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Numerical Correlation between Impact Factor and Web Ranking of Electronic Scientific Journals Using Regression Analysis

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Abstract

The present study attempts to examine the numerical correlation between web ranking of electronic scientific journals and impact factor of these journals using the method of regression analysis. Regression analysis allows the option of investigating and predicting the numerical relationship between website ranking of scientific journals on the World Wide Web and the value of impact factor of the journals. A sample of 57 publishers with 6,272 scientific journals and 50 standalone scientific journals was analyzed during research procedure. In this study, two different indicators about websites classification on World Wide Web were examined separately for 57 publishers and 50 standalone journals, Alexa rank and Statscrop rank. The electronic databases through the internet constitute the main information resources of this study about the impact factors. The general conclusion that arises is that the impact factor of electronic scientific journals illustrates a very strong positive correlation with classification of websites on the World Wide Web. Furthermore, it is concluded that the change of web ranking as a function of impact factor is governed by a Gaussian function or rational function with lower Pearson coefficient and presents non-linearly correlation. Even if there is very strong correlation between impact factor and web rank for electronic journals, the prediction of impact factor from web rank is not possible and presents many divergences.

Keywords: Scientometric; Webometric; Impact Factor; Numerical Correlation; Web Ranking

1. Introduction

The specific study has the purpose to informing the researchers that intend to send their manuscripts to the electronic scientific journals with evaluated and given impact factor, if they can be entirely based on the web ranking of the journal website to predict the impact factor of journal during the searching and selection of electronic scientific journal. This means that there should be a numerical correlation between web ranking and impact factor of electronic scientific journals. The mathematical relationship will be investigated in this study. There are many electronic scientific journals which belong to the large and known publishers with high web ranking on the World Wide Web; however, the impact factors of the journals are lower than other publishers with lower web ranking.

Impact factor is one of the most important statistical bibliometric indicator such as h-index, SJR and SNIP indicators for a scientific journal. Impact factor (IF) is an indicator that determines the quality of scientific journals (Ferrer-Sapena, Sánchez-Pérez, Peset, González, & Aleixandre-Benavent, 2016; Lazaroiu, 2012). The IF is a valuable source of information for scientific

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community. The value of each of these indicators results after conducting statistical research and calculations. Scientists are interested about which papers have value to be cited in their manuscripts, because the citation may affect the impact factor of journals that the papers were published. Furthermore, scientific journals are classified in the lists depending on the level of particular indicators and scientific subject of each journal (Colledge et al., 2010; Moed, 2005).

In the last years, various researchers are trying to correlate numerically the above statistical indicators and factors with other indicators that are related to the scientific journals, such as acceptance or rejection rate, public availability and citation performance or citation time of the journals. Indicative surveys about the correlation of acceptance and rejection rates (Haensly, Hodges, & Davenport, 2008; Kurmis & Kurmis, 2006), about the correlation of public availability (Aleixandre-Benavent, Moreno-Solano, Ferrer Sapena, & Sánchez Pérez, 2016; Alsheikh-Ali, Qureshi, Al-Mallah, & Ioannidis, 2011), about the correlation of citation performance or citation time with impact factor (Finardi, 2013; Liu, Gai, Zhang, & Wang, 2015) and generally surveys about the correlation of impact factor with others bibliometric parameters (Elkins, Maher, Herbert, & Sherringhton, 2010; Li, 2011; Mirsaeid, Motamedi, & Ghorbani, 2015). The present study is a combination between scientific disciplines of scientometrics and webometrics. There are already some surveys that link the disciplines of scientometrics and webometrics. Smith (2012) examines the correlation between web ranking and scientific quality for Australian and New Zealand institutional repositories. The regression take place through the Web Impact Factor (WIF) and citations by ISI (Institute for Scientific Information) Thomson Reuters. The WIF of a website is a fraction that depended by the number of inlinked and outlinked pages that have indexed by the search engines (Noruzi, 2006; Thelwall & Harries, 2004). Smith concludes that low correlation exists between WIF and citations of institutional repositories. Another research about webometric characteristics of medical scientific journals investigates the web ranking of most accredited journals based on the number of inlinked pages and Web Impact Factor (Isfandyari-Moghaddam, Danesh, & Hadji-Azizi, 2015).

Impact factor was invented by Eugene Garfield in 1955 (Garfield, 2006) and calculated for the first time in 1975 for certain scientific journals. Impact factor calculated for each year by Thompson Scientific ISI web of knowledge. In addition, each year, the Journal Citation Reports of Institute for Scientific Information (ISI) shall publish the lists of impact factors for thousands scientific journals. The value of impact factor is calculated from the ratio of total citations number of a scientific journal for previous two years to the number of total research articles which were published in the journal for previous two years (Moed, 2005), according to equation (1).

$$IF_v = \frac{c_{v-2} + c_{v-1}}{p_{v-2} + p_{v-1}} \quad (1)$$

Where:

IF: The impact factor (citations per article of the journal).

v: The reference year.

c_{v-2}: The number of citations of the journal 2 years before the reference year.

$c_{\nu-1}$: The number of citations of the journal 1 year before the reference year.
$p_{\nu-2}$: The number of published articles of the journal 2 years before the reference year.
$p_{\nu-1}$: The number of published articles of the journal 1 year before the reference year.

The situation in respect to web ranking and classification of electronic journals on the World Wide Web is not so clear. As yet, there is no official organization provides webometrics information of electronic scientific journals. In the certain survey, two different web tools for finding the classification of websites of electronic scientific journals on the World Wide Web, the web ranking by Alexa Internet Inc. and the web ranking by Statscrop, will be used. The webometric ranking and classification of websites is very volatile in regard to the time. Consequently, two different Alexa web ranks for 2016 and 2017 respectively will be presented in this study. The two different web ranks allow a diachronic observation of change of web ranking in regard to the time. The selection of web ranking values for 2016 and 2017 carried out 11-12 months apart. The web service of Alexa has the opportunity to save the previous changes and history of the web ranking. There is no similar possibility on the Statscrop.

The Alexa web rank "AR" is determined from an algorithm which examines two different parameters. Initially, the algorithm calculates the average value of individual users that visit the website for one day and the second parameter are the page views that correspond to the website (Li, Mao, Wang, Zhang, & Wei, 2014). The algorithm that determines the Statscrop rank "ST" shall take into consideration the value of average daily visitors, the value of average daily page views and the average daily bandwidth.

The highest web rank classification that may be recorded by Alexa Inc. and Statscrop is the 1st position, whereas the lowest web rank by Alexa and Statscrop is estimated at up to 15,000,000-20,000,000. This means that, the lower the value of Alexa and Statscrop web rank the higher the position of website on the World Wide Web. Alexa and Statscrop web ranking is varied between 1-20,000,000.

2. Materials and Method

2.1 Regression steps

In this survey, two different types of regression analysis were carried out. In the first step of analysis about the sample of 57 publishers with 6,272 scientific journals, three functions, IF(AR) for 2016, IF(AR) for 2017 and IF(ST) were extracted. The first function f1 = IF(AR), relating to the numerical correlation of average impact factor with web ranking of Alexa Inc. for 2016. The second function f2 = IF(AR), relating to the correlation of average impact factor with web ranking of Alexa Inc. for 2017. The third function f3 = IF(ST), relating to the correlation of average impact factor to the Statscrop rank. In the next step of analysis about the sample of 50 standalone journals, is repeated the same procedure and three additional functions f4 = IF(AR) for 2016, f5 = IF(AR) for 2017 and f6 = IF(ST) were extracted. It is important to check if there is different correlation between impact factor and web ranking for scientific publishers and standalone scientific journals. This can be seen from Pearson's correlation coefficient. Regressions and functions are reported summary in the Table 1. The research process is reported analytically in the Figure 1.

2.2 Data collection, web ranking tools and average impact factor

During the first regression process for the sample of 57 publishers with 6,272 scientific journals were calculated the total impact factor ΣIF of all journals per publisher and next the average impact factor $\overline{IF}$. The average impact factor for a publisher is the ratio of the sum of impact factors of each journal of the publisher to the number of journals that measured in this study. This logic will be implemented because the tools

Table 1. Regressions Analysis and Functions that Result at Each Step of the Survey

Regression step	Regression content, correlated variables	Regressions number
1st step Publishers	Regression between $\overline{IF}$ and Alexa Rank 2016	3
	Regression between $\overline{IF}$ and Alexa Rank 2017	
	Regression between $\overline{IF}$ and Statscrop Rank 2017	
2nd step Standalone journals	Regression between IF and Alexa Rank 2016	3
	Regression between IF and Alexa Rank 2017	
	Regression between IF and Statscrop Rank 2017	

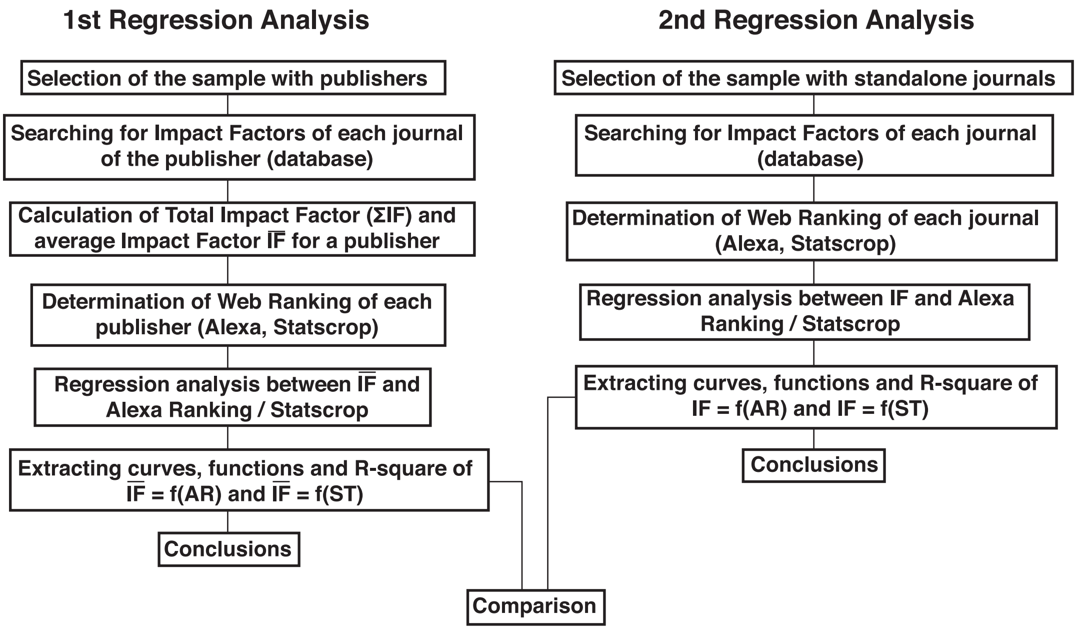

Figure 1. The Survey Process

that determine the web ranking investigate only the activity that corresponds on the main domain of a website and not the subdomain.

Therefore, it is impossible to determine the web rank of each scientific journal which belongs to the publisher, because almost all publishers have a main domain for their sites. In the other hand, websites of standalone journals correspond to the only one individual domain. The number of total page views that corresponds in the main domain of a publisher, is equal to the sum of page views that corresponds in each subdomain (Figure 2). This problem does not exist in the standalone journals because each journal has its own website and different domain name (Figure 3).

2.3 Correlation coefficient

The correlation level that exists between web ranking and impact factor of scientific journals is depended by Pearson's correlation coefficient "*r*". This coefficient calculated together with functions that result by software during the regression process. More precisely, we have the following characterization depending on the Pearson's coefficient (Evans, 1996). Some scientists such as Gerstman (2006), suggest different values for R-coefficient. Therefore, low correlation for $0 < r < 0.3$, moderate correlation for $0.3 < r < 0.7$ and high correlation for $0.7 < r < 1.0$. In the specific survey, the Evans criteria will be preferred.

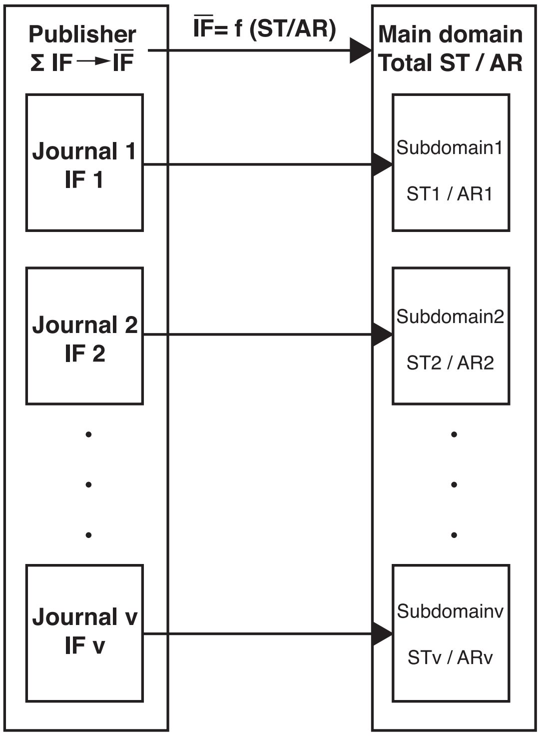

Figure 2. Illustrative Diagram that Indicates the Correspondence between Average $\overline{IF}$ and Web Ranking in a Publisher

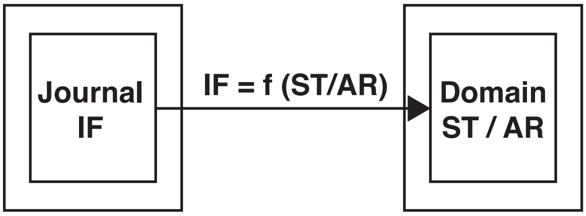

Figure 3. Illustrative Diagram that Indicates the Correspondence between IF and Web Ranking in a Standalone Scientific Journal

Table 2. Characterization of Regression Depending on the Correlation Coefficient (Evans, 1996)

Characterization	R-coefficient
Very low	0 – 0.19
Low	0.20 – 0.39
Moderate	0.40 – 0.59
Strong	0.60 – 0.79
Very strong	0.80 – 1.0

2.4 Sampling criteria, sample description and impact factor databases

There is a sample that is divided into two parts. The first part is made up from 57 publishers that own 6,272 electronic scientific journals and the second part is made up from 50 standalone scientific journals. Appendix A shows analytical information about publishers and number of their journals that were selected for research purposes. Also, the average impact factor for scientific journals of the publishers as well as Alexa rank, Statscrop rank is calculated. Period for data collection about web ranking: April 2016-May 2016 for Alexa rank in 2016 and May 2017 for Alexa and Statscrop web rank in 2017.

The selection of the sample with 57 scientific publishers was carried out under the four basic criteria. Initially, the first 10 publishers that were included are the bigger scientific publishers according the number of published and released electronic journals (Morris, 2007; Ware & Mabe, 2015). The next 27 publishers were included by SCI journal list according to impact factor of scientific publishers (International Scientific Institute, n.d.). The remaining 20 publishers were selected randomly from Google search engine and were included in the sample with following conditions. The majority of journals of the publisher must have evaluated impact factor by some database. There must be specific web ranking by Alexa and Statscrop services. The 23 publishers was marked with asterisk in the Appendix A.

The selection of the sample with 50 standalone scientific journals was carried out under the following criteria. The journals were selected

Table 3. Distribution Rates about 50 Standalone Scientific Journals Depending on the Scientific Discipline of Journals

Scientific field	Number of journals	Frequency (%)
Medicine, psychiatry, dentistry, biology	12	24
Physics, mathematics, chemical, nature, environmental, agricultural, geoscience	11	22
Financial, economics, business, markets	4	8
Engineering, technology, computer sc.	16	32
Social science, humanity, law, arts	5	10
General content, multidisciplinary	2	4

randomly from google search engine. The journals must have evaluated impact factor by some database. There must be specific web ranking by Alexa and Statscrop services. The Table 3 presents the distribution rates of the sample of 50 standalone scientific journals depending on the scientific discipline of each journal. The standalone journals are presented in the Appendix B.

3. Regression Analysis and Results

1st step. The change of total impact factor as a function of Alexa rank 2016, Alexa rank 2017 and Statscrop rank in 2017 for 57 publishers with 6,272 electronic scientific journals.

$$\overline{IF}(AR)=180.7\exp\left(-\left(\frac{AR-22890}{273.2}\right)^2\right)+2.43\exp\left(-\left(\frac{AR+16710}{1003000}\right)^2\right) \quad (2)$$

$R^2=0.6545 \Leftrightarrow |R|=0.809$ for Alexa rank 2016

$$\overline{IF}(AR)=147.4\exp\left(-\left(\frac{AR-17120}{324.4}\right)^2\right)$$
$$2.527\exp\left(-\left(\frac{AR+66320}{244900}\right)^2\right) \quad (3)$$

$R^2=0.6307 \Leftrightarrow |R|=0.794$ for Alexa rank 2017

$$\overline{IF}(ST)=624.2\exp\left(-\left(\frac{ST-18900}{466.6}\right)^2\right)+7.712\exp\left(-\left(\frac{ST+67000}{8837}\right)^2\right)$$
$$+1.217\times10^{15}\exp\left(-\left(\frac{ST+5.605\times10^6}{965400}\right)^2\right)+25.5\exp\left(-\left(\frac{ST+2.984\times10^5}{45860}\right)^2\right) \quad (4)$$

$R^2=0.7335 \Leftrightarrow |R|=0.856$

2nd step. The change of impact factor as a function of Alexa rank 2016, Alexa rank 2017 and

Statscrop rank in 2017 for standalone electronic scientific journals.

$$IF(AR) = 833.7\exp\left(-\left(\frac{AR-73730}{1309}\right)^2\right) + 3.238\exp\left(-\left(\frac{AR-1.6\times10^6}{737000}\right)^2\right) \quad (5)$$

$R^2 = 0.8914 \Leftrightarrow |R| = 0.9441$ for Alexa rank 2016

$$IF(AR) = 459.7\exp\left(-\left(\frac{AR-9895}{904.6}\right)^2\right) + 126\exp\left(-\left(\frac{AR-2.12\times10^6}{1176000}\right)^2\right) \quad (6)$$

$R^2 = 0.9097 \Leftrightarrow |R| = 0.9598$ for Alexa rank 2017

$$IF(ST) = 116.1\exp\left(-\left(\frac{ST-10310}{1299}\right)^2\right) + 8.654\exp\left(-\left(\frac{ST-68220}{84100}\right)^2\right) \quad (7)$$

$R^2 = 0.9062 \Leftrightarrow |R| = 0.952$

We have the following restrictions and domain functions about independent variables AR, ST of resulting functions of regression analysis. AR∈[0, 2×10^7], ST∈[0, 2×10^7], IF∈[0, +∞].

4. Discussion

The mathematical models and the curves of regression functions extracted with MATLAB software. During the searching of the model with higher correlation coefficient for the sample of study, it is confirmed that the change of impact factor of the electronic journals in relation to the web ranking of website of the journals, is governed by a Gaussian function. Gaussian function is a special form of exponential function (Ribeiro, 2004) and defined as:

$$f(x) = \frac{1}{a\sqrt{2\pi}}\exp\left(\frac{-(x-b)^2}{2a^2}\right) \quad (8)$$

Where, a, b real coefficients which determined by statistical software after the regression. The specific function follows the normal distribution, so the Gaussian function is suitable for non-linear regression analysis during statistical research as well as the investigation of various mathematical correlations. In addition, during the searching of mathematical model, it is confirmed that there are other models that can describe the relationship between impact factor and web ranking, such as rational equations. The rational equation is a fraction of two polynomials with form f(x) = P(x)/Q(x). The models with rational functions has lower correlation coefficients in comparison to Gaussian functions. The average Pearson coefficient of equations (2), (3) and (4) from the sample of scientific publishers and the equations (5), (6) and (7) from the sample of standalone scientific journals, amounting to 0.82 and 0.952 respectively, this divergence is due to the fact that the average impact factor of each publisher was used in the first sample. One more basic characteristic of mathematical model that is witnessed by the Figures 4, 5, 6 and 7 are the many critical, stationary and turned points of the curves. This means that the change of impact factor in relation to the web ranking is not linearly. In the Appendix A, B and Figures 4, 6 demonstrates the differences of Alexa web ranking between 2016 and 2017. The average Alexa web ranking for 2016 and 2017 for the sample of publishers amounting to 158,270 and 104,581 respectively. The average Alexa

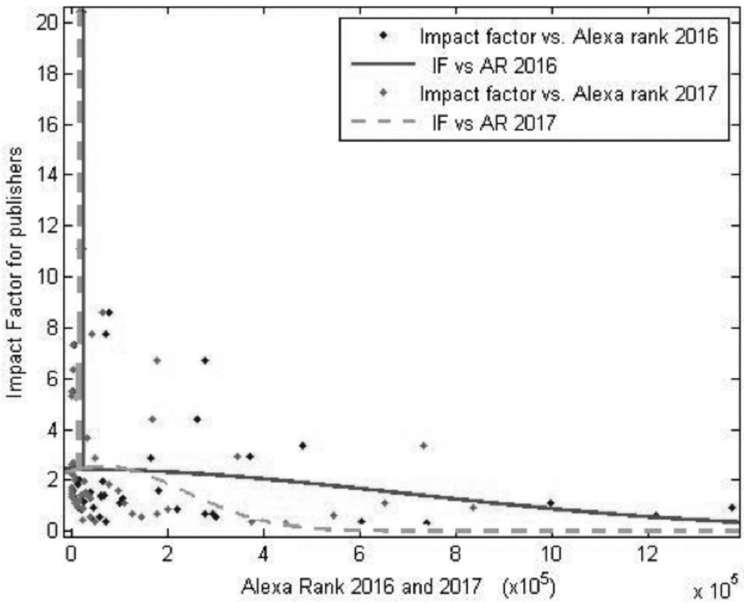

Figure 4. The Change Curve of Average Impact Factor $\overline{IF}$ of Publishers to the Alexa Web Ranking for 2016 and 2017

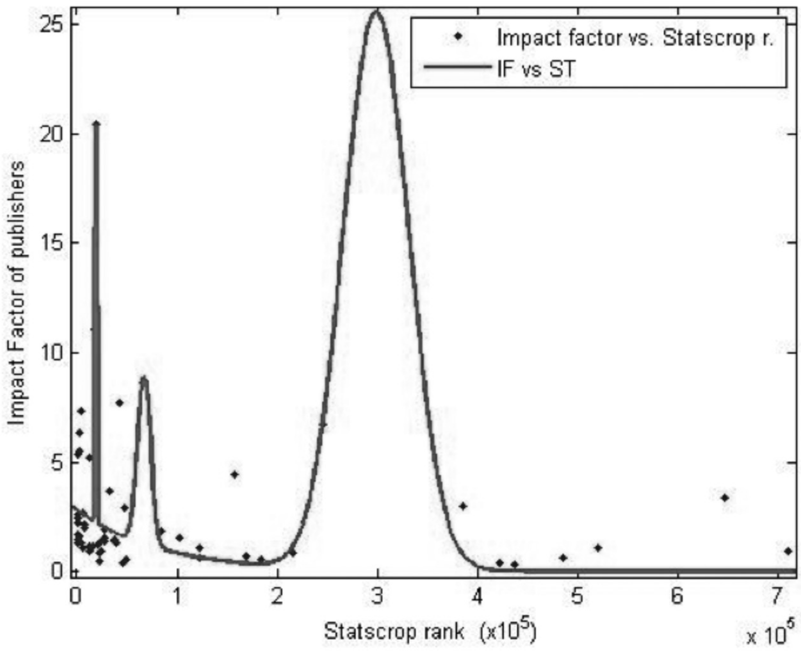

Figure 5. The Change Curve of Average Impact Factor $\overline{IF}$ of Publishers to the Statscrop Rank

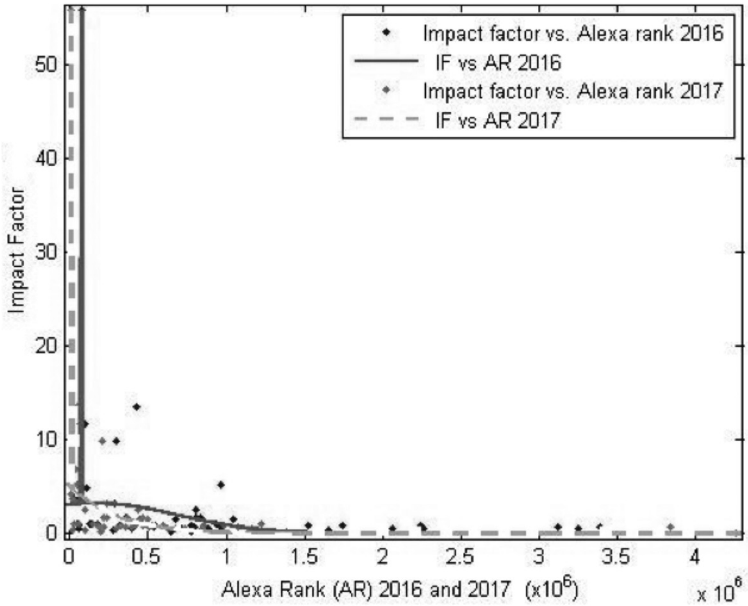

Figure 6. The Change Curve of Impact Factor IF for Standalone Scientific Journals to the Alexa Web Ranking for 2016 and 2017

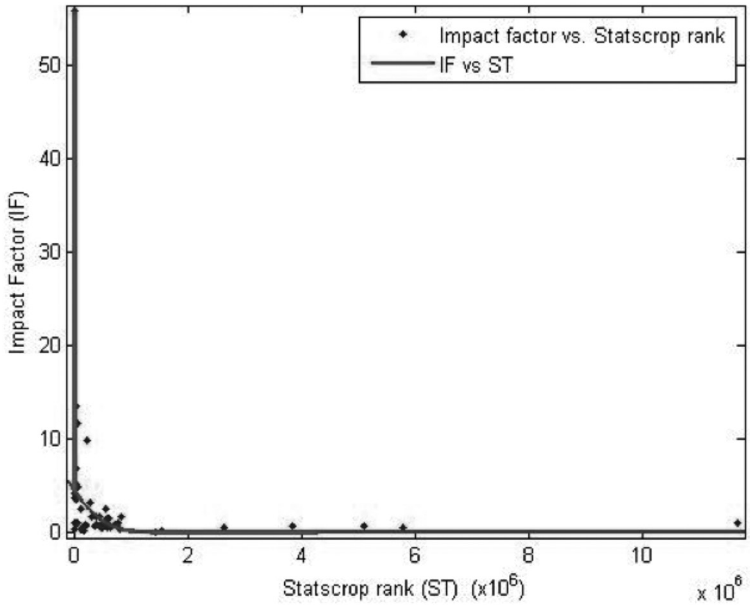

Figure 7. The Change Curve of Impact Factor IF for Standalone Scientific Journals to the Statscrop Rank

web ranking for 2016 and 2017 for the sample of standalone journals amounting to 827,445 and 547,587 respectively. Consequently, the average Alexa rank for 57 publishers improved by 53,689 positions or 33.9% per year and the average Alexa rank for 50 standalone journals improved by 279,858 positions or 33.8% per year. The improvement of web ranking percentages between publishers and standalone journals for one year is the same. Generally, the change of percentage of impact factor in regard to the time may be present different variations for various scientific fields, indicative study (Althouse, West, & Bergstrom, 2009). The volatility of web ranking in regard to the time as well as impact factor is an issue for a researcher that seeks to entirely based on web ranking for selection of a journal. The value of Alexa and Statscrop web rank announcing every 3-4 months on the website of services. In the other hand, the procedure for data collection, calculation and evaluation of new impact factors from databases can take up to 12 months in many cases. The average Statscrop rank for the sample of publishers and the sample of standalone journals amounting to 100,742 and 930,696 respectively. The divergence between average Alexa rank and Statscrop rank is due to the different algorithms that use the two web services for calculation of web ranking.

In this study, two samples were examined. The first includes 57 scientific publishers with 6,272 electronic scientific journals and the second sample includes 50 standalone electronic scientific journals. Larsen and von Ins (2010) investigate the number of active scientific journals on a global basis and report that the number of scientific journals is estimated approximately at 24,000 journals. From the above information, it is concluded that the sample of study corresponds to 26.3% of the number of active scientific journals for 2010.

5. Conclusions

The change of average impact factor of electronic scientific journals of the publishers and impact factor of standalone journals presents very strong mathematical correlation in relation to the web ranking. The numerical correlation between impact factor and web ranking for publishers and standalone journals is governed by a Gaussian or rational equation. The models of Gaussian functions present higher correlation coefficients in comparison to the models of rational functions. The rational equations present moderate with strong mathematical correlation. According to the regression functions, the change of impact factor in relation to the web ranking is non-linearly and presents positive correlation. If the volatility of web ranking in regard to the time and the change of impact factors every year, taken into consideration, then it is concluded that researchers cannot be entirely based on the web ranking of electronic scientific journals to predict the impact factor of journal. Consequently, even if there is very strong numerical correlation between impact factor and web ranking, the prediction of impact factor by web ranking from specific mathematical model, may have many numerical divergences.

Appendix A

Information about sample of 57 publishers with 6,272 journals

Publisher	Number of journals	$\overline{IF}$	Σ IF	Alexa Rank 2016	Alexa Rank 2017	StatsCrop Rank '17	Web database
AAPS*	3	2.953	8.859	372,303	345,139	385,225	AAPS
Acedemia Publishing*	8	0.914	7.318	1,375,894	836,915	709,729	RG, GIF
Academic Journals	12	0.431	4.750	45,024	25,196	23,342	-
ACM*	10	1.408	14.080	5,728	3,324	3,320	CF
ACS*	23	5.484	126.132	2,971	2,391	2,306	ACS
AENSI*	4	0.318	1.270	739,467	446,692	436,163	RG
AIAA Journals*	6	1.948	11.688	64,257	27,820	26,795	RG
AIP Publishing*	17	1.859	31.803	12,978	78,272	84,181	AIP
American Marketing Assoc.*	4	3.685	14.740	34,429	34,204	33,321	RG
Annual Reviews	43	11.080	476.440	23,371	16,539	17,933	RG
ARVO Journals*	2	2.899	20.293	166,962	50,782	47,227	CF
ASBMB*	4	6.696	26.784	278,550	178,670	245,624	ASBMB
American Society of Microb*	14	5.167	72.338	18,550	12,871	12,986	CF
ASME	24	1.140	27.360	23,932	13,315	13,081	ASME
ATS Journals*	2	8.600	17.200	79,918	65,895	64,999	ATS
Bentham Open	37	1.574	76.295	181,773	98,809	102,373	Bentham
Cambridge Journals	238	1.336	317.968	995	553	578	Cambridge
CCSE	7	0.360	2.520	73,393	48,083	46,577	CCSE, SCIM
CMS*	2	0.695	1.390	277,414	178,705	168,907	RG
CSIR-NISCAIR Journals*	14	0.563	7.880	60,537	40,530	49,395	RG, SCIM
De Gruyter Journals	158	1.137	179.646	25,486	4,510	15,264	DGJ
Elsevier	158	2.438	385.204	1,565	1,198	1,179	Elsevier
Emerald Insight	61	1.096	66.856	10,423	6,179	6,091	Emerald
European Scientific Journal*	3	0.654	-	295,000	127,715	122,797	GIF
Global Society of Scientific Research and Researchers*	3	0.366	1.099	603,773	373,882	421,752	GSSRR
Hindawi Publishing Corp.	166	1.296	215.136	8,163	4,563	4,540	RG, SCIM
Hogrefe & Huber Publishers	21	1.098	19.640	102,343	109,507	122,531	SCIM

Publisher	Number of journals	$\overline{IF}$	Σ IF	Alexa Rank 2016	Alexa Rank 2017	StatsCrop Rank '17	Web database
IEEE	98	2.247	220.206	1,682	770	783	RG
IET*	4	1.512	6.048	41,559	30,094	27,157	CF
Inderscience Publishers	174	1.440	250.560	62,660	37,748	37,624	SCIM
Intern. Press of Boston*	14	1.113	12.810	997,919	652,682	519,070	RG
IOP Publishing	63	2.669	168.147	14,023	5,221	5,068	IOP Pub.
IOSR Journals	21	1.412	29.652	69,516	28,168	28,038	IOSR
ISCA*	13	0.574	7.468	300,080	147,280	183,074	GIF
ISSR*	2	0.621	1.241	1,217,368	545,303	484,518	ISSR
Mary Ann Liebert Inc.	65	1.402	114.292	36,306	22,023	23,788	RG, MAL
Materials Science	105	4.413	463.365	263,189	168,903	157,377	Mat. Sci.
MDPI Open Access Publ.*	25	2.021	50.726	16,360	7,782	8,180	MDPI
Nature	47	5.330	250.510	1,545	833	860	Nature
NRC Research Press	19	1.379	26.210	63,846	37,490	37,033	RG, SCIM
OMICS International	307	1.197	367.479	26,632	18,518	21,611	OMICS
Oxford Journals	194	2.606	505.564	3,164	1,609	1,597	Oxford Journals
PLOS Journals	7	7.309	51.163	6,710	3,382	3,463	RG
RSC Publishing	33	6.328	208.758	5,505	3,644	3,240	RSC Pub.
Sage Publishing	870	1.578	1372.860	2,964	1,734	1,792	Sage
Science and Education*	7	1.270	8.890	106,337	40,375	39,050	Sc. & Ed.
Scientific Research Publ.	292	0.940	201.980	24,068	12,676	12,175	-
Springer	1659	1.496	2481.860	985	585	601	Springer
STM Journals	20	3.355	67.100	480,740	733,223	645,930	STM
Taylor Francis	795	1.486	1181.370	2,305	1,109	1,141	Taylor Francis
Termedia	13	0.862	11.206	221,129	201,685	214,754	RG, CF
The Lancet	7	20.440	143.094	22,480	17,612	19,773	The Lancet
The Rockefeller University Press*	3	7.450	22.350	72,500	43,471	41,812	RG
Tubitak Academic Journals	12	0.855	9.542	19,943	22,684	23,191	RG
Wiley Online	71	1.726	122.546	882	502	503	Wiley
Wolters Kluwer LLW	190	2.153	409.170	8,794	7,036	6,958	Walters Kl. LLW
World Scientific Publishing	98	0.920	90.197	45,000	24,736	23,895	RG, SCIM, GISI

Appendix B

Information about sample of 50 standalone journals

Name of the journal	ISSN	IF	Alexa Rank 2016	Alexa Rank 2017	StatsCrop Rank 2016	Web data
AAPG Bulletin	0149-1423	2.606	93,292	92,678	109,120	AAPG
African Invertebrates	1681-5556	0.464	53,440	201,977	168,759	GIF
American Journal of Archaeology	0002-9114	0.590	884,846	678,050	2,640,918	SCIM
American Journal of Botany	1537-2197	3.220	289,524	239,627	284,966	RG, SCIM
American Journal of Managed Care	1088-0224	1.657	241,000	219,919	406,005	CF
American Journal of Psychiatry	1535-7228	13.505	426,621	42,109	47,020	GIF
Asian Journal of Science and Technology	0976-3376	0.778	52,829	851,345	592,402	GIF
Australasian Journal of Philosophy	0004-8402	0.750	3,123,492	3,841,030	3,841,030	SCIM
Condensed Matter Physics	1607-324X	0.529	2,067,493	622,792	594,153	SCIM
Engineering Journal	0125-8281	0.943	135,914	1,220,198	11,686,707	GIF
Finance of Ukraine	2305-7645	0.851	541,777	597,290	717,037	GIF
International Journal of Advanced Research	2320-5407	0.220	650,000	193,010	186,379	RG
International Journal of Advanced Computer Technology	2319-7900	0.453	3,250,000	847,711	5,791,682	GIF
International Journal of Business and Management Invention	2319-8028	1.482	1,044,009	500,611	600,246	AQCJ
International Journal of Civil Engineering	1735-0522	0.360	21,305	15,600	15,784	RG
International Journal of Computational Engineering Research	2250-3005	0.675	797,582	507,265	534,939	GIF
International Journal of Computer and Information Technology	2279-0764	0.890	2,241,311	989,019	760,296	GIF
International Journal of Current Research	0975-833X	0.765	978,881	220,408	208,084	GIF
International Journal of Engineering	1735-9244	0.765	530,827	394,864	569,849	RG
International Journal of Innovative Science, Engineering and Technology	2348-7968	0.611	960,968	356,004	359,567	RG

Name of the journal	ISSN	IF	Alexa Rank 2016	Alexa Rank 2017	StatsCrop Rank 2016	Web data
International Journal of Management Sciences and Business Research	2226-8235	0.454	2,258,141	1,162,029	628,419	IIFS
International Journal of Humanities and Social Science Invention	2319-7722	1.756	802,632	369,887	437,187	AQCJ
International Journal of Scientific and Engineering Research	2229-5518	0.987	130,158	55,261	57,768	GIF
International Journal of Scientific & Technology Research	2277-8616	0.987	174,673	151,486	51,124	GIF
Journal of Adolescent Health	1054-139X	0.570	395,100	300,260	478,385	RG
Journal of Advertising Research	0021-8499	1.640	833,333	468,515	833,340	RG
Journal of Biological Chemistry	0021-9258	3.630	28,667	17,839	16,252	RG
Journal of Cell Science	0021-9533	3.500	46,941	28,841	27,661	RG
Journal of Coastal Research	1551-5036	0.956	935,897	426,392	770,562	RG, SCIM
Journal of Computers	1796-203X	0.370	1,657,927	1,153,996	795,991	RG
Journal of Electrical Engineering	1335-3632	1.040	44,303	23,794	22,558	RG
Journal of Engineering Research	2307-1885	0.128	776,760	1,379,971	1,556,003	GIF
Journal of Hepatology	0168-8278	0.890	319,000	326,526	466,054	RG
Journal of Language and Linguistic Studies	1305-578X	0.765	3,392,326	1,073,997	5,092,585	GIF
Journal of Periodontology	0022-3942	1.710	354,167	235,854	302,569	RG
Journal of Personality and Social Psychology	0022-3514	4.230	6,181	4,444	4,387	RG
Journal of Statistical Software	1548-7660	9.910	300,098	208,821	238,018	RG
Mitteilungen Klosterneuburg	0007-5922	0.080	2,774,814	4,260,277	1,444,951	RG
New England Journal of Medicine	0028-4793	55.873	75,901	8,554	9,140	RG
Plant Physiology	1532-2548	4.840	109,816	63,302	67,214	RG
Polish Journal of Environmental Studies	1230-1485	0.871	772,521	467,549	390,100	RG
Strojniški Vestnik – Journal of Mechanical Engineering	0039-2480	0.821	1,740,497	520,745	608,140	SV
Research Journal of English Language and Literature	2321-3108	0.453	711,816	733,136	511,239	GIF
The International Journal of Engineering and Science	2319-1913	0.898	1,522,063	178,914	205,712	RG

Name of the journal	ISSN	IF	Alexa Rank 2016	Alexa Rank 2017	StatsCrop Rank 2016	Web data
The Journal of Arthroplasty	1532-8406	2.515	800,500	434,867	547,980	ISI
The Journal of Immunology	1550-6606	5.220	964,880	45,078	43,880	RG
The Journal of Clinical Investigation	1558-8238	11.625	98,500	66,071	66,597	RG, SCIM
The Journal of Neuroscience	1529-2401	6.920	11,073	34,624	35,365	RG
The Journal of Prosthetic Dentistry	0022-3913	1.515	670,588	447,412	598,780	ISI
Walailak Journal of Science and Technology	1686-3933 2228-835X	0.380	277,895	99,404	111,879	SCIM

Where:

AAPG: American Association of Petroleum Geologists.

AAPS: American Association of Pharmaceutical Sciences.

ACS: ACS Publications.

AIP: AIP Publishing.

AQCJ: African Quality Center for Journals database.

ASBMB: American Society of Biochemistry and Molecular Biology.

ASME: The American Society of Mechanical Engineers.

ATS: American Thoracic Society Journals.

CCSE: Canadian Center of Science and Education.

CF: Citefactor database.

DGJ: De Gruyter Journals.

GIF: Global Impact Factor database.

GISI: Global Institute for Scientific Information, Journal Impact Factor database.

GSSRR: Global Society of Scientific Research and Researchers.

IIFS: International Impact Factor Services database.

IOSR: International Organization of Scientific Research.

ISI: Thomson Reuters, Journal Citation Report.

ISSR: Innovative Space of Scientific Research Journals.

MDPI: MDPI Publisher.

OMICS: OMICS International Publishing Group.

RG: Researchgate database.

RSC: Royal Society of Chemistry Publishing.

SCIM: Scimago database.

STM: STM Publishing.

SV: Strojniski Vestnik – Journal of Mechanical Engineering.

Appendix C
Impact factor and web databases

African Quality Centre for Journals, http://aqcj.org
Alexa Inc., Alexa Rank, http://www.alexa.com
CiteFactor Database, http://www.citefactor.org
Global Impact Factor Database, http://globalimpactfactor.com
International Impact Factor Services, http://impactfactorservice.com
ResearchGate Database, https://www.researchgate.net
Statscrop Rank, http://www.statscrop.com

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以迴歸分析探討電子學術期刊影響係數與網站排名之關聯

Numerical Correlation between Impact Factor and Web Ranking of Electronic Scientific Journals Using Regression Analysis

Giorgos P. Kouropoulos[1]

摘　要

本研究試圖以迴歸分析方法探討電子學術期刊網站排名與其影響係數兩者間的相關性，使用迴歸分析得以調查與預測學術期刊於全球資訊網中的網站排名以及期刊影響係數兩者間的數值關係。研究分析的樣本為57家出版商及其下的6,272種學術期刊，與其他非隸屬於出版商而獨立出版（Standalone Journals）的50種學術期刊。本研究採用在全球資訊網中網站分類的兩種指標——Alexa排名、Statscrop排名，分別檢驗57家來自出版商與50種獨立期刊。本研究所使用的影響係數之主要來源為電子資料庫。研究發現電子學術期刊之影響係數與其在全球資訊網中的網站分類呈現高度正相關。此外，作為影響係數的函數之一的網站排名受到高斯函數或皮爾森相關係數低的有理函數影響，而呈現非線性相關。即使電子期刊的影響係數與網站排名間為高度相關，但仍然無法以網站排名來預測影響係數。

關鍵字：科學計量、網頁計量、影響係數、統計相關、網站排名

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