

Comparison of Spanish and Swedish Journals Indicators (Impact Factor and self-citation rate) in the JCR

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Abstract:

Geographical and social differences between two non-English language European countries (Spain and Sweden) attracted our attention to review the Impact Factors and self-citation rate of scientific journals published in Spain and Sweden. The study endeavours to compare the trend of citation and Impact Factor of all Spanish and Swedish journals indexed in the JCR throughout 2000-2005 and to show the difference between these two sets of journals.

The analysis of data showed that there is a significant difference between the self-citing rate and the self-cited rate among the same set of journals in Spain as well as in Sweden throughout the period of study. The IF of Spanish journals in 2005 showed significant growth compared to the same set of journals in 2000. Such differences, however, were not found among Swedish journals.

The comparison of Spanish journals to Swedish journals during 2000-2005 showed that the mean values of references per article in Spanish journals are higher than in Swedish journals. The mean values of references per article in Spanish journals are 40.82 and 49.39 respectively in the years 2000 and 2005, whereas the numbers of references per article in Swedish journals are 29.69 and 32.67 respectively.

Another finding of this study is that 86% of Spanish journals in the year 2000 and 93% of them in 2005 had at least one or more citation to their own. This portion among Swedish journals is 79% in 2000 and 100% in 2005.

The study further showed that the largest group in the self-citing group is that with the least self-cited rate less than 5%, which accounts for 25 journals (44%) from a total of 28 Spanish journals, the second largest group is the journals with a citing-rate from 5% to 10%. These two groups constitute 100% of the all 28 Spanish journals in 2000. In the term of self-cited rate the largest group is that with the self-cited rate higher than 20%.

The largest group in the self-citing group among Swedish journals is that with the least self-cited rate, which is less than 5%, and accounts for 13 journals (68%) from all 19 journals, the second largest group is that with a citing-rate from 5% to 10%. These two groups constitute about 95% all 19 Swedish journals. In the self-cited group, the large groups are likewise the two mentioned groups.

The largest group in the self-citing rate is that with self-cited rate less than 5% which account for 18 journals (60%) from a total of 28 Spanish journals, the second largest group is the journals with a citing-rate from 5% to 10%. These two groups constitute 93% of all 28 Spanish journals in the year 2005. The largest group in the column of self-cited among Spanish journals is that with self-cite rate of higher than 20%.

The largest group in 2005 among Swedish journals in the self-cited group is that with self-cite rate from 5% to 10%. The largest group in the self-citing group are those with self-citing rates below 10%. There is no journal with a self-citing rate higher than 10% in this group in the year 2005.

Introduction:

Using a map of Europe (appendix1), we see that Sweden, with a population of 9,016,596 and with a constitutional monarchy, is located in the northern Europe; on the opposite side of the continent, Spain is located in the south-western Europe, which has a population more than four times that of Sweden (40,397,842) and parliamentary monarchy. Besides geographical differences, there are a few social differences (Table 12) between the two countries that attracted our attention and interest to study the differences between their scientific journals' indicators published in these countries that indexed in the JCR.

Citation analysis has become a dominant research technique in library and information science. Citations analysis is a well-known method in bibliometric studies for measuring the influence and impact of scholarly journals; hence, it is used as a quantitative tool for ranking, evaluating, categorizing and comparing journals by librarians and information scientists. The use of citations goes back to 1927, when Gross and Gross¹ in a citation study undertaken in 1927, discovered that few journals were cited in the Journal of the American Chemical Society, while many journals were only cited once. Their findings have shown similarities with power law. All of them characterised by the phenomenon that K. Merton described as the Matthew Effect², it is interpreted as "the rich get richer and the poor get poorer". On July 15, 1955, Eugene Garfield published his groundbreaking paper on citation indexing³. In this paper he suggested that the Science Citation Index would be a great asset in measuring impact and facilitating historiography. Since then we are witnessing an increasing use of citation analysis as an important tool in the hands of bibliometricians to determine the influence and impact of journals, authors and etc.

Researchers may use the citation analysis for several reasons, such as:

“ to find out how much impact a particular article has had, by showing which other authors based some work upon it or cited it as an example within their own papers.”

“ to determine more about a field or topic (by reading the papers that cite a seminal work in that area).”

“ to find out how much impact a particular author has had (by looking at his/her total citations).”⁴

¹ Gross, P. L. K. & Gross, E. M. (1927). College libraries and chemical education. *Science* 66, 385-389.

² Robert K. Merton (1968 January 5). Matthew Effect in Science. *Science*, 159(3810), 56-63. Retrieved September 4, 2006, from <http://www.garfield.library.upenn.edu/merton/matthew1.pdf#search=%22Robert%20K.%20Merton%20matthew%20effect%22>

³ Eugene Garfield (1955 July 15). Citation Indexes for Science: A New Dimension in Documentation through Association of Ideas. *Science*, Volume 122, No. 3159, 108-111. Retrieved September 7, 2006 from http://www.garfield.library.upenn.edu/papers/science_v122v3159p108y1955.html.

⁴ Bieber and Jacoby (2002). *Information System Principles*. Retrieved December 16, 2006 from <http://web.njit.edu/~bieber/CIS677S02/citation-analysis.html#science-search>

The tremendous growth of scientific literature, particularly in special fields in the scholarly world, and easy access to them causes researchers to use and cite more references in their works. On the other hand attempts to gain prestige among academic scientists and researchers may be another reason for the increase of the citation rate- authors can and do cite their prior work (self-citation). “High rate of author self-citation may result from the fact that authors stick to their specific field of research and, naturally, rely on their previous results.”⁵ “Self-citation of Journals, especial in the SCI is getting high and higher. Nearly every journal in the JCR-Science Edition contains at least some reference to its own.”⁶

Ken Hyland found that about 70% of the articles contained a reference to one of the author’s earlier publications.⁷ In other study, Apoor S. Gami, and et al.,⁸ found that nearly one-fifth of all citations to articles about diabetes mellitus in clinical journals in the year 2000 were author self-citations. The frequency of self-citation was not associated with the quality of publications.

In a study⁹ based on information extracted from the Science Citation Index (SCI) database, Garfield found that, in terms of articles published, the biochemical literature is growing faster than scientific literature as a whole.

In this study Garfield found that another ‘growth’ indicator within the biochemical literature was the increase in the average number of references contained in a typical article. To examine this factor he developed a ‘R/S’ value for each core journal. This is the number of references contained in all of a journal’s issues during a specified year (R) divided by the number of source articles (S) it published that year.

The study showed that the average biochemistry article contained at least 70% more references than the average article in the SCI database. For example, in 1977 the average biochemistry article contained 23.4 references as compared to the 13.5 references in the average SCI any references, the R/S for SCI articles as a whole will be lower than the R/S for biochemistry articles. However, this situation could only account for a very small part of the 70% difference.

The study showed that the average R/S for the core journals has increased 10.4% in ten years, from 21.2 in 1968 to 23.4 in 1977. However, over a 16-year period, in the years 1962–1977,

⁵ Nataša Kovačić and Aleksandra Mišak (2004 June 22). Author self-citation in medical literature, CMAJ, 170 (13), doi:10.1503/cmaj.1040513. Retrieved September 2006, from <http://www.cmaj.ca/cgi/content/full/170/13/1929>.

⁶ Marie E. McVeigh (2002), Journal self-citation in the journal citation reports - Science edition. Retrieved December 7, 2006 from <http://scientific.thomson.com/free/essays/journalcitationreports/selfcitation2002/>.

⁷ Ken Hyland (2003 February 1). Self-Citation and Self-Reference: Credibility and Promotion in Academic Publication, Journal of the American Society for Information Science and Technology, Volume 54, Issue 3, 251-259. Retrieved December 4, 2006, from <http://www3.interscience.wiley.com/cgi-bin/fulltext/102523280/PDFSTART>.

⁸ Apoor S. Gami and et al (2004 June 22). Author self-citation in the diabetes literature. CMAJ.170(13): 1925–1927. Retrieved September 7, 2006, from <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=421720>.

⁹ Eugene Garfield (1979-80). Trends in biochemical literature, Essays of an Information Scientist, Volume 4, 419-425.

some of the CEBJ journals (journals whose editors are full members of the Committee of Editors of Biochemical Journals of the International Union of Biochemistry)¹⁰ have had increases in R/S as high as 64% (Biochim. Biophys. Acta). On average, the R/S value for CEBJ journals increased by 43% (18.2 to 26.1) from 1962 to 1977. As of 1977, biochemistry articles, on average, had 12% more references than botany articles (23.4 v. 21.0) and 85% more references than mathematics articles (23.4 v. 12.6). Mathematics and botany articles increased their R/S values by 8 and 7%, respectively, between 1968 and 1977; these increases are substantially less than the 10.4% growth in the biochemistry R/S over the same period. Nevertheless, all three fields did show an increase in the number of references contained in an average article.

In another study¹¹ Garfield found that the biochemical literature is the fastest growing of any field in science. He found that the number of source items for each journal, along with the average number of references per item is provided. He asserted that some CEBJ journals have increased their average number of references per source item by as much as 64% in 16 years.

This study endeavours to determine the trend of citation, Impact Factor and references per articles of all Spanish and Swedish journals that were indexed in the JCR and to show the differences between them. The analysis of data showed that there is a significant difference between the self-citing rate and the self-cited rate of journals in Spain as well as in Sweden throughout the period of study.

The IF of Spanish journals in 2005 showed significant growth in comparison to the same set of journals in 2000. Such differences were not found among Swedish journals, however. The comparison of Spanish journals with Swedish journals during 2000-2005 showed that the mean value of references per article in Spanish journals are higher than in Swedish journals the mean value of references per article in Spanish journals are 40.82 and 49.39 respectively in the years 2000 and 2005, whereas the number of references per article in Swedish journals are 29.69 and 32.67 respectively through the years 2000 and 2005.

The study further showed that the largest group in the self-citing group is that with the least self-cited rate less than 5% which account for 25 journals (44%) from a total of 28 Spanish journals, the second large group is the journals with a citing-rat from 5% to 10%. These two groups constitute 100% of the all 28 Spanish journals in 2000.

In the term of self-cited rate the largest group is that with the self-cited rate higher than 20%. It is clear that there are significant differences between these two groups.

The largest group in the self-citing group among Swedish journals is that with the least self-cited rate less than 5% which account for 13 journals (68%) from all 19 journals, the second largest group is the journals with a citing-rate from 5% to 10%. These two groups constitute about 95% all 19 Swedish journals. In the self-cited group the large groups are likewise the two mentioned groups.

¹⁰ Garfield E. (1979-80). *Essays of an Information Scientist*, Volume 4, 414-418. Retrieved September 19, 2006 from <http://www.garfield.library.upenn.edu/essays/v4p414y1979-80.pdf#search=%22CEBJ%20biochemical%20%20journals%22>.

¹¹ Eugene Garfield (1979-80). *The Number of Biochemical Articles Is Growing, But Why Also the Number of References per Article?* *Essays of an Information Scientist*, Volume 4, 414-418.

The largest group in the self-citing rate is that with self-cited rate less than 5% which account for 18 journals (60%) from a total of 28 Spanish journals, the second largest group is the journals with a citing-rate from 5% to 10%. These two groups constitute more than 93% of all 28 Spanish journals in the year 2005. The largest group in the column of self-cited among Spanish journals is that with a self-cite rate of higher than 20%.

The largest group in 2005 among Swedish journals in the self-cited group is that with self-cite rate from 5% to 10%. The largest group in the self-citing group are those with self-citing rate of below 10%. There is no journal with a self-citing rate higher than 10% in this group in the year 2005.

We have noticed that 4 journals from a total of 28 journals published in 2000 in Spain were cancelled in 2005 and 6 new journals published in 2006, and 5 journals from a total 19 journals published in 2000 in Sweden were cancelled and 5 new journals published in 2005.

Method and Materials:

All journal self-citation and Impact Factors data were extracted from the 2000 and 2005 Journal Citation Reports (JCR). In order to determine the correlation between the Impact Factor and self-citation of journals, all journals from the two countries this study is focusing on were chosen from the Journal Citation report of ISI web of knowledge available at: <http://portal.isiknowledge.com/portal.cgi?DestApp=JCR&Func=Frame>.

The correlation between Impact Factor and the rate of journals self-citation were analysed by the software package of SPSS.

Finding and results:

Table 1
Distribution of journal self-citation rate in Spain (2000)

Citation rate	Self-cited		Self-citing	
	No. of journals	Percent	No. of journals	Percent
< 5%	8	29	25	89
5-10%	5	18	3	11
10-15%	3	11	-	0
15-20%	1	4	-	0
>20%	11	39	-	0
Total	28	100	28	100

Table 1 illustrates the Spanish journals distribution based on self-cited rate as well as self-citing rate. The table indicates that the largest group in the self-citing group is that with the least self-cited rate less than 5% which account for 25 journals (44%) from a total of 28 journals, the second largest group is the journals with a citing-rate from 5% to 10%. These two groups constitute 100% of the 28 journals studied.

In the term of self-cited rate the largest group is that with the self-cited rate higher than 20%. It is clear that there are significant differences between two groups.

Table 2
Distribution of journal self-citation rate in Sweden (2000)

Citation rate	Self-cited		Self-citing	
	No. of journals	Percent	No. of journals	Percent
< 5%	8	42	13	69
5-10%	5	26	5	26
10-15%	-	0	1	5
15-20%	3	16	-	0
>20%	3	16	-	0
Total	19	100	19	100

Table 2 shows the Spanish journals distribution based on self-cited and self-citing rate in 2000. The table indicates that the largest group in the self-citing group is that with the least self-cited rate less than 5% which account for 13 journals (69%) from all 19 journals, the second largest group is the journals with a citing-rate from 5% to 10%. These two groups constitute about 95% all studied journals. In the self-cited group the large groups are likewise the two mentioned groups.

Table 3
Distribution of journal self-citation rate in Spain (2005)

Citation rate	Self-cited		Self-citing	
	No. of journals	Percent	No. of journals	Percent
< 5%	9	30	18	60
5-10%	3	10	10	33
10-15%	1	3	2	7
15-20%	3	10	-	0
>20%	14	47	-	0
Total	30	100	30	100

The largest group in the self-citing rate is that with self-cited rate less than 5% which account for 18 journals (60%) from a total of 30 journals, the second largest group is the journals with a citing-rate from 5% to 10%. These two groups constitute 93% of all studied journals. The largest group in the column of self-cited group is that with a self-cite rate higher than 20%.

Table 4
Distribution of journal self-citation rate in Sweden (2005)

Citation rate	Self-cited		Self-citing	
	No. of journals	Percent	No. of journals	Percent
< 5%	3	17	10	56
5-10%	8	44	8	44
10-15%	4	22	-	0
15-20%	2	11	-	0
>20%	1	6	-	0
Total	18	100	18	100

The largest group in the self-citing column are those with self-citing rate of below 10%. There is no journal with a self-citing rate higher than 10% in this group.

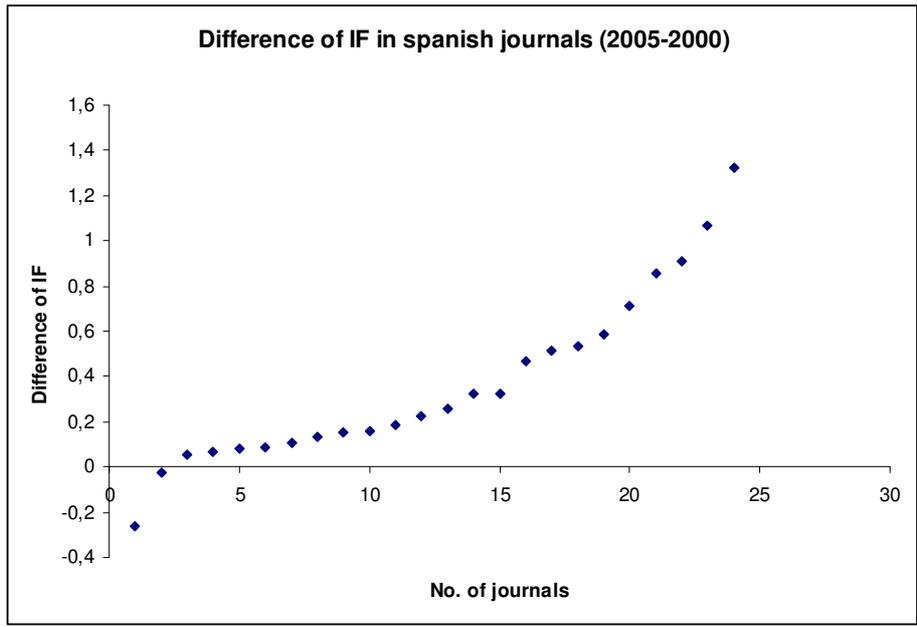


Fig.2: Difference of Spanish journals IF (2005-2000)

Comparing of Spanish journals Impact factor in 2000 and 2005 in the same set of journals indicates that 91.6% of Spanish journals IF in 2005 are higher than the same set of journals in 2000.

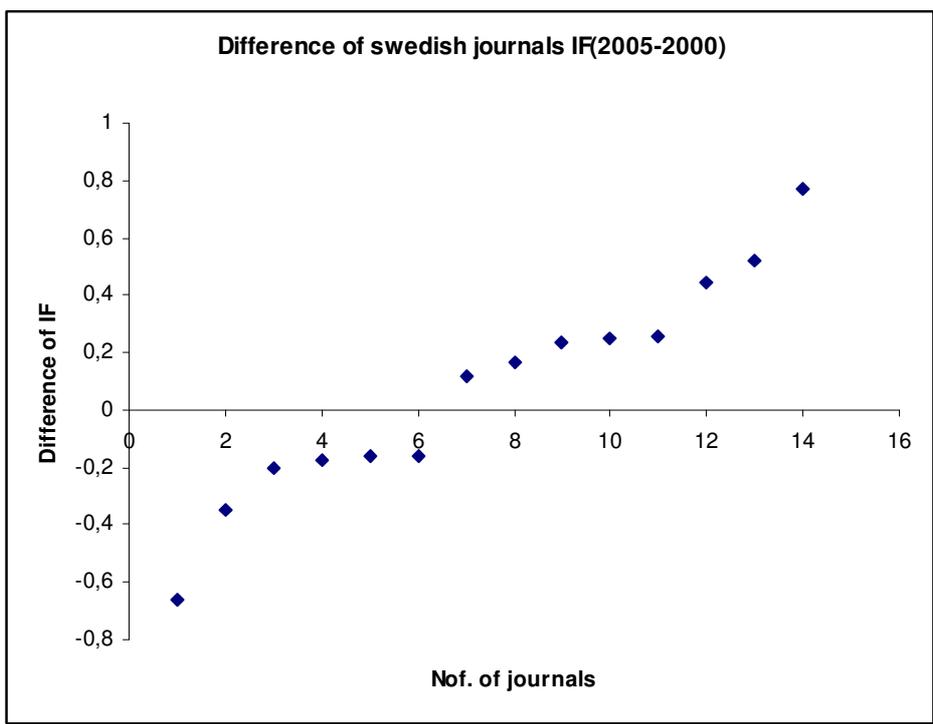


Fig.3: Difference of Swedish journals IF (2005-2000)

Comparing Fig.2 with Fig.3 indicates that Spanish journals are more productive than Swedish journals in the same period of study. As the graph illustrates, 50% of Swedish journals IF in 2005 with compare to the same set of journals in 2000 has increased and the IF of 50% in the same set of journals have decreased. This indicates that there is no significant growth in the term of journals IF for the Swedish journals.

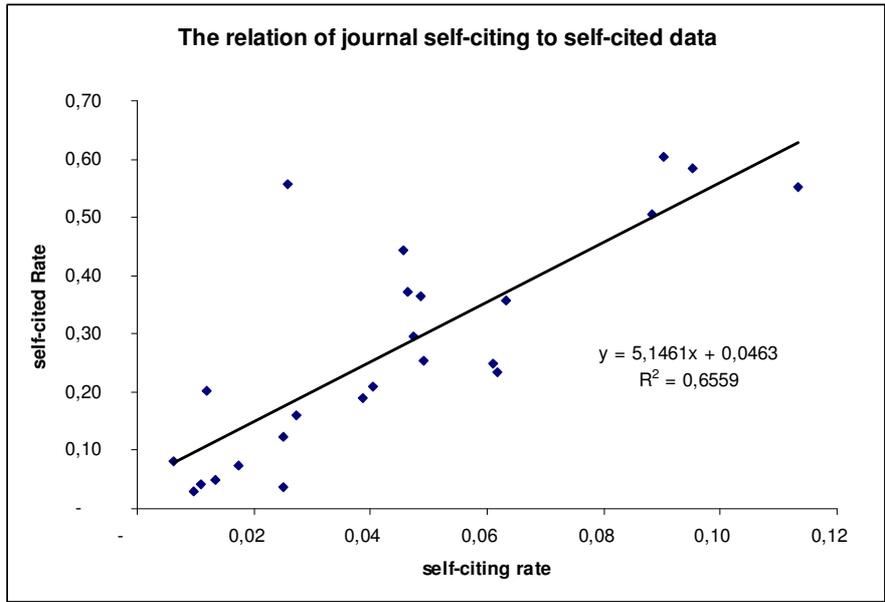


Fig.4: The relation of journal self-citing to self-cited for Spanish journals in 2005.

As the graph illustrates, there is a linear correlation between Spanish journal self-citing and journal self-cited values. The graph indicates that more Spanish journals are citing their own the more are cited by other.

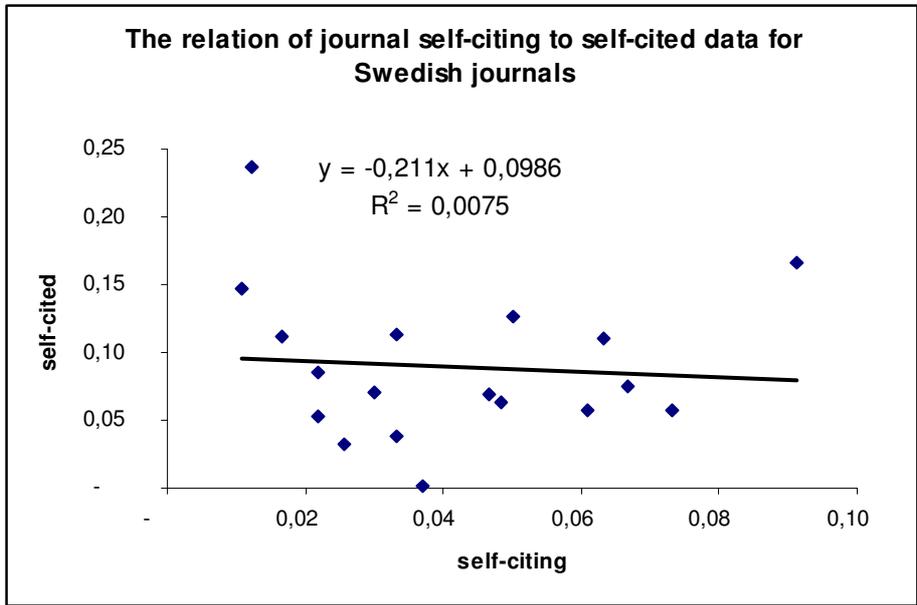


Fig.5: The relation of Swedish journals self-citing and self-cited rate in 2005.

The graph illustrates that the more Swedish journals cite themselves the less are cited.

Table 5
Number of articles and references for Spanish journals 2000-2005

Year	No. of article	No. of references	Mean value of references per article
2000	2329	95093	40.82
2005	1998	98692	49.39

As the Table 9 shows, the number of references per article in Spanish journals increased about 1.7 references per article annually.

Table 6
Number of articles and references for Swedish journals 2000-2005

Year	No. of article	No. of references	Mean value of references per article
2000	1210	35931	29.69
2005	1151	37609	32.67

As the Table 10 indicates, the number of references per article in Swedish journals increased about 0.6 references per article annually.

Table 7
List of Sweden journal based on self-citing Rank (2000)

Rank	Journal titles (abbreviated)	Impact factor	Total citation	Self-cited rate	Self-citing rate
1	TELLUS B	3.256	1984	0.2	0.14
2	GEOGR ANN A	0.868	522	0.17	0.09
3	NORD PULP PAPER RES	0.759	384	0.25	0.09
4	SWED DENT J	0.914	561	0.07	0.09
5	J VEG SCI	1.589	1924	0.16	0.08
6	TELLUS A	1.178	1032	0.05	0.05
7	ACTA PHYSIOL SCAND	1.764	7707	0.03	0.04
8	ACTA RADIOL	0.785	2343	0.03	0.04
9	HEREDITAS	0.753	1392	0.05	0.04
10	PHYS SCRIPTA	0.578	4078	0.08	0.04
11	AMBIO	1.142	2109	0.04	0.03
12	GFF	0.756	200	0.26	0.03
13	SCAND J METALL	0.074	292	0.07	0.03
14	SCAND J STAT	0.655	634	0.04	0.03
15	J NONLINEAR MATH PHY	0.250	39	0.23	0.01
16	ACTA MATH-DJURSHOLM	1.941	1637	0.00	0.00
17	ARK MAT	0.511	357	0.00	0.00
18	SCAND J SOC MED	1.250	517	0.00	0.00
19	SWED J AGR RES	0.238	247	0.00	0.00

The table maps the journal of (Tellus series B-chemical and Physical Meteorology) with 14% of self-citing rate has got the first rank in 2000.

The mean self-cited rate is 9% and the mean self-citing rate is 5%.

Table 8
List of Swedish journal based on self-citing Rank (2005)

Rank	Journal titles (abbreviated)	Impact factor	Total citation	Self-cited rate	Self-citing rate
1	NORD PULP PAP RES J	0.600	798	0.17	0.09
2	J VEG SCI	2.112	3370	0.08	0.07
3	TELLUS B	2.592	2052	0.06	0.07
4	SWED DENT J	0.568	558	0.06	0.06
5	TELLUS A	1.947	1144	0.11	0.06
6	AMBIO	1.378	2609	0.07	0.05
7	GEOGR ANN A	0.667	753	0.13	0.05

8	PHYS SCRIPTA	1.240	4057	0.06	0.05
9	ACTA MATH-DJURSHOLM	1.778	1934	0.00	0.04
10	ACTA RADIOL	1.031	2379	0.03	0.03
11	APPL VEG SCI	1.517	319	0.11	0.03
12	SCAND J METALL	0.517	365	0.07	0.03
13	SCAND J STAT	0.822	914	0.04	0.03
14	ARK MAT	0.628	415	0.05	0.02
15	J REHABIL MED	1.799	455	0.09	0.02
16	NEUROENDOCRINOL LETT	1.005	614	0.11	0.02
17	GFF	0.581	80	0.24	0.01
18	J NONLINEAR MATH PHY	0.508	190	0.15	0.01

The table shows the journal of (Nordic Pulp & Paper Research) with 9% self-citing rate has not the first rank in 2005 and the journal of (Tellus series B-chemical and Physical Meteorology) was lowered to the third rank.

The mean self-cited rate is 9% and the mean self-citing rate is 4%.

Table 9
List of Spain journals based on self-citing Rank (2000)

No.	Journal titles (abbreviated)	Impact factor	Total citation	Self-cited rate	Self-citing rate
1	REV ESP CARDIOL	0.700	683	0.73	0.07
2	MED CLIN-BARCELONA	0.750	1628	0.42	0.06
3	NEFROLOGIA	0.310	277	0.68	0.05
4	GRASAS ACEITES	0.453	343	0.20	0.04
5	REV ESP ENFERM DIG	0.384	308	0.27	0.04
6	MATER CONSTRUC	0.219	28	0.46	0.03
7	REV MAT IBEROAM	0.750	239	0.05	0.03
8	REV METAL MADRID	0.190	54	0.41	0.03
9	INT J DEV BIOL	1.963	1594	0.06	0.02
10	REV CLIN ESP	0.217	411	0.14	0.02
11	SCI MAR	0.521	516	0.16	0.02
12	AFINIDAD	0.152	95	0.15	0.01
13	BOL SOC ESP CERAM V	0.099	56	0.36	0.01
14	HISTOL HISTOPATHOL	1.553	1246	0.07	0.01
15	J INVEST ALLERG CLIN	0.537	279	0.05	0.01
16	J PHYSIOL BIOCHEM	0.958	85	0.11	0.01
17	METHOD FIND EXP CLIN	0.543	675	0.04	0.01
18	NEUROCIRUGIA	0.154	41	0.56	0.01
19	REV NEUROLOGIA	0.256	339	0.67	0.01
20	TEST	0.308	52	0.08	0.01
21	DRUG FUTURE	0.015	16	-	-
22	QUIM ANAL	0.246	183	-	-
23	ACTAS LUSO-ESP NEUR	0.302	80	-	-
24	AN QUIM-INT ED	0.312	331	-	-
25	ACTAS ESP PSIQUIATRI	0.098	5	0.4	0
26	ARCH COMPUT METHOD E	0.688	87	0.01	0
27	DRUG NEWS PERSPECT	0.835	256	0.01	0
28	DRUGS TODAY	0.339	273	0.04	0

The table illustrates the journal of (Revista española de Cardiología) with 7% of self-citing rate rose to the first rank among Spanish journals in 2000.

The mean self-cited rate is 22% and the mean citing-rate is 2%.

Table 10
List of Spain journals based on self-citing Rank (2005)

Rank	Journal titles (abbreviated)	Impact factor	Total citation	Self-cited rate	Self-citing rate
1	REV METAL MADRID	0.414	152	0.55	0.11
2	ARCH BRONCONEUMOL	1.401	660	0.58	0.1
3	BOL SOC ESP CERAM V	0.684	287	0.6	0.09

4	REV ESP CARDIOL	1.769	993	0.5	0.09
5	GRASAS ACEITES	0.194	426	0.25	0.06
6	MATER CONSTRUCC	0.542	98	0.23	0.06
7	MED CLIN-BARCELONA	1.074	2084	0.36	0.06
8	ARDEOLA	0.509	219	0.37	0.05
9	ENFERM INFEC MICR CL	0.905	550	0.29	0.05
10	NEFROLOGIA	0.466	390	0.44	0.05
11	REV ESP ENFERM DIG	0.535	365	0.25	0.05
12	REV NEUROLOGIA	0.391	1157	0.37	0.05
13	NEUROLOGIA	0.571	416	0.21	0.04
14	SCI MAR	1.036	1247	0.19	0.04
15	J PHYSIOL BIOCHEM	0.934	177	0.12	0.03
16	NEUROCIROLOGIA	0.232	104	0.56	0.03
17	REV CLIN ESP	0.273	428	0.16	0.03
18	REV MAT IBEROAM	0.855	367	0.04	0.03
19	INT MICROBIOL	1.868	337	0.07	0.02
20	ACTAS ESP PSIQUIATRI	0.286	109	0.2	0.01
21	AFINIDAD	0.220	148	0.08	0.01
22	HISTOL HISTOPATHOL	2.023	2152	0.05	0.01
23	INT J DEV BIOL	2.051	2258	0.03	0.01
24	TEST	1.163	163	0.04	0.01
25	ARCH COMPUT METHOD E	1.400	122	-	-
26	DRUG FUTURE	0.547	355	0.01	0
27	DRUG NEWS PERSPECT	2.159	516	0.02	0
28	DRUGS TODAY	1.248	592	0.01	0
29	METHOD FIND EXP CLIN	0.798	823	0.01	0
30	PUBL MAT	0.659	129	-	-

The journal Revista de Metalurgia, with 6% of self-citing rate, rose to the first rank among Spanish journals in 2005 and the journal of (Revista española de Cardiología) was lowered to the fourth rank.

The mean self-cited rate is 22% and the mean self-citing rate is 4%.

Table 11

The portion of Spanish and Swedish journals entering material in the JCR data bank in 2005

Origin of journals	No. of journal	percent	Articles	percent	Citations	percent
Spanish journals in the JCR	30	0.5%	1,151	0.1%	17,824	0.10%
Swedish journals in the JCR	19	0.3%	1,998	0.2%	23,006	0.08%
All journals in the JCR	6,088	100.0%	847,114	100.0%	22, 353,992	100.00%

The table illustrates, from a total number of 6,088 journals in the JCR in 2005, 30 (0.5%) were published in Spain, and 19 (0.3%) were published in Sweden. The 6,088 journals in the JCR produced 847,114 articles, 1998 (0.2%) appeared in the Spanish journals and 1151 (0.1%) in the Swedish journals. Of the 22,353,992 citations in 2005, 23006 (0.10%) came from Swedish journals and 17824 (0.08%) came from Spanish journals.

Table 12

Geographical and social differences between Spain and Sweden¹²

	Spain	Sweden
Location	South-western Europe, bordering the Bay of Biscay, Mediterranean Sea, North Atlantic Ocean, and Pyrenees Mountains, southwest of France	Northern Europe, bordering the Baltic Sea, Gulf of Bothnia, Kattegat, and Skagerrak, between Finland and Norway
Area	<i>total:</i> 504,782 sq km <i>land:</i> 499,542 sq km <i>water:</i> 5,240 sq km	<i>total:</i> 449,964 sq km <i>land:</i> 410,934 sq km <i>water:</i> 39,030 sq km
Climate	temperate; clear, hot summers in interior, more moderate and cloudy along coast; cloudy, cold winters in interior, partly cloudy and cool along coast	temperate; in south with cold, cloudy winters and cool, partly cloudy summers; subarctic in north
Natural resources	coal, lignite, iron ore, copper, lead, zinc, uranium,	iron ore, copper, lead, zinc, gold, silver,

¹² Central Intelligence Agency, the world fact book. Retrieved December 2, 2006, from <https://cia.gov/cia/publications/factbook>

	tungsten, mercury, pyrites, magnesite, fluorspar, gypsum, sepiolite, kaolin, potash, hydropower, arable land	tungsten, uranium, arsenic, feldspar, timber, hydropower
Population growth rate	0.13% (2006 est.)	-
Birth rate	10.06 births/1,000 population (2006 est.)	10.27 births/1,000 population (2006 est.)
HIV/AIDS – deaths	9.72 deaths/1,000 population (2006 est.)	less than 100 (2003 est.)
Sex rate	<i>At birth:</i> 1.07 male(s)/female <i>under 15 years:</i> 1.06 male(s)/female <i>15-64 years:</i> 1.01 male(s)/female <i>65 years and over:</i> 0.72 male(s)/female <i>total population:</i> 0.96 male(s)/female (2006 est.)	<i>At birth:</i> 1.06 male(s)/female <i>under 15 years:</i> 1.06 male(s)/female <i>15-64 years:</i> 1.03 male(s)/female <i>65 years and over:</i> 0.77 male(s)/female <i>total population:</i> 0.98 male(s)/female (2006 est.)
Life expectancy at birth	<i>Total population:</i> 79.65 years <i>male:</i> 76.32 years <i>female:</i> 83.2 years (2006 est.)	<i>Total population:</i> 80.51 years <i>male:</i> 78.29 years <i>female:</i> 82.87 years (2006 est.)
people living with HIV/AIDS	140,000 (2001 est.)	3,600 (2001 est.)
Religion	Roman Catholic 94%, other 6%	Lutheran 87%, Roman Catholic, Orthodox, Baptist, Muslim, Jewish, Buddhist
Langue	Castilian Spanish 74%, Catalan 17%, Galician 7%, Basque 2%; note - Castilian is the official language nationwide; the other languages are official regionally	Swedish, small Sami- and Finnish-speaking minorities
GDP - real growth rate	3.5% (2005 est.)	2.7% (2005 est.)

Conclusion:

In spite of the large geographical and social differences between Spain and Sweden (Table 12), there is some similarity among journals indicators published in these two European countries.

From a total number of 6,088 journals in the JCR in 2005, 30 (0.5%) were published in Spain, 19 (0.3%) were published in Sweden, The 6,088 journals in the JCR produced 847,114 articles, 1998 (0.2%) appeared in the Spanish journals and 1151(0.1%) in the Swedish journals. Of the 22,353,992 citations in 2005, 23006(0.1%) came from Swedish journals and 17824(0.08%) came from Spanish journals.

The study showed that there is a significant difference between the self-citing rate and the self-cited rate of journals in Spain as well as in Sweden throughout the period of study. Analysis of data indicated that the more a journal cites the more tends to be cited.

The IF of Spanish journals in 2005 showed significant growth with compare to the same set of journals in 2000. Such difference didn't find among the Swedish journals. The comparison of Spanish journals with Swedish journals during 2000-2005 showed that the mean value of references per article in Spanish journals are higher than in Swedish journals the mean value of references per article in Spanish journals is 40.82 and 49.39 respectively in the years 2000 and 2005, whereas the mean value of references per article in Swedish journals is 29.69 in 2000 and 32.67 in 2005.

Table 1 illustrates that the largest group in the self-citing group is that with the least self-cited rate less than 5% which account for 25 journals (44%) from a total of 28 Spanish journals, the second largest group is the journals with a citing-rate from 5% to 10%. These two groups constitute 100% of the all 28 Spanish journals in 2000. In the term of self-cited rate the largest group is that with the self-cited rate higher than 20%.

Table 2 indicates that the largest group in the self-citing group among Swedish journals is that with the least self-cited rate less than 5% which account for 13 journals (68%) from all 19 journals, the second largest group is the journals with a citing-rate from 5% to 10%. These two groups constitute about 95% all 19 Swedish journals. In the self-cited group the large groups are likewise the two mentioned groups.

Table 3 shows that the largest group in the self-citing rate is that with self-cited rate less than 5% which account for 18 journals (60%) from a total of 28 Spanish journals, the second largest group is the journals with a citing-rate from 5% to 10%. These two groups constitute 93% of all 28 Spanish journals in the year 2005. The largest group in the column of self-cited among Spanish journals is that with self-cite rate of higher than 20%.

Table 4 indicates that the largest group in 2005 among Swedish journals in the self-cited group is that with self-cite rate from 5% to 10%. The largest group in the self-citing group are those with self-citing rate of below 10%. There is no journal with a self-citing rate higher than 10% in this group in 2005.

The study further showed that the mean value of self-cited rate among Swedish journals is 9% in 2000 as well as in 2005. The mean value of self-citing rate is 5% and 4% respectively in the years 2000 and 2005.

The mean value of self-cited rate among Spanish journals is 22% in 2000 as well as in 2005. The mean value of self-citing rate is 2% in 2000 and 4% in 2005.

We have noticed that 86% of Spanish journals in the year 2000 and 93% of them in 2005 had at least one or more citation to their own. This portion among Swedish journals is 79% in 2000 and 100% in 2005.

The Spanish journals made 3,396.18 citations per journals in 2000 and 3,296.73 citations per journals in 2005 whereas the Swedish journals made 1,996.38 citations per journals in 2000 and 2,089.38 citations per journals in 2005.

4 journals from a total of 28 journals published in 2000 in Spain were cancelled in 2005 and 6 new journals published in 2005; 5 journals from a total of 19 journals published in 2000 in Sweden were cancelled in 2005 and 5 new journals published in 2005.

References:

Apoor S. Gami, Victor M. Montori, Nancy L. Wilczynski, and R. Brian Haynes (2004 June 22). Author self-citation in the diabetes literature. *CMAJ*.170(13): 1925–1927. Retrieved September 7, 2006, from <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=421720>.

Bieber and Jacoby (2002). Information System Principles. Retrieved December 16, 2006 from <http://web.njit.edu/~bieber/CIS677S02/citation-analysis.html#science-search>.

Central Intelligence Agency, the world fact book. Retrieved December 2, 2006, from <https://cia.gov/cia/publications/factbook>.

Garfield E. (1955 July 15). Citation Indexes for Science: A New Dimension in Documentation through Association of Ideas. *Science*, Volume 122, No. 3159, 108-111. Retrieved September 7, 2006 from http://www.garfield.library.upenn.edu/papers/science_v122v3159p108y1955.html.

Garfield E. (1979-80). Trends in biochemical literature, *Essays of an Information Scientist*, Volume 4, 419-425.

Garfield E. (1979-80). *Essays of an Information Scientist*, Volume 4, 414-418. Retrieved September 19, 2006 from <http://www.garfield.library.upenn.edu/essays/v4p414y1979-80.pdf#search=%22CEBJ%20biochemical%20%20journals%22>.

Garfield E. (1979-80). The Number of Biochemical Articles Is Growing, But Why Also the Number of References per Article? *Essays of an Information Scientist*, Volume 4, 414-418.

Gross, P. L. K. & Gross, E. M. (1927). College libraries and chemical education. *Science* 66, 385-389.

Ken Hyland (2003 February 1). Self-Citation and Self-Reference: Credibility and Promotion in Academic Publication, *Journal of the American Society for Information Science and Technology*, Volume 54, Issue 3, 251-259. Retrieved December 4, 2006, from <http://www3.interscience.wiley.com/cgi-bin/fulltext/102523280/PDFSTART>.

Marie E. McVeigh (2002), Journal self-citation in the journal citation reports - Science edition. Retrieved December 7, 2006 from <http://scientific.thomson.com/free/essays/journalcitationreports/selfcitation2002/>.

Nataa Kovai and Aleksandra Miak (2004 June 22). Author self-citation in medical literature, *CMAJ*, 170 (13), doi:10.1503/cmaj.1040513. Retrieved September 2006, from <http://www.cmaj.ca/cgi/content/full/170/13/1929>.

Robert K. Merton (1968 January 5). Matthew Effect in Science. *Science*, 159(3810), 56-63. Retrieved September 4, 2006, from <http://www.garfield.library.upenn.edu/merton/matthew1.pdf#search=%22Robert%20K.%20Merton%20matthew%20effect%22>.

Appendix 1: The European countries map

