

Preliminary Assessment of National Universities Rankings as Economic Indicators in Africa

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ABSTRACT

With growing globalization and tendency to rank all products, university ranking systems have grown in prominence, especially within the last one decade. Three of the best known ranking systems are the 'Shanghai ranking' (ARWU), Times Higher Education Supplement (THE-QS), and the Webometric Ranking System. Due largely to the differing methodologies used by these systems, the results of the rankings have been hotly debated and sometimes ignored. Similarly, the performance of national economies have been ranked using such economic indicators as Gross Domestic Product – per capita (PPP) and Human Development Index (HDI). This study aimed at demonstrating the reliability of the universities ranking systems and, thereafter, investigate the linkage between performance of national economies and performance of universities. Data for this study were provided by a variety of public international sources. The study showed a striking similarity in the ranking of top universities by THE – QS and ARWU, with the same outstanding universities generally making the top charts no matter the ranking system. Using African countries, the study also demonstrated convincing linkage between universities ranking and economic performance, with generally higher university rankings more obvious in countries with higher GDP-PPP and HDI performance. Considering that universities are becoming “magnetic poles” for economic growth, the study recommended the recognition of university performance as one of the economic indicators of national economies.

Keywords: Universities ranking, economic indicators, Shanghai, Times Higher Education, Webometrics.

1.0 INTRODUCTION

One of the inevitable consequences of globalization is the growing tendency to rank all products and processes on an international scale. Thus, yearly, we have rankings for the best car, the best radio, the best wine, etc, all in an attempt to evaluate one's global competitiveness. Thus national economic performances of countries are ranked globally using such economic indicators as Gross Domestic Product (GDP), GDP – per capita (PPP), Human Development Index (HDI) etc.

Higher education has not been spared this phenomenon. Consequently, several international ranking systems have risen to prominence within the last few years. Altogether, thousands of universities and polytechnics

are evaluated annually, sometimes ranking them up to the first 6,000. Interest in the yearly universities rankings is growing enormously. This is not surprising as universities are increasingly being perceived as magnetic poles of economic development. Most of the technological advances that have economic consequences can be traced directly or indirectly to universities, either through the training provided, the knowledge spillover, or the actual research conducted or through university – industry – links (Yusuf and Nabeshima, 2007).

Technology is tethered to science. Continued technological growth can only be sustained by relentless deepening of scientific knowledge. Virtually every industrialized country is moving to make university-industry links a centerpiece of its innovative systems. Thus the concept of a triple helix- a symbiotic relationship between government, the universities and the business community – is gaining universal acceptance (Etzkowitz and Leydesdorff, 2000; Etzkowitz, 2002).

The French President, Nicolas Sarkozy, recently declared his wish to see more French universities in the top 20 and tasked his Minister of Higher Education to draft a strategy in that direction. The Vice-Chancellor of University of Malaya stepped down following a perceived drop in his university ranking. Unknown to the Malaysians then, the drop was due to a change in the ranking methodology (Salmi, 2009). It is also rumored that the pay package of some Presidents (Vice-Chancellors) of U.S universities depends on the performance of their universities in the rankings.

In this paper, the methodologies and rankings of the various ranking systems are briefly evaluated for common grounds of similarity. Taking into account the well-established link between knowledge accumulation and gross domestic product (Lucas, 1989; Romer, 1989), can the performance of countries in the universities rankings in themselves be seen as economic indicators? Using African countries, in attempt to answer this question, this paper compares the performance of university systems in Africa vis-à-vis the performance of their national economies in terms of GDP – per capita and HDI.

2.0 MATERIALS AND METHODS

Scoring criteria and methodologies of the major universities ranking systems were evaluated to appraise common grounds and demonstrate their validity. Since most African universities do not make the ARWU and THE-QS rankings, the 4icu web-metric ranking was preferred in the comparison of African universities. Performance of a country in the rankings was judged by number of her universities that made the top 100 as well as their positions on the rankings.

The performance of countries in the universities rankings was then compared with the performance of their national economies using GDP – per Capita (PPP) and Human Development Index (HDI) rankings.

3.0 RESULTS AND DISCUSSION

3.1 Criteria of universities ranking systems

Three of the most publicized ranking systems are the Academic Ranking of World Universities (ARWU) known as the ‘Shanghai ranking’, the ‘Times Higher Education Supplement’ and the webometric ranking. The Shanghai ranking is provided by the Institute of Higher Education of the Shanghai Jiao Tong University in Shanghai, China. Times Higher Education Supplement is a UK based magazine which in collaboration with Quacquarelli Symonds Ltd (a career and education network consultancy), produces a joint ranking known as THE-QS. The webometrics ranking is produced by Cybermetrics lab, an affiliate of Superior Council of Scientific Investigation which is the largest public research body in Spain. Other global ranking

systems, though less publicized, include the rankings done by Leiden University, 4 International Colleges and Universities (4 icu) and Ecole de Mines de Paris (Paris Tech).

Details of the scoring criteria employed by these ranking systems are provided by Evrard (2011). Table 1 summarizes ARWU ranking criteria which lay high emphasis on research output and number of Alumni who are Nobel Prize laureates or Fields medal recipients. Table 2 summarizes THE-QS ranking criteria where peer-review is the highest scoring criterion. Survey recipients are asked to name their top 30 peers. Webometrics ranking uses four criteria, all extracted from search engines. The criteria are size of the institutional domain, number of external inlinks, number of files deemed to be of academic material and Google Scholar site count (Evrard, 2011). The domain size is not necessarily the total number of pages in a web domain, but more the perceived relevance of the pages.

Expectedly, all the ranking systems have their proponents and detractors. It is however interesting that, despite the differences in the methodologies adopted by these systems, their rankings have remarkable similarities in terms of universities that make the top charts. But for relatively few exceptions, the same group of outstanding universities still makes the 'premier league', no matter the ranking methodology. For instance, Table 3 compares THES and ARWU rankings in 2008. The two rankings show 70% similarity in terms of composition of the universities, with Harvard University coming first in the two ranking systems. This similarity in composition is highly significant considering the fact that these top 20 emerged from a pool of over 6,000 universities.

Table 4 shows country ranking of top 20 in universities performance in Africa for 2011. The 4icu web ranking has been used for these comparisons since African universities rarely make the charts in the THE-QS and ARWU world rankings. For instance, in the 2011 world rankings, only two African universities made the charts, namely, University of Cape Town, South Africa and Alexandria University, Egypt. Table 4 shows South Africa scoring first in universities performance with a total of 21 of its universities in Africa's top 100. Egypt came strongly in the second position with 15 of its universities in the list. Where two or more countries have the same number of universities in the list, the country whose universities performed better was placed higher. For instance, Botswana, Ethiopia, Mozambique etc have one university each in the list. But Botswana was placed higher in the comparison because University of Botswana came up on the 18th position, higher than Mozambique whose Universidade Eduardo Mondlane is on the 27th position, etc, etc.

3.2 Economic Indicators

The most widely used economic indicator is GDP – per capita (PPP). This is defined as the Gross Domestic Product (GDP) on a purchasing power parity basis divided by the population of the country. In 2010, the GDP – per capita (PPP) values ranged from \$300.00 for Burundi to \$179,000.00 for Qatar, thus declaring Qatar the richest country in the world in 2010 (CIA, 2011).

In recent years, interest has been growing in the use of more composite indices that lay more emphasis on development rather than just income. Some of the composite indices include the Human Development Index (HDI), the Inequality-adjusted Human Development Index (IHDI), the Gender Inequality Index (GII) and the Multidimensional Poverty Index (MDI). Of these, the most widely used is the Human Development Index (HDI). HDI measures the average achievements in a country in three basic dimensions of human development: a long and healthy life, access to knowledge and a decent standard of living (UNDP, 2011). Simply put, the concept of human development focuses on the ends rather than the means of development

and progress. Thus in the 2011 HDI rankings, Norway came first while Qatar (which was first in GDP - per capita) came 37th in a ranking of 187 countries (UNDP, 2011).

3.3 University Performance Compared with Economic Indicators

Table 5 compares the top 20 African GDP – per capita (PPP) rankings with top 20 African universities performance. The table shows that 11 of the top 20 (i.e 55%) highest PPP countries in Africa were also among the top 20 best in university performance. Similarly, table 6 compares top 20 African HDI rankings with top 20 African universities performance. Here again, 12 of the top 20 (i.e 60%) highest HDI countries in Africa were also among the top 20 university performance.

This correlation between university performance and economic indicators is quite significant considering that over 50 African countries were involved in these rankings. This relationship is more obvious when viewed from the bottom charts. For instance, table 7 shows the bottom 20 African countries on 2011 HDI rankings. Only four of the countries (20%), namely, Sudan, Zimbabwe, Ethiopia and Mozambique made the top 20 on university performance. Simply put, the top charts in university performance generally had more of the countries with high PPP and HDI rankings, and vice versa.

4.0 CONCLUSIONS

Despite the controversies arising from the differing methodologies employed by the universities ranking systems, the results of the rankings can be relied on as a general guide to the performance of universities. The rankings from different systems may not show a perfect positive rank correlation, but it should also be accepted that the same group of outstanding universities make the ‘premier league’, no matter the ranking system. Any university management team that is fully focused on the development of the 24 key characteristics of world-class universities, as listed by Alden and Lin (2004), will surely score high on any ranking system. Those who argue that African universities should focus on production of appropriate manpower required for Africa’s development, rather than seeking global ranking glory (Baty, 2010), apparently miss the point. The scoring criteria used by these ranking systems are such that will encourage universities to produce high-quality, competitive university products, not nominal university graduates who are liabilities to modern economies.

It is imperative at this point to admit a critical shortcoming in the country ranking of the university systems in this study. The ranking, as presented, merely compares the number of universities in the African top 100. It does not take account of the population of the countries. For instance, strictly speaking, Nigeria with a population of over 150 million and 6 universities in the top list has not done better than Ghana with a far smaller population of about 25 million but 5 universities in the top list.

In this study, African countries with better university performance generally showed better rankings on the economic indicators. However, the argument about the relationship between performance of the university system and the economy can go either direction: is it strong university system that produces a strong economy, or is it strong economy that produces a strong university system? Overall, the balance of argument tends to suggest that, other factors remaining favourable, a strong university system will ultimately produce a strong economy. Science and technology are critical to economic prosperity, food security, disease control and environmental stability. Knowledge-driven economies have shown more strength and resilience than economies that are mainly dependent on export of raw materials. For instance, South Africa is Africa’s higher education brightest spot with a system that can compete with the world’s best. The University of

Cape Town is ranked among the global top 200 institutions. Correspondingly, South Africa is the most dominant economic force in Africa both in terms of size and diversity. Egypt, Algeria and Morocco are in hot pursuit. Ghana's rising profile is impressive. As more African nations transform increasingly to knowledge-driven economies, the correlation between university system and economic performance will certainly become more definitive.

Table 1: ARWU ranking criteria

S/n	Criteria	Score (%)
1.	No. of highly cited researchers	20
2	No. of papers indexed in Science Citation and Social Science Citation Index	20
3	No. of articles published in <i>Nature</i> and <i>Science</i>	20
4	Alumni who are Nobel prize laureates or fields medal recipients	10
5	Productivity	10
6	No. of academic staff who are fields medalists/Nobel laureates	20
	Total score	100%

(Adapted from Evrard, 2011)

Table 2: THE-QS ranking criteria

S/n	Criteria	Score (%)
1.	No. of citations per faculty	20
2	Graduate employability	10
3	Ratio of foreign staff and students	10
4	Student/faculty ratio	20
5	Peer-review	40
	Total score	100

(Adapted from Evrard, 2011)

Table 3: Top 20 universities in THES and ARWU world rankings

Rank	THES	Rank	ARWU
1	Harvard University	1	Harvard University
2	Yale University	2	Stanford University
3	University of Cambridge	3	University of California Berkeley
4	University of Oxford	4	University of Cambridge
5	California Inst. of Tech	5	MIT
6	Imperial College, London	6	California Inst. of Tech

7	University of College London	7	Columbia University
8	University of Chicago	8	Princeton University
9	MIT	9	University of Chicago
10	Columbia University	10	University of Oxford
11	University of Pennsylvania	11	Yale University
12	Princeton University	12	Cornell university
13	Duke University	13	University of California (L.A)
14	John Hopkins	14	University of Calif (San Diego)
15	Cornell University	15	University of Pennsylvania
16	Australian National Inst.	16	University of Washington
17	Stanford University	17	University of Wisconsin
18	University of Michigan	18	University of Calif (San Fran)
19	University of Tokyo	19	University of Tokyo
20	McGill University	20	John Hopkins

Source: Salmi (2009)

Table 4: Country ranking of top 20 in university performance in Africa

S/n	Country	No. of universities in Africa's top 100
1.	South Africa	21
2	Egypt	15
3	Algeria	11
4	Morocco	10
5	Kenya	7
6	Nigeria	6
7	Ghana	5
8	Uganda	2
9	Tanzania	2
10	Namibia	2
11	Sudan	2
12	Rwanda	2
13	Botswana	1
14	Ethiopia	1
15	Mozambique	1
16	Senegal	1
17	Somalia	1
18	Zimbabwe	1
19	Mauritus	1
20	Libya	1

Source: 4 icu.org University Web Ranking (2011)

Table 5: Top 20 African PPP rankings compared with top 20 African universities performance

S/n	Country	Position on top 20 African PPP rankings	Position on top 20 African universities performance
1	Equatorial Guinea	1	-
2	Gabon	2	-
3	Libya	3	20
4	Mauritus	4	19
5	Botswana	5	13
6	South Africa	6	1
7	Tunisia	7	-
8	Angola	8	-
9	Algeria	9	3
10	Namibia	10	10
11	Egypt	11	2
12	Morocco	12	4
13	Congo (Republic of..)	13	-
14	Cape Verde	14	-
15	Nigeria	15	6
16	Western Sahara	16	-
17	Ghana	17	7
18	Cameroon	18	-
19	Sudan	19	11
20	Mauritania	20	-

Sources: CIA World factbook 2011; 4 icu.org University Web Ranking 2011

Table 6: Top 20 African HDI rankings compared with top 20 African universities performance

S/n	Country	Position on top 20 African HDI rankings	Position on top 20 African universities performance
1	Libya	1	20
2	Mauritania	2	19
3	Tunisia	3	-
4	Algeria	4	3
5	Gabon	5	-
6	Egypt	6	2
7	Botswana	7	13
8	Namibia	8	10
9	South Africa	9	1
10	Morocco	10	4
11	Cape Verde	11	-
12	Ghana	12	7
13	Equatorial Guinea	13	-
14	Congo	14	-
15	Kenya	15	5
16	Sao Tome & Principe	16	-

17	Angola	17	-
18	Cameroon	18	-
19	Tanzania	19	9
20	Senegal	20	16

Sources: 2011 Human Development Report, UNDP; 4 icu.org University Web Ranking 2011

Table 7: Country ranking of bottom 20 in HDI ranking in Africa

S/n	Country	Position on 2011 HDI ranking
1.	Benin	167
2	Gambia	168
3	Sudan	169
4	Ivory Coast	170
5	Malawi	171
6	Zimbabwe	173
7	Ethiopia	174
8	Mali	175
9	Guinea Bissau	176
10	Eritrea	177
11	Guinea	178
12	Central African Rep	179
13	Sierra Leone	180
14	Burkina Faso	181
15	Liberia	182
16	Chad	183
17	Mozambique	184
18	Burundi	185
19	Niger	186
20	Congo (Dem. Rep. of)	187

Sources: 2011 Human Development Report, UNDP

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