

**ACADEMY OF ECONOMIC STUDIES**



CYBERNETICS AND ECONOMIC STATISTICS DOCTORAL SCHOOL

**DOCTORAL THESIS**

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Doctoral thesis title:

**STATISTICAL AND ECONOMETRIC ANALYSIS OF THE SMART  
ECONOMY IN THE EUROPEAN UNION, IN THE CONTEXT OF  
THE FIFTH INDUSTRIAL REVOLUTION, WITH A FOCUS ON  
ROMANIA**

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## **Abstract**

The thesis explores the smart economy through the dual transition – digital and energy – that defines the Fifth Industrial Revolution. It combines AI progress with clean energy, shaping productivity, competitiveness, and resilience.

The research applies advanced statistical and econometric methods – regressions, panel models, LCA, factor analysis, Monte Carlo simulations, machine learning – on official data (Eurostat, OECD, World Bank, DESI, ECS 2019) at both macro and micro levels.

Findings show AI and renewables boost performance, though disparities persist. Romania is a “laggard” in AI adoption, yet benefits from a balanced energy mix and potential via renewables and SMRs. Public policy, human capital, and digital infrastructure are confirmed as key convergence drivers.

Contributions are theoretical (defining the Fifth Industrial Revolution), methodological (broad analytical tools), and practical (recommendations for Romania).

**Key words:** The Fifth Industrial Revolution, Artificial Intelligence, clean energy