(-.017)	(-.106)	(.147)	(.009)
Industry			1.00	.323	(-.069)	.304	.340
Research				1.00	(.106)	.872	.821
Citation					1.00	**.523**	**.380**
Overall						1.00	.941
Overall2							1.00

Note: All correlation coefficients are statistically significant ($p<.05$) except those in parentheses.

Table 14 shows for the top 10 universities their respective semi-SD scale grouping for the five THEWUR predictors. As there are relatively less significant correlations among the predictors, the profiles of the universities in term of grouping show much variation. It is interesting that all 10 universities have high groupings for three traditional roles of a university (Teaching, Research, and Citation), but there is much diversity in InterMix and Industry, presumably reflecting the philosophies and emphases of the individual universities. For example, while Harvard has a mediocre grouping in InterMix and a low one in Industry, Imperial places roughly equal emphasis on these two predictors. For these two predictors, the emphases of Harvard and Stanford are just the reverse.

TABLE 14
Ranks in THEWUR predictors of top 10 universities

	Teaching	InterMix	Industry	Research	Citation
Harvard University	9	5	2	9	8
California Institute of Technology	9	4	7	9	9
Massachusetts Institute of Technology	9	6	8	8	9
Stanford University	9	2	5	9	8
Princeton University	9	5	4	8	9
University of Cambridge	9	6	4	8	8
University of Oxford	8	6	6	8	8
University of California Berkeley	8	3	4	9	8
Imperial College London	9	7	8	8	7
Yale University	9	4	4	8	7

For other universities interested in finding out their standings in the predictors, conversion tables are available in the Appendix Table A3.

Discussion and conclusion

University ranking is nothing more than an attempt to arrange universities in descending order of merit, however this is defined. The

results of such rankings have attracted a lot of attention and often are taken too literally and too seriously. This is perfectly understandable because university sponsors and supporters, administrators, teaching staff, and students (as well as the parents) need information to assist them in evaluating the qualities of universities for various purposes. The three currently most popular systems of world university rankings define the quality or merit of the institutions in their own ways in terms of the predictors. Data were collected world-wide and organised with complex procedures but with simplistic reporting using total or Overall scores for ranking. Since most or almost all rank-users are practical-minded, the mammoth data collection and complex analysis can be impressive to them and its attractiveness is enhanced by the simple reporting of ranks (which satisfies human curiosity in a competitive world today).

If arranging the world universities on a scale of merit is the only purpose of university ranking, it has been shown that more parsimonious models involving only two or three predictors (instead of five or six) will do the job almost equally well. Extra predictors (those found to be 'redundant') add very little value to the prediction or ranking, although they may create an impression of being thorough and comprehensive. Moreover, ranking a very large number of universities by playing up small score differences (even decimal values) misleads by capitalising on spurious precision (an apparent precision with no substantive meaning). This ignores measurement errors which may be in whole numbers of a few score points.

The fact that ranking is based on composite predictor scores means that the predictors are functional. But, it is observed that the *a priori* weights actually did not work; a predictor carrying more weight at the data collection stage may (and has) turned out to make little contribution to the final ranking, and vice versa. This definitely is misleading. Moreover, the process of summation make the predictors non-functional in that they do not give information beyond the total or Overall score once this is obtained for ranking the universities.

It is difficult to disagree that the quality of a university is too complex to be pinned down as one number or even a few. Besides, universities have their individual philosophies, purposes, resources, and societal milieus; they may not want to compete with other universities on the same ground and they may not even want to compete. University quality does not change over-night, not even in two to three years. While the top universities seek improvement in their own ways and continue to enjoy their hard-earned reputations, one way the lesser ones seek to

improve their standings is by comparing with the greater one. It is here the predictors used for ranking can prove to be useful in their efforts. Knowing only the rank confirms a less university's inferiority and engenders disappointment; the benefit of this is doubtful. To move ahead in the future, it needs to know more. This is where profiling on the predictors (assuming their acceptance) can prove to be more helpful in that a comparison of profiles surfaces where the discrepancies are and where further improvement efforts can be more effective and beneficial.

Reading a football league table and finding the favourite team nearing the top is gratifying. This is emotional and its usefulness stops there. The coach needs to know not only how close his team is to the top but also in what specific ways the team is different from the top teams if he is to work toward it. Analogously, ranking universities has limited value, but profiling them is more informative and hence useful; the predictors provide information that deserves to be maximised if exercises of university ranking are to serve its original purpose.

Address for correspondence
50 Lorong 40 Geylang, #07-29 The Sunny Spring, Singapore 398074.
Email: sohkc@singnet.com.sg

References

Liu, N C and Cheng, Y (2005) 'Academic ranking of world universities: methodologies and problems', *Higher Education in Europe*, 30 (2)

Liu, N C, Cheng, Y and Liu, L (2005) 'Academic ranking of world universities using Scientometrics: A comment to the "Fatal Attraction"', *Scientometrics,* 64(1), 101-109

Soh, K C (2011a) 'Don't read university rankings like reading football league tables: taking a close look at the indicators', *Higher Education Review,*44(1), 15-29.

Soh, K C (2011b) 'Mirror, mirror on the wall: a closer look at the top ten universities' rankings', *European Journal of Higher Education,* 1, 77-83 DOI: 101080/215682352011577179

Wali, F (2011) 'Why the QS World Universities Rankings Should be Ditched New Asian Republic', 4 July 2011. Accessed on 21 July 2011 from http://newasiarepublic.com/?p=30182

Appendix tables

TABLE A1

Minimum ARWU predictor scores for semi-SD scale groupings

Grouping	Overall	Alumni	Award	HiCi	NS	PUB	PRCP
9	69.6	67.6	92.6	66.8	68.4	79.8	64.5
8	60.4	65.5	78.4	56.2	64.8	69.7	53.1
7	54.6	50.3	67.4	48.6	51.6	63.9	47.1
6	48.7	40.2	57.6	40.1	43.6	58.6	40.0
5	40.6	30.6	44.9	32.2	35.9	51.8	33.5
4	33.2	21.3	32.1	23.9	28.4	46.4	27.0
3	26.4	11.9	21.8	16.1	20.8	39.9	20.9
2	24.0	7.5	10.9	7.2	13.5	34.2	17.5
1	Scores below those for Grouping 2						

TABLE A2

Minimum QSWUR predictor scores for semi-SD scale groupings

Grouping	Overall	Peer	Employer	Staff/Std	Citation	InterStaff	InterStd
9	98.0	97.0	97.0	98.0	100.0	100.0	99.0
8	94.3	91.0	87.0	87.0	91.0	87.0	86.0
7	89.1	85.0	77.0	75.0	82.0	72.0	74.0
6	82.9	79.0	67.0	64.0	70.0	59.0	64.0
5	78.2	73.0	58.0	52.0	60.0	43.0	51.0
4	73.8	69.0	48.0	42.0	51.0	29.0	37.0
3	68.8	62.0	38.0	34.0	42.0	20.0	26.0
2	-	89.0	36.0	18.0	31.0	-	21.0
1	Scores below those for Grouping 2						

TABLE A3

Minimum THEWUR predictor scores for semi-SD scale groupings

Grouping	Overall	Teaching	InterMix	Industry	Research	Citation
9	95.5	89.2	99.5	97.8	97.8	99.9
8	89.0	82.2	87.5	87.0	87.8	92.5
7	83.4	74.9	77.2	83.7	79.3	85.0
6	78.0	67.9	63.4	73.3	68.8	77.7
5	72.8	60.6	52.2	59.6	59.5	70.2
4	66.3	53.1	39.1	50.2	50.4	64.3
3	60.3	46.3	28.3	40.4	42.4	57.7
2	57.3	38.3	16.7	30.7	34.4	51.6
1	Scores below those for Grouping 2					

Erratum

The author of this article has informed us that the following correction applies to the previous article Soh, K C (2011b) 'Don't read university rankings like reading football league tables: taking a close look at the indicators', *Higher Education Review*, 44 (1): 15-29

Page 22: Table 5 is to be replaced by the table below.

TABLE 5
Comparison of b-weights and Beta-weights of ARWU indicators

	Assigned weight (per cent)	b-weight	Beta-weight
Alumni	10	.103	.140
Award	20	.206	.333
HiCi	20	.207	.250
NS	20	.206	.231
PUB	20	.206	.183
PCP	10	.103	.093

Page 23: First paragraph is to be replaced by the following: the changes are shown in bold

'…corresponding beta-weights show much discrepancy from the intended weights. For instance, Award's contribution to the overall score is supposed to be twice that of Alumni's (20:10). This is consistent with the assigned weights (0.206: 0.103) but not in the corresponding beta-weights, which show that Award's contribution to the overall score to be ***more than twice that of*** Alumni's (0.333: 0.140). Likewise, the contribution of Alumni and PCP to the overall score are supposed to be the same (10:10) but the attained weights of Alumni is ***1.5 times*** (0.14: 0.093) that of PCP. These shows that the a *prior* assigned weights were not realised in the actual outcomes.'