



## DEVELOPMENT OF THE SCIENTIFIC SCHOOL OF ECONOMETRIC RESEARCH OF REGIONS

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**Abstract.** *This article analyzes the emergence and scientific schools of the theory of econometric study of regions in the world. The article considers economic and scientific approaches aimed at a deeper understanding of the processes of regional economic growth and development. The main theories and methodologies used in the econometric analysis of regions are analyzed, including such scientific schools as regional convergence, spatial econometric modeling, new economic geography, innovation and human capital approaches.*

**Keywords:** *econometric analysis, scientific school, economic geography, innovation, human capital, econometric modeling.*

Econometric research of regions is aimed at analyzing territorial differences in economic activity, and this area was formed as a separate direction of economic analysis and scientific research in the second half of the 20th century. It provides theoretical and practical approaches that help to better understand the development of regional economies and economic inequalities between regions, differences between countries. One of the most important components of these analytical methodologies is econometric approaches, which are used as the main tool in the analysis of economic growth, integration and stability.

An important methodological aspect of assessing the effectiveness of the development of the social sphere of the region is the selection and justification of indicators and criteria for the development of the social sphere. The analysis shows that in modern economic practice, both domestic and international, two main methodological approaches are used to assess the effectiveness of social development: using a system of indicators, as well as in the form of complex indicators.

The theoretical foundations of econometric research of regions were formed based on a number of economic theories and methods. These theories focus on economic growth, convergence, regional integration, and socio-economic factors. By the end of the 20th century, macroeconomic analysis methods, in particular econometric modeling, began to be widely used in identifying and understanding regional differences. By the way, this process includes several stages:

1950-1970s: The first studies of regional economics are based on specific models of economic growth. During this period, economists focused mainly on analyzing macroeconomic factors and their distribution across regions. One of the main scientific approaches of this period is the analysis based on the theory of growth and convergence of Barro and Sala-i-Martin (1992).



1980-1990s: The development of econometric methodologies and the increasing importance of spatial analysis. Spatial econometric modeling, developed by Anselin (1988), allowed for the consideration of linkages and interactions between regions. During this period, regional analysis began to explore the relationship between geography and economic activity.

1990-2000: New methodologies and scientific approaches, such as the theory of "new economic geography" (Krugman, 1991), required the analysis of regional differences to take into account more macro and micro factors. These theories also allowed for the study of the impact of economic integration and regional policies on economic growth.

Several scientific schools and approaches have emerged in the field of econometric research of regions, some of which are as follows:

Macroeconomic approach (Barro and Sala-i-Martin):

Theoretical foundations: The theory of regional growth and convergence, developed by Barro and Sala-i-Martin (1992), explains how economic growth is distributed among regions. They use a growth model to analyze global and regional levels of economic growth. In this approach, differences and convergence between regions are analyzed based on the distribution of capital and labor.

This approach has allowed the study of regional economic differences through macroeconomic analysis and regression models.

The analysis is based only on economic parameters and the distribution of capital, and is limited in taking into account social and political factors.

Spatial econometric analysis, developed by Anselin, the founder of the spatial econometric approach, takes into account spatial autocorrelation and interaction between regions. This method requires the consideration of geographical factors in regional economic analysis.

It allows for a deeper analysis of the spatial aspects of the regional economy and shows the specificity of the distribution of economic growth between regions.

Sometimes, due to the focus only on spatial aspects, problems arise in taking into account time changes.

The new economic geography theory, developed in 1991 by the famous scientist Krugman, analyzes regional growth and integration from a geographical perspective. In this approach, the processes of economic growth and economic integration are interconnected and provide new methods for understanding differences between regions.

The innovation and human capital approach was theoretically founded by the foreign scientist Romer. The innovation and human capital approach developed by him takes into account knowledge and technology as the main factors of regional growth. In this approach, innovative activity and human capital are of great importance as the main factors of regional economic growth and development.



The innovation approach approaches regional growth and development from a new perspective and provides an analysis of growth based on new technologies and knowledge.

There are some shortcomings in taking into account other economic factors in the analysis of human capital and innovation.

The emergence and development of the theory of econometric study of regions has developed the necessary methodologies for understanding economic growth and regional differences. Although each scientific school has its own strengths and weaknesses, using them has made an important contribution to identifying new directions in regional economic growth and development. Future research and scientific work will help to carry out a more accurate and complete analysis of regional economic growth.

There are many scientific articles, books and studies to prepare a review of the literature on econometric study of regions. This review reviews the main scientific works aimed at studying statistical and econometric methods aimed at analyzing regional economic growth, stability and resource allocation. Below, some methods used in the economic analysis of regions and the articles of the authors related to them are analyzed.

The study conducted by economists Barro and Sala-i-Martin studies the convergence of economic growth between regions. The authors analyze the dynamics of growth taking into account macroeconomic and microeconomic parameters. Using regression methods, they were able to identify regional inequalities in economic growth. The method used only regression models, therefore, statistical uncertainties and the limitations of the parameters included in the model were not taken into account.

Martin provides a deep theoretical foundation in the field of analysis of regional growth and development. The article examines the interrelationships between regional policies and economic growth. In some cases, it is not enough to take into account the interaction of economic policies and macroeconomic factors.

Another scholar, Anselin, in this work studies the spatial aspects of regional economic analysis and develops special statistical methods to take into account spatial autocorrelation and interaction. Spatial econometric models help to better understand the relationships between regions in economic growth and change. The article talks more about spatial autocorrelation, which limits the analysis of time changes.

Lucas studies the important role of human capital in regional economic growth. He manages to statistically prove the effect of human capital in the model. The article only considers scientific and technical workers and has shortcomings in taking into account other factors (for example, natural resources, infrastructure).

Feldstein and Horioka consider issues of economic convergence, taking into account trade and capital flows between regions. Their analysis helps to better understand economic changes. Considering only macroeconomic changes and global trade, not taking into account regional factors, limits some aspects.





The well-known scientist Krugman analyzes how regional policies should affect economic development. He shows the distribution of macroeconomic factors by region in economic growth and development. The model considers only factors related to economic forces and does not take into account the influence of political or social factors.

Helpman studies the interaction between economic growth and trade. This paper provides an in-depth analysis of the impact of trade between regions on growth. The model only considers economic changes, so there are some limitations in accounting for social and political factors.

Romer studies innovation and technology and shows statistically how they affect regional economic growth. Other economic factors (such as infrastructure or natural resources) are less likely to be considered in the analysis of innovation factors.

Fagerberg studies regional economic integration and its impact on development. It provides a good description of changes in the process of economic integration. There are some limitations in accounting for regional policies and economic strategies.

Duranton and Puga examine the factors affecting the regional distribution of economic activity. They comprehensively analyze the relationship between geography and economic activity. There are some statistical uncertainties in considering some regional differences.

Research in the field of statistical and econometric methods of econometric study of regions allows for a deep analysis of regional differences in economic growth and development processes. Researchers have tried to understand regional differences by studying the impact of economic growth, regional convergence, integration processes, innovations and human capital. At the same time, the complex nature of regional economic analysis requires the need to take into account the interaction of economic and social factors. The above-mentioned articles include various economic theories and methodologies, such as regional growth and convergence, spatial econometric modeling, interregional trade and economic integration, innovations and human capital. These articles, in general, have made a significant contribution to the study of the balance of macroeconomic and microeconomic processes in determining regional differences in economic growth. However, some articles have some limitations, such as considering only economic factors or not taking into account regional policies and other social factors.

In addition, assessing the strengths and weaknesses of the methodologies used in each study will help to determine the effectiveness of the analytical methods based on them and identify new prospects for regional economic growth and development. Regional econometric analyses can also be used to help policymakers identify new directions for economic growth and development, reduce economic disparities, and ensure economic stability.

In addition, factors such as economic integration and innovation play an important role in reducing differences between regions. However, it is necessary to take into account



statistical uncertainties and methodological limitations when taking these factors into account. Thus, further improvement of regional economic analysis requires more in-depth research based on new methods and new theories.

In general, scientific work on econometric studies of regions is important not only for economic analysis, but also for political and social decisions. Therefore, effective use of these studies, methodologies and methods is necessary for successful management of economic growth and development processes. The approaches and recommendations in the articles serve as important directions for future research and policy formulation.

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