INDICATORS OF THE ACTIVITY OF ECONOMIC PUBLICATIONS – AN AREA UNDER THE IMPACT OF STATISTICAL CREATIVITY

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Abstract

This article goes beyond the space devoted to the performance and evolution of an economic journal (or publication), which can be quantified and demonstrated by statistical indicators (scientometric indicators, access and download statistical indicators, absolute or relative classical intensity and distributional indicators). Thus, the first two categories of indicators are listed and briefly exemplified, and the others, which belong to the classical type, are developed and analyzed in this original approach, the author remaining aware that there are many unquantified qualitative elements, such as editorial management and editorial decisions that can enhance the quality of the team and the editorial projects of an economic journal (or of economic journals). This is in fact the very major theme of the paper, which involves the adaptation of classical constructions of indicators to the innovative and dynamic universe of the economic literature published. The original approach of constructing classical statistical indicators in the field described in the title of the paper is underlied by methods of presenting the intensity of editorial effects, the correlation or association of some publishing tendencies, as well as analyzing a number of evolutions of the Kernel-type distributions in editorial databases, and, apparently last, the frequency statistical investigations. Some final remarks clarify the development prospects of these new areas of application of statistical methods.

Key words: *scientometric indicator, distribution analysis method, correlation matrix, frequency analysis method, classical editorial statistics.*

1. Introduction

Who could today imagine a picture of a journal (or publication) with a recognized editorial reputation but lacking a major statistical component to support it? The international finding that there is an increasingly more prominent impact of scientometric statistics and statistical indicators contradicts the tendency of relative depreciation or limitation of the practical consequences of articles and economic publications in economic, managerial or entrepreneurial

activities, etc. Undoubtedly, there are many attempts to measure the actual impact of an article or paper on their economic efficiency (Bromwich, Scapens, 2016), approached in terms of the increasing competitiveness of companies and the efficiency of their products and services as a direct result of reading a text published in a journal, but citations remain so far the most relevant form of quantification of research contribution in an article. It is true that there are constant attempts to identify new peer-review formulas based on innovative principles related to eligibility, and even new standard components of an article (comparable to those of expressing the authors' anks – *Acknowledgements* – related to the recognition of the applicability of economic research at the level of companies. Though scientometric statistics are developing, which are derived from the prevailing analysis of citations, or related to effective access through the dynamics and hierarchies of visitors and readers of prestigious articles or journals, yet there is still a need for classical editorial statistics centered on innovative indicators.

2. Scientometric indicators of journals indexed in databases

Scientometric indicators have gradually formed the bulk of the statistical solutions with a major impact on the international ranking of scientific research (Table 1). Many of the quantitative criteria relevant to the economic performance of a journal (publication) start from the number of published articles, and go up to the number of citations in different indexing systems (Web of Science, Scopus, Google, etc.), detailing the ratio of the number of citations and the number of years since the article was published, and even structuring the number of citations obtained in papers in relation to many variables (spatial, temporal, etc.).

The best economic journals according to international criteria or hierarchies

Table no. 1

Journal (Review)	ISSN	ABDC	WU	DK	CNRS	AERLS	ASBS	ABS
American Economic Review	0002-8282	A*	Star	2	1*	A	4	4*
Econometrica	0012-9682	A*	Star	2	1*	A	4	4*
J. of Political Economy	0022-3808	A*	Star	2	1*	A	4	4*
Quarterly J. of Economics	0033-5533	A*	Star	2	1*	A	4	4*

Sources: WU Journal Ranking, 2016; Dinu, Săvoiu, Dabija, 2017, p.363. Note*: Criteria abbreviations or international hierarchies:ABDC = Australian Business Deans Council Journal Rankings List; WU = Economic University of Viena; DK = Danish Ministry Journal List; CNRS = CNRS Economics and Management; AERLS = Agence d'Évaluation de la Recherche et de l'Enseignement Supérieur; ASBS = Ashton Business School Journal Ranking; ABS = Association of Business Schools Academic Journal Quality.

The effort to adapt to the scientometric indexes of the journals in the European ex-socialist countries has been and remains of a high intensity, exemplified in Table 2, but remains significant in relation to the developed countries in Europe (Table 3) as it results from a top (Dragos, 2014, Dinu, Săvoiu, Dabija, 2017) with an emphasis on citations and articles by article, but especially by the Hirsch index:

Top 10 developed European countries, according to the Hirsch index

Table no. 2

Rank	Country	Papers	Citations	Self-Citations	Citations per paper	Hirsch Index
1	**Great Britain**	78679	1230010	334773	15,63	274
2	**Netherlands**	18337	384045	55928	20,94	211
3	**Germany**	36571	316512	65649	8,65	176
4	**France**	20346	237590	32095	11,68	172
5	**Sweden**	10702	175460	27409	16,4	151
6	**Spain**	18310	212889	45576	11,63	142
7	**Italy**	15691	181570	39010	11,57	135
8	**Switzerland**	8214	120853	10355	14,71	131
9	**Belgium**	6873	107041	10713	15,57	123
10	**Finland**	8427	115529	18502	13,71	120

Source: Extracted and adapted after Dinu, Săvoiu, Dabija, 2017, p. 371 (taken from SCImago Country Rank, 2016).

Tabel no. 3: The top 10 ex-socialist European countries according to the Hirsch index

Rank	Country	Papers	Citations	Self- Citations	Citations per paper	Hirsch Index
1	**Slovenia**	2196	16178	2275	7,37	50
2	**Poland**	4835	20248	4960	4,19	47
3	**Hungary**	1405	9433	966	6,71	44
4	**Russia**	5628	10582	2553	1,88	39
5	**Lithuania**	2010	11628	5931	5,79	39
6	**Czech Republic**	3369	8176	3278	2,43	31
7	**Croatia**	1755	4883	1202	2,78	28
8	**Georgia**	229	3101	22	13,54	25
9	**Estonia**	725	3534	788	4,87	24
10	**Romania**	5343	4816	1666	0,9	22

Source: Extracted and adapted after Dinu, Săvoiu, Dabija, 2017, p. 371 (taken from SCImago Country Rank, 2016).

The International Web Data Science Database (formerly Thomson Reuters, currently Clarivate Analytics) makes use, in order to work out the

hierarchy of journals and authors, a well-established and slightly or relatively distinct range of scientometric indicators and indices, which range from the most major ones, like *impact factor* (IF), *Hirsch index* (H-index), *Eigenfactor*, *absolute influence score* (AIS), and continuing with a number of seemingly less important ones, such as the *total number of papers in a journal* (articles/results/found), the *sum total of citations of a journal* (sum of times cited), the *total number of citations of a journal, exclusive of self-citations* (Sum of Times Cited without self-citations), the *total number of articles in which the article in question was cited* (Citing Articles), the *total number of articles in which the article in question was cited*, excluding self-citations (Citing Articles without self-citations), etc.

The Impact Factor (IF), which has been in existence for over half a century (Garfield, 2006; IF Gidelines, 2008), is usually determined in a given year, taking into account information on citations and items (n papers) in two previous years, or especially in five previous years, according to the relationship:

IF = C itations of Recent Articles (Previous Years*) : Number of Recent Articles (Previous Years*) (1)

**where the number of years may be two previous years, or five previous years*

The Hirsch index (H-index) was created by American physicist Jorge Hirsch of the University of California (USA) in 2005. The H-index implies the prior arrangement of published works in the descending order of the number of citations (with the most cited paper in first position), and highlights the share of intensely cited articles compared to the unrecognized ones. The Hirsch index evaluates the influence of a journal (or publication) by aggregating the journal's work productivity with its impact quantified by the quotes accumulated over the said period of time (UQ Library, 2016):

Influence = Productivity + Impact (2)

The *Eigenfactor* indicator quantifies the percentage of weighted citations obtained by a journal from the previous five years, and excludes citations as the essential benchmark for calculating another major scientometric indicator, *AIS* (Article Influence Score), or *the absolute influence score*, resulting from dividing *Eigenfactor* to the percentage of all articles published by that journal (articles also found in the Journal Citation Reports). AIS is capitalized by UEFISCDI in assessing the Relative Influence Score (UEFISCDI SRI, 2015).

An illustration of these scientometric indicators for *Amfiteatru*

Economic (*Economic Amphitheater*), the best rated and ranked economic journal in Romania that is indexed in the Web of Science database (WoS), for the past two years, is shown in Table no. 4*:*

Essential Scientometric Indices of the Economic Amphitheater Journal (Clarivate Analytics Web of Science)

Table no. 4

Journal Citation Reports (JCR)	Impact Factor (IF)	Five-year IF	Article Influence Score (AIS)	IF without self-cites	Total cites	Rank in category	Quartila	H-index
2017	0,581	0,530	0,049	0534	234	253/347	Q3	16
2016	0,564	0,584	0,038	0,342	228	242/345	Q3	13

Source: Amfiteatru economic, 2018. *Scientometric Indices* [online] Available at: http://www.amfiteatrueconomic.ro/ JournalMetrics.aspx [Accessed 17 January 2018].

Scientometric indicators or indexes coexist with other statistical access and download statistical indicators provided by the journals' websites, recalling the top of the most accessed or downloaded *n* articles or abstracts (10, 25, 50, etc.), the top of the most cited *n* articles (10, 25, 50, etc.) relative to the current year, or to the period of existence or indexation of the journal (or publication).

3.Statistical indicators of the editorial activity of an economic publication

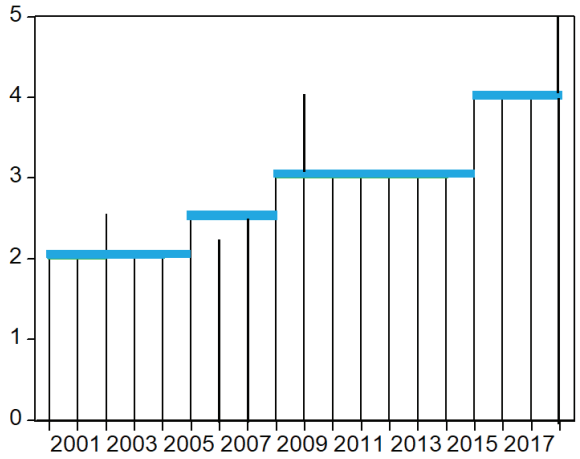
A statistical analysis of an economic journal, which has gained an international status through indexing in internationally recognized databases, allows different chronological lines or periodizations, of a decision-making, anniversary, etc., nature. At the same time, such periodic statistical analyses make use of distinctive indicators, in point of both inventories, revealing images and pictures, similar to snapshots of the journal's evolution, and flux, in an attempt to identify the major qualitative changes in the editorial and managerial progress of the journal (relating to changes in the journal editorial or scientific board, linked to certain developments or anniversary indexings), combining purely descriptive statistical methods with statistical confrontation methods, as well as frequency analysis methods and methods of assessing distribution normality in relation to three major factors of any scientific publication: published articles, their authors, and other quantitative assessments of the size and structure of the publication. Thus, an applicative field can be delineated, placed under the impact of statistical creativity, an area focused on the original construction and the innovative adaptation of classical statistical indicators in relation to the expected effect of presenting

the intensity of the editorial effects, identifying the correlation or association of a set of publishing tendencies, as well as outlining a number of developments in Kernel-type distributions, and frequency statistical investigations (Săvoiu, 2013).

The developments of an indicator during some stages of a journal's life cycle may also be revealed by means of the absolute classic indicators (number of authors, number of articles, number of issues or annual appearances of the publication), as in the example described in Figure no. 1:

Stages of a journal's evolution in relation to the annual editorial numbers

Figure no. 1

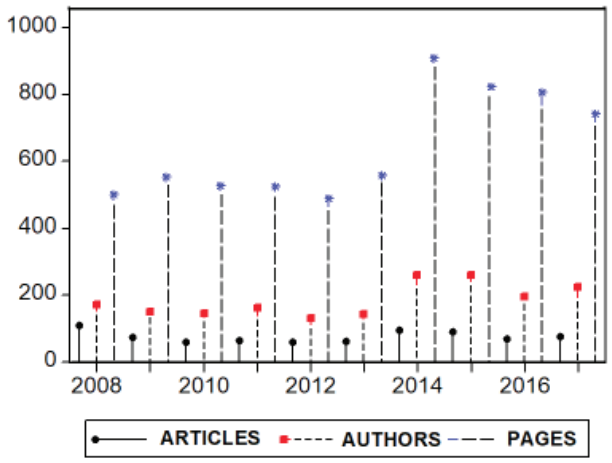


Software used: Eviews

A complex statistical solution that makes recourse to charts, which brings together and confronts significant stock indicators, can describe the evolutionary dimensions of a journal in a more visual and, at the same time, in a comparative manner, by including three indicators: i) the number of articles; ii) the number of authors who published those articles; iii) the total number of pages published by the journal during a period analyzed (Figure no. 2):

Statistical indicators of a journal – correlated in terms of evolution

Figure no. 2



Software used: Eviews

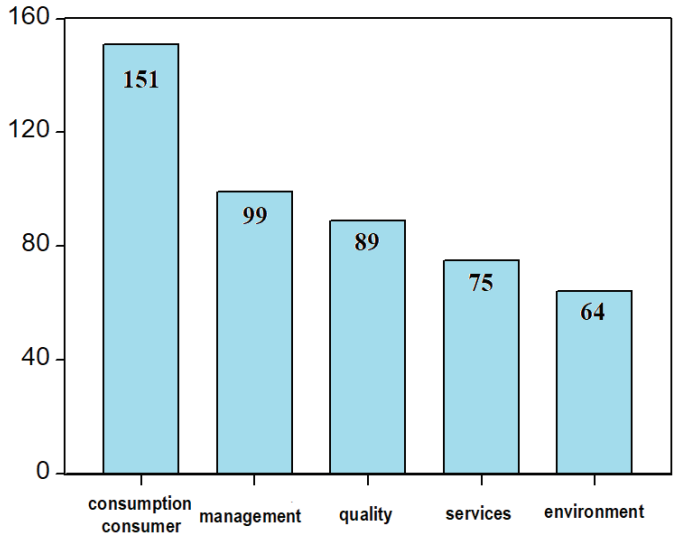
However small could a set of relative intensity indicators be imagined, which is capable of characterizing, be it minimally, the maturing process of a journal, it cannot omit the *dynamics of the annual average number of authors per article* and *the evolution of the annual number of pages per article* (giving greater visibility by the synthesis of the multiplicators). This system should be complemented by a set of indicators capable of outlining an editorial statistical profile in the journal's life cycle stages, innovative through multidimensionality and structural contour provided by: i) *typological topic distribution of the articles published*; ii) *distribution in relation to the country of the authors*; iii) *distribution according to the academic or research institution in which they work*; iv) *the distribution of the articles in relation to the funds from which the scientific investigations have been funded*.

Another area of statistical analysis consists in assessing the state of equilibrium/balance or imbalance, with the help of statistical indicators referring to the inputs and outputs of citations, favourable to the evolution of a journal in the situation given by the identification of the gap between the citations of the articles in the journal in other articles appearing in other publications indexed in the Web of Science / Clarivate Analytics and self-citations, along with citations of other articles in the articles in the analyzed journal, regardless of whether the background of the analysis is represented by the total number of citations, or the number of citations without self-citations.

The statistical frequency analysis of the occurrence of keywords redefines the specificity of a journal by convincingly reconfirming various paradigms of specific contents and themes through relevant flexionary tables. This can be illustrated by the example of the same economic journal *Amfiteatru Economic*, the best quoted in Romania. Figure no. 3 clearly shows which are the top five keywords according to their frequency of occurrence in articles published in the ten years since the journal was indexed in Web of Science, currently Clarivate Analytics (formerly Thomson Reuters):

Illustrating the top five keywords appearing in the journal pages

Figure no. 3

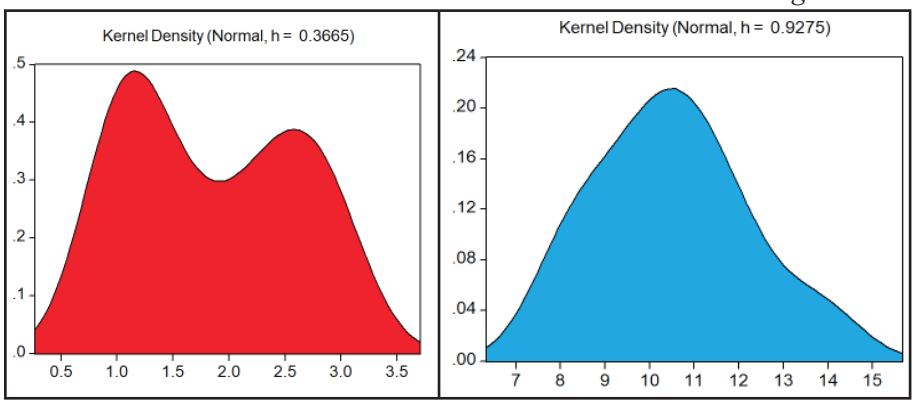


Software used: Eviews

The original statistical analysis of distributions of Kernel-type frequency of indicators like articles, authors, pages, citations, or relativized through comparison with the number of articles (number of authors per article, page number per article) provides individual approaches or confrontations by discriminating normal Gaussian distributions from the abnormal ones through visible and meaningful graphical representations. An example described in Figure 4 distinguishes between two distributions of some indicators (the one on the left is abnormal, and the one on the right is visibly the opposite of the first one):

Illustrating the distributional analysis of a number of statistical indicators of the journal

Figure no. 4



Software used: Eviews

4. A final remark

Very much as the image of a prestigious journal is preserved in the memory of readers, sponsors, stakeholders, and especially that of external evaluators, gradually becoming an editorial reputation in economic research or journalism or other scientific fields, so the statistical indicators describe the effectiveness of an editorial management. In the case of a journal or other publication, its reputation describes a complex concept focused on careful marketing and appropriate branding (Bunzel, 2007, p. 152). The evolution of a journal or economic publication will also be reflected, in the future too, by appropriate indicators and methods of analysis, without however forgetting the role of scientific and artistic self-determination in the process of creation or investigation, writing and publishing.

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