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## Doctoral Thesis Summary

# INNOVATION AND TECHNOLOGY TRANSFER IN THE ECONOMY OF MOUNTAIN REGIONS

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## Introduction

Innovation and technology transfer are two of the most dynamic directions of current economic development trends, influencing territorial transformation, regional competitiveness and the sustainability of key sectors of the economy. In this context, mountain areas – both vulnerable and resource-rich – are at the crossroads of meeting the need to protect natural heritage and upgrade on sustainable economic development. The thesis starts from the premise that sustainable innovation in mountain regions is a necessity. Challenges such as geographical isolation, rather poor infrastructure and climate change require a rethinking of the public policies and regional development instruments, which should support the emergence of economic models adapted to the mountain specificities.

## **Overall goal**

The general objective of this PhD thesis is to analyze and validate the ways in which innovation and technological transfer contribute to the sustainable development of economies in mountain areas, through the integration of public policies, institutional mechanisms and innovative tourism solutions. The research aims to adapt and apply relevant theoretical and statistical models to provide recommendations on strengthening innovative capacity in mountain regions, especially in the Carpathian and Alpine context.

## **Methodology and own contribution**

The paper combines a theoretical-conceptual approach with applied research, based on statistical models and comparative analyses among European mountain regions, especially the Carpathian and Alpine ones.

Territorial dynamics, forms of certification and traceability, as well as the interaction between public policies and innovation metrics in the economy are investigated. The structure of the thesis reflects this double dimension: a first conceptual and theoretical framework part (chapters 1–3) followed by a personal, applied contribution (chapters 4–6), which includes case studies on innovation infrastructure, regional policies and innovative tourism solutions.

The methodology of this doctoral research is based on variables extracted from EUROSTAT data, namely the Regional Innovation Scoreboard at NUTS 2 level for European mountain regions (Alps and Carpathians). Since the indicators selected in the research are predominantly quantitative, this aspect allowed the application of complex quantitative methods, such as:

- inferential statistical methods;
- Student's t-test to compare the mean values of all innovation indicators;
- Pearson parametric correlation to analyze whether there are correlations/associations between indicators related to innovation infrastructure for the Carpathian countries;
- to determine the causal relationship between innovation indicators and to find the best predictors for innovation in the Alpine and Carpathian Mountain regions, a multilinear regression model was applied.

The originality resides in the integrated way in which complex concepts are analyzed (innovation management, technological transfer, economy, mountain areas, integrated territorial development, smart specialization, public policies) in a framework that combines sustainable development, European regulations and specific territorial dynamics.

## Conclusions

In the context of using advanced methods of statistical analysis, this research integrates quantitative and qualitative approaches to provide a coherent and applicable view of the role of innovation in the economy of mountain areas. Through the results generated, the thesis contributes to the consolidation of scientific knowledge and provides relevant recommendations for future public policies, institutional interventions and entrepreneurial initiatives in European mountain regions

Starting with the most complex results of the doctoral research, the comparison between the two large European mountain areas – the Alps and the Carpathians – we can state that the results partially confirm Porter and Stern's findings according to which a limited focus on innovation capacity, especially in Eastern Europe, will restrict the progress of states, and proactive economies will prosper.

The positioning of most Carpathian regions below the EU27 average and Alpine regions slightly above this average attest to the fact that common policy measures for innovation are not duly considered. This aspect has historical causes (capitalism vs. communism, private property vs. collectivization, differentiated bottom-up approaches in the Alps vs. common top-down approaches in the Carpathians), but looking at the manifestation of policies in recent decades, we observe that Alpine regions have developed and operationalized smart specialization strategies at various territorial levels, while in the Carpathians this concept is still emerging.

A territorial differentiator among the studied areas is the location of innovation centers. While in the Alps economic and applied research-oriented cities are found in the Alpine areas, unfortunately, the Carpathian region does not benefit from such centers.

In mountain areas, innovation governance is not context-based, but often based on policies transferred from other systems, domains or regions. This is also the case with the attempt to copy Alpine policies in the Carpathians. The public sector should support the process by providing an appropriate legislative framework, innovative public procurement and proper mitigation for risk-sharing in research.