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RESEARCH ARTICLE

Funding agencies in Tamil Nadu State Universities: A scientometric perspective

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Abstract

Scientometrics is a significant area of information science because it offers a unique variety of tools and techniques for managing knowledge in social and organizational contexts as well as for maintaining and evaluating information resources. The multiple scientometric components of the articles published by Tamil Nadu's top eight universities between 1989 and 2023 were examined in this study. Data analysis shows that the average growth rate is increasing at a 9.76% annual pace. This extensive study finds the subtle interactions between funding agencies and research productivity in Tamil Nadu's state universities. A comprehensive assessment of the funding landscape is carried out by methodically gathering data from eight notable universities, including Alagappa University, Anna University, Annamalai University, and others. With a remarkable total of 19,524 funding agencies discovered across various roles within these universities, the breadth of support highlights the importance of external money in propelling research efforts. Notably, Anna University appears as a frontrunner, with 4,162 funding agencies, demonstrating a strong network of support. The findings highlight the relevance of understanding how funding agencies affect research ecosystems within academic institutions.

Keywords: Funding agencies, Scientometric, Publications.

Introduction

In a special issue of the American Society for Information Sciences (JASIS), scientometrics is often defined as "the quantitative study of science and technology." The Russians Nalimov and Mulchenko (1969) defined scientometrics as quantitative methods dealing with the analysis of science as an information process. According to Beck (1978), scientometrics is defined as the quantitative evaluation and comparison of scientific activity, productivity and progress. Bookes (1990) provided further insight into usage and definition, arguing that "Scientometrics, developed by Tibor Braun, has become prolific in science policy research. Its techniques have been developed by small groups of researchers working enthusiastically in compact research units, particularly in Budapest and Leiden. But, other research units in Europe, East and West began to engage in scientometric research. The concept has now acquired an important role in the social sciences. So far, applications have been limited to using the citation data provided by the ISI, but further improvements are now being critically explored. Although the five techniques of scientometrics and bibliometrics are very similar, their different roles are distinguished by very different contexts. In addition, Tague-Sutcliffe (1992) defined scientometrics as "a scientific discipline or an economic activity to study the quantitative aspects of science." It is part of the sociology of science and is applied to science policy decision-making. It includes quantitative studies of scientific activity, including, but not limited to, publications, and thus overlaps to some extent with bibliometrics.

Review Literature

Zou (2022) investigated the impact of funding on research and development in Shenzhen city from 2008 to 2020, utilizing metadata from the Web of Science database, government documents, and relevant literature. The study delved into patterns of scholarly communication, funded research programs, capabilities of fund-receiving institutions, funding categories, and geographical influences. Findings revealed that scientific publications predominantly originated from publicly funded institutions and research institutes rather

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than private companies, with geography playing a crucial role in collaborations. Maheswaran (2016) conducted a scientometric analysis of research funding patterns among G9 countries from 2009 to 2014, highlighting China's highest percentage of funded publications and the United States' role as a primary sponsor for papers from other nations. Governmental bodies primarily sponsored financed articles, with a focus on domestic research initiatives. Beula and Velmurugan (2021) examined research outcomes and trends in diabetes, particularly within India, from 2009 to 2018. Their analysis, utilizing various scientometric techniques, revealed significant research output and collaboration within the country, offering insights into key journals and areas for future research and improvement. Liu (2020) conducted a study on the increasing use of Scopus in academic research and evaluation practices, particularly focusing on its data quality and reliability in comparison to Web of Science. Using twenty-six English papers published between 2014 and 2019, the research examined the accuracy of funding information in Scopus. The findings indicated that Web of Science generally provided more accurate funding information compared to Scopus, which still exhibited noticeable errors in funding acknowledgment text and funding agency fields. The study suggests the need for Scopus to enhance its methods for identifying funding acknowledgment text and improve the extraction and standardization strategy for funding .

Materials and Methods

This chapter aims to outline the objectives of the current study, provide a methodological description including sampling techniques and data collection methods, discuss the statistical tools utilized, address the limitations of the study, and give particular emphasis to the research output of the "Top Eight Tamil Nadu State Universities."

Objective of study

The objective of the study was to provide a scientometric analysis of the research output from Tamil Nadu State Universities that was published in academic journals all over the world. Among the parameters examined are:

- To investigate the pattern of growth in the research output of the eight universities;
- In order to determine the publication count and citation pattern of Tamil Nadu universities,
- Identify the diffusion patterns of eight universities, including source of funding.
- Research productivity of eight universities: Funding Agencies with a prolific track record

Results and Discussion

Tamil Nadu is very proud of numerous high-ranking universities that produce academicians as well as those involved in the research processes. Anna University, set up in 1978, is fairly distinctive, with an NIRF rank of 14 and a score of 60.48, well known as the holder of the engineering course (Figure 1 and Table 1). Bharathiyar University was established in the year of 1982 and it is at the ranking position of 21st acquired with a score of 57.82, extended special emphasis on performing interdisciplinary research and innovation activities. Alagappa University, set up in 1985, is placed at rank 30 with a score of 53.53 and is especially strong in the categories of management and science. The Bharathidasan University, which was established in 1982, occupies the 41st place and has a score of 51.48 and is known for its Arts and Science faculties. The history of the university for madras could be traced back to 1857 and currently, it has the rank 50 with 49 scores. 50 and is a versatile scholar in most fields of study that exist today. Finally, Madurai Kamaraj University, which was founded in 1966, got the 53rd position having a score of 48. Both persons are identified with the University of Southern England 95, which indeed consists of research centers and distance learning sections. Periyar

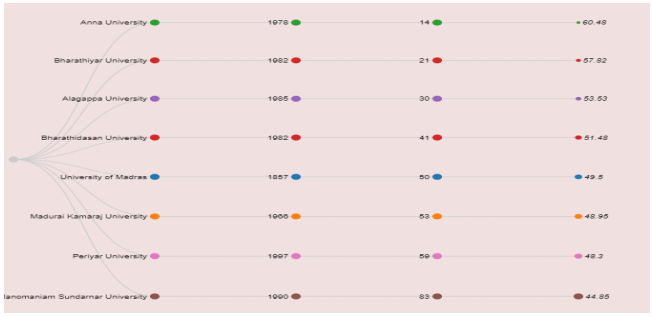

Figure 1: Tamil Nadu's top universities: A NIRF ranking overview

Table 1: Tamil Nadu's top Universities: A NIRF ranking overview

S. No	*Name of the University*	*Established Year*	*NIRF Ranking*	*NIRF Score*	*URL Link*
1	Anna University	1978	14	60.48	https://www.annauniv.edu/
2	Bharathiyar University	1982	21	57.82	https://b-u.ac.in/
3	Alagappa University	1985	30	53.53	https://www.alagappauniversity.ac.in/
4	Bharathidasan University	1982	41	51.48	https://www.bdu.ac.in/
5	University of Madras	1857	50	49.50	https://www.unom.ac.in/
6	Madurai Kamaraj University	1966	53	48.95	https://mkuniversity.ac.in/new/
7	Periyar University	1997	59	48.30	https://www.periyaruniversity.ac.in/
8	Manonmaniam Sundaranar University	1990	83	44.85	https://www.msuniv.ac.in/

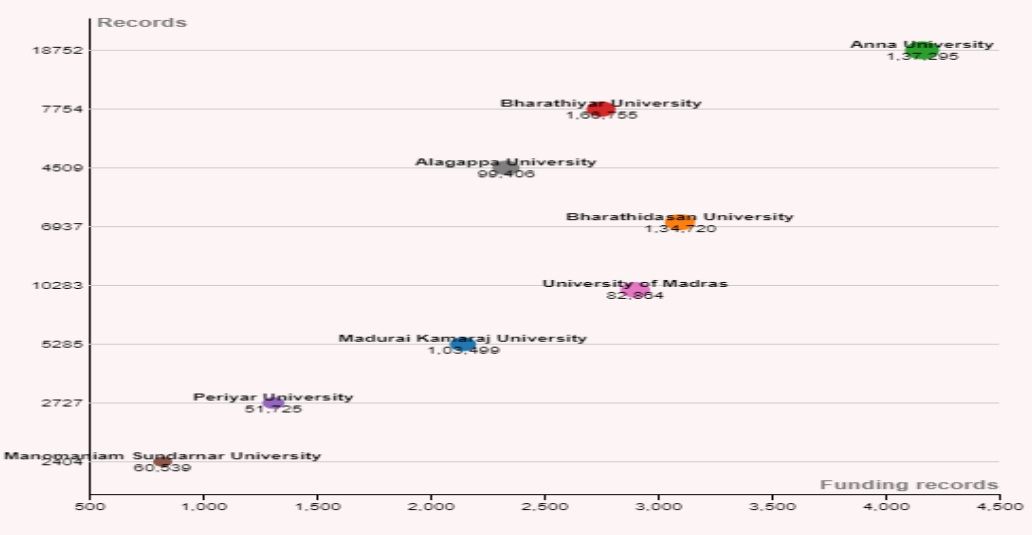

Figure 2: Research and Funding: Tamil Nadu Universities compared

Table 2: Publication count and citation pattern of Tamil Nadu Universities

S. No	*Name of the University*	*H-index*	*Records*	*Citation*	*Citation per item*	*Total no. of authors*	*Funding records*
1	Anna University	182	18,752	1,37,295	20.29	21,216	4,162
2	Bharathiyar University	139	7,754	1,66,755	21.47	10,257	2,751
3	Alagappa University	106	4,509	99,406	22	6,203	2,333
4	Bharathidasan University	123	6,937	1,34,720	19.42	14,838	3,085
5	University of Madras	136	10,283	82,864	20.12	15,721	2,914
6	Madurai Kamaraj University	113	5,285	1,03,499	19.58	6,801	2,144
7	Periyar University	83	2,727	51,725	18.93	4,437	1,311
8	Manonmaniam Sundaranar University	77	2,404	60,539	25.19	7,290	824

University, established in 1997 holds rank 59 with a score of 48. 30, is categorized in socio-economic development and community sensitization. The Manonmaniam Sundaranar University, founded in 1990, is placed at 83 with a score of 44.85 for promoting rural development and sustainable use of natural resources.

The Figure 1 depicts the ranks of several Tamil Nadu universities, together with their establishment years and a specific metric value (which could be their overall score or another performance indicator).

Table 2 provides insights into the performance of several universities based on various metrics. Among the universities listed, Anna University stands out with a high H-index of 18,752 and a substantial number of records and citations, indicating significant research output and impact. Bharathiyar University follows closely with an impressive H-index of 139 and a remarkable citation count of 1,66,755, showcasing its strong academic standing. Alagappa University also demonstrates a commendable H-index of 106, reflecting its contributions to scholarly research. Bharathidasan University, Madurai Kamaraj University, and the University of Madras exhibit notable citation per-item ratios, suggesting a high level of impact per research output. Meanwhile, Periyar University and Manonmaniam Sundaranar University demonstrate relatively lower H-index values but still contribute significantly to research, as indicated by their respective citation counts. The total number of authors involved in research varies across universities, with Bharathiyar University having the highest count of 10,257 authors, reflecting its extensive collaborative research efforts. Funding records, which signify the financial support received by each university for research endeavors, also vary, with Manonmaniam Sundaranar University having the lowest funding records (Figue 2). Overall, the table highlights the diverse academic landscapes of these universities, showcasing their research productivity, impact, and collaborative efforts in advancing knowledge across various fields.

The graph shows the number of records (presumably publications or research outputs) on the vertical axis versus funding records on the horizontal axis for various Tamil Nadu universities.

Table 3 displays the total number of publications (TP) and their respective percentages for each university across different years from 1991 to 2024. Each row represents a specific year, while each column corresponds to a different university. Analysis of the data indicates variations in publication output among the universities over time. Notably, Anna University consistently maintains a high percentage of publications, with Bharathiyar University and Madurai Kamaraj University also demonstrating notable publication percentages in recent years. On the other hand, Alagappa University, Bharathidasan University, and the University of Madras exhibit fluctuating publication percentages across the years, suggesting varying research productivity levels. Periyar University and Manonmaniam Sundaranar University show relatively lower publication percentages throughout the period. Overall, this data

Table 3: Research growth pattern of Universities of Tamil Nadu

UN	*Alagappa University*		*Anna University*		*Bharathidasan University*		*Bharathiyar University*		*Madurai Kamaraj Univerisity*		*Manomaniam Sundarnar University*		*Periyar University*		*University of Madras*	
YEAR	TP	%	TP	%	TP	%	TP	%	TP	%	TP	%	TP	%	TP	%
1991	-	-	1	0.02	1	0.03	-	-	1	0.05	-	-	-	-	-	-
1992	-	-	-	-	1	0.03	-	-	-	-	-	-	-	-	-	-
1993	-	-	-	-	1	0.03	-	-	-	-	-	-	-	-	-	-
1994	-	-	1	0.02	-	-	-	-	1	0.05	-	-	-	-	1	0.03
1995	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.03
1997	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	0.1
1998	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	0.17
1999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0.07
2000	-	-	1	0.02	-	-	-	-	-	-	-	-	-	-	3	0.1
2001	-	-	-	-	-	-	-	-	2	0.09	-	-	-	-	4	0.14
2002	-	-	2	0.02	-	-	1	0.04	1	0.05	-	-	-	-	2	0.07
2003	-	-	1	0.02	-	-	-	-	1	0.05	-	-	-	-	3	0.1
2004	-	-	1	0.02	-	-	-	-	-	-	-	-	-	-	1	0.03
2005	-	-	9	0.02	-	-	1	0.04	1	0.05	-	-	-	-	5	0.17
2006	-	-	5	0.02	-	-	1	0.04	2	0.09	-	-	-	-	7	0.24
2007	-	-	5	0.02	-	-	-	-	5	0.23	-	-	-	-	3	0.1
2008	8	0.34	46	1.1	28	0.9	23	0.83	24	1.12	6	0.72	8	0.61	60	2.06
2009	17	0.73	111	2.66	124	4	53	1.92	71	3.31	17	2.05	28	2.14	191	6.55
2010	38	1.63	156	3.73	124	4	75	2.72	86	4.01	29	3.5	41	3.13	158	5.42
2011	74	3.17	191	4.57	197	6.35	106	3.84	142	6.62	17	2.05	39	2.97	181	6.21
2012	64	2.74	199	4.76	173	5.58	115	4.16	130	6.06	47	5.67	47	3.59	140	4.8
2013	87	3.73	258	6.18	180	5.87	120	4.35	153	7.13	37	4.7	53	4.04	159	5.46
2014	101	4.33	274	6.56	214	6.86	138	5	171	7.97	43	5.19	85	6.48	219	7.52
2015	100	4.29	283	6.77	208	6.7	176	6.37	172	7.97	42	5.07	81	6.18	180	6.18
2016	138	5.92	311	7.44	197	6.35	184	6.66	155	7.13	73	8.81	78	5.95	158	5.42
2017	148	6.34	277	6.63	185	5.96	266	9.63	191	8.9	71	8.57	95	7.25	181	6.21
2018	178	7.63	306	7.32	181	5.83	238	8.62	174	8.11	83	10.01	91	6.94	170	5.83
2019	221	9.47	355	8.5	195	6.28	251	9.09	130	6.06	48	5.79	101	7.7	178	6.11
2020	329	14.1	400	9.53	243	7.8	254	9.2	150	6.99	63	7.6	115	8.77	216	7.41
2021	338	14.49	406	9.74	301	9.73	300	10.86	133	6.2	83	10.01	164	12.51	246	8.44
2022	269	11.53	322	7.73	291	9.44	253	9.16	136	6.34	93	11.22	152	11.59	237	8.13
2023	199	8.53	231	5.7	227	7.73	188	7.1	109	5.22	66	8.08	129	9.84	191	6.55
2024	24	1.03	11	0.46	14	0.52	9	0.4	3	0.19	6	0.97	4	0.31	10	0.34

provides insights into the research output of different universities over a span of several years, highlighting both consistent performers and those with fluctuating trends in publication percentages.

In the provided table, the highest and lowest total publications (TP) can provide valuable insights into the research productivity of the universities over the years. Among the universities listed, Anna University consistently demonstrates one of the highest total publication counts throughout the years, indicating a sustained and significant research output. Anna University's consistent presence at the top of the total publication count suggests a strong commitment to academic research and scholarly activities across various disciplines. Conversely, the university with the lowest total publication count fluctuates across different years. For instance, in recent years, Manonmaniam Sundaranar University and Periyar University have tended to have comparatively lower total publication counts. This may reflect factors such as resource constraints, research focus, or institutional priorities impacting their research output. Analyzing the universities with the highest and lowest total publication counts can offer valuable insights into the factors driving research productivity, funding allocation, institutional support for research, and the overall academic environment within each university. It also underscores the diversity in research output and priorities across different academic institutions.

Table 4 provides a complete overview of research relationships between Tamil Nadu universities and other funding sources, including the research count (RC) for each cooperation. Anna University stands out for its significant number of research collaborations, particularly with the Department of Science and Technology India (1,230 RC), the University Grants Commission India (787 RC), and the Council of Scientific and Industrial Research (CSIR) India (654 RC). Similarly, Bharathidasan University has a large research connection, particularly with the Department of Science and Technology India (1,181 RC) and the University Grants Commission India (968 RC). Alagappa University has significant ties, including with the Department of Science and Technology India (789 RC) and the University Grants Commission India (710 RC). Madurai Kamaraj University has important collaborations, notably with the University Grants Commission India (858 RC) and the Department of Science and Technology India (751 RC). The University of Madras also has a well-rounded research portfolio, particularly

Table 4: Sponsored research outcome of eight Universities

Alagappa University		*Anna University*		*Bharathidasan Unversity*		*Bharathiyar University*	
Funding agencies	RC	Funding agencies	RC	Funding agencies	RC	Funding agencies	RC
Department of Science Technology India	789	Department of Science Technology India	1,230	Department of Science Technology India	1,181	University Grants Commission India	644
University Grants Commission India	710	University Grants Commission India	787	University Grants Commission India	968	Department of Science Technology India	628
Department of Biotechnology Dbt India	420	Council of Scientific Industrial Research Csir India	654	Council of Scientific Industrial Research Csir India	615	Council of Scientific Industrial Research Csir India	258
Dst Purse	199	Department Of Biotechnology Dbt India	237	Department Of Biotechnology Dbt India	235	National Research Foundation of Korea	164
Council of Scientific Industrial Research CSIR India	194	Department Of Atomic Energy Dae	142	King Saud University	206	National Natural Science Foundation of China Nsfc	135
Madurai Kamaraj University		*Manonmainam Sundarnar University*		*Periyar University*		*University of Madras*	
Funding agencies	RC	Funding agencies	RC	Funding agencies	RC	Funding agencies	RC
University Grants Commission India	858	University Grants Commission India	227	University Grants Commission India	348	Department Of Science Technology India	863
Department of Science Technology India	751	Department of Science Technology India	218	Department Of Science Technology India	304	University Grants Commission India	790
Council of Scientific Industrial Research CSIR India	436	King Saud University	105	Council Of Scientific Industrial Research CSIR India	182	Council Of Scientific Industrial Research CSIR India	606
Department Of Biotechnology Dbt India	186	Council Of Scientific Industrial Research Csir India	59	King Saud University	116	Department Of Biotechnology Dbt India	158
King Saud University	105	Department Of Biotechnology Dbt India	43	Periyar University	93	Indian Council Of Medical Research Icmr	153

Table 5: Research productivity of eight Universities: Funding agencies with a prolific track record

University	*Total funding RC*	*DRP*	*MRP*	*DRP percentage (%)*	*MRP percentage (%)*
Alagappa University	2312	420	1892	18.16	81.84
Anna University	3050	237	2813	7.77	92.23
Bharathidasan University	3205	206	2999	6.43	93.57
Bharathiyar University	1819	164	1655	9.02	90.98
Madurai Kamaraj University	2336	186	2150	7.96	92.04
Manonmaniam Sundaranar Univ.	593	43	550	7.25	92.75
Periyar University	927	93	834	10.03	89.97
University of Madras	2570	153	2417	5.95	94.05

Abbreviations: DRP- Domin Relevant Publication; MRP- Methodologically Relevant Publications

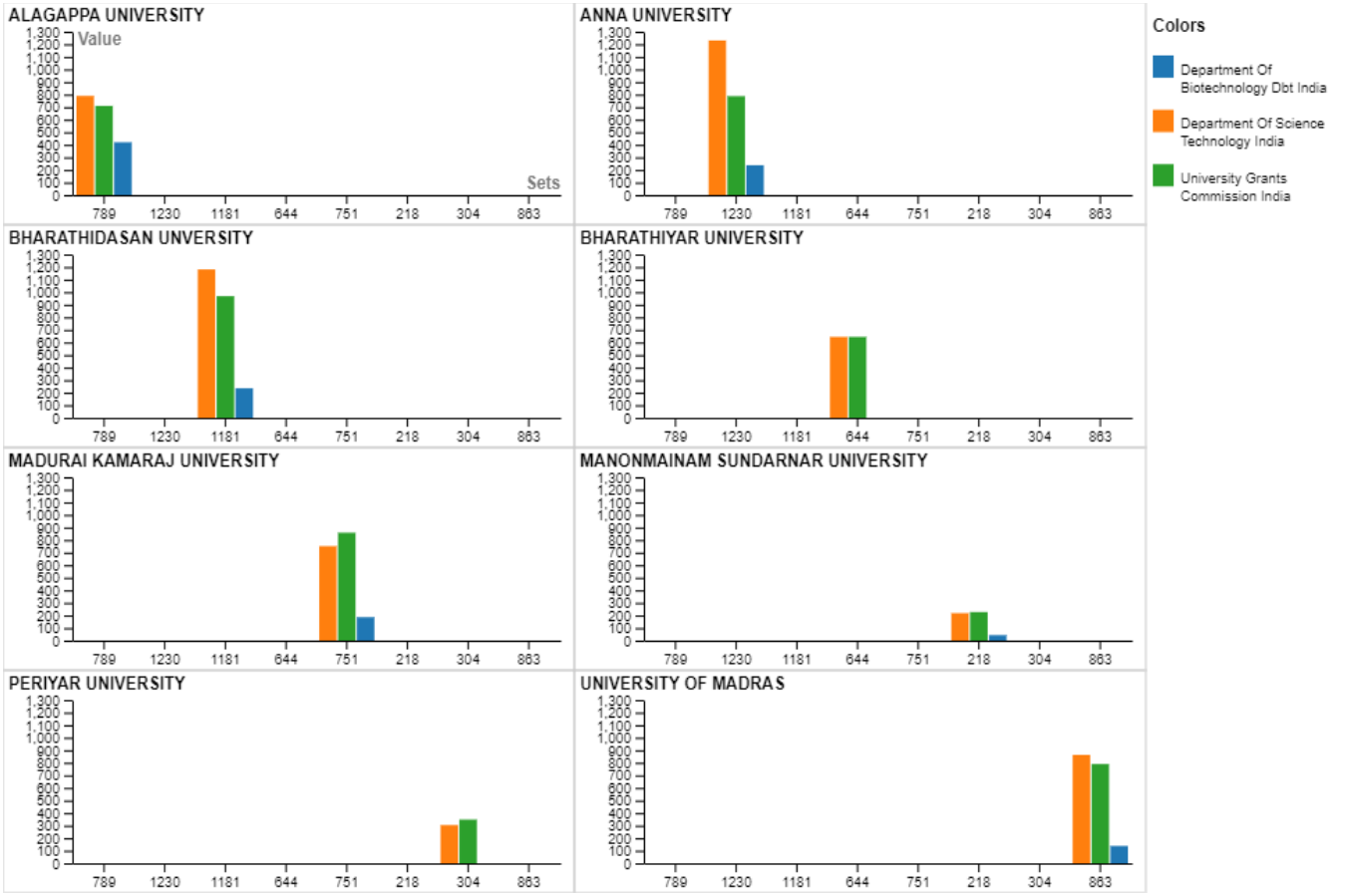

Figure 3: Funding sources for Tamil Nadu Universities

through collaborations with the Department of Science and Technology India (863 RC) and the University Grants Commission India (790 RC). These figures highlight funding organizations' substantial contributions to encouraging research excellence and innovation across Tamil Nadu's academic institutions.

The data in Table 5 showcases a prevailing emphasis on methodological research across all eight universities, underscoring a collective commitment to advancing research techniques and general scientific knowledge. Alagappa University, with 81.84% of its contributions categorized as methodologically relevant publications (MRP), displays a significant dedication to refining research methodologies, albeit with a relatively lesser focus on domain-specific studies compared to others. Anna University surpasses this trend, allocating 92.23% of its efforts to MRP, demonstrating a pronounced focus on interdisciplinary approaches and research techniques, with domain-specific studies

comprising only 7.77% of its contributions. Bharathidasan University and Madurai Kamaraj University follow suit, showcasing strong methodological orientations, with over 90% of their contributions falling under MRP. Despite varying total research contributions, their priorities remain consistent with a marked emphasis on methodological advancements. Bharathiyar University and Periyar University, while also prioritizing methodological research, exhibit slightly more balanced distributions, with around 90% of their contributions directed towards MRP, leaving room for a modest focus on domain-specific research. Manonmaniam Sundaranar University maintains a similar pattern, albeit with a lower total research contribution, indicating a comparable dedication to methodological advancements. The University of Madras, with a notable total research contribution and 94.06% of its efforts categorized as MRP, stands out for its steadfast commitment to refining research methodologies, with domain-specific studies representing a smaller yet still present aspect of its research portfolio. Overall, while the universities exhibit nuanced variations in their research emphases, a common thread of prioritizing methodological advancements prevails, reflecting a collective pursuit of advancing research practices and fostering interdisciplinary collaborations.

Figure 3 depicts the distribution of funding sources for major universities in Tamil Nadu. The funding is divided between three main agencies: The Department of Biotechnology (DBT), the Department of Science and Technology (DST), and the University Grants Commission (UGC). Each university's financing is expressed in terms of value, indicating how much each source gives.

The data in Table 6 provided offers insights into the research productivity, funding allocation, and impact of several Indian universities, including Alagappa University, Anna University, Bharathidasan University, Bharathiyar University, Madurai Kamaraj University, Manonmaniam Sundaranar University, Periyar University, and University of Madras. Bharathiyar University emerges as a leader in both publication count (7,913) and total citations (171,224), showcasing significant research output and impact within India. Anna University demonstrates strength in funding reports (4,163), indicating substantial financial support for its research endeavors. Other Indian universities contribute to the country's research environment at varying rates of output. This data highlights the diversity of research characteristics within India's academic environment, with each university playing a distinct role in furthering knowledge and innovation domestically.

The provided data offers a comprehensive insight into the international research collaborations of prominent universities in Tamil Nadu, showcasing both the absolute research count (RC) and the percentage breakdown with various countries. While all universities have substantial

Table 6: Analysis of funding agencies in eight Universities

Alagappa University				*Anna University*				*Bharathidasan University*				*Bharathiar University*			
Countries	*TP*	*FR*	*TC*	*Countries*	*TP*	*FR*	*TC*	*Countries*	*TP*	*FR*	*TC*	*Countries*	*TP*	*FR*	*TC*
India	4,616	2,334	102584	India	19706	4,163	386828	India	7049	3,085	138766	India	7913	2,752	171224
South Korea	627	351	15190	South Korea	793	362	24843	Saudi Arabia	497	345	7625	South Korea	871	444	21492
Saudi Arabia	402	313	8331	Saudi Arabia	393	202	6946	South Korea	419	259	9011	Taiwan	441	309	10221
China	277	192	6262	USA	553	194	17545	USA	362	184	8823	China	479	268	14756
Norway	143	126	1904	Japan	427	172	12258	China	286	177	4728	USA	474	258	12695
Madurai Kamaraj University				*Manonmaniam Sundarnar University*				*Periyar University*				*University of Madras*			
Countries	TP	FR	TC	Countries	TP	FR	TC	Countries	TP	FR	TC	Countries	TP	FR	TC
India	5344	2,144	105516	India	2502	824	63617	India	2815	1,311	53740	India	10431	2915	199122
Saudi Arabia	264	216	7457	Saudi Arabia	212	144	28904	Saudi Arabia	327	233	4960	Saudi Arabia	354	221	8441
USA	328	175	9512	USA	1167	95	30299	South Korea	315	205	7120	USA	571	207	17537
Spain	129	116	9213	South Korea	115	75	28243	China	206	123	3993	South Korea	370	169	8457
South Korea	167	108	5752	China	95	54	29223	USA	138	85	3517	Japan	254	96	9378

Abbreviations: TP represents total publications, TC represents total citations; and FC represents total funding records.

connections within India, considerable differences appear in their global partnerships. Anna University and Bharathiyar University have a large international reach, with Anna University having relationships in Saudi Arabia (4.85%) and the United States (4.66%), while Bharathiyar University has significant cooperation with South Korea (16.13%) and Taiwan (11.23%). In contrast, Alagappa University and Bharathidasan University prioritize collaboration with South Korea, accounting for 15.04 and 8.40% of their respective research activities. Madurai Kamaraj University and Periyar University, albeit having lesser overall international participation, have significant collaboration with Saudi Arabia, accounting for 10.08 and 17.77% of their respective research efforts.

In the Table 6, the highest counts of research contributions (RC) from a single country vary among the universities. Alagappa University, India, has the highest RC count of 2,334, constituting 100% of the total RC count. Similarly, for Anna University, India again has the highest count of 4,163, representing 100% of the total. Bharathidasan University also sees India with the highest RC count at 3,085, forming 100% of the total RC count. Meanwhile, Bharathiyar University records the highest RC count from South Korea at 444, making up 16.13% of the total.

Conversely, the lowest counts of RC from a single country also differ across the universities. For Alagappa University, the lowest count is from China at 192, constituting 8.23% of the total RC count. In Anna University's case, the lowest count is from the USA at 184, representing 5.96% of the total. Bharathidasan University records its lowest count from Norway at 116, forming 5.41% of the total RC count. Finally, for Bharathiyar University, the lowest count is from Japan at 96, making up 3.29% of the total.

These variations in the highest and lowest counts of RC across the universities indicate differing research collaborations and strengths in various academic disciplines and partnerships with international institutions.

Conclusion

The article describes a comprehensive scientometric study conducted on the articles published by Tamil Nadu's top eight universities between 1989 and 2023. This study aims to analyze various aspects, such as research trends, characteristics, growth, and collaboration patterns within the published literature.

Average Growth Rate

The analysis indicates that the average growth rate of publications is increasing at a significant pace, with a calculated rate of 9.76% annually. This statistic reflects the dynamic nature of research output and scholarly activity within the academic institutions of Tamil Nadu.

Funding Landscape Assessment

The study includes a detailed assessment of the funding landscape within the eight notable universities. It involves systematically gathering data on funding agencies associated with research projects. Notably, a total of 19,524 funding agencies are identified across various roles within these universities, underscoring the importance of external funding in driving research endeavors.

University-Specific Findings

The content highlights specific findings related to individual universities. For example, Anna University emerges as a frontrunner with 4,162 funding agencies, indicating a robust network of support for research activities. Additionally, the text mentions other universities such as Alagappa University, Annamalai University, and others, suggesting a comprehensive examination of the funding landscape across multiple academic institutions.

Country-wise Contribution

The analysis also delves into the country-wise contribution to research publications from the top eight universities in Tamil Nadu. While specific numbers are not provided in the given excerpt, it implies that the study evaluates the international collaboration and involvement of various countries in research endeavors within the academic institutions of Tamil Nadu.

A significant aspect illuminated by the analysis is the observed growth trajectory in research output. The calculated average growth rate of publications, standing at a noteworthy 9.76% annually, serves as a testament to the burgeoning scholarly activity within these universities over the studied period. This upward trend not only reflects the universities' commitment to advancing knowledge but also underscores the evolving nature of academic research and its impact on societal progress.

In the process, across the eight universities fostering research activities, the various funding agencies are evaluated exhaustively. An aggregate of 19,524 funding agencies is a clear pointer that external funding has a significant input on research endeavors in terms of intensity as well as range. This aspect brings into focus the connections between funding agencies, research output and the rest of the academic environment, and is informative of the ways in which research activities are supported and enabled.

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