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REVUE EUROPEENNE D ETUDES EUROPEAN JOURNAL OF MILITARY STUDIES
Social Science Journal

Business Intelligence and Public Finance Models

By

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Abstract

A documentary review was developed about the elaboration and production of research works related to the study of Business Intelligence and Public Finance Models carried out to know, through a bibliometric study, the main characteristics of 13 publications registered in the Scopus database during the period 2017-2022 worldwide. The results obtained from this database were organized in graphs and figures, categorizing the information by variables such as Year of Publication, Country of Origin and Area of Knowledge, which allowed identifying, through qualitative analysis, the position of different authors regarding the proposed topic. The main findings of this research were that the United States stood out for having the highest scientific production, leading the list with three publications. Likewise, the Knowledge Area that made the greatest contribution to the construction of bibliographic material related to the study of variables was Computer Science, with eight published documents.

Keywords: Business Intelligence, Public Finance Models, Data, Information, Technology.

1. Introduction

The constant changes in the market's needs and requirements have turned information into a key element for companies, leading to adopting new technologies that allow them to maximize their benefits while providing a better service. It is there when we must allude to Business Intelligence, a term that can be analyzed from different definitions that agree on its influence on decision-making. On the one hand, it can be defined as a tool that "aims to support organizations sustainably and continuously to improve their competitiveness, providing the necessary information for decision-making" (Cano, 2007). On the other hand, Raul Otra describes it as "an umbrella term that encompasses the processes, tools, and technologies to

convert data into information, information into knowledge and plans to conduct business activities effectively" (Oltra Badenes, 2017).

Although Business Intelligence usually concerns private companies, it is important to emphasize that it can be used by any organization, including Public Finance, which has focused its attention not only on obtaining better economic results but also on identifying the expectations and needs of its users in order to improve the interaction between the parties. For this reason, this article seeks to describe the main characteristics of the set of publications attached to the Scopus database and that are directly related to the variables of Business Intelligence and Public Finance Models, as well as the description of the position of certain authors affiliated to institutions around the world during the period between 2017 and 2022.

2. General Objective

To analyze from a bibliometric and bibliographic perspective, the development of research papers on the variables Business Intelligence and Public Finance Models in Scopus during 2017-2022.

3. Methodology

This article is conducted through a mixed research approach combining quantitative and qualitative methods.

On the one hand, a quantitative analysis of the information selected in Scopus is carried out under a bibliometric approach of the scientific production corresponding to the study of Business Intelligence and Public Finance Models.

On the other hand, from a qualitative perspective, examples of some research works published in the area of the study mentioned above are analyzed from a bibliographic approach that allows describing the position of different authors on the proposed topic.

It is important to note that the entire search was carried out through Scopus, establishing the parameters referenced in Figure 1.

3.1 Methodological design

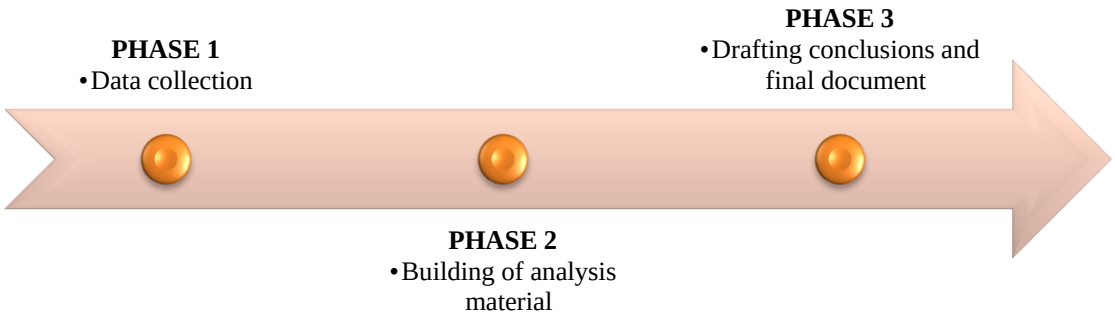

Figure 1. *Methodological design*
Source: *Own elaboration*

3.1.1 Phase 1: Data Collection

The data collection was executed from the Search tool on the Scopus web page, where 13 publications were obtained from the choice of the following filters:

TITLE-ABS-KEY (Business AND Intelligence AND Public AND Finance AND Models) AND (LIMIT-TO (PUBYEAR, 2022) OR LIMIT-TO (PUBYEAR, 2021) OR LIMIT-TO (PUBYEAR, 2020) OR LIMIT-TO (PUBYEAR, 2019) OR LIMIT-TO (PUBYEAR, 2017) OR LIMIT-TO (PUBYEAR, 2017))

- ❖ Published papers whose study variables are related to Business Intelligence and Public Finance Models.
- ❖ Publications between the years 2017- 2022.
- ❖ No country limit.
- ❖ Without distinction of area of knowledge.
- ❖ Without distinction of type of publication.

3.1.2 Phase 2: Construction of analysis material

The information collected in Scopus during the previous phase is organized and subsequently classified employing graphs, figures and tables as follows:

- ❖ Word Co-occurrence
- ❖ Year of publication
- ❖ Country of origin of the publication
- ❖ Knowledge area
- ❖ Type of Publication

3.1.3 Phase 3: Drafting conclusions and final document

In this phase, the study proceeded with an analysis of the results previously obtained, resulting in the determination of conclusions and, consequently, the final document.

4. Results

4.1 Co-occurrence of words

Figure 2 shows the Co-occurrence of keywords found in the publications identified in the Scopus database.

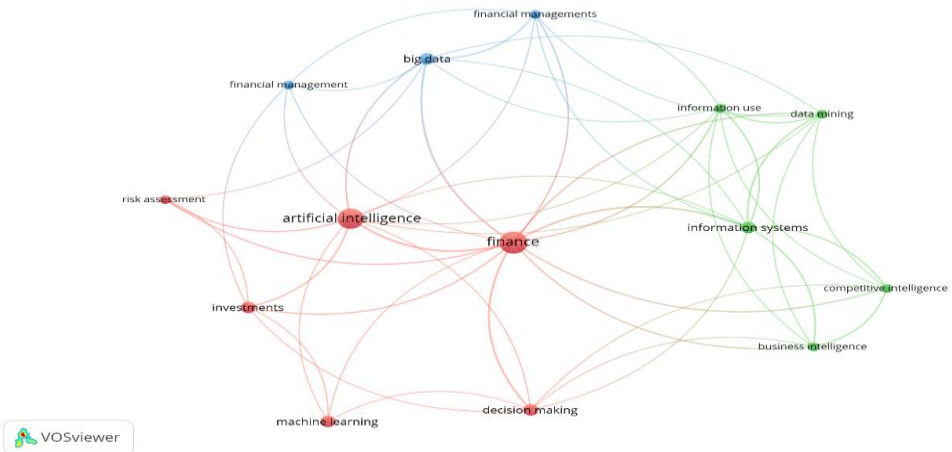

Figure 2. *Co-occurrence of words*
Source: *Own elaboration (2022); based on data exported from Scopus.*

As mentioned above, the data in Figure 2 were exported from Scopus, which shows our variables and their relationship with other terms, such as information systems, competitive intelligence, and financial management, analyzed below.

On the one hand, the study finds a direct link between business intelligence and finance as it plays an important role in decision-making through competitive intelligence and the processing and disseminating data from information systems.

Similarly, financial management requires information systems, albeit on a larger scale, which is why it relies on big data and artificial intelligence for its management.

4.2 Distribution of scientific production by year of publication.

Figure 3 shows how the scientific production is distributed according to the year of publication from 2017 to 2022.

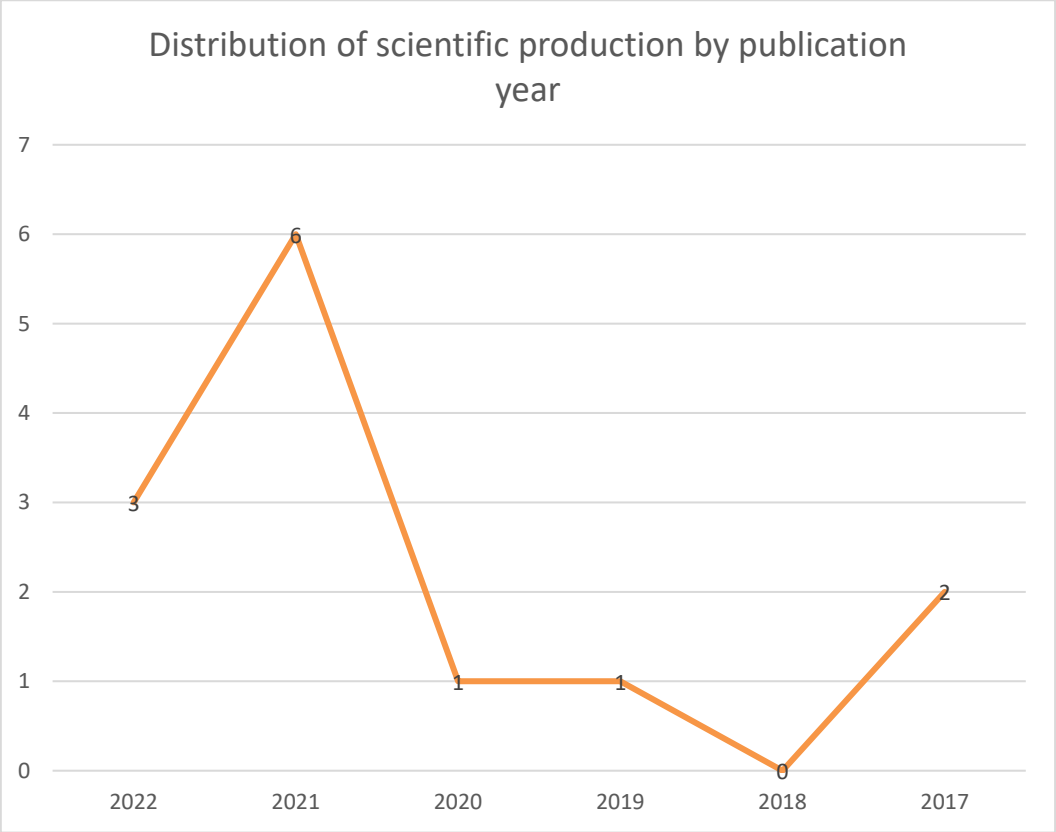

Figure 3. *Distribution of scientific production by year of publication.*
Source: *Own elaboration based on The Scopus database.*

Figure 3 shows the scientific production concerning the variables Business Intelligence and Public Finance Models between the years 2017 and 2022, left as a result of the publication of 13 papers containing the keywords. Although not many documents were found, it should be noted that the most critical year was 2018, with no research on this topic. It was until 2021 that the highest peak of the period was achieved with the registration of 6 publications, decreasing the following year again.

4.3 Distribution of scientific production by country of origin.

Figure 4 shows the distribution of scientific production according to the nationality of the authors.

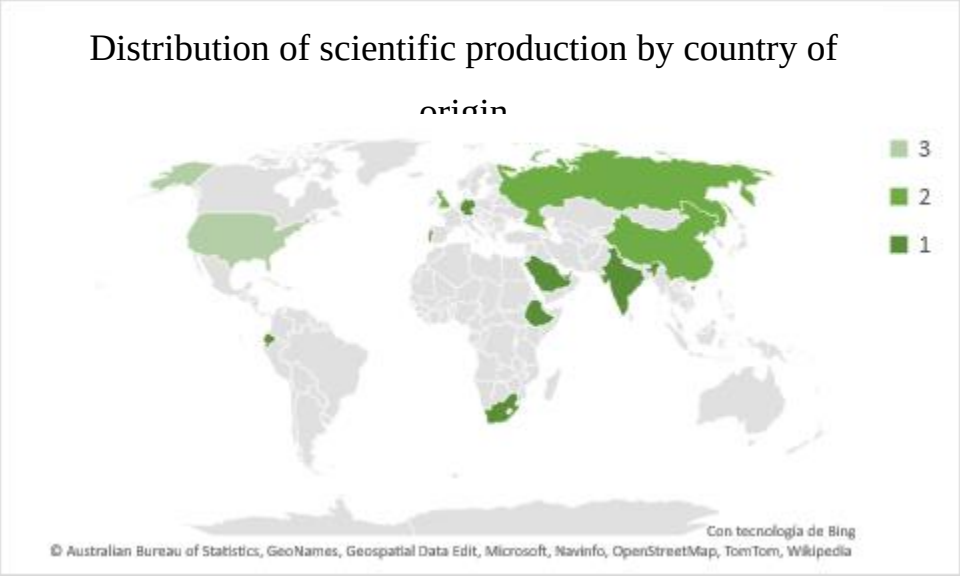

Figure 4. *Distribution of scientific production by country of origin.*
Source: *Own elaboration (2022); based on data provided by Scopus.*

In the study of Business Intelligence and Public Finance Models, the United States leads the list of published papers with a total of 3 records in the Scopus database during the period 2017-2022, followed by China and Russia, with 2 texts each. An example of these is the conference proceedings entitled "Business Intelligence in a Public Institution - Evaluation of a financial data mart" (Ramos, Alturas, & Moro, 2017), in which the relevance of data processing in the decision-making process of public organizations is exposed. For this reason, a data storage system is designed to provide a solution to the existing shortcomings in collecting and processing information and then evaluated according to "usability, utility and ease of use" (Ramos et al., 2017).

At this point, it is important to note that the elaboration of scientific publications, in many cases, is based on collaborations that may involve private and public institutions from one or several countries. Therefore, the same publication may be linked to one or more authors with different nationalities and thus to more than one country simultaneously, making part of each of the total number of articles or publications in the final sum.

4.4 Distribution of scientific production by area of knowledge

Figure 6 shows the distribution of the production of scientific publications according to the area of knowledge through which the different research methodologies are implemented.

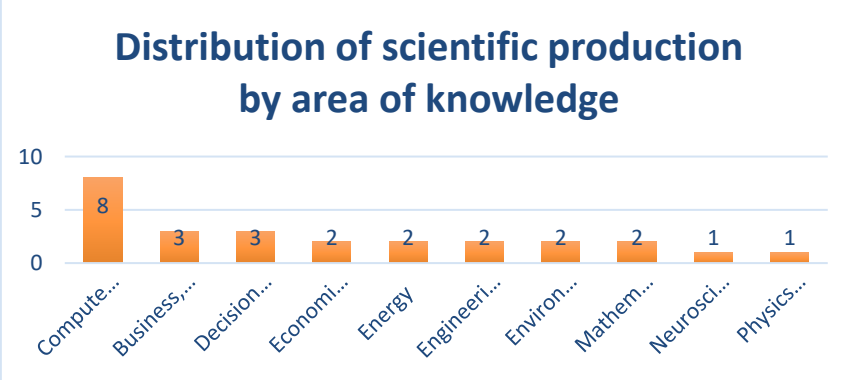

Figure 6. *Distribution of scientific production by area of knowledge.*
Source: *Own elaboration (2022); based on data provided by Scopus.*

During this research, it was determined that Computer Science is the area in which most papers related to Business Intelligence and Public Finance Models are made and subsequently published in the Scopus database. However, also other areas such as business, management and accounting, as well as decision sciences, contributed to the study of such variables between 2017 and 2022, managing to publish 3 papers each.

As can be seen in Figure 6, the variables that are the object of this study can be treated from different areas of knowledge since every organization needs tools that allow it to evaluate processes and markets based on the knowledge of the opinion of its customers or users and thus find solutions.

4.5 Type of publication

The following graph shows the distribution of the bibliographic findings according to the type of publication made by each of the authors found in Scopus.

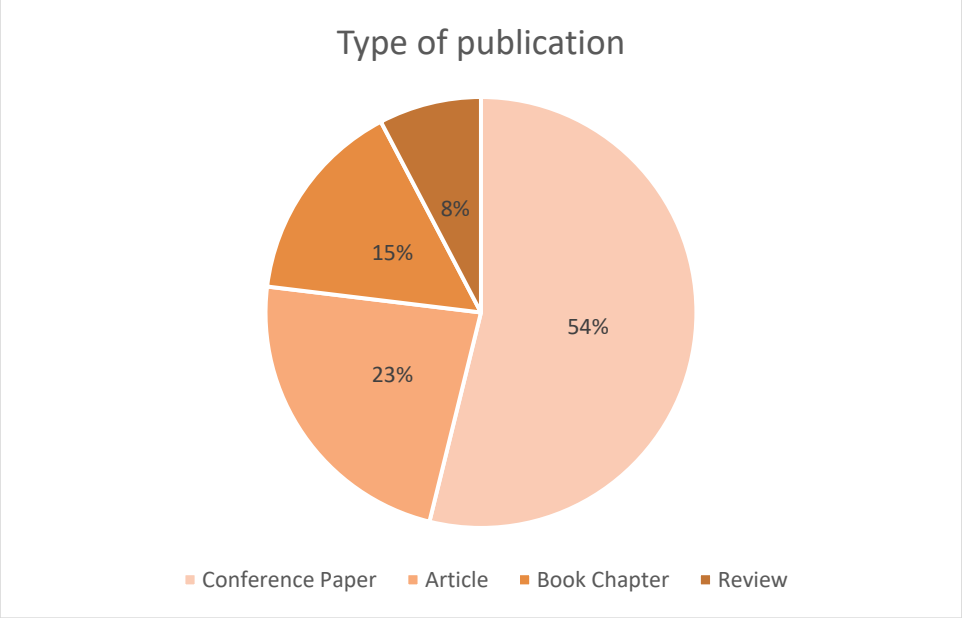

Figure 7. *Type of publication*
Source: *Own elaboration (2022); based on data provided by Scopus.*

Figure 7 clearly shows that the predominant publication type in the study of Business Intelligence and Public Finance Models during 2017-2022 was conference proceedings, with 7 papers, comprising 54% of the total sum. "Automatic Information Exchange Model Based on Big Data Mining Algorithm" (Xiaqiu, 2021), which bases its study on "automated models for the exchange of public financial information," and its increase in companies as a result of the (Xiaqiu, 2021) and their increase in companies as a result of the change in conventional management models. Specifically, they mention big data, a technology that facilitated financial analysis in selected companies showing improvements in their profitability after some time, despite the high costs generated by adapting this type of technological algorithm.

5. Conclusions

Finally, thanks to the bibliometric analysis carried out in this research work, it was possible to establish that the United States was the country with the largest number of published records regarding the variables Business Intelligence and Public Finance Models, with a total of 3 publications in the Scopus database during the period 2017-2022. Likewise, it was

determined that conference proceedings led the type of publication with 6 texts and that Computer Science was the area with the highest number of studies concerning the subject in the previous years.

On the one hand, it ratifies the importance of Business Intelligence in the decision-making of any organization, private or public, thanks to the conversion of data or codes into clear and concise information that can be analyzed only by the person selected for such function, thus facilitating the management of information and classification of this according to the case or objective. In the case of Public Finance Models, it is possible to affirm that financial managers should resort to the use of Business Intelligence technologies, such as "Big Data," in order to perform "a real and timely analysis of public spending, as well as to be massively accessible to citizens in their constant search for transparency in government management" (Reyes Bermudez, 2017). Such was the case in South Africa, which developed a "novel decision support system (DSS) for decentralized general waste management," which made it possible to delimit the best alternatives for managing decentralized waste (M, S.E., & R., 2022) which made it possible to delimit the best alternatives to implement, leaving aside the uncertainty and distrust that historically plagues them due to mismanagement.

Despite the above, it was not possible to find much information linking Business Intelligence technologies or systems with Public Finance Models, so one could infer that those in charge of the financial management of the State are not familiar with software or tools of this style.

References

belle, V., & Papantonis, I. (2021). Principles And Practice Of Explainable Machine Learning. Frontiers In Big Data.

Cano, L. J. (2007). Business Inteligence: Competir con Información. Madrid : Banesto, Fundación Cultural .

D, H., Mishra, N., G, P., Mavaluru, D., Vajpayee, A., Kushwaha, S., & Sahile, K. (2022). Applications of Intelligent Model to Analyze the Green Finance for Environmental Development in the Context of Artificial Intelligence. Computational Intelligence and Neuroscience.

Efimova, O. V., Rozhnova, O. V., & Basova, M. M. (2022). Analysis and Assessment of the Relationship of Sustainable Development Goals, Innovation, and Human Capital in the Reporting of Large Russian Companies. En Advances in Science, Technology and Innovation (págs. 299-304). Springer Nature.

Faccia, A., Al Naqbi, M. Y., & Lootah, S. A. (2019). Integrated cloud financial accounting cycle. How artificial intelligence, blockchain, and XBRL will change the accounting, fiscal and auditing practices. ACM International Conference Proceeding Series, (págs. 31-37). Oxford .

Liu, L. (2020). Application Strategy of Big Data in Enterprise Financial Management from the Perspective of Risk Society Coupling. Lecture Notes in Electrical Engineering, (págs. 1661-1668). Singapore .

M, B., S.E, T., & R., L. (2022). A decision support system for business development around decentralised waste utilisation in South Africa. Cleaner Environmental Systems.

Oltra Badenes, R. F. (2017). Business Intelligence. Definición. 1-8.

Ramos, J., Alturas, B., & Moro, S. (2017). Business intelligence in a public institution - Evaluation of a financial data mart. Iberian Conference on Information Systems and Technologies, CISTI. Lisbon.

Rasskazov, V. E. (2020). Financial and economic consequences of distribution of artificial intelligence as a general-purpose technology. Finance: Theory and Practice, 120-132.

Reyes Bermúdez, H. R. (2017). NTELIGENCIA DE NEGOCIOS APLICADA DESDE BIG DATA COMO HERRAMIENTA PARA ANALIZAR EL PRESUPUESTO NACIONAL DE. Guatemala .

Romero-Romero, E., & Romero-Urueña, N. (2019). Finanzas Públicas. Para una mejor gestión de los recursos. . Bogotá : Ediciones de la U.

Sanz, J. L., & Zhu, Y. (2021). Toward Scalable Artificial Intelligence in Finance. Proceedings - 2021 IEEE International Conference on Services Computing, SCC 2021, (págs. 460-469).

Sultanow, E., Chircu, A., Plath, R., Friedmann, D., Merscheid, T., & Sharma, K. (2021). Al evolves IA: A practitioner view on artificial intelligence information architecture. En Robotic Process Automation: Management, Technology, Applications (págs. 349-376).

Xiaqiu, L. (2021). Information Automatic Sharing Model Based on Big Data Mining Algorithm. Journal of Physics: Conference Series. Chongqing.

Zhu, X., Yang, S. Y., & Moazeni, S. (2017). Firm risk identification through topic analysis of textual financial disclosures. 2016 IEEE Symposium Series on Computational Intelligence, SSCI 2016. Athens.

Zúñiga, M. D., Fuertes, W., Flores, H. V., & Toulkeridis, T. (2021). Management Support Systems Model for Incident Resolution in FinTech based on Business Intelligence. International Conference on Enterprise Information Systems, ICEIS - Proceedings, (págs. 240-247).