

A BIBLIOMETRIC ANALYSIS OF INNOVATION RESEARCH

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ABSTRACT

Innovation research is becoming very significant during the last decades due to the strong development of research and technology worldwide. The aim of this study is to present the evolution of academic research in innovation between 1989 and 2013. In order to do so, this work uses the Web of Science database, which is usually regarded as the most significant one for scientific research. The article analyzes the annual numbers of studies in innovation and compares it with the total number of articles published annually in the database. Next, the work studies the citation structure in this field in order to see the number of cites obtained by any article in the field. The study ends analyzing the most influential journals in this field. The results show a strong increase of innovation research during the last years with many leading management journals publishing significant studies in this field.

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1. INTRODUCTION

Innovation is a fundamental concept for the development of an economy because it brings new products and services into the market increasing the wealth of the society. During the last decades, the interest on innovation has grown a lot due to the rapid development of research and technology around the world. Multinationals are continuously improving their products in order to remain competitive in the market. Most of them have a specific section in the company that focuses on innovation. Due to this, academic research in innovation is becoming more relevant in the scientific community. More and more researchers tend to make research in innovation establishing research groups and sometimes even departments on innovation at many universities worldwide.

From an academic point of view, innovation started with the classical studies of Schumpeter (1934) and other related authors. Today many leading management associations have a section on innovation including the Academy of Management (Technology and Innovation Management Division) and the Strategic Management Society (Knowledge and Innovation Group). Moreover, there are also some associations specialized in the field of research, development and innovation including the Product Development and Management Association founded in 1976, which publishes the Journal of Product Innovation and Management (JPIM).

A practical way to analyze a research field over a period of time is by using bibliometric indicators. Bibliometrics is the field that studies quantitatively the bibliographic material (Broadus, 1987). Bibliometric studies are becoming very popular in the scientific literature strongly motivated by the development of computers and internet that has facilitated the access to bibliographic information. Many authors have developed bibliometric analysis in a wide range of fields including management (Podsakoff et al. 2008), economics (Coupé, 2003), entrepreneurship (Landström, 2012), finance (Merigó et al. 2014), accounting (Merigó and Yang, 2014), fuzzy systems (Merigó et al. 2015), OWA operators (Emrouznejad and Marra, 2014), pricing research (Leone et al. 2012) and health economics (Wagstaff and Culyer, 2012).

Some studies have also developed bibliometric analyses in innovation. Fagerberg et al. (2012) presented a general perspective considering the most cited papers in the field and identifying some of the leading authors and institutions. This article generalized a previous study developed by Fagerberg and Verspagen (2009). Thieme (2007) also studied the leading authors in innovation. His study was extended by Yang and Tao (2012) with an updated analysis that also included a university ranking. Biemans et al. (2007) studied the evolution of JPIM between 1984 and 2005 showing the leading authors and institutions in the journal. Biemans et al. (2010) and Durisin et al. (2010) analyzed the impact of JPIM works identifying the leading ones in the journal. Martin (2012) developed a more general approach considering the most cited articles in science policy and innovation. Some other authors have studied the leading journals in the field developing different types of rankings according to a wide range of indicators (Linton and Thongpapanl, 2004; Shafique, 2013).

The aim of this article is to present a bibliometric overview of the publication and citation structure in innovation research. By doing so, the study shows the annual number of publications in the field in the Web of Science (WoS). In general, innovation is growing a lot having a proportional growth bigger than the average growth of research in any discipline. The citation structure identifies the citation level that this field is getting being able to see the location of the most cited papers over the last twenty-five years. Additionally, it also shows the number of papers with lower levels of citations including those that has not received any

citation yet. The article also develops a journal analysis identifying the leading ones in the field. Essentially, two types of journals lead the field: leading management journals that sometimes publish some high quality innovation papers and specialized journals that concentrate most of the innovation papers. This journal ranking is also compared with other previous rankings in order to see if different indicators lead to the same rankings or important deviations occur. Moreover, a temporal analysis is developed in order to see which journals have been the most influential ones throughout time.

The rest of the article is as follows. Section 2 briefly reviews the bibliometric methods. Section 3 presents the publication evolution, the citation structure and the journal analysis. Section 4 summarizes the main findings and conclusions of the study.

2. METHODS

Bibliometrics is a research field that studies quantitatively the bibliographic material (Broadus, 1987) providing a general overview of a research field according to a wide range of indicators. There are different ways for ranking the material in a bibliometric analysis. The most common approaches use the total number of articles or the total number of citations. Another useful indicator is the *h*-index (Hirsch, 2005) that combines articles with cites indicating the number of studies *X* that have received *X* or more citations. In the literature, there is a lot of discussion regarding the optimal measure for evaluating research (Alonso et al. 2009; Egghe, 2006). For example, Podsakoff et al. (2008) argued that the total cites were more effective in the evaluation of an author or an institution although previous studies preferred to use the number of articles. This work uses several indicators in order to provide a more complete picture of a set of papers. The information is ranked according to one of the indicators. But the other ones are also included in the analysis so the reader can get a general idea and see the leaders according to different indicators. Note that the general assumption is that the number of articles shows the productivity while the total cites reflects the influence of a set of articles.

WoS is one of the most popular databases for classifying scientific research worldwide. The assumption is that it only includes those journals that are evaluated with the highest quality. Currently, WoS includes more than 15.000 journals and 50.000.000 articles that encompass all the known sciences. The material is classified by research categories and research areas. Today, there are about 250 categories that are grouped in 150 areas. Note that there are many other databases available for scientific research including Scopus and Google Scholar.

In order to search for articles that have focused on innovation research, the study uses the keyword innovation in the title, abstract and keywords of any work available in WoS between 1989 and 2013. In order to focus on a management perspective, an additional filter is used that only considers the research areas of Business & Economics, Public Administration, Operations Research & Management Science, Government & Law, Geography, Social Sciences and Other Topics, Computer Science, Sociology, Urban Studies, History and Philosophy of Science, Transportation, Social Work, Social Issues, Area Studies, Behavioral Sciences and Asian Studies. This search finds 40865 articles that becomes 36644 studies if only considering articles, reviews, letters and notes. The search was developed in December 2014 and January 2015.

When developing bibliometric analysis, several limitations may occur due to the specific nature of the research considered. First, the database always gives one unit to any journal, author, university or country involved in an article. But some studies may only have

one author while some others may have three or four. Therefore, the unit given in the first case does not have the same value than the second case. However, today WoS is not considering this issue. A second limitation is that the value of the journals is not the same because publishing in a leading journal is not equivalent to a medium one. Another important limitation is that many studies may receive a better bibliometric evaluation because the type of research receives more citations and other related issues. However, many important works may receive fewer citations because not many people are working on these topics although their importance is equivalent to well-regarded topics. Finally, many important issues in scientific research cannot be evaluated with bibliometric measures including the involvement in journals and international conferences.

3. RESULTS

This section presents the results of the paper. First, the study analyzes the publication evolution of innovation research during the last twenty-five years. Next, the work analyzes the citation structure indicating the number of articles that reaches a specific citation threshold. Finally, the article analyzes the most influential journals in innovation research according to WoS and compares the results obtained with previous studies.

3.1. *Publication evolution in innovation research*

Over the last twenty-five years, 36644 articles have been published in innovation research with a management perspective. Figure 1 presents the evolution of the number of papers published annually in innovation.

Figure 1 here.

In order to see the real growth of the field, Figure 2 presents the annual growth in innovation research in percentages. The annual growth of all the journal publications included in WoS is also considered in order to compare the growth of innovation against the growth in any other science.

Figure 2 here.

In general, the growth of innovation over the last twenty-five years is bigger than the growth of science worldwide. This growth is usually over 10% until 2011 when the increase is smaller and close to the world growth of science.

3.2. *Citation structure in innovation research*

Since the classical work of Schumpeter (1934), many studies have made fundamental contributions to innovation research. Table 1 presents the number of works that reaches a certain citation threshold in order to see the citation level that innovation articles obtain. The analysis is developed between 1989 and 2013 and considers the citation thresholds of 200, 100, 50, 20, 10, 5 and 1. The total number of cites obtained by papers published in each year is also included.

Table 1 here.

As we can see, most of the highly cited studies in innovation were published in the late nineties and beginning of the new millennium. The number of articles published in innovation increases every year so the number of highly cited works also tends to increase. However, the citation level for studies published during the last five years is still very low because these articles still need more years in order to consolidate a strong citation level. In general, only 1.4% of the articles have received more than 200 citations and more than half of the articles receive at least five citations. Only a 16% of the works do not receive any citation.

3.3. *Leading journals in innovation research*

There are many journals in the scientific community that publishes material related to innovation research. Table 2 presents a list with the fifty journals with the highest h -index in innovation research. Many other indicators are included in order to get a general picture of all these leading journals. Note that six additional journals that are strongly focused on innovation research are also included although they did not enter the top 50.

Table 2 here.

Most of the leading management journals are well placed in the list because most of them regularly publish highly cited articles in innovation research which represents 10 to 20% of the publications of the journal. Moreover, those journals with a strong focus in innovation research also obtain a very good position in the ranking.

An important issue to remark is that Table 2 aims to be informative but it does not represent a strict ranking. The main reason for this is that depending on the perspective considered, different journals may obtain a more influential position. This is proved in Table 2 by looking to other indicators included in the list which shows different rankings depending on the criteria used. Moreover, it is also interesting to see if the results of this study are in accordance with previous works or not. Table 3 shows the top 25 journals in innovation research found by different studies and periods of time.

Table 3 here.

In general, the results are quite similar with only some small deviations. The exception is the study of Shafique (2013) that gave more emphasis on the leading social science journals. In the rest of the works, the leading management journals are well ranked although some specialized innovation journals obtain very good positions.

3.4. *Leading journals in innovation by periods of time*

In this section, let us focus on the evolution of leading journals in innovation research throughout time. For doing so, the study considers periods of five years between 1989 and 2013. In each period, a list with the journals that has published the highest number of articles in innovation is presented. The analysis uses similar indicators than Table 2. Tables 4, 5, 6, 7 and 8 present the results.

Tables 4-8 here.

Research Policy and Strategic Management Journal have been the main leaders during the last twenty-five years. In the nineties, there were not many specialized journals in innovation indexed in WoS. Therefore, the majority of the journals at the top of the ranking

have a general orientation in management and sometimes also in economics. Throughout time, more journals strongly focused on innovation have been included in WoS and soon they have appeared in the rankings. The forecast for the future is that more innovation journals will enter WoS becoming influential in the field. The main reason for this is that innovation research is growing a lot due to the strong increase of research worldwide. Thus, more researchers are publishing innovation research so more journals should be created from a general perspective and indexed in WoS in order to cover this growing demand by scientists.

4. CONCLUSIONS

The article provides a general bibliometric overview of innovation research between 1989 and 2013. The publication and citation structure during this period is considered. The results show a strong increase of innovation research that is aligned with the growth of science worldwide. From a proportional perspective, the growth of innovation is bigger than the average of all sciences. The study also presents a journal analysis with a list of the fifty most influential journals in the field. Most of the leading management journals tend to publish a significant number of papers focused on innovation research every year that have influenced the field a lot including the Strategic Management Journal and the Academy of Management Journal. Moreover, there are several specialized journals that have a strong impact in the scientific community including Research Policy and the Journal of Product Innovation Management.

The study gives an updated list of influential journals in innovation research taking into account a wide range of indicators. The results are in accordance with previous studies although some important deviations are found. In general, this work finds that during the last years, the specialized innovation journals are receiving more attention by the scientific community obtaining more cites than before. When comparing the results with the leading management journals, the specialized ones tend to publish more studies in the field while the leading ones publish less but receive more cites and have more influence worldwide. This result is quite logical because the leading journals are very selective regarding the articles published in the journal. Therefore, only those with a very strong potential are considered for publication. On the other hand, specialized journals look more to the core of innovation without taking into account so much their impact in neighboring fields.

Further studies in this direction are needed in order to obtain a more general view of the state of the art in this field. This article has considered innovation from the journal perspective and looking to the publications and citations from a general point of view. However, future works should consider other issues including the influence of authors, institutions and countries in the discipline. Some authors have already considered this issue. But a more specific analysis that considers more deeply the specialized journals in the field is necessary.

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Figure 1. Annual number of studies in innovation research

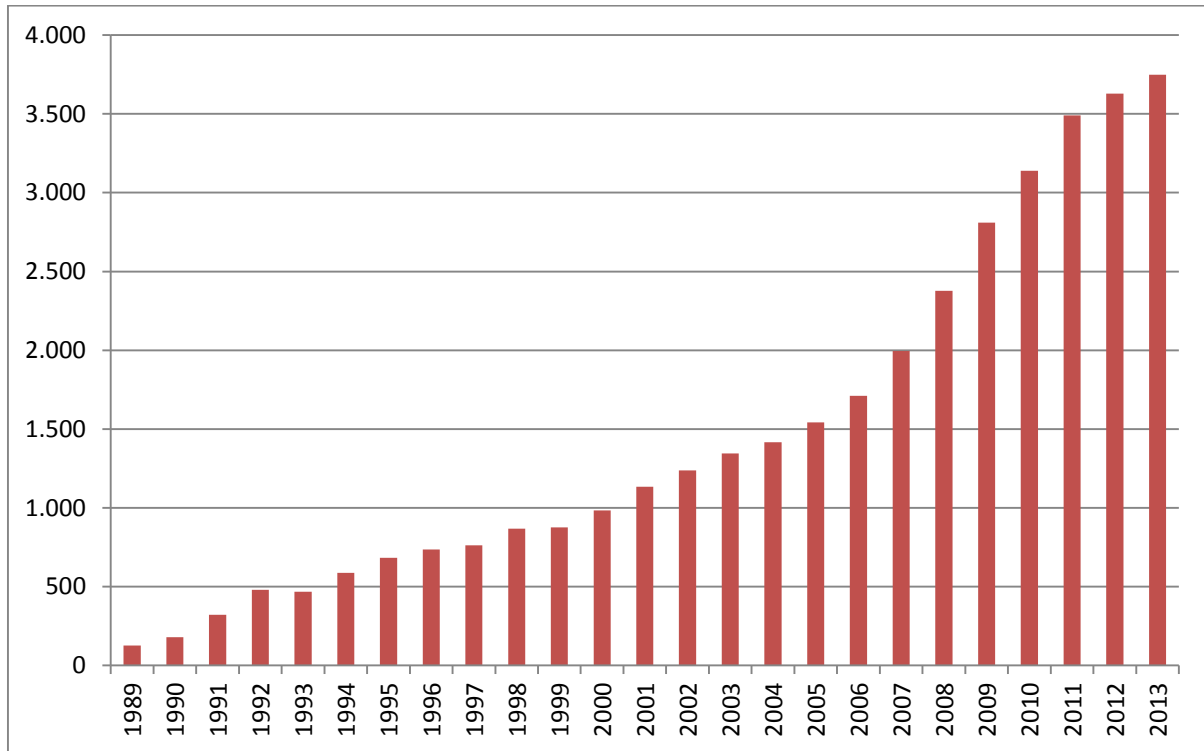


Figure 2. Annual growth of innovation research compared to the average growth of all sciences

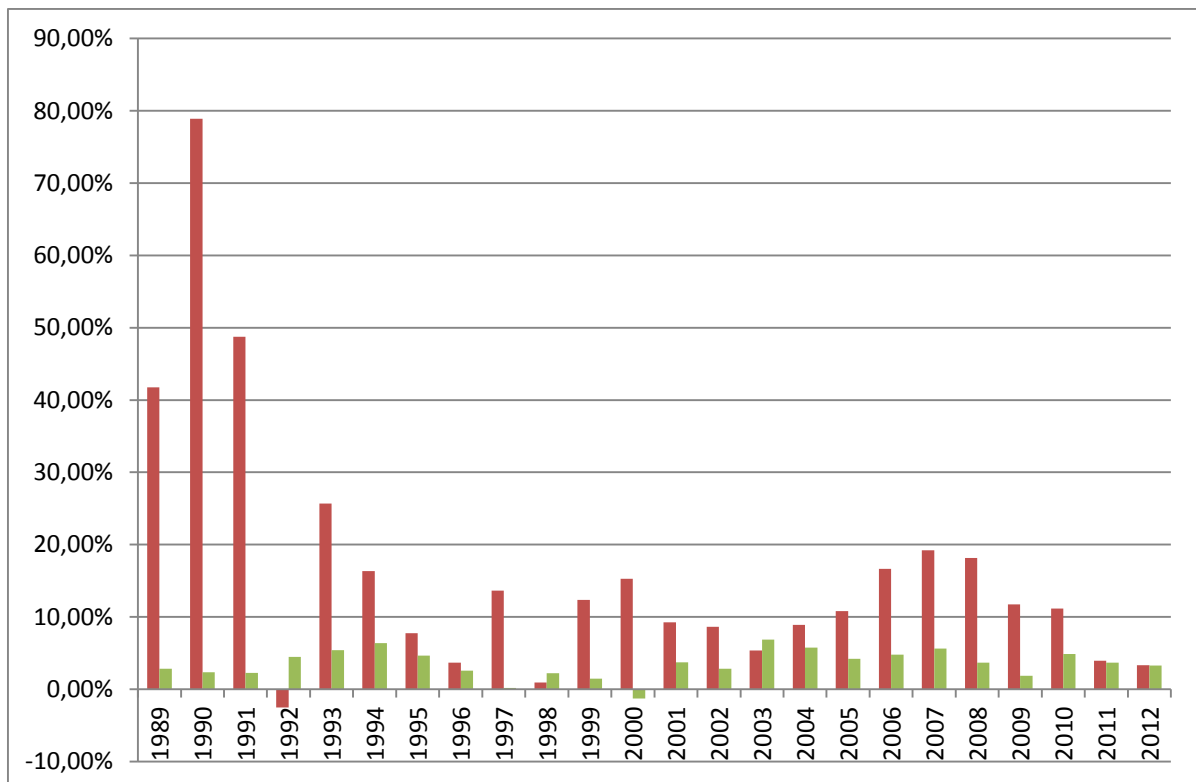


Table 1. Citation structure in innovation research

Year	≥200	≥100	≥50	≥20	≥10	≥5	≥1	Cites per year	Studies per year
1989	3	5	11	35	52	64	98	4523	127
1990	7	17	31	50	70	92	133	14280	180
1991	13	29	44	99	141	183	272	14334	322
1992	20	46	90	154	212	263	402	24094	479
1993	21	49	84	152	221	291	406	19987	467
1994	27	64	109	194	260	349	485	25936	587
1995	31	71	126	251	348	438	608	30352	683
1996	43	85	146	274	380	496	663	41219	736
1997	35	81	149	294	410	512	683	36257	763
1998	44	78	150	309	465	604	780	35287	867
1999	29	76	153	335	492	613	797	33231	875
2000	33	100	211	410	577	727	902	42157	983
2001	47	123	248	493	673	839	1041	48960	1133
2002	50	140	257	539	758	934	1157	51134	1238
2003	37	93	238	545	796	1010	1256	49372	1345
2004	30	106	252	594	841	1076	1326	47074	1417
2005	33	93	258	602	922	1173	1462	46694	1543
2006	20	90	236	590	951	1250	1578	44095	1710
2007	7	42	190	607	1045	1415	1844	39373	1995
2008	2	21	130	558	1036	1525	2147	34965	2378
2009	0	22	111	500	1027	1620	2467	33511	2810
2010	1	15	71	345	895	1635	2724	28915	3140
2011	0	1	18	181	580	1319	2791	19359	3490
2012	0	0	3	65	283	832	2641	12019	3628
2013	0	0	0	4	43	232	1996	4841	3748
Total	533	1447	3316	8180	13478	19492	30659	781969	36644
Percentage	1.45%	3.95%	9.05%	22.32%	36.78%	53.19%	83.67%		

≥200, ≥100, ≥50, ≥20, ≥10, ≥5, ≥1 = Number of articles with more than 200, 100, 50, 20, 10, 5 and 1 cites.

Table 2. Most influential journals in innovation research

R	Journal	HI	TCI	TPI	%PI	≥250	≥100	≥50	IF2	IF5	TP	TC	H
1	Strategic Management J.	116	55721	351	21,23%	52	134	204	2.993	5.929	1653	167140	195
2	Research Policy	110	51505	1318	67,62%	21	129	292	2.598	3.989	1949	76779	131
3	Academy of Management J.	93	28853	194	13,31%		91	126	4.974	8.443	1458	170864	210
4	Organization Science	85	35886	294	24,34%	29	73	129	3.807	5.512	1208	101693	147
5	Management Science	80	20948	298	9,35%	14	68	122	2.524	3.458	3187	148124	161
6	J. Product Innovation Management	71	17943	595	65,89%	4	43	112	1.379	2.770	903	28153	82
7	Academy of Management Review	57	15382	87	10,10%	18	39	61	7.817	9.698	861	146309	197
8	J. Marketing	51	11057	106	11,34%	10	35	51	3.819	6.682	935	111675	172
9	J. Business Venturing	51	7856	155	18,88%	4	24	52	3.265	4.571	821	36136	92
10	Technovation	50	13274	799	53,05%	0	8	50	2.704	3.251	1506	20918	54
11	Regional Studies	48	8826	309	17,84%	3	19	45	1.756	2.017	1732	29836	66
12	Administrative Science Quarterly	47	27095	63	12,26%	26	36	47	2.394	7.057	514	98304	166
13	J. Management Studies	47	6852	183	14,76%	4	13	43	3.277	5.196	1240	44731	95
14	Harvard Business Review	45	8532	271	5,57%	5	16	37	1.831	2.070	4861	64486	111
15	R & D Management	45	8032	423	54,44%	1	9	37	1.266	2.635	777	12745	50
16	MIS Quarterly	44	12503	92	12,04%	10	28	41	5.405	8.157	764	70183	127
17	MIT Sloan Management Review	42	5200	160	34,78%	1	3	12	1.803	1.988	460	8.480	44
18	California Management Review	41	6945	142	19,69%	7	15	34	1.944	2.672	721	29400	83
19	J. Management	41	4756	90	8,40%	1	13	33	6.862	8.027	1071	74612	130
20	J. Int. Business Studies	40	5314	95	8,35%	4	14	33	3.594	5.534	1138	57248	117
21	Small Business Economics	40	5196	259	22,60%	0	9	21	1.641	2.621	1146	18838	58
22	RAND J. Economics	39	6347	86	8,56%	7	19	34	1.219	2.148	1005	35610	89
23	IEEE Trans. Engineering Management	39	5346	275	26,12%	1	5	18	0.938	1.557	1053	16631	51
24	Information Systems Research	38	6410	84	13,79%	4	18	29	2.322	4.276	609	31947	90
25	Organization Studies	38	4686	140	11,80%	2	7	27	2.504	3.355	1186	36226	81
26	American Economic Review	37	6796	77	1,69%	5	15	32	3.305	4.568	4557	227625	208
27	Industrial and Corporate Change	37	5383	264	48,35%	2	7	26	1.330	2.071	546	10449	50
28	Technological Forecasting and Social Change	36	7253	612	35,27%	0	2	18	1.959	2.405	1735	18382	50
29	J. Operations Management	35	4552	80	13,77%	3	13	31	4.478	7.718	581	27531	90
30	J. Business Research	34	4421	268	9,25%	0	6	19	1.306	2.341	2896	46640	81
31	Int. J. Industrial Organization	34	4177	194	14,39%	1	5	21	0.947	1.372	1348	18093	55
32	Industrial Marketing Management	34	4135	268	15,33%	1	1	15	1.897	2.366	1748	26461	63
33	Technology Analysis & Strategic Management	32	5049	476	62,80%	1	7	11	0.841	1.285	758	7488	35
34	J. Economic Geography	32	4328	106	27,46%	3	8	23	2.821	4.396	386	11501	52
35	Information & Management	32	3775	100	7,33%	2	8	19	1.788	3.392	1364	33833	80
36	J. Engineering and Technology Management	32	3423	197	61,18%	0	3	11	2.106	2.155	322	4979	36
37	Leadership Quarterly	31	2913	51	6,61%	1	8	19	2.006	3.006	771	28271	79
38	Environment and Planning A	30	3348	160	5,24%	1	5	16	1.694	2.485	3054	49143	73
39	Decision Sciences	30	3221	63	6,28%	2	8	18	1.561	3.025	1003	26472	73
40	Urban Studies	30	2941	109	3,93%	1	5	13	1.330	1.961	2776	46770	79
41	J. Applied Psychology	29	4982	39	1,65%	6	16	22	4.367	6.952	2365	184267	190
42	World Development	29	3380	143	4,12%	1	6	18	1.733	2.319	3470	70095	98
43	Marketing Science	29	2887	60	6,42%	1	9	18	2.208	3.012	934	33598	87
44	J. Academy of Marketing Science	29	2828	68	10,79%	1	8	19	3.410	4.518	630	27301	85
45	Economic Journal	27	4413	68	3,34%	2	9	15	2.587	3.418	2037	60369	101
46	Cambridge J. Economics	27	3703	101	8,85%	2	11	20	0.914	1.545	1141	14516	49
47	Review of Economics and Statistics	27	3184	78	3,96%	2	8	16	2.718	4.132	1971	64365	109
48	Long Range Planning	27	2426	123	10,07%	0	3	12	2.111	4.365	1221	15326	51
49	J. Evolutionary Economics	27	2296	200	40,73%	0	0	5	0.675	1.512	491	6164	40
50	Economic Geography	27	2239	65	14,35%	1	4	14	3.281	5.580	453	12742	58

Some other journals strongly focused on innovation

European Planning Studies	26	3127	387	37,14%	0	2	10	1.025	1.147	1042	7736	33
Research Technology Manage.	26	2405	289	29,92%	0	2	10	0.745	N/A	966	7050	37
Int. J. Technology Management	23	4104	803	45,44%	0	1	2	0.492	0.659	1767	8580	32
Entre.and Regional Development	22	1537	116	33,14%	0	2	2	1.000	1.633	350	4734	33
J. Technology Transfer	18	1065	182	66,91%	0	0	0	1.305	1.884	272	1711	20
Industry and Innovation	13	704	160	83,33%	0	0	0	1.116	1.422	192	901	15
J. Knowledge Management	11	453	105	35,35%	0	0	0	1.257	N/A	297	1605	15
Innovation M. Policy & Practice	8	345	168	87,96%	0	0	0	0.439	N/A	191	423	9
Science and Public Policy	8	328	127	50,20%	0	0	0	0.985	N/A	253	715	10
Asian J. Technology Innovation	5	134	108	76,60%	0	0	0	0.167	0.260	141	155	5

The requirement to be considered in the ranking is to have at least 80 papers on innovation research and an H-index of 20. HI, TCI, TSI = H-index and number of cites and studies in innovation; %SI = Percentage of innovation articles in the journal; ≥ 250 , ≥ 100 , ≥ 50 = Number of articles with more than 250, 100 and 50 cites; IF2, IF5 = 2 and 5 year impact factor; TS, TC, H = Total studies, citations and *h*-index of the journal.

Table 3. Comparison with previous journal rankings

R	Linton and Thongpapanl (2004)	Fagerberg et al. (2012)	Shafique (2013)	This study – Total cites	This study – <i>h</i> - index
1	JPIM	RP	SMJ	SMJ	SMJ
2	RP	SMJ	RP	RP	RP
3	RTM	IJTM	ASQ	OS	AMJ
4	HBR	AMR	OS	AMJ	OS
5	SMJ	JMS	MS	MS	MS
6	MS	OS	JPIM	JPIM	JPIM
7	ASQ	AMJ	AMJ	AMR	AMR
8	RDM	TECH	AER	TECH	JBV
9	IEEETEM	ASQ	AMR	MISQ	JMK
10	AMR	OS _t	AJS	JMK	TECH
11	AMJ	RS	RJE	RS	RS
12	JMK	TFSC	EJ	HBR	JMS
13	CMR	MS	ASR	RDM	RDM
14	SMR	RDM	ROB	JBV	HBR
15	OS	ICC	HBR	TFSC	MISQ
16	TFSC	TASM	JM	CMR	CMR
17	IJTM	HR	JPE	JMS	JM
18	JMKR	SBE	ECMT	ICC	SBE
19	TECH	JIBS	JEL	IEEETEM	JIBS
20	TASM	CJE	QJE	JIBS	IEEETEM
21	AER	-	-	SBE	OS _t
22	LRP	-	-	TASM	ICC
23	MQ	-	-	JM	TFSC
24	JMS	-	-	OS _t	JBR
25	IMM	-	-	JBR	IMM

JPIM = J. Product Innovation Management; RP = Research Policy; RTM = Research-Technology Management; HBR = Harvard Business Review; SMJ = Strategic Management J.; MS = Management Science; ASQ = Administrative Science Quarterly; RDM = Research & Development Management; IEEETEM = IEEE Trans. Engineering Management; AMR = Academy of Management Review; AMJ = Academy of Management J.; JMK = J. Marketing; CMR = California Management Review; SMR = Sloan Management Review; OS = Organization Science; TFSC = Technological Forecasting and Social Change; IJTM = Int. J. Technology Management; JMKR = J. Marketing Research; TECH = Technovation; TASM = Technology Analysis & Strategic Management; AER = American Economic Review; LRP = Long Range Planning; MQ = Mississippi Quarterly; JMS = J. Management Studies; IMM = Industrial Marketing Management; OS_t = Organization Studies; RS = Regional Studies; ICC = Industrial & Corporate Change; HR = Human Relations; SBE = Small Business Economics; JIBS = J. Int. Business Studies; CJE = Cambridge J. Economics; AJS = American J. Sociology; RJE = RAND J. Economics; EJ = Economic J.; ASR = American Sociological Review; ROB = Research in Organizational Behavior; JM = J. Management; JPE = J. Political Economy; ECMT = Econometrica; JEL = J. Economic Literature; QJE = Quarterly J. Economics; MISQ = Management Information Systems Quarterly; JBV = J. Business Venturing; JBR = J. Business Research.

Table 4. Leading journals in innovation between 1989–1993

The table includes the journals with the highest number of papers in innovation in this period but ranked according to the h-index.

Table 5. Leading journals in innovation between 1994–1998

R	Journal	TPI	TCI	HI	TCI/TPI	%PI	TP	TC	H	TC/TP
1	Research Policy	169	10104	52	59,79	61,23%	276	15408	62	55,83
2	Strategic Management Journal	52	21370	49	410,96	16,83%	309	52909	117	171,23
3	Journal of Product Innovation Management	83	5203	39	62,69	59,71%	139	8468	52	60,92
4	Management Science	38	5287	34	139,13	5,79%	656	38372	96	58,49
5	Organization Science	34	10973	32	322,74	15,89%	214	28180	87	131,68
6	Academy of Management Journal	26	7627	26	293,35	8,50%	306	53511	127	174,87
7	California Management Review	28	4452	23	159,00	18,18%	154	11926	53	77,44
8	IEEE Transactions on Engineering Management	46	1407	23	30,59	23,83%	193	3783	34	19,6
9	Journal of Business Venturing	25	2177	22	87,08	18,66%	134	8682	53	64,79
10	Technology Analysis Strategic Management	77	1588	20	20,62	54,23%	142	2017	22	14,2
11	R D Management	48	1063	20	22,15	37,21%	129	2158	26	16,73
12	Technovation	88	1331	19	15,12	35,77%	246	2873	28	11,68
13	Small Business Economics	37	1265	19	34,19	17,87%	207	4444	36	21,47
14	Rand Journal of Economics	22	1641	18	74,59	10,63%	207	9922	57	47,93
15	Academy of Management Review	17	5534	17	325,53	9,09%	187	48518	104	259,45
16	Harvard Business Review	36	2956	17	82,11	5,11%	704	19934	71	28,32
17	International Journal of Industrial Organization	36	1370	17	38,06	19,89%	181	4307	35	23,8
18	Journal of Engineering and Technology Management	37	833	17	22,51	57,81%	64	1226	21	19,16
19	European Economic Review	20	1954	16	97,70	3,79%	528	15448	59	29,26
20	Sloan Management Review	24	1123	15	46,79	6,56%	366	10227	55	27,94
21	International Journal of Technology Management	157	1057	15	6,73	32,44%	484	2675	22	5,53
22	Regional Studies	31	1234	14	39,81	9,23%	336	5614	36	16,71
23	Journal of Industrial Economics	15	954	14	63,60	10,87%	138	4621	36	33,49
24	Journal of Management Studies	16	973	13	60,81	8,99%	178	6458	44	36,28
25	World Development	21	706	13	33,62	2,94%	715	17371	61	24,3
26	Research Technology Management	46	701	13	15,24	21,30%	216	1990	22	9,21
27	Technological Forecasting and Social Change	52	671	13	12,90	19,33%	269	2408	24	8,95
28	Human Relations	17	467	13	27,47	5,28%	322	9286	49	28,84
29	Review of Economics and Statistics	16	1483	12	92,69	4,42%	362	15588	62	43,06
30	Journal of Economic Behavior Organization	22	547	10	24,86	5,31%	414	7999	42	19,32
31	Environment and Planning A	17	374	10	22,00	3,13%	544	9476	43	17,42
32	Journal of Evolutionary Economics	16	244	10	15,25	28,07%	57	942	19	16,53
33	Futures	18	390	8	21,67	4,17%	432	3030	26	7,01
34	Long Range Planning	25	386	8	15,44	6,43%	389	4973	36	12,78
35	Industrial Marketing Management	19	283	8	14,89	8,37%	227	3226	27	14,21
36	Review of Industrial Organization	16	281	8	17,56	8,33%	192	1778	21	9,26
37	Applied Economics	25	266	8	10,64	3,24%	771	6054	30	7,85
38	Journal of Economic Dynamics Control	17	259	8	15,24	4,87%	349	6450	39	18,48
39	Economics Letters	18	220	7	12,22	1,69%	1068	9418	39	8,82
40	Technology in Society	27	108	6	4,00	14,52%	186	548	11	2,95

Table 6. Leading journals in innovation between 1999–2003

R	Journal	TPI	TCI	HI	TCI/TPI	%PI	TP	TC	H	TC/TP
1	Research Policy	241	18554	72	76,99	63,09%	382	27021	91	70,74
2	Strategic Management Journal	81	18135	66	223,89	23,82%	340	48572	117	142,86
3	Academy of Management Journal	58	12321	54	212,43	18,71%	310	46036	133	148,49
4	Management Science	69	8394	48	121,65	12,37%	558	42325	107	75,85
5	Organization Science	52	9438	41	181,50	23,96%	217	28955	92	133,43
6	Journal of Product Innovation Management	82	4912	40	59,90	62,60%	131	7010	50	53,51
7	Technovation	155	2654	29	17,12	46,13%	336	4806	34	14,3
8	R D Management	85	2149	28	25,28	49,13%	173	3634	37	21,01
9	Regional Studies	49	2853	27	58,22	14,41%	340	8494	44	24,98
10	IEEE Transactions on Engineering Management	61	2339	27	38,34	32,97%	185	5493	41	29,69
11	MIS Quarterly	23	8025	23	348,96	21,30%	108	21364	68	197,81
12	Industrial and Corporate Change	35	2370	23	67,71	42,17%	83	4234	36	51,01
13	Journal of Management Studies	34	1581	23	46,50	12,64%	269	12397	63	46,09
14	Small Business Economics	59	1464	23	24,81	25,65%	230	5629	40	24,47
15	Journal of Business Venturing	28	2183	22	77,96	20,14%	139	9362	54	67,35
16	Harvard Business Review	58	1805	22	31,12	7,30%	794	13205	58	16,63
17	Organization Studies	37	1563	22	42,24	18,05%	205	8809	55	42,97
18	Technological Forecasting and Social Change	77	1468	22	19,06	31,69%	243	3704	32	15,24
19	Journal of Engineering and Technology Management	41	1271	22	31,00	56,16%	73	1914	27	26,22
20	Academy of Management Review	22	5415	21	246,14	12,50%	176	31474	97	178,83
21	Technology Analysis Strategic Management	76	1537	21	20,22	52,41%	145	2379	27	16,41
22	International Journal of Industrial Organization	45	1307	21	29,04	13,72%	328	5881	38	17,93
23	Journal of Marketing	21	2466	20	117,43	13,38%	157	21543	90	137,22
24	International Journal of Technology Management	201	1534	20	7,63	40,85%	492	2971	24	6,04
25	Journal of Evolutionary Economics	40	807	20	20,17	33,06%	121	2570	27	21,24
26	Environment and Planning A (And E&P C)	49	1616	19	32,98	6,36%	770	15562	55	20,21
27	Journal of Business Research	37	1290	19	34,86	8,24%	449	12372	57	27,55
28	International Journal of Operations Production Management	35	1060	19	30,29	8,68%	403	10187	49	25,28
29	Industrial Marketing Management	27	1123	18	41,59	9,44%	286	8852	47	30,95
30	World Development	25	1024	18	40,96	4,01%	624	22353	73	35,82
31	California Management Review	22	974	18	44,27	15,38%	143	7562	50	52,88
32	European Planning Studies	45	718	16	15,96	21,43%	210	2746	27	13,08
33	Urban Studies	23	1071	14	46,57	3,73%	617	16045	60	26
34	International Journal of Production Economics	25	529	14	21,16	3,14%	796	18599	60	23,37
35	Oxford Review of Economic Policy	25	787	13	31,48	14,88%	168	3265	29	19,43
36	Scientometrics	37	477	13	12,89	7,79%	475	8133	43	17,12
37	Research Technology Management	51	548	12	10,75	27,42%	186	1570	19	8,44
38	European Economic Review	22	1065	11	48,41	5,12%	430	13796	59	32,08
39	Journal of Economic Behavior & Organization	21	635	11	30,24	5,29%	397	7899	44	19,9
40	Applied Economics (and AE Letters)	47	300	10	6,38	2,51%	1872	11958	34	6,39

Table 7. Leading journals in innovation between 2004–2008

R	Journal	TPI	TCI	HI	TCI/TPI	%PI	TP	TC	H	TC/TP
1	Research Policy	380	17354	70	45,67	74,66%	509	22889	76	44,97
2	Strategic Management Journal	92	9650	57	104,89	27,54%	334	24149	89	72,3
3	Management Science	90	6410	46	71,22	13,08%	688	27605	78	40,12
4	Technovation	288	6879	44	23,89	61,67%	467	9573	45	20,5
5	Organization Science	62	5771	42	93,08	24,70%	251	16904	78	67,35
6	Journal of Product Innovation Management	105	4659	41	44,37	72,92%	144	5876	46	40,81
7	Academy of Management Journal	48	5431	39	113,15	16,16%	297	28121	95	94,68
8	R D Management	118	3054	31	25,88	64,48%	183	3936	33	21,51
9	Journal of Management Studies	57	2843	31	49,88	17,76%	321	12852	59	40,04
10	Regional Studies	82	3718	29	45,34	23,56%	348	7456	40	21,43
11	Journal of Business Venturing	40	1990	28	49,75	21,62%	185	7986	52	43,17
12	Industrial Marketing Management	69	1862	28	26,99	16,75%	412	9404	45	22,83
13	Harvard Business Review	93	2890	27	31,08	9,31%	999	10082	47	10,09
14	Technological Forecasting and Social Change	145	2751	27	18,97	42,27%	343	6603	37	19,25
15	Industrial and Corporate Change	82	2252	26	27,46	42,05%	195	4868	33	24,96
16	Journal of Business Research	68	1749	26	25,72	8,85%	768	17036	56	22,18
17	Organization Studies	46	1777	25	38,63	13,18%	349	10799	51	30,94
18	Journal of Economic Geography	38	2212	24	58,21	26,03%	146	6472	43	44,33
19	Environment and Planning A (And E&P C)	84	1674	24	19,93	11,90%	706	13941	50	19,75
20	Small Business Economics	56	1683	23	30,05	19,65%	285	6303	41	22,12
21	IEEE Transactions on Engineering Management	62	1230	23	19,84	27,93%	222	4080	34	18,38
22	European Planning Studies	138	1808	22	13,10	41,32%	334	3428	26	10,26
23	Information Management	37	1703	22	46,03	11,21%	330	12795	59	38,77
24	Technology Analysis Strategic Management	102	1465	21	14,36	60,36%	169	2122	23	12,56
25	California Management Review	42	1110	20	26,43	28,77%	146	3598	33	24,64
26	Ecological Economics	41	1274	19	31,07	3,90%	1051	27913	75	26,56
27	Journal of Engineering and Technology Management	50	1044	19	20,88	58,14%	86	1463	23	17,01
28	MIT Sloan Management Review	42	1004	19	23,90	19,63%	214	3718	32	17,37
29	Journal of Evolutionary Economics	57	964	19	16,91	42,22%	135	2054	29	15,21
30	International Journal of Industrial Organization	47	1068	18	22,72	13,91%	338	4251	31	12,58
31	Entrepreneurship and Regional Development	40	800	18	20,00	32,00%	125	2597	28	20,78
32	Research Technology Management	84	894	16	10,64	46,93%	179	1319	18	7,37
33	Industrial Management Data Systems	50	775	16	15,50	13,93%	359	5205	35	14,5
34	International Journal of Production Research	34	605	16	17,79	2,43%	1402	17516	45	12,49
35	International Journal of Technology Management	219	1176	15	5,37	50,34%	435	2276	19	5,23
36	World Development	37	753	15	20,35	5,97%	620	15830	57	25,53
37	Scientometrics	57	671	15	11,77	9,45%	603	11713	47	19,42
38	International Journal of Operations Production Management	36	798	14	22,17	12,08%	298	6692	41	22,46
39	Journal of Business Ethics	33	657	14	19,91	2,82%	1169	17944	50	15,35
40	Service Industries Journal	37	477	14	12,89	11,75%	315	2485	21	7,89

Table 8. Leading journals in innovation between 2009–2013

R	Journal	TPI	TCI	HI	TCI/TPI	%PI	TP	TC	H	TC/TP
1	Research Policy	475	5872	33	12,36	75,9%	626	7630	38	12,19
2	Organization Science	124	3176	31	25,61	29,2%	424	7088	42	16,72
3	Technovation	225	2815	25	12,51	77,9%	289	3386	26	11,72
4	Strategic Management Journal	100	1863	25	18,63	26,3%	380	6388	41	16,81
5	Technological Forecasting and Social Change	299	2446	24	8,18	47,8%	625	4667	27	7,47
6	Management Decision	126	1472	24	11,68	26,6%	474	3351	28	7,07
7	Journal of Product Innovation Management	284	2348	22	8,27	75,5%	376	2815	23	7,49
8	Journal of Management Studies	62	1427	21	23,02	20,8%	298	4655	33	15,62
9	Management Science	86	1182	19	13,74	11,9%	722	6282	31	8,7
10	R D Management	142	1228	18	8,65	84,0%	169	1350	18	7,99
11	Industrial and Corporate Change	147	1139	17	7,75	54,9%	268	1753	20	6,54
12	Journal of Business Research	146	1092	17	7,48	13,1%	1114	6518	29	5,85
13	Regional Studies	136	1075	17	7,90	30,6%	444	2479	20	5,58
14	Industrial Marketing Management	146	1036	16	7,10	23,6%	618	4043	24	6,54
15	Ecological Economics	65	604	16	9,29	5,2%	1250	141212	45	11,3
16	Small Business Economics	97	892	15	9,20	26,1%	372	2439	20	6,56
17	International Journal of Production Economics	67	692	15	10,33	4,3%	1574	12681	37	8,06
18	Expert Systems with Applications	124	880	14	7,10	2,0%	6193	51778	53	8,36
19	Journal of Economic Geography	59	706	14	11,97	28,9%	204	2221	22	10,89
20	Service Industries Journal	149	698	14	4,68	23,5%	635	2467	18	3,89
21	Scientometrics	155	762	13	4,92	13,5%	1150	7614	27	6,62
22	Journal of Technology Transfer	135	667	13	4,94	69,6%	194	1008	16	5,2
23	International Journal of Project Management	70	547	13	7,81	16,2%	433	3024	20	6,98
24	European Planning Studies	204	803	12	3,94	41,0%	498	1683	16	3,38
25	Journal of Knowledge Management	102	514	12	5,04	34,3%	297	1737	16	5,85
26	Journal of Engineering and Technology Management	69	451	12	6,54	69,7%	99	550	12	5,56
27	Technology Analysis Strategic Management	221	744	11	3,37	73,4%	301	1001	12	3,33
28	Journal of Business Ethics	79	512	11	6,48	4,3%	1817	10271	30	5,65
29	Industrial Management Data Systems	70	408	11	5,83	19,8%	353	1773	17	5,02
30	Entrepreneurship and Regional Development	60	369	11	6,15	35,3%	170	902	14	5,31
31	International Journal of Technology Management	226	531	9	2,35	63,5%	356	739	9	2,08
32	Industry and Innovation	134	457	9	3,41	84,3%	159	542	10	3,41
33	Journal of Evolutionary Economics	87	406	9	4,67	48,9%	178	686	12	3,85
34	Science and Public Policy	127	369	9	2,91	50,2%	253	795	10	3,14
35	Innovation Management Policy Practice	140	292	9	2,09	91,5%	153	313	9	2,05
36	Research Technology Management	99	290	9	2,93	65,1%	152	359	9	2,36
37	International Journal of Human Resource Management	70	247	9	3,53	7,7%	914	3492	20	3,82
38	Harvard Business Review	65	402	8	6,18	4,8%	1366	2272	20	1,66
39	IEEE Transactions on Engineering Management	85	291	8	3,42	32,0%	266	1086	13	4,08
40	Creativity and Innovation Management	90	253	7	2,81	77,6%	116	377	9	3,25