

II. АКТУАЛЬНІ ПРОБЛЕМИ СУСПІЛЬНОЇ ГЕОГРАФІЇ ТА КРАЇНОЗНАВСТВА

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ІНТЕЛЕКТУАЛЬНА ВЛАСНІСТЬ ЯК ЧИННИК РЕГІОНАЛЬНОГО РОЗВИТКУ В КРАЇНАХ ЄС

Мета представленої дослідження – проаналізувати роль інтелектуальної власності як чинника регіонального розвитку в країнах Європейського Союзу, порівняти просторові особливості її формування та використання, а також виявити взаємозв'язок між рівнем інтелектуальної активності регіонів і їх соціально-економічним розвитком. Особливу увагу приділено з'ясуванню місця інтелектуальної власності в системі регіональної політики ЄС та її значенню для формування інноваційних і креативних територій.

Методика. У методологічному плані дослідження ґрунтується на положеннях економічної та суспільної географії, теорії регіонального розвитку та концепції економіки знань. Інтелектуальна власність розглядається як нематеріальний ресурс території та складова її інноваційного потенціалу. У процесі дослідження використано порівняльно-географічний, системно-аналітичний, міждисциплінарний і структурно-функціональний методи. Застосовано елементи просторового аналізу для виявлення регіональних відмінностей у патентній активності, розвитку креативних індустрій і концентрації інноваційних кластерів у межах Європейського Союзу.

Результати. Уточнено зміст поняття інтелектуальної власності в контексті регіонального розвитку та визначено її основні функції в просторовій організації економіки ЄС. Виявлено значні територіальні диспропорції у рівні інтелектуальної активності між регіонами Західної, Північної, Південної та Східної Європи. Обґрунтовано, що регіони з високою концентрацією патентів, торговельних марок і креативних індустрій демонструють вищі показники зайнятості, інвестиційної привабливості та інноваційного розвитку. Доведено роль інтелектуальної власності у формуванні інноваційних кластерів і полюсів економічного зростання.

Наукова новизна. Полягає у географічному осмисленні інтелектуальної власності як чинника регіонального розвитку та у виявленні просторових закономірностей її впливу на соціально-економічну динаміку регіонів ЄС. Розширено уявлення про нематеріальні ресурси територій у сучасній регіональній географії.

Практична значимість. Результати дослідження можуть бути використані при розробленні стратегій регіонального розвитку, у навчальних курсах з економічної та соціальної географії, регіональної політики, а також у підготовці фахівців у сфері туризму, регіонального менеджменту та просторового планування.

Ключові слова: інтелектуальна власність, регіональний розвиток, Європейський Союз, інноваційні регіони, просторові диспропорції, кластери.

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INTELLECTUAL PROPERTY AS A FACTOR OF REGIONAL DEVELOPMENT IN THE COUNTRIES OF THE EUROPEAN UNION

Purpose. The purpose of this study is to analyze the role of intellectual property as a factor of regional development in the countries of the European Union, to compare the spatial features of its formation and use, and to identify the relationship between the level of intellectual activity of regions and their socio-economic development. Particular attention is paid to clarifying the place of intellectual property within the EU regional policy system and its significance for the formation of innovative and creative territories.

Methodology. From a methodological perspective, the research is based on the principles of economic and social geography, regional development theory, and the concept of the knowledge economy. Intellectual property is considered as an intangible territorial resource and a component of regional innovation potential. The study employs comparative-geographical, system-analytical, interdisciplinary, and structural-functional methods. Elements of spatial analysis are applied to identify regional differences in patent activity, the development of creative industries, and the concentration of innovation clusters within the European Union.

Results. The content of the concept of intellectual property in the context of regional development has been clarified, and its main functions in the spatial organization of the EU economy have been identified. Significant territorial disparities in the level of intellectual activity between regions of Western, Northern, Southern, and Eastern Europe have been revealed. It is substantiated that regions with a high concentration of patents, trademarks, and creative industries demonstrate higher levels of employment, investment attractiveness, and innovation development. The role of intellectual property in the formation of innovation clusters and poles of economic growth has been proven.

Scientific novelty. The scientific novelty lies in the geographical interpretation of intellectual property as a factor of regional development and in the identification of spatial patterns of its influence on the socio-economic dynamics of EU regions. The study expands the understanding of intangible territorial resources within contemporary regional geography.

Practical significance. The research results can be used in the development of regional development strategies, in educational courses on economic and social geography and regional policy, as well as in the training of specialists in tourism, regional management, and spatial planning.

Keywords: intellectual property, regional development, European Union, innovative regions, spatial disparities, clusters.

Problem Statement. In the context of the emerging knowledge economy, intellectual property is increasingly recognized as one of the key intangible resources that shape socio-economic and regional development. In the European Union, intellectual property functions not only as a legal mechanism for protecting the results of research, technological and creative activities, but also as an important driver of regional competitiveness, innovation capacity, and economic growth. It plays a significant role in the formation of innovation ecosystems, the development of knowledge-based industries, and the strengthening of regional specialization.

However, the spatial distribution of intellectual activity across the European Union remains highly uneven. Patent activity, research and development (R&D) expenditures, and the concentration of high-tech industries and creative sectors are primarily located in major metropolitan areas and economically advanced regions of Western and Northern Europe. In contrast, many regions of Southern and Eastern Europe remain less integrated into the processes of knowledge creation, technological innovation, and commercialization of intellectual property. These disparities contribute to the persistence of regional socio-economic inequalities and complicate the implementation of the European Union's policy objectives aimed at achieving balanced and sustainable regional development.

Despite the existence of a considerable number of studies devoted to innovation and the knowledge economy, the issue of intellectual property as a spatially conditioned factor of regional development remains insufficiently explored from the perspective of economic and social geography. Most scientific works focus primarily on the legal or general economic aspects of intellectual property, whereas its role in the formation of regional innovation systems, urban growth centers, and interregional disparities within the European Union requires a comprehensive territorial analysis.

This issue becomes particularly relevant in the context of current transformational processes in Europe associated with digitalization, the transition to a green economy, the development of regional smart specialization, and increasing competition for human and intellectual capital. Under the conditions of Ukraine's European integration, the study of the European experience in using intellectual property as a factor of regional development gains additional practical importance for the formation of effective regional and innovation policies.

In this regard, there is a need for a more in-depth study of the territorial patterns of intellectual activity in the countries of the European Union, the identification of the role of intellectual property in the development of different types of regions, and the exploration of possibilities for adapting European experience to countries with transition economies.

Analysis of Recent Research and Publications. The issue of intellectual property as a factor of regional development has become the subject of active scientific analysis in both European and national academic discourse. European studies increasingly focus on the spatial aspects of innovation activity, the distribution of scientific and innovation resources, and their impact on regional disparities. In particular, a study based on a cluster analysis of regional indicators of scientific and technological activity in Europe revealed significant differences in knowledge productivity, where factors such as expenditures on research and development (R&D) and the number of researchers directly influence the patent activity of EU regions. The analysis was conducted using Eurostat databases and data on patent applications submitted to the European Patent Office (Puiu & Necula, 2021).

Reports of the European Commission emphasize the persistent concentration of innovation activity in a relatively small number of regions: more than 70% of patent applications originate from approximately 20% of EU territories, primarily large cities and innovation hubs such as Munich, Stockholm, Helsinki, and Paris. These findings confirm the global trend toward the spatial polarization of innovation activity, where major urban agglomerations act as key generators of knowledge (JRC Publications Repository, 2026).

Some publications analyze the practical aspects of intellectual property in the European Union, particularly the registration of IP rights by small and medium-sized enterprises (SMEs). Studies indicate that more than half of such enterprises report difficulties in the registration process, which constitutes a barrier to their innovation activities. This highlights that even in highly developed EU countries, procedural and administrative constraints may limit the expansion of intellectual property as a resource for regional growth (Ukrainskyi natsionalnyi..., 2023).

Among recent studies on intellectual property and regional development, particular attention should be given to research applying spatial econometric models to analyze innovation outputs in European regions, including patents, trademarks, and industrial designs. Such approaches, including the MGWR-SAR model, allow for a deeper understanding of the spatial determinants of innovation performance across regions (Furková, 2025).

Another research direction is related to the assessment of university patenting as a component of regional innovation potential (Acosta, Coronado, & Martínez, 2012) and the growing share of academic patents in Europe (Špurek & Reháček, 2022). Studies of inventor networks confirm that spatial patterns of collaboration can either facilitate or constrain the diffusion of innovation between regions.

The analysis of R&D spillover effects indicates the importance of combining human resources and technological linkages for regional innovation development (Kanellopoulos, 2026). Ukrainian sources, in particular the work of Khaustov (2021) and publications of the Ukrainian National Office for Intellectual Property and Innovations (2024), provide valuable context regarding the relationship between intellectual property, innovation development, and the legal environment at the national level.

Main Body of the Study. The level of intellectual activity in Europe is characterized by a clearly pronounced spatial asymmetry, which is manifested in the concentration of patent activity, research and development, and creative industries in particular regions. These differences have been shaped by historical, economic, institutional, and socio-cultural factors.

In 2024, the European Patent Office received nearly 199,300 patent applications, which remained almost at the same level as in 2023 (−0.1%) following three consecutive years of growth (EU Reporter Correspondent, 2025). Patent applications from European countries accounted for approximately 43% of the total volume, although a significant number of applications also originate from the United States, Japan, China, and South Korea.

In 2024, computer technologies, including artificial intelligence, became the leading field in terms of patent applications, with more than 16,800 applications submitted (EPO Publishes Patent Index, 2024).

Approximately 22% of patent applications in Europe were filed by individual inventors or small and medium-sized enterprises (SMEs), while an additional 7% were submitted by universities and research institutions, indicating the involvement of different types of innovators in the intellectual property protection system. The share of patent applications in which at least one of the inventors is a woman accounted for about 25% in Europe in 2024 (EU Reporter Correspondent, 2025).

According to the Knowledge Assets Index (2025), there are significant differences among EU countries in the indicators of patents and other intellectual property objects (Fig. 1).

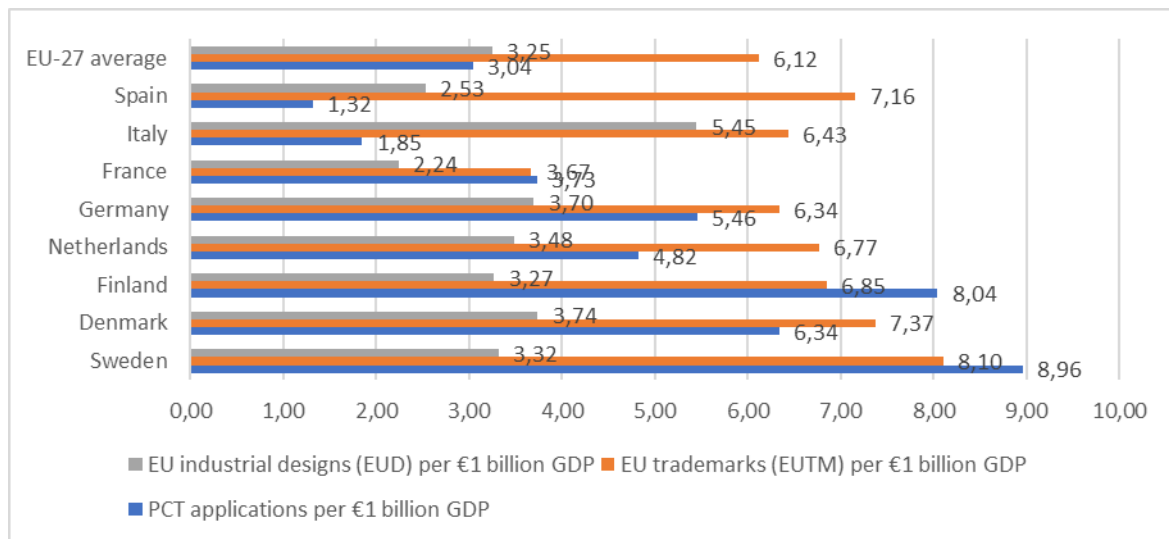


Fig. 1. Geographic differentiation of intellectual activity in the European Union (based on data from EU Reporter Correspondent, 2025; EUIPO Statistics for the EU, 2026)

These data indicate a high level of innovation activity in the Scandinavian and Western European countries (Sweden, Denmark, and Finland), whereas the countries of Southern Europe (Italy and Spain) demonstrate lower levels of patent activity relative to GDP.

The regions of Western Europe exhibit the highest level of intellectual activity. A significant share of patent applications, research centers, multinational corporations, and world-class universities is concentrated in these areas. Spatially, intellectual activity has a cluster-based character and tends to be concentrated in large urban agglomerations and industrially developed regions. Western Europe acts as the core of the innovation economy within the European Union, which determines its leading role in the overall European knowledge space.

Northern Europe is characterized by a high intensity of intellectual activity despite a relatively small population. These regions are typified by significant investments in science and education, the digitalization of the economy, and a focus on high-tech industries. Intellectual activity here is more qualitative than quantitative, which ensures the regions' high competitiveness at the global level.

Southern European regions exhibit lower levels of patent activity and knowledge commercialization compared to Western and Northern Europe. Intellectual activity is often concentrated in capital cities and coastal areas, while inland territories remain less engaged in innovation processes. At the same time, Southern Europe has substantial potential in the creative industries, cultural heritage, and tourism, which forms an alternative model of intellectual activity.

Eastern European regions generally demonstrate the lowest levels of intellectual activity within the EU. Key challenges include limited funding for scientific research, brain drain, and insufficient integration of science with business. Intellectual activity tends to be fragmented and predominantly concentrated in capital regions, exacerbating intra-regional disparities.

To visualize statistical data for European Union countries, which formed the basis of the study, cartographic modeling was conducted. This allowed for the demonstration of their spatial distribution and the identification of countries playing the most significant roles in the region.

Two statistical methods of cartographic representation were selected: cartograms and chart maps (cartodiagrams).

For the creation of the chart map, logarithmic data normalization was applied using the tools available in ArcGIS Pro. This mathematical transformation involves taking the logarithm of each value to modify their distribution for visualization purposes. It allows for a better representation of uneven data, particularly when there is a substantial difference between minimum and maximum values. By default, ArcGIS Pro displays logarithmic scale values such as 1, 2, 3, 4, corresponding to absolute values of 10, 100, 1000, 10000. For the visualization of three indicators, three-dimensional column chart symbols were chosen.

For the cartogram, a weighting coefficient was calculated for each EU country, reflecting its share in the total number of submitted applications.

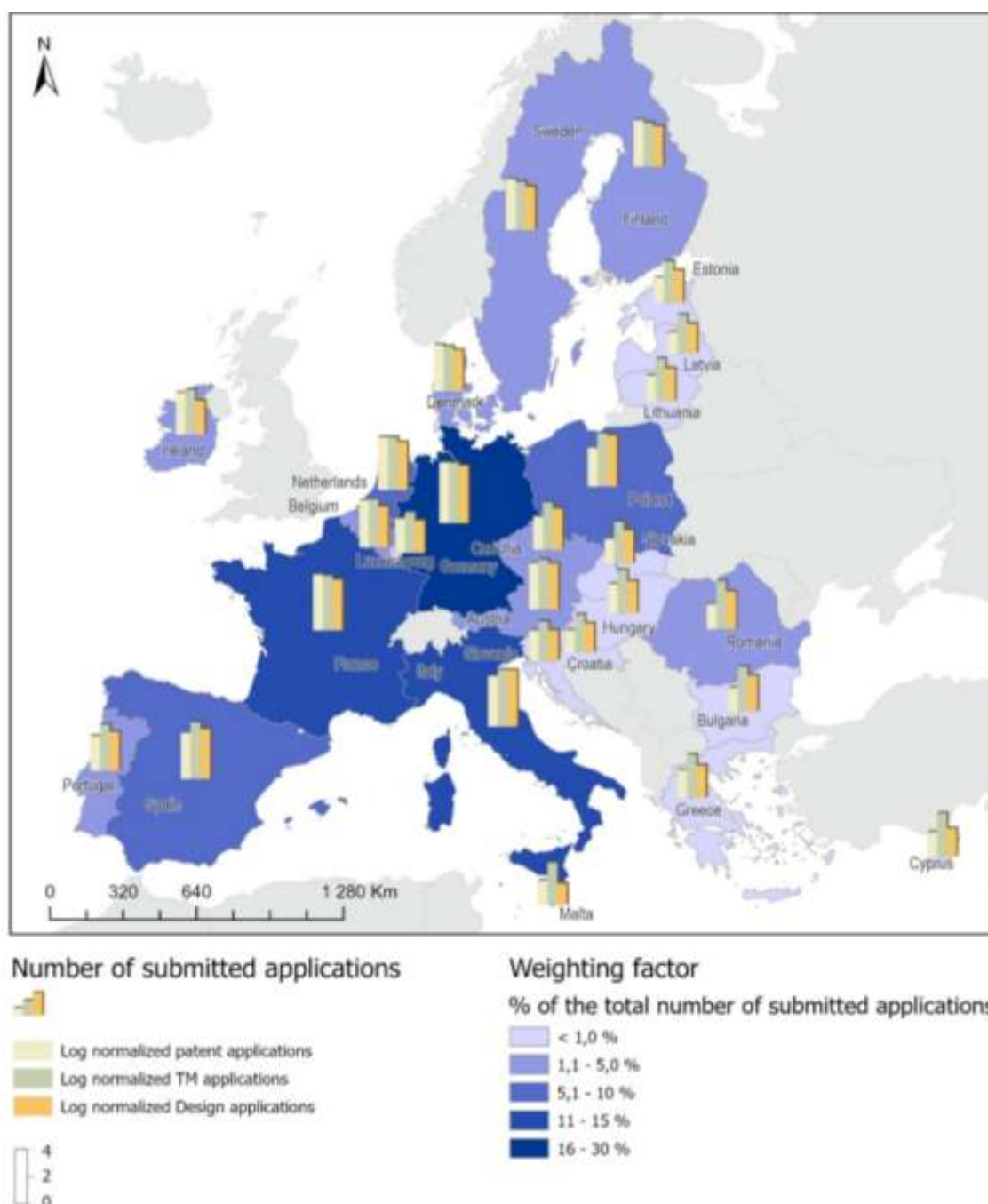


Fig.2 Spatial distribution of intellectual activity in European Union countries, 2025 (based on EUIPO Statistics for Europe, 2026; EU Reporter Correspondent, 2025; Data to download, 2026)

Thus, a clear “core–semi-periphery–periphery” model has emerged in Europe regarding the distribution of intellectual activity. Western and Northern Europe serve as the innovation core, Southern Europe represents zones of potential growth, and Eastern Europe corresponds to regions of structural catching-up development. Addressing these disparities remains one of the key objectives of the European Union’s regional policy.

Compared to the regions of Western and Northern Europe, Ukraine is generally characterized by a lower level of intellectual activity, consistent with the model of catching-up regions. In 2024, a total of 31,183 applications for industrial property objects were filed in Ukraine, of which 2,559 were for inventions (1,155 national + 1,404 via the international PCT procedure). The number of registrations amounted to 20,090 IP objects (Ukrainskyi natsionalnyi ofis..., 2025).

During 2025, approximately 31,452 examinations and registrations were recorded, including 25,407 trademarks, 3,718 utility models, 1,224 inventions, and 1,099 industrial designs (Ukrainskyi natsionalnyi ofis..., 2025). Compared to 2022, the total number of applications increased: in 2023, over

2,900 invention applications, around 3,500 utility model applications, and 30,798 trademark applications were submitted (trademark applications grew despite a decline in 2022 figures). Data for the first quarters of 2025 indicate a continued rise in IP filings (7,241 applications in Q1 2025), representing a 16.7% increase compared to Q1 2024 (Ukrainskyi natsionalnyi ofis... IP v tsyfrakh, 2025).

In 2024, foreign companies filed approximately 2,573 trademark applications in Ukraine, which is 37% lower than pre-2022 levels but still indicates a recovery of interest from abroad (Opendatabot, 2025). During 2024, the share of invention applications from foreign applicants exceeded 60%, with the leading source countries being the United States, the United Kingdom, and Germany (Ipstyle, 2025).

According to WIPO, Ukraine ranked 21st in Europe and approximately 43rd globally in terms of patent applications during a given period, accounting for around 3.2% of regional patent activity in Europe (Chambers and Partners, 2026).

At the same time, spatial analysis indicates significant intra-regional disparities, similar to those observed in Eastern European EU member states.

Intellectual activity in Ukraine exhibits a pronounced polarized character. The main hubs of patent activity, scientific research, and creative industries are concentrated in the capital and major urban agglomerations. Regions with a strong university base, research institutions, and IT clusters form the core of the national intellectual space. In contrast, most peripheral and rural areas remain weakly involved in knowledge generation and commercialization processes.

In terms of patent activity and investment in scientific research, Ukraine approaches the level of the least developed regions of Eastern and Southern Europe, significantly lagging behind the innovation centers of Western and Northern Europe. As in many Eastern European EU countries, Ukraine exhibits an excessive concentration of intellectual resources in the capital region, which exacerbates spatial inequality.

The main causes of territorial disparities in intellectual activity in Ukraine are: insufficient funding for science and innovation; weak integration between the scientific sector, business, and regional authorities; migration of highly qualified personnel to EU innovation centers; and the consequences of military actions, which have led to the destruction of scientific and educational infrastructure in certain regions.

European experience indicates that reducing territorial disparities is possible through the integration of intellectual property into regional development strategies. For Ukraine, promising directions include the support of regional innovation clusters, the development of university centers, the stimulation of creative industries, and the harmonization of the intellectual property protection system with European Union practices.

In terms of intellectual activity, Ukraine corresponds to the peripheral segment of the European knowledge space; however, it has significant potential to reduce regional disparities by utilizing intellectual property as a tool for regional development.

Conclusions. The conducted study has shown that intellectual property is one of the key intangible factors of regional development in the countries of the European Union, significantly influencing the spatial organization of the economy, innovation activity, and the socio-economic dynamics of territories. It represents an important element of the knowledge economy, providing competitive advantages for regions in both the global and intra-European space.

Significant territorial disparities in the formation and use of intellectual property objects among EU regions have been identified. The highest levels of intellectual activity are characteristic of the regions of Western and Northern Europe, where strong innovation ecosystems, developed research centers, and creative industries have been formed. In contrast, the regions of Southern and Eastern Europe demonstrate lower levels of patent and creative activity, which contributes to the asymmetry of socio-economic development.

A high concentration of patents, trademarks, and creative industries positively correlates with employment rates, investment attractiveness, innovation development, and the formation of cluster structures. Intellectual property acts as an important factor in the formation of innovation clusters and poles of economic growth, contributing to the strengthening of territorial specialization and regional competitiveness.

Intellectual property occupies an important place in the system of regional policy of the European Union, particularly in the context of supporting smart specialization, developing creative territories, and reducing interregional disparities. The effective integration of intellectual property

management instruments into regional development strategies is considered a prerequisite for sustainable and inclusive growth.

The obtained results confirm the relevance of the geographical approach to the analysis of intellectual property as a resource for territorial development and may serve as a scientific basis for further research on intangible factors of regional competitiveness, as well as for practical implementation in spatial development policies.

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