

Author Productivity and Authorship Patterns in Tadwin: Journal of Library and Information Science, 2020–2025 (A Lotka's Law Analysis)

¹Syariv Avrizal Timbang, Wahida Harsono², Ahmad Aryadi³, Nur Arifin⁴

^{1,2,3,4}Universitas Islam Negeri Datokarama Palu

¹syarivavrizal@gmail.com, ²wahidaharsono3@gmail.com,
³ahmad.aryadi@uindatokarama.ac.id, ⁴nurarifin@uindatokarama.ac.id

DOI: 10.30742/tb.v10i2.5594

Received: 12 June 2026

Revised: 3 July 2026

Accepted: 18 September 2026

ABSTRACT

Research Objective. This study investigates author productivity and authorship patterns in *Tadwin: Journal of Library and Information Science* during the 2020–2025 period using Lotka's Law. **Research Method.** This study employed a quantitative bibliometric approach. Data were collected through documentation of 87 articles published in *Tadwin: Journal of Library and Information Science*. Total sampling was used, involving all articles published during the study period. **Data Analysis.** The analysis included author productivity measurement using the complete counting method, Lotka's Law modeling, calculation of the exponent (n) and constant (C), and the Kolmogorov–Smirnov test to assess the conformity of the observed distribution with Lotka's Law. **Results.** The findings show that 87 articles were published during the study period, with an increasing publication trend in 2024–2025. Author affiliations were predominantly from higher education institutions, particularly State Islamic Higher Education Institutions (PTKIN), with UIN Raden Fatah Palembang contributing the highest number of authors. Authorship patterns were dominated by collaborative writing, particularly articles with two and three authors. Most authors contributed only one publication. The Lotka model produced a constant value (C) of 0.841 and an exponent (n) of 2.929. The Kolmogorov–Smirnov test yielded a maximum deviation of 0.0318, which was lower than the critical value of 0.0968, indicating that the observed author productivity distribution was consistent with Lotka's Law. **Conclusion.** Author productivity in *Tadwin: Journal of Library and Information Science* follows the distribution pattern described by Lotka's Law, characterized by a large proportion of authors with relatively low productivity and a smaller proportion of highly productive authors. The predominance of collaborative authorship also indicates that research collaboration is an important feature of scholarly publication in the journal.

Keywords: Bibliometrics; Author Productivity; Authorship Pattern; Lotka's Law

A. INTRODUCTION

The advancement of science and information technology in the era of globalization has experienced remarkable growth. Information has become an essential resource in various aspects of human life, particularly within academic and research environments (Mukhlisa & Hasan, 2024). This increasing volume of information production necessitates effective management to ensure that available information can be utilized optimally. In this context, the field of Library and

Information Science plays a strategic role in managing, organizing, and disseminating information to users in an accurate and efficient manner.

Along with the expansion of research activities, scholarly journals have become the primary medium for disseminating research findings (Farikha & Juvitasari, 2025). Scientific journals not only serve as a means of academic communication but also function as indicators of the development and advancement of a particular discipline. As the number of published articles continues to increase, the volume and complexity of information generated also grow, thereby necessitating analytical methods capable of examining such developments in a systematic and measurable manner.

One of the approaches that can be employed to analyze scholarly publications is bibliometrics (Kurdi & Kurdi, 2021). Bibliometric analysis is a method used to evaluate scientific literature from various perspectives, including author productivity, authorship patterns, research topics, and the development of scientific knowledge (Wekke et al., 2025). The results generated through bibliometric analysis are evaluative in nature and can serve as an evidence-based foundation for decision-making processes (Aulia & Rusli, 2020).

Studies on author productivity and authorship patterns are closely associated with the application of bibliometric laws. The bibliometric laws proposed by George Kingsley Zipf, Samuel C. Bradford, and Alfred J. Lotka constitute the fundamental framework for the development of bibliometrics, scientometrics, and informetrics. These principles continue to be widely applied in contemporary research across various disciplines (Fadhli et al., 2023).

Author productivity is one of the key indicators in bibliometric analysis, as it reflects the extent of an individual's contribution to the production of scholarly works (Julianti, Winoto, & Kusnandar, 2025). Author productivity serves as an important measure for assessing individual contributions to scientific publications, while authorship patterns provide insights into the nature and extent of collaboration among researchers within a particular field of study. Such analyses can be utilized to identify prolific authors and to examine the distribution of scholarly contributions within a journal.

In the analysis of author productivity, one of the most widely applied theoretical frameworks is Lotka's Law (Tran & Aytac, 2021). This method was introduced by Alfred James Lotka in 1929 based on his study of scientific productivity among authors in the fields of Chemistry and Physics. Author productivity is also commonly referred to as scientific productivity (Pattah, 2013). Lotka's Law explains the distribution of author productivity based on the number of publications produced, proposing that a relatively small proportion of authors contribute a large number of publications, while the majority of authors produce only a few works (Coile, 1977). By employing this approach, the distribution patterns of author productivity within a journal can be examined in a more systematic and quantitative manner. In applying Lotka's Law, the method used to count author contributions is an important methodological consideration, particularly in publications involving multiple authors. Different counting methods may produce different representations of author productivity. In this study, the complete counting method was selected because it recognizes the contribution of

all authors equally, providing a comprehensive representation of author productivity (Wahyudi, 2018).

In this study, the object of analysis is *Tadwin: Journal of Library and Information Science*, a scholarly journal that publishes research in the field of Library and Information Science. The journal serves as a platform for academics and researchers to disseminate their research findings. Nevertheless, studies specifically examining author productivity and authorship patterns within this journal remain limited, particularly those employing the framework of Lotka's Law.

Several relevant previous studies have been conducted. One study by Pratiwi et al., (2024), entitled *Author Productivity Analysis in Q1 Journals Using Lotka's Law*, examined author productivity in Q1-ranked Library and Information Science journals and found an exponent value of $n = 1.591$, with the observed distribution not conforming to Lotka's Law. Another study by Wirayuda (2025), entitled *Analysis of Author Productivity in Lentera Pustaka: Journal of Library, Information, and Archival Science, Diponegoro University, 2016–2024*, found an exponent value of $n = 3.289$, with the observed productivity distribution relatively close to the theoretical Lotka distribution. Furthermore, Rahayu and Noor (2022), through their study *Authorship Patterns and Degree of Collaboration in Perpustakaan Nasional Journal Published by the National Library during the 2017–2021 Period*, found that single-authored articles were more dominant than collaborative articles.

Although previous studies have established important foundations for the analysis of author productivity and authorship patterns, variations in research focus, journal characteristics, publication periods, and author-counting methods may produce differences in the resulting findings. Consequently, the findings of previous studies cannot be generalized directly to other Library and Information Science journals. A context-specific bibliometric analysis is therefore required to examine the distribution of author productivity, assess its conformity with Lotka's Law, and identify authorship patterns within a particular scholarly journal. Nevertheless, an integrated examination of author productivity based on Lotka's Law and authorship patterns remains limited in the context of *Tadwin: Journal of Library and Information Science*. This research gap provides a basis for conducting a comprehensive analysis of author productivity and authorship patterns in the journal.

Based on this gap, the research questions addressed in this study are: (1) How is author productivity distributed in *Tadwin: Journal of Library and Information Science* during the 2020–2025 period based on Lotka's Law? and (2) What authorship patterns are found in articles published in the journal during the same period? Therefore, this study aims to analyze author productivity and authorship patterns in *Tadwin: Journal of Library and Information Science* during the 2020–2025 period using Lotka's Law. Specifically, it examines the distribution of author productivity and its conformity to Lotka's Law, as well as the authorship patterns reflected in the journal's publications. The findings are expected to contribute empirical evidence to bibliometric research in Library and Information Science and provide a more specific understanding of scholarly productivity and collaboration within the journal.

B. METHODS

This study employs a quantitative research design with a bibliometric approach to analyze author productivity and authorship patterns in Tadwin: Journal of Library and Information Science. The bibliometric approach was selected because it enables the objective, systematic, and measurable analysis of scholarly publication data. The population consisted of all articles published in Tadwin: Journal of Library and Information Science during the 2020–2025 period, comprising 87 articles. A total sampling technique was employed, whereby all members of the population were included as the research sample (Sugiyono, 2013). Thus, all 87 articles were analyzed in this study.

Data were collected using documentation techniques. The researchers identified, recorded, and organized bibliographic information from each article, including author names, number of publications, publication year, and institutional affiliations. The data were obtained from the official website of Tadwin <https://jurnal.radenfatah.ac.id/index.php/tadwin/index>. The collected data were organized into a structured dataset for subsequent analysis.

To ensure the accuracy of author productivity calculations, author names were standardized and disambiguated before analysis. Variations in author names, including differences in capitalization, punctuation, initials, and name order, were standardized to a consistent format. Authors with identical or similar names were distinguished by comparing additional identifying information, particularly institutional affiliations and other bibliographic information provided in the published articles. This procedure was applied to minimize the risk of counting the same author as multiple individuals or incorrectly combining different authors under the same name.

Data analysis consisted of author productivity analysis, Lotka's Law analysis, authorship pattern analysis, and statistical testing. Author productivity was analyzed using the complete counting method. Each author listed in an article was assigned one full credit, regardless of the number of co-authors (Wahyudi, 2018). The number of publications was then tabulated for each author to determine the distribution of individual author productivity.

Authorship patterns were analyzed by examining the number of authors contributing to each article. Articles were classified according to the number of authors, such as single-authored, two-authored, three-authored, and multi-authored publications. This analysis was used to identify the dominant authorship pattern and the extent of collaboration among researchers.

Lotka's Law was applied to examine the distribution of author productivity. The theoretical distribution was calculated using the Lotka model:

$$Y_x = C x^{-n}$$

Where:

Y_x = the proportion of authors producing (x) publications

x = the number of publications produced by an author

C = the proportionality constant

n = the exponent or Lotka's productivity parameter

The Lotka model was used to calculate the theoretical distribution of author productivity based on the estimated values of (C) and (n). The observed

and theoretical author productivity distributions were then compared to assess the extent to which the observed publication pattern conformed to Lotka's Law. The conformity of the observed author productivity distribution to Lotka's Law was tested using the Kolmogorov–Smirnov (K–S) test at a significance level of $\alpha = 0.05$. The test was conducted by comparing the maximum deviation (Dmax) between the observed and theoretical cumulative distributions with the critical value. If Dmax was smaller than the critical value, the observed distribution was considered consistent with Lotka's Law. Conversely, if Dmax was greater than the critical value, the observed distribution was considered inconsistent with Lotka's Law.

The bibliographic data were processed using Microsoft Excel for data cleaning, author-name standardization, tabulation, calculation of author productivity, Lotka's Law, and the Kolmogorov-Smirnov test. The results were presented using tables and graphs to facilitate interpretation and provide a clear representation of author productivity and authorship patterns in Tadwin: Journal of Library and Information Science.

C. RESULT AND DISCUSSION

I. Number of Articles

To obtain a comprehensive overview of the number of articles published in Tadwin: Journal of Library and Information Science during the 2020–2025 period, the data were categorized according to volume and issue number for each publication cycle. This categorization was intended to provide a more systematic representation of article distribution and to identify trends in publication output over time. Furthermore, presenting the data by journal issue facilitates the examination of changes and developments in the number of articles published across different publication periods.

Based on the results of data collection and processing, all articles published during the study period were counted and classified according to their respective publication issues. The number of articles published in each volume and issue of Tadwin: Journal of Library and Information Science from 2020 to 2025 is presented in the following table:

Table I. Number of articles

No.	Jurnal Tadwin	Number of Articles	Persentase
1.	Vol. 1 No. 1, 2020	6 Articles	7 %
2.	Vol. 1 No. 2, 2020	6 Articles	7 %
3.	Vol. 2 No. 1, 2021	6 Articles	7 %
4.	Vol. 2 No. 2, 2021	6 Articles	7 %
5.	Vol. 3 No. 1, 2022	6 Articles	7 %
6.	Vol. 3 No. 2, 2022	6 Articles	7 %
7.	Vol. 4 No. 1, 2023	6 Articles	7 %
8.	Vol. 4 No. 2, 2023	6 Articles	7 %
9.	Vol. 5 No. 1, 2024	6 Articles	7 %
10.	Vol. 5 No. 2, 2024	8 Articles	9 %
11.	Vol. 6 No. 1, 2025	12 Articles	14%

No.	Jurnal Tadwin	Number of Articles	Persentase
12.	Vol. 6 No. 2, 2025	13 Articles	15%
Total		87 Articles	100%

Based on the data collected, a total of 87 articles were published in Tadwin: Journal of Library and Information Science during the 2020–2025 period. The distribution of articles across volumes and issues indicates that the number of published articles remained relatively stable from 2020 to 2023, with each issue consistently containing six articles. However, an increase in publication output was observed beginning in 2024 and continuing into 2025. In Volume 5, Issue 2 (2024), the number of published articles increased to eight. This growth became more pronounced in 2025, with 12 articles published in Volume 6, Issue 1, and 13 articles in Volume 6, Issue 2. These findings suggest a growing trend in publication productivity within Tadwin over the last several years, reflecting the journal's expanding role in disseminating scholarly research in the field of Library and Information Science.

Furthermore, to illustrate the distribution of articles across publication years, the data can be presented in the following graph. This graphical representation provides a clearer visualization of publication trends and facilitates the identification of changes in article output throughout the 2020–2025 period.

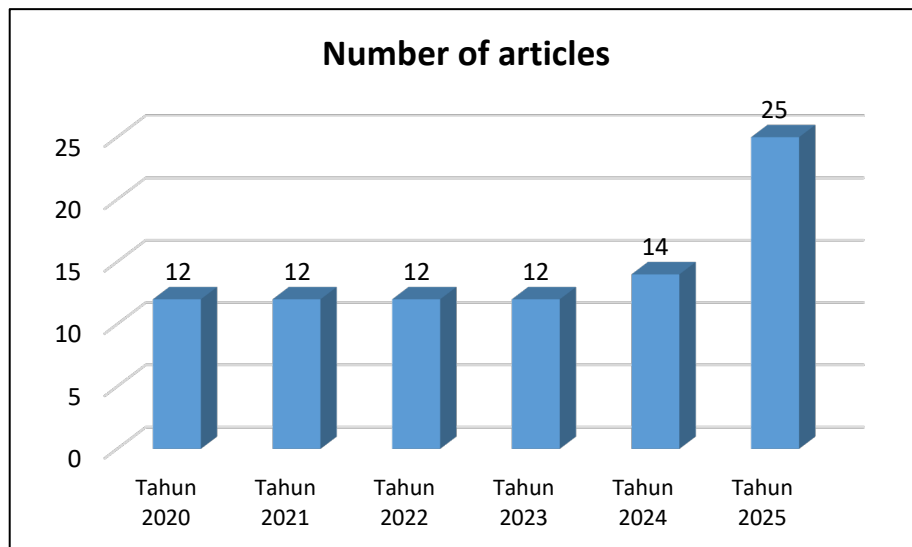


Figure 1. Distribution of Articles by Year

The graph demonstrates a stable publication trend from 2020 through 2023, with 12 articles published each year, followed by an increase to 14 articles in 2024. A more substantial increase was evident in 2025, when the total number of published articles reached 25. These findings indicate a consistent upward trend in the number of articles published in Tadwin over the study period, suggesting an expansion in the journal's publication capacity and its growing contribution to scholarly communication in the field of Library and Information Science.

2. Author Affiliations

Author affiliation refers to the institution or organization with which an author is associated, as indicated in a scholarly publication. The analysis of author affiliations was conducted to identify the distribution of institutional contributions to articles published in Tadwin during the 2020–2025 period. Through this analysis, it is possible to determine which institutions have been the most active contributors to the journal's publications. To provide an overview of the distribution of author affiliations in Tadwin from 2020 to 2025, the data were categorized according to the authors' institutional affiliations. Based on the results of the data analysis, a total of 39 institutions (affiliations) were identified as contributors to the articles published in the journal during the study period.

Given the considerable diversity of author affiliations, the analysis in this study focuses on the ten institutions with the highest number of affiliated authors (Top 10 Affiliations). This limitation was intended to highlight the institutions that made the most significant contributions to the journal and to facilitate a more systematic examination of the distribution of author affiliations. The details of the top ten author affiliations in Tadwin during the 2020–2025 period are presented in the following table.

Table 2. Top 10 Author Affiliations

No.	Affiliation	Number of Affiliations
1.	Universitas Islam Negeri Raden Fatah Palembang	39
2.	Universitas Islam Negeri Sunan Kalijaga Yogyakarta	28
3.	Universitas Lancang Kuning	20
4.	Institut Agama Islam Negeri Curup	19
5.	Universitas Pembangunan Nasional "Veteran" Jakarta	14
6.	Universitas Islam Negeri Imam Bonjol	11
7.	Universitas Padjadjaran	11
8.	Universitas Sumatera Utara	10
9.	Universitas Islam Negeri Sumatera Utara Medan	8
10.	Institut Agama Islam Negeri Madura	7

Based on the results of the data analysis, author affiliations in Tadwin during the 2020–2025 period indicate that the largest contributions originated from a number of specific institutions. In this study, the analysis was focused on the ten institutions with the highest number of author affiliations in order to examine the dominance of institutional contributions. The findings reveal that Universitas Islam Negeri Raden Fatah Palembang ranked first with 39 affiliations, followed by Universitas Islam Negeri Sunan Kalijaga Yogyakarta with 28 affiliations, and Universitas Lancang Kuning with 20 affiliations. These institutions emerged as the most prominent contributors to the journal throughout the study period.

Furthermore, Institut Agama Islam Negeri Curup ranked fourth with 19 affiliations, followed by Universitas Pembangunan Nasional Veteran Jakarta with 14 affiliations. The subsequent positions were occupied by Universitas Islam Negeri Imam Bonjol and Universitas Padjadjaran, each contributing 11 affiliations, while Universitas Sumatera Utara recorded 10 affiliations. Meanwhile, Universitas Islam

Negeri Sumatera Utara Medan and Institut Agama Islam Negeri Madura completed the top ten institutions with 8 and 7 affiliations, respectively. These findings demonstrate that scholarly contributions to Tadwin: Journal of Library and Information Science were concentrated among a relatively small number of higher education institutions, particularly Islamic higher education institutions in Indonesia.

Based on these findings, it can be observed that author affiliations were predominantly associated with higher education institutions, particularly State Islamic Higher Education Institutions (PTKINs). This indicates that Tadwin maintains strong connections with the academic community, especially within the field of Library and Information Science. The dominance of contributions from universities further reflects the journal's role as an important platform for the dissemination of scholarly research and academic discourse in this discipline.

3. Authorship Patterns

To examine the authorship patterns of articles published in Tadwin during the 2020–2025 period, the data were categorized according to the number of authors contributing to each article. This analysis was conducted to identify the forms of authorship, including both single-authored and collaborative publications, as well as to examine trends in the number of authors involved in each publication. Such an analysis provides insights into the extent of research collaboration and the prevailing authorship practices within the journal.

The distribution of the number of authors per article, categorized by publication year, is presented in the following table.

Table 3. Author Authorship Patterns by Publication Year

Publication Year	1 Author	2 Authors	3 Authors	4 Authors	5 Authors	6 Authors	7 Authors
2020	1	2	7	2	-	-	-
2021	3	4	4	-	-	1	-
2022	3	4	3	1	1	-	-
2023	4	3	4	-	1	-	-
2024	3	4	4	3	-	-	-
2025	-	11	6	5	-	1	2
Total	14	28	28	11	2	2	2

Based on the data concerning the number of authors per article in Tadwin during the 2020–2025 period, the authorship pattern was predominantly collaborative in nature. This is evidenced by the fact that articles authored by two authors and those authored by three authors each accounted for 28 publications, making them the most dominant forms of authorship within the journal. These findings indicate a strong tendency toward research collaboration among authors contributing to the journal.

Meanwhile, a total of 14 articles were authored by a single author, indicating that single-authored contributions remained present within the journal, although they did not constitute the dominant form of authorship. Articles written by four authors accounted for 11 publications, whereas those involving five, six, and seven authors were relatively uncommon, with only 2, 2, and 1 articles, respectively.

These findings further suggest that collaborative authorship involving two or three authors was the prevailing pattern, while larger research teams contributed only a limited number of publications during the study period.

When examined by publication year, the authorship pattern reveals variations in the level of author collaboration. From 2020 to 2024, the number of authors per article generally ranged from one to four authors. However, in 2025, a notable increase in collaborative authorship was observed, as evidenced by the predominance of articles written by two and three authors. Furthermore, publications involving larger research teams emerged during this period, with some articles being authored by as many as seven contributors. These findings suggest a growing tendency toward collaborative research and co-authorship in Tadwin, particularly in the most recent year of the study period.

Overall, these findings demonstrate that authorship in Tadwin is predominantly characterized by collaborative authorship, as evidenced by the higher proportion of articles involving two or more authors. This finding contrasts with Rahayu and Noor (2022), who reported a predominance of single-authored articles in the three journals published by the National Library of Indonesia during the 2017–2021 period. This difference indicates that authorship and collaboration patterns may vary across Library and Information Science journals, reflecting differences in institutional environments, research contexts, and scholarly publication practices. In the context of Tadwin, the predominance of collaborative authorship indicates that research collaboration constitutes an important feature of scholarly communication within the journal. Such collaboration may facilitate knowledge exchange, the integration of diverse perspectives, and the development of research partnerships among scholars in the field of Library and Information Science.

4. Author Productivity

Based on the findings of the data analysis, author productivity in during the 2020–2025 period exhibited varying levels of scholarly contribution. The findings indicate that several authors demonstrated higher publication productivity compared to others, as reflected in the number of articles they contributed to the journal. Examining author productivity is essential for identifying the most prolific contributors and understanding the distribution of scholarly output within the journal. The ten most productive authors (Top 10 Authors), ranked according to the number of published articles, are presented in the following table.

Table 4. Top 10 Most Productive Authors

No.	Author Name	Number of Articles
1.	Budhi Santoso	4
2.	Misroni	4
3.	Okky Rizkyantha	4
4.	Frial Ramadhan Supratman	3
5.	Hadira Latiar	3
6.	Halimatus Sa'diyah	3
7.	Nor Huda Ali	3
8.	Sri Rohyanti Zulaikha	3
9.	Sukaesih	3

No.	Author Name	Number of Articles
10.	Abdul Karim Batubara	2

Based on the data presented in the table, Budhi Santoso, Misroni, and Okky Rizkyantha were identified as the most productive authors, each contributing four articles during the study period. In addition, several authors published three articles each, including Frial Ramadhan Supratman, Hadira Latiar, Halimatus Sa'diyah, Nor Huda Ali, Sri Rohyanti Zulaikha, and Sukaesih. Meanwhile, Abdul Karim Batubara was recorded as having published two articles throughout the study period. These findings indicate that although a number of authors contributed repeatedly to the journal, the distribution of publications remained relatively dispersed among contributors.

To examine the distribution of author productivity, this study employed Lotka's Law as the analytical framework. The analysis was based on the frequency of publications produced by individual authors. Based on the results of the data analysis, the distribution of authors according to the number of articles published was obtained and is presented in the following table.

To examine the distribution of author productivity, Lotka's Law was applied to the publication data collected from *Tadwin: Journal of Library and Information Science* during the 2020–2025 period. The analysis focused on the relationship between the number of publications and the number of authors contributing to those publications. Based on the data analysis, the distribution of authors according to the number of articles published was obtained and is presented in the following table.

Table 5. Distribution of Articles and Authors

No. (Varian)	Number of Articles (x)	Number of Authors (y)
1	1	172
2	2	16
3	3	6
4	4	3
Total		197

Based on the data presented in the table, a total of 172 authors published only one article in *Tadwin* during the 2020–2025 period. In addition, 16 authors published two articles, six authors contributed three articles, and only three authors published four articles. These findings indicate that the majority of authors exhibited a relatively low level of publication productivity, while only a small proportion of authors demonstrated high productivity. This pattern is consistent with the general principle of Lotka's Law, which suggests that a large number of authors tend to produce a small number of publications, whereas a relatively small number of authors account for a larger share of scholarly output.

The next step in the analysis of author productivity involved calculating the productivity distribution using the framework of Lotka's Law. The calculation began with the determination of the constant (C) and exponent (n) values based on the relationship between the number of publications and the number of

authors. According to Lotka's formulation, this relationship is expressed through the following general equation:

$$C = \frac{1}{\sum 1/x^n}$$

Where:

c = constant value

x = number of articles published by an author

n = exponent value

Before determining the values of the constant (C) and exponent (n), additional processing was performed on the data concerning the number of articles (x) and the number of authors (y) to comply with the analytical procedures of Lotka's Law. At this stage, several additional variables were introduced, namely $X = \log x$, $Y = \log y$, XY , and X^2 . These variables served as the basis for the linear regression analysis used to estimate the exponent value in Lotka's distribution. The logarithmic transformation of the data enables the relationship between the number of publications and the number of authors to be expressed in a linear form, thereby facilitating the estimation of the exponent parameter through regression analysis. The results of this data processing are presented in the following table.

Table 6. Logarithmic Values and Linear Regression Analysis for Lotka's Law

No. (Varian)	Number of Articles (x)	Number of Authors (y)	$X=\log X$	$Y=\log Y$	XY	X^2
1	1	172	0	2,236	0	0
2	2	16	0,301	1,204	0,362	0,091
3	3	6	0,477	0,778	0,371	0,228
4	4	3	0,602	0,477	0,287	0,362
Total		197	1,380	4,695	1,021	0,681

The calculation results indicate that the exponent value (n) was determined by first estimating the value of b. In the framework of Lotka's Law, the parameter b is equivalent to $-n$; therefore, the value of n can be obtained once the value of b has been calculated. The estimation of b was carried out using the following equation:

$$b = \frac{N\sum xy - \sum x \sum y}{N(\sum x^2) - (\sum x)^2}$$

$$b = \frac{4(1,021) - (1,380)(4,695)}{4(0,681) - (1,380)^2}$$

$$b = \frac{4(1,021) - (1,380)(4,695)}{4(0,681) - (1,380)^2}$$

$$b = \frac{4,084 - 6,480}{2,723 - 1,905}$$

$$b = \frac{-2,396}{0,818}$$

$$b = -2,929$$

The calculation results indicate that the value of b is -2.929 . Consequently, the exponent value (n) obtained is 2.929 , since in Lotka's Law the relationship between these parameters is expressed as $b = -n$. The exponent value obtained from the analysis reflects the distribution pattern of author productivity within the journal. After determining the exponent value, the next step was to calculate the constant value (C). This process involved computing the values of x^n and $1/x^n$ for each publication frequency, followed by summing all $1/x^n$ values. The resulting total was then used to determine the constant value according to Lotka's formula. The detailed results of these calculations are presented in the following table.

Table 7. Values of x^n and $1/x^n$

No.	Number of Articles (x)	X^n	$1/X^n$
1	1	1	1
2	2	7,616	0,131
3	3	24,974	0,040
4	4	58,001	0,017
Total			1,1886

Based on the data presented in the table, the total value of $1/x^n$ was calculated to be 1.1886 . Subsequently, the constant value (C) was determined using the following formula:

$$c = \frac{1}{\sum 1/x^n}$$

$$c = \frac{1}{1,1886}$$

$$c = 0,841$$

Based on the overall calculation, the constant value (C) was found to be 0.841 , while the exponent value (n) was 2.929 . Accordingly, the author productivity model can be expressed as $Yx = 0.841x^{-2.929}$. The value of C represents the proportionality constant in the Lotka distribution, while the exponent n indicates the rate at which the number of authors decreases as the number of publications increases. Thus, the value of $n = 2.929$ indicates that the number of authors decreases as the number of publications increases. These parameters describe the distribution of author productivity in *Tadwin* during the 2020–2025 period and provide the basis for assessing the conformity of the observed author productivity distribution to Lotka's Law.

The calculation of author productivity based on Lotka's Law and the observed percentages can be conducted using the formula $Y(x) = C/X^n$. The results of the calculation are presented in the following table.

Table 8. Percentage Distribution of Authors Based on Observed Data and Lotka's Law predictions.

Number of Articles (x)	Number of Authors (y)	Percentage of Authors Based on Observation (y')	Percentage of Authors Based on Lotka's Law (y')	Difference
1	172	87,3	84,1	3,2
2	16	8,1	11,0	3,1
3	6	3,0	3,4	0,4
4	3	1,5	1,5	0
Total	197	100%	100%	

Based on the comparison between the percentage of authors obtained from the observed data and the theoretical percentages predicted by Lotka's Law, differences can be observed at each level of author productivity. Author contributions ranged from 1 to 4 articles throughout the study period, and no authors were identified as having published more than 4 articles during the period under investigation.

For the category of authors producing one article, the observed percentage was 87.3%, while the theoretical value based on Lotka's Law was 84.1%, resulting in a difference of 3.2%. For authors contributing two articles, the observed percentage was 8.1%, whereas the theoretical Lotka value reached 11.0%, indicating a difference of 3.1%. Furthermore, in the category of authors producing three articles, the observed percentage was 3.0%, while the theoretical calculation based on Lotka's Law was 3.4%, yielding a difference of 0.4%. Meanwhile, for authors who produced four articles, both the observed and theoretical percentages were identical at 1.5%, indicating no difference between the two values.

Subsequently, a Kolmogorov-Smirnov test was conducted to examine the validity of Lotka's Law equation using the previously obtained values of n and C, as shown in the following calculations.

Table 9. Kolmogorov-Smirnov Test

No.	Number of Articles (x)	Number of Authors (y)	Percentage of Authors (y')	Cumulative Percentage of y' (Sn(x))	Theoretical Frequency Based on Lotka's Law (Yx)	Cumulative Theoretical Frequency (Fo(x))	Kolmogorov-Smirnov Test (Fo(x) - Sn(x))
1	1	172	0,873	0,873	0,841	0,841	-0,0318
2	2	16	0,081	0,954	0,110	0,952	0,0025
3	3	6	0,030	0,985	0,034	0,985	0,0007
4	4	3	0,015	1,000	0,015	1,000	0
Total		197					

In the Kolmogorov-Smirnov test, negative deviation values were converted into absolute values to determine the maximum deviation. Based on the calculation results, the maximum deviation value was found to be 0.0318. This value was then

compared with the critical value at a 0.05 significance level, which was calculated using the following formula:

$$D_{Kritis} = \frac{1,36}{\sqrt{197}}$$

$$D_{Kritis} = 0,0968$$

The calculation results yielded a critical value of 0.0968. As the maximum deviation was lower than the critical value ($0.0318 < 0.0968$), the distribution of author productivity in *Tadwin* during the 2020–2025 period is considered consistent with Lotka's Law. This finding differs from Pratiwi et al., (2024), whose results did not conform to Lotka's Law, but is consistent with the findings of Wirayuda (2025), which showed that the author productivity distribution was relatively close to the theoretical Lotka distribution. The conformity observed in *Tadwin* indicates that author productivity follows the general pattern described by Lotka's Law, in which the majority of authors exhibit relatively low productivity, while a smaller proportion contribute multiple publications.

E. CONCLUSION

Based on the findings, *Tadwin: Journal of Library and Information Science* published 87 articles during the 2020–2025 period. The authorship pattern was predominantly collaborative, with two and three-author articles being the most common forms of authorship. The analysis of author productivity showed that most authors contributed only one article, while a relatively small number of authors produced multiple publications. Using Lotka's Law, the proportionality constant (C) was 0.841 and the exponent (n) was 2.929. The Kolmogorov–Smirnov test showed that the observed author productivity distribution was consistent with Lotka's Law, with $D_{max} = 0.0318$, which was smaller than the critical value of 0.0968.

These findings indicate that author productivity in *Tadwin* follows the typical pattern described by Lotka's Law, in which most authors have relatively low publication productivity and only a small proportion of authors are highly productive. The predominance of collaborative authorship also indicates a strong tendency toward research collaboration. These findings can provide useful information for journal editors in encouraging broader author participation and strengthening research collaboration. For researchers, the findings provide an overview of publication productivity and collaboration patterns within the journal.

This study is limited to articles published in *Tadwin* during the 2020–2025 period. Future research may extend the observation period, compare *Tadwin* with other Library and Information Science journals, and apply different author-counting methods to examine whether variations in counting procedures affect the distribution of author productivity and its conformity to Lotka's Law.

REFERENCE

- Aulia, E. S., & Rusli, R. P. (2020). Manfaat Kajian Bibliometrik Sebagai Penunjang Analisis Kebutuhan Kurikulum Program Studi Ilmu Perpustakaan dan Informasi. *Inovasi Kurikulum*, 17(2), 59–68. <https://doi.org/10.17509/jik.v17i2.36827>
- Coile, R. C. (1977). Lotka's frequency distribution of scientific productivity. *Journal of the American Society for Information Science*, 28(6), 366–370. <https://doi.org/10.1002/asi.4630280610>
- Fadhli, R., Rahmat, B., Ibrahim, C., & Kurnia, B. E. (2023). Uncovering patterns of author productivity in educational leadership and management in Indonesia: A bibliometric study using lotka's law. *Record and Library Journal*, 9(2), 306–318. <https://doi.org/10.20473/rlj.V9-I2.2023.306-318>
- Farikha, S., & Juvitasari, P. B. (2025). Kajian Bibliometrik: Analisis Publikasi Ilmiah Terindeks Scopus Civitas Akademika UIN Sayyid Ali Rahmatullah Tulungagung (2020-2024). *IQRA` : Jurnal Perpustakaan dan Informasi*, 19(1), 68–96. <https://doi.org/10.30829/iqra.v19i1.23637>
- Julianti, S. A., Winoto, Y., & Kusnandar, K. (2025). Analisis Bibliometrik Terhadap Tren Penelitian Perpustakaan Digital Berbasis Scopus Tahun 2014-2023. *IQRA` : Jurnal Perpustakaan dan Informasi*, 19(1), 97–128. <https://doi.org/10.30829/iqra.v19i1.23798>
- Kurdi, M. S., & Kurdi, M. S. (2021). Analisis Bibliometrik dalam Penelitian Bidang Pendidikan: Teori dan Implementasi. *Journal on Education*, 3(4), 518–537. <https://doi.org/10.31004/joe.v3i4.2858>
- Mukhlisa, N., & Hasan, K. (2024). Analisis Bibliometrik: Konsep, Metodologi, Dan Aplikasinya Dalam Penelitian Ilmiah. *Seminar Nasional LP2M UNM*, (0). <https://ojs.unm.ac.id/semnaslemlit/article/view/67272>
- Pattah, S. H. (2013). Pemanfaatan Kajian Bibliometrika sebagai Metode Evaluasi dan Kajian dalam Ilmu Perpustakaan dan Informasi. *Khizanah al-Hikmah : Jurnal Ilmu Perpustakaan, Informasi, dan Kearsipan*, 1(1), 47–57. <https://journal.uin-alauddin.ac.id/index.php/khizanah-al-hikmah/article/view/25>
- Pratiwi, N. M., Ibrahim, C., Alkarimah, N. U., Arifah, Z. N., Jatmik, T. H., Mutiara, A., Azzahra, A. F., Putri, S. W., Kangko, D. D., Astarika, R., & Jopang, J. (2024). Author productivity analysis in QI of authors in journal library and information science QI journals using with Lotka's Law. *Berkala Ilmu Perpustakaan Dan Informasi*, 20(1), 163–176. <https://doi.org/10.22146/bip.v20i1.8272>
- Rahayu, R., & Noor, A. Z. (2022). Pola Kepengarangan dan Derajat Kolaborasi Pada Jurnal Perpusdokino Terbitan Perpustakaan Nasional Periode 2017-2021. *Jurnal Gema Pustakawan*, 10(2), 75–87. <https://doi.org/10.31258/jgp.10.2.75-87>
- Sugiyono. (2013). *Metode Penelitian Kuantitatif, Kualitatif dan R&D*. Alfabeta.
- Tran, C. Y., & Aytac, S. (2021). Scientific Productivity, Lotka's Law, and STEM Librarianship. *Science & Technology Libraries*, 40(3), 316–324. <https://doi.org/10.1080/0194262X.2021.1907268>

- Wahyudi, A. (2018). Tentang Dalil Lotka. Perbedaan Antara Complete Count dengan Straight Count: Studi Produktivitas Penulis pada Majalah Visi Pustaka Periode Terbit Tahun 2005-2014. *Media Pustakawan*, 25(1), 29–35. <https://doi.org/10.37014/medpus.v25i1.189>
- Wekke, I. S., Ismail, R., & Adi, T. B. (2025). Analisis Bibliometrik atas Publikasi Ilmiah di Indonesia: Refleksi Kritis 2020–2025. *Maximal Journal : Jurnal Ilmiah Bidang Sosial, Ekonomi, Budaya Dan Pendidikan*, 2(4), 339–342. <https://malaqbipublisher.com/index.php/MAKSI/article/view/577>
- Wirayuda, I. M. I. (2025). Analysis of Author Productivity in Lentera Pustaka Journal: Library, Information, and Archival Studies, Diponegoro University 2016-2024. *JPUA: Jurnal Perpustakaan Universitas Airlangga: Media Informasi Dan Komunikasi Kepustakawanan*, 15(2), 63–69. <https://doi.org/10.20473/jpua.v15i2.2025.63-69>