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INNOVATION CAPACITY AND ECONOMIC RESILIENCE: EVIDENCE FROM SERBIA

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Introduction

Contemporary global dynamics are increasingly shaped by rapid technological change, intensified international competition, and the restructuring of global economic relations. In this environment, the ability of national economies to adapt depends more on their capacity to generate, absorb, and apply innovation. Innovation capacity is a key determinant of economic resilience, defined as an economy's ability to respond to external shocks, adapt to change, and sustain long-term development. At the same time, it influences a country's position in the international economy. In advanced economies, innovation capacity primarily supports the maintenance and further strengthening of established competitive advantages, while in developing and transition economies, it plays a more decisive role in creating opportunities to improve their position in the global economy. The existence of a gap relative to more developed economies, along with structural imbalances across innovation system dimensions and regions, complicates the assessment of the actual adaptive capacity of the economy in the context of current global changes. Against this background, the paper examines how national and regional innovation capacities shape Serbia's potential to improve its economic position in the current global environment, with particular focus on small and medium-sized enterprises. The analysis is based on the composite SME Innovation Pulse index, developed within the IES study "Innovation Pulse of the Republic of Serbia 2025," which enables a comparison between Serbia and the EU27 across key dimensions of innovation performance. The central argument of the paper is that the key challenge lies not only in the

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level of innovation performance, but primarily in its structure and uneven distribution. This raises the question of their role in shaping economic resilience and Serbia's position in the international economy.

Theoretical Framework

Innovation capacity is a key determinant of economic growth and competitiveness, as it shapes an economy's ability to generate and apply new knowledge and influences its industrial development and export performance (Đuričin et al. 2022; de Oliveira and Nicolay 2022). Economic resilience refers to the ability of an economy to respond to shocks, adapt to change, and sustain development through adjustments in production, technologies, and business models (Wu et al. 2022; Jiang et al. 2024). The relationship between these concepts is that innovation capacity determines an economy's adaptive potential and its position in the international economy.

Data and Methodology

The analysis is based on the composite SME Innovation Pulse Index, which is designed to systematically monitor the performance of Serbia's innovation ecosystem and its regions, and to enable comparison with the European Union average. Serbia's results are assessed relative to the European Union, where the average of the member states (EU27) is set as the reference value (100). The index is structured around four key pillars: innovation activities, digital transformation, research and development, and eco-innovation. The composite value of each pillar is calculated as the arithmetic mean of its underlying indicators, all of which are equally weighted. This produces a value indicating the extent to which Serbia or a given region lags behind or advances in a specific dimension of innovation development. The overall index is calculated as the arithmetic mean of the four pillars and serves as a comprehensive measure of innovation performance in Serbia and its regions relative to the EU average. Methodological limitations arise from the equal weighting of indicators, despite potential differences in their actual impact, and from reliance on available and internationally comparable data. As a result, certain aspects of innovation development remain outside the scope of analysis, and time lags in data availability limit their timeliness.

Results

The results present that Serbia achieves 66.9% of the average innovation performance level of the European Union, indicating partial convergence but also highlighting a significant development gap. In innovation activities, Serbia reaches 67.6% of the EU average, suggesting some dynamism at the firm level. However, innovation remains mostly limited to internal processes, with insufficient collaboration among firms and other actors in the innovation system. Additionally, the slower growth of revenues from new products compared to the EU indicates limited market valorization of innovation and a gap between its creation and commercialization. Digital transformation, at 86.3% of the EU average, represents a relatively advanced segment, supported by solid infrastructure and available technologies. However, a lack of digital skills and the slow adoption of advanced technologies, particularly artificial intelligence, constrain its impact on productivity and competitiveness. In eco-innovation, Serbia reaches 91.4% of the EU average, indicating solid potential. However, slow progress in the energy transition, especially in shifting from fossil fuels to renewable energy sources, remains a key constraint on competitiveness. The most pronounced gap is in research and development, where Serbia reaches only 22.3% of the EU level, with business sector expenditure at 0.38% of GDP compared to 1.49% in the EU. This level of investment reflects structural weaknesses in the innovation system and limited capacity for knowledge generation. At the regional level, significant differences appear in both the level and structure of innovation performance. The Belgrade region achieves the highest results across most dimensions (74.1% in innovation activities and 96% in digital transformation), with strong performance in circular practices but clear weaknesses in market valorization of innovation and the energy transition. Vojvodina exhibits a relatively balanced performance, with 69.6% in innovation activities and 89.9% in digital transformation, and the highest level of research and development at 33.6%, although it has weaknesses in certain technological and green segments. Šumadija and Western Serbia (65.8% in innovation activities, 80.8% in digital transformation, 15.4% in research and development) display a basic level of innovation capacity but face significant limitations in advanced technologies and research capabilities. The lowest performance is recorded in Southern and Eastern Serbia (58.2% in innovation activities, 74.3% in digital transformation, and 14.9% in research and development), where constraints are particularly evident in collaboration, digital skills, and R&D capacities, despite some isolated improvements. This pattern confirms that the national average

conceals internal disparities that further limit the overall innovation potential of the economy.

Conclusion

The findings indicate that Serbia's innovation capacities remain structurally uneven, with a pronounced gap in research and development and significant regional disparities. This situation constrains the economy's adaptive potential and its ability to translate innovation into sustainable competitive advantage. In the context of contemporary global changes, innovation capacities in Serbia allow for some adjustment but do not support a strong shift toward higher segments of the global economy. This confirms that the level of innovation alone is not decisive; rather, its structure and distribution determine the extent of economic resilience and the potential for improving international positioning. Strengthening research and development and reducing regional disparities are key prerequisites for transforming innovation capacities into drivers of long-term resilience and competitiveness. This requires improving the effectiveness of existing fiscal incentives for research and development, encouraging investment in in-house development functions, introducing regionally differentiated support measures, and strengthening linkages between firms and research institutions to enhance the commercialization of innovation and ensure more balanced capacity development.