Mapping the Global Research Output on 'Intellectual Property Rights' : A Scientometric Analysis

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ABSTRACT

This Scientometric study explores the global landscape of intellectual property rights (IPR) research, examining key aspects such as funding agencies, publication titles, publishers, research areas, affiliations, document types, countries, and authors. Analysing extensive datasets reveals trends, prominence, and contributions within the academic discourse. The central role of prestigious publishers and funding agencies, and the interdisciplinary nature of IPR research. This



comprehensive overview provides insights crucial for policymakers, researchers, and institutions, facilitating informed decisions and strategic planning in intellectual property rights.

Keywords : Intellectual Property Rights, Scientometrics, Author Contribution, Affiliation, Funding.

1. Introduction :

Intellectual property rights (IPR) encompass legal protections for intangible assets such as inventions, artistic works, trademarks, and trade secrets. These rights grant creators and innovators exclusive rights to their creations, fostering innovation, creativity, and economic growth. Understanding the dynamics of IPR is crucial in navigating the complex intersection of law, technology, business, and society.

Scientometric studies offer valuable insights into the landscape of IPR research by quantitatively analysing scholarly publications, citations, and collaborations. By employing scientometric methods, researchers can identify trends, emerging topics, influential authors, and key research areas within the field of IPR. Additionally, scientometric analysis can help assess the impact of funding agencies, publishers, and academic institutions on IPR research, shedding light on the global distribution of knowledge and expertise.

2. Objectives of the Study :

- To measure and quantify the research publications over a specified time period
- To identify the most prolific authors
- To evaluate the contributions of various journals and conference



- To map the primary funding sources in intellectual property rights
- To analyse the distribution of institutional affiliations
- To evaluate the extent of interdisciplinary research
- To analyse the primary research areas

3. Methodology:

To conduct a comprehensive scientometric analysis of research output on Intellectual Property Rights (IPR), data was meticulously gathered from the Web of Science (WoS) database. Keywords such as "Intellectual Property," "Copyright," "Trademark," and "IPR" were used to retrieve relevant publications spanning from 2000 to 2023. The extracted data, included author affiliations, institutions, research areas, and publication types like journal articles, conference proceedings, and book chapters.

The analysis focused on publication counts and trends over time, institutional contributions, and the distribution across research areas to highlight the interdisciplinary nature of IPR. This methodology ensures a thorough and systematic approach to mapping the research output on Intellectual Property Rights, providing valuable insights into the trends, contributions, and impact of this field.

4. Literature Review :

The literature review gathers insights from recent research to understand the current state of knowledge. It examines different studies to see what they reveal about the topic, including their methods and findings. This review aims to highlight areas where understanding is strong and identify gaps where further research could contribute new insights.

Singh and Hasan (2013) conducted a Scientometric analysis using the Science Citation Index Expanded (SCI-Expanded) to evaluate scholarly output on intellectual property from 2001 to 2010. They identified 1439 publications, averaging 143.9 papers annually, with a peak of 172 papers in 2010. The study involved 74 countries, led by the United States (39.75%), followed by Great Britain (8.23%), and India (3.75%). This comprehensive review utilized Microsoft Excel for data analysis, revealing significant growth in intellectual property literature post-2002. Key trends include a notable increase in research output from various global contributors.

Gnanasekaran and Balamurugan (2016) conducted a scientometric analysis to assess the global landscape of Intellectual Property Rights (IPRs) research from 2005 to 2014 using the Scopus database. They identified over 1.5 million publications, analyzing trends in publication output, citation rates, and the influence of different countries and institutions. The study highlights the dominance of developed countries like the United States, China, and the United Kingdom in IPR research output. Journals were the primary source of publications, reflecting the multidisciplinary nature of IPR research across fields such as Medicine and Engineering, underscoring the global importance and scholarly impact of IPR studies.

Hosseini and others (2021) conducted a dynamic co-word analysis spanning 2008-2019 to map the intellectual structure of GIS-T (Geographic Information Systems in Transportation). They identified key thematic areas such as sustainability, health, planning and management, and methods/tools based on Web of Science publications. This study pioneers the application of text mining methods to unravel the interdisciplinary landscape of GIS-T research. Using clustering algorithms and visualization tools like Gephi, they highlighted evolving



research themes and prominent authors in the field. Their findings underscore the diverse and multidisciplinary nature of GIS-T research, emphasizing its growth trajectory over the analyzed period.

5. Analysis and Discussion :

Table 1.Year-wise Distribution of Publications

Sl. No.	Publication Year	No. of Publications	%	Sl. No.	Publication Year	No. of Publications	%
1.	2023	271	4.10	25.	1999	70	1.06
2.	2022	328	4.96	26.	1998	102	1.54
3.	2021	330	4.99	27.	1997	63	0.95
4.	2020	300	4.54	28.	1996	108	1.63
5.	2019	280	4.24	29.	1995	58	0.88
6.	2018	313	4.74	30.	1994	33	0.50
7.	2017	348	5.27	31.	1993	96	1.45
8.	2016	329	4.98	32.	1992	11	0.17
9.	2015	317	4.80	33.	1991	13	0.20
10.	2014	298	4.51	34.	1990	26	0.39
11.	2013	303	4.59	35.	1989	15	0.23
12.	2012	265	4.01	36.	1988	6	0.09
13.	2011	357	5.40	37.	1987	9	0.14
14.	2010	320	4.84	38.	1986	1	0.02
15.	2009	308	4.66	39.	1983	1	0.02
16.	2008	261	3.95	40.	1982	1	0.02
17.	2007	194	2.94	41.	1979	1	0.02
18.	2006	167	2.53	42.	1977	1	0.02
19.	2005	115	1.74	43.	1972	1	0.02
20.	2004	165	2.50	44.	1970	1	0.02
21.	2003	111	1.68		**Total**	**6608**	**100.00**
22.	2002	94	1.42				
23.	2001	81	1.23				
24.	2000	136	2.06				

This table presents a chronological analysis of publication trends over the past five decades. The data reveals a concentration of publications in recent years, with 2011 leading at 5.403%, followed closely by 2017 (5.266%) and 2021 (4.994%). The distribution shows a steady output over the past decade, with 2010, 2016, and 2022 among the top years, each contributing about 5% to the total. These years reflect active research and publication trends, likely driven by technological advancements and changes in academic publishing. In contrast, earlier years show a decline in publications, especially before the 2000s. Notable drops in years like 1993, 1999, and 2001, each accounting for less than 2% of the total, suggest shifts in research focus or data availability over time.

Table 2. Author Contribution Patterns in Publication Trends

Sl. No.	Author	No. of Publications	%
1.	Anguera J	46	0.696
2.	AndÃºjar A	28	0.424
3.	Fricdman PA	22	0.333
4.	Maskus KE	22	0.333
5.	Chu AC	21	0.318
6.	Meenakshi S	21	0.318
7.	Van Overwalle G	21	0.318
8.	Nair MD	20	0.303
9.	Huys I	19	0.288
10.	Puente C	19	0.288

The table highlights the publication count and percentage contribution of various authors in a specific field. Anguera J leads with 46 publications, making up 69.6% of the total contributions, indicating a significant influence in the field.

Andújar A and Anonymous follow with 28 (42.4%) and 26 (39.3%) publications respectively, showcasing their substantial involvement. A

cohort of authors, including Friedman PA, Maskus KE, Chu AC, Meenakshi S, and Van Overwalle G, each contributed 22 publications, representing 33.3%. Further down, Nair MD, Huys I, and Puente C have 20 and 19 publications each, with percentages around 30.3% and 28.8%. Authors such as Srinivasan A, Karthikeyan P, Liu Y, Picher C, Blind K, Delgado J, Mahato DK, Naghavi A, and Saggi K contributed between 15 and 13 publications, with percentages from 22.7% to 19.7%. Despite their lower individual counts, they collectively impact the overall body of work.

This diversity of contributors underscores the collaborative nature of scholarly research, where varying levels of contribution collectively advance the field.

Table 3. Institutional Contribution Analysis

Sl. No.	Affiliation with Department	Publication	Percentage
1.	University of Nottingham Faculty of Social Sciences	25	0.378
2.	Zhejiang University Faculty of Social Sciences	23	0.348
3.	The Gandhigram Rural Institute Deemed University Department of Chemistry	21	0.318
4.	University of Colorado Boulder College of Arts and Sciences	20	0.303
5.	University of Colorado Boulder Department of Economics	19	0.288
6.	Columbia Medical Center	17	0.257
7.	University of Bologna School of Economics and Management	17	0.257
8.	New York University School of Law	16	0.242
9.	Stanford Medicine	16	0.242
10.	University of Bologna Department of Economics	16	0.242

The table presents data on affiliations with various academic departments and institutions, highlighting their publication counts and percentage contributions. Leading the list is the University of Nottingham Faculty of Social Sciences with 25 publications, accounting for approximately 37.8% of the total. Zhejiang University Faculty of Social Sciences follows closely with 23 publications (34.8%), indicating significant research activity in social sciences. The Gandhigram Rural Institute Deemed University Department of Chemistry has 21 publications (31.8%), reflecting a strong focus on scientific research.

Prominent institutions such as the University of Colorado Boulder, Stanford University, and the University of Bologna also feature. Internationally, Zhejiang University, Osaka University, and Tsinghua University show substantial research activity, indicating global collaboration. The interdisciplinary nature of academic research is evident, with contributions from Columbia Medical Centre and New York University School of Law alongside traditional departments.

Table 4. Global Research Publication Landscape

Sl. No.	Countries/Regions	Publication	Percentage
1.	USA	1836	27.785
2.	Peoples Republic China	1035	15.663
3.	England	619	9.367
4.	India	600	9.08
5.	Germany	363	5.493
6.	Canada	277	4.192
7.	Italy	277	4.192
8.	Australia	258	3.904
9.	France	241	3.647
10.	Netherlands	213	3.223



Table 4 presents a detailed analysis of global academic research publications by country or region, highlighting top ten significant contributors to scholarly output. The United States leads with 1836 publications, comprising 27.785% of the total, underscoring its dominant role in global research. Following closely, the People's Republic of China and England contribute 15.663% and 9.367%, respectively, demonstrating substantial academic output. India and Germany also feature prominently with 9.08% and 5.493%, reflecting their growing influence in research.

Countries like Canada, Italy, and Australia maintain notable contributions, each accounting for around 4% of publications. France and the Netherlandsemphasize regional strengths in academic research. It shows the importance of international collaboration in advancing knowledge and addressing global challenges across diverse fields of study.

Table 5. Analysis of Scholarly Publication Types

Sl. No.	Document Types	Publication	Percentage
1.	Article	4486	67.887
2.	Proceeding Paper	1611	24.38
3.	Review Article	322	4.873
4.	Editorial Material	184	2.785
5.	Book Review	131	1.982
6.	Early Access	75	1.135
7.	Meeting Abstract	42	0.636
8.	Letter	40	0.605
9.	Book Chapters	17	0.257

10.	News Item	17	0.257
11.	Correction	7	0.106
12.	Note	4	0.061
13.	Reprint	3	0.045
14.	Data Paper	2	0.03
15.	Excerpt	2	0.03
16.	Retracted Publication	2	0.03
17.	Correction, Addition	1	0.015
18.	Discussion	1	0.015

The table shows different document types inpublications, highlighting their publication counts and percentage contributions. Leading the list is the "Article" category with 4486 publications, making up 67.887% of the total. Articles are the primary mode of scholarly communication, presenting original research findings and theoretical contributions. "Proceeding Papers" follow with 1611 publications (24.38%), often presented at conferences, sharing research insights and fostering academic discourse.

"Review Articles" account for 322 publications (4.873%), critically evaluating existing literature and guiding future research. "Editorial Material" and "Book Reviews" contribute 184 (2.78%) and 131 (1.98%) publications respectively, offering editorial comments and critical assessments of books. Smaller contributions come from "Early Access," "Meeting Abstract," and "Letter" document types, ranging from 0.6% to 1.1%, reflecting preliminary findings and conference abstracts. "Book Chapters," "News Items," and "Corrections" contribute minimally, serving specific purposes like disseminating book chapters or rectifying errors. Each serves unique functions in knowledge dissemination, scholarly exchange, and advancing research.



Table 6. Funding Agencies Contributions to Intellectual Property Rights

Sl. No.	Funding Agencies	Publication	Percentage
1.	National Natural Science Foundation of China NSFC	197	2.981
2.	United States Department of Health Human Services	164	2.482
3.	National Institutes of Health (NIH USA)	161	2.436
4.	European Union Eu	75	1.135
5.	UK Research Innovation Ukri	73	1.105
6.	Medtronic	63	0.953
7.	Pfizer	57	0.863
8.	Ministry of Education Culture Sports Science and Technology Japan (MEXT)	56	0.847
9.	Japan Society for The Promotion of Science	54	0.817
10.	Defence Research Development Organisation (DRDO)	46	0.696

The table highlights the contributions of various funding agencies to research publications, revealing the crucial role they play in scientific research and innovation.

Topping the list is the National Natural Science Foundation of China (NSFC) with 197 publications, accounting for 2.981% of the total. This underscores China's significant investment in scientific R&D. US agencies, including the Department of Health and Human Services (164 publications) and the National Institutes of Health (NIH) (161 publications), contribute 2.482% and 2.436% respectively, reflecting their support for biomedical research. The European Union (EU) and UK Research and Innovation (UKRI) also feature prominently with 75 and 73 publications, contributing 1.135% and 1.105%. These agencies foster collaborative research and scientific excellence in Europe

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and the UK. Additionally, industry players such as Medtronic, Pfizer, and Novartis fund research in healthcare and pharmaceuticals, indicating private sector involvement in R&D. Japanese agencies like MEXT and the Japan Society for the Promotion of Science highlight Japan's commitment to innovation. Government agencies such as India's DRDO and Australia's DMTC Limited emphasize strategic research funding, particularly in defense and technology.

Table 7. Trends in Scholarly Publication Titles

Sl. No.	Publication Titles	Publication	Percentage
1.	Journal of Intellectual Property Rights	214	3.238
2.	Research Policy	111	1.68
3.	Technological Forecasting and Social Change	50	0.757
4.	IIC International Review of Intellectual Property and Competition Law	43	0.651
5.	Sustainability	40	0.605
6.	Queen Mary Journal of Intellectual Property	38	0.575
7.	Technovation	36	0.545
8.	Journal of Ethnopharmacology	35	0.53
9.	Lecture Notes in Computer Science	35	0.53
10.	Acta Horticulture	33	0.499

The table analyses the distribution of research publications across various academic journals, highlighting their contributions to scholarly discourse. Leading the list is the "Journal of Intellectual Property Rights," with 214 publications, accounting for 3.238% of the total. This journal is pivotal in intellectual property research. "Research Policy" follows with 111 publications (1.68%), significantly impacting innovation and technology management discussions. Other notable journals include "Technological Forecasting and Social Change," "IIC International Review of Intellectual Property and Competition Law,"



and "Sustainability," contributing to research in technology, law, and sustainability. Specialized journals like "Queen Mary Journal of Intellectual Property," "Technovation," and "Journal of Ethnopharmacology" focus on niche research areas. Conference proceedings, such as "Lecture Notes in Computer Science" and "Acta Horticulture," highlight the importance of sharing research at conferences. This diversity of journals supports academic research across disciplines, helping researchers find relevant literature for scholarly collaboration.

Table 8. Publisher Trends in Intellectual Property Rights Research

Sl. No.	Publishers	Publication	Percentage
1.	Elsevier	1175	17.781
2.	Springer Nature	711	10.76
3.	Wiley	583	8.823
4.	IEEE	378	5.72
5.	Taylor & Francis	376	5.69
6.	Oxford University Press	194	2.936
7.	NISCAIR	146	2.209
8.	Sage	141	2.134
9.	Cambridge University Press	99	1.498
10.	MDPI	86	1.301

The table provides data on the distribution of research publications among various publishers, highlighting key players and the diversity within academic publishing. Leading the list is Elsevier, with 1175 publications, accounting for 17.781% of the total. This underscores Elsevier's significant influence across various disciplines. Following is Springer Nature, with 711 publications (10.76%), noted for its high-quality scholarly works under imprints like Springer, Nature, and Palgrave Macmillan.

Wiley, IEEE, and Taylor & Francis are also major contributors, each with hundreds of publications covering diverse subjects.

Oxford University Press, National Institute of Science Communication and Information Resources (NISCAIR), and Sage further contribute significantly across a range of topics, including scientific research, humanities, and social sciences, Cambridge University Press, and MDPI offering insights within their domains.

Table 9. Analysis of Research Publications by Research Areas

Sl. No.	Research Areas	Publication	Percentage
1.	Business Economics	2223	33.641
2.	Government Law	1056	15.981
3.	Engineering	796	12.046
4.	Computer Science	602	9.11
5.	Agriculture	292	4.419
6.	International Relations	288	4.358
7.	Environmental Sciences Ecology	281	4.252
8.	Science Technology Other Topics	259	3.919
9.	Social Sciences Other Topics	252	3.814
10.	Information Science Library Science	224	3.39

The table provides an overview of research publications across diverse fields, revealing insights into the distribution and focus of academic research. Business Economics leads with 2223 publications, constituting 33.641% of the total, highlighting its pivotal role in academic discourse and policy formulation. Government Law follows closely with 1056 publications (15.981%), emphasizing its influence on societal norms and governance structures. Engineering (796) and Computer Science (602) underscore the significance of technological innovation and computational advancements in addressing complex challenges across sectors.



Research in Agriculture, Environmental Sciences Ecology, and Plant Sciences reflects a growing focus on sustainability and ecosystem conservation. International Relations, Social Sciences, and Information Science Library Science highlight data-driven decision-making and healthcare advancements.

Table 10. Analysis of Research Publications by Affiliation

Sl. No.	Affiliation with Department	Publication	Percentage
1.	University of Nottingham Faculty of Social Sciences	25	0.378
2.	Zhejiang University Faculty of Social Sciences	23	0.348
3.	The Gandhigram Rural Institute Deemed University Department of Chemistry	21	0.318
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9.	Stanford Medicine	16	0.242
10.	University of Bologna Department of Economics	16	0.242

The table presents insights into research publication distribution across academic affiliations, showcasing contributions from various universities and research centers to scholarly discourse.

The University of Nottingham's Faculty of Social Sciences leads with 25 publications (0.378% of the total), highlighting its impactful research in sociology, psychology, and economics. Zhejiang University's Faculty of Social Sciences follows closely with 23 publications (0.348%), emphasizing its global academic influence in social sciences.

Prominent mentions include Gandhigram Rural Institute Deemed University's Department of Chemistry and the University of Colorado Boulder's College of Arts and Sciences and Department of Economics, illustrating diverse research strengths across institutions. Medical and research centers like Columbia Medical Center, Stanford Medicine, and Stanford University School of Medicine contribute significantly to medical research and innovation.

6. Conclusion :

In conclusion, the data analysis provides valuable insights into academic research and scholarly discourse. The distribution of research publications by academic affiliations highlights diverse contributions across various fields. Prominent institutions underscore their expertise, while interdisciplinary collaboration drives innovation and knowledge exchange.

The breadth of research areas, from business economics to engineering, reflects the interdisciplinary nature of academic inquiry. Leading publications and conference proceedings play significant roles in disseminating research findings. The linguistic diversity in research publications, with English predominating, underscores the need for inclusivity and international collaboration.

The distribution of research across publishers and funding agencies highlights collaborative efforts in supporting scientific research. This comprehensive overview aids researchers, policymakers, and academic institutions make informed decisions and strategic investments to promote global academic research and innovation.



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