

Publication Trends In Journal Of Scientometrics During 2007-2016: A Scientometric Study

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Abstract: *The Journal of Scientometrics is a peer-reviewed academic journal in the field of Scientometric. This article aims to measuring through Scientometric analysis of the research productivity of this Journal. Measuring techniques are the pattern of growth of the research output published in the journal during 2007 to 2016, pattern of authorship, author productivity, etc. It is found that 2550 articles were published during the period of study (2007-2016). The third fourth of articles were published by collaborative in nature. The study applied standard formula and statistical tools to bring out the factual result.*

Keywords: *Relative Growth Rate and Doubling Time, Degree of Collaboration (DC), Collaborative Index (CI), Exponential Growth Rate (EGR)*

1. INTRODUCTION

Scientometrics journal publishes original studies, short communications, preliminary reports, and review papers, letters to the editor and book reviews on Scientometrics. Scientometrics is a peer-reviewed academic journal in the field of Scientometrics. The journal publishes original studies, short communications, preliminary reports, and review papers, letters to the editor and book reviews on Scientometrics. It is published by Akadémiai Kiadó and Springer Science+Business Media and was established in 1978. According to the Journal Citation Reports, the journal has a 2016 impact factor of 2.147. Due to its fully interdisciplinary character, the journal is indispensable to research workers and research administrators. It provides valuable assistance to librarians and documentalists in central scientific agencies, ministries, research institutes and laboratories. Scientometrics includes the Journal of Research Communication Studies. Consequently its aims and scope cover that of the latter, namely, to bring the results of such investigations together in one place.

2. REVIEW OF LITERATURE

Review of literature is of pivotal importance in any research investigation. Further it aims to analyses the past trends, emerging new areas of research, growth of literature, productivity of researchers and performance of research institutions. Manimekalai, A & Amsaveni, N (2012) has analyzed the growth of research publications and the authorship pattern on Genetics and other related subject has been analyzed for the data taken from the articles listed in Web of Science covering the period 1998 to 2011. The records considered for the study is 871 and the pattern of productivity of various author categories are identified. The total of authors downloaded (4433) papers were divided into different categories, namely all authors, first

authors, non-collaborative authors and co-authors. Amsaveni, N et.al (2013) has studies the authorship pattern of collaborative research in Bioinformatics, deals with the authorship collaboration research. The team authored work has been well recognized feature of the modern science and there has been a reliable trend towards enlarged collaboration in all branches of science and technology during the present century. Totally 91655 authors were produced 17318 articles in this subject of bioinformatics. 9.77 percent of articles were single authors' contribution. 90.17 percent of articles produced by collaborative authors. Two authors team has produced more articles and six authors team has highest number of authors.

3. OBJECTIVES

To identify the number of contributions and the pattern of growth of articles published in the Scientometric journal during 2007 to 2016.

- To study the Authorship Pattern and author productivity of exists in the published articles.
- To determine the Degree of Collaboration of the articles published during the period of study.
- To analyse the Relative growth rate and doubling time of research productivity and their Exponential Growth Rate

4. METHODOLOGY

The present study is an effort to make it an update by studying the volumes from 70 to 109 (2007-2016), 2550 articles were included have been taken for this analysis in this paper. A data sheet was created on different aspects for main articles. The researcher has taken the secondary sources and necessary data from online website (<https://link.springer.com/journal/volumesAndIssues/11192>) which are available. The journal impact factor value is 2.147 (2017). This journal is peer-reviewed academic journal. A total of 5220 records were collected and tabulated for analyzed using from MS-Excel. The following statistical tools were used in the present study,

1. Relative Growth Rate and Doubling Time;
2. Degree of Collaboration;
3. Collaborative Index;
4. Compound Annual Growth Rate and
5. Exponential Growth Rate.

5. ANALYSIS AND DISCUSSION

The collected data of 2550 research articles covered from 70 to 109 volumes have been analysed using the statistical tools given in the methodology. There have been three issues in every volume found and totally 120 issues have been taken for this study.

5.1 Analysis of Year wise distribution of Articles Published

Table1: Year wise distribution of Number of Articles Published

S.No	Year	Volumes	Issues	No. of articles	% of articles	Cum. No. of articles	Cum. % of articles
1	2007	70 - 73	12	129	5.06	129	5.06

2	2008	74 - 77	12	132	5.18	261	10.24
3	2009	78 - 81	12	193	7.57	454	17.81
4	2010	82 - 85	12	235	9.22	689	27.03
5	2011	86 - 89	12	227	8.90	916	35.93
6	2012	90 - 93	12	267	10.47	1186	46.4
7	2013	94 - 97	12	265	10.39	1448	56.79
8	2014	98 - 101	12	354	13.88	1802	70.67
9	2015	102 - 105	12	367	14.39	2169	85.06
10	2016	106 - 109	12	381	14.94	2550	100
Total		40	120	2550	100		

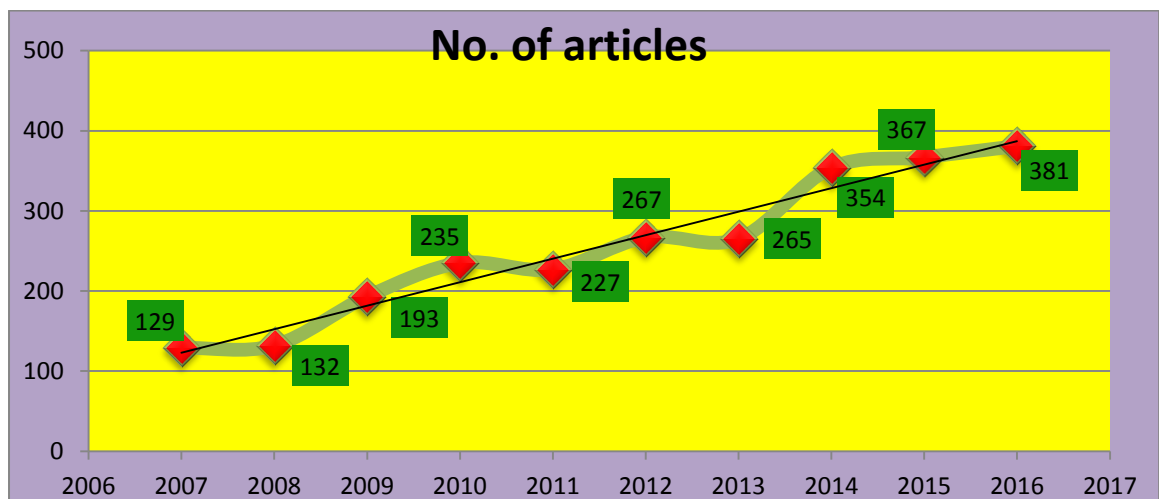


Figure 1: Year wise number of articles by the journal of Scientometrics

The table and Graph explained the Number of distribution of papers according to year wise. It is shown that a total of 2520 papers have been published during 2007-2016. In which Maximum number of paper were published in the year 2016 which is accounted to. 381 (14.94%), whereas the minimum count of 129 papers were published in the year 2007 it is calculated about 5.06 percentages. It could be known from this analysis is the research growth is increased three times also fifty percent of articles comes out after seventh year.

5.2 Analysis of Authorship Pattern

Table2: Year wise Authorship Pattern

Year / Volumes	1	2	3	4	5	6	7	8	9	10+	Total
2007 / 70 - 73	31	39	32	19	5	0	3	0	0	0	129
	24	30.2	24.8	14.7	3.9	0	2.3	0	0	0	5.06
2008 / 74 - 77	41	50	25	7	5	1	2	0	1	0	132
	31.1	37.9	18.9	5.3	3.8	0.8	1.5	0	1	0	5.18
2009/ 78 - 81	55	65	37	20	9	4	2	0	1	0	193
	28.5	33.7	19.2	10.4	4.7	2.1	1.0	0	0.5	0	7.57
2010/ 82 - 85	66	76	57	24	7	3	0	0	1	1	235

	28.1	32.3	24.3	10.2	3.0	1.3	0	0	0.4	0.4	9.22
2011/ 86 - 89	60	72	55	23	12	2	1	1	1	0	227
	26.4	31.7	24.2	10.1	5.7	0.9	0	0.4	0.4	0	8.90
2012/ 90 - 93	71	85	56	29	13	6	4	2	1	0	267
	26.6	31.8	21	10.9	4.9	2.2	1.5	0.7	0.4	0	10.47
2013/ 94 - 97	61	80	65	32	16	6	2	1	1	1	265
	23	30.2	24.5	12.1	6.1	2.3	0.8	0.4	0.4	0.4	10.39
2014/98 - 101	65	94	113	49	23	10	0	0	0	0	354
	18.4	26.6	31.9	13.8	6.5	2.8	0	0	0	0	13.88
2015/102-105	65	113	87	57	23	13	7	1	0	1	367
	17.7	30.8	23.7	15.5	6.3	3.5	1.9	0.3	0	0.3	14.39
2016/106-109	64	106	115	56	24	7	6	2	0	1	381
	16.8	27.8	30.2	14.7	6.3	1.8	1.6	0.5	0	0.3	14.94
Total	579	780	642	316	138	52	26	7	6	4	2550
	22.7	30.6	25.2	12.4	5.4	2.04	1.02	0.27	0.24	0.16	100

The table 2 analysis reveals that the authorship pattern published by the journal of Scientometric during the sample period. The authorship patterns are, out of 2550 articles 579 (22.7%) of articles were be single authored contribution followed by 780 (30.6%) of articles were by two authored contribution, 642 (25.2%) of article by three authored contribution, 316 (12.4%) of article by four authored contribution, 138 (5.4%) of article by five authored contribution, 52 (2.04%) of article by six authored contribution, 26 (1.02%) of article by seven authored contribution, 7 (0.27%) of article by eight authored contribution, 6(0.24%) of article by nine authored contribution, and 4 (0.16%) of article by ten and above authored contribution respectively. It is found from this authorship pattern analysis the joint authorship (77.3 %) is highest then the solo contribution particularly the two authorship pattern is maximum number of articles published. Single authored (22.7%) contribution also more or less equivalently appreciable. The three author contributions are at the third rank place.

5.3 Analysis of Year wise Authors contribution

Table 3: Year wise Authors in the Scientometric journal publications

Year / Volumes	1	2	3	4	5	6	7	8	9	10+	Total
2007 / 70 - 73	31	78	90	84	25	0	21	0	0	0	329
	9.4	23.7	27.4	25.5	7.6	0	6.4	0	0	0	4.93
2008 / 74 - 77	41	100	75	28	25	6	14	0	9	0	298
	13.8	33.6	25.2	9.4	8.4	2.0	4.7	0	3	0	4.47
2009/ 78 - 81	55	130	111	80	45	24	14	0	9	0	468
	11.8	27.8	23.7	17.1	9.6	5.1	3	.0	1.9	0	7.02
2010/ 82 - 85	66	152	171	96	35	18	0	0	9	11	558
	11.8	27.2	30.6	17.2	6.3	3.2	0	0	1.6	2	8.36
2011/ 86 - 89	60	144	165	92	60	12	7	8	9	0	557

	10.8	25.9	29.6	16.5	10.8	2.2	1.7	1.4	1.6	0	8.35
2012/ 90 - 93	71	170	168	116	65	36	28	16	9	0	679
	10.5	25	24.7	17.1	9.6	5.3	4.1	2.4	1.3	0	10.18
2013/ 94 - 97	61	160	195	128	80	36	14	8	9	10	701
	8.7	22.8	27.8	18.3	11.4	5.1	2	1.1	1.3	1.4	10.51
2014/98 - 101	65	188	339	196	115	60	0	0	0	0	963
	6.7	19.5	35.2	20.4	11.9	6.2	0	0	0	0	14.44
2015/102-105	65	226	264	228	115	78	49	8	0	11	1041
	6.2	21.7	25.1	21.9	11	7.5	4.7	0.8	0	1.1	15.6
2016/106-109	64	212	345	224	120	42	42	16	0	12	1077
	5.9	19.7	32	20.8	11.1	3.9	3.9	1.5	0	1.1	16.14
Total	579	1560	1920	1272	685	312	189	56	54	44	6671
	8.7	23.4	28.8	19.1	10.3	4.7	2.8	0.8	0.8	0.7	100

The table 3analysis reveals that the authorship team has beenpublished by the journal of Scientometric during the sample period. The contributed authors were increased on par with the number of research output. The total 2550 articles were published by the total 6671 authors. 329 (4.93%) of authors were contributed by the year of 2007 followed by 298 (4.47%) of authors were contributed by 2008, 468 (7.02%) of authors were contributed by 2009, 558 (8.36%) of authors were contributed by 2010, 557 (8.35%) of authors were contributed by 2011, 679 (10.18%) of authors were contributed by 2012, 701 (10.51%) of authors were contributed by 2013, 963 (14.44%) of authors were contributed by 2014, 1041 (15.6%) of authors were contributed by 2015, and 1077 (16.14%) of authors were contributed by 2016 respectively.

Out of 6671 authors, 579 (8.7%) of authors were be single authored contribution followed by 1560 (23.4%) of two authored team, 1920 (28.8%) of three authored team, 1272(19.1%) of four authored team, 685 (10.34%) of five authored team, 312 (4.7%) of six authored team, 189 (2.8%) of seven authored team, 56 (0.8%) of eight authored team,54 (0.8%) of nine authored team, and 44 (0.7%) of article by ten and above authored team respectively. It is found from this table analysis three authored team contributed maximum publication of this journal.

5.4Analysis of Collaborative Index, Degree of collaboration and Exponential growth rate

Table4:Collaborative index, Degree of Collaboration and Exponential growth rate

Year / Volumes	Total No of articles	Total No of authors	CI	Productivity per author	Degree of collaboration	Exponential growth rate
2007 / 70 - 73	129	329	2.55	0.39	0.76	-
	5.06	4.93				
2008 / 74 - 77	132	298	2.26	0.44	0.69	1.02
	5.18	4.47				
2009/ 78 - 81	193	468	2.42	0.41	0.72	1.46

	7.57	7.02				
2010/ 82 - 85	235	558	2.37	0.42	0.72	1.22
	9.22	8.36				
2011/ 86 - 89	227	557	2.45	0.41	0.74	0.97
	8.90	8.35				
2012/ 90 - 93	267	679	2.54	0.39	0.73	1.18
	10.47	10.18				
2013/ 94 - 97	265	701	2.65	0.38	0.77	0.99
	10.39	10.51				
2014/98 - 101	354	963	2.72	0.37	0.82	1.34
	13.88	14.44				
2015/102-105	367	1041	2.84	0.35	0.82	1.04
	14.39	15.6				
2016/106-109	381	1077	2.83	0.35	0.83	1.04
	14.94	16.14				
Total	2550	6671	2.62	3.91 (0.38)	0.77	10.25
	100	100				

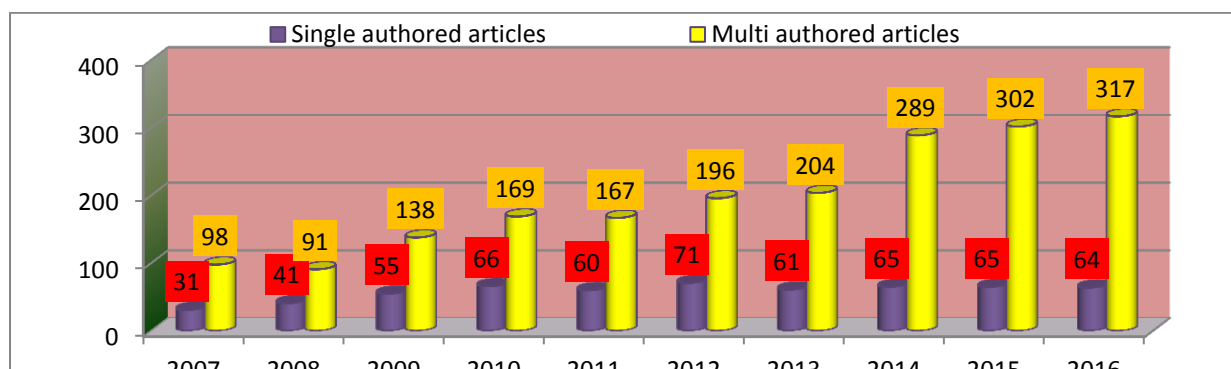


Figure 2: Articles contributed by single authors and multi-authors in Scientometrics

Table 4 analysis reveals that the collaborative index and degree of collaboration of the Scientometric journal publications during the sample periods. The total number of papers doubled from 129 to 267 in the years 2007 to 2012. It gradually decreased in the next years. On the other hand the number of authors increased on par with the number of articles. Even though the number of articles calculated 329 in 2007 to 1077 in 2016. The highest number of author's productivity found in the study was 2016. The minimum number of author's productivity noted was 298 (4.47%) in the year 2008. The average value of productivity per author is 0.38.

The degree of author collaboration analyzed in the study undertaken. It was calculated using Subramanian's formula: $C = NM / (NM + NS)$. Where C = degree of collaboration, Nm=Number of multi-authored works, Ns= Number of single-authored works. The Collaborative Index is also calculated and presented. The values from 0.76(2007) to 0.83(2016) and the average degree of collaborative value is 0.77, i.e., 77 percent of articles were comes by

collaborative mode for publication. The collaborative index witnessed the growth in collaboration ranged from 2.55 to 2.83 and the average CI value is 2.62.

The results of Exponential Growth Rate of publications published in the Journal of Scientometrics during 2007 to 2016 (10 years). The highest growth rate 1.46 was found during 2009 with 193, it shows suddenly increased the publications are the mentioned year and the remaining years values shows in decreasing trends..It is also found that the total Exponential Growth Rate was found to be 10.25.

5.5 Analysis of Relative Growth of Rate and Doubling Time

Table 5: Analysis of Relative Growth of Rate and Doubling Time

Year	No. of publication	Cum. No. of Publication	W1	W2	R (a) (W1- W2)	Doubling Time
2007	129	129	-	4.860	-	-
2008	132	261	4.860	4.883	0.023	30.144
2009	193	454	4.883	5.263	0.380	1.824
2010	235	689	5.263	5.460	0.197	3.520
2011	227	916	5.460	5.425	0.035	20.008
2012	267	1183	5.425	5.587	0.162	4.270
2013	265	1448	5.587	5.580	0.008	92.169
2014	354	1802	5.580	5.869	0.290	2.393
2015	367	2169	5.869	5.905	0.036	19.215
2016	381	2550	5.905	5.943	0.037	18.511
	2550				1.083 (0.11)	32.3 (3.23)

Table 5 indicates that the relative growth rates of articles output and also calculate its doubling time of the publication. It could be observed that the relative growth rates of all sources of research output have decreased from 0.023 in 2007 to 0.037 in 2016. The mean relative growth rate for the periods of 2007 to 2016 is observed to 0.11. The study period has observed a mean relative growth rate at significant level. The doubling time for publication has decreased from 30.144 in 2007 to 18.511 in 2016. Also 2013 have shown an increasing trend. The mean doubling time for publications for the periods of 2007-2016 was 3.23 years which has shown a steady growth of publications in the Journal of Scientometrics.

6. FINDINGS AND CONCLUSION

The necessary data was collected from the online sources of <https://link.springer.com/journal/volumesAndIssues/11192> website for this study. The Archives of the journals were downloaded the pdf of all the articles and extracted necessary data were

analysed for the purpose of present study during 2007 to 2016. Findings from this analysis, the year 2016 has highest number of articles, majority of articles were published by two authors and the three authored team has contributed highest publications. It is also witnessed with the degree of collaboration at 0.77 percentages. This result shows that the 77 percent of articles were published by the joint authored it means team work has been getting success and dominated then single contribution. Collaborative index value is 2.62, it means the collaborative between two to three authors. The total average number of authors per paper found in the study was 3.91 and the average productivity per author was 0.38. The Exponential Growth Rate was found to be 10.25, which shows a developmental sign of activity. The study period has witnessed a mean relative growth rate of 0.11. The mean doubling time for publications for the periods of 2007-2016 was 3.23 years. This kind of study on the authorship pattern and authors distribution of the journal of Scientometrics publications during 2007 to 2016 carried out to motivation for new researchers and helps to evaluate the various funding agencies and using to policy makers and knowledge managers. In future research should be attentive towards understanding authorship distributions within various sub-fields in various kind of publications, types of collaborative author affiliation etc.

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