

**ANALYSIS OF OBSTACLES AND SUCCESS FACTORS OF INNOVATION
COMMERCIALIZATION¹****Shcherbachenko V.O.,***Candidate of Economic Sciences, Associate Professor, Senior Lecturer of the Department of International Economic Relations,**Sumy State University,**v.shcherbachenko@macro.sumdu.edu.ua**<http://orcid.org/0000-0002-4570-3389>***Kotenko S. I.,***Assistant of the Oleg Balatskyi Management Department,**Sumy State University,**s.kotenko@management.sumdu.edu.ua**<http://orcid.org/0000-0001-8684-0163>*

The article presents the results of a study of the prospects for the commercialization of innovations and the factors hindering their development. The purpose of the study is to identify factors that contribute to the market success of innovation, as well as to examine the barriers that hinder the innovation of enterprises and do not allow to achieve the desired effect. To achieve this goal it is necessary to implement the following tasks: to conduct a bibliometric analysis of the relationship of factors of commercialization of innovation, to explore the negative factors contributing to the failure of innovation, to identify obstacles to innovation at different stages, and to determine factors of successful commercialization of innovations. The main research methods that were used in writing the article are comparative analysis of scientific publications and research on the work of commercialization of innovations, synthesis, generalization, and visualization map by VOSviewer software.

With the help of the VOSviewer software product, a visualization map was created in connection with the concept of "commercialization of innovations" and related ideas, based on information from the Scopus database. In the process of working on the article, literary sources were analyzed, which are close to the research topic. The results of the analysis confirmed the theory of factor influence on the effectiveness of commercialization of innovations. Both internal and external factors that directly and indirectly affect the results of innovation and opportunities to increase its profitability were identified. Groups of clusters formed as a result of the construction of visualization maps reflect additional factors that are insufficiently studied in the thematic scientific literature. Such factors, when further analyzed, can be the subject of new research and can help determine their specific impact (positive or negative) on the end result of the commercialization of innovation. Moreover, we have defined that innovation commercialization process has a number of practical advantages: economic, social, competitive, market benefits for companies, consumers, society in large.

Keywords: *success factors, competitive advantages of innovation, commercialization of innovations, technology transfer, innovation*

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INTRODUCTION

Innovation is an important driver of economic development. Creating competitive innovations solves many social, economic, environmental and technological problems. The Commercialization of innovation is essential for stakeholders, and in a broad sense it means a process involving the practical use of research and development results to bring to market new or improved products, services or processes with a commercial effect. Enterprises that implement innovative activities are interested in the commercialization of innovations created by them. However, not always, they manage to achieve market success.

Commercialization is a considerable intermediary between scientific and technical development and the object of purchase. It is an effective lever through which the newly created innovative development is profitable. Commercialization is a kind of impetus for economic development.

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ANALYSIS OF RECENT RESEARCH AND PUBLICATIONS

The issue of commercialization of innovations in recent years has become particularly relevant. The work of such researchers focused on the study of the concept, procedures and factors influencing the process of creating innovation [1-5], including the stage of commercialization of innovation results and creative ideas [6-10]. Sharing of R&D results, technology transfer, corporate governance are the key factors that bring success in innovation activity of enterprises [10-14].

Commercialization of innovations in different areas has investigated and described in such articles: peculiarities of sales policy at innovation active enterprise [2]; distinguishing success from failure in the market of technological innovation [3]; analysis of the innovative development directions for industrial enterprises [14]. Cross-country analysis, cultural aspects and research on international market of innovative products have described in [1, 5, 6, 11, 15].

SETTING OBJECTIVES

The purpose of the study is to identify factors that contribute to the market success of innovation, as well as to examine the barriers that hinder the innovation of enterprises and do not allow to achieve the desired effect. To achieve this goal it is necessary to implement the following tasks: to conduct a bibliometric analysis of the relationship of factors of commercialization of innovation, to explore the negative factors contributing to the failure of innovation, to identify obstacles to innovation at different stages, and to determine factors of successful commercialization of innovations.

RESEARCH METHODS

The main research methods that were used in writing the article are comparative analysis of scientific publications and research on the work of commercialization of innovations, synthesis, generalization and visualization map by VOSviewer software.

RESEARCH RESULTS

The topic of commercialization of innovations began to be studied in the 80s of the last century, when the capitalist world focused on technological innovations and their commercial success in world markets. The corresponding picture can be seen in Fig. 1, which shows the statistics of publications in the Scopus database by year, by the search term "commercialization of innovations".

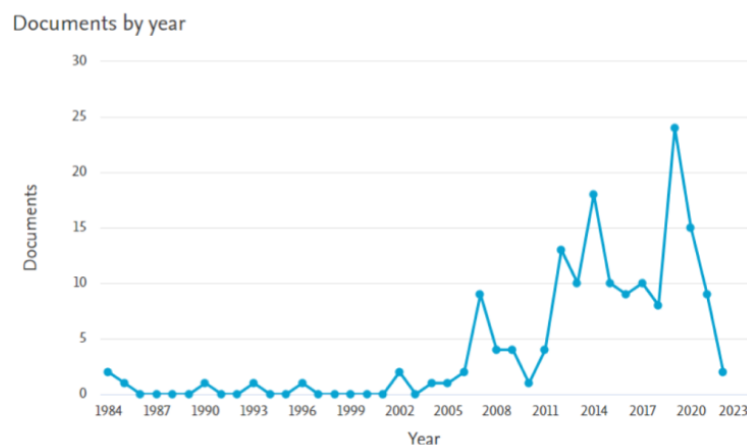


Figure 1 – Statistics of publications in the Scopus database by year, by the search term "commercialization of innovations"

Source: formed by the author on the basis of statistical information from the Scopus database

In fig. 1 you can see a growing trend, which reflects a significant increase in interest in the topic of commercialization of innovation since 2000. The highest "peak" of the number of annual publications was reached in 2019, but even now this topic is relevant and researched.

Statistics of publications on the topic of "commercialization of innovations" in terms of authors' affiliation to certain countries, can reflect the geographical trends and relevance of publications in certain countries (fig.2).

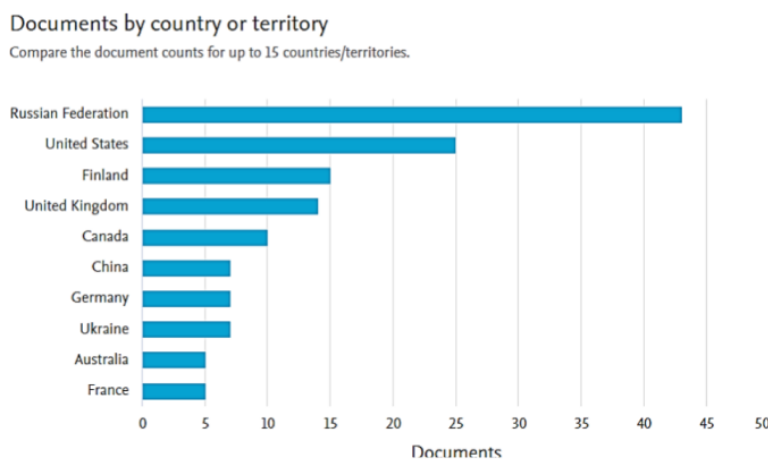


Figure 2 – Statistics of publications in the Scopus database by country or territory, by the search term "commercialization of innovations"

Source: formed by the author on the basis of statistical information from the Scopus database

According to the figure above, we can conclude that the relevance of the commercialization of innovation exists in Russia, Europe and North America. The countries of Asia, Oceania and Africa are poorly represented or absent.

In addition, fig. 3 presents a diagram showing the affiliation of publications on "commercialization of innovations" to different subject areas.

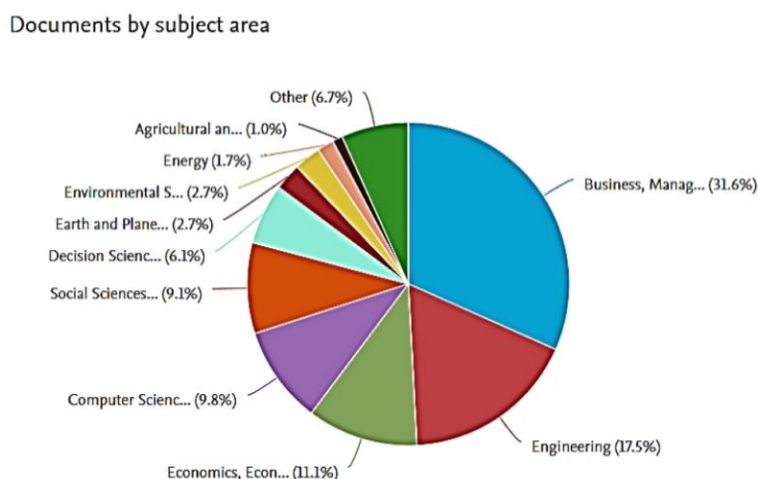


Figure 3 – Statistics of publications in the Scopus database by subject area, by the search term "commercialization of innovations"

Source: formed by the author on the basis of statistical information from the Scopus database

Figure 3 shows the interest, first of all, managers and economists in studying the process of commercialization of innovation and its impact on the management system of the organization.

With the help of the VOSviewer software product, a visualization map was created in connection with the concept of "commercialization of innovations" and related ideas, based on information from the Scopus database: 163 documents, 1984-2022 (Fig. 4).

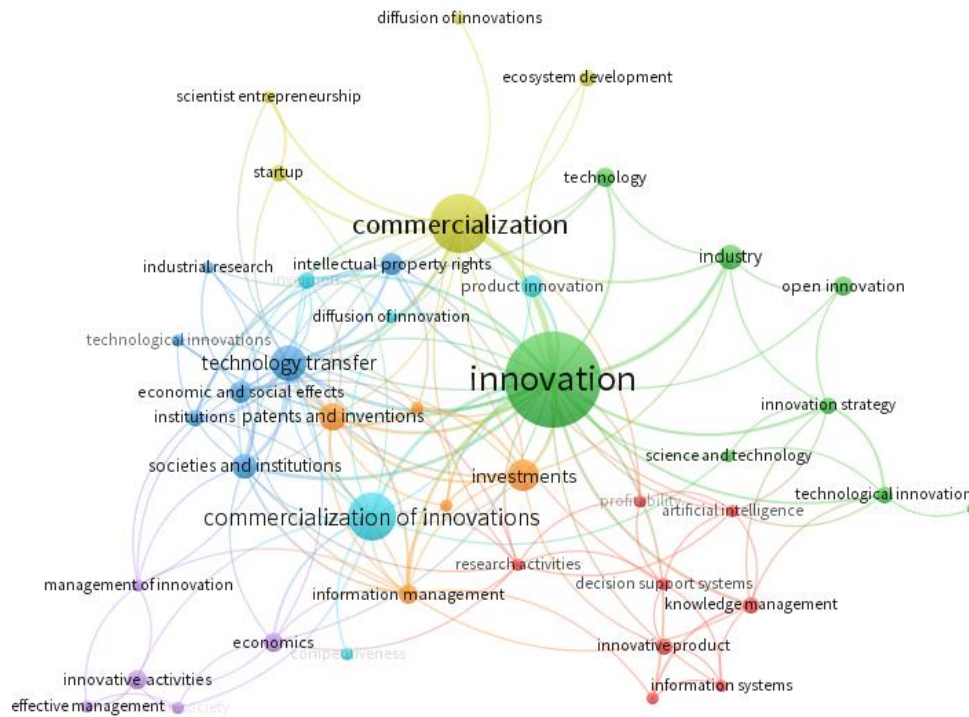


Figure 4 – The visualization of the keywords network in the field of research

Source: Constructed by authors via VOSviewer for the keyword "commercialization of innovations" (Input data: 156 documents, 1984-2021, Scopus Database, refined).

As we can see from the visualization, clusters of concepts, interconnected, are grouped by factor:

1. Blue cluster - factors of intellectual property, technology transfer, economic and social factors;
2. Red cluster - an information factor that combines access to information, its quality, the availability of effective information systems and knowledge management systems;
3. Green - production and industry factors;
4. Yellow - the main element is the concept of commercialization, which is combined with startups and research entrepreneurship in the profitability factor;
5. Purple cluster - a management factor, which includes innovation management and effective management at the level of firms and organizations.

The keywords "commercialization of innovations" and "factors" were specified and expanded for a more detailed analysis. Based on the results of data processing, the following visualization was built (fig. 5).

Fewer documents that were analyzed and processed by analogy with Figs. 4, allowed to reduce the number of clustered definitions and concepts. However, as a result of the analysis, factors were added to the list that were not taken into account in the visualization results in Fig. 5. These include the following:

1. The human factor that is associated with research activity.

2. Political and competitive factors that are components of the environmental factor.
3. Marketing factor, which is an integral part of the process of commercialization of innovations.

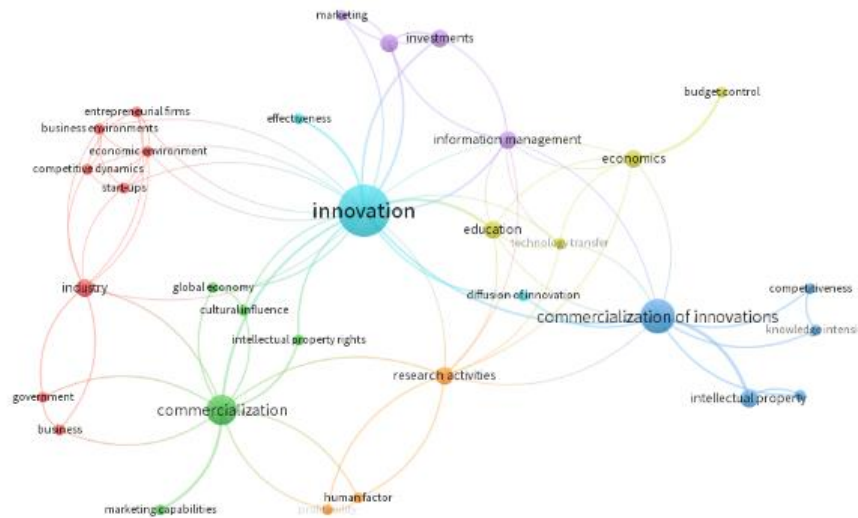


Figure 5 – The visualization of the keywords network in the field of research

Source: Constructed by authors via VOS viewer for the keyword "commercialization of innovations" AND "factors" (Input data: 36 documents, 1976-2021, Scopus Database, refined).

In the article "Absorptive capacity, marketing capabilities, and innovation commercialization in Nigeria" [15], which is one of the most cited articles on research in the Scopus database, emphasizes the role of marketing in the commercialization of innovation.

The authors of the above article suggest that the factors that positively affect the effectiveness of the commercialization of innovation may be indicators of absorption capacity, openness of innovation, marketing opportunities, including marketing new products and marketing innovation. The authors of the article investigate the commercialization of innovation within the system of income from innovation (IFI) and dynamic opportunities (DO). The authors acknowledge that firms are undergoing constant change and that there may be unobserved or unmeasured heterogeneity. Cultural diversity and economic factors, which can vary widely from region to region, can also have a strong impact on the effectiveness of commercialization. Firms can benefit from offering marketing opportunity development programs. And high-quality government support aimed at marketing new products and marketing innovations can play a positive role in the successful commercialization of innovations.

In the article name "Predicting anticipated rent from innovation commercialization in SMEs" by T. Hang Do and others [16], which is also included in the TOP-20 articles of the research topic according to the Scopus database, the authors investigated the relationship between the expectations of small businesses regarding future profits from the commercialization of innovation and key organizational elements. The authors highlight the following organizational factors that have a strong influence on the effectiveness of the commercialization of innovations:

- knowledge (information);
- culture;
- organizational strategy;
- portfolio;
- project management system;

The results of the analysis provide information to managers on potential success factors in increasing the effectiveness of commercialization, and, in addition, reflect entrepreneurial optimism in the process of innovation management.

Based on the analysis of thematic literature, we can conclude that the topic of commercialization of innovations in the scientific community is at the peak of its popularity. Foreign scientists, in their work, identify a large number of factors that directly and indirectly affect the effectiveness of the process of profit from innovation.

Visualization and cluster analysis help to recognize the relationship between certain factors and their impact on the commercialization of innovation.

The innovation commercialization process has a number of practical advantages [17]:

1) owners of an innovative product can be founders of companies without diversion of real money by depositing objects intellectual property in the authorized capital of the enterprise;

2) you can receive additional income for the transfer of the right of use innovative product;

3) innovative product as intellectual property is possible use as collateral when obtaining a loan;

4) intellectual property provides protection from competitors for the period bringing innovative products to market, as well as protection against unfair competition; intellectual property helps to create an advertising image when informing about the legal protection of innovative products or work under the license of a known manufacturer;

5) intellectual property allows you to reduce income tax by reducing the tax base by the amount of depreciation intangible assets and the cost of creating innovation product;

6) protected innovative product allows you to reduce value added tax value if the agreement is executed as a patent, license or copyright contract.

CONCLUSIONS

Based on the conducted research we conclude that on the one hand the relevance of the commercialization of innovation exists in Russia, European countries and North America. On the other hand, the countries of Asia, Oceania and Africa are poorly represented or absent in investigation of commercialization of innovation.

According to the analysis of thematic literature, we can conclude that the topic of commercialization of innovations in the scientific community is very popular and actual. The highest "peak" of the number of annual publications was reached in 2019, but even now this topic is relevant and researched. Investigating factors that influence innovation commercialization, we can define the following: economic, social, political, legal, competitive, market factors and etc.

Next research directions include the development of organizational and legal mechanism of protection of intellectual capital in the process of commercialization of innovations; investigation of communication interaction of stakeholders in the process of commercialization of innovations.

АННОТАЦІЯ

Щербаченко В.О., Котенко С.І. Аналіз перешкод та факторів успіху комерціалізації інновацій

У статті наведено результати дослідження перспектив комерціалізації інновацій та факторів, що гальмують їх розвиток. Метою дослідження є виявлення факторів, що сприяють ринковому успіху інноваційної діяльності, а також дослідження бар'єрів, що перешкоджають інноваційній діяльності підприємств і не дозволяють досягти бажаного ефекту. Для досягнення поставленої мети було поставлено такі завдання: провести бібліометричний аналіз взаємозв'язку факторів комерціалізації інновацій, дослідити негативні фактори, що сприяють провалу інновацій, виявити перешкоди інноваційній діяльності на різних етапах та визначити фактори успішної комерціалізації інновацій. Основними методами дослідження, які були використані при написанні статті, є порівняльний аналіз наукових публікацій та дослідження роботи з комерціалізації інновацій, синтез, узагальнення та карти візуалізації за допомогою програмного забезпечення VOSviewer.

За допомогою програмного продукту VOSviewer створено карту візуалізації у зв'язку з концепцією «комерціалізація інновацій» та пов'язаними з нею ідеями на основі інформації з бази даних Scopus. У процесі роботи над статтею було проаналізовано літературні джерела, близькі до теми дослідження.

Результати аналізу підтвердили теорію впливу факторів на ефективність комерціалізації інновацій. Визначено як внутрішні, так і зовнішні фактори, що прямо та опосередковано впливають на результати інноваційної діяльності та можливості підвищення її рентабельності. Групи кластерів, що утворилися в результаті побудови карт візуалізації, відображають додаткові фактори, які недостатньо вивчені в тематичній науковій літературі. Такі фактори при подальшому аналізі можуть стати предметом нових досліджень і можуть допомогти визначити їх конкретний вплив (позитивний чи негативний) на кінцевий результат комерціалізації інновацій. Крім того, ми визначили, що процес комерціалізації інновацій має ряд практичних переваг: економічні, соціальні, конкурентні, ринкові переваги для компаній, споживачів, суспільства в цілому.

Ключові слова: фактори успіху, конкурентні переваги інновацій, комерціалізація інновацій, трансфер технологій, інновація

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