

## The innovations'role in facilitating regional development

### O papel da inovação na facilitação do desenvolvimento regional

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#### **ABSTRACT**

The paper analyses the impact of innovations on facilitating regional development in Ukraine. The main goal is the estimation of the innovations' role in the regional economy. Applying Schumpeter approach to dynamic economic growth, we consider the special policy for regional equalizations based on decreasing asymmetric innovative development in regions. Substantiated the development and implementation policy taking into account the innovative component for each individual region. The adoption and application of innovation policy measures proposed for inequalities smoothing and competitiveness increase in Ukraine's regions. The improvement and overcoming of regional disproportions through equalization of gross regional product per capita in regions proposed. The strategy of coordination activities, financing, and attracting investment in regions analyzed. The hierarchical cluster analysis proposed for the assessment of regional innovative inequalities. The special regional policy based on the hierarchical cluster estimation's results suggested decreasing imbalances and stimulating innovations inflow in regions.

**Keywords:** region, development, innovations, innovative component, innovation policy.

## RESUMO

O artigo analisa o impacto das inovações na facilitação do desenvolvimento regional na Ucrânia. O objetivo principal é estimar o papel das inovações na economia regional.

Aplicando a abordagem de Schumpeter ao crescimento econômico dinâmico, consideramos a política especial para equalizações regionais com base na diminuição do desenvolvimento inovador assimétrico nas regiões. Sustentou a política de desenvolvimento e implementação tendo em conta a componente inovadora de cada região.

A adoção e aplicação de medidas de política de inovação propostas para atenuar as desigualdades e aumentar a competitividade nas regiões da Ucrânia. A melhoria e superação das desproporções regionais por meio da equalização do produto regional bruto per capita nas regiões propostas. A estratégia de atividades de coordenação, financiamento e atração de investimentos nas regiões analisadas.

A análise hierárquica de clusters proposta para a avaliação das desigualdades inovativas regionais. A política regional especial com base nos resultados da estimativa de cluster hierárquico sugeriu diminuir os desequilíbrios e estimular o fluxo de inovações nas regiões.

**Palavras-chave:** região, desenvolvimento, inovações, componente inovadora, política de inovação.

## 1 INTRODUCTION

The aim of the paper is devoted to the analysis of the innovations' role in facilitating regional development. The main goal is the definition the causes of regional disparities, and the estimation of the role of innovation policy in regional disbalances and inequalities smoothing. Innovation policies in regions vary in countries. Some scientists define the crucial role of innovation for regional strategy. Another group of scientists emphasizes the role of innovations for economic growth based on regional territorial advantages.

Schumpeter approach to technological accumulation and creative destruction is the basis of the theory of dynamic economic growth explaining the nature of innovations. The concepts of technological accumulation and creative destruction are fundamental in theory J. Schumpeter. The author distinguishes investments in Research and Development (R&D) from other investments in two kinds of capital, including physical and human capital. Metcalfe and Ramlogan (2006) consider innovation as a process of generating the growth of knowledge connecting investment, demand, and structural transformation. Technical progress and the competitive process are carried out inseparably, moreover adaptive evolutionary processes coordinated by diverse market structures, and changing patterns of economic behavior.

Kingston (2017) examines capitalism using the concept of property rights. He explains the historical development of the economic cycles of capitalism through the changes in property forms, especially intellectual property rights. The author emphasizes that creative innovations have been captured by groups of people who wanted mostly to benefit from them. The reduction of wealth generalization and inequality growth contradicts the modern capitalist system's progress.

Antonelli (2017) applies the Schumpeterian creative response by implementing the tools of complexity economics. The consequent introduction of innovations may knock firms further out of

equilibrium and cause positive changes in the system's properties that feed the introduction of further innovations and vice versa. The path-dependent loop of interactions between the system properties and individual actions of firms ascertain relationships among knowledge, innovation, technological advancement, and economic growth. Almudi & Fatas-Villafranco (2019) apply the Neo-Schumpeterian concept of sectoral systems of innovation to reflect on the uneven sectoral patterns and analyze the interaction between technological factors, income growth, and distinct income elasticities of sectoral demand. They highlight the multisectoral modeling results that economic growth depends on sectoral innovation, and demand-side fundamentals. Aghion et al. (2001) address the product market competition and imitation goods and prove a positive effect on growth, The model points to complementary roles for competition (antitrust ) policy and patent policy. The application Schumpeterian model for human capital accumulation determines a country's capacity to absorb knowledge and provide its diffusion. After increasing a country's absorption capacity, it starts to be not an imitator, but an innovator who creates new knowledge itself.

In the literature review, we analyze the regional innovative approaches and consider the innovation system's and innovation policy's forms and methods. Entrepreneurs' innovations are studied as a factor in the long-term company's growth. The destruction of old company values is the basis for its further modernization. Innovative activity determination based on economic assessment, continuous technological and product rivalry of old with new ones that use to replace them.

In the other part, we estimate the cluster model of the dependence of regional classification on the macroeconomic parameters and innovation indicators in regions in Ukraine. We apply hierarchical cluster analysis for 24 Ukrainian regions in 2017 and emphasize the factors influencing the existing disproportions between the economic sectors, and asymmetric innovative development. The improvement and overcoming of regional disproportions through equalization of gross regional product per capita in regions proposed. We define the basic problems of regional development are the lack of capital investments, old capital assets, the high share of unprofitable enterprises, enterprise indebtedness, low innovations level, and insufficient infrastructure level hamper economic upswing. The assessment of Ukrainian competitiveness shows the market concentration at the national level and inadequate finance and human capital distribution in regions. The competition demonstrates the weakness of some regions. Concentration has a negative and highly significant effect on labor productivity growth. The financial shortage causes the reduction of the quantity of enterprises applied the innovations. Applying the Schumpeter approach to dynamic economic growth, we propose suggestions for regional equalization of gross regional capital per capita.

## 2 LITERATURE REVIEW

Most scientists identify the company's innovative activities as the main component of economic growth. Using innovation allows you to adapt to the constant changes in the external environment. Chaminade et al (2018, p.79) examine the innovation system related to economic, social, and environmentally sustainable development. Authors consider innovative policy in regions based on the theoretical study of national innovation systems in globalization, the legal environment, and regional policies supporting innovations. Edler &Fagerberg, J. (2017) focus their research on the definition of innovation policy and theoretical rationales. They consider the innovation policy mechanism and introduce the model that is designed to identify, analyze and deepen our understanding of innovation policy, and its application mechanism.

Edler et al (2016) attempt to understand the logic and effects of innovations. The scientists present meta-evaluations for 16 key forms of innovation policy instruments and their complex analysis. They underline the role of policymakers who are making tough decisions about the future of competitiveness and innovations.

Granstrand (2018) reviews the connections between R&D, various patents, different kinds of innovations, entrepreneurship, and effects on growth rate. The author concludes with proposals for spreading entrepreneurship, and innovativeness as a generator for industrial growth in Europe. Schomberg and Hankins (2018) develop the concept of reasonable innovation and explore the prospects for its further implementation in emerging markets. The authors consider the impacts of investigation through reconnecting science and innovations using the same standards opposite other existing public policies. They argue that responsible innovation needs to be sensitive to local, regional, and specific cultural contexts. The discussion on shared values may well lead to a variety of different requirements for good innovations (Schomberg & Hankins, 2018, p. 6). Fagerberg (2018, p. 16) ascertains that various national factors influenced firms' abilities to benefit from their own technological capabilities. National and firm-level capabilities interact in the process of development. Edler &Fagerberg, J. (2017) focus their research on the definition of innovative policy and theoretical rationales. They consider the innovative policy mechanism, and how it is designed, implemented, and governed. Eriksson et al (2010) apply strategic niche management (SNM) approach that is designed to facilitate the introduction and diffusion of new technologies through setting up protected experimental settings (niches) in which actors learn about the design, user needs, cultural and political acceptability, and offers suggestions for regional policy. Polverari (2018, p.10) points out the current paradigm, open innovation, that considers innovation as an open process that takes place in 'innovation ecosystems', 'in which companies, public research institutions, financial institutions, and government bodies interact through the exchange of skills, information, and ideas. The author proposes to exploit synergies between innovations in general and in regions. First, by pulling financial resources from both kinds of policies to fund the same programs, schemes, or projects,

and second, by strategic alignment. *Pyka et al (2019) introduce an agent-based model that provides a virtual simulation environment for ex-ante evaluation of policy intervention in regional innovation systems. Their findings show that regional learning and knowledge exchange processes tend to be accompanied by pronounced non-linearity. Different policy interventions may affect each other in complex and often-unexpected ways has far-reaching implications for policymakers.* Bogliacino et al. (2016) prove that without complementary investments, it will not be possible fully benefit from the advantages of information communication technologies (ICT) capital for productivity growth.

Understanding national innovation system, we define regional policy. Implementation mechanism supports the idea of interdependence and direct effects of innovations into economic sectors, improved synergies in regions, and internationalization of firms increasing cooperation in the international markets (Nosova, 2017, p. 117). The utilization of the existing approaches` results suggests its usage for proposing innovative economic policy for supporting innovations as a component of regional policy.

## 2.1 THE REGIONAL INNOVATION POLICY APPROACHES

Ukraine's policy has a priority task reflecting solutions to the uneven development of regions, restructuring of rural areas, and nature restoration. Adopting a special mechanism for innovative program implementation is critical that increasing productivity and Gross Regional Product (GRP) per capita in regions. Capello et al (2011, p. 305) discover regional policy as the competition among global players, combining the richest, central regions and poor periphery ones in countries. The prospects for priorities and directions of innovative development require increased positions in the international division of labor in a specific region and a focus on investment in R&D, the learning process, and innovations. Innovation policies are a complex of measures directed to promote technology development, creating an attractive business climate for economic progress. Gonsalez-Lopez & Asheim (2020) provide empirical results of interdependence regions and innovation policies. They propose the strategies and define the role of European Union institutions responsible for the promotion of diffusion innovation. The Ministry of Regional Development, Construction, Housing, and Communal Services in Ukraine fulfills functions of coordination and regulation, and scientific and methodological support of activities in regions. The adoption of the strategy of development of the innovative activity sphere for 2030 in Ukraine defines the aim and structural elements of the national innovation ecosystem. The strategy's implementation will ensure the interaction between all elements and accelerate economic growth. The regulatory acts' adoption creates a legal base for coordination and cooperation regional integration process. The innovative strategy aims to concentrate business resources on new breakthrough technologies providing competitiveness increase, innovative updating fixed capital, R&D expenditures increase, and state partnership.

In order to facilitate Ukraine's development it should be noted that defining and taking advantage of the specific region, determining basic spheres of investment, and including innovation components in

regional policy are basic policy directions for ensuring, and accelerating economic growth. The new law ‘On innovation activity of technological parks’; has to determine the forms of public-private partnership (PPP) in the innovation sphere (clusters, technological platforms, start-ups).

The deep literature analysis confirms our understanding of interdependence innovation, strategy, and political and innovation institutions, responsible for forecasting economic, scientific, technical, and informational functions. The study of various scientific works gives empirical evidence that spreading innovations enhance the advancement of technologies and economic growth. Polverari (2018, p. 12) presents models of innovation process which focus on linear models, interactive models, network models, and open innovations models. Globalization and advancements in informational technologies result in spreading the innovation process. Different actors in firms, companies, public research institutions, financial institutions, and government bodies interact, exploit, and transmit new ideas and knowledge from local, state, and national to world levels.

Barjak (2001) uses cluster analysis to construct regional models for East Germany and Poland using economic indicators. The author receives empirical results that the most capable regions are those with or near the largest agglomerations in both countries. Besides high income, low unemployment, and population gains from migration, these regions have comparatively large stocks of qualified labor and participate in technical progress. The author suggests two regional types: rural regions peripheral to the agglomerations and old industrialized regions. The innovative policy in regions based on theoretical study of national innovation systems, and regional policies support the policymakers who are making the tough decisions about the future of competitiveness and innovations, and empirical works considering the linkages between R&D, patents, innovations, entrepreneurship, and growth. Sukhanova (2015, p.98) proposes a complex innovative model. She includes territorial innovative clusters in it. Such a model reflects the connection between the socioeconomic structures of regions and the global economy. The stages of knowledge generation to its transfer, diffusion, and commercialization demonstrates new knowledge creation. The interaction between elements of innovative system stimulates the circulation of information and accelerate new knowledge creation.

The innovative development in Ukrainian regions continues to be constrained by high innovative costs, lack of state financing, absence of business partners, low demand for innovative products, and absence of information for technologies and qualified personnel (Nosova, 2018).

Assessment of the integral index for small business development in the region demonstrated that in 2010 seven regions in Ukraine had the lowest values comparing the national average level. In 2017, only six regions had an index below average, and only three regions had a value higher than the national level of 10 %. It confirms the asymmetry deepening, differentiated impact of small businesses at the regional level. In 2017, 14% of enterprises in the total economy were located in the capital city of Kyiv, employing 24% of the workforce. Also, 11% of all individual enterprises were in Kyiv, and 25% of all



legal entities. The latter employed 30% of the workforce and generated 40% of the turnover in the total economy of Ukraine (OECD, 2018). The major part of a number of enterprises by legal form includes and concentrates in Kharkiv, Dnipropetrovsk, and Odesa regions. The small business indicators' evaluation at the regional level shows widening imbalances in economic development that strengthen the predominant effect and demonstrate differential character for regions.

## 2.2 MODEL SPECIFICATION

We apply general scientific and special methods of cognition: structural-logical method – to build the general structure of the research. Content analysis and bibliographic search applied to the study of innovation policy in regions based on the theoretical study of national innovation systems and regional policies supporting innovations, the role of policymakers who are making the tough decisions about the future of competitiveness and innovations, and empirical works considering the linkages between R&D, innovations, entrepreneurship, and growth. Comparative analysis is used to study and compare forms and methods of innovation development in Ukraine.

We use hierarchical cluster analysis for comparing the regions of Ukraine in terms of innovative development. Economic and statistical methods were used to assess the level of innovative development in Ukraine's regions.

The graphic method is used to visualize estimation calculation results. The application of graph analysis of data of GDP and index of economic freedom for Ukraine 1991-2017 illustrates economic activity decrease in unpredictable world conjuncture, and regional economic and social disparities increase. Scientific generalization justifies the results of the investigation, makes conclusions, and proposes policy recommendations. We analyze the results of hierarchical cluster analysis for Ukrainian regions for 2017. The data of the State Statistics Service of Ukraine was used for the assessment of the Gross Regional Product from variables defining regional development for 24 Ukrainian regions (Regions of Ukraine, 2019).

Hierarchical cluster analysis identifies and organizes data object structures into clusters. It identifies homogenous groups of cases of unknown groups of estimation. Considering the regional innovation development, we apply hierarchical clustering analysis of Gross Regional Product (GRP) from the employment, industrial production index, fixed capital investment index, the number of organizations, conducting scientific research, the total value of innovation costs per one thousand employed workers and foreign direct investment (FDI). The hierarchical clustering analysis uses the SPSS Statistics program. The application of Ward's method calculates the simple Euclidean distances from each case in a cluster to the mean of all variables. We assume that GRP is associated with total industrial production in Ukraine's regions. Employment defines labor in the region. The industrial production index, fixed capital, and investment index determine regional capital. The number of organizations, conducting scientific research,

the total value of innovative costs per one thousand employed workers, and FDI in the region denote total factor productivity.

### 2.2.1 Research Hypothesis

We test the following hypothesis: the dependence of regional cluster classification on the macroeconomic parameters and innovation indicators in regions in Ukraine. We assess calculated distances between the most developed regions and the least undeveloped regions in hierarchical clustering. We estimate the single linkage criteria, showing the distance between the closest neighboring points. The estimation results outline that Kyiv is distinguished from other regions. Capital Kyiv is considered an outlier from other Ukrainian regions for all estimated periods with the biggest share of GRP.

The strong specialization by regions producing specific kinds of heavy industry products caused division between highly industrialized developed regions with high urbanization and ‘less developed’ rural regions with agrarian orientation in Ukraine. The centralized industrial organization and the inefficient regional structure formation resulted in a disproportionate regional division in the former Soviet Union.

Growth in incomes during the decade before the crisis was largely driven by favorable prices for commodity exports (particularly steel and chemicals) rather than much-needed improvements in productivity and competitiveness (OECD, 2013). Consistent delays in implementing structural reforms and recurrent political instability left the economy stuck in transition and overly exposed to external shocks. The external position also strengthened, with the current account deficit falling from 9.2% of GDP in 2013 to 3.6% in 2016. Gross reserves remain low but have doubled to USD 15 billion.

Low demand and liquidity problems remained the major impediments to business development for Ukrainian industrial enterprises in 2013. Other important barriers to development were excessive taxation (which includes tax rates and tax administration) and an unfavorable regulatory climate. Enterprise managers assessed the investment climate in 2013 as unfavorable. The share of enterprises that considered the year 2013 to be “unfavorable for the purchase of equipment”, the indicator that measures the investment environment, increased by 13.9 % to 71% in 2013. According to the results of the survey conducted in the 1st quarter of 2014, among the major obstacles that hampered the investment activity of companies in 2013 were insufficient income value (45.5%), unstable political situation (34%), and high cost of capital (28.7%) ((Innovation support measures currently in place in Ukraine, 2017).

## 2.3 MODELING HIERARCHICAL CLUSTER ANALYSIS RESULTS

The Gross Regional Product estimation interdependence is from variables of the average monthly salary (UAH), consumer price index (%), the volume of industrial production sales (goods and services) (mln UAH), fixed capital investment in real prices (bln USD), the total area of residential buildings



accented in operation (thousand square meters), exports goods (mln USD), imports goods (mln USD) strengthens the dependence of regional cluster classification on the macroeconomic factors' combination in Ukrainian regions.

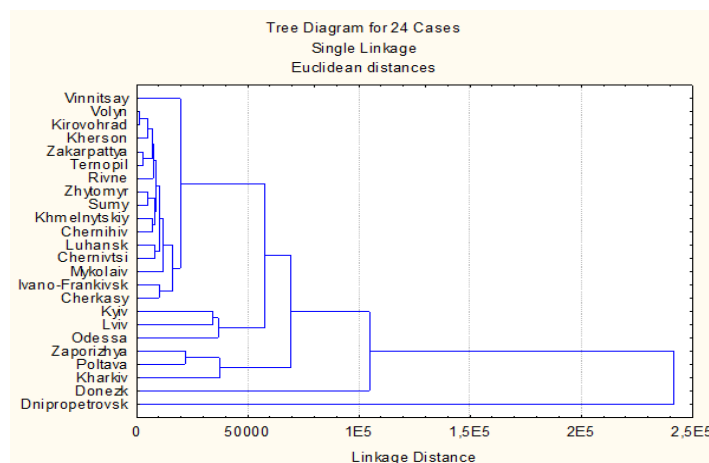
The present structure does not consider the geographical location, the economic endowment, and regional specificity. The graphical analysis of the line of the significant coefficients Ward's method proves the basic three clusters determination. The three clusters differ in particular in regarding to the levels of industrial development and scientific potential. It should be noted the increase of heterogeneity with every step of econometric analysis. A hierarchical clustering model of 24 regions graphically represented at the dendrogram of regional cluster classification on the input factors of production combination in regions for 2017. Classification of the macroeconomic factors' combination in regions demonstrates that each region has various distributions.

Hierarchical cluster analysis usage for 24 Ukrainian regions in 2017 demonstrates the existing significant differences in the level of economic, and scientific potentials, and confirms the low convergence among four clusters. The sufficient economic and technical endowment inheritance creates opportunities to exploit potentials and to improve position in cluster 2 for the rest regions.

The estimation results demonstrate the predominance of Dnipropetrovsk, Donezk, Kharkiv, Poltava, and Zaporizhya regions in the analysis compared to other regions, and indicate their significant role in regional development. The first cluster shows a relatively higher-than-average level of economic estimation in comparison with the two others (See Figure 1).

It distinguishes via the biggest industrial production concentration, the attraction of the significant financial flows of capital, the highest innovation capacity within regions, and more than average per capita income in comparison to Ukraine. The real GDP index, and the industrial production index decreased compared to 2016. Inflation (consumer price index), public debt, and unemployment rate increases in 2017. The net inflow of foreign capital made up 2,3 billion USD in Ukraine.

Figure 1. Dendrogram of regional cluster classification on the macroeconomic indicators in regions (Source: Authors' estimations).

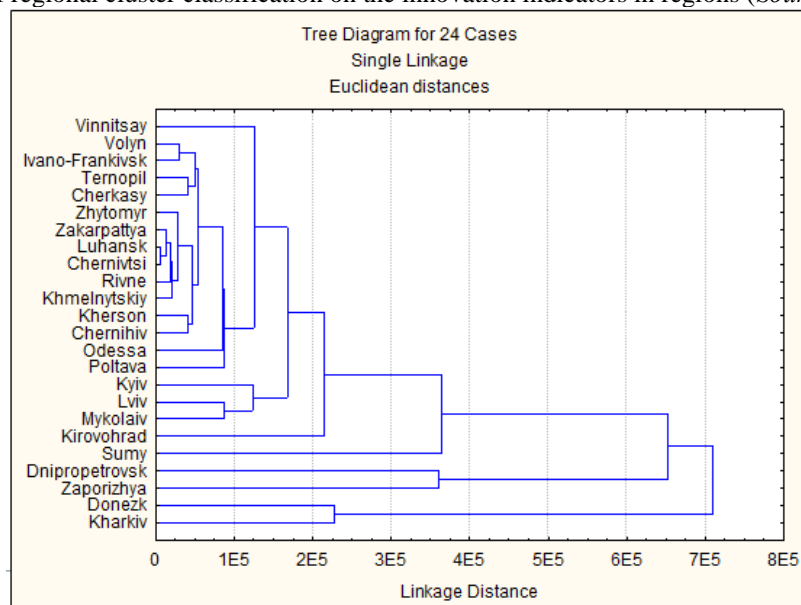


The first cluster has the biggest industrial production concentration, more than average per capita income, and attracts the significant financial flows of capital in Ukraine. Kharkiv, Dnepropetrovsk, and Donetsk regions show the best-performing capital, labor, and R&D capacities in the country. Cluster 2 includes the main regions of Kyiv, Lviv, Odesa, Luhansk, Ivano-Frankivsk, Cherkasy, Chernivtsi, and Mykolaiv. The third and fourth clusters involve the rest regions, some of which are specialized in agrarian production. Cluster mobility shows a low spread in economic development between regions.

The regional content of the second cluster and the third and fourth clusters indicate unstably and changeability for all estimation periods for 2017. These regions' industrial, and scientific potentials are significantly low compared to the first cluster. The second cluster and third and fourth clusters include some regions, which are specialized in agrarian production and have low industrial capacities. The cluster mobility shows a low spread in economic development between regions.

For a more in-depth analysis of regional differences, we continue our estimation by applying the data for innovation development. We test the following hypothesis: the dependence of regional cluster classification on the innovation parameters in regions in Ukraine. We assess dependence GRP from the number of employees engaged in R&D (quantity), the number of enterprises implementing innovations (quantity), the innovation costs of industrial enterprises engaged in innovation activity (thousand UAH), the volume of innovation products sales (quantity), costs of technological innovations, new technological products (goods and service) (quantity), the number of applied new technological products in enterprise's production (quantity) in Ukrainian 24 regions in 2017. The estimation results could be seen in figure 2.

Figure 2. Dendrogram of regional cluster classification on the innovation indicators in regions (Source: Authors' estimations).



The estimation results reflect a more clustered arrangement of regions based on the innovation indicators. Dendrogram is different from the previous diagram of macroeconomic parameters for 24 regions. The assessment results of innovation indicators demonstrate the predominance of the Kharkiv and Donezk regions in the first cluster. These regions have the highest innovation capacity compared to other items in the cluster classification. Zaporizhya, Dnipropetrovsk, Sumy, Kirovohrad, and Mykolaiv refer to the second cluster. Lviv, Kyiv, Odesa, Chernihiv, and Kherson occupy the third cluster position. The rest of the regions form the fourth cluster with low innovation potential.

The share of industrial enterprises that introduced innovative products amounted to 10.5% during 2012 - 2014; innovation processes - 11.3%, organizational innovations - 2.3%, and marketing innovations - 2.9% (State Statistic Service Ukraine, 2014). This tendency indicates an unfavorable situation in the R&D financing in regions and results in the low efficiency of innovative activity. Following it, one can mention a decrease in the share of realized innovative products in the total volume of industrial production in Ukraine which makes up 3 % in 2017. The analysis of the distribution of total funding innovation activity by sources in Ukraine illustrates the predominance of the own funds that make up 84.5 %, the state and the local budgets are 3.5 %, the domestic investors' funds - 3 %, foreign investors' funds - 1.2 %, loans – 6,5 %, funds from other sources equal 1.3 % in 2017 (Scientific and Innovative Activity of Ukraine, 2018, p.91). Insufficient financing reduces efficient development and leads to the of high-tech products and technologies imported dependence in regions.

The modeling results prove a necessity to apply effective regional policy at the state level for innovative development. Strategic tasks of the regional policy in Ukraine are increasing the regional competitiveness and strengthening their resource potential; ensuring the development of human resources; determining of spheres innovative breakthroughs, developing inter-regional cooperation, and creating favorable business conditions for regional prosperity.

Further estimations tree of unification Ukrainian regions in the clusters by the method of single communication using features of logarithmic scale demonstrates domination the predominance of industrial regions. The variables a number of enterprises that introduced innovations, costs of technological innovations, new technological products, low waste; resource-saving, waste-free processes applied for assessment of 24 regions in 2017 in Ukraine. The concentration of the bulk R&D resources in Kyiv, Kharkiv, Dnepropetrovsk, and Donetsk causes the necessity of financial redistribution and scientific resources among regions for equalization of its regional gross product per capita growth.

The choice and construction of the model of hierarchical cluster analysis suggest the assessment of the economic variables, estimation of the significant coefficients, and determination of some of the basic factors of innovation policy. The solution of the specific research task indicates the problem of the availability of statistical information, methods of estimation, and receiving results. The increased period of investigation and inclusion of additional variables for estimation will provide a detailed analysis of

regional development in Ukraine.

The study results confirm the feasibility of applying this approach to assess regional innovation potential. Providing access to the results of hierarchical cluster analysis offers an insightful assessment of innovation policy practice and its evaluation for Ukraine's regions. Following our approach, we consider that regional policy should take into account the innovation component of each individual region.

The innovative breakthrough in regional development considers the active state policy, building up administrative capacity at local and regional levels, comprehensive regulatory support of an innovative activity, and formation favorable institutional environment. The regional authority's function is to elaborate and realize inter-cluster projects, and support of new ideas and experience. The organization attractive innovation policy for innovative cluster development based on coordination activities, financing, and attracting investment will stimulate innovations increase in regions. The aim of the regional authorities is to elaborate, implement inter-cluster innovative projects, and support the exchange of experience and new ideas.

### 3 CONCLUSION

The obtained results highlight that macroeconomic differences create the basis for asymmetric innovative development at the regional level. The assessment of regional indicators taking into account macroeconomic and innovation data confirms the need for a differentiated approach based on the economic and innovative levels. An effective regional policy is a basis for improvement and overcoming regional disproportions through equalization of gross regional product per capita. The implementation of regional economic policy provides a need to pay attention to regional authorities to the innovative component in it. Clusters' creation in the form of technology parks is an important direction of the strategy for innovative development in the regions. The mechanisms of technology park implementation consider based on zones with attractive innovation climates. The favorable law legislation, tax exemptions, access to financial sources, availability of office production infrastructure, telecommunications, and conditions for comfortable living standards are vivid components of the analyzed mechanism.

Using the obtained results of hierarchical cluster analysis, it should be noted the crucial role of forms of private-public partnership. The state is responsible for legal initiatives in providing policy for innovative environment formation. Entrepreneurs' state support plays a crucial role in disseminating innovative ideas and implementing innovative projects.

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