Clustering of universities from CIVETS countries in the Top 20 of the Web of Universities Ranking

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Abstract

There are nations that can be considered emerging because they have economies with medium and low GDP, and a market with investment opportunities. Some of these nations (such as Colombia, Indonesia, Vietnam, Egypt, Turkey, and South Africa) are grouped under the acronym "CIVETS" to be analyzed and compared based on their socioeconomic results. A pattern of comparison is university performance through the Web of Universities Ranking, which orders higher education institutions based on their web visibility, their presence, and access to the web, through a World Rank that lists four indicators: Presence, Impact, Openness, and Excellence. This paper has characterized, through clusters, the universities of CIVETS countries in the Top 20 of the Web of Universities Ranking July 2020, in order to relate and compare their position in the indicators through a descriptive analysis. First, information on the CIVETS countries (from the ranking indicators) is presented. Then, the conglomerates formed between the World Rank and the individual performances of the universities with respect to the classification of the indicators are shown. It stands out as a result that four ZAF universities: UCT, WITS, SU, and UP; one from TUR: METU; and one from COL: UNIANDES, they are the best positioned in the four Ranks: Presence, Impact, Openness, and Excellence (except for UNIANDES (COL) which is located in cluster 2 in Rank OR).

Keywords: Clusters, University, Web of Universities Ranking, CIVETS

1. Introduction

A group of emerging nations (Colombia, Indonesia, Vietnam, Egypt, Turkey, and South Africa) make up an acronym "CIVETS" [1] [2] as they are recognized by the FTSE Group of the Financial Times [3] as developing countries or developed countries (with rapid economic

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growth, or with potential for it) [1] [2]. In addition to this, UNESCO's Sustainable Development Goal 9 [4] [5] urges governments to promote sustainable industrialization and innovation, by rapidly increasing spending on Research and Development (I+D). That is why one of the global indicators is investment in I+D as a percentage of Gross Domestic Product (GDP) to classify world economies.

On the other hand, a way to compare the countries is through the rankings of universities, which include SIR Iber [6], QS World University Rankings [7], QS World University Rankings® Latin America Region [8], and (for the purposes of this paper) Web of Universities Ranking (or Webometrics Ranking) [9]. These rankings publish a classification of university institutions in the world, and, in addition, of countries that make up the CIVETS [10] in order to measure university web performance (such as presence, visibility and access to the web) [11] through a number that places the university in the World Rank (WR) related to four indicators: Presence (P), Impact (I), Openness (O), and Excellence (E) [12] [13].

The aim of this work is to characterize (through clusters) universities in countries of the CIVETS in the Top 20 of the Web of Universities Ranking July 2020 [13], in order to relate and compare their position indicators through a descriptive analysis. First of all, information on the CIVETS countries (from the ranking indicators) is presented. Then, the conglomerates formed between the World Rank and the individual performances of the universities with respect to the classification are shown: PR, IR, OR, and ER.

Nomenclature	
WR	World Rank
PR	Presence Rank
IR	Impact Rank

OR	Openness Rank
ER	Excellence Rank
GDP	Gross Domestic Product
(I+D)	Research and Development

2. The CIVETS countries and Web of Universities Ranking July 2020

To refer to the emerging markets of Colombia, Indonesia, Vietnam, Egypt, Turkey, and South Africa, the acronym "CIVETS" is used (taken from the carnivorous mammal that lives in Asia: civet). This term is used by the FTSE Group from Financial Times [3]. These countries, despite having different policies, geographies, religions, and cultures, make up a bloc due to their similarities because they have a medium and low GDP, and a moderately developed market that represents an investment opportunity [2].

In this sense, Table 1 includes the values of GDP per capita growth (annual %) 2019, GDP per capita 2019 (Current US $), research and development expenditure (% of GDP), government expenditure on education 2018 (% of GDP), Total Population 2019, and Classification according to the Human Development Index 2019, to characterize these countries. Regarding investment in I+D as a percentage of their Gross Domestic Product (GDP): Egypt, Colombia, and Indonesia invested, in 2018, 0.72%; 0.24%, and 0.23%, respectively. Meanwhile, the rest of the countries showed a different percentage: Turkey 0.96%, South Africa 0.83%, and Vietnam 0.53% in 2017. In the same way, the indicator Government expenditure on education total 2018 (% of GDP) stands out: South Africa stands out with 6.2%, followed by Colombia and Vietnam with 4.5% and 4.2%. Then there are Egypt with 3.8%, Indonesia with 3.6% and, finally, Turkey with 2.8%.

Table 1. Socioeconomic indicators that characterize the countries belonging to the CIVETS [14] [15] [16] [17] [18] [19].

Country	GDP per capita growth (annual %) 2019 [14]	GDP per capita 2019 (Current US$) [15]	Research and development expenditure (% of GDP) [16]	Government expenditure on education, total 2018 (% of GDP) [17]	Total Population 2019 [18]	Classification according to the Human Development Index 2019[19]
Colombia	1,9	6.432,40	0,24 (2018)	4,5	50.339.440	79
Indonesia	3,9	4.135,60	0,23 (2018)	3,6	270.625.570	111
Vietnam	6,0	2.715,30	0,53 (2017)	4,2	96.462.110	118
Egypt	3,5	3.020,00	0,72 (2018)	3,8	100.388.070	116
Turkey	-0,5	9.042,50	0,96 (2017)	2,8	83.429.620	59
South Africa	-1,2	6.001,40	0,83 (2017)	6,2	58.558.270	113

On the other hand, the Web of Universities ranking (carried out every six months by the National Research Council (CSIC) based in Madrid) [20] publishes the seventeenth edition in July 2020 [21]. When selecting the world category, in addition to providing the option to classify universities globally, universities can also be sorted by CIVETS countries [10]. This order is taken into account according to a World Rank resulting from the combination of four indicators: Presence (P), Impact (I), Openness (O), and Excellence (E) [12]. These indicators, in turn, produce a university ranking when selected individually. The reports do not show the values of the indicators, but rather the ranking of the universities based on the best ones. Table 2 contains the characteristics of each indicator, its weighting, its meaning, and the source of information used to collect the data [12].

Table 2. Web of Universities ranking indicators [12].

Indicators	Weight	Source	Meaning	Methodoly
Presence	5%	Google	Public knowledg shared	Size (number of pages) of the main webdomain from the institution
Visibility	50%	Ahrefs Majestic	Web contents impact	Number of external networks (subnets) linking to the institution´s webpages
Transparency	10%	Google Scholar Profiles	Top cited researchers	Number of citations from Top 210 authors
Excellence	35%	Elsevier´s Scopus Database	Top cited papers	Number of papers amongst the top 10 most cited in each one from the 26 disciplines of the full database. Last period: 2014-2018

Table 3 shows the results of the positions of universities from CIVETS countries in the Top 20 of the Web of Universities Ranking July 2020 [10], which has been used for descriptive analysis. The universities are distributed in this way among five countries: UNIANDES from Colombia, UI and ITB from Indonesia, ICU from Egypt; eight from Turkey: METU, ITU, BOUN, HU, IU, AU, BU, and KU; and eight from South Africa: UCT, WITS, SU, UP, UKZN, UJ, UNISA, and UWC. Vietnam does not have universities ranked in this selection. Furthermore, it is highlighted that two universities are private: UNIANDES (COL) [22] and KU (TUR) [23].

Regarding the rest of the universities, eighteen are of a public nature.

3. Web of Universities Ranking July 2020 and the Top 20 universities in CIVETS countries

The conglomerates formed by relating the World Rank value with the values of: PR, IR, OR, and ER of the universities of CIVETS countries in the Top 20 of the Web of Universities Ranking July 2020 are shown below [10].

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3.1. Relationship between World Rank and Presence Rank (PR)

The conglomerate formed with the universities of the CIVETS countries present in the Top 20 of the Ranking Web of Universities July 2020, when relating the values of World Rank and PR, [10] is presented in Fig. 1. In addition, its characteristics are seen in Table 4. The six best ranked universities (located in cluster 1) are four from ZAF: UCT, WITS, SU, and UP; METU (TUR), and UNIANDES (COL). Cluster 3 includes: six TUR institutions: ITU, BOUN, HU, IU, AU, and BU; UKZN (ZAF), one from EGY: ICU, and two from IDN: UI and ITB second (with WR values higher than 600, but with PR lower than 1,500).

Table 3. List of universities from CIVETS countries in the Top 20 of the Web of Universities Ranking July 2020 [10].

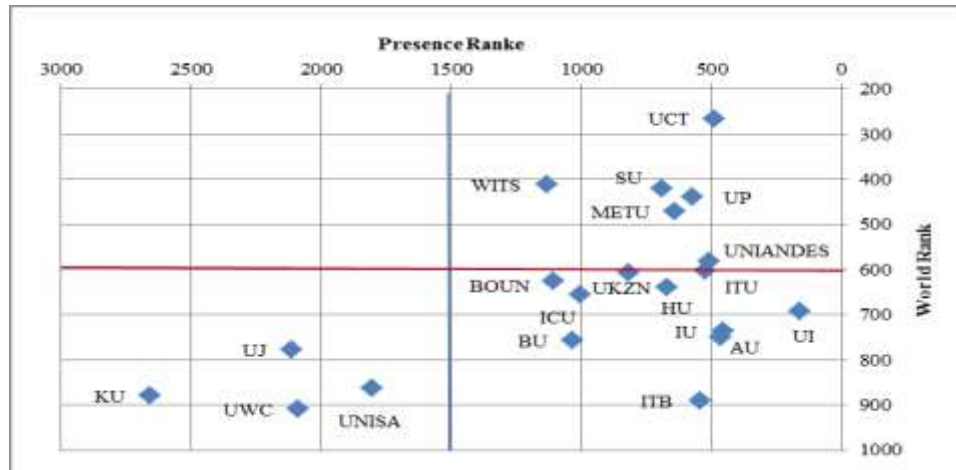| University		Country	World Rank	Presence Rank	Impact Rank	Openness Rank	Escellence Rank
				5%	50%	10%	35%
University of Cape Town	UCT	ZAF	265	487	394	225	247
University of the Witwatersrand	WITS	ZAF	411	1129	714	429	345
Stellenbosch University	SU	ZAF	420	690	622	361	444
University of Pretoria	UP	ZAF	440	570	616	466	496
Middle East Technical University	METU	TUR	472	639	503	552	602
Universidad de los Andes	UNIANDES	COL	581	510	535	697	831
Istanbul Technical University	ITU	TUR	603	521	992	591	608
University of Kwazulu Natal	UKZN	ZAF	606	818	1349	539	485
Bogazici University	BOUN	TUR	625	1106	898	736	643
Hacettepe University	HU	TUR	640	669	1111	494	641
Cairo University	ICU	EGY	655	1004	1431	662	501
Universitas Indonesia	UI	IDN	693	158	465	774	1286
Istanbul University	IU	TUR	737	453	1391	577	748
Ankara University	AU	TUR	751	462	1292	666	776
Bilkent University	BU	TUR	756	1031	885	678	974
University of Johannesburg	UJ	ZAF	777	2113	2047	711	539
University of South Africa	UNISA	ZAF	863	1804	1028	956	1065
Koc University	KU	TUR	879	2657	1309	603	1023
Institute of Technology Bandung	ITB	IDN	891	544	875	921	1416
University of the Western Cape	UWC	ZAF	909	2086	1241	885	1089

Fig. 1. Conglomerate of the World Rank and Presence Rank (PR) of universities from CIVETS countries in the Top 20 of the Web of Universities Ranking July 2020 [10].

Table 4. Characteristics of the conglomerate of the World Rank and Presence Rank (PR) of universities from CIVETS countries in the Top 20 of the Web of Universities Ranking July 2020 [10].

Cluster	University	World Rank	Presence Rank
1	UCT, WITS, SU, UP, METU, UNIANDES	WR<600	PR<1500
2	UJ,UNISA, KU, UWC	WR>600	PR>1500
3	ITU, UKZN, BOUN, HU, ICU, UI, IU, AU, BU, ITB	WR>600	PR<1500

3.2. Relationship between World Rank and Impact Rank (IR)

Fig. 2 presents the conglomerate formed with the universities of CIVETS countries present in the Top 20 of the Web of Universities Ranking July 2020, by relating the values of World Rank and IR. The characteristics of the cluster are presented in Table 5 [10]. The six best ranked universities, located in cluster 1, are four from ZAF: UCT, WITS, SU, and UP; METU (TUR), and UNIANDES (COL) (they repeat as happens with the PR ranking). In cluster 3, five TUR institutions: ITU, HU, BOUN, AU, and BU; two from IDN: UI and ITB; and two from ZAF: UNISA and UW stand out in second place. These institutions, with WR values above 600, have IR values below 1300.

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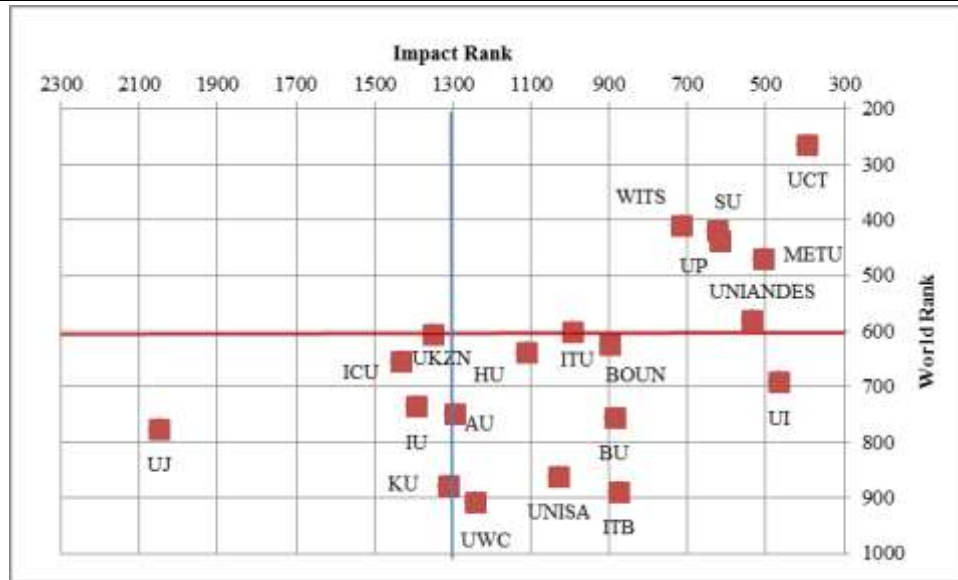
Fig. 2. Conglomerate of the World Rank and Impact Rank (IR) of universities from CIVETS countries in the Top 20 of the Web of Universities Ranking July 2020 [10].

Table 5. Characteristics of the conglomerate of the World Rank and Impact Rank (IR) of universities from CIVETS countries in the Top 20 of the Web of Universities Ranking July 2020 [10].

Cluster	University	World Rank	Impact Rank
1	UCT, WITS, SU, UP, METU, UNIANDES	WR<600	IR<1300
2	UKZN, ICU, IU, KU, UJ	WR>600	IR>1300
3	ITU, HU, BOUN, UI, AU, BU, ITB, UNISA, UWC	WR>600	IR<1300

3.3. Relationship between World Rank and Openness Rank (OR)

The conglomerate constituted with the universities from the CIVETS countries present in the Top 20 of the Web of Universities Ranking July 2020, when relating the values of World Rank and OR [10], is presented in Fig. 3. The characteristics of the conglomerate can be seen in Table 6, where five higher education institutions stand out as the best: four from ZAF: UCT, WITS, SU, and UP; and one from TUR: METU. UNIANDES (COL) is located in cluster 2 with values of WR <600 and OR> 600. In cluster 4, three from TUR stand out: ITU, HU, and IU; and one from ZAF: UKZN.
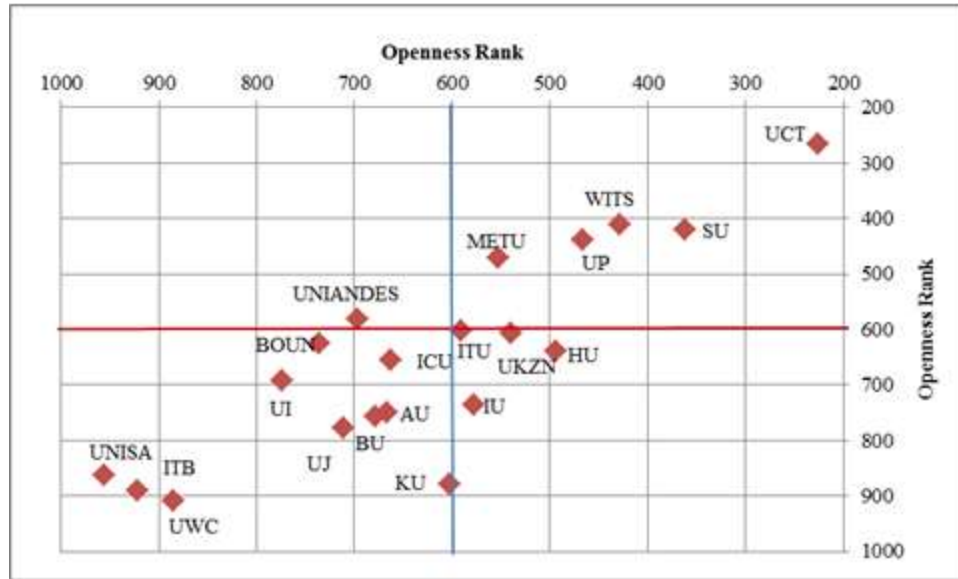
Fig. 3. Conglomerate of World Rank and Openness Rank (OR) of universities from CIVETS countries in the Top 20 of the Web of Universities Ranking July 2020 [10].

Table 6. Characteristics of the World Rank and Openness Rank (OR) conglomerate of universities from CIVETS countries in the Top 20 of the Web of Universities Ranking July 2020 [10].

Cluster	University	World Rank	Openness Rank
1	UCT, WITS, SU, UP, METU	WR<600	OR<600
2	UNIANDES	WR<600	OR>600
3	BOUN, ICU, AU, BU, UI, UJ, KU, UNISA, ITB, UWC	WR>600	OR>600
4	ITU, UKZN, HU, IU	WR>600	OR<600

3.4. Relationship between World Rank and Excellence Rank (ER)

The conglomerate formed with the universities from CIVETS countries present in the Top 20 of the Web of Universities Ranking July 2020, by relating the values of World Rank and ER [10], is shown in Fig. 4. Its characteristics are shown in Table 7. In this case, six best universities located in cluster 1 are positioned again, as happens with the PR and IR rankings: four from ZAF: UCT, WITS, SU, and UP; METU (TUR), and UNIANDES (COL). In cluster 3, with values of WR> 600 and ER <900, there are five from TUR: ITU, HU, BOUN, AU, and IU; two from ZAF: UKZN and UJ; and one from EGY: ICU.

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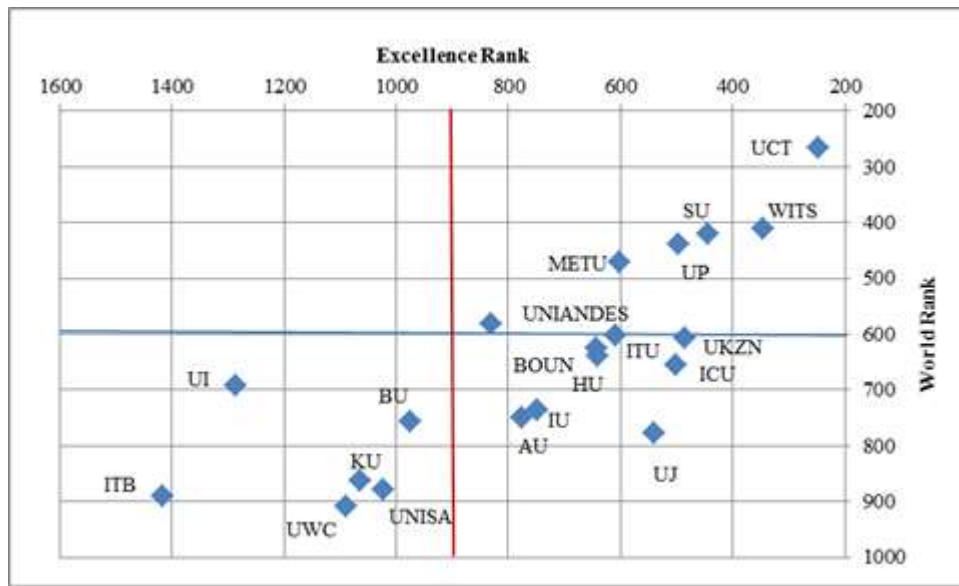
Fig. 4. Conglomerate of the World Rank and Excellence Rank (ER) of universities from CIVETS countries in the Top 20 of the Web of Universities Ranking July 2020 [10].

Table 7. Characteristics of the World Rank and Excellence Rank (ER) conglomerate of universities from CIVETS countries in the Top 20 of the Web of Universities Ranking July 2020 [10].

Cluster	University	World Rank	Excellence Rank
1	UCT, WITS, SU, UP, METU, UNIANDES	WR<600	ER<900
2	UI, BU, KU, UNISA, UWC, ITB	WR>600	ER>900
3	ITU, UKZN, ICU, BOUN, HU, IU, AU, UJ	WR>600	ER<900

4. Conclusions

Countries are also ranked according to their web university performance. The Web of Universities Ranking aims to encourage competition between universities with respect to their presence on the web through a classification that positions and ranks them (from highest to lowest) according to a World Rank based on four indicators: Presence (P), Impact (I), Openness (O) and Excellence (E). These indicators have different weights: 5%, 50%, 10% and 35% (correspondingly) and, in turn, originate a ranking. This paper has characterized, through clusters, the universities from CIVETS countries in the Top 20 of the Ranking Web of Universities July 2020, in order to relate and compare their position in the indicators through a descriptive analysis. This Top 20 includes a university from Colombia, two from Indonesia, one from Egypt, eight from Turkey and eight from South Africa. Vietnam does not have universities ranked in this selection. Among the most relevant results, the six universities best positioned in the PR, IR, and ER ranks (located in cluster 1) are four from ZAF: UCT, WITS, SU, and UP; one from TUR: METU, and one from COL: UNIANDES. The first five are also ranked OR in cluster 1. While UNIANDES (COL) is located in cluster 2 in indicator O: with values of WR <600 and OR> 600.

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