

## ABSTRACT

The impact of climate change on the region occurs at environmental, economic, social, political levels. In the case of the regional economy, the impact is two-sided. Rapid economic growth and a growing population remain the main sources of greenhouse gas emissions that generate the global warming effect. Climate change, in turn, is altering living conditions and economic practices in the regions susceptible to its occurrence. Over the past decades, this interdependence has forced the implementation of mitigation and adaptation actions to climate change. These have resulted in a transformation taking place in sectors sensitive to temperature fluctuations (*e.g.* agriculture), but also in sectors based on fossil fuels (*e.g.* energy). It has forced a redefinition of the sources of regional advantage; it has raised questions about the direct and indirect effects of climate change on regional competitiveness.

One contentious area of environmental economics remains the relationship between economic competitiveness (and economic growth) and environmental sustainability. A pessimistic approach suggests that increased competitiveness is at odds with environmental sustainability due to the need to exploit the environment as a source of resources and a reservoir of waste. The opposite approach assumes that improvements in competitiveness, due to continuous technological change, need not conflict with environmental sustainability, and that both variables can increase simultaneously. The importance of clean technologies and alternative consumption habits that do not reduce competitive potential is emphasised here. The environment and the economy can develop in parallel if they are based on environmentally friendly innovations. According to this position, the possibility of combining improved competitiveness with environmental sustainability should be accepted. This growth can be disrupted by risk factors. One of these is climate change.

For regional economies, understanding the economic impacts of and adaptation to climate change is crucial, above all for better adaptation. This is because, in socio-economic systems, the effects of these changes are not limited to where they occur, but extend to other spheres and geographical regions. They generate additional uncertainty about the magnitude and channels of the impact of change, the scale of adaptation and how they will translate into economic outcomes, including competitiveness.

Analogous to economic growth, the competitiveness-climate change relationship is two-sided. Competitiveness is part of the climate change problem, but also part of the solution. The ability to absorb negative climate impacts depends on factors that shape

a region's high competitiveness, such as a good institutional environment, health status, sanitation infrastructure, education system. High competitiveness makes it possible to reduce vulnerability to climate change and adapt to it more quickly; regions with higher competitiveness will have higher levels of growth and better adaptation to weather turbulence and climate change. There is a lack of studies in the literature on competitiveness under climate change conditions

Traditional analysis of regional competitiveness used published reports (*e.g.* Regional Competitiveness Index, RCI) and methods of multi-criteria comparative analysis. A synthetic construction of competitiveness indicators was used, based on which its level was determined for selected regions. In turn, the analysis of the determinants of competitiveness was of cognitive and practical importance – it guided improvement and formed the basis for planning and implementation work. The proposed methods for assessing the level of regional competitiveness consisted of selecting a certain set of measurement indicators, depicting selected aspects of competitiveness. However, previous analyses of this phenomenon have not taken into account the challenges generated by changes in the climate for regional competitiveness. The aim of this monograph, therefore, is to present a method for evaluating the climate competitiveness of regions, and to determine its levels and ranking for EU regions.

The difficulties associated with conceptually defining the concept of climate competitiveness, as well as those associated with capturing this phenomenon through one or more indicators, should be highlighted. The methodological proposal presented in this paper is based on the approach adopted by the European Commission in its methodology for estimating the RCI. Thus, the proposed index of climate competitiveness focuses on the determinants of the level of productivity of the regional economy, which is the source of local prosperity. In the authors' view, the approach adopted allows for the presentation of a synthetic picture of the climate competitiveness of EU regions, taking into account a broad and balanced range of factors shaping the long- and short-term potential of regional economies under climate change conditions.

This study consists of four chapters. The first chapter presents climate change in relation to socio-economic development, treating it, on the one hand, as an effect of the current development model and, on the other, as an impetus for a radical change in future development trajectories. Chapter two provides an overview of the main ideas underlying competitiveness. Focusing on aspects and factors that are particularly relevant at the regional level, it describes the key areas of competitiveness. It also provides an overview of the basic research models used to diagnose and assess the level of competitiveness of areas. The third chapter presents the methodological basis for the construction of the index of regional climatic competitiveness and the assumptions and results of the analysis of primary data. In particular, the results of statistical analyses of the individual pillars of the proposed index are presented. Chapter Four takes a closer look at the results obtained for the sub-indices and the climate competitiveness index for EU regions. The chapter includes spatial analyses and rankings of the study areas.

**Keywords:** Climate change, climate competitiveness, European Union, regional competitiveness.