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Yu. V. Polyakova

Dr.Sci. (Econ.), Prof., Senior Researcher of the Department of problems of real sector of economy of regions of the Dolishniy Institute of Regional Research of NAS of Ukraine, Professor of the Department of international economic relations of the Lviv University of Trade and Economics
e-mail: polyakova0909@gmail.com
ORCID ID: <https://orcid.org/0000-0002-8073-6186>

A. V. Stepanov

Associate Professor of the Department of foreign languages of the Lviv University of Trade and Economics
e-mail: stepanovandriy@gmail.com
ORCID ID: <https://orcid.org/0000-0001-7430-9578>

FEATURES OF THE DEVELOPMENT OF THE MODERN GLOBAL TECHNOLOGY MARKET

The article presents an analysis of trends in the global technology market, with the objective of substantiating a set of proposals for domestic practice. The authors examine the global characteristics of high-tech exports and identify current trends in the development of the international technology market. The article evaluates the influence of scientific, technical, and innovative activities on the economic development indicators of countries with the highest GDP. The effect of a range of indicators on GDP is therefore examined. It is demonstrated that the costs of using intellectual property exert an average influence on GDP, whereas the volume of high-tech exports and the volume of patent applications exert a similarly high level of impact on GDP. Promising world-class technologies, such as those pertaining to generalised experience, confidentiality and data privacy, accessibility of the IT operating model, hyper-automation, and artificial intelligence, which demonstrate methodological development and a significant distribution scale, are highlighted.

Keywords: technology, technological development, technological market, high-tech products.

Полякова Ю. В., Степанов А. В. ОСОБЛИВОСТІ РОЗВИТКУ СУЧАСНОГО СВІТОВОГО РИНКУ ТЕХНОЛОГІЙ

Стаття присвячена аналізу тенденцій розвитку світового ринку технологій для обґрунтування комплексу пропозицій для вітчизняної практики. Наголошено, що особливої важливості для України набуває вивчення трендів розвитку світового ринку технологій та її перспектив у технологічній сфері в умовах протистояння військовій агресії рф. Розглянуто світові характеристики експорту високотехнологічної продукції, динаміку експорту та імпорту високотехнологічної продукції країн-членів ЄС зокрема. З'ясовано сучасні тенденції розвитку міжнародного технологічного ринку – стабільне домінування на міжнародному технологічному ринку економічно розвинених країн, формування структури міжнародного ринку високотехнологічних товарів і послуг; високий ступінь монополізації міжнародного ринку високотехнологічної продукції; збільшення кількості малих і середніх венчурних компаній. Проведено оцінювання впливу результатів науково-технічної та інноваційної діяльності на показники економічного розвитку країн з найбільшим обсягом ВВП. Досліджено вплив на ВВП різноманітних показників, зокрема витрат на використання інтелектуальної власності, кількості патентних заявок і обсягів високотехнологічного експорту. Установлено, що витрати на використання інтелектуальної власності характеризуються середнім рівнем впливу на ВВП, а обсяг високотехнологічного експорту та обсяг патентних заявок мають схожий за характером високий рівень впливу на ВВП. Виокремлено перспективні технології світового рівня, як от узагальнений досвід, забезпечення конфіденційності даних, вседоступність операційної моделі ІТ, гіперавтоматизація, штучний інтелект, які демонструють методичний розвиток і масштабність розповсюдження. Обґрунтовано, що пріоритетом для України сьогодні стає трансформація економічної системи, оновлення науково-технічної сфери відповідно до чинних міжнародних або європейських стандартів.

Ключові слова: технологія, технологічний розвиток, технологічний ринок, високотехнологічна продукція.

Problem statement. The contemporary advancement of science and technology is inextricably linked with the ongoing globalisation of the world economy. A country's position in the current global environment is contingent upon two key factors: the quality of its human resources and the extent to which science and technology achievements are integrated into its production processes. The capacity to create and utilise technological solutions

as a means of implementing scientific and technical knowledge ensures a high level of international competitiveness for entities of diverse levels. The advent of new technologies and information systems has prompted the country to consider alternative sources of competitive advantage, such as innovations and technologies. Furthermore, innovative and technological development is regarded as a means of addressing

intricate social and economic issues. It is imperative that Ukraine's integration into European and global technological processes should be informed by an understanding of the prevailing trends in the international technology market.

It is evident that Ukraine's technological advancement, particularly in the context of military resistance to the military aggression of the Russian Federation, exhibits distinctive characteristics, features, and priorities. These can be elucidated from the standpoint of the accomplishments of scientific research by eminent scientists. It is therefore becoming increasingly important to study the peculiarities of the global technology market and the prospects for Ukraine's development in the technological sphere in detail.

Analysis of recent research. The development of new technologies and innovations at the international level, as well as within individual countries or regions, is a topic of interest for many scholars. In particular, G. Androshchuk and L. Rabotiahova observe that the latest trends in the development of the modern economy, which is primarily characterised by a constant increase in the level of its technological sophistication, knowledge intensity, and cross-border activity, determine the formation of an integrated system of the legal protection of intellectual property [1]. American researcher Ph. L. Speser examines the substance of technology and its role in the process of technological exchange, conceptualising technology as a method of performing specific activities that are continually repeated. It can be defined as a tool, technique, or material, given the fact that people engage in activities that are repeated on a regular basis. This justifies the creation of useful tools that could perform these activities in a more efficient or effective manner [2].

Several researchers have highlighted the significance of innovation and technological advancement. For example, O. Salikhova examines the evolution of the concept of «high technology», the genesis of international and national methodological approaches to assessing technology intensity, and proposes her own tools for identifying high-tech enterprises, assessing imports of high-tech goods, as well as a set of measures to stimulate research and innovation to boost national high-tech industries [3]. For instance, L. Fedulova highlights the substantial influence of the technological imperative on the evolution of all life processes. In the contemporary era, digitalisation represents a pivotal global phenomenon, with the potential to profoundly transform all facets of public life in the future [4].

Proposals for innovative and technological development are not a novel concept.

In 1969, P. Drucker raised the question of which resource is central to the modern economy. The scholar eventually concluded that the two main milestones of economic development are the innovative economy and the entrepreneurial society. The scientist delineated the essential characteristics of the nascent innovative economy, which is characterised by the preponderance of intellectual property, the intellectualisation of labour as the primary process of production, the predominance of investment in the development of intellectual capital, and the rapid advancement of science as a source of innovation [5].

Traditionally, examples of successful scientific, innovative, and technological development are demonstrated by various countries, primarily the United States, Japan, and Germany. N. Hruschynska posits that substantial shifts have occurred within the global economy in recent years. The latest phase of the scientific and technological revolution, coupled with the internationalisation of capital flows, has brought about a significant transformation in the fundamental models of economic development. The model that is currently being implemented by the majority of countries is that of a growth economy. At the international level, we are witnessing not only a gradual evolutionary transition to a higher economic order but also global neo-economic transformations. The advent of promising technologies offers countries with limited resources a distinctive opportunity to circumvent the protracted full cycles of industrial development that have heretofore been necessary to attain the current level of economic advancement observed in Western societies. In the twentieth century, economic achievements were based on the utilisation of natural resources and the implementation of efficient technologies. In contrast, in the current century, the ascendancy of artificial intellectual industries and the economy of intellectual assets have led to a shift in focus. The availability of an idea, a viable project, or an innovation programme has become the key factor of development, rather than production and implementation [6].

I. Sochynska-Sybirtseva studying the factors of innovative development stresses that the leading innovative countries of the world constantly activate the factor of establishment of interaction between the state and society by creating conditions conducive to the development of science and education, intensification of scientific research and development within the limits of financial support of innovative development by the state [7, p. 75]. In our opinion, based on this, the development of the national economy of Ukraine requires the use of the most influential factors of innovation activity.

The study of the aspects of the priority of technological development shows the existence of a certain scientific controversy. According to Yu. Stasiuk, technological progress has several advantages, including comfort and improvement of the quality of life, productivity growth, improvement of medicine, environmental protection, communication, and information. On the other hand, the author also mentions the disadvantages of technological progress, including security and privacy, lack of jobs, dependence on technology, consumption of resources, and social challenges [8].

At the same time, there are some key aspects that indicate the role and importance of technology and technological development: stimulating economic growth, increasing productivity, stimulating investment and entrepreneurship, changing the structure of the economy, and improving the quality of life.

The paper purpose is to study the specific features of the development of the modern global technology market.

Major research findings. At the global level, the challenges of technoglobalisation are driving the introduction of the concept of technological activity in countries, aimed at maintaining competitiveness in the face of internal and external factors. To enhance their

competitive advantage, countries establish priorities for innovation, investment, and technological development, as well as areas for improving human capital, funding scientific and technological development, and so forth.

The world's leading innovative countries are consistently fostering interaction between the state and society by establishing conditions that facilitate the advancement of science and education. They are intensifying scientific development and research within the context of financial support for innovative development at the state level.

A review of global experience reveals that the largest exporters of high-tech products among developed countries are the United States and certain EU member states. Subsequently, countries with considerable potential for enhancing their technological capabilities are identified. China, India, Singapore, South Korea, Taiwan,

Thailand, Malaysia, the Philippines, and several European countries (Sweden, the Czech Republic, Italy, Ireland, Spain, Belgium, and Austria) are notable examples.

The exports and imports of high-tech products by EU Member States demonstrate a general tendency towards growth, although the balance has been negative in recent years. From 2012 to 2022, the total value of high-tech product trade with countries outside the EU (comprising imports and exports) increased from €512 billion to €927 billion. This represents an average annual growth rate of 6.1%. Imports increased from €252 billion to €481 billion, representing an average annual growth rate of 6.7%, while exports increased from €259 billion to €445 billion, indicating an average annual growth rate of 5.6%. Consequently, the trade balance shifted from a surplus of €7 billion in 2012 to a deficit of €36 billion in 2022 (Table 1).

Table 1

Exports and imports of high-tech products of the EU countries, billion USD						
	2012	2014	2016	2018	2020	2022
Exports	259,2	266,5	307,7	348,0	341,9	446,1
Imports	252,4	249,1	301,7	347,7	346,5	481,6
Balance	6,8	17,4	6,7	0,3	-4,6	-35,5

Source: [9].

The share of high-tech products in total extra-EU trade (imports + exports) increased from 14.7% in 2012 to 16.6% in 2022. Between 2012 and 2021, the share of imports exceeded that of exports. However, in 2022, the share of imports was 16.0%, while that of exports was 17.3%.

In the global market, Germany is the foremost exporter of high-tech products, accounting for 10.8% of world exports in this category. South Korea, China, the United States, and Singapore are the next most prominent exporters of high-tech products. The growth of high-tech exports from developing countries is occurring at a rate that is twice as fast as that of developed countries, which serves to demonstrate the strength of these countries in the global market. The growth observed among all participants in economic rivalry, coupled with the intensification of competitive methods, serves to determine changes in the dynamics of the global market and the ranking of leading exporters [10].

The United States consistently ranks among the top five exporters and importers of high-tech goods, competing successfully with numerous other countries. The United States is unquestionably a frontrunner in the domains of telecommunications, computer and information technology, and software development. Prominent representatives in these fields include major corporations such as Apple, Cisco, Hewlett-Packard, IBM, Intel, and Microsoft. The country maintains its position as a dominant exporter of computer hardware and software and continues to be recognised as a leader in innovation. The current trends in the high-tech sector include the development of social media platforms and the active utilisation of cloud technologies.

Consequently, the European high-tech market is somewhat less developed than that of the United States in sectors such as telecommunications and electronics and lags behind Japan and South-East Asia in the field of

high-tech mass products. The number of high-tech companies in Europe represents only 30-40% of the global total. The observed growth rates of European IT markets can be attributed directly to the automation of business processes in large companies. Asian economies have been able to offset the impact of rising oil prices through using low-cost labour, which has served to neutralise the effects of dumping in the IT export sector [11].

The global high-tech market is a subject of constant scrutiny for experts and analysts, who, in addition to the high rate of development of the industry, identify other current trends, in particular [12]:

- The continued dominance of economically developed countries in the international technology market (their share in international scientific and technological exchange is almost 90%). The five countries that export the greatest quantity of high-tech products are the UK, Germany, the USA, France, and Japan. There is evidence of inter-enterprise exchange among EU Member States, while technology exchange is mainly observed within the EU.
- The formation of a two-tier structure of the international market for high-tech goods and services can be attributed to the location of production facilities in countries with lower labour costs and the active use of outsourcing schemes. Several South-East Asian countries have experienced positive developments in the high-tech sector, with India and China representing particularly noteworthy examples.
- The international high-tech market is characterised by a high degree of monopolisation, exceeding 90%. This is attributable to the unique properties of the goods themselves and the transformation of transnational companies into key market players.

СОЦІАЛЬНО-ЕКОНОМІЧНІ ПРОБЛЕМИ СУЧАСНОГО ПЕРІОДУ УКРАЇНИ

The aggregation of a substantial proportion of scientific and technical concepts and developments within TNCs, coupled with the utilisation of R&D outcomes by organisations on a collective basis, ensures the advancement of the global technology market, offers the possibility of exerting control over the pricing of patented products, and enables the domination of the market in its entirety.

- There has been a notable surge in the number of small and medium-sized venture capital firms, which are supported by leading corporations in assuming the risks associated with research and development, new product development, and the practical testing of innovations.

It can be seen, therefore, that the high-tech market plays an important role in the growth of the international

economy and of individual economies. This is becoming increasingly important for Ukraine, in particular in view of its entry into the newest stage of development and the need to solve current problems.

It is crucial to evaluate the influence of scientific, technical, and innovative activities on the economic growth of countries. For this purpose, a list of countries with the highest GDPs has been compiled, as illustrated in Fig. 1. An econometric model has been constructed that mathematically describes the dependence of the GDP of these leading countries on certain indicators, which demonstrate the results of scientific, technical and innovation activities. These include intellectual property expenditures, the number of patent applications, and the volume of high-tech exports.

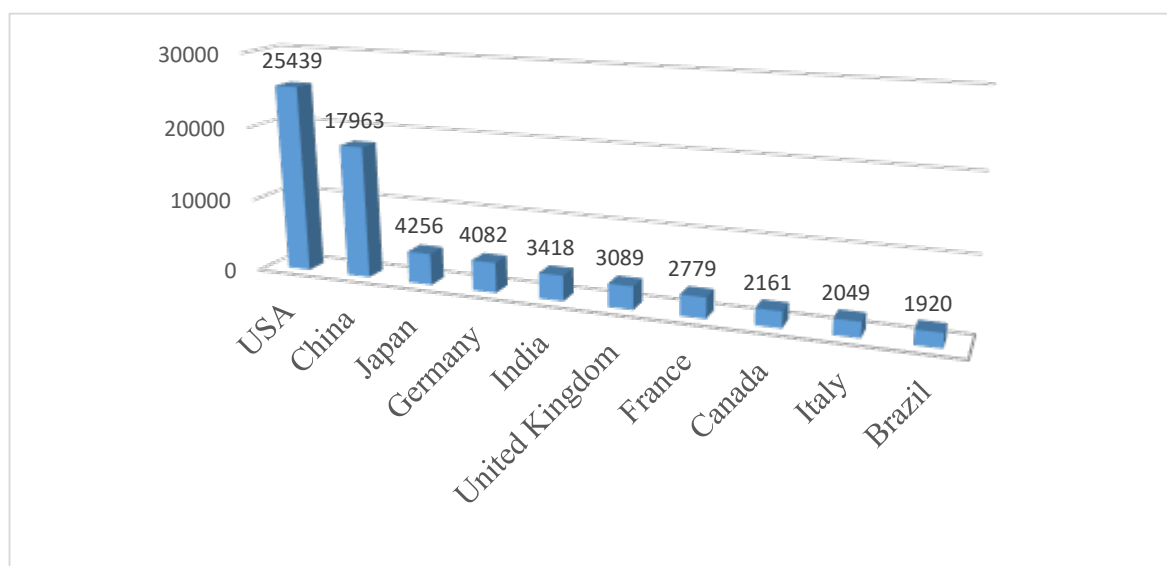


Fig. 1. Countries that are world leaders in terms of gross domestic product in 2022

Source: [13].

The data used in the construction of the model are presented in Table 2 and pertain to the following countries: the United States of America, China, Japan,

Germany, India, the United Kingdom, France, Canada, Italy, and Brazil.

Table 2

Data used to construct the regression model, 2022

Country	GDP, USD billion	Expenses for the use of intellectual property, USD million	Patent applications	High-tech exports, USD million
USA	25439	53241,0	591473	166435,6
China	17963	44474,1	1585663	769699,3
Japan	4256	27797,8	289200	83102,8
Germany	4082	19844,5	58569	223370,8
India	3418	10427,8	61573	35219,1
United Kingdom	3089	17784,2	18855	72663,1
France	2779	13407,8	14759	95753,9
Canada	2161	16084,4	37155	30335,0
Italy	2049	5788,0	11078	43256,5
Brazil	1920	72997,3	24232	7651,7

Source: [13].

The study analysed the impact of various indicators on GDP, including the cost of using intellectual property, the number of patent applications and the volume of high-tech exports. Firstly, a correlation analysis was conducted

between these indicators and GDP, with the results presented in Table 3 in the form of correlation coefficients.

Table 3

Correlation of the studied indicators with GDP		
Expenses for the use of intellectual property, USD million	Patent applications	High-tech exports, USD million
0,49	0,75	0,59

Source: authors' calculations.

The results demonstrate that there is a statistically significant positive correlation between patent applications and GDP, with a correlation coefficient of 0.75. Expenditures on the use of intellectual property and high-tech exports rank second with approximately equal correlation coefficients – 0.49 and 0.59, respectively. The results of this analysis indicate that there is a strong correlation between patent applications and GDP. Nevertheless, it is inadvisable to draw such conclusions based solely on correlation coefficients, as they do not provide sufficient insight. It is therefore recommended to conduct additional visual analysis.

The visual analysis demonstrated that there is a relatively high degree of accuracy in the reflection of the overall GDP trend by patent applications. Additionally, the volume of high-tech exports generally reflects this trend, although not with the same degree of accuracy as patent applications. Conversely, expenditure on the

utilisation of intellectual property exhibits minimal correlation with the GDP trend.

Subsequently, a regression analysis was conducted to ascertain the relationship between these indicators and GDP. In this analysis, the indicators were employed as inputs to a linear regression mathematical model, with GDP serving as outputs, the dependent variable. During the analysis, the model was trained to «predict» the value of GDP based on these indicators by constructing a linear regression model and calculating the coefficients of influence for each indicator. The resulting model demonstrated a high degree of accuracy in predicting GDP, with relatively minor deviations observed only in the cases of the United States and Brazil. We shall now proceed to analyse the linear regression coefficients. The coefficients demonstrate the influence of each indicator on GDP. The results of the regression analysis are presented in Table 4.

Table 4

Coefficients of influence of indicators derived from the regression analysis		
Expenses for the use of intellectual property, USD million	Patent applications	High-tech exports, USD million
0,21	0,65	-0,06

Source: authors' calculations.

The data presented in the table demonstrates that the highest coefficient of influence (0.65) is associated with patent applications. This indicator is markedly disparate from the other coefficients, indicating a pronounced influence of patent applications on GDP. With regard to the remaining indicators, the expenditures on the utilisation of intellectual property exert a relatively modest influence (0.21), while the value of high-tech exports is close to zero (-0.06), indicating that the model does not incorporate this variable. This can be attributed to the fact that the volume of high-tech exports and patent applications exhibit a similar pattern of behaviour, with the mathematical model selecting one of the two for analysis. This does not imply that high-tech exports do not exert an influence on GDP; rather, it suggests that the latter and patent applications may potentially have a similar impact on GDP.

In conclusion, the results of both analyses indicate that intellectual property expenditures exert an average impact on GDP according to both methods. The volume of high-tech exports and the volume of patent applications exert a similarly high level of impact on GDP.

It is anticipated that the high-tech market will continue to expand at a rapid pace in the forthcoming years. A more detailed examination of specific industries is now in order.

Accordingly, experts anticipate accelerated advancement in these technological domains. Firstly, it is

necessary to consider the generalised experience. These technologies integrate the experience of customers, employees, and users, which is essential for effective communication in a virtual setting. In light of the aforementioned predictions, it is anticipated that organisations utilising generalised experience will outperform their competitors over the forthcoming years. Secondly, the issue of data privacy is becoming increasingly significant, with nearly half of the leading companies implementing computing systems to guarantee data privacy and ensure confidentiality in untrusted environments by 2025.

Thirdly, the universal accessibility of the IT operating model is a further key factor. The model will render it unnecessary for users to conduct business in a particular location. It is anticipated that a considerable number of companies will utilise the new model for both virtual and physical contact with customers and employees. Fourthly, hyper-automation represents a shift from the automation of discrete tasks to the general automation of interrelated processes, as well as the automation of business ecosystems as a whole. The fifth area of focus is the design of artificial intelligence systems. Only 53% of AI projects progress from the prototype stage to production, indicating a need for the development of a reliable framework for the design, scaling, and transition of AI systems to production processes [14].

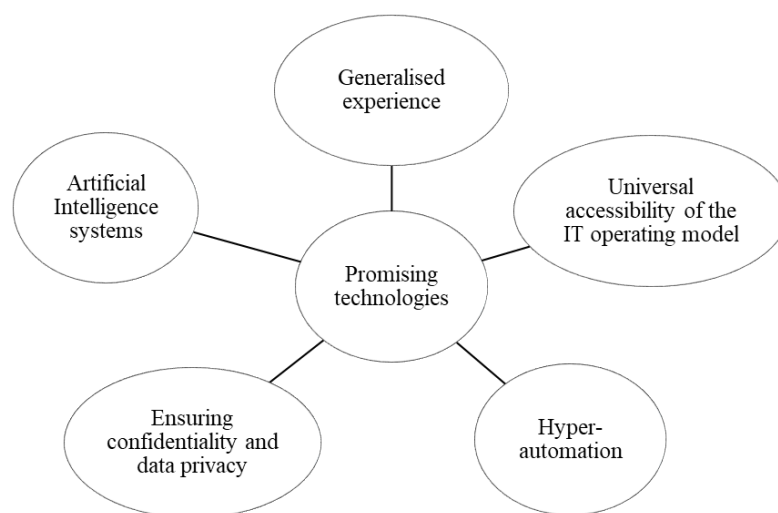


Fig. 2. Promising world-class technologies

Source: [14].

It is important to recognise that the most significant trends of the present era have not emerged haphazardly. Rather, they have been the result of a process of systematic development, hypothesis testing and accumulation of momentum and scale. The development of fundamental sciences and fields exerts a significant influence on modern technological trends. In addition, digital trends have the potential to impact the global environment. To illustrate, the military technology sector in Ukraine is a principal driver of economic growth and development, with the potential to influence the trajectory of other sectors. Until 2014, there was a paucity of companies and domestic entrepreneurs willing to engage in modern developments in the field of military-oriented innovations. However, the situation is now entirely different, and it can be argued that the full-scale military invasion has proved to be a significant impetus to innovation and technological advancement.

The Government of Ukraine has repeatedly articulated the necessity for a transformation of the existing economic system and an enhancement of the scientific and technological sphere by the most rigorous international or European standards. It is evident that any state possesses a finite quantity of resources, which gives rise to the question of how these resources should be allocated to areas of development that are of national priority and offer significant potential for growth in the science, technology, and innovation sectors. A review of international experience demonstrates that a focus on priorities facilitates the generation of national-level efforts in breakthrough industries, thereby ensuring high rates of economic development on an innovative basis in the future.

Conclusions. The current challenges of technoglobalisation justify the importance of introducing the concept of technological development in countries through the improvement of existing technologies and equipment, the search for and implementation of fundamentally new scientific solutions and achievements, and the development of human resources. The international technology market remains dominated by economically developed countries, with a corresponding structure of high-tech goods and services being formed. There is also a high level of monopolisation of the high-

tech sector and a growing number of small and medium-sized venture capital companies. In global practice, the volume of high-tech exports and the number of patent applications have been demonstrated to have a positive impact on the economic development of countries.

It is anticipated that the high-tech market will continue to expand at a rapid pace in the coming years. The most promising world-class technologies include generalised experience, artificial intelligence systems, ensuring confidentiality and data privacy, universal accessibility of the IT operating model, and hyper-automation. In light of the prevailing and prospective trends in the global technology market, it is becoming increasingly imperative for Ukraine to adopt a forward-thinking approach.

References

1. Androshchuk, H. O., & Rabotyahova, L. I. (2018). Rozvytok hlobal'noyi mizhnarodnoyi systemy pravovoyi okhorony intelektual'noyi vlasnosti [Development of the global international system of legal protection of intellectual property]. In *Pytannya intelektual'noyi vlasnosti [The issue of intellectual property]*: Vol. 15 (pp. 6-35). [in Ukrainian].
2. Speser, Ph. L. (2016). *The Art and Science of Technology Transfer*. Publisher Wiley.
3. Salikhova, O. B. (2012). *Vysokotekhnologichni vyrobnytstva: vid metodolohiyi otsinky do pidnesennya v Ukraini [High-tech production: from evaluation methodology to promotion in Ukraine]*. Kyiv: Institute of Economics and Forecasting of the National Academy of Sciences of Ukraine. [in Ukrainian].
4. Fedulova, L. (2020). Tendentsiyi rozvytku ta vprovadzhennya tsyfrovyykh tekhnolohiy dlya realizatsiyi tsiley staloho rozvytku [Development trends and implementation of digital technologies for sustainable development goals]. *Ekonomika pryrodokorystuvannya i stalyy rozvytok – Environmental Economics and Sustainable Development*, 6, 6-14. DOI: [https://doi.org/10.37100/2616-7689/2020/7\(26\)/1](https://doi.org/10.37100/2616-7689/2020/7(26)/1) [in Ukrainian].
5. *Pro innovatsiyi. Harvard Business Review: 10 naykrashchyykh statey [About innovations. Harvard Business Review: Top 10 Articles]* (2018). Kyiv: KM-Books. [in Ukrainian].

6. Hrushchynska, N. M. (2009). Teoretyko-metodolohichni zasady suchasnoho ekonomichnoho rozvytku z urakhuvannyam transformatsiyi tekhnolohichnykh ukkladiv [Theoretical and methodological foundations of modern economic development, taking into account the transformation of technological structures]. *Ekonomika ta derzhava – Economy and the state*, 12, 29-31. Retrieved from http://www.economy.in.ua/pdf/12_2009/10.pdf [in Ukrainian].

7. Sochynska-Sybertseva, I. M. (2021). Chynnyky innovatsiynoho rozvytku krayiny [Factors of the country's innovative development]. *Pidpryyemnytstvo ta innovatsiyi – Entrepreneurship and innovation*, 18, 73-77. DOI: <https://doi.org/10.37320/2415-3583/18.13> [in Ukrainian].

8. Stasyuk, Yu. M. (2023, Jun 02). Innovatsiynyy rozvytok ta transfer tekhnolohiy yak faktory stiykoho ekonomichnoho zrostannya [Innovative development and technology transfer as factors of sustainable economic growth]. *Challenges and Issues of Modern Science: Proceedings of the international scientific and practical conference*. Retrieved from <https://fti.dp.ua/conf/2023/06027-0637> [in Ukrainian].

9. International trade and production of high-tech products (2023). *Eurostat: Website*. Retrieved from https://ec.europa.eu/eurostat/statistics-explained/index.php?title=International_trade_and_production_of_high-tech_products#Main_conclusions

10. High-technology exports in current prices (US dollars) (2023). *Knoema: Website*. Retrieved from <https://knoema.com/atlas/maps/Hightechnology-exports>

11. Akhvlediani, T., & Śledziowska, K. (2015). *What Determines Export Performances in High-tech Industries?* University of Warsaw. Retrieved from <http://www.delab.uw.edu.pl/wp-content/uploads/2015/10/WP-What-Determines-High-tech-Exports.pdf>

12. Tymoshenko, I. V. (2020). Suchasni tendentsiyi rozvytku svitovoho rynku vysokyykh tekhnolohiy [Current trends of the global high technology market]. *Skhidna Yevropa: ekonomika, biznes ta upravlinnya – Eastern Europe: Economy, Business and Management*, 2(25), 69-78. DOI: <https://doi.org/10.32782/easterneurope.25-10> [in Ukrainian].

13. Countries that are world leaders in terms of gross domestic product (2023). *World Bank: Website*. Retrieved from <https://databank.worldbank.org/reports.aspx?source=2&series=NY.GDP.MKTP.CD&country>

14. Musiyenko, O. (2021, Apr 08). Yak zminylsya tekhnolohiyi za 10 rokiv i shcho nas chekaye v maybutn'omu [How technologies have changed in 10 years and what awaits us in the future]. *Imena.ua: Website*. Retrieved from <https://www.imena.ua/blog/technology-change-in-10-years> [in Ukrainian].

List of used sources

1. Андрощук Г. О., Работягова Л. І. Розвиток глобальної міжнародної системи правової охорони

інтелектуальної власності. *Питання інтелектуальної власності: зб. наук. пр.* 2018. Вип. 15. С. 6-35.

2. Speser Ph. L. *The Art and Science of Technology Transfer*. Publisher Wiley, 2016. 408 p.

3. Саліхова О. Б. *Високотехнологічні виробництва: від методології оцінки до піднесення в Україні: монографія*. К.: Інститут економіки і прогнозування НАН України, 2012. 624 с.

4. Федулова Л. Тенденції розвитку та впровадження цифрових технологій для реалізації цілей сталого розвитку. *Економіка природокористування і сталий розвиток*. 2020. № 7. С. 6-14. DOI: [https://doi.org/10.37100/2616-7689/2020/7\(26\)/1](https://doi.org/10.37100/2616-7689/2020/7(26)/1)

5. Про інновації. *Harvard Business Review: 10 найкращих статей*. К.: КМ-Букс, 2018. 208 с.

6. Грущинська Н. М. Теоретико-методологічні засади сучасного економічного розвитку з урахуванням трансформації технологічних укладів. *Економіка та держава*. 2009. № 12. С. 29-31. URL: http://www.economy.in.ua/pdf/12_2009/10.pdf

7. Сочинська-Сибірцева І. М. Чинники інноваційного розвитку країни. *Підприємство та інновації*. 2021. Вип. 18. С. 73-77. DOI: <https://doi.org/10.37320/2415-3583/18.13>

8. Стасюк Ю. М. Інноваційний розвиток та трансфер технологій як фактори стійкого економічного зростання. *Challenges and Issues of Modern Science: Proceedings of the international scientific and practical conference*. 02.06.2023. URL: <https://fti.dp.ua/conf/2023/06027-0637>

9. International trade and production of high-tech products. *Eurostat: Website*. 2023. URL: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=International_trade_and_production_of_high-tech_products#Main_conclusions

10. High-technology exports in current prices (US dollars). *Knoema: Website*. 2023. URL: <https://knoema.com/atlas/maps/Hightechnology-exports>

11. Akhvlediani T., Śledziowska K. *What Determines Export Performances in High-tech Industries?* University of Warsaw, 2015. URL: <http://www.delab.uw.edu.pl/wp-content/uploads/2015/10/WP-What-Determines-High-tech-Exports.pdf>

12. Тимошенко І. В. Сучасні тенденції розвитку світового ринку високих технологій. *Східна Європа: економіка, бізнес та управління*. 2020. Вип. 2(25). С. 69-78. DOI: <https://doi.org/10.32782/easterneurope.25-10>

13. Countries that are world leaders in terms of gross domestic product. *World Bank: Website*. 2023. URL: <https://databank.worldbank.org/reports.aspx?source=2&series=NY.GDP.MKTP.CD&country>

14. Мусієнко О. Як змінилися технології за 10 років і що нас чекає в майбутньому. *Imena.ua: сайт*. 08.04.2021. URL: <https://www.imena.ua/blog/technology-change-in-10-years>

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