

# **Bibliometric Analysis of Doctoral Dissertations in Political Science: A Study of the University of Burdwan**

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## **Abstract**

*The present study is based on 7711 citations, appended in the 56 PhD theses of Political Science submitted to the University of Burdwan during the period from 1986- 2015. The purpose of this study is to examine decade-wise distribution of form of literature cited, rank list of core journals, authorship pattern, authorship collaboration and degree of collaboration of the citations in Political Science. In preliminary stage, all the informations have been collected from the research section of Burdwan University and Shodhganga (<http://shodhganga.inflibnet.ac.in/>) has also been consulted for accuracy of results. Finally, all the data have been analyzed against pre-defined parameters using dBaseIII plus programme. The study revealed that highest number of theses (23) were submitted from 2006-2015. It was also found that Books were the most cited sources accounting for 51.91% of total citations used followed by journals with 28.36% citations. The journal 'EPW' has ranked the first place with 307 (14.031%) citations. It has taken 16 years to cover 'half life period' of Political Science literatures when age of references are concerned. It is also found that majority of citations have been by single author (93.68%) followed by two authors with 3.84%.*

**Keywords:** Age of references, Authorship collaboration, Bibliometric study, Citation analysis, Journal ranking, authorship trend, Political Science.

## **1. Introduction:**

The term "bibliometrics" was first coined by Alan Pritchard in 1969 who denote that it as, "the application of mathematics and statistical methods to books and other media of communication" (Pritchard, 1969). It is basically a quantitative method used to investigate scientific communication progress by measuring and analyzing various aspects of written

documents. Bibliometrics is that techniques which are used for variety of purposes such as evaluation of scientific output, journal selection of libraries, forecasting the potential of a particular field (Zafrunnisha, 2012). Isiakpona (2012) suggested that 'Bibliometrics' is a study which gives a detailed statistical analysis of published literature in different fields of learning. Bibliometrics and citation analysis have been provided growing and obsolescent areas of specific field of research by analyzing those resources (Nkiko & Adetoro, 2007). This method has already been used in many disciplines to assess the academic outputs and our discipline, LIS is not the exception. Due to the enormous growth of literatures, it has become a challenging tasks to the working librarians to select the relevant documents to support ongoing research and this study may help administrators in managing as well as building collections of a library. Scientometric, webometrics are also frequently used in our domain to provide quantitative analysis of web documents. The present work is an attempt to study the trends of Political Science subject by analyzing the references of the submitted theses during the period 1986-2015 under The University of Burdwan.

## 2. Literature Review

Journal ranking is one of the parameter of Bibliometric analysis and many authors (Gross & Gross, 1927; Lal, 1990; Haridasan, 2007; Ritzberger, 2008) have applied this technique to select the core journals in any disciplines. After analyzing 30 Ph.D theses of Chemical Sciences, Gohain & Saikia (2014) reported that '*Journal of American Chemical Society*' ranked 1<sup>st</sup> position, out of 337 journals, with 617 (7.13%) citations. In another study on Chemistry, Gooden (2016) reported that '*Journal of the American Chemical Society*' occupied the 1<sup>st</sup> position with 364 (11.45%) citations.

Authorship trend is another important tools of bibliometric study and several authors have studied authorship pattern (Vimla & Ready, 1996; Glanzel, 2002; Ezhilrani, Suryanarayanan & Kanthimathi, 2006). Bandyopadhyay (2000) reported after analyzing 92 doctoral dissertations of University of Burdwan from 1981-1990 and showed that 3.85% articles in Political Science were multiple authored. He further reported that multiple authorship trend in Political Science was highest during 1961-1970. In another study, Bandyopadhyay (2004) studied 71 doctoral theses in Physics, Philosophy and Political Science during 1986-1995 in Burdwan University and reported that 2.20% of the total articles in Political Science were multiple authored. In another paper, Bandyopadhyay & Mondal (2016) have studied multiple authorship pattern with past study and found multiple authorship trend has increased. After reviewing theses of Political Science, Malik (2016) observed that most of the citations used by the research scholars in the year 2012 were single author (91.67%).

A large number of studies have been conducted on bibliometric study in different disciplines such as Economics (Nasir & Kumar, 2011; Trayambakrao & Sonwane, 2012); Sociology (Singh & Bebi, 2013); Library and Information Science (Kumar & Reddy, 2012; Gupta & Khare, 2013; Rajev & Joseph, 2016); English (Mishra & Solanki, 2012); Botany (Doraswamy, 2006; Banateppanvar, Biradar & Kannappanavar, 2013a); Zoology (Banateppanvar, Biradar & Kannappanavar, 2013b); Biotechnology (Banateppanvar, Biradar & Kannappanavar, 2013c).

After analyzing the doctoral theses in Social Science during 1970-1980, Thoidingjam (1994) reported that all the theses had received an average number of citations. She concluded that the highly cited literature were books (64.95%) followed by journals article (15.42%). Bandyopadhyay (1999) had conducted a bibliometric study on five different subjects both

from Science and Social Sciences. He revealed that the maximum references were from Political Science and books were cited mostly.

## 2. Objectives

The objective of the present study is to examine the Doctoral Dissertations in Political Science from 1986- 2015, in order to determine the following:

- To find the bibliographic forms of literature used by the research workers of political science.
- To prepare a ranked list of core journals in Political Science.
- To study the age of the reference and age distribution of references.
- To study the pattern of authorship collaboration and degree of collaboration in Political Science.

## 2. Scope of the study

All fifty-six (56) doctoral theses on Political Science of the University of Burdwan have been taken as the source data for the study. A total of 7711 references including online sources during the said period have been considered for this study.

## 3. Methodology

All the PhD theses in Political Science have been examined and informations under different heads such as bibliographic forms used, preparing ranked list of journals, age-wise distribution of references, authorship collaboration, self-citations, etc. have been collected for analyzing and interpretation of results. All the information has been analyzed using dBaseIII plus programmes. Apart from the research section of the University of Burdwan, Shodhganga (<http://shodhganga.inflibnet.ac.in/>), a repository of Indian theses, has also been consulted in order to increase the accuracy level of the data.

## 4. Data analysis and interpretation of results

This section analyzes and evaluates all the theses against different pre-defined parameters. Table 1 shows the number of theses awarded during the period (decade-wise) and total number of references used by all the theses during the said period.

	Year (Decade-wise)			Total
	1986-1995	1996-2005	2006-2015	
Theses	20	13	23	56
References	2054	2293	3364	7711

Table-1: No. of theses and references of Political Science

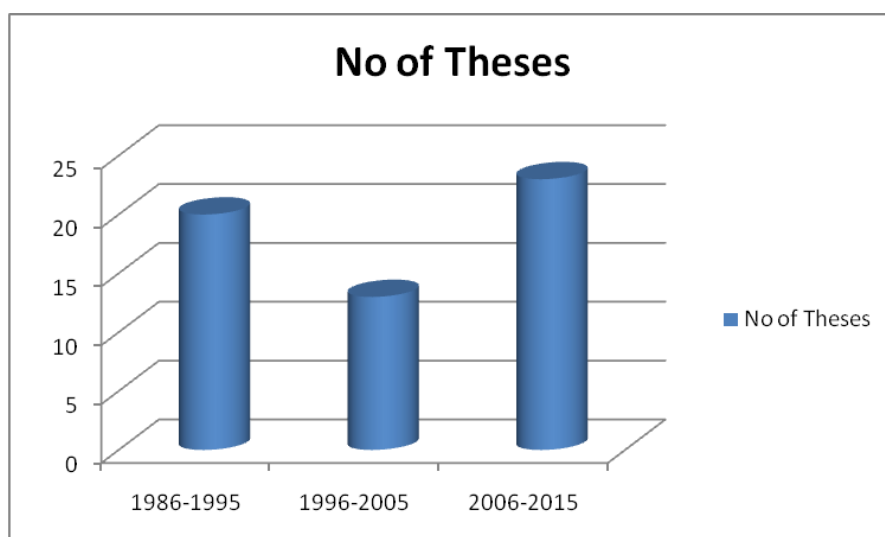


Fig. 1: No. of theses

### 5.1 Form of literature

This section shows different types of literatures (e.g. Books, Journals, Reports, Theses etc) used by the scholars in Political Science. It is observed that highest number of literature accounted for books, monographs etc with 4003 (51.91%) citations followed by journals with 2187 (28.36%) citations. Reports having 444 citations (5.76%) rank 3<sup>rd</sup> position.

Form	No. of citation	Percentage
BOOKS, MONOGRAPHS ETC.	4003	51.91
JOURNALS	2187	28.36
REPORTS	444	5.76
OTHERS	341	4.42
PERSONAL INTERVIEW	300	3.89
UNPUBLISHED	151	1.96
CONFERENCE/SEMINAR ETC.	148	1.92
ACTS	105	1.36
ONLINE BOOK	22	0.29
THESIS	9	0.12
ONLINE JOURNAL	1	0.01
<b>TOTAL</b>	<b>7711</b>	<b>100.00</b>

Table 2: Type of documents used

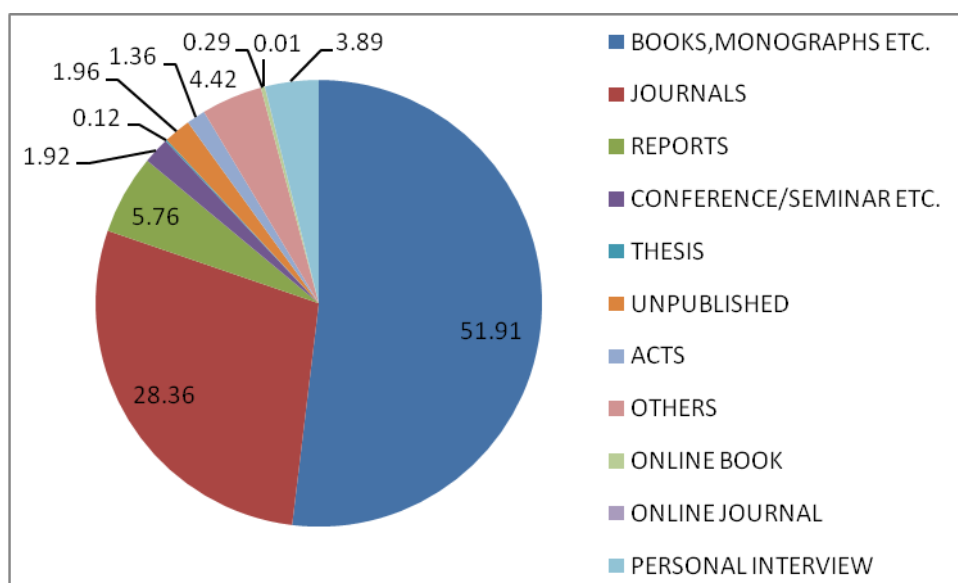


Fig. 2: Type of documents used

### 5.1.1 Form of literature (Decade wise)

Table-3 shows the overall distribution of literatures through decade-wise. There is a steady growth of literatures (sl no. 1-3) throughout the years except 'Act' (sl. no. 7). Whereas use of literatures like theses (sl. no 5) have been decreased in **1996-2005**.

Forms	1986-1995		1996-2005		2006-2015	
	No of Citation	Percentage	No of citation	Percentage	No of citation	Percentage
BOOKS, MONOGRAPHS, ETC	952	46.35	1129	49.24	1922	57.13
JOURNALS	648	31.55	756	32.97	783	23.28
REPORTS	88	4.28	107	4.67	249	7.40
CONFERENCE/ SEMINAR ETC	56	2.73	40	1.74	52	1.55
THESIS	1	0.05	0	0	8	0.24
UNPUBLISHED	91	4.43	21	0.92	39	1.16
ACTS	64	3.12	31	1.35	10	0.30
OTHERS	94	4.58	96	4.19	151	4.49
ONLINE BOOKS	0	0	0	0	22	0.65

ONLINE JOURNALS	0	0	0	0	1	0.03
PERSONAL INTERVIEW	60	2.92	113	4.93	127	3.78

Table -3: Type of documents used (Decade-wise)

## 5.2 Rank list of Journals

Table 4 shows the ranking of journals used in this study. For this purpose, a total of 308 journals have been considered and 2187 citations have been counted. It is found that 'Economic and Political Weekly' with 307 (14.031%) citations ranks 1<sup>st</sup> position followed by 'The Statesman' 224 (10.238%) and 'Ananda Bazar Patrika' 95 (4.342%) citations. There are some journals having same number of citations shares the same position.

Sl.no	Rank	Journals	Citation no	Cum. No	%	Cum. %
1	1	EPW	307	307	14.031	14.031
2	2	THE STATESMAN	224	531	10.238	24.269
3	3	ANANDA BAZAR PATRIKA	95	626	4.342	28.611
4	4	NEW AGE	78	704	3.565	32.176
5	5	IJPA	57	761	2.605	34.781
6	6	THE HINDU	54	815	2.468	37.249
7	6	KURUKSHETRA	54	869	2.468	39.717
8	8	TIMES OF INDIA	49	918	2.239	41.956
9	9	THE HINDUSTAN TIMES	45	963	2.057	44.013
10	10	CROSSROADS	38	1001	1.737	45.75
11	11	HARIJAN	33	1034	1.508	47.258
12	12	AMRITA BAZAR PATRIKA	32	1066	1.463	48.721
13	13	ASIAN SURVEY	31	1097	1.417	50.138
14	13	PEOPLE DEMOCRACY	31	1128	1.417	51.555
15	15	GANASHAKTI	29	1157	1.325	52.88
16	15	SOC SCIENTIST	29	1186	1.325	54.205
17	15	THE SUNDAY STATESMAN	29	1215	1.325	55.53
18	18	NATIONAL FRONT	28	1243	1.28	56.81
19	18	INDIAN EXPRESS	28	1271	1.28	58.09
20	20	THE TELEGRAPH	26	1297	1.188	59.278
21	21	PEOPLES WAR	23	1320	1.051	60.329
22	22	SOCIALIST PERSPECT	22	1342	1.005	61.334
23	23	IND J POLIT SCI	21	1363	0.96	62.294

24	24	PEOPLES AGE	19	1382	0.868	63.162
25	24	INDIA TODAY	19	1401	0.868	64.03
26	26	NATUN CHITHI	18	1419	0.823	64.853
27	26	MAINSTREAM	18	1437	0.823	65.676
28	28	SWADHINATA	17	1454	0.777	66.453
29	28	CONGRESS SOCIALIST	17	1471	0.777	67.23
30	30	SOUTH ASIA POLITICS	14	1485	0.64	67.87
31	31	J FRONTIER	12	1497	0.548	68.418
32	31	THE ECONOMIC TIMES	12	1509	0.548	68.966
33	31	FAR EASTERN ECON REV	12	1521	0.548	69.514
34	31	NEW YORK TIMES	12	1533	0.548	70.062
35	31	PANAGARH BARTA	12	1545	0.548	70.61
36	36	YOJANA	11	1556	0.503	71.113
37	36	NEW TIMES	11	1567	0.503	71.616
38	36	DESH	11	1578	0.503	72.119
39	36	S ASIA SURVEY	11	1589	0.503	72.622
40	40	PRAVDA	10	1599	0.457	73.079
41	40	ECON WEEKLY	10	1609	0.457	73.536
42	42	SUNDAY NEWS	9	1618	0.411	73.947
43	42	THE HINDUSTAN STANDA	9	1627	0.411	74.358
44	42	COMMUNIST	9	1636	0.411	74.769
45	45	ELECTION MANIFESTO	8	1644	0.366	75.135
46	45	FRONTLINE	8	1652	0.366	75.501
47	47	ASIAN RECORDER	7	1659	0.32	75.821
48	47	J HIGH EDUC	7	1666	0.32	76.141
49	47	J SOC POLIT STUD	7	1673	0.32	76.461
50	47	CAN DIVERSITY	7	1680	0.32	76.781
51	47	WEST BENGAL	7	1687	0.32	77.101
52	47	DEV CHANGE	7	1694	0.32	77.421
53	47	NAWAJIBAN	7	1701	0.32	77.741
54	47	STRATEGIC ANALYSIS	7	1708	0.32	78.061
55	55	SAPTAHIK NATUN PATRI	6	1714	0.274	78.335
56	55	PATRIOT	6	1720	0.274	78.609
57	55	AM POLIT SCI REV	6	1726	0.274	78.883
58	55	INT STUD	6	1732	0.274	79.157
59	55	AM J SOCIOL	6	1738	0.274	79.431
60	55	DESH HITAI SHI	6	1744	0.274	79.705
61	55	AAJKAL	6	1750	0.274	79.979



62	62	DAINIK MUKTOBANGLA	5	1755	0.229	80.208
63	62	SOV REV	5	1760	0.229	80.437
64	62	LOKSANSKRITI	5	1765	0.229	80.666
65	62	J SOC STUD	5	1770	0.229	80.895
66	62	ECON REV	5	1775	0.229	81.124
67	62	MODERN REVIEW	5	1780	0.229	81.353
68	62	PEKING REV	5	1785	0.229	81.582
69	62	INT STUD QUART	5	1790	0.229	81.811
70	62	WB POLIT SCI REV	5	1795	0.229	82.04
71	62	AM SOCIOLOG REV	5	1800	0.229	82.269
72	62	PAC AFF	5	1805	0.229	82.498
73	73	THE ASIAN AGE	4	1809	0.183	82.681
74	73	MARXIST REV	4	1813	0.183	82.864
75	73	YOUNG INDIA	4	1817	0.183	83.047
76	73	J POLIT SCI	4	1821	0.183	83.23
77	73	ASIAN AGE	4	1825	0.183	83.413
78	73	AMERICAN ANTHROPOLOG	4	1829	0.183	83.596
79	73	ASIAN STUD	4	1833	0.183	83.779
80	73	SEMINAR	4	1837	0.183	83.962
81	73	MORNING NEWS	4	1841	0.183	84.145
82	73	JANATA	4	1845	0.183	84.328
83	73	IZVESTIA	4	1849	0.183	84.511
84	73	J CONTEMP ASIA	4	1853	0.183	84.694
85	73	THE TRIBUNE	4	1857	0.183	84.877
86	73	IND QUART	4	1861	0.183	85.06
87	73	ADMINISTRATIVE CHANG	4	1865	0.183	85.243
88	88	FEDERATIONS	3	1868	0.137	85.38
116	88	J COMMONW COMP POLIT	3	1952	0.137	89.216
117	117	IND J AGRIC ECON	2	1954	0.091	89.307
160	117	PERSPECT POLIT SCI	2	2040	0.091	93.22
161	161	J PUBLIC ADMIN REV	1	2041	0.046	93.266
308	161	ABARTTITA	1	2187	0.046	100.028

Table 4: Rank list of journals



### 5.2.1 Rank list of journals (Decade-wise)

Table 5 shows the ranking of journals (decade-wise). In preparing this table, only top 20 journals having more than 25 citations have been considered. Picture may vary if we compare all journals (Decade-wise). As per table 4 'EPW' ranks 1<sup>st</sup> position during the whole period but here ranks 2<sup>nd</sup> position during the period 1996-2005. Again, 'The statesman' changes its position and ranks 5<sup>th</sup> position during the period 1986-1995.

Sl no	Journals	Total Year		Decade-wise					
		1986-2015		1986-1995		1996-2005		2006-2015	
		Rank	Citation	Rank	Citation	Rank	Citation	Rank	Citation
1	EPW	1	307	1	61	2	112	1	134
2	THE STATESMAN	2	224	5	27	1	133	2	64
3	ANANDA BAZAR PATRIKA	3	95	10	20	3	58	7	17
4	NEW AGE	4	78	2	42	4	36	-	-
5	IJPA	5	57	15	13	5	34	15	10
6	THE HINDU	6	54	-	-	11	14	3	40
7	KURUKS HETRA	6	54	12	17	10	17	6	20
8	TIMES OF INDIA	8	49	-	-	9	22	4	27
9	THE HINDUSTAN TIMES	9	45	27	5	13	13	4	27
10	CROSSROADS	10	38	3	38	-	-	-	-
11	HARIJAN	11	33	6	24	-	-	17	9
12	AMRITA BAZAR PATRIKA	12	32	6	24	57	1	22	7
13	ASIAN SURVEY	13	31	20	8	17	9	9	14
14	PEOPLE DEMOCRACY	13	31	38	3	6	25	44	3
15	GANASHAKTI	15	29	60	1	6	25	44	3
16	SOCIAL SCIENTIST	15	29	9	22	21	5	62	2
17	THE SUNDAY	15	29	21	6	8	23	-	-

	STATESMAN								
18	NATIONAL FRONT	18	28	4	28	-	-	-	-
19	INDIAN EXPRESS	18	28	60	1	11	14	11	13
20	THE TELEGRAPH	20	26	-	-	14	11	8	15

Table -5: Ranking of Journals (Decade-wise)

### 5.3 Age study of references

To get the age of reference, the year of publication of a reference is subtracted from the year of submission of the citing theses. Here, the age grouping is made by five years block such as 0-4, 5-9, 10-14 and so on. It is observed that in the 2<sup>nd</sup> group of age (5-9 years block) has received maximum citations with 16.55%.

<u>Age</u>	<u>Citations</u>	<u>Cumulative Citation</u>	<u>%</u>	<u>Cumulative %</u>
0 -4	973	973	12.62	12.62
5-9	1276	2249	16.55	29.17
10-14	1211	3460	15.7	44.87
15-19	932	4392	12.09	56.96
20-24	683	5075	8.86	65.82
25-29	616	5691	7.99	73.8
30-34	524	6215	6.8	80.6
35-39	373	6588	4.84	85.44
40-44	336	6924	4.36	89.79
45-49	262	7186	3.4	93.19
50-54	163	7349	2.11	95.31
55-59	74	7423	0.96	96.27
60-64	59	7482	0.77	97.03
65-69	35	7517	0.45	97.48
70-74	26	7543	0.34	97.82
75-79	38	7581	0.49	98.31
80-84	20	7601	0.26	98.57
85-89	20	7621	0.26	98.83
90-94	16	7637	0.21	99.04
95-99	6	7643	0.08	99.12
100+	68	7711	0.88	100

Table 6: Age study of references

#### 6.3.1 Age study of references (Decade-wise)

This particular section shows decade-wise growth of references. It is found that the highest number of citations e.g. 3364 (43.62%) have been received during 2006-2015. There is a

steady growth of total number of references except the following three age bar e.g. 15-19, 40-44, 50-54.

Year (Decade-wise)												
1986-1995					1996-2005				2006-2015			
Age	Cit	Total cit	%	Cum %	Cit	Total cit	%	Cum %	Cit	Total cit	%	Cum %
0-4	244	244	11.879	11.879	334	334	14.577	14.577	395	395	11.74	11.74
5-9	318	562	15.482	27.361	294	628	12.829	27.361	664	1059	19.74	31.48
10-14	250	81	12.171	39.533	394	1022	17.187	44.57	567	1626	16.85	48.34
15-19	220	1032	10.711	50.243	363	1385	15.830	60.40	349	1975	<b>10.37</b>	<b>58.71</b>
20-24	179	1211	8.715	58.958	219	1604	9.555	69.95	285	2260	8.47	67.18
25-29	183	1394	8.909	67.868	185	1789	8.072	78.02	248	2508	7.37	74.55
30-34	172	1566	8.374	76.241	136	1925	5.935	83.95	216	2724	6.42	80.98
35-39	133	1699	6.475	82.717	95	2020	4.149	88.09	145	2869	4.31	85.29
40-44	103	1802	5.015	87.731	123	2143	5.366	93.46	110	2979	<b>3.27</b>	<b>88.56</b>
45-49	72	1874	3.505	91.237	58	2201	2.539	95.99	132	3111	3.92	92.48
50-54	85	1959	4.138	95.375	28	2229	1.221	97.21	50	3161	<b>1.49</b>	<b>93.97</b>
55-59	19	1978	0.925	96.300	12	2241	0.523	97.73	43	3204	1.28	95.24
60-64	15	1993	0.730	97.030	3	2244	0.136	97.86	41	3245	1.22	96.46
65-69	10	2003	0.487	97.517	4	2248	0.174	98.04	21	3266	0.62	97.09
70-74	7	2010	0.341	97.858	13	2261	0.570	98.60	6	3272	0.18	97.27
75-79	12	2022	0.584	98.442	12	2273	0.523	99.13	14	3286	0.42	97.68
80-84	5	2027	0.243	98.685	4	2277	0.170	99.30	11	3297	0.33	98.01
85-89	5	2032	0.243	98.929	2	2279	0.099	99.39	13	3310	0.39	98.39
90-94	1	2033	0.049	99.978	1	2280	0.043	99.43	14	3324	0.42	98.81
95-99	1	2034	0.049	99.026	2	2282	0.092	99.52	3	3327	0.09	98.90

100+	20	2054	0.974	100.00	11	2293	0.48	100.00	37	3364	1.10	100.00
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Table 7: Age of literature (Decade-wise)

#### 5.4 Age distribution (Year-wise)

Table-8 shows the year wise age distribution of references. It shows the age of the cited documents to find out 'Half-life' period of the documents. Half-life is the period of time during which a half of the currently cited literature was published (Meadows,1974). It is found that the half life period of Political Science literature is nearly 15.9 years. It is also found that the time taken to cite the 7711 citations is 446 years.

REFAGE	CITNO	CUMUL_N O	PERCEN T	CUM_PERC EN
0	45	45	0.58	0.58
1	188	233	2.44	3.02
2	228	461	2.96	5.98
3	249	710	3.23	9.21
4	263	973	3.41	12.62
5	250	1223	3.24	15.86
6	307	1530	3.98	19.84
7	282	1812	3.66	23.5
8	219	2031	2.84	26.34
9	218	2249	2.83	29.17
10	272	2521	3.53	32.7
11	254	2775	3.29	35.99
12	242	3017	3.14	39.13
13	253	3270	3.28	42.41
14	190	3460	2.46	44.87
15	209	3669	2.71	47.58
<b>16</b>	<b>187</b>	<b>3856</b>	<b>2.43</b>	<b>50.01</b>
17	195	4051	2.53	52.54
18	155	4206	2.01	54.55
19	186	4392	2.41	56.96
20	158	4550	2.05	59.01
21	130	4680	1.69	60.7
22	153	4833	1.98	62.68
23	125	4958	1.62	64.3
24	117	5075	1.52	65.82
25	124	5199	1.61	67.43
26	151	5350	1.96	69.39
27	116	5466	1.5	70.89
28	111	5577	1.44	72.33
29	114	5691	1.48	73.81

30	113	5804	1.47	75.28
31	107	5911	1.39	76.67
32	93	6004	1.21	77.88
33	104	6108	1.35	79.23
34	107	6215	1.39	80.62
35	114	6329	1.48	82.1
36	62	6391	0.8	82.9
37	76	6467	0.99	83.89
38	78	6545	1.01	84.9
39	43	6588	0.56	85.46
40	58	6646	0.75	86.21
41	65	6711	0.84	87.05
42	60	6771	0.78	87.83
43	80	6851	1.04	88.87
44	73	6924	0.95	89.82
45	48	6972	0.62	90.44
46	62	7034	0.8	91.24
47	79	7113	1.02	92.26
48	32	7145	0.41	92.67
49	41	7186	0.53	93.2
50	49	7235	0.64	93.84
51	35	7270	0.45	94.29
52	40	7310	0.52	94.81
53	26	7336	0.34	95.15
54	13	7349	0.17	95.32
55	27	7376	0.35	95.67
56	14	7390	0.18	95.85
57	12	7402	0.16	96.01
58	13	7415	0.17	96.18
59	8	7423	0.1	96.28
60	10	7433	0.13	96.41
61	16	7449	0.21	96.62
62	18	7467	0.23	96.85
63	10	7477	0.13	96.98
64	5	7482	0.06	97.04
65	7	7489	0.09	97.13
66	7	7496	0.09	97.22
67	8	7504	0.1	97.32
68	10	7514	0.13	97.45
69	3	7517	0.04	97.49
70	4	7521	0.05	97.54
71	5	7526	0.06	97.6
72	4	7530	0.05	97.65
73	7	7537	0.09	97.74

74	6	7543	0.08	97.82
75	6	7549	0.08	97.9
76	13	7562	0.17	98.07
77	10	7572	0.13	98.2
78	3	7575	0.04	98.24
79	6	7581	0.08	98.32
80	5	7586	0.06	98.38
81	3	7589	0.04	98.42
82	1	7590	0.01	98.43
83	7	7597	0.09	98.52
84	4	7601	0.05	98.57
85	4	7605	0.05	98.62
86	4	7609	0.05	98.67
87	5	7614	0.06	98.73
88	5	7619	0.06	98.79
89	2	7621	0.03	98.82
90	11	7632	0.14	98.96
91	1	7633	0.01	98.97
93	3	7636	0.04	99.01
94	1	7637	0.01	99.02
96	2	7639	0.03	99.05
97	2	7641	0.03	99.08
99	2	7643	0.03	99.11
100	1	7644	0.01	99.12
101	3	7647	0.04	99.16
102	3	7650	0.04	99.2
103	1	7651	0.01	99.21
106	2	7653	0.03	99.24
108	1	7654	0.01	99.25
110	1	7655	0.01	99.26
112	4	7659	0.05	99.31
113	6	7665	0.08	99.39
114	1	7666	0.01	99.4
115	3	7669	0.04	99.44
116	1	7670	0.01	99.45
118	1	7671	0.01	99.46
119	1	7672	0.01	99.47
120	3	7675	0.04	99.51
121	1	7676	0.01	99.52
123	1	7677	0.01	99.53
124	2	7679	0.03	99.56
125	2	7681	0.03	99.59
126	2	7683	0.03	99.62
127	2	7685	0.03	99.65

128	2	7687	0.03	99.68
129	1	7688	0.01	99.69
131	2	7690	0.03	99.72
133	1	7691	0.01	99.73
139	1	7692	0.01	99.74
144	2	7694	0.03	99.77
145	2	7696	0.03	99.8
148	1	7697	0.01	99.81
149	5	7702	0.06	99.87
151	1	7703	0.01	99.88
152	1	7704	0.01	99.89
173	1	7705	0.01	99.9
176	1	7706	0.01	99.91
177	1	7707	0.01	99.92
178	1	7708	0.01	99.93
195	1	7709	0.01	99.94
201	1	7710	0.01	99.95
446	1	7711	0.01	99.96

Table 8: Age distribution of references (Year wise)

#### 5.4.1 Half-Life (Decade-wise)

Table-9 shows that the years of documents needed to satisfy 50% of demand of Political Science subject. To cover 50% of references 18.8 years are needed during the year 1986-1995, where as 15.6 years are needed in the year 1996-2005 and 14.7 years are needed during the year 2006-2015.

Decade	Years needed to cover 50% of References
1986-1995	18.8
996-2005	15.6
2006-2015	14.7

Table 9: Half life distribution (Decade- wise)

#### 5.5 Authorship pattern of references

Table 10 shows that 95.66% of the total literature covered by single author (7378 citations) followed by double authors with 296 citations (3.87%). There are 100% of total citations covered by five authors.



No. of authors	No of citation	Total citation	Percentage	Cum %
1	7378	7378	95.68	95.68
2	296	7674	3.84	99.52
3	30	7704	0.39	99.91
4	4	7708	0.05	99.96
5	3	7711	0.04	100

Table 10: Authorship characteristics of references

### 5.5.1 Authorship pattern (Decade- wise)

Table 11 shows the authorship pattern of cited documents (decade-wise). It is found that the single authorship pattern decreases in 1996-2005 and in 2006-2015 in compare to 1986-1995. It is also found that multi authorship pattern has increased during 1996-2005 and 2006-2015. So, it may be concluded that that single authorship trend is gradually decreasing whereas multi-authorship trend increases with time.

1986-1995					1996-2005					2006-2015				
Autho rs	Citat ion	Cum- citatio ns	%	Cumu %	Autho rs	Citati on	Cum- citatio ns	%	Cumu %	Auth ors	Citati on	Cum- citatio ns	%	Cumu %
1	2021	2021	98.39	98.39	1	2221	2221	96.86	96.86	1	3135	3135	93.22	93.22
2	29	2050	1.41	99.81	2	66	2287	2.88	99.74	2	201	3336	5.98	99.20
3	2	2052	0.10	99.90	3	5	2292	0.22	99.96	3	23	3359	0.68	99.88
4	2	2054	0.10	100.0	4	0	2292	0.00	99.96	4	2	3361	0.06	99.94
5	0	0	0	0	5	1	2293	0.04	100.0	5	2	3363	0.06	100.0

Table 11: Authorship pattern (Decade-wise)

### 5.6 Degree of collaboration (Decade-wise):

Degree of collaboration is the ratio of multi-authored papers published during a year and the total number of papers published during the year. Here, Degree of collaboration is 0.04 during the whole period. Though it is same (0.03) during the period 1986-1995 and 1996-2005. But it increases during 2006-2015 (Table 12).

Year	Degree of collaboration
1986-1995	0.03
1996-2005	0.03

2006-2015	0.07
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Table-12: Degree of collaboration

### 5.7 Average number of Authors (Decade-wise):

It is found that average number of authors per article is 1.02 during 1986-1995. Though it has increased gradually with time in next two decades.

Year	Average Authors per Reference
1986-1995	1.02
1996-2005	1.03
2006-2015	1.08

Table 13: Average Authors per Reference

## 6. Conclusion

It is observed that the growth of research in Political Science is increasing and more and more online documents are being cited in this field of research in addition to printed books. But the results may vary with time with another disciplines or subjects or if sample size is changed. Majority of citations have been single authored but trends is towards multi authorship pattern. In this context, this study may show trends of research in Political Science and may help librarians in taking managerial decisions with regards to the library budget, acquisition and collections development policy.

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