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Valentyna Martynenko,
Andrii Lypkan

SYSTEMATIZATION OF APPROACHES TO STATE ECONOMIC SECURITY USING BIBLIOMETRIC METHODS

The object of research is the economic security of the state as the basis for protecting the national economy from threats in conditions of crises, martial law and integration transformations. It covers historical and modern aspects of the formation of this concept, starting from the "New Deal" of 1934 in the USA to modern Ukrainian realities.

The lack of a single definition of the economic security of the state and the plurality of theoretical approaches complicate the formation of effective state policy. The problem lies in the need to systematize approaches to the concept, take into account the impact of crises, martial law and external threats, as well as identify key factors for ensuring economic security in conditions of European integration.

Using bibliometric analysis of Scopus and Web of Science data, a retrospective analysis of indexed sources on economic security was conducted. Based on this, 10 classification approaches were identified: growth capacity, economic system balance, threat resistance, resource-functional approach, protective approach, investment-innovation approach, economic-legal approach, sustainable development security, pandemic-economic approach and military-economic security. The author's definition of the economic security of the state was proposed, which takes into account its interdisciplinary nature and modern challenges.

Three broad clusters of 256 keywords were formed in Scopus; five narrower clusters of 146 words (45% less) were formed in Web of Science. A wider thematic coverage was found in Scopus and a more specialized one in Web of Science, reflecting different research emphases.

The results are recommended for developing a state policy of economic security, improving anti-crisis management, planning economic development and harmonization with European standards. They can be used to forecast risks, assess the stability of the economic system and support sustainable development in conditions of martial law and post-war recovery.

Keywords: *economic security, state policy, economic system, economic development, crisis, sustainable development.*

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1. Introduction

Economic security is an important component of the national security of the state. The study of the theoretical and methodological foundations of its provision requires taking into account the objective and subjective conditions of uncertainty, randomness, conflict and risk. It is important to identify external and internal potential and real threats, as well as the main aspects of the environment of social life, in particular global, international and national, political, economic, social, natural, security, cultural, religious, etc.

The state policy of economic security appeared and attracted significant public attention in the political discourse on June 29, 1934 with the creation of the Committee on Economic Security and the Advisory Council on Economic Security in the United States of America (USA) [1]. This event was part of the "New Deal" of the administration of President F. Roosevelt among the comprehensive measures of state regulation of the national economy [2]. The New Deal was implemented primarily to overcome the consequences of the Great Depression – the largest and most destructive global financial crisis of the 20th century [3].

It is important to understand the purpose for which the Committee on Economic Security and the Advisory Council on Economic Security were created in the United States. They were created to "study plans and make recommendations for future legislation that will provide people with decent housing and productive work" and "protect them from the misfortunes that cannot be completely eliminated in this man-made world" [4]. With the creation of the Committee on Economic Security and the Advisory Council on Economic Security in the United States on June 29, 1934, the fundamental provisions of the state policy of social protection of the population were initiated. Thus, the American social insurance program was created, which gave rise to the main forms of social insurance that exist to this day. The foundations of accident insurance, medical insurance, disability insurance, unemployment insurance, pension annuities, insurance in connection with the loss of the breadwinner, family assistance, pregnancy and childbirth, etc. were laid [5]. That is, at the first stage of its formation, the state policy of economic security was actually the prototype of the modern policy of employment and social protection of the population.

For the first time, the outline of the problems of state policy in the field of economic security was presented in [6], which can be considered the first recorded theoretical understanding of the problems of economic security, caused by the consequences of the global financial and economic crisis "The Great Depression" and, accordingly, unprecedented threats to the economic security of the United States.

Undoubtedly, the idea of ensuring the stability and protection of the country's economy has historical roots, but the formalization of the term "economic security of the state" in the context of the implementation of the state national security policy after World War II and became widespread in academic discourse already in the Cold War era. In particular, in [7] the origins of the confrontation itself of 1945–1950 are directly linked to issues of economic security. In [8] this concept is analyzed as a key problem of cooperation and collaboration in Europe after the end of the Cold War. It is noteworthy that even in 2011 economic security is characterized as an important, but still often ignored dimension of national security [9]. The concept of national security becomes the fundamental principle of US international policy when President Harry Truman signed the "National Security Act" on July 26, 1947 [10]. However, economic security did not become a full-fledged scientific component of national security in the USA at that time.

From 1977 to 2011, a number of meetings were held at which fundamental international documents in the field of security were adopted, in particular: the Charter of Paris for a New Europe [11], the Treaty on Conventional Armed Forces in Europe [12], the Charter on European Security [13], the Agreement on the Adaptation of the Treaty on Conventional Armed Forces in Europe [14], the OSCE Vienna Document on Confidence- and Security-Building Measures in the Military Field in Europe [15], etc.

The term "economic security" acquired legal status in the resolution "International Economic Security", adopted at the XL session of the UN General Assembly on December 17, 1985. The purpose of the resolution is "to promote international economic security for the socio-economic development and progress of every country in the world, especially developing countries, through international economic cooperation and the use of the potential of multilateral and regional organizations" [16]. With the acceleration of globalization at the end of the 20th century, discussions on economic interdependence, trade policy, financial systems and potential risks associated with economic openness [17, 18] contributed to the further development of the conceptual principles of the economic security of the state in international politics, regulated by interstate regulatory legal acts, as well as through the implementation of the state policy of economic security in each country through the harmonization of national legislation taking into account the protection of national interests [19–22]. Thus, in Ukraine, the category of "economic security" was first normatively enshrined in the Resolution "On the Concept (Fundamentals of State Policy) of National Security of Ukraine" [23] and, in fact, since the beginning of 1997, the progress of state policy in the field of national security has officially begun in Ukraine, an important component of which has become economic security.

Although the phenomenon of economic security has a historical basis, its crystallization as an important concept in academic discourse and its inclusion in political discussions on national security took place over a long period of time. Here, it is worth noting the contribution of various scientists and politicians in different periods, starting from the 1930s in the USA, especially in the second half of the 20th century.

Despite the significant volume of scientific works devoted to the theoretical foundations and practical aspects of the economic security of the state, there are still a number of critical gaps (unresolved issues) in the scientific discourse that require additional attention.

First, despite the awareness of the polysemantic nature of the concept, most studies offer a qualitative, often subjective, analysis of individual definitions and approaches. At the same time, there is no systematic, quantitatively-oriented retrospective analysis capable of objectively identifying hidden thematic clusters, key trends and interdisciplinary connections, which is critically important for a holistic understanding of the essence of the concept of "economic security of the state".

Second, existing studies ignore global crisis phenomena and new challenges, in particular the consequences of pandemics, martial law, and European integration processes, which have a significant impact on the formation of a modern understanding of the concept of "economic security of the state", which requires theoretical generalization.

Thirdly, the methodological tools used in the scientific literature usually did not provide effective identification and visualization of thematic clusters, analysis of the geography of research and dynamics of scientific interests of researchers of economic security. In this regard, there is a need to form a modern holistic, relevant and expanded definition of the concept of "economic security of the state".

Thus, the scientific problem of the lack of systematicity in retrospective studies of the concept of "economic security of the state" using bibliometric methods of analyzing relationships between metadata is being updated. The solution to the problem is proposed in this article for the purpose of theoretical generalization and systematization of approaches to the economic security of the state and the development of effective mechanisms for managing it in the conditions of modern threats.

The object of research is the economic security of the state as a set of processes that ensure the protection of the national economy from threats in conditions of crises, martial law and integration transformations. This object includes mechanisms of state regulation, economic institutions and state policy of protection of economic interests, which are aimed at strengthening the economic security of the state in conditions of crisis and martial law, as well as European integration transformations. The research is based on improving approaches to the study of the economic security of the state by implementing methods of bibliometric analysis.

The aim of research is to systematize theoretical approaches to the concept of "economic security of the state" in order to develop a scientifically sound definition and improve the state policy of economic security.

Research tasks:

1. To identify and classify theoretical approaches to the definition of economic security.

2. To compare bibliometric clusters of keywords in Scopus and Web of Science.

3. To generalize the definition of the concept of "economic security of the state" based on the results of bibliometric analysis.

2. Materials and Methods

The basis for the analysis of the formation, formation and development of state policy in the field of economic security is the theoretical direction of the study of economic security as a scientific category in retrospect on the basis of scientific sources. For its implementation, it is advisable to use the methodological support of dynamic and bibliometric analysis using VOSviewer version 1.6.20 [24], Scopus Citation Overview tool [25] and Web of Science Results Analysis Tool [26]. Using VOSviewer, which is based on a remote approach to the visualization of bibliometric networks, the obtained search results are visualized, the so-called "science mapping" [27]. Using VOSviewer tools allows to isolate and visualize all keywords mentioned in the analyzed articles and quotes on the issue of economic security. It is also possible to identify directions with strong connections (according to VOSviewer algorithms, the closer the keywords are to each other, the stronger the connection between them). These tools are also used to determine the subject area, number of works, related fields of research, country of origin of authors and journals, citations, etc.

The results of the bibliometric analysis of scientific publications indexed in Scopus and Web of Science Core Collection, in which the concept of "economic security" is present in the title or list of keywords, should provide answers to the following questions:

1. What is the number of scientific works indexed for the entire period in the scientometric databases Scopus and Web of Science Core Collection, with a distribution by year?

2. Authors from which countries publish the most works on economic security?

3. What are the main thematic areas of publications?

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4. Which publications and journals containing economic security research are the most cited?

5. What is the clustering and interrelationships between areas of economic security research?

3. Results and Discussion

A retrospective analysis of the concept of "economic security of the state" using bibliometric means allows to obtain answers to the 5 questions posed above. First, a search query in English "economic security" was formed in Scopus [25] and Web of Science Core Collection [26]. As a result, the sample in Scopus amounted to 4,838 publications (an average of 59 publications per year) for 1931–2023, and in Web of Science – 3,104 publications (an average of 58.6 publications per year) for 1970–2023 (Fig. 1).

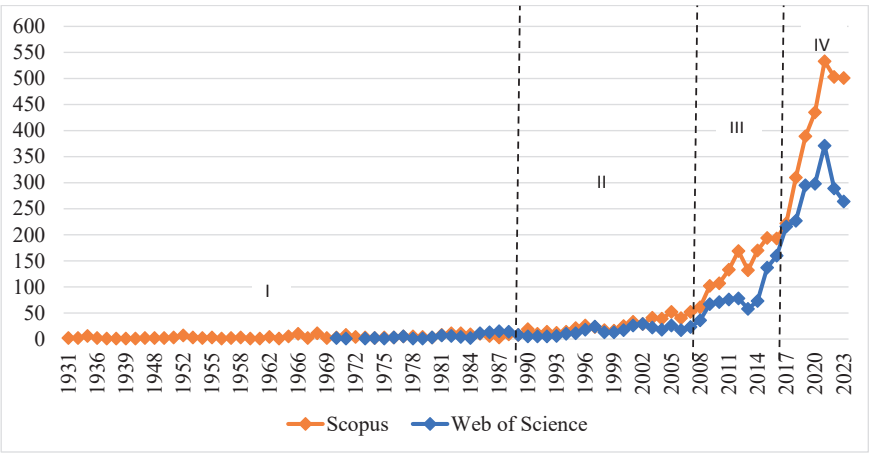

Fig. 1. Dynamics of indexing of publications in Scopus and Web of Science Core Collection, which contain the concept of "economic security" (formed according to data as of 31.12.2023, given in [25, 26])

As can be seen from the data given in Fig. 1, the term "economic security" in Scopus was first mentioned in a scientific publication in 1931 [6] and related to social protection of the population, and in Web of Science economic security was first mentioned in 1970 [28], and is associated with the protection of the economic interests of artists in the so-called "right of succession" ("droit de suite"). Analyzing the publication activity on the issue of economic security in the studied scientometric databases, 4 periods can be distinguished:

Stage I – from 1931 (Scopus) and from 1970 (Web of Science) to 1989, 201 publications were indexed in Scopus and 100 publications in Web of Science, which amounted to 4.15% and 3.22% of all publications for the entire period, respectively. This stage can be considered the birth of the concept of "economic security", which has not yet acquired a generally accepted definition and subject area in economic science. It concerned various spheres of economic life of society – from social protection and economic interests of an individual to the protection of economic interests of the state under the influence of decolonization, postcolonialism and the "cold war". Volatility according to Scopus was 1–11, according to Web of Science – 1–15 publications. The average annual growth of publication activity in Scopus was +4.5%, in Web of Science +13.9%.

Stage II (1990–2007) – moderate growth of publication activity, the final formation of the concept of "economic security" as a component of national security and protection of national interests of the state in the economic sphere. This stage was accompanied by the end of the Cold War, the collapse of the USSR and Yugoslavia, and a rethinking of the consequences of these global processes for global economic development. Volatility in Scopus was 10–52, in Web of Science – 5–29 publications. Volatility in Scopus was 1–11, in Web of Science – 1–15 publications. The average annual growth of publication activity in Scopus was +11.0%, in Web of Science +6.0%.

Stage III (2008–2016) – a stage of accelerated growth of scientific interest in the issues of economic security under the influence of the consequences of the Great Recession of 2008–2009, the emergence of cryptocurrencies and the beginning of the hybrid phase of the Russian-Ukrainian war. Volatility according to Scopus amounted to 61–170 publications, according to Web of Science – 36–160. The average annual growth of publication activity in Scopus was +15.7%, in Web of Science +24.1%.

Stage IV (2017–2023) – slowdown (stabilization) of publication activity and scientific discourse on economic security issues, as well as the process of rethinking its subject area and functionality under the influence of the COVID-19 pandemic, the concept of sustainable development, Industry 4.0 and the phase of large-scale invasion in the Russian-Ukrainian war. Volatility according to Scopus amounted to 222–533 publications, according to Web of Science – 216–371. The average annual publication activity in Scopus increased by 14.6%, in Web of Science – by 7.4%.

The overall average annual growth of publication activity on economic security issues according to Scopus was +7.5%, and according to Web of Science +11.8%. At the same time, the maximum number of indexed publications was reached in 2021 – 533 units (11% of the total) in Scopus and 371 units (12%) in Web of Science. The h-index of publications on economic security in Scopus reached 87, the total number of citations was 44,844, an average of 9.27 citations per publication and 546.88 citations per year. The h-index of publications on economic security indexed in the Web of Science Core Collection reached 72, the total number of citations was 28,689, an average of 9.24 citations per publication and 541.3 citations per year. That is, the average level of scientific impact of research on economic security is high and equivalent in both scientometric databases.

Analyzing the affiliation of authors to the country, it should be noted that the largest number of articles in both Scopus and Web of Science with authors representing the USA – 1,098 and 734, respectively (Fig. 2).

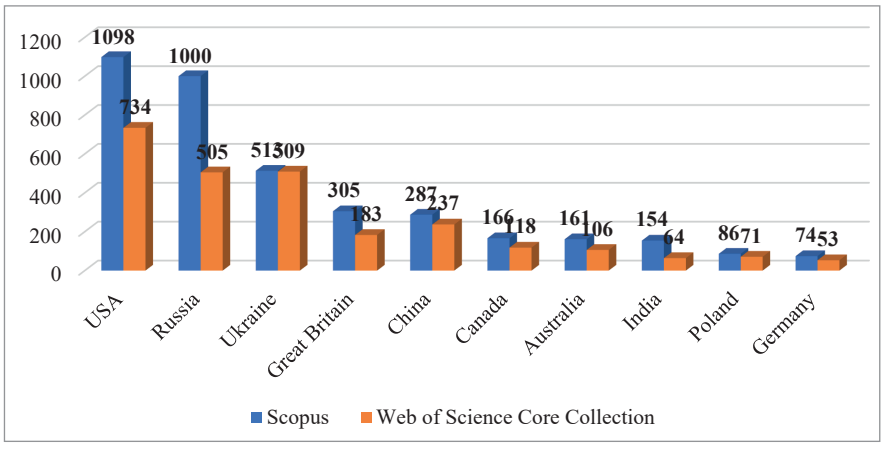

Fig. 2. TOP-10 countries by affiliation of authors in publications on the topic of economic security, indexed in scientometric databases (formed according to data provided in [25, 26])

It is noteworthy that the interest of authors in the issues of economic security in both scientometric databases by their affiliation to the TOP-10 countries coincides; only the places in the ranking differ. In Scopus, representatives of the Russian Federation are in second place with 1000 articles, in third place – Ukrainian authors with 513 articles, in fourth place – British scientists with 305 articles, in fifth place – Chinese scientists with 287 articles. In second place in Web of Science, Ukrainians are in third place with 509 articles, in Russians with 505 articles, in fourth place – Chinese with 237 articles, in fifth place – British with 183 articles.

Data on economic security research in different fields of knowledge from Scopus and Web of Science Core Collection were also obtained (Table 1).

Analyzing the data in Table 1, it should be noted that in Scopus, the methodology for calculating the number of publications and their share in the corresponding field of knowledge is carried out for each fact of affiliation. That is, if a scientific journal is indexed in several fields of knowledge, then the article is counted for each of them. Therefore, the total number of publications in Table 1 is 1.8 times larger in Scopus than by the fact of indexing. In the Web of Science Core Collection, the publication is counted for the first field of knowledge, regardless of their number, therefore the total in Table 1 for Web of Science coincides with the number of indexed articles on economic security in this scientometric database. Also, according to the data given in Table 1, it is possible to conclude that in both scientometric databases the share of publications in social and economic sciences is over 44%.

It should also be noted that among the publications indexed in Scopus, 64.6% or 3126 are journal articles (Articles), 13.9% or 672 are conference papers (Conference Papers in Scopus and Proceeding Papers in Web of Science), 12.2% or 589 are book chapters, 9.3% or 451 are other types of scientific works. In the Web of Science Core Collection, 2367 or 76.3% of journal articles, 549 or 17.7% of conference papers, 87 or 2.8% of book chapters, 101 or 3.2% of other types of scientific works are indexed. That is, among scientists, book chapters indexed in Scopus are significantly more popular than in Web of Science, but journal articles and conference abstracts indexed in Web of Science Core Collection were more popular with authors than in Scopus.

The next stage of bibliometric analysis is the assessment of indexed periodicals that contain the most publications on economic security in Scopus (Table 2) and Web of Science Core Collection (Table 3).

Table 1

TOP-10 fields of knowledge in which economic security is researched (according to Scopus and Web of Science Core Collection)

Scopus database			Web of Science database		
Field of knowledge	Number of publications, units	Share, %	Field of knowledge	Number of publications, units	Share, %
Social sciences	2078	24.0	Economics	594	19.1
Economics, econometrics and finance	988	11.4	Business	217	7.0
Business, management and accounting	768	8.9	Management	215	6.9
Engineering	714	8.2	Political science	192	6.2
Environmental sciences	714	8.2	Corporate finance	184	5.9
Medicine	523	6.0	International relations	182	5.9
Computer sciences	512	5.9	Social sciences	170	5.5
Arts and humanities	389	4.5	Regional studies	152	4.9
Energy	344	4.0	Environmental sciences	152	4.9
Earth and planetary sciences	328	3.8	Sociology	133	4.3
Other	1322	15.1	Other	913	29.4

Note: generated based on data provided in [25, 26]

Table 2

TOP-10 journals indexed in Scopus that published works on economic security during 1931–2023

Journal name	Publisher	Country of registration	CiteScore 2022	Quartile	Number of publications, units	Share, %
1. Lecture Notes in Networks and Systems	Springer Nature	Switzerland	0.7	Q4	127	2.63
2. E3S Web of Conferences	EDP Sciences	France	1	Q4	111	2.29
3. Actual Problems of Economics	National Academy of Management	Ukraine	0.1	Q4	107	2.21
4. Economy of Regions	The Ural Branch of Russian Academy of Sciences	Russia	1.9	Q2	66	1.36
5. IOP Conference Series: Earth and Environmental Science	IOP Publishing Ltd	United Kingdom	0.8	Q4	59	1.22
6. Economic Annals – XXI	Institute of Society Transformation	Ukraine	1.5	Q3	41	0.85
7. Journal of Security and Sustainability Issues	The General Jonas Zemaitis Military Academy of Lithuania	Lithuania	3.9	Q2	36	0.74
8. Financial and Credit Activity: Problems of Theory and Practice	Fintech Aliance LLC	Ukraine	0.5	Q4	35	0.72
9. Espacios	Revista Espacios	Venezuela	0.5	Q3	27	0.56
10. Advances in Science Technology and Innovation	Springer Nature	Switzerland	0.6	Q3	27	0.56

Note: formed according to the data given in [25]

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Analyzing the data in Table 2, it should be noted that among the 10 periodicals indexed in Scopus, only six are scientific journals. Also, three publications are conference proceedings (Lecture Notes in Networks and Systems, E3S Web of Conferences and IOP Conference Series: Earth and Environmental Science). One publication is a book series Advances in Science Technology and Innovation. In addition, three journals, namely Actual Problems of Economics, Journal of Security and Sustainability Issues and Espacios, are excluded from Scopus and the indexing of articles published in them is discontinued. At the same time, previously indexed articles remain in the database with their past and future bibliometric indicators. It should be noted that only 13.2% of scientific works are published in the given list of periodicals. Among these publications, three scientific journals are Ukrainian (Actual Problems of Economics, Economic Annals – XXI and Financial and Credit Activity: Problems of Theory and Practice). Two of the six journals are highly ranked, as they are in the Q2 quartile at the end of 2022.

Analyzing the data in Table 3, it should be noted that among the 10 periodicals indexed in the Web of Science Core Collection, only 1 is a conference proceeding (AEBMR Advances in Economics Business and Management Research), and the rest are scientific journals.

Also, two scientific journals, namely Actual Problems of Economics and International Journal of Computer Science and Network Security, are excluded from the Web of Science. However, previously indexed articles remain in the database with their past and future bibliometric results. In addition, 14.2% of scientific works are published in the given list of periodicals, of which 2 scientific journals are Ukrainian (Actual Problems of Economics and Financial and Credit Activity: Problems of Theory and Practice). Three journals out of nine (Economy of Regions, Journal of Security and Sustainability Issues and Social Indicators Research) are highly rated, since they were in the quartiles Q2–Q1 at the end of 2022.

An important component of the bibliometric analysis is the analysis of publications in which the term "economic security" occurs in the context of the country, the results of which allow to understand for which scientists from which countries the problem under study is relevant. The construction of a bibliographic network of citations (Citation) by country (at least 20 publications per country) was formed for each cited reference [27]. The number of bibliographic links between a pair of documents should be equal to the number of pairs of citations in these two documents that have identical correspondence keys. Thus, Fig. 3 shows a visualization of citations of publications by scientists on economic security in Scopus, by country, and Fig. 4 shows a similar visualization for the Web of Science Core Collection.

As can be seen from the resulting bibliographic map in Fig. 3, the problem of economic security is widespread and relevant for scientists from the United States of America (USA), the People's Republic of China (PRC), Australia and European countries – Great Britain, Ukraine, the Russian Federation (RF). The data presented in Fig. 3 show that the most cited publications were published in the USA – 924 publications cited 19492 times, in the Russian Federation there are 2598 citations for 829 publications, respectively, in Ukraine – 385 publications cited 1815 times, in the UK – 7971 citations for 259 publications, in the PRC – 1314 citations for 196 publications. The lines show the connections between countries, that is, in the works of scientists from which countries are studies of the problems of economic security of representatives of other countries most often cited. Thus, Ukraine is in the same cluster with Poland and the Republic of South Africa and has close ties with the USA, the Russian Federation, Great Britain, India and South Korea.

Table 3

TOP 10 journals indexed in the Web of Science Core Collection that published works on economic security during 1970–2023

Journal name	Publisher	Country of registration	Journal Citation Indicator 2022	Quartile	Number of publications, units	Share, %
1. Financial and Credit Activity – Problems of Theory and Practice	Fintech Aliance LLC	Ukraine	0.33	Q3	100	3.22
2. AD Alta Journal of Interdisciplinary Research	Magnanimitas	Czech Republic	0.27	Q3	65	2.09
3. Actual Problems of Economics	National Academy of Management	Ukraine	–	Q4	61	1.97
4. Baltic Journal of Economic Studies	Publishing House of Polonia University "Educator"	Latvia	0.18	Q4	59	1.90
5. AEBMR Advances in Economics Business and Management Research	AEBMR	Netherlands	–	Q4	34	1.10
6. Economy of Region	The Ural Branch of Russian Academy of Sciences	Russia	0.71	Q2	28	0.90
7. International Journal of Computer Science and Network Security	IJCSNS	South Korea	0.17	Q4	28	0.90
8. Marketing and Management of Innovations	Sumy State University	Ukraine	0.35	Q3	23	0.74
9. Gerontologist	Gerontological Society of America	USA	1.73	Q1	22	0.71
10. Social Indicators Research	Springer	Netherlands	1.46	Q1	22	0.71

Note: formed according to the data provided in [26]

A similar situation is observed with the Web of Science Core Collection database (Fig. 4): USA (667 documents), Ukraine (509 documents), the Russian Federation (502 documents), the People's Republic of China (231 documents), England (174 documents), Canada (115 documents), Australia (102 documents), Poland (71 documents), etc. Among the 5 formed clusters, the USA and Ukraine clusters have the strongest connections and cooperate with all other clusters. This gives reason to believe that in the Web of Science economic security for scientists from the USA and Ukraine is a popular topic.

The final stage of bibliometric analysis using the VOSviewer functionality is the construction of a bibliographic map by forming clusters and relationships between keywords used in articles devoted to the study of economic security. The results for Scopus are shown in Fig. 5.

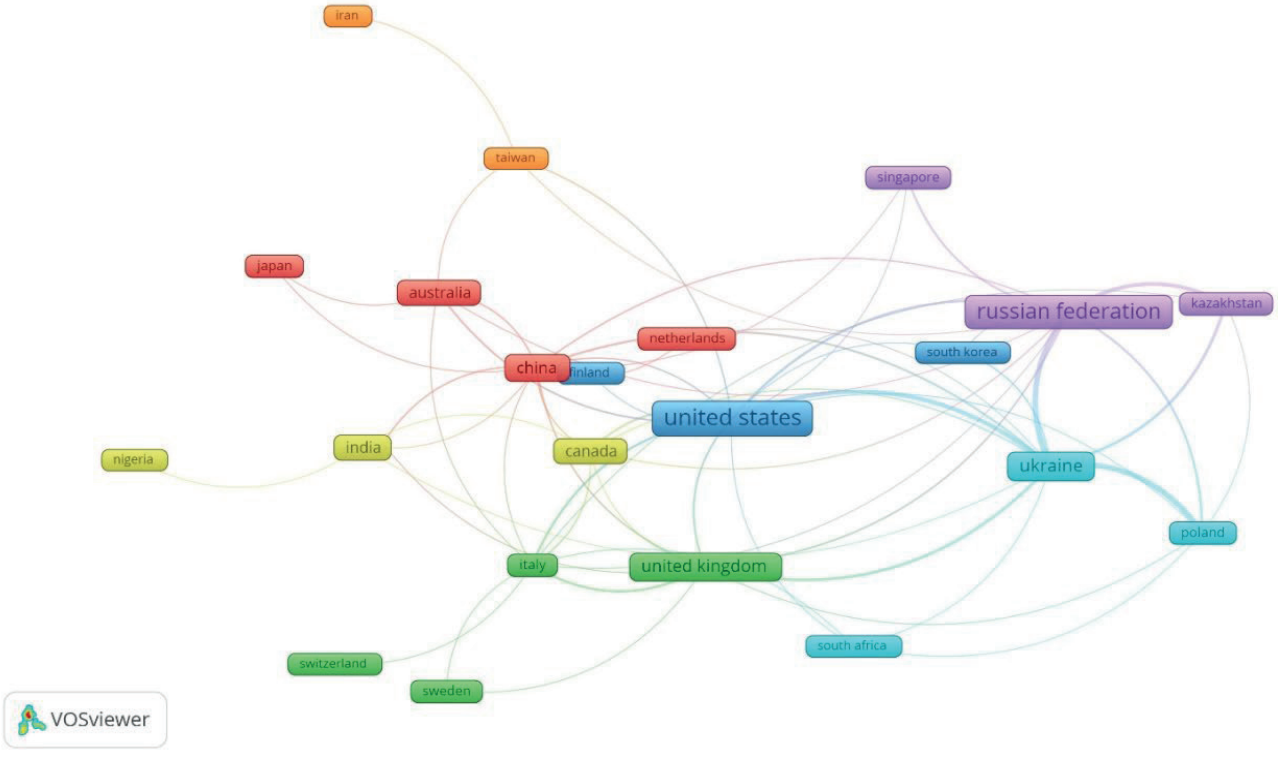

Fig. 3. Citations in Scopus of works by scientists who studied the issue of economic security, by country (constructed using the Scopus database [25] and VOSviewer)

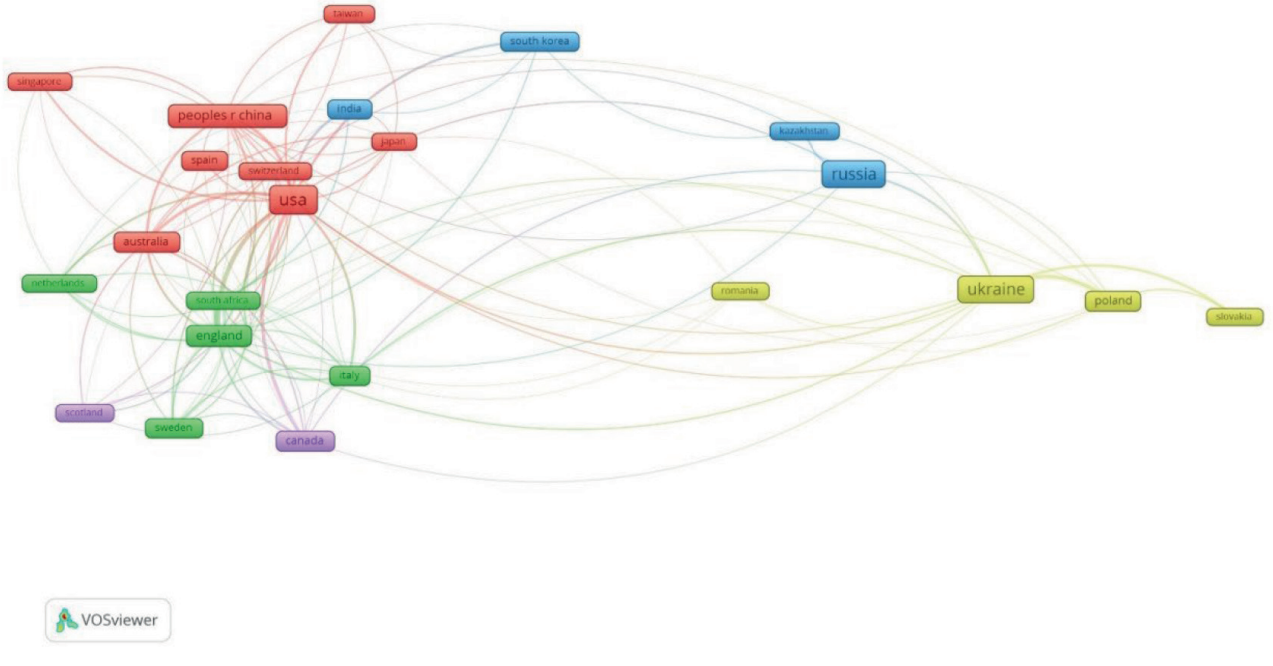

Fig. 4. Citations in the Web of Science Core Collection of works by scientists who studied economic security issues, by country (constructed using the Web of Science database [26] and VOSviewer)

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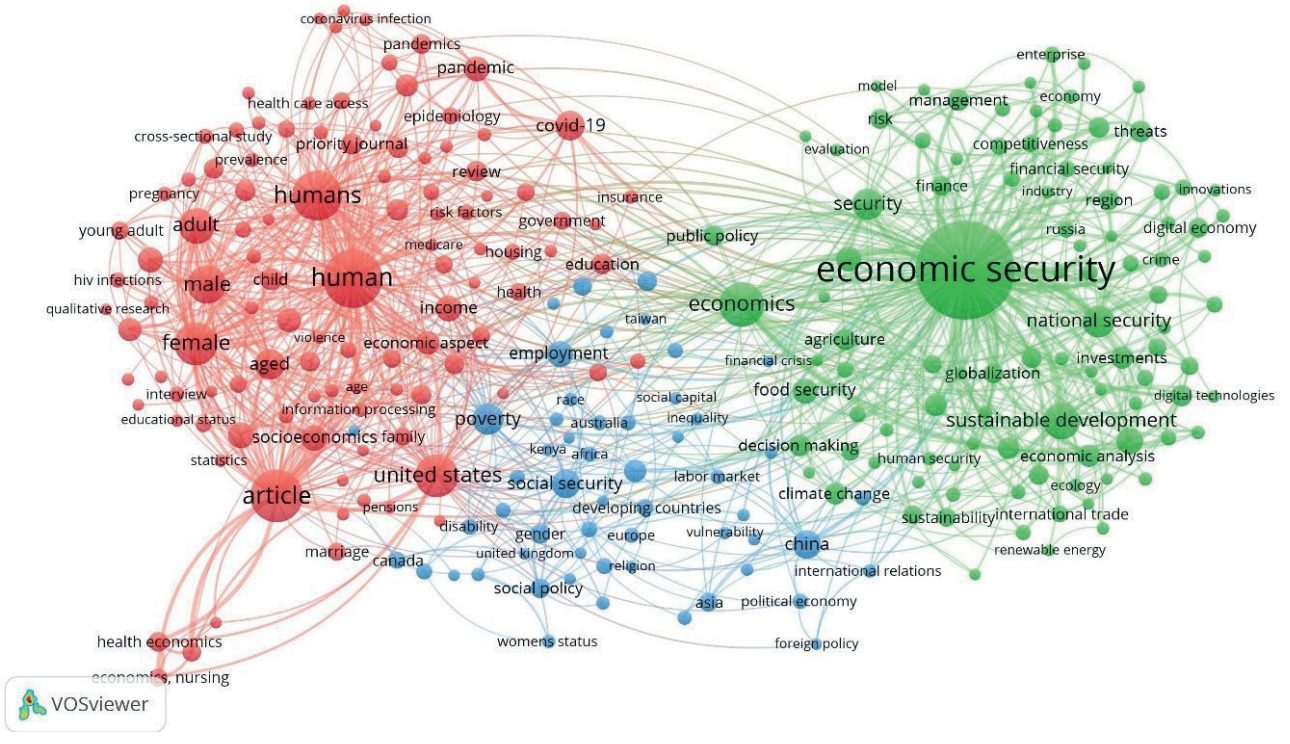

Fig. 5. Bibliographic map of keywords of publications on economic security indexed in Scopus during 1931–2023 (constructed using the Scopus database [25] and VOSviewer)

To construct a bibliographic map in the VOSviewer program, 265 keywords were selected from 14,623, mentioned in 15 or more scientific publications. As a result, 3 clusters were obtained in Fig. 5. It is obvious that the most popular keyword is "economic security", which occurs in 1,082 publications out of 4,838 published during 1931–2023, i. e. 22.4% of publications on economic security contain the term "economic security" in the list of keywords. Other popular words that appeared in over 200 publications were: "human", present in 380 publications, "article" in 310 publications, "humans" in 274 publications, "economics" in 219 publications, "female" in 201 publications, "United States" in 200 publications. Another 258 keywords occur from 15 to 167 times in publications on economic security. The 3 clusters formed are characterized by 11830 connections between 265 keywords with a total strength of 5157.50. The first cluster, colored red in Fig. 5, united 109 keywords. The most popular keyword was "human". The next most popular were "gender", "people", "female", "United States", "male", "adult", "elderly", which are found in over 100 publications. Also "COVID-19" (found in 95 publications), "socioeconomics", 77 cases, "socioeconomics factors", 73 cases, "income", 74 cases and others. The vast majority of keywords are placed next to each other, which indicates a close connection between them. The context of the relationships between the keywords of the first cluster gives reason to believe that the problems of economic security were studied in the context of human security, their medical, mental, age, gender, educational needs, and threats of the COVID-19 pandemic. Out of the total volume of 200 projects, 101 words were implemented using the example of the USA.

The keywords of the second cluster in the amount of 101 words are colored green in Fig. 5. The most popular keyword in this cluster is "economic security", followed by "economic theory", "sustainable development", "national security", "security", which is found in over 100 publications. "Economic and social effects" is found in 79 publications, "food security" – in 69 cases, "economic development" – in 55 cases. "Economic analysis" and "investments" occurred 54 times, "planning", "decision making" and "agriculture" – 52 times, "threats" – 51 times, "management" – 50 times, "public policy" – 49 times, etc. The problems of economic security in the publications of the second cluster were studied in the context of ensuring national security, improving public management of the national economy, food and energy security, sustainable economic development, etc. These problems were raised by scientists primarily using the example of Ukraine and the Russian Federation, since the keywords include "Ukraine" (30 cases), "Russia" and "Russian Federation" (78 cases in total).

The third cluster combined 55 keywords, colored in blue in Fig. 5. Among these words, the most popular was "poverty", which was used in 107 publications during 1931–2023. The following keywords were placed: "social security" – 91 mentions in scientific publications, "China" (89 mentions), "employment" (77 mentions), "socioeconomics factors" (73 mentions). "India" was mentioned 58 times, "developing country(ies)" – 57 times, "social policy" and "quality of life" – 45 times each, "gender" – 42 times, "unemployment" – 41 times, etc. The vast majority of keywords are placed next to the word "social security". That is, the publications of the third cluster studied economic security in the context of ensuring social security, the development of social capital, unemployment and employment of the population, migration, etc. This was characteristic of both European, African, Asian developing countries, and developed countries of North America and Australia.

The resulting bibliographic map in the VOSviewer program according to the data of the Web of Science Core Collection scientometric database is shown in Fig. 6. To build a bibliographic map in the VOSviewer program, 146 out of 9944 keywords mentioned in 15 or more scientific publications were selected. As a result, in Fig. 6, 5 clusters were obtained, characterized by 3175 connections between 146 keywords with a total strength of 2239.50. As in Scopus, the most popular keyword in scientific publications is "economic security", which was contained in 654 publications out of 3104 published during 1970–2023. In addition, the keyword "economic-security" was also found, which is present in 81 publications. In total, the number of publications with the keyword "economic security" indexed in the Web of Science Core Collection is 1.5 times less than the number of publications indexed in Scopus.

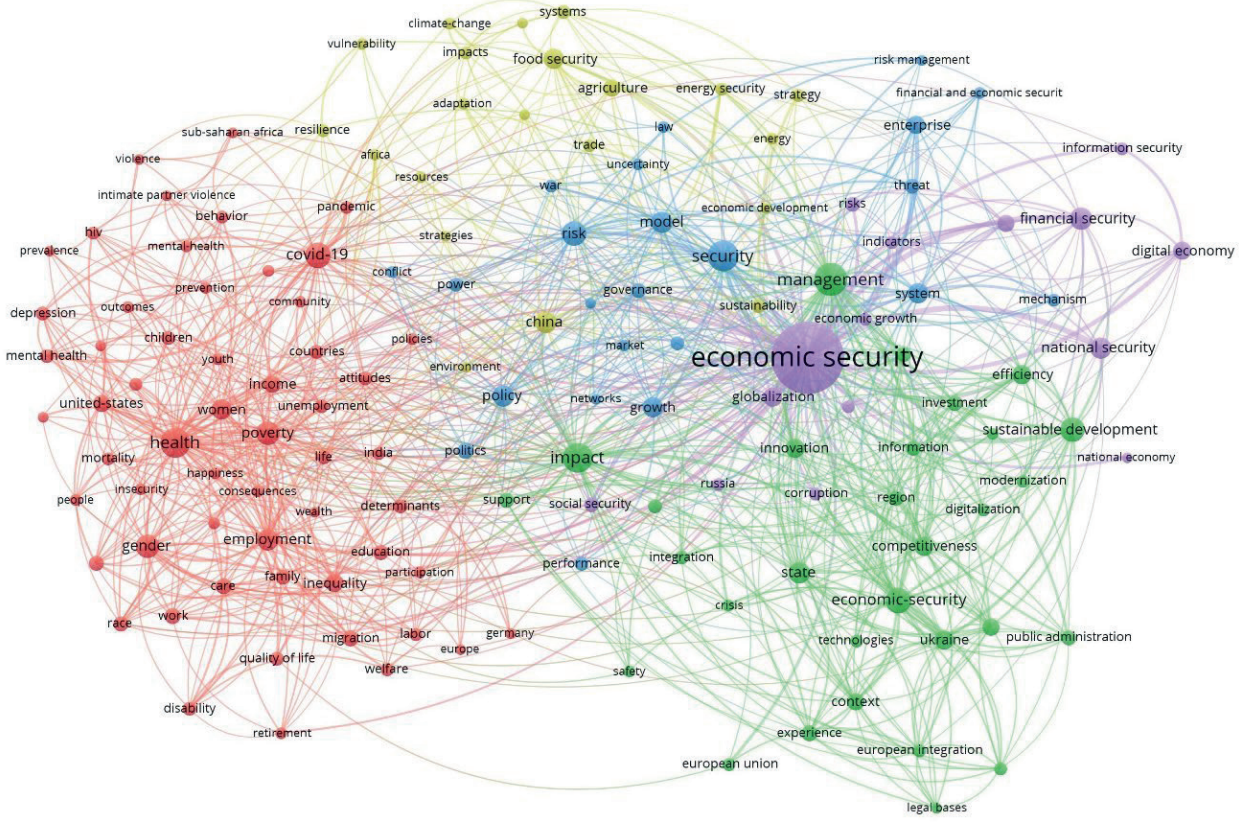

Fig. 6. Bibliographic map of keywords of publications on economic security indexed in the Web of Science Core Collection during 1970–2023 (constructed using the Web of Science database [26] and VOSviewer)

The first cluster, colored red in Fig. 6, combines 57 keywords, among which the most popular keyword is "health", which is mentioned in 101 scientific publications indexed in the Web of Science. The following keywords were next in popularity: "COVID-19" (85 mentions), "poverty" (73 mentions), "gender" (68 mentions), "employment" (59 mentions), "woman" (55 mentions), "inequality" (41 mentions), "USA" (40 mentions), "profit" (37 mentions), "work" (34 mentions), "migration" (34 mentions), "care" (33 mentions), etc. The vast majority of keywords in the first cluster are placed close to each other, that is, in close connection. Based on the context of the relationships between keywords, it should be understood that the problems of economic security in the publications of the first cluster coincide with the problems of the first and partly the third clusters of publications in Scopus (Fig. 5) and concern the economic security of a person, its medical, mental, behavioral, sexual needs, gender equality, poverty, as well as the threats of the COVID-19 pandemic, using the example of the USA.

The second cluster, colored green in Fig. 6, combines 30 keywords. The most popular keyword in this cluster was "management", which was mentioned 142 times in scientific publications on economic security indexed in the Web of Science Core Collection. The next most popular keyword was "impact" (114 mentions), followed by "economic-security" (81 mentions) – a phrase that probably contains a typical mistake, "sustainable development" (75 mentions), "state" (56 mentions), "Ukraine" (50 mentions), "competitiveness" (49 mentions), "innovation" and "efficiency" (46 mentions each) and others. All publications in the second cluster were devoted to sustainable development management, innovation, information to ensure economic security, mostly using the example of Ukraine.

The third cluster, colored blue in Fig. 6, combined 23 keywords, among which the most popular was "security", which was mentioned in 120 publications during 1931–2023. The following keywords were: "risk" (74 mentions), "model" (59 mentions), "policy" (57 mentions), "system" (52 mentions), "growth" (51 mentions), "enterprise" (43 mentions), "politics" (34 mentions), "threats" (30 mentions), "management" (29 mentions), "support" (29 mentions) and others. It is worth noting that among the keywords mentioned in scientific publications a smaller number of times, there are "uncertainty", "risk management", "war", "conflict", "law", "authority". Therefore, it should be concluded that in the publications of the third cluster, the modeling of the system (mechanism) of ensuring economic security is studied in conditions of risk, uncertainty, conflict, war using the example of a state and an enterprise.

The fourth cluster, colored in yellow in Fig. 6, combines 21 keywords, the most popular of which was "China", which was mentioned in 57 scientific publications on economic security indexed in the Web of Science Core Collection. The next most popular keyword was "food security" (54 mentions), then "strategies" (39 mentions), "agriculture" (36 mentions), "climate change" (35 mentions), "sustainability" (27 mentions), "energy security" (23 mentions), etc. Publications of the fourth cluster addressed the problems of ensuring economic security in the context of its food and energy components in the context of climate change, taking into account the challenges of sustainable development, mostly on the example of the PRC. The fifth cluster, colored purple in Fig. 6, united only 15 keywords, that is, the smallest of all clusters, but the most popular word of this cluster is the most popular keyword among all – "economic security", which is mentioned in 654 scientific publications indexed in the Web of Science. The following keywords were next in popularity: "financial security" (62 mentions), "national security" (60 mentions), "globalization" (45 mentions), "digital economy" (44 mentions), "threats" (36 mentions), "social security" (28 mentions), etc. The publications of the last fifth cluster are considered in the context of the financial and social components of national security under the influence of globalization in the digital economy.

It should be noted that the issues of ensuring economic security in the fourth and fifth clusters are close to the issues of the second cluster of publications indexed in Scopus (Fig. 5).

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Combining the results of retrospective analysis, in particular practical and theoretical directions, it is possible to state that the basis for the formation and development of modern theoretical approaches to the concept of "economic security of the state" were specific historical events and periods [29]. The interdisciplinary nature of economic security contributes to the formation of multidirectional conceptual approaches to the interpretation of its economic content, subject area and functional characteristics. Let's summarize the main ones of these approaches (Fig. 7).

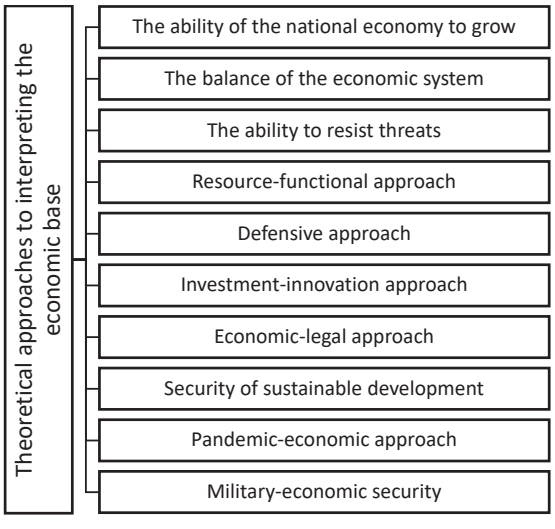

Fig. 7. Systematization of scientific approaches to the interpretation of the essence of the concept of "economic security of the state"

Let's characterize each of the theoretical approaches to the definition of the concept of "economic security" given in Fig. 7. Thus, according to the first approach, the effectiveness of economic security is determined by the stability of the economy and the reliability of its components, as well as vertical and horizontal connections within the system. This stability is manifested in the ability of the economy to withstand pressure in conditions of unpredictable factors, which creates the prerequisites for supporting economic growth and expanded reproduction in the state [30–32].

The balance of the economic system as a theoretical approach to the definition of economic security is understood from the position of ensuring balance between different sectors of the economy, the public and private sectors [33–35]. The balance of the economic system is the basis of economic growth. It minimizes the negative impact of economic crises and maximizes the economic stability of the state in the future. In this approach, the effectiveness of financial management, transparency of state institutions, stimulation of innovation and support for entrepreneurial activity are important.

The theoretical approach "ability to withstand threats" (Fig. 7) in defining economic security is determined by the ability of the state to adapt to internal and external challenges, maintaining the stability and functionality of the economic system during crises and unforeseen circumstances. State management of economic security involves the creation of strategies taking into account risks. It is necessary to balance the economic structure, create the right ways to respond to changes in the world, and also wisely use resources and new ideas to support stable development and protect the interests of the country [36–39].

Scientists who are supporters of the resource-functional approach study how money, technology, people and nature work together in the economy. They explain that it is necessary to coordinate how resources ensure the performance of economic functions by the state. This will help the country to resist external and internal threats, as well as adapt to changes in the global world [40–42]. It is important to optimally use resources to increase the country's economic stability and national security.

The study of the economic security of the state also takes place in the context of a protective approach. Here, scientists focus on measures and strategies that can reduce risks and prevent threats to the economic system [43–46]. The research involves the development of measures to create and implement protective mechanisms. The basis of such mechanisms is the stabilization of financial policy, regulation of markets, support for social protection of the population and strengthening of financial and economic institutions.

There is reason to believe that the investment-innovation approach to the study of the economic security of the state emphasizes the need to introduce innovations and attract investments for the development of the economy and increase its competitiveness [47–50]. Proponents of this approach argue that investment activity and innovation underlie the development of key sectors of the economy, increase labor productivity, and create new opportunities for economic growth [51, 52]. Therefore, to strengthen the economic security of the state, long-term innovative development should be supported, taking into account global trends in technological development.

The economic-legal approach to the definition of "economic security of the state" draws attention to how economic and legal factors jointly affect the stability and efficiency of the economic system. It is obvious that legal norms and economic mechanisms play a leading role in regulating the processes of protecting the economic interests of the state. The aforementioned approach requires the development and implementation of legal mechanisms to combat corruption, ensure state control, protect property rights, and create a favorable legal environment for the development of business and investment [53–55]. In the economic-legal approach, it is important to harmonize economic and legal policies to strengthen the economic security of the state.

Economic security of the state in the context of sustainable development means that the economic system satisfies the social needs of people, does not deplete natural resources, and does not harm the environment for future generations. This requires national and municipal plans for resource management, economic diversity, support for new ideas, and balancing social, environmental, and economic needs [56–59]. The economic security of the state in the context of sustainable development requires taking into account the long-term consequences of economic decisions and striving to improve people's well-being, reducing the anthropological impact on the environment.

Global pandemics and economic crises affect the economic stability of countries, so a pandemic-economic approach to defining economic security has recently been introduced. The pandemic-economic approach involves the development of strategies and mechanisms that help prevent and overcome economic problems that arise during a pandemic. The pandemic-economic approach includes health care reform, increasing the flexibility of the economy, and assisting enterprises and the population during a pandemic. The pandemic-economic approach also requires a combination of economic and medical strategies to strengthen the economic security of the state in the context of pandemics and other global crises [60–63].

In conditions of martial law, the economic security of the state is the ability to keep the economic system stable and efficient. The economic security of the state requires the creation and implementation of measures that satisfy the basic needs of people, ensure optimal resource management and support for important sectors of the economy. During war, the economic security of the state depends on the mobilization of resources, the preservation of budget-forming enterprises, support for industry and financial stability [64–67]. In addition, measures that preserve economic independence and stability play an important role in ensuring the economic security of the state during war.

Based on the systematization of theoretical approaches (Fig. 7), it is proposed to understand the economic security of the state as a functional component of national security with a complex (flexible, adaptive, dynamic) structure, vertical hierarchy, horizontal connections between mechanisms, which has unique properties, functions, tools necessary for:

– implementation of the state policy of national security in the field of protecting private and public economic interests, needs, rights and freedoms from real and potential threats, especially in conditions of pandemics and armed aggression;
– optimal use and distribution of resource potential, promoting the balance of elements of the economic system, its ability to withstand threats;
– introduction of innovations and attracting investments to increase the competitiveness of the national economy and ensure sustainable economic development;
– taking into account the long-term consequences of economic decisions and the desire to sustainably increase the standard of living of citizens, minimizing the impact on the natural environment;
– development and implementation of legal mechanisms aimed at combating corruption, protecting property rights, creating a favorable legal environment for business and investment development;
– harmonization of medical and economic strategies for the state to effectively confront the impact of pandemics and other global crises;
– mobilization of all available resources to expand military-industrial production to resist armed aggression and ensure the stability of the financial and economic system, etc.

The obtained research results have significant practical significance for the formation and adjustment of the state policy of economic security. First, the identified thematic clusters (Fig. 5 and Fig. 6) and their analysis can be used by state authorities to understand the complex interdisciplinary connections of economic security, in particular with health care (pandemics), social policy, digital transformation and sustainable development. Second, the proposed systematization and theoretical generalization of the economic security of the state should be taken as a methodological basis in the development and updating of state programs, strategies and doctrines in the field of national security. Which is especially important in improving anti-crisis management in conditions of martial law and post-war reconstruction of the national economy. The main limitations of this study are due to the choice of bibliometric methods and source base. Thus, the search query was limited to the English term "economic security", as a result of which a significant number of publications using related concepts (for example, "economic stability" or "financial security") were automatically excluded. In addition, the sample did not include works in languages other than English that are not indexed in Scopus and Web of Science. The same applies to unindexed monographs, dissertations and government reports, which are important for taking into account national characteristics. In addition, the "science mapping" method provides identification of thematic connections and frequency of metadata use, but does not allow for a qualitative analysis of the content and argumentation within the 10 proposed approaches to systematizing the economic security of the state. Prospects for further research are to overcome the identified limitations and deepen the analysis. It is advisable to conduct a deep qualitative and comparative analysis of the content of each of the 10 systematized approaches in order to identify their strengths and weaknesses. An urgent scientific and practical task is to develop, based on the proposed author's definition, a comprehensive methodology (system of indicators) for quantitative assessment of the level of economic security of the state, which would take into account specific modern challenges identified in the clusters, such as martial law, pandemics, and the requirements of European integration. A separate study also requires a detailed analysis of the newest and most dynamic clusters, in particular "military-economic security" and "pandemic-economic approach".

4. Conclusions

1. Based on retrospective analysis and bibliometric mapping results, 10 key theoretical approaches to defining the essence of economic security have been identified and systematized. These include: the ability to grow, the balance of the economic system, resistance to threats, resource-functional, protective, investment-innovative, economic-legal, sustainable development security, as well as the latest approaches that have become relevant – pandemic-economic and military-economic security.

2. A comparison of bibliometric clusters has been performed, which revealed differences in the structuring of scientific knowledge. 3 broad clusters (based on 265 keywords) have been formed in Scopus, combining socio-economic, medical and national aspects. Instead, Web of Science identified 5 narrower, more specialized clusters (based on 146 keywords), which more clearly distinguish the topics of health care, management, food security and national security.

3. Based on the synthesis of 10 identified approaches, the concept of "economic security of the state" is generalized. Its interpretation is proposed as a functional component of national security, which has a complex adaptive structure and a set of mechanisms necessary for the implementation of state policy to protect economic interests, optimal use of resources, the introduction of innovations and ensuring the stability of the system in the face of modern challenges, such as pandemics and armed aggression.

Conflict of interest

The authors declare that they have no conflict of interest in relation to this research, whether financial, personal, authorship or otherwise, that could affect the research and its results presented in this paper.

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Data availability

Manuscript has no associated data.

Use of artificial intelligence

The authors confirm that in the process of writing the article, the Grok artificial intelligence (beta version 4.1) was used exclusively to check grammar, spelling, and punctuation, but without changing the main text. In addition, Grok was used to search for open access sources on the topic of the study. The authors bear full responsibility for the reliability, uniqueness, and scientific integrity of the research results. AI tools were not used to generate empirical data or develop conceptual provisions. The unique research results were obtained by the authors personally, on the basis of which the author's conclusions were formed.

Authors' contributions

Andrii Lypkan: Formal analysis, Investigation, Resources, Validation, Writing – original draft; ***Valentyna Martynenko***: Conceptualization, Data curation, Methodology, Project administration, Writing – review and editing.

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Valentyna Martynenko, *Doctor of Economic Sciences, Professor, Department of Public Finance, State Tax University, Irpin, Kyiv Region, Ukraine, ORCID: https://orcid.org/0000-0001-9078-8345*

✉***Andrii Lypkan,*** *PhD Student, Department of Management and Business Administration, State Tax University, Irpin, Kyiv Region, Ukraine, ORCID: https://orcid.org/0009-0004-3005-7961, e-mail: andrii.lypkan@ukr.net*

✉*Corresponding author*