



**Romanian Academy
INSTITUTE OF NATIONAL ECONOMY**

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(editors)

BOOK OF ABSTRACTS

**The 4th International Conference
"Resilience and competitiveness of the national
economies - under the sign of creativity, crisis and
conflicts" - RESILNAT-3C**

**2026 Edition: Shifting the economic development models in the
context of fragile resilience, geoeconomic confrontation, debt-
driven constraints, and cost-of-living squeeze**

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Institute of National Economy**

Book of Abstracts of the International Conference

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CONFERENCE OBJECTIVE

The Conference aims to promote the research results, the diagnosis of economic and social development and the identification of challenges and trends for the future society, based on sustainable development and digital transformation.

We wish to develop and extend scientific collaboration with researchers and practitioners from Europe and worldwide, to debate and highlight (inter) national and local development features.

CONFERENCE SESSIONS:

1. UNLOCKING GROWTH THROUGH RESEARCH FOR SUSTAINABLE DEVELOPMENT
2. FINTECH FOR ECONOMIC RESILIENCE
3. GEOPOLITICAL SCENARIOS FOR BUSINESS DECISION MAKING AND VALUE CREATION
4. NATURE-BASED SOLUTIONS, GREEN CITIES AND CIRCULAR ECONOMY
5. INCLUSION, DIVERSITY AND INNOVATION IN SOCIAL DEVELOPMENT
6. THE NEW PATH FOR DIGITAL PROGRESS AND IMPACT IN OUR LIFE
7. NATIONAL ECONOMY RESILIENCE - BALANCING ECONOMIC GROWTH, SOCIAL EQUITY, AND ENVIRONMENTAL SUSTAINABILITY IN AN UNCERTAIN INTERNATIONAL CONTEXT
8. SPECIAL SECTION FOR PHD STUDENTS.

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Dr. Alina Maria Vaduva is a Senior Lecturer in Business Strategy at the University of East London, a researcher, and an elected local councillor whose work focuses on migration, AI-enabled integration, sustainability, and inclusive labour market transitions. Drawing on interdisciplinary expertise in business, public policy, and digital transformation, her recent research explores how AI-driven education and skills development can support migrants' integration into employment and society. Her work examines migration systems through the lens of institutional responsiveness, labour market adaptation, and responsible innovation, with a particular interest in the role of short courses, digital tools, and governance in supporting equitable integration outcomes.

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Dr. Patrick Blessinger is a global thought leader in curriculum, instruction, learning, assessment, and research. He is the Founder, President, and Chief Research Scientist of the International Higher Education Teaching and Learning Association, which holds consultative status with the United Nations. His work advances lifelong learning, the democratization of knowledge, and the role of education in promoting sustainable development and human progress. Dr. Blessinger has convened many international conferences and scholarly initiatives that bring together educators, researchers, and institutional leaders from around the world. He teaches education at the State University of New York at Old Westbury, New York, and has many years of experience as a licensed public school teacher. He serves as Editor-in-Chief of the Journal of Applied Research in Higher Education and the book series Global Perspectives on Higher Education Development. His honors include Fulbright Senior Scholar, Governor's Teaching Fellow, and National Geographic Certified Educator.

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Florian Nuță is a Full Professor Dr. Habil. in Accounting at Danubius International University from Galați, with over 17 years of teaching and research experience. He is affiliated with the Doctoral School of Social and Human Sciences at Ștefan cel Mare University of Suceava for research and doctoral supervision activities. Dr. Nuță holds a bachelor's degree in Finance and Insurance and a master's degree in Accounting from the "Dunărea de Jos" University of Galați. He attended the Doctoral School of Economics and Business Administration at Alexandru Ioan Cuza University of Iași, where he defended the thesis "Environmental Protection Accounting in the Contemporary Economy" in 2009. In 2011, Dr. Nuță won a national grant competition to finance a postdoctoral project on a topic related to SME's corporate social and environmental responsibility. The Alexandru Ioan Cuza University of Iași and the Bucharest University of Economic Studies hosted the project activities, which included a research visit to the University of Messina, Italy, in 2012. Since 2014, he has been in charge of research activity management as vice-rector at Danubius University in Galați. In January 2022, Dr. Nuță defended his habilitation thesis, entitled "Research on Environmental and Social Accounting in the Context of Sustainable Development Objectives and for Ensuring Intergenerational Equity" at the Ștefan cel Mare University of Suceava, Doctoral School of Social and Human Sciences, and was afterward affiliated with the same doctoral school. His scientific research is conducted in the following fields: Environmental Accounting, Climate Change Economics, Energy Economics, Urban Environmental Accounting, Carbon Accounting, Green Taxation, and Public Policy. He is involved in numerous editorial initiatives as editor-in-chief, editor, and member of the international scientific board, and as a reviewer for scientific journals and international conferences, conducting more than 500 peer reviews during his academic career. Dr. Nuță worked as a reviewer for Renewable & Sustainable Energy Reviews, Energy Efficiency, Resources Policy, Sustainable Energy Technologies and Assessments, Sustainability, Energies, Economic Research, Journal of Entrepreneurship in Emerging Countries, Cogent Business and Management, and other peer-reviewed scientific journals.

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Alina Cristina Nuță is a Professor Dr. Habil. at Danubius International University (full-time). She is an expert evaluator for the European Research Executive Agency - European Commission. She serves as an independent expert at the National Authority for Research - Ministry of Education and Research. She is a National Council for Attesting University Titles, Diplomas and Certificates (CNATDCU) Expert, as named by the Education Ministry. She serves as a Projects evaluator in the Executive Unit for the Financing of Higher Education, Research, Development and Innovation (UEFISCDI- Ministry of Education). In 2016, she became an External Quality Assurance Expert at the Romanian Agency for Quality Assurance in Higher Education (ARACIS), Economics- Finance. She also serves as a member of the Senate of Danubius International University, coordinating

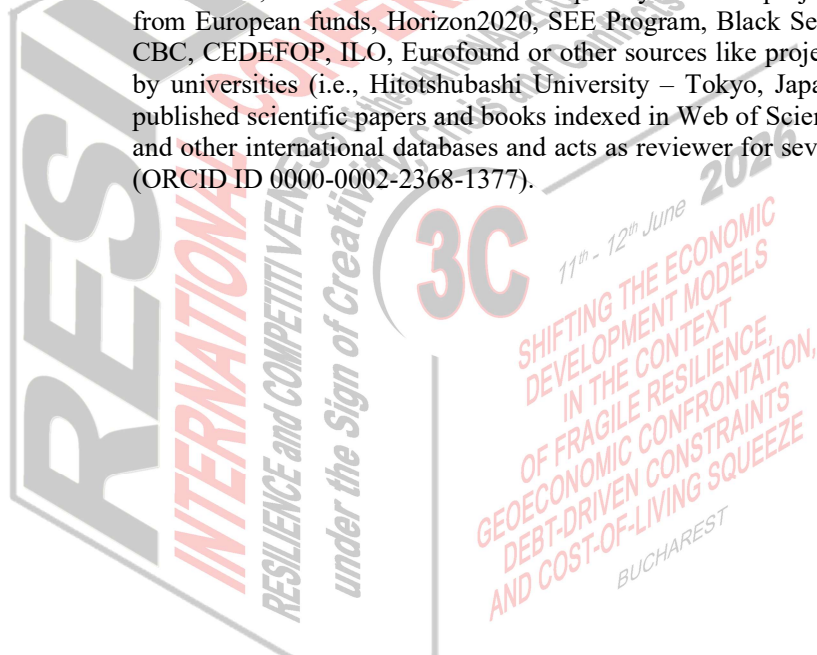


the Committee for Strategy, Institutional Development, and Quality Assurance, with over 19 years of teaching and research experience. Starting in 2014, she has been coordinating the Open, Online, and Distance Learning Department at Danubius University, Galati.

Valentina VASILE, Institute of National Economy, Romanian Academy, Romania



Valentina Vasile, PhD in economics, full professor and senior researcher first degree is working as Director of The Institute of National Economy-Romanian Academy and is teaching at Nicolae Titulescu University of Bucharest. She is also PhD advisor in ECONOMICS on SCOSAAR of the Romanian Academy. Has a wide experience as researcher in economics, who participated in internal and international interdisciplinary research projects, main topics of research being labor economics, migration, human capital, digital economy and employment, social policies, education and lifelong learning, macroeconomics, sustainable development, resilience and circular economy. She has good international cooperation as coordinator, team member in interdisciplinary research projects financed from European funds, Horizon2020, SEE Program, Black Sea Basin ENI CBC, CEDEFOP, ILO, Eurofound or other sources like projects financed by universities (i.e., Hitotsubashi University – Tokyo, Japan etc.). She published scientific papers and books indexed in Web of Sciences, Scopus and other international databases and acts as reviewer for several journals (ORCID ID 0000-0002-2368-1377).





PLENARY SESSION: KEYNOTE SPEAKERS

RETHINKING URBAN RESILIENCE FOR A SUSTAINABLE FUTURE THROUGH NATURE-BASED SOLUTIONS AND CIRCULAR CITIES

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Abstract

Objective: This study analyses the potential role of nature-based solutions and circular development approaches in transforming urban planning toward resilient urban development in an age characterized by climate instability, ecosystem destruction, resource shortages, and rising inequality in access to opportunities and resources. The aim is to demonstrate that green cities should not be viewed simply as highly technological cities. On the contrary, green cities should be regarded as regenerative cities, characterized by the interconnected, sustainable development of their ecosystems, the adaptability and resilience of their economies, and improvements in people's lives.

Method: An analytical, interdisciplinary methodology is used in this study. Literature reviews and analyses of theories from the fields of urban sustainability and resilience, ecological economics, and the circular economy form the basis for developing an interpretative model. The focus is on the interplay between nature-based infrastructural systems, closed-circular material flows, social inclusiveness, and adaptable and resilient urban governance practices. The purpose is to develop a conceptual comparative lens to interpret examples of how environmental regeneration contributes to value creation for urban communities across multiple areas.

Results: Four results emerge. First, nature-based solutions such as urban forests, green zones, rehabilitated water systems, permeable land surfaces, and biodiversity-friendly land-use policies should be viewed as core urban infrastructures rather than mere aesthetic elements of cities. Second, closed and circular flows of materials through the reuse, maintenance, and repair of structures; adaptive regeneration; recycling; and the productive redevelopment of brownfields and vacant sites significantly increase cities' resilience capacity. Third, the synergy between ecological and circular urban development yields numerous co-benefits, such as adaptation to climate change impacts, improvements in residents' health, increased community cohesion, and greater opportunities for innovation. Fourth, resilient transformation requires effective urban governance capable of coordinating public authorities, civil society organizations, higher education institutions, and businesses to achieve regenerative outcomes. Overall, urban resilience grows when cities transform from extractive,



fragmented models to integrated development models that provide environmental, economic, and social benefits for all citizens.

Originality: *The key contribution of this paper is the introduction of an integrated framework that considers nature-based solutions and circular development as two sides of the same urban development strategy. The proposed conceptual model offers a human-centered approach, based on the premise that resilient cities need to become regenerative not only in sustainability and adaptability but also in inclusiveness and people's dignity.*

Keywords: *nature-based solutions, green cities, circular economy, urban resilience, sustainable development, regenerative urbanism, environmental governance*





REIMAGINING MIGRANT INTEGRATION THROUGH AI-ENABLED TALENT TRACKING: UNLOCKING HUMAN CAPITAL POTENTIAL FOR SUSTAINABLE ECONOMIES

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Abstract

Objective: With over 123 million displaced people globally, migration represents not only a humanitarian and political challenge but also a significant, yet underutilised, reservoir of human capital. Prevailing narratives frequently frame migrants as a fiscal burden; however, this paper challenges such perspectives by foregrounding migrants' skills, education, and adaptive capabilities as critical assets for host economies. The study aims to reconceptualise migration through a human capital lens by focusing on the systematic assessment, recognition, and mobilisation of migrant talent. It explores how Artificial Intelligence (AI) can first be used to assess and map migrants' existing skills and educational backgrounds, and subsequently support their integration through targeted learning pathways, labour-market matching, and access to both classic and fully digital employment opportunities, thereby contributing to sustainable and regenerative economic systems.

Method: The paper adopts a conceptual and interdisciplinary approach grounded in human capital theory. It synthesises literature on migration, sustainability, labour market integration, and digital education, with a focus on the feasibility of creating a database of people, their skills, training, and talent. A dialogic framework is employed to explore a two-stage model: (1) AI-enabled assessment and profiling of migrants' existing human capital, including formal education, informal skills, and professional experience; and (2) the development of AI-powered job-matching based on multiple criteria, including suitability for remote and platform-based work. The approach includes the conceptualisation of a dynamic digital talent database, where validated migrant profiles are stored and made accessible, under appropriate governance and ethical safeguards, to employers and recruiters seeking to fill skills shortages across both physical and digital labour markets. The migrants could potentially check the profile of employers and elements such as staff satisfaction before engaging in a conversation.

Results: The analysis identifies that a key inefficiency in current migration systems lies in the absence of structured mechanisms to assess and make visible migrants' existing human capital. As a result, valuable skills remain unrecognised and underutilised. The proposed model demonstrates that AI-enabled assessment tools can systematically capture, translate, and



validate migrants' qualifications and competencies across different national and institutional contexts. This data can feed into a secure and standardised talent database, effectively creating a pool of visible, searchable, and job-ready candidates for employers. Importantly, the inclusion of fully digital job pathways reduces geographical and regulatory constraints, enabling migrants to access employment opportunities regardless of immediate physical integration into local labour markets. This dual approach, assessment and activation, enhances labour market matching, increases productivity, and expands access to global digital work. It also supports migrants' self-sufficiency and accelerates their economic integration, while offering employers access to a previously untapped and diverse talent pool.

Originality: This paper makes an original contribution by introducing a structured, two-step human capital optimisation model for migration: first, the systematic identification and digitisation of migrant skills and education into an accessible talent database; second, the targeted enhancement and deployment of this human capital through AI-enabled job matching across both local and digital labour markets. By explicitly incorporating the growing potential of fully digital work, the study extends traditional integration frameworks beyond geographically bounded employment systems. It reframes migration as a problem of information and coordination failure rather than resource scarcity, positioning AI as a critical enabler of more efficient and globally connected human capital allocation. The approach aligns with responsible management education and sustainability principles by reducing human capital waste, fostering inclusive labour markets, and supporting long-term economic resilience and the creation of shared value.

Keywords: human capital, migration, artificial intelligence, sustainability, job matching, labour market integration, talent database, digital work

Funding: This work was supported by the University of East London.



PRELIMINARY STUDY ON THE ROLE OF MUNICIPALITIES IN ENTREPRENEURSHIP

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Abstract

This paper focuses on the role of local governments in providing stable, long-term support for entrepreneurs. The study goes beyond the traditional understanding of municipalities' roles as public procurers or tax aid providers and analyses entrepreneurship through the three dominant perspectives in entrepreneurial theories, offering a distinctive approach that encourages reflection. The study investigates entrepreneurial identity and other fundamental concepts through comprehensive research involving 61 entrepreneurs operating in Poland. The Friedman test was performed and was statistically significant. Therefore, post-hoc analyses were performed using the Dunn-Sidak test. The null hypothesis was rejected, while the alternative hypothesis was confirmed. The findings reveal that entrepreneurs perceive their identity through the prism of creating needs and resources. They primarily expect municipalities to establish an environment grounded in ethical values, and they collect and share reliable information that facilitates the development of economic ventures. The municipality's role in network building creates an environment conducive to entrepreneurship. These findings demonstrate the importance of contextualising entrepreneurial identities within municipalities' roles in entrepreneur development.

Keywords: entrepreneurship, local governments, network building



DIGITALIZATION OF THE LABOR MARKET. THE DIGITAL NOMAD - A RISK OR AN OPPORTUNITY FOR THE COUNTRY OF ORIGIN

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Abstract

Labour migration has long constituted a chronic challenge for less developed countries, as disparities in economic and professional opportunities- including earnings, working conditions, career prospects, quality of life, and remittance potential - have remained the most enduring driver over the past three decades. The digitalization of the labour market has facilitated remote work, while the COVID-19 pandemic transformed digital nomadism from an exception, confined to a niche segment of professions and workforce categories, into an emerging mobility model that has expanded across a much broader range of occupations and employment sectors.

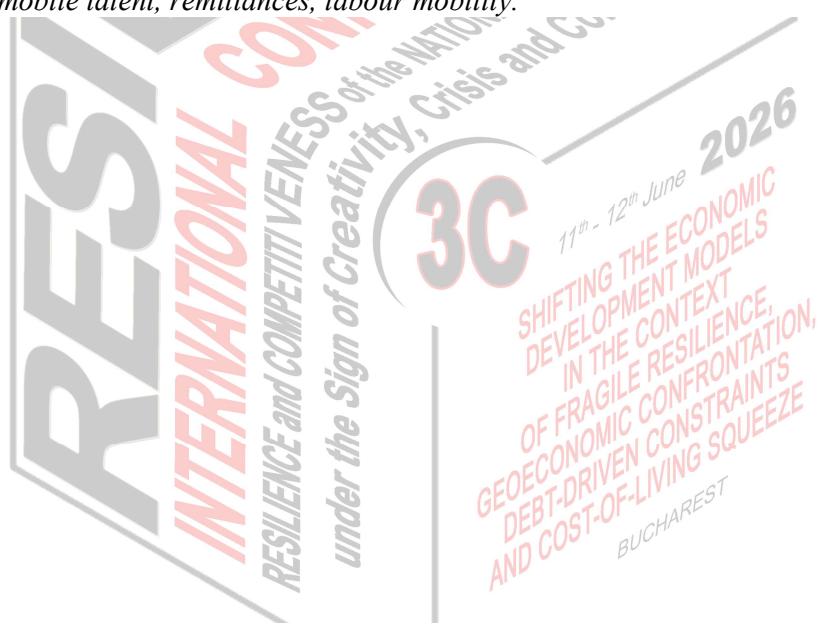
Furthermore, traditional forms of international labour mobility are no longer the primary option for Millennials and Generation Z, as digital nomadism has increasingly become a mainstream mobility strategy. The existing body of research on this topic remains limited and has focused predominantly on social dimensions, with more recent studies addressing legal developments. The present paper aims to identify, from an economic perspective, both the risks associated with labour markets and the externalities generated for households and local development in the country of origin. The paper begins with an analysis of reports on the dynamics of digital nomadism, highlighting, from an economic perspective, the main individual opportunities as well as the risks posed to labour markets and business performance in the country of origin. Drawing on statistics on return migration, the opportunities created by the digitalization of work, and government initiatives aimed at attracting this mobile population—such as digital nomad visas, residency pathways, and tailored tax regimes—the study outlines the typology of externalities associated with digital nomadism in general and those affecting countries of origin in particular. Romania is presented as a case study to illustrate these risks and externalities. Current statistics identify Romania as a major exporter of labour,



particularly among university graduates, while return migration remains modest and has been declining since 2023. At the same time, the country exhibits a high propensity for remote work and employment in digitally enabled occupations. Furthermore, through its current visa framework and fiscal incentives, Romania has positioned itself as a facilitator of the development of flexible hubs for digital nomads at the European level. Qualitative research conducted among final-year undergraduate and master's students from five major universities in Romania reveals a pragmatic approach to career choice and a strong preference for forms of employment associated with digitally enabled occupations. Moreover, digital nomadism emerges as an increasingly attractive mobility option, with respondents indicating a growing willingness to pursue this form of work and lifestyle.

Finally, the paper proposes policy recommendations for the management of emerging forms of labour mobility, with particular emphasis on the smart governance of digital nomadism. As a category of workers characterized by high spending power and low dependency on public services, digital nomads represent a strategic resource whose potential benefits for both origin and destination countries require carefully designed policy interventions.

Keywords: digital nomadism, digital nomads, digital nomad visas, labour market, externalities, mobile talent, remittances, labour mobility.





MULTIPLE ECONOMIC DEPENDENCIES IN THE ERA OF DEGLOBALIZATION

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Abstract

Globalization and trade openness can act in both ways, regarding energy diversification and renewable energy expansion. First, it can create the premises and a favourable context for technological development, which supposedly promotes the development and transfer of green technologies, green investments, increased energy efficiency, and renewables. On the other hand, free trade can increase the dependence of countries with limited access to energy sources or limited renewable generation potential on fossil fuels, thereby increasing carbon emissions and creating energy security risks. More recently however, slowbalization and even some deglobalizing catalysed by trade wars and trade constraints push national economies to enhance their ability to provide resources, including energy, to support social and economic welfare. National economies remain highly sensitive to market disruptions and strategic resources limitations, such as energy, seeking new options and opportunities to decouple from the global markets uncertainties and reduce their dependency. For the energy sector these efforts translate into energy diversification and green transition.

Nations are seeking strategies to leverage their advantages and moderate their weaknesses. This research evaluates the relationship between energy-related features and economic growth in a complex context, describing dependency on foreign markets. Furthermore, the study discusses the effects of a selection of variables describing the green transition (energy import dependency, energy diversification, and the share of renewable energy) on economic growth. The data covers the period between 1995 and 2024 for 25 European countries. The study uses Cross-Sectionally Augmented ARD (CS-ARDL) for the main empirical analysis and Augmented Mean Group (AMG) to check the robustness of the main results. Furthermore, the Method of Moments Quantile Regression (MMQR) is employed to capture the impact more precisely across various stages of countries' development.

The findings fill a gap in understanding how European economies resiliently cope with deglobalization and adjust their energy-economy systems to maintain economic and social welfare unaltered. As reflected in the main results, expanding the role of renewable energy sources in total consumption, as part of diversification efforts, is significant to the overall picture.

Keywords: green transition, economic growth, European countries



SESSION 1: UNLOCKING GROWTH THROUGH RESEARCH FOR SUSTAINABLE DEVELOPMENT

FROM FRAGILE RESILIENCE TO REGENERATIVE ECONOMIES: A CIVIL SOCIETY MODEL FOR RURAL REGENERATION, ECONOMIC DIVERSIFICATION, AND COST-OF-LIVING RESILIENCE IN MEDITERRANEAN ISLAND COMMUNITIES

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Abstract

Mediterranean island economies present a complex and internally differentiated picture that resists uniform diagnosis. High-profile tourism destinations — from the Ionian and Aegean islands of Greece to Malta and Sardinia — have experienced sustained private investment growth, rising luxury hospitality revenues, and expanding real estate markets even through periods of national fiscal austerity. Yet this surface prosperity conceals a structural bifurcation: between a high-value, privately-capitalised tourism and real estate economy insulated from macro-fiscal pressures, and the broader rural hinterland economy — characterised by agricultural decline, seasonal labour precarity, youth outmigration, and limited access to skills formation — which has not shared in this prosperity and remains acutely exposed to cost-of-living pressures, geoeconomic supply chain disruptions, and debt-constrained public investment. This paper argues that addressing the resilience deficit of Mediterranean island rural economies requires not a single development model, but a deliberate strategy for activating the latent productive potential of rural communities through integrated cultural, ecological, and entrepreneurial development — financed primarily through blended private and philanthropic capital, with EU funding instruments as complementary co-investment mechanisms rather than primary drivers. Drawing on the CorfuGen initiative in Corfu, Ionian Islands, implemented by CulturePolis CSO, the paper demonstrates how a multi-pillar regenerative development model can shift local economic trajectories toward diversification, year-round employment, and genuine competitiveness within the structural constraints of the current era.

Keywords: *economic resilience, rural regeneration, cost-of-living squeeze, geoeconomic fragmentation, Mediterranean island economies, dual-track development, creative economy, blended finance, civil society organisations, debt-constrained development.*



THE ROLE OF SMART CITY ORIENTED TOWARD THE SUSTAINABLE DEVELOPMENT OF COMMUNITY

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Abstract

Objective: The Sustainable Development Goal - Sustainable Cities and Communities, within the 2030 Sustainable Development Agenda (SDG), directly targets local public authorities, responsible for the management and development of communities. By having administrative and decision-making powers, as well as by developing and implementing transparent strategic plans, they can ensure sustainable and balanced development of local communities. Sustainable Cities and Communities, part of the ADD 2030, which also includes the concept of smart cities, is directly aimed at local public authorities. Developing transparent elaboration plans by applying one's own skills and abilities could ensure sustainable evolution of local communities.

Method: The authors used a set of scientific research methods, applied at both the theoretical and empirical levels. Among the general research methods used are the analysis and synthesis of selected information. The empirical research included the comparative method, and at the theoretical level the logical method was applied, used to interpret and substantiate the conclusions.

Results: The purpose of the study is to highlight the importance of smart cities with the application of digital technologies, creating modern and functional infrastructures, economic platforms for citizen entrepreneurs (the economically active population), etc., aimed at involving the community in activities relevant to the regions of the Republic of Moldova.

Originality: The study proposes to identify existing support mechanisms obtained through partnerships with the application of pillars that strengthen dialogue and cooperation between central public authorities, local public authorities, citizens and entrepreneurs, partners from the European Union in order to consolidate a sustainable regional ecosystem.

Keywords: ecosystem, smart city, local community, sustainability, community development, sustainable development.



THE IMPACT OF RENEWABLE ENERGY CONSUMPTION AND ENVIRONMENTAL SUSTAINABILITY ON ECONOMIC GROWTH: AN ECONOMETRIC ANALYSIS IN EUROPEAN COUNTRIES

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Abstract

Objective: This study examines the relationship between renewable energy consumption, environmental sustainability, and economic growth within European countries, placing the analysis within the broader context of global efforts toward sustainable development and climate change mitigation. As economies increasingly transition from fossil fuels to cleaner energy sources, understanding how renewable energy influences economic performance has become a central issue for policymakers and researchers. The main objective of this paper is to empirically assess whether renewable energy consumption and environmental sustainability indicators contribute positively to economic growth, and to identify the extent to which these factors shape long-term economic development across European economies during the period 2008–2022.

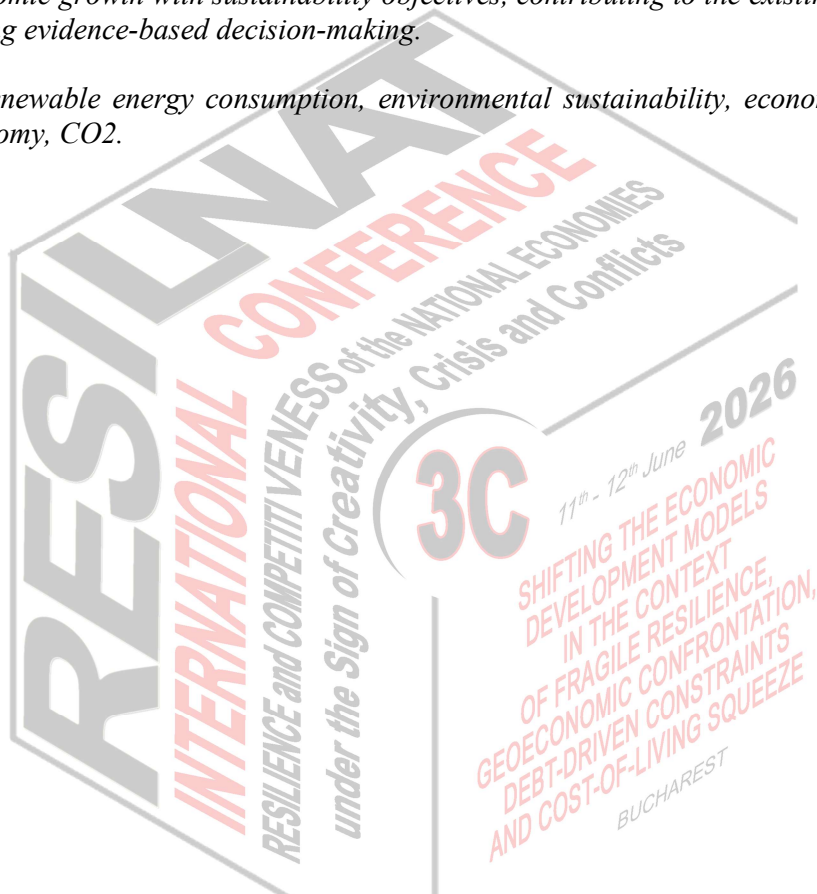
Method: The study adopts a quantitative research approach based on secondary data obtained from international databases such as the World Bank and Eurostat. A balanced panel dataset covering multiple European countries over a 15-year period (2008–2022) is constructed. Econometric techniques, including panel regression analysis, are employed to estimate the relationship between the dependent variable (economic growth, measured by GDP) and independent variables such as renewable energy consumption, CO₂ emissions, access to electricity, and other environmental sustainability indicators. Various diagnostic tests are conducted to ensure the robustness and reliability of the model, including tests for multicollinearity, heteroskedasticity, and autocorrelation. Fixed effects and random effects models are considered, with the appropriate specification selected based on standard statistical criteria.

Results: The empirical findings reveal a strong and statistically significant positive relationship between renewable energy consumption and economic growth in European countries. Increased use of renewable energy sources is associated with higher GDP growth, reflecting the role of clean energy in fostering innovation, improving energy efficiency, and reducing dependency on fossil fuels. Environmental sustainability indicators also demonstrate a positive contribution to economic performance, suggesting that environmentally responsible policies and practices can coexist with and even enhance economic development. In contrast, CO₂ emissions are found to have a negative and statistically significant impact on economic growth, indicating that environmental degradation can hinder long-term economic progress. The variable representing access to electricity is not statistically significant, likely due to the already high and relatively uniform levels of electrification across European countries. Overall, the results support the hypothesis that transitioning toward renewable energy and sustainable environmental practices contributes positively to economic growth.



Originality: *The originality of this study lies in its comprehensive and integrative approach to analyzing the joint impact of renewable energy consumption and environmental sustainability on economic growth within a European context. Unlike many previous studies that focus on a limited number of variables or a narrower geographical scope, this research combines multiple environmental and energy-related indicators within a unified econometric framework over an extended time period. Additionally, the study provides updated empirical evidence covering recent years, capturing the effects of ongoing energy transitions and policy changes in Europe. By highlighting both the economic benefits of renewable energy and the detrimental effects of environmental degradation, the study offers valuable insights for policymakers seeking to balance economic growth with sustainability objectives, contributing to the existing literature and supporting evidence-based decision-making.*

Keywords: *renewable energy consumption, environmental sustainability, economic growth, circular economy, CO2.*





IMPROVING OPERATIONAL EFFICIENCY THROUGH SUSTAINABLE MANAGEMENT PRACTICES

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Abstract

This study explores the integration of operational management and sustainable development, with a particular focus on how sustainability-oriented practices can enhance business efficiency and contribute to regional economic development in Georgia. In the context of increasing global environmental and economic challenges, the alignment of operational strategies with sustainability principles has become a critical factor for long-term competitiveness and resilience.

The research adopts a mixed-methods approach, combining quantitative survey data with qualitative insights derived from case-based analysis across selected regions of Georgia. The study examines the extent to which businesses incorporate sustainable technologies and practices - such as energy efficiency, resource optimization, and environmentally responsible processes - into their operational activities.

The findings reveal that, despite a growing awareness of sustainable development, the actual implementation of green technologies remains limited. Key barriers include financial constraints, insufficient access to knowledge, and limited institutional support. At the same time, the results highlight significant untapped potential: the adoption of sustainable operational practices can reduce costs, improve resource efficiency, and strengthen competitive positioning.

Importantly, the study emphasizes the role of region-specific and sector-sensitive approaches. The effectiveness of sustainable integration is significantly enhanced when strategies are adapted to local economic structures and environmental conditions. The research also identifies the need for targeted policy interventions, including financial incentives, capacity-building initiatives, and knowledge-sharing platforms to facilitate broader adoption.

The paper contributes to the literature by demonstrating that the integration of sustainable development principles into operational management is not only environmentally necessary but also economically beneficial. It provides practical and policy-relevant insights for fostering a balanced approach to economic growth, environmental sustainability, and social well-being at the regional level through improving operational efficiency.

Keywords: *operational management, sustainable development, green technologies, business efficiency, resource optimization*



DETERMINANTS OF ENTREPRENEURIAL INITIATIVE IN ROMANIA: A COUNTY-LEVEL ANALYSIS

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Abstract

Objective: Due to its transformative nature, entrepreneurship serves as an effective instrument to transcend systemic socioeconomic constraints and to alleviate poverty. Although entrepreneurship is widely recognised as a key driver of economic growth, its complexity means that it is difficult to empirically validate any single explanatory theory. The analysis of entrepreneurial initiative requires a multidimensional perspective, one that accounts for the diversity of economic contexts and the need for a tailored approach across regions. Therefore, it is essential to identify the conditions that favour success and test combinations of factors that are sufficient and necessary for it. The purpose of this paper is to analyse from a territorial perspective, at the level of counties in Romania, the factors that contribute to the creation of new firms, with a focus on economic and social determinants.

Method: To this end, a comprehensive database was developed, comprising a wide range of economic and social indicators relevant to entrepreneurial activity at the county level in Romania during the 2008–2023 period. The selected variables include gross domestic product, unemployment rate, average age, research and development personnel, and the number of university graduates, all considered significant determinants of new business formation in the specialized literature. Furthermore, specific spatial analysis methods were employed in order to capture the territorial disparities and interregional interactions that characterize the entrepreneurial environment. These techniques enable the identification of spatial dependencies, spillover effects, and regional clusters that cannot be adequately revealed through classical econometric approaches. By incorporating the spatial dimension into the analysis, the study provides a more comprehensive understanding of the factors influencing entrepreneurial initiative and highlights the importance of regional context in shaping business creation dynamics.

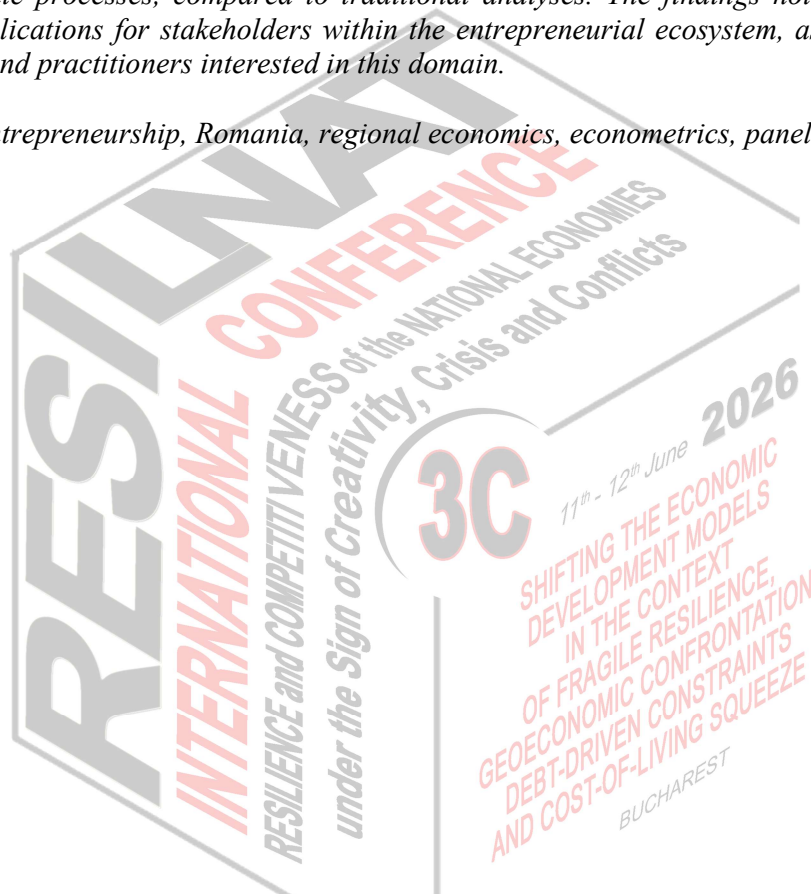
Results: The results obtained from the econometric models indicate statistically significant spatial effects. Furthermore, the spatial econometric models indicate a significant temporal persistence in firm creation; specifically, the emergence of new enterprises within a county is positively correlated with the previous year's entrepreneurial activity. This result underscores



the importance of path dependency and a stable economic environment in sustaining entrepreneurial initiatives. At the same time, new firm formation displays a negative time-lagged spatial dependence, suggesting that enterprise creation in a given county is adversely affected by the volume of new firms established in neighbouring counties during the previous period. This result highlights a strong competitive pressure between neighbouring counties for resources. These findings emphasize the need for regional policies aimed at supporting entrepreneurial development.

Originality: *The research uses advanced spatial methods that incorporate spatial interactions between neighbouring regions, thus providing a better and more complex image of territorial socio-economic processes, compared to traditional analyses. The findings hold significant practical implications for stakeholders within the entrepreneurial ecosystem, as well as for researchers and practitioners interested in this domain.*

Keywords: *entrepreneurship, Romania, regional economics, econometrics, panel data*





THE RESOURCE PARADOX IN ROMANIA: BETWEEN NATURAL POTENTIAL AND STRUCTURAL TRADE DEFICIT

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Abstract

Romania's endowment with natural resources — comprising extensive forested areas, fertile agricultural land and a historically significant chemical industrial base — stands in marked contrast with the country's persistent structural trade deficit. This paper investigates the mechanisms through which a resource-rich economy continues to generate negative trade balances, directing attention to three sectors that collectively account for approximately one third of total Romanian exports in 2024: the wood industry, the agri-food sector and the chemical industry. The central argument advanced is that Romania's trade vulnerabilities do not originate primarily in external competitive pressures, but rather in a systematic misalignment between the exploitation of domestic natural endowments, industrial processing capacity and sustainability governance.

The empirical foundation of this research draws on international trade statistics sourced from national and European institutional databases covering the period 2008–2024, complemented by policy documents, sustainability assessments and scholarly literature on circular economy frameworks and industrial transition. The analytical methodology integrates quantitative trade performance indicators with qualitative evaluation of regulatory and governance dimensions, allowing for a multi-sectoral reading of Romania's economic structural weaknesses.

In the forestry sector, the predominance of raw and semi-processed timber in the export structure constitutes a form of chronic under-utilization of economic potential. The outflow of unprocessed wood generates foregone value addition domestically, contributes to employment contraction in downstream manufacturing and compounds environmental pressures arising from inadequate reforestation enforcement. A structural reorientation toward higher-order processing stages, supported by coordinated investment in sustainable forest management, remains largely unrealized.

The agri-food sector presents a similarly diagnostic pattern. Despite Romania's significant agricultural land area and favourable climatic conditions, the food processing industry remains underdeveloped relative to the country's raw production capacity. The consequence is a structural asymmetry: primary agricultural commodities flow outward while manufactured food products are imported, creating exposure to international price volatility and supply chain instability. Underlying this configuration are structural obstacles including land fragmentation, deteriorated rural infrastructure and the limited integration of sustainability criteria into agricultural policy instruments.



The chemical industry illustrates a different, though related, dimension of the same problem - deindustrialization and the erosion of previously existing production capacity. Rising energy input costs have contributed to the decline of domestic fertilizer and plastics manufacturing, shifting Romania from a net producer to a net importer of categories it once supplied internally. This transition represents not only a deterioration in trade balances but also a contraction of technological and innovation capacity. The slow adoption of clean chemical processes and circular economy principles further compounds this structural regression.

Taken together, the three sectors examined reveal a coherent pattern: the absence of an integrated framework linking trade policy, industrial modernization and resource sustainability produces cumulative losses across economic, ecological and strategic dimensions. Value addition migrates abroad, ecological costs are internalized domestically, and the national economy becomes progressively more dependent on external supply chains for goods that could be produced domestically with appropriate institutional and investment conditions.

The paper contributes to existing literature by departing from conventional trade analysis centred on exchange rate dynamics, labour cost differentials or market access barriers, and instead situating Romania's trade imbalances within a framework that accounts for policy coherence and ecological governance. This reframing shifts the diagnostic emphasis from external factors to internal structural deficiencies, and correspondingly reorients policy recommendations.

The prescriptive dimension of the study focuses on green industrialization strategies, investment in processing infrastructure and the operationalization of circular economy principles across the three sectors examined. These recommendations are situated within the broader architecture of the European Green Deal and aligned with international sustainability commitments, offering Romania a trajectory toward export structures with higher embedded value and reduced ecological footprint. The conclusion reached is that sustainable trade policy is not merely an environmental consideration but a prerequisite for long-term economic sovereignty, structural resilience and the effective conversion of natural resource endowments into durable economic advantage.

Keywords: *foreign trade; sustainable trade; natural resource management; circular economy; trade deficit*



BALANCING TOURISM DEVELOPMENT AND SUSTAINABILITY: A MODEL-BASED APPROACH TO CLIMATE-RESILIENT REGIONAL PLANNING IN GEORGIA

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Abstract

This study investigates how sustainable economic development principles can be integrated into regional planning in Georgia, with a focus on the challenges posed by tourism-related construction. Guided by the “People, Planet, Profit” framework, the research examines the interplay between natural, human, and economic capital to identify spatial development strategies that support climate-resilient growth.

The study draws on international best practices, including Austria’s and Poland’s national spatial development concepts, to identify components of sustainable economic development applicable to Georgia. Using a set of context-specific indicators linked to policy priorities, the research develops land use models to simulate alternative development scenarios. Tools employed include the Land Use Scanner, shared socioeconomic pathways (SSPs), bottom-up optimization models, and applied analysis in GAMS, enabling quantitative evaluation of policy impacts on environmental, economic, and social outcomes.

The Bakuriani ski resort serves as a case study, illustrating the trade-offs of high-rise and large-scale construction for green tourism. The analysis shows that poorly planned tourism infrastructure can undermine sustainability goals, highlighting the importance of policy-guided, climate-resilient development.

The study produces a scientifically grounded methodology for optimizing land use in Georgia, offering actionable strategies to integrate sustainability into regional policy, enhance resilience, and support balanced territorial development.

This research was supported by the Shota Rustaveli National Science Foundation of Georgia (SRNSFG) [grant number: YS-24-308].

Keywords: *sustainable regional planning, land use modeling, climate-resilient development, green tourism, regional policy*



SOCIOECONOMIC DETERMINANTS OF AI READINESS IN EASTERN EUROPE: PANEL EVIDENCE FROM EU AND NON-EU ECONOMIES

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Abstract

Purpose: This study investigates the macroeconomic foundations of government AI readiness across Eastern Europe and asks whether those foundations work differently inside the European Union than outside it — a policy-relevant question in a region marked by wide income gaps, uneven digital infrastructure and high cross-border labour mobility.

Data and methods: We assemble a balanced panel of nine Eastern European economies for the years 2019 through 2024, pairing six EU members — Czechia, Poland, Hungary, Romania, Bulgaria and Slovakia — with three post-Soviet economies outside the Union, namely Russia, Belarus and Moldova; the latter three are rarely included in comparative work on AI readiness. AI readiness is captured by the annual score on the Oxford Insights Government AI Readiness Index. Three covariates enter the model: the log of per-capita GDP (UNCTAD), the unemployment rate (ILOSTAT) and an education index from the World Population Review, the last entered with a two-year lag. We then fit pooled, fixed-effects and random-effects specifications, choosing among them on the basis of the poolability F-test, the Hausman test and the gap between within- and between-country R^2 . Each specification is run on the full nine-country sample and again on the six EU members.

Findings: Log per-capita GDP enters with a positive and highly significant coefficient in both samples ($\beta \approx 9.7$ in the full sample and $\beta \approx 11.1$ within the EU), pointing to economic development as the dominant structural driver. The fixed-effects specification explains about 18% of within-country variation in AI readiness, while between-country variation accounts for the bulk of the cross-sectional pattern; this is consistent with a process in which AI readiness is still shaped primarily by long-running differences in income and institutional capacity rather than by short-term changes within countries. Unemployment is essentially zero in the full sample but turns negative and significant once the analysis is restricted to EU members ($\beta \approx -1.28$, $p < 0.05$), indicating a labour-market channel that operates only within the more institutionally homogeneous Union group. The lagged education index does not reach significance in either model; its sign is positive in the full sample and counterintuitively negative in the EU subsample, with standard errors too large to permit firm conclusions. The Hausman test fails to reject random effects, but its power is low in such a small sample, and the divergence in R^2 decompositions across estimators argues for the fixed-effects specification, which is therefore retained as the preferred model.



Originality / Value: *The contribution is threefold. The analysis brings longitudinal panel evidence to a debate still dominated by single-year snapshots of the Index, allowing within-country dynamics to be separated from between-country structural differences; it widens the comparative frame across the EU border to include three post-Soviet non-EU economies — Russia, Belarus and Moldova — that share geographical, historical and economic proximity with the EU's eastern members but are typically excluded from comparative analyses; and it isolates the explanatory role of broad macroeconomic conditions — income, labour-market slack and human capital — alongside the existing focus on innovation systems, brain drain and talent. The methodology provides a parsimonious specification against which more elaborate models with additional controls can be benchmarked in future work.*

Practical implications: *Economic development is the most robust structural driver of AI readiness in the region. The stronger labour-market effect inside the EU is consistent with the additional pull of institutional alignment, coordinated digital policy and EU-level support mechanisms. These coordination mechanisms appear to translate macroeconomic conditions into AI readiness more efficiently than national policy acting alone. Lifting AI readiness across Eastern Europe therefore calls for parallel progress on economic development, labour-market performance and digital governance, with particular attention to integration and partnership channels for the non-EU economies. Because human-capital effects appear to materialise only with long lags and through channels not fully captured by an aggregate education index, future policy evaluation should rely on more particular measures such as tertiary STEM enrolment, ICT specialist density and digital-literacy indicators.*

Keywords: *artificial intelligence (AI), AI readiness index, education, Eastern Europe, unemployment*





IMPLEMENTATION OF SUSTAINABLE FINANCING IN THE REPUBLIC OF MOLDOVA: INSTITUTIONAL PARTICULARITIES, STRUCTURAL CONSTRAINTS AND PROSPECTS FOR HARMONIZATION TO EUROPEAN STANDARDS

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Abstract

In the context of accelerating climate change, increasing pressure on natural resources, and the urgent need to reduce greenhouse gas emissions, the role of the financial system has evolved beyond traditional intermediation toward actively supporting the transition to a sustainable economy. The shift toward low-carbon and resource-efficient development models is no longer a purely policy-driven objective, but a structural transformation in which financial institutions play a pivotal role in directing capital toward environmentally and socially responsible investments. Within this framework, green lending has emerged as a key financial instrument designed to support investments in areas such as energy efficiency, renewable energy, and sustainable infrastructure. Existing literature highlights that the integration of ESG factors into lending practices contributes not only to environmental objectives but also to risk management and long-term financial stability. Nevertheless, the development of green lending remains uneven across countries, largely depending on the maturity of regulatory frameworks, institutional capacity, and financial market development. At the international level, significant progress has been made through the establishment of sustainable finance frameworks, including green taxonomies, disclosure standards, and mechanisms for integrating climate-related risks into the financial system. International financial institutions have also played a crucial role in promoting green lending, particularly in emerging economies. Despite these advancements, the literature identifies several persistent challenges, including the lack of standardized reporting, difficulties in measuring environmental impact, and institutional constraints at the national level.

The relevance of this topic is particularly pronounced for the Republic of Moldova, a small open transition economy characterized by high import dependence, elevated energy intensity, and increased exposure to climate-related risks. At the same time, the country's development trajectory has been significantly influenced by its European Union candidate status, granted in 2022, which has accelerated the alignment of national policies with European sustainability and climate objectives. Strategic documents such as the National Development Strategy "European Moldova 2030", the Reform and Growth Agenda (2025-2027), and the Law on Climate Action establish ambitious targets related to decarbonization, energy efficiency, and



sustainable growth. However, achieving these objectives requires substantial financial resources that cannot be met solely through public budgets, highlighting the importance of mobilizing private capital through the banking sector.

Despite the growing policy emphasis on sustainability, a persistent gap remains between macro-level strategic objectives and micro-level access to finance for households and enterprises. Micro, small, and medium-sized enterprises (MSMEs), as well as households, often face financial, informational, and institutional barriers that limit their ability to invest in energy efficiency, renewable energy, and sustainable infrastructure. In this regard, green lending represents a critical mechanism for translating national and international sustainability commitments into tangible investments with measurable environmental and socio-economic benefits. Understanding the determinants, constraints, and institutional conditions shaping green lending development is therefore of both theoretical and practical importance.

The purpose of this research is to analyse green lending as a financial mechanism for channelling capital toward sustainable activities and to assess its potential to support economic transition in the Republic of Moldova.

In order to achieve this purpose, the research pursues the following **objectives**:

- to evaluate the economic, environmental, and financial context influencing the development of green lending in the Republic of Moldova;
- to analyse the current status and dynamics of green lending in the Moldovan banking sector;
- to identify the main barriers and determinants affecting the development of green lending at the national level;
- to formulate practical recommendations aimed at strengthening green lending as an instrument of sustainable economic transition in the Republic of Moldova.

To achieve these objectives, the study adopts a mixed **methodological approach**, combining qualitative and quantitative methods. The research methodology includes descriptive and comparative analysis, graphic representation, classification, analysis and synthesis. The literature review was based on a diverse bibliographic source, including legislative and regulatory documents, academic literature, annual reports and institutional documents, scientific papers and articles from specialized publications, as well as reports of international financial institutions.

The scientific originality of the research consists in the integrated analysis of green lending through the lens of ESG determinants in the specific context of a transition economy with high climate and energy vulnerabilities. The study contributes by linking macro-level sustainability policies with micro-level financial mechanisms, emphasizing the role of banks as transmission channels for sustainable development objectives. The findings provide policy-relevant insights applicable to both regulators and financial institutions operating in similar economic environments.

Keywords: sustainable development, sustainable finance, green lending, ESG factors, CO₂ emissions, GHG, banking sector, IFIs, energy efficiency, renewable energy.

Funding

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OPTIMAL MODELS OF GDP STRUCTURE FOR SUSTAINABLE DEVELOPMENT: A COMPARATIVE ANALYSIS BETWEEN THE REPUBLIC OF MOLDOVA AND ROMANIA

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Abstract

Objective: Effective access to regional value chains and ensuring competitiveness on the European Single Market require, among other things, alignment of the Republic of Moldova's economic structure with the scales and dimensions practiced in the EU. This paper focuses on a comparative analysis of the structure of gross domestic product (GDP) in the Republic of Moldova and Romania across the three approaches to measuring the aggregate macroeconomic indicator: production (output/value added), distribution (income and redistribution), and final consumption (expenditure). The issues addressed in this article are dedicated to the exercise of identifying optimal structural models that support sustainable development.

Method: To ensure data comparability between the two states analyzed, the study covers the most recent 10-year period (2011–2024) and uses official data from the institutions responsible for official statistics (the National Bank of Moldova and the National Institute of Statistics of Romania), aggregated at NACE rev.2 classification levels (1/2). The study aims (i) to compare the GDP structure obtained by the three approaches in each country, (ii) to diagnose sectors that sustain economic growth versus vulnerable or low-productivity sectors, and (iii) to identify optimal structural models and policy packages to reconfigure the economies toward higher value-added growth. The methodological approach combines descriptive analyses, methodological reconciliations and decomposition techniques to isolate sectoral contributions to GDP dynamics and differences arising from measurement methods. To assess sustainability dimensions, we construct derived indicators such as: sectoral contributions to value added (GDP) associated with productivity per employee; the shares of distribution and redistribution elements alongside those of final consumption; and social inclusion instruments (median wages and employment). Based on these indicators, we assemble a “structural efficiency index” that combines productivity and social impact, providing a practical instrument to monitor structural progress over time.

Results: The study's results reveal significant differences between the two countries across the three GDP measurement methods. While Romania displays a more diversified economic structure, with a relatively large share of manufacturing and services, the Republic of Moldova remains more dependent on agriculture and low-productivity branches, although it shows emerging digital services sectors with growth potential. Based on the performed diagnosis, several indicative optimal development models can be elaborated.

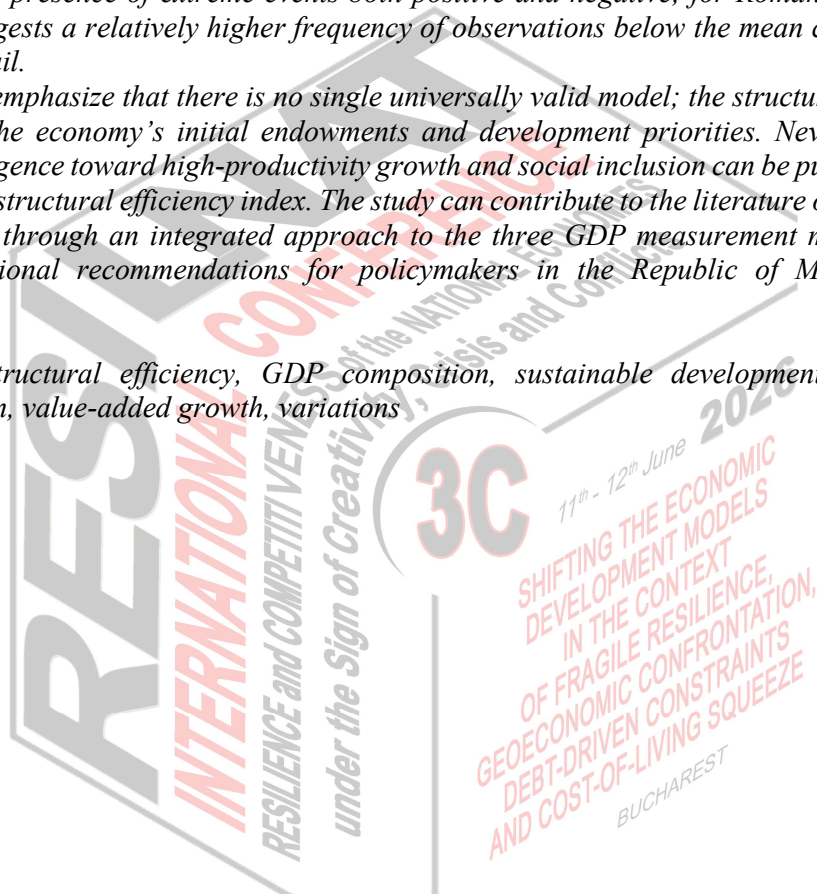
The study's general findings indicate structural and macroeconomic behavioral differences between the Republic of Moldova and Romania. Over the reference period, Romania recorded a slightly higher average annual GDP growth rate than Moldova, and this growth was



substantially more stable: observed dispersion (standard deviation and variance) is notably lower and the confidence interval for the mean is narrow, signaling more precise and predictable aggregate performance estimates. This stability suggests a more diversified economic structure and the presence of mechanisms (possibly institutional as well) that cushion shocks. In contrast, the Republic of Moldova exhibits a much more volatile dynamic: variation amplitudes are larger, with pronounced peaks and troughs. This situation reflects a combination of possible factors — sectoral exposure, vulnerability to external and internal shocks, and limitations in macro-structural stabilization capacity. The distribution of Moldova's data is approximately symmetric in terms of skewness but shows moderate kurtosis, indicating the presence of extreme events both positive and negative; for Romania, negative skewness suggests a relatively higher frequency of observations below the mean compared to the positive tail.

Conclusions emphasize that there is no single universally valid model; the structural optimum depends on the economy's initial endowments and development priorities. Nevertheless, a policy convergence toward high-productivity growth and social inclusion can be pursued using the proposed structural efficiency index. The study can contribute to the literature on economic restructuring through an integrated approach to the three GDP measurement methods and offers operational recommendations for policymakers in the Republic of Moldova and Romania.

Keywords: structural efficiency, GDP composition, sustainable development, economic diversification, value-added growth, variations





PUBLIC ADMINISTRATION SUSTAINABLE DEVELOPMENT IN ALBANIA

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Abstract

This paper discusses the impact of artificial intelligence (AI) on society and the workplace, focusing on changes in communication and decision-making. It highlights both benefits, like increased efficiency and innovation, and challenges, such as job displacement and ethical concerns. The article advocates for a balanced approach to AI integration, stressing the need for policies that safeguard workers while promoting technological progress.

The analysis focuses on the potential advantages of AI, including better problem-solving skills, more efficiency, and improved information availability. The rapid advancement of digital technologies has significantly altered government interactions in Albania, leading to the emergence of smart governance. This concept integrates information and communication technologies (ICTs), data-driven decision-making, and digital public services, improving transparency, accountability, and citizen participation. Albania's digital transformation prioritizes modernizing public services and aligning practices with EU standards, exemplified by e-government platforms and digital identification systems that enhance accessibility and efficiency. However, reliance on digital solutions raises concerns over privacy and cybersecurity, necessitating robust frameworks to protect data and public trust. This study explores smart governance's impact on economic development and challenges in integrating privacy and cybersecurity, aiming to enhance Albania's digital governance ecosystem with evidence-based recommendations for sustainable, citizen-centered governance models.

The study also explores the possible drawbacks that artificial intelligence may present in the workplace. Topics like automation bias, job displacement, and the need for reskilling are examined. It emphasizes how crucial it is to address ethical issues in AI development, such as responsibility and transparency.

The paper ends with a recommendation for a systematic approach to AI integration. It highlights the need for proactive measures to reduce any risks while utilizing AI's potential to advance society and create a more flexible work environment.

Keywords: public administration, sustainable development, smart governance, e-Albania, institutional law



FISCAL SUSTAINABILITY IN AN ERA OF MULTIPLE CRISES: A BIBLIOMETRIC INVESTIGATION

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Abstract

Objective: The sustainability of public finances represents a fundamental concern in contemporary economic research, particularly in the context of successive global crises that have affected fiscal stability, public debt dynamics, and governments' capacity to finance essential public policies. Economic recessions, pandemic emergencies, geopolitical tensions, and environmental crises generate significant pressures on public budgets and require complex fiscal responses. In recent decades, the scientific literature addressing these issues has expanded considerably, becoming increasingly interdisciplinary and integrating perspectives from economics, public administration, health policy, environmental studies, and political science. However, despite this growth, the literature remains fragmented across different crisis categories, making it difficult to identify common research patterns and emerging thematic directions. Therefore, the objective of this study is to provide a comparative bibliometric analysis of the relationship between public finances and four major categories of crises: economic crises, pandemic crises, geopolitical crises, and environmental crises. The paper aims to identify the main research trends, influential authors, thematic structures, and collaboration networks that characterize the evolution of the field.

Method: The study employs a bibliometric methodology based on quantitative science-mapping techniques using the Bibliometrix package and the Biblioshiny interface in the R programming environment. The bibliographic data were collected exclusively from the Web of Science database due to its high-quality indexing standards and metadata consistency. Four distinct datasets were constructed by combining the term "public finances" with crisis-specific expressions related to economic, pandemic, geopolitical, and environmental crises. Only articles and book chapters indexed in Web of Science were included, without temporal restrictions, in order to capture the historical evolution of the literature. The retrieved records were subjected to preprocessing procedures, including deduplication, standardization of author names and affiliations, and harmonization of keywords. The analysis integrates several



bibliometric techniques, such as descriptive performance indicators, citation analysis, co-authorship networks, co-word analysis, bibliographic coupling, thematic mapping, and co-citation analysis. In addition, the PRISMA framework was applied to ensure transparency and replicability in the selection and filtering process. Through these methods, the study systematically explores the cognitive and conceptual structure of the scientific literature concerning public finances in crisis contexts.

Results: *The results reveal significant differences in the maturity, thematic structure, and collaboration patterns of the four research domains. The literature on public finances and economic crises represents the most mature and consolidated field, dominated by themes such as public debt, fiscal policy, austerity, and fiscal governance. Research on pandemic crises expanded rapidly after COVID-19 and recorded the highest levels of interdisciplinarity and international collaboration, connecting public finance with health policy and resilience studies. The geopolitical crisis corpus remains fragmented and comparatively underdeveloped, focusing mainly on defense financing, sanctions, energy security, and fiscal resilience. In contrast, the environmental crisis domain demonstrates the highest citation impact and strong interdisciplinary links with green finance, ESG frameworks, climate policy, and sustainable public investment. Overall, the bibliometric analysis highlights the growing diversification of research on public finances in crisis contexts and reveals distinct thematic and intellectual structures for each crisis category.*

Originality: *The originality of this study lies in its comparative bibliometric perspective integrating four major categories of crises within a unified analytical framework centered on public finances. Unlike previous studies that analyze crises separately, this research systematically compares the intellectual evolution, thematic structures, and collaboration dynamics across economic, pandemic, geopolitical, and environmental crises. The study also contributes methodologically by combining multiple science-mapping techniques with a transparent and replicable research design. Furthermore, the paper identifies several emerging research directions, including fiscal resilience, green budgeting, climate-related fiscal risks, and the role of institutional governance in crisis management. By offering a comprehensive overview of the scientific literature at the intersection between public finances and global crises, the study provides valuable insights for both researchers and policymakers interested in sustainable fiscal strategies under conditions of uncertainty.*

Keywords: *public finances, economic crises, pandemic crises, geopolitical crises, environmental crises, bibliometric analysis, fiscal sustainability, Bibliometrix, public debt, green finance*



SESSION 2: FINTECH FOR ECONOMIC RESILIENCE

BANKING THE UNBANKED WITHOUT BANKING THEM: MOBILE FINANCIAL SERVICES (MFS) AS SUBSTITUTE BANKING INFRASTRUCTURE AMONG RURAL USERS IN EMERGING ECONOMIES

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Abstract

Context of the study: Despite decades of expansion within the traditional banking system, financial exclusion remains a problem in emerging economies. World Bank figures show that around 45 per cent of adults in Bangladesh remain unbanked, with geographical distance, documentation and minimum balance requirements among the various factors preventing them from accessing banks. Despite the adoption of Mobile Financial Services (MFS), like bKash, Nagad and Rocket, and the total number of registered MFS accounts in Bangladesh crossed the milestone of 239.3 million in January 2025, with about 42% of these accounts belonging to women, most of them have not established formal credit histories or savings products. As a result, there is a parallel system in which transactions take place digitally, but the users are not visible to the institutional loan. Consequently, financially excluded groups rely on informal credit markets and moneylenders as their other sources of credit, which are typically charged at a monthly effective interest rate of 20–25%. The relevance lies in the fact that financial fragility of households can be correlated with the financial vulnerability of the economy, especially when Bangladesh is on the verge of being a Least Developed Country (LDC) and facing climate shocks. There is a research gap: research so far has not examined the differences in resilience mechanisms between the unbanked-user MFS model and the formal banking system in emerging economies.

Objective: The possibilities of mobile financial services (MFS) to create real economic resilience versus transactional convenience are still significantly under-theorized, even as they are often touted as a means to reaching the unbanked. Given the shortcomings of aggregate measures of adoption, the primary goal of this study is to shift the focus and make a comparative assessment of the resilience impacts on unbanked rural users in Bangladesh, referencing Nigeria, India, Pakistan, Vietnam, and Türkiye. The focus of this paper is the “invisible middle”, people who actively use MFS but do not have formal bank accounts, and



how partial inclusion and different regulatory architectures affects coping capacity of households when facing income shocks.

Methodology: The study is conducted under the qualitative systematic literature review (SLR) approach and secondary data on the selected topics, which are mobile financial services (MFS), financial inclusion and economic resilience of households. Sources used were academic databases and reliable sources from institutions. It compiles information and evidence on the adoption of MFS, regulations and financial shock-response mechanisms in six emerging economies. The analysis is conducted in a deductive way through thematic coding based on the following six phases described by Braun and Clarke: exploring the phenomenon, making sense of the data, organizing the data into categories, identifying subthemes, summarizing, and drawing conclusions. General population studies were not included, only studies on MFS users in rural areas.

Results: The study leads to a comparative analytical framework, which provides insight into the impact of MFS on financial inclusion and household resilience in emerging economies. The main findings are: (1) there are still access gaps in the provision of financial services between account ownership and having access to credit, and (2) the resilience effects are not uniform across MFS, with unbanked users relying more on remittance-based coping but recovering more slowly, (3) there is a combined cost burden stemming from digital transaction fees and informal lending interest, and (4) the divergence in country-level results is influenced by the extent of credit integration and interoperability systems.

Originality/Value: This study presents a comparative assessment of resilience of unbanked users among six emerging economies and proposes a new “Incomplete Inclusion Matrix” (IIM), which categorizes users according to their financial inclusion status. It sets out a Graduated Resilience Framework, differentiating between transactional and structural resilience, builds on CGAP's Resilience-Through-Inclusion thesis and demonstrates that access to transactions without credit can lower resilience when facing shocks. **Practical Implications:** This study provides a useful guide to authorities, financial institutions, and charities in enabling rural people to benefit from financial services. Formal banks and mobile money systems, when integrated, can leverage the clients' transaction histories to provide them with small loans, narrow the unfair information gap, and improve lending decisions. The model also promotes equitable digital systems, more effective microcredit schemes, and essential financial literacy programs. In fact, this method is in line with SDG 1 (alleviating poverty), SDG 8.10 (financial inclusion), and SDG 9 (enhanced digital infrastructure), and it enables the poor households to maintain financial resilience in the face of unforeseen emergencies.

Keywords: mobile financial services, unbanked users, economic resilience, financial inclusion, Bangladesh, emerging economies, digital financial infrastructure

Funding: This study did not receive any grants from any third parties.



REVERSE FACTORING AS A SUPPLY CHAIN RESILIENCE INSTRUMENT IN EMERGING ECONOMIES: EVIDENCE FROM SECONDARY DATA ON TRADE FINANCE CONSTRAINTS AND INSTITUTIONAL READINESS (2015–2025)

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Abstract

Objective: In light of a series of shocks experienced by global supply chains since 2020, namely disruptions induced by the coronavirus pandemic, geopolitical realignment, and rising trade protectionism, easy access to working capital becomes a crucial component of economic resilience. One of such instruments enabling small and medium-sized enterprise (SME) suppliers to receive early payments facilitated by an anchor buyer with superior credit standing via a third-party financier, reverse factoring (RF), proves to be structurally significant and underappreciated. The market size of SCF in 2024 amounted to USD 2,462 billion worldwide, while the RF niche was estimated at USD 590–638 billion, growing with CAGR of 9.4 to 11.2% during 2030-2034. In terms of geographical spread, the Americas accounted for 51%, Europe for 26% of approved payables finance program volumes (BCR, 2025), and traditional supplier-led factoring remained concentrated in Europe at a 65-70% share of global factoring turnover (FCI data). However, scholarly investigation into RF adoption dynamics and patterns among South Asian countries, Southeast Asia, and Sub-Saharan Africa is limited and fragmented, lacking methodological homogeneity. Hence, this paper presents a secondary, comparative cross-regional analysis, examining:

- (i) RF adoption across three regional blocs of developing economies;
- (ii) Structural barriers limiting RF uptake in these regions; and
- (iii) The link between RF adoption and increased SME trade finance accessibility.

Thus, identifying RF as an instrument for enhancing macroeconomic resilience instead of merely being a financial technology.

Method: The study is drawn exclusively following a qualitative-comparative research design covering secondary sources (including quantitative and qualitative data from firms' reports) which are publicly accessible from databases of relevant institutions. Particularly, this study gathers data from several sources including the World Bank Reverse Factoring Product Card and Credit Infrastructure Requirements framework; ADB Trade Finance Gaps, Growth, and Jobs Survey series (2020–2025); UNCTAD's 2025 report on SCF determinants in African markets; BCR/Citi World Supply Chain Finance Reports (2024–2025); IMF Financial Soundness Indicators and World Bank Governance Indicators as proxies for institutional quality and EBRD legal reform assessments on factoring regulation across transition economies. A comparative regional method is designed such as Southeast Asia, South Asia,



and Sub-Saharan Africa as the primary units of analysis. The descriptive analysis is also represented in this study using a high-level, interpreted programming language software Python software for data visualization to ensure simplicity, credibility, and readability of analyzed data. Here, four analytical dimensions are classified for structural barriers' codes like (a) digital infrastructure readiness, (b) banking sector capacity, (c) legal-regulatory environment and (d) anchor buyer ecosystem density and these are triangulated to export the central outcomes in this study, named Regional RF Readiness Matrix (RRRM) through triangulation of qualitative documents with statistical indicators derived from corporate reports and institutional datasets.

Results: Five key insights are derived. First, Africa experienced the highest global SCF growth of 14-15% during 2023-2024, but the country has a negligible share in the global SCF market value; such a trend denotes high growth from a low base typical of structurally limited markets. Second, the global trade finance gap persists at USD 2.5 trillion without any reduction despite increased trade volumes and improved risk management of SMEs, suggesting that the rise in the RF platform does not narrow the supply-demand mismatch for the weakest suppliers. Third, SME trade finance refusal rates have been reduced to 41%, almost equal to large-corporation rates, but SMEs residing in countries without established SCF legislation are systematically discriminated against because of ambiguity regarding receivables transfer regulations. Fourth, regulatory restrictions are the main impediment in all three regional groups, overshadowing digitalization gaps gradually resolved via platform-based initiatives; the regulatory vacuum in Nigeria serves as an example. Finally, the Trade and Supply Chain Finance Program of the Asian Development Bank (ADB), which facilitated over 27,000 deals amounting to USD 4.9 billion and supported 13,500 SMEs in 2024, proves that multilateral co-guarantees can be used as alternatives to domestic laws, albeit with a geographically restricted impact.

Originality: There are three primary original contributions in this study: creating the first secondary data-based Regional RF Readiness Matrix (RRRM), redefining RF from its traditional conceptualization as a FinTech innovation to that of a national resilience tool, and identifying an empirical paradox where substantial development in the RF marketplace coexists with continued stagnation in the trade finance gap, thereby explicitly questioning the commonly held assumption that FinTech innovations automatically bring positive externalities for developing countries.

Keywords: reverse factoring, supply chain finance, fin-tech, trade finance gap, emerging economies, fragile resilience, SMEs

Funding: The study did not receive any grants or external funding from any third parties.



TAXATION AS AN ALTERNATIVE INDICATOR OF THE QUALITY OF DEMOCRACY: A CRITICAL ANALYSIS OF THE CASE OF ROMANIA

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Abstract

This paper investigates the relationship between the level of taxation and the quality of democracy, proposing an alternative approach to the classic models of evaluating political regimes. The central hypothesis claims that the real fiscal pressure borne by citizens can be a relevant indicator of democratic functionality, as it directly reflects the ratio between individual contributions and collective benefits provided by the state.

In the specialized literature, the evaluation of democracy is mainly based on institutional and normative indicators, such as the independence of the judiciary, political pluralism or freedom of the press. Although essential, these indicators do not adequately capture the economic dimension of the social contract, namely the balance between the level of taxation and the quality of public services provided. Thus, the exclusively institutional analysis may lead to an incomplete picture of the real functionality of a democratic system.

The paper proposes to complete this framework by integrating an empirical indicator with direct relevance for the citizen: the "Fiscal Freedom Day" (FFD). This indicator expresses the moment in the calendar year until which the income generated by an individual is, in theory, allocated to the payment of taxes and contributions to the state. Unlike traditional indicators (e.g. the share of tax revenues in GDP), the ZLF offers an intuitive and comparable perspective on the real tax burden.

The comparative analysis carried out highlights the fact that countries with high levels of taxation (such as France, Belgium or Germany) compensate for this pressure through robust social protection systems and quality public services. In these cases, the relationship between the citizen and the state is characterized by a relatively high degree of fiscal legitimacy, determined by the perception of redistributive equity.

In contrast, the case of Romania reveals the existence of significant discrepancies between the level of taxation and the perceived public benefits, which can negatively affect trust in state institutions and voluntary tax compliance. Although the aggregate level of taxation (expressed by ZLF or other measures) is close to that of developed countries, the efficiency of redistribution and the quality of public services are perceived as inferior.

Therefore, the paper argues that the level of taxation should not be analyzed in isolation, but in correlation with the concrete results of state intervention. In this sense, fiscal pressure becomes not only an economic instrument, but also an indirect indicator of democratic legitimacy, reflecting the extent to which the state manages to transform the collected resources into relevant public goods. In conclusion, the research supports the need for a multidimensional approach to the assessment of democracy, in which economic indicators,



such as real fiscal pressure, complement the classical institutional analysis. This perspective allows for a more nuanced understanding of the relationship between the state and the citizen, especially in emerging economies or in systems characterized by governance deficiencies.

Keywords: *fiscal burden, tax legitimacy, public service quality, economic resilience, fiscal governance, redistribution, informal economy, state–citizen relationship, tax morale, tax freedom day*





THE RISK SYNTHESIS MATRIX – AN IMPORTANT TOOL IN ORGANIZATIONAL PERFORMANCE AUDITING

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Abstract

Objectives: The primary objective of this paper is to analyze and optimize reporting mechanisms in internal audit through the implementation of the Risk Synthesis Matrix. The research aims to demonstrate how transforming qualitative descriptive data into visual risk indicators (Heat Maps) can significantly enhance managerial decision-making. Specific objectives include identifying vulnerabilities within the key processes of a public utility entity and evaluating the effectiveness of internal controls through the lens of compliance and performance criteria.

Method: The research adopts a qualitative-interpretative paradigm, grounded in an exploratory case study. The methodological rigor is ensured through a four-stage interdependent process:

Data Synchronization and Collection: The process commenced with the extraction and systematization of 24 control points from an Annual Audit Report, employing documentary analysis techniques to isolate empirical observations from the broader narrative context.

Operationalization and Logical Mapping of Variables: A two-dimensional analysis matrix was constructed, where the vertical axis (\$YS) was defined by six operational domains with inherent risk (Liquidity, Fixed Assets, Current Assets, Creditors, Taxes, Investment Projects), and the horizontal axis (\$XS) integrated four fundamental internal control attributes: existence of documentary support, accounting record accuracy, transaction authorization, and physical correspondence of assets.

Algorithmic Coding of Performance Indicators: The method's originality lies in developing a protocol for transposing audit semantics into severity indicators. A pattern matching technique was used to correlate the (S) indicator - Satisfactory - with total compliance zones, and the (M) indicator - Moderate - with procedural vulnerability or latent reporting risk zones.

Aggregation and Heat Map Synthesis: The final stage involved utilizing a tripartite chromatic scale (green-yellow-red) to convert severity scores into a risk heat map. This aggregation mechanism allowed for the transformation of atomized findings into a holistic view of organizational exposure, facilitating the rapid identification of critical audit points.

Results: The findings indicate a high degree of compliance across most operational and financial processes analyzed. However, the application of the synthesis matrix revealed a zone of moderate risk within the "Implementation of the P.I.U. Project" domain, where temporary deficiencies in the allocation of supervision expenses were identified. The analysis

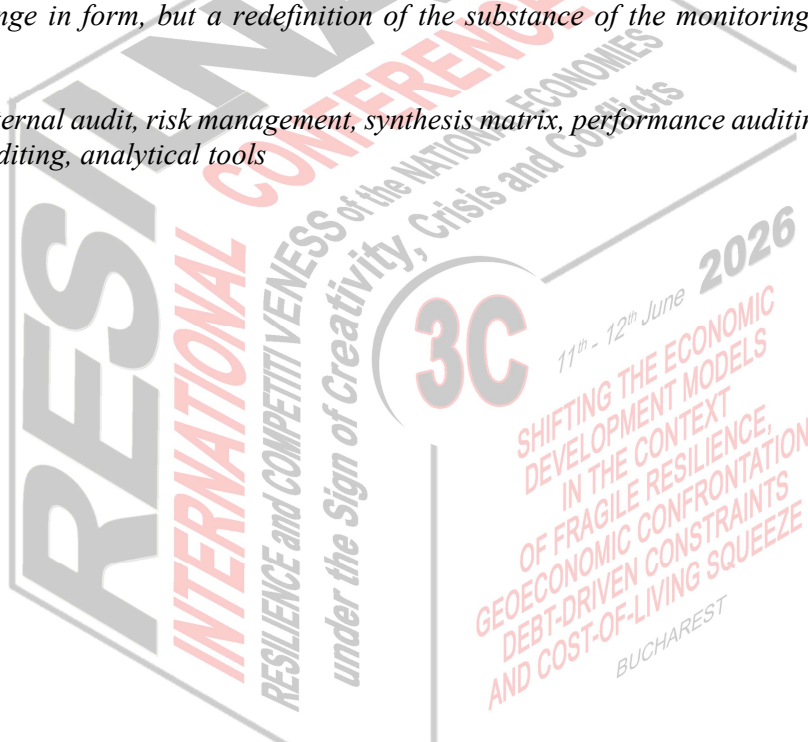


demonstrates that while traditional tabular reporting may obscure certain risks within large volumes of text, the Risk Synthesis Matrix visually isolates these critical points, allowing for an immediate prioritization of necessary interventions.

The paper concludes that implementing synthesis matrices in audit reporting represents a qualitative leap from "fact-finding auditing" to "risk-based auditing." This approach reduces information asymmetry between the auditor and management, providing a holistic perspective on organizational health. It is recommended that this visual reporting model be adopted as a standard in public institutions to increase transparency and the efficiency of resource utilization.

Originality: *The originality of this research lies in the proposal of an algorithmic transposition model of textual audit observations into a strategic risk map, specifically adapted to the public utilities sector in Romania. The primary contribution consists of developing a practical synthesis tool that facilitates the rapid interpretation of complex data. The paper adds value to the specialized literature by demonstrating that the visual digitalization of auditing is not merely a change in form, but a redefinition of the substance of the monitoring and control process.*

Keywords: *internal audit, risk management, synthesis matrix, performance auditing, heat map, risk-based auditing, analytical tools*





THE ROLE AND RELEVANCE OF SOVEREIGN GUARANTEES IN SUPPORTING THE STRATEGIC SECTORS OF THE ROMANIAN ECONOMY

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Abstract

Objective: Sovereign guarantees represent an essential financial policy instrument through which governments can stimulate investments, facilitate access to financing, and support the development of strategic sectors of the national economy without generating immediate direct pressure on public budgets. In the context of increasing geopolitical uncertainty, energy transition requirements, post-pandemic recovery measures, and the need to strengthen national economic resilience, sovereign guarantees have become increasingly important for emerging economies such as Romania. The objective of this paper is to analyze the role and relevance of sovereign guarantees in supporting strategic sectors of the Romanian economy, focusing on their contribution to mobilizing private capital, reducing financing costs, mitigating credit risk, and supporting long-term sustainable development objectives.

Method: The research methodology combines qualitative and quantitative approaches. The qualitative analysis is based on the review of specialized literature, European Union regulations, national fiscal policies, and institutional frameworks governing sovereign guarantees in Romania. The quantitative analysis relies on statistical data collected from Romanian public institutions, the Ministry of Finance, the National Bank of Romania, Eurostat, and international financial organizations for the period 2010–2025.

Results: The findings demonstrate that sovereign guarantees have played a significant role in enhancing access to financing for strategic sectors of the Romanian economy, particularly during periods characterized by financial instability and increased market uncertainty. State guarantees contributed to lowering borrowing costs, improving investment bankability, and increasing investor confidence.

Originality: The originality of this study derives from its integrated analysis of sovereign guarantees as a multidimensional economic governance instrument within the Romanian context. The paper emphasizes the strategic development dimension of sovereign guarantees and their contribution to economic resilience, investment stimulation, and sustainable growth.

Keywords: sovereign guarantees, strategic sectors, fiscal policy, credit risk, public investment, economic resilience, Romania



FROM CLIENTS TO NODES: STABLECOINS AND THE TRANSFORMATION OF FINANCIAL ARCHITECTURE

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Abstract

Objective: Contemporary debates on global stablecoins primarily focus on their implications for monetary transmission, deposit flight in advanced economies, and dollarization pressures in emerging markets. Such discussions typically conceptualize traditional finance and crypto-finance as competing monetary architectures and emphasize potential crowding-out effects. This study argues that a more fundamental and less visible transformation is already taking place: the progressive erosion of institutional boundaries between crypto-finance and the traditional financial system under conditions of fragmented stablecoin legalization. The paper examines how divergent regulatory regimes reshape the economic nature of stablecoin issuers and potentially transform crypto intermediaries from clients of the banking system into infrastructural nodes within the payment architecture of reserve currency issuers.

Method: The study employs comparative institutional and legal analysis of the regulatory treatment of stablecoins in the European Union and the United States. Particular attention is devoted to the comparison between the EU Regulation 2023/1114 on Markets in Crypto-Assets (MiCA) and the U.S. GENIUS Act framework. The research also applies conceptual analysis grounded in monetary theory, banking theory, and financial stability literature, including the Diamond-Dybvig framework of bank runs and historical evidence from money market fund crises. Technological aspects of blockchain architecture, Layer 2 scaling solutions, token interoperability, and the institutional structure of crypto intermediaries are incorporated into the analysis.

Results: Under MiCA, fiat-referenced stablecoins pegged to a single official currency may operate only as electronic money tokens (EMTs), legally approximating electronic money institutions such as PayPal while introducing additional technological and institutional risks associated with distributed ledger infrastructure. These include smart-contract vulnerabilities, interoperability failures, risks stemming from cross-chain bridges, liquidity risks amplified by secondary token markets, and conflicts of interest caused by the vertical integration of exchange, custody, market-making, brokerage, and lending functions within crypto conglomerates. In contrast, softer regulatory approaches, such as those emerging in the United States under the GENIUS Act and certain state-level licensing regimes, economically transform stablecoin issuers into entities resembling weakly regulated banks or money market funds without equivalent prudential safeguards. Conversely, full-reserve “narrow bank” models theoretically reduce credit risk but simultaneously undermine the business model of stablecoins and generate regulatory asymmetries between jurisdictions.

The technological evolution of decentralized payment architectures increasingly relies on complex and fragmented infrastructures that differ substantially from the relatively safe and



simple but poorly scalable security model of the early Bitcoin blockchain. Layer 2 systems and cross-chain interoperability mechanisms effectively “import” trust from more secure blockchains while executing transactions off the main chain, thereby increasing the number of systemic vulnerability points. Although stablecoins circulating across heterogeneous infrastructures are presented as fungible, they operate on platforms characterized by substantially different levels of security and operational resilience.

Currently, specialized blockchains for the USDT and USDC stablecoins are being developed and tested. However, these infrastructures will likely differ substantially from the entrenched perception of the early decentralized Bitcoin blockchain, where identifying a clear point for regulatory oversight was inherently difficult. Instead, they increasingly resemble centralized payment infrastructures endowed with certain novel technological features, such as programmability and atomic settlement capabilities, while at the same time remaining subject to a significantly lighter regulatory and supervisory regime than traditional payment systems performing functionally comparable roles.

Permitting stablecoin issuers and crypto exchanges to obtain certain forms of state banking charters and access to the Federal Reserve payment system creates important geopolitical and systemic implications. Entities such as crypto exchanges, which function as global offshore hyper-intermediaries combining exchange, brokerage, custody, dealer, lending, and investment banking activities, thereby shift from being customers of the banking system to becoming direct infrastructural nodes within the monetary architecture of the world’s dominant reserve currency. Under such conditions, traditional banks cease to function as institutional filters separating the speculative and highly fragmented crypto ecosystem from the issuer of the global reserve currency. If stablecoins become the settlement asset for tokenized securities markets, crises originating in stablecoin infrastructures may also transmit directly into capital markets and broader financial stability.

Originality: *The originality of the study lies in shifting the analytical focus from conventional debates about competition between traditional finance and stablecoins toward the institutional convergence of crypto-finance and banking infrastructures. The paper introduces the conceptual distinction between crypto entities as “clients” and as “nodes” within central bank payment architectures and argues that this topological transformation may produce long-term systemic and geopolitical consequences that remain insufficiently addressed in current regulatory discussions.*

Keywords: *stablecoins, financial architecture, tokenized finance, blockchain, Layer 2, payment infrastructures, banks, crypto exchanges, regulatory arbitrage, financial stability, Federal Reserve, MiCA, GENIUS Act*



THE GLOBAL PAYMENT SYSTEMS FRAGMENTATION

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Abstract

Objective: The fragmentation of global payment systems pertains to the deterioration of a cohesive, cross-border financial infrastructure, wherein varying regulatory frameworks, technical standards, and, in certain instances, geopolitical tensions hinder the smooth transfer of funds. The aim of the study was to highlight the essence, driving forces and prospects of the fragmentation of global payment systems.

Method: The study was based on the screening of open publications in the Internet space.

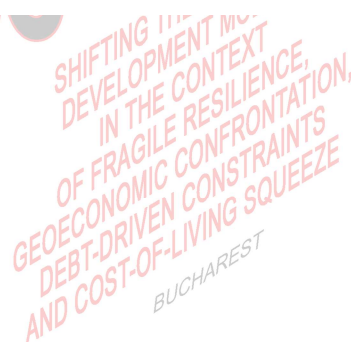
Results: The global financial system is shifting from a single network to a layered architecture of competing blocs. Fragmentation appears as the presence of various payment "rails" that may not interact with each other. It denotes the deterioration of the universality and impartiality of global financial infrastructure. The fragmentation of global payment systems signifies the reduction of the cohesive, Western-dominated financial framework (primarily SWIFT) in favour of various, partially compatible, and frequently rival systems. Global payment systems are becoming fragmented as a result of the influence of a complex of factors. First of all, it is about geopolitical mutations, weaponization and national security considerations. Payment systems are increasingly used as tools of economic governance. Increased geopolitical tensions are causing countries to look for alternative payment methods to reduce dependence on global systems. Sanctions are forcing some countries to build alternative, independent, non-Western or parallel regional systems (e.g. China's CIPS, Russia's SPFS, and BRICS Pay). Second, regulatory divergences are evident. Varying standards on anti-money laundering (AML), data privacy, and capital controls make it difficult for systems to be interoperable. Divergent regulatory frameworks for stablecoins and Central Bank Digital Currencies (CBDCs) in the US, EU, and Asia are producing conflicting technological standards that lack interoperability. Thirdly, there exist gaps in technology and innovation. Some areas progress with innovations such as blockchain and CBDCs, while others depend on outdated infrastructure, leading to disjointed technological capabilities. The emergence of alternative payment methods and digital wallets also disrupts the landscape, as favoured options differ greatly across regions. Similarly, market-driven preferences can be mentioned. As businesses expand, they adopt regional payment solutions, creating a patchwork of systems rather than a cohesive global approach. The disintegration of worldwide payment systems leads to a rise in localized, autonomous payment networks and a reduction in reliance on standardized global systems like SWIFT. The fragmentation of global payment systems poses a risk of rising transaction costs, complicating operations, and generating inefficiencies,



with possible GDP losses exceeding \$0.6 trillion, or as much as 5% of global GDP in extreme cases. Small, open financial centers face increased pressure to choose between rival systems, frequently dealing with intensified compliance demands and reputational risks. Among the scenarios for the further evolution of the phenomenon under study, the emergence of parallel payment infrastructures is mentioned, especially between BRICS nations, to bypass Western-dominated systems, such as SWIFT, which are increasingly used to enforce sanctions. Countries that focus on domestic payment systems may lack interoperability, restrict global remittances and hinder smooth cross-border transactions. A fragmented landscape for stablecoins and central bank digital currencies, with the US focusing on private stablecoins to support the dollar while the EU pursues central bank digital currencies, may lead to the fragmentation of liquidity pools. A transition towards managing intricate "multi-hop" systems, wherein financial institutions are required to simultaneously support various competing networks, thereby escalating compliance and maintenance expenses. To address this fragmentation, financial institutions and central banks must prioritize interoperability, utilizing standardized ISO 20022 messaging and collaborative, multi-rail platforms. It is important to highlight that ISO 20022 serves as a comprehensive, data-rich language designed to mitigate global payment fragmentation resulting from various legacy formats. By standardizing structured data internationally, it enhances straight-through processing, improves compliance, decreases manual reconciliation efforts, and facilitates superior interoperability among instant payment systems.

Originality: The originality of the study lies in presenting a complex vision of the phenomenon of fragmentation of global payment systems.

Keywords: payment system, fragmentation, impact, drivers, scenario





SECTORAL INDEBTEDNESS IN ROMANIA AND CENTRAL EUROPE

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Abstract

Objective: The study compares the dynamics of sectoral indebtedness of Romanian firms with that of three benchmark economies in Central Europe (Hungary, the Czech Republic and Poland) over the period 2019–2023. The main objective is to identify differences between economic sectors in terms of the level and composition of corporate debt, as well as to assess the financing gap between small and medium-sized enterprises (SMEs) and large firms. Distinct attention is paid to the debt maturity structure and the role of trade credit in shaping firm financing. The results highlight how the structure of corporate financing differs between economies with similar levels of institutional development and integration into the European single market, but with distinct financial architectures. The analyzed period covers four successive macroeconomic episodes: the pre-pandemic phase (2019 – early 2020), the pandemic shock (2020), the post-pandemic recovery (2021) and the inflationary and energy shock (2022–2023).

Method: The methodology applies a descriptive-comparative analysis based on aggregated financial data at the firm and economic sector level, compiled from national and international sources. For each country and for each year of the analyzed period, comparable indicators are constructed regarding the total debt level, debt maturity structure and trade credit intensity. These indicators are calculated separately for small and medium-sized enterprises and for large firms and are aggregated by economic sectors defined according to the NACE Rev. 2 classification. The analysis uses weighted averages (by total assets) and median values at the sector level to reduce the influence of extreme values. Comparability between countries is ensured by using standardized definitions of SMEs and by harmonizing financial indicators at the balance sheet structure level. The results are interpreted in a descriptive-comparative framework, without estimating causal relationships.

Results: The analysis identifies three major structural divergences between Romania and the three comparator countries. First, in Romania, the highest debt ratios are recorded in construction and wholesale and retail trade, while in the Czech Republic and Poland the manufacturing industry holds the main share in the corporate debt structure. Second, the use of trade credit evolves divergently over the period 2019–2023: in Romania it increases in the second part of the period, especially in the trade and services sectors, while in the reference economies it remains stable or slightly declining – indicating a partial substitution of bank financing by inter-firm trade credit. Third, the differences between SMEs and large firms are more pronounced in Romania: Romanian SMEs rely predominantly on short-term debt and



trade credit, while SMEs in the Czech Republic and Poland have a more balanced debt structure, with higher access to long-term bank credit.

Originality: The main contribution of the study lies in the simultaneous integration of three analytical dimensions: the sectoral structure of indebtedness, the differentiation between SMEs and large firms, and the comparison between four Central European economies. Unlike previous studies, which have analyzed either aggregate indebtedness at the country level or sectoral dynamics in isolation, this paper systematically combines the three dimensions into a unified comparative framework. The study introduces the concept of the “trade credit trap” to describe the structure of corporate financing in Romania – an increasing reliance on inter-firm trade credit, which becomes pro-cyclical and amplifies vulnerabilities in periods of economic stress. This mechanism is associated with a higher reliance on short-term financing and with an increased sensitivity of firms to liquidity conditions in the economy.

Keywords: sectoral indebtedness, SME financing, commercial credit, descriptive-comparative analysis, corporate debt structure.





FIRMS' INDEBTEDNESS UNDER FINANCIAL TIGHTENING: EVIDENCE FROM RECENT ECONOMIC SHOCKS

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Abstract

Objective: The paper takes as its starting point the economic and financial transformations that took place in the post-2019 period, characterized by a succession of economic shocks and significant changes in the international macroeconomic environment. The COVID-19 pandemic, supply chain disruptions, the energy crisis and rising inflationary pressures determined major changes in the monetary policies adopted by central banks. After a long period characterized by low interest rates and easy access to financing, monetary institutions have implemented restrictive measures to limit inflation, leading to higher interest rates and tighter financial conditions. These changes have had direct effects on economic activities and the financial behavior of firms, especially on decisions regarding access to and use of external financing. In this context, the study aims to analyze the impact of the tightening of financial conditions on firms' indebtedness in the post-2019 period and to highlight the main effects generated on firms' financing structures. The objective of the research is to identify how changes in credit conditions and the increase in the cost of financing influence the indebtedness behavior of firms and to highlight existing differences between firms and economic sectors, depending on their sensitivity to the cost of capital and access to financial resources.

Method: The research is based on a descriptive and qualitative analysis of the specialized literature and macroeconomic and financial data, aggregate data on firms' indebtedness are used to surprise the developments at the economy level and to highlight the relationships between financial conditions and the level of firms' indebtedness in the post-2019 period. Studies and scientific articles published in international databases, such as Scopus and Web of Science, are analyzed, as well as economic reports and documents elaborated by international institutions and financial institutions, including the International Monetary Fund (IMF), the European Central Bank (ECB), the Organization for Economic Cooperation and Development (OECD) and the World Bank. The analysis aims to identify the main dimensions of the relationship between financial conditions and indebtedness behavior of firms, including the evolution of interest rates, the accessibility of credit, changes in financing costs and changes in the structure of capital used by firms. Differences between various categories of firms and between the main economic sectors are also examined, in order to highlight the differential impact of tightening financial conditions on indebtedness decisions.

Results: The study results show that the tightening of financial conditions in the post-2019 period has significantly influenced the indebtedness behavior of firms. The increase in interest rates and the application of more restrictive credit granting criteria contributed to an increase



in the costs associated with external financing and to a decrease in firms' access to capital sources. The analysis highlights the fact that firms have reacted by adapting their financing strategies and by changing the debt structure. In many cases, firms have reduced their dependence on long-term financing and have shown a tendency to orient themselves towards alternative sources or towards the use of available internal resources. At the same time, the increase in financing costs has a negative impact on the ability of firms to support investments and maintain high levels of economic development. The results also indicate the existence of important differences between firms and economic sectors. Firms with a high level of initial indebtedness are more vulnerable to changes in financial conditions, as they support additional costs associated with debt service and have greater difficulty in refinancing existing obligations. Small and medium-sized enterprises are also more affected than large firms, as they have more limited access to alternative sources of financing and a lower capacity to absorb financial shocks. The results suggest that maintaining restrictive financial conditions for long periods may generate additional vulnerabilities regarding the sustainability of firms' indebtedness and may negatively impact investment and economic growth prospects.

Originality: *The originality of the study consists in the integrated analysis of the impact of the tightening of financial conditions on the indebtedness behavior of firms in a certain period of major shocks. The research proposes an approach that correlates macroeconomic developments and monetary policy changes with the financing decisions of firms and the effects generated on their debt structures. At the same time, the study highlights the differences between the categories of firms and economic sectors, providing a perspective on how financial conditions influence the sustainability of financing and the resilience of the business environment in the current economic context.*

Keywords: *major shocks, shock phases, firms' indebtedness, financial conditions, financing cost, financial stability.*





EMERGING TECHNOLOGIES' APPLICATION IN THE INSURANCE FIELD. PROSPECTS AT THE EUROPEAN UNION AND ROMANIA LEVELS

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Abstract

Objectives: *The insurance market in the European Union and Romania is in a continuous expansion mainly due to the adoption of emerging disruptive technologies. Currently, the most significant digital technologies used in this field are artificial intelligence, telematics, the Internet of Things (IoT) and drones. Tangible examples of the application of new technologies within the insurance field include the use of drones for inspections, satellite imagery for claims management and IoT sensors for real-time monitoring. Insurance companies are pursuing their implementation in order to simplify the process of obtaining insurance products and customize the services offered to interested parties. With the help of technological tools, policy beneficiaries can request remote online assistance, insure goods in a short time, as well as manage the purchased products. IoT technology offers policyholders the opportunity to directly influence policy prices, and insurers the opportunity to improve their services and, implicitly, their revenues. Telematics offers the possibility of creating personalized auto policies, while artificial intelligence is increasingly used in fraud detection, subscription and customer relations. Technological solutions assist the creation of innovative business models for the insurance market. This is how on-demand insurance, microinsurance, continuous subscription and insurance for partners emerged. Given the importance of using new emerging technologies in the insurance sector, we considered necessary to conduct an exploratory research to identify how these disruptive technologies are used within the insurance field, both at the European Union level and in Romania. The main objectives of the paper are to assess and identify the level of adoption of these technologies and to highlight their contribution to the development of the insurance sector.*

Method: *In order to identify the manner in which emerging technologies are used both at the European Union level and in Romania, an exploratory analysis was conducted. This approach involved reviewing existing academic research, practical studies, and several international databases that illustrate the level of adoption of these technologies in the insurance market.*



Results: *The results of the study indicate that at present, artificial intelligence-based applications are widely used across the European Union in the insurance sector, particularly in customer service, fraud detection, claims management, and pricing activities. Machine Learning (ML) and Artificial Intelligence (AI) have had a significant impact on actuarial models, facilitating the transition from traditional Generalized Linear Models (GLM) to more advanced predictive models. The findings show that the use of these disruptive technologies enables more accurate risk assessment and greater stability in insurance premiums, mainly due to the integration of larger volumes of historical and behavioral data. From the perspective of Romania, although there has been a noticeable increase in premium volumes and demand for personalized products, several structural challenges remain, such as the rapid growth in claims. In this context, the integration of emerging technologies in the insurance sector, both at the European Union level and in Romania, could generate significant opportunities, including increased operational efficiency, improved subscription processes, and enhanced customer experience.*

Originality: *The originality of this paper lies in the integration and comparative analysis of how emerging technologies are applied in the insurance sector, both at the level of the European Union and in Romania. The added value of the study consists in the correlations established and in highlighting the main findings related to Romania in comparison with the European Union. Furthermore, the research makes it possible to identify the key gaps that exist between countries. The paper contributes both from a theoretical and a practical perspective. From a theoretical standpoint, it provides conceptual insights into the use of emerging technologies in the insurance sector, while from a practical perspective, it highlights the level of implementation of these technologies in the European Union and Romania, as well as areas that require improvement in order to increase their adoption.*

Keywords: *insurance sector, insurance premiums, emerging technologies, digitalization, artificial intelligence*



SESSION 3: GEOPOLITICAL SCENARIOS FOR BUSINESS DECISION MAKING AND VALUE CREATION

THE MILITARY-ECONOMIC COMPONENT OF GLOBAL GEOPOLITICAL CYCLICALITY: THE ROLE OF CRISIS-MILITARISTIC PHASES

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Abstract

Objective: *The aim is to examine the role of crisis-militaristic phases of global military-economic cycles in the periodic resolution of geopolitical conflicts and the transformation of the global geopolitical system, as well as the cyclical alternation of globalization and localization, which manifests itself in changes in international trade regimes.*

Method: *The study mainly applied logical and historical methods, as well as dialectical ascent from the abstract to the concrete, including general scientific methods of analysis and synthesis, induction and deduction.*

Results: *Under capitalism, global military-economic cycles are shaped by the dynamics of the contradictory interaction between the political and economic systems of the most developed countries at the core of the capitalist world system. This dynamic inevitably influences the development of the rest of the world, setting its cyclical rhythm, which has individual characteristics in each country on the semi-periphery and periphery of the capitalist world system. This creates the basis for the formation and periodic partial resolution of contradictions between globalization processes and localization.*

The partial resolution of the contradiction between globalization and localization, and as a result, the reformatting of the global geopolitical system, is taking place in the process of the unfolding of the crisis-militaristic phases of global military-economic cycles, among which long cycles of world politics, Kondratiev cycles, and cycles of hegemony play a decisive role.

In the course of inter-civilizational competition, there are periodic profound intensification of contradictions between their leading countries, caused by the struggle for world leadership, and thus also between the allies and satellite countries of the opposing sides.

Historically, the resolution of such contradictions has occurred through military means, in the form of “proto-global” and “global” wars. The totality of military-political and socio-economic processes arising during the aggravation and resolution of these contradictions



defines the crisis-militaristic phases of global military-economic cycles. These unfold through military conflicts whose outcomes shape the partial resolution of inter-civilizational contradictions and determine the balance of power within regional and global geopolitical systems.

According to the theory of long cycles in world politics, around 2026, a "macro-decision" phase will begin, which in previous cycles unfolded as a 30-year period of global confrontation, leading to world wars.

The conditions for a new crisis-militaristic phase in the cyclical development of the world system have already been established. This trend is evidenced primarily by economic indicators. According to the Stockholm International Peace Research Institute (SIPRI), global military spending increased by 37% between 2015 and 2024 and grew in all five geographical regions; compared to 2002, the total sales of the 100 largest arms manufacturers and military service providers doubled in 2023 (from US\$331 billion to US\$632 billion).

The outcome of the crisis-militaristic phases of global military-economic cycles is the reformatting of the global economic space based on a new geopolitical hierarchy, for the stability of which the leading actors in geopolitics care not only about the growth of their geopolitical influence, but also about internal stability. This forces them to create conditions for expanding opportunities for businesses and citizens to pursue their economic interests. In other words, states that are competing geopolitical actors in the recovery phase following the crisis-militaristic phase are implementing measures to improve the well-being of their citizens, which means that the social quality and loyalty of citizens towards their governments and, in general, towards the emerging social structure of society are growing.

The cyclical nature of global political and economic development is clearly reflected in the cyclical change of international trade regimes, coordinated with the unfolding of geopolitical processes in such a way that during the crisis-militaristic phases of global military-economic cycles, foreign trade relations are conducted in accordance with protectionist policies, and after their completion, the capitalist world system enters another wave of free trade, in a form that is adequate to the specific historical conditions.

Originality: *This study presents an original scholarly interpretation of the role of crisis-militaristic phases of global military-economic cycles within the context of geopolitical cyclicity, namely: the unfolding of these phases leads to the emergence of a new leader of the global geopolitical system or a shift in the geopolitical strategy of the old leader who has retained its dominance. The leader of the global geopolitical system determines the direction of the world economy, which creates conditions for the realization of economic interests. The leading state in the global geopolitical system receives the main advantages for the realization of its economic interests. Its partners also achieve a more advantageous position than other countries in the system of international economic relations that is established after each crisis-militaristic period. This creates the basis for future exacerbation of geopolitical contradictions and, consequently, the unfolding of new crisis-militaristic phases. Furthermore, the distinctive role of crisis-militaristic phases is evident in the decisive influence their outcomes have on the cyclical alternation of periods of postwar globalization with periods of localization, amid the intensification of geopolitical conflicts and their resolution through military means.*

Keywords: *global military-economic cycles, crisis-militaristic phases, international trade regimes, globalization, localization, contradictions, geopolitical hierarchy*



FROM RESOURCES TO VALUE: INTERPRETIVE PLANNING AS A MECHANISM FOR DESTINATION COMPETITIVENESS

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Abstract

Objective: This paper explores interpretive planning as a mechanism for transforming tourism resources into economic value and enhancing destination competitiveness. While previous research has established the absence of interpretive logic in municipal tourism strategies, the present study advances the discussion by repositioning interpretation within the economic framework of tourism development. In the context of increasing global competition, fragile resilience, and growing demand for experience-based tourism, destinations face the challenge of converting cultural and natural assets into differentiated and competitive products. The objective of this study is to conceptualize interpretive planning as a value-creation process linking resources, visitor experience, and economic outcomes, and to demonstrate its role in strengthening destination positioning and resilience.

Method: The research employs a qualitative and conceptual design, combining documentary analysis and empirical evidence from Bulgarian municipalities. The methodology builds upon previous case-based research (Radomir and Berkovitsa) and reinterprets the findings through an economic lens. The analysis focuses on the relationship between resource potential, interpretive design, and value generation, using an analytical model that links: (1) resource identification and valuation; (2) thematic interpretation and message construction; (3) experience design through appropriate media; and (4) economic effects such as visitor satisfaction, length of stay, and destination differentiation. The study also integrates insights from international frameworks in tourism management, experience economy, and sustainable development.

Results: The findings demonstrate that the absence of interpretive planning leads not only to conceptual and managerial deficits but also to significant losses in economic value. Destinations lacking thematic coherence and interpretive design fail to convert available resources into meaningful experiences, resulting in weak differentiation and limited competitiveness. Conversely, the integration of interpretive planning enhances the perceived value of the destination by structuring experiences, strengthening emotional engagement, and supporting responsible visitor behavior. The analysis confirms that interpretation functions as a "semantic transformer," converting resources into experiences and experiences into economic value. This process contributes to increased visitor satisfaction, extended stays, and improved destination positioning in competitive markets.

Originality: The originality of this study lies in shifting the analytical focus from interpretive planning as a managerial necessity to its role as an economic mechanism for value creation and competitiveness. While previous research has documented the absence of interpretation in strategic frameworks, this paper advances the discourse by introducing a conceptual model that links interpretation to economic outcomes and destination performance. By integrating



perspectives from tourism management, experience economy, and sustainability, the study positions interpretation as a strategic tool for enhancing resilience and competitiveness in tourism destinations. This approach provides a foundation for incorporating interpretive planning into economic and policy frameworks as a measurable and outcome-oriented process.

Keywords: *interpretive planning, destination competitiveness, tourism value creation, experience economy, sustainable tourism, destination management, Bulgaria*





THE ENTREPRENEURIAL MIX AND ITS IMPACT ON TERRITORIAL INEQUALITY

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Abstract

Objective: This study investigates the heterogeneous impact of different forms of entrepreneurship on regional socioeconomic disparities. It evaluates whether entrepreneurial activity acts as a catalyst for reducing territorial gaps—operating via employment generation, local resource valorisation, innovation, structural economic development, and municipal fiscal enhancement—or conversely, exacerbates spatial polarization by clustering within pre-existing agglomeration economies. Particular attention is paid to the distinction between opportunity-driven and necessity-driven entrepreneurship, as well as to dissimilarity between microenterprises, small and medium-sized enterprises, and large firms with more than 250 employees. Furthermore, the study also examines the role of investment and employment as mechanisms mediating the nexus between entrepreneurship and regional development trajectories.

Method: This study utilizes a comprehensive county-level panel dataset for Romania spanning the 2000–2023 period, integrating key economic, social, and entrepreneurial indicators. The operationalized variables capture a heterogeneous spectrum of entrepreneurial modalities—ranging from sole proprietorships and family-owned enterprises to microenterprises, SMEs, and large-scale corporations—alongside metrics quantifying capital investment, labour absorption, and regional socioeconomic development trajectories. Methodologically, the inquiry employs a spatial dynamic panel data framework integrated with unobserved common factors, estimated via an instrumental variables approach. This robust econometric specification effectively accounts for temporal persistence, localized spatial spillovers, and omitted cross-county heterogeneity. Consequently, the model isolates direct, indirect, and total effects, offering a wider understanding of whether different types of entrepreneurship contribute to reducing regional disparities.

Results: Results indicate statistically significant spatial effects, confirming the existence of territorial interdependencies in the evolution of regional disparities. The models reveal temporal persistence, suggesting that current disparities are strongly influenced by previous levels of regional development, known as path dependence. Beyond these spatial and dynamic effects, the employment indicator turns out to be one of the most important determinants of regional disparities. Higher employment levels are correlated with more favourable economic



outcomes, indicating that job creation is a key mechanism through which entrepreneurship can contribute to reducing regional gaps. These findings suggest that the impact of entrepreneurship on regional disparities depends not only on the type or size of firms, but also on their capacity to create employment and support local economic development.

Originality: The originality of this research consists in applying a spatial dynamic panel data model with unobserved common factors to the analysis of entrepreneurship and regional socioeconomic disparities in Romania. Special focus is put on employment as a key mechanism through which entrepreneurial activity may influence regional development. Empirical insights derived from this robust econometric specification offer critical, evidence-based implications for regional planners, entrepreneurial actors, and researchers targeting territorial convergence and structural socioeconomic mitigation.

Keywords: entrepreneurship, Romania, regional economics, econometrics, panel data





NEARSHORING IN CENTRAL AND EASTERN EUROPE: CAPITALISING ON THE RECONFIGURATION OF GLOBAL VALUE CHAINS

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Abstract

Over the last three decades, Central and Eastern European (CEE) countries have emerged as attractive destinations for foreign direct investment (FDI), mainly by Western European companies, due to their competitive advantages in terms of resource availability and cost, with their participation in the European single market acting as a major external supporting factor. FDI has played a key role in connecting these economies, mainly to global value chains (GVCs), with beneficial effects for CEE economies related to economic growth, employment and foreign trade. The post-pandemic geopolitical context has generated strategic decisions to reconfigure globally dispersed production structures, among which nearshoring, friendshoring, and even reshoring stand out. In this context, CEE economies could benefit from an increase in FDI attracted due to the strategic reorientation of multinational companies with globally dispersed activities, mainly in distant locations, to closer locations, which is the case in nearshoring. Thus, CEE economies could be an advantageous location for nearshoring investments, especially from investors whose outputs are oriented towards the European Community market.

*The main **objective** of this study is to assess the level of integration of CEE economies into GVCs through backward and forward linkages, identifying the key industries and trading partners involved. In this regard, six economies are analysed, namely Romania, Bulgaria, Hungary, Poland, the Czech Republic and Slovakia, for the period between 2015 and 2024.*

Within this investigation, a quantitative analysis is carried out based on data published by Eurostat, and for the granular analysis, the Regional Integration and Value Chain Analyzer (RIVA) developed by the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) is used. In this regard, a comparative approach is also envisaged, with the examination of the evolution of the six countries, through the perspective of backward and forward linkages, by sector and trade partners. Throughout the paper, personal interpretations and opinions are taken into account in the context of identifying how the effects of ambitious national policies and strategies developed in recent years, highlighted in the reports of national and international institutions, are reflected in the indicators related to backward and forward linkages. The selected indicators aim to provide an overview of the six countries engaging in international cooperation through the perspective of GVCs and FDI, the results being expected to reveal the level of interdependence of the six economies with Western European partners, and consequently their integration into the European value chains.

The research is conducted on two major directions, as follows: the evolution of FDI and foreign trade, with goods and services, both finished and intermediate, of the six countries, covering the period between 2015 and 2024, to emphasise their fundamental background of their participation in GVCs; (ii) the main characteristics of the six economies, from the perspective

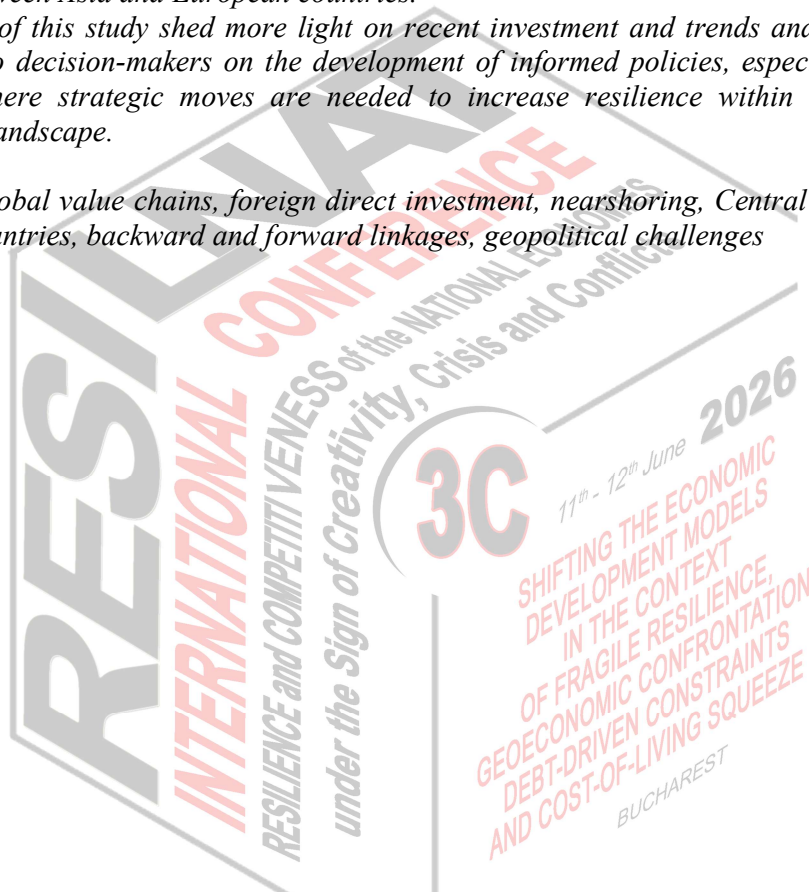


of their forward and backward trade linkages, to emphasise the general characteristics of their participation in GVCs during 2015-2024; (iii) the six CEE economies' capacity to be appropriate location for nearshoring investment strategies taking into account their competitive advantages in specific industries, such manufacturing and services.

The research **results** are expected to offer a perspective regarding the recent trend of nearshoring strategies, where CEE economies could take advantage of shifting the production chains and operational processes by multinational companies from globally dispersed locations to geographically closer locations to ensure their resilience in the context of geopolitical challenges, with an impact especially on connectivity, as is the case in maritime transport between Asia and European countries.

The findings of this study shed more light on recent investment and trends and can offer a perspective to decision-makers on the development of informed policies, especially in CEE countries, where strategic moves are needed to increase resilience within the evolving geopolitical landscape.

Keywords: global value chains, foreign direct investment, nearshoring, Central and Eastern European countries, backward and forward linkages, geopolitical challenges





CHANGES IN LABOUR MARKET INSTITUTIONS IN THE EUROPEAN UNION IN THE CONTEXT OF EXTERNAL SHOCKS AND THE EXPANSION OF ARTIFICIAL INTELLIGENCE

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Abstract

Objectives: *The current period is fraught with considerable changes in all spheres and levels of economic, social, political, and cultural life. One of the major displays is the evolution of the labour market institutions in the European Union, and it can be tracked based on a comprehensive historical and contemporaneous framework capturing the profound structural transformations driven by recurrent external shocks and the accelerated digitalization of the economy, including the expansion of artificial intelligence. The study intends to map the developments as of the post-war reconstruction period, up to now, including the consolidation of the social market economy model, and to highlight how European integration, successive enlargements and policy coordination mechanisms have influenced and impacted the configuration and functioning of labour market institutions. At the same time, the research aims to assess the impact of emerging technologies on employment relations, labour market structures, and social protection systems, as well as the need of economic-social institutions' adjustment to new economic and social realities from the perspective of path dependence and institutional isomorphism.*

Method: *The methodological approach combines historical-institutional analysis with quantitative and econometric techniques. The first step is to examine key transformations of labour market institutions throughout the period of European integration, from the post-war period to recent crises, highlighting issues related to path dependence and institutional isomorphism, determining more or less "institutional club convergence" based on instruments such as the European Employment Strategy, European Social Fund and the European Semester. Next, the empirical analysis relies on the LABREF database on labour market reforms, complemented by governance indicators, and extended institutional frameworks. Five key institutional fields are investigated: labour market activation measures, unemployment benefits, labour taxation, employment protection legislation, and wage-setting mechanisms. The analysis explores dynamics, frequency, and intensity of reforms, as well as convergence and divergence patterns among member-states, by using panel data techniques and convergence testing methods.*

Results: *The findings show that labour market institutions within the EU have evolved through a continuous process of adjusting to economic, social and technological changes influenced strongly by the stages of European integration and major external shocks. While the post-war period supported the development of the social market economy and laid emphasis on*



strengthening social protection and social dialogue, the European integration fostered institutional “club” convergence through financial instruments and coordination mechanisms. However, some major events, like economic crises, and especially the 2008-2012 period, followed from a historical perspective almost immediately by the Covid-19 pandemic, led to a reorientation of policies towards active labour market measures, and rapid interventions for preserving employment. This also contributed to highlighting the crucial role played by the European solidarity mechanisms. At the same time, empirical evidence shows the existence of differentiated reform patterns across groups of member-states, suggesting partial and conditional convergence rather than full harmonization. The changes driven by digitalization and artificial intelligence exert significant pressure on traditional institutions, leading to emerging new forms of work and algorithmic management, as well as to changes in the structure of labour demand and skills supply. These processes contribute to increasing and widening income polarisation, considerable and higher inequalities, in particular in the absence of adequate institutional frameworks for monitoring, and regulating the labour market and ensuring protection of labour.

Originality: *The originality of the study is two-fold: on one hand it integrates the historical perspective on the evolution of labour market institutions with the contemporary analysis of digital and technological transformations. On the other hand, it integrates qualitative and quantitative analysis by building a bridge between the two dimensions, based on econometric techniques. Thereby, the paper proposes an interdisciplinary approach that combines institutional theory with empirical methods for analysing reforms and outcomes, thus providing for a comprehensive understanding of institutional adaptation mechanisms. Furthermore, the paper contributes to literature by highlighting the need for flexible and adaptive institutional frameworks for addressing the challenges posed by the digital economy and artificial intelligence intervention, while ensuring the balance between economic competitiveness, social protection, and inclusion.*

Keywords: *labour market institutions, institutional ‘club’ convergence, digitalization, artificial intelligence, employment policies, structural reforms, econometric modelling.*



THE SECTORAL ANATOMY OF MOLDOVA'S EXTERNAL VULNERABILITY: EVIDENCE FROM THE RECONSTRUCTED INPUT-OUTPUT SERIES

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Abstract

Objective: *The resilience of small open economies under geoeconomic confrontation, debt-driven external constraints, and cost-of-living pressure depends on how external shocks propagate through the sectoral structure of production, not only on their aggregate magnitude. The Republic of Moldova exemplifies the structural condition of small post-Soviet economies: open to external trade, dependent on a narrow range of trading partners, and exposed to economic shocks originating in those partners. While this vulnerability has been described qualitatively in successive IMF Article IV consultations and World Bank Country Economic Memoranda, no publicly documented analytical infrastructure has existed that would permit its quantification at sectoral resolution. The objective of this paper is to produce the first publicly documented sectoral anatomy of Moldova's external vulnerability, identifying both the magnitude and the channels through which external shocks transmit across sectors.*

Method: *The analysis combines two analytical components. First, an annual input-output series for the Republic of Moldova covering 2014–2023 at 20-sector NACE Rev.2 disaggregation, reconstructed by biproportional RAS updating from the 2014 Supply-Use Table published by the National Bureau of Statistics, with annual marginal controls on gross output, intermediate consumption, and gross value added. Second, a parsimonious semi-structural macroeconomic framework comprising five OLS-estimated behavioural equations for the expenditure-side aggregates – consumption, exports, imports, gross capital formation, and government consumption – estimated on annual data 2014–2024 and closed by the standard accounting identity. A structural bridge methodology translates aggregate macroeconomic shocks into sectoral output impacts via the Leontief inverse, applying the relation $\Delta x = L \cdot W \cdot \Delta Y$, where W is a sector-share weight matrix calibrated on observed export and consumption structures. Three counterfactual scenarios are examined: a 5% contraction in EU27 real GDP, a 10% fiscal revenue increase, and a 15% Moldovan leu depreciation against the euro.*

Results: *The 5% EU27 contraction generates a 9.8% reduction in total Moldovan gross output ($\Sigma \Delta x = -23.16$ billion MDL at constant 2014 prices), of which 26% accrues to sectors not directly exposed to exports through indirect supply-chain channels – a structural pattern invisible in standard aggregate macroeconomic models. Manufacturing absorbs 55% of the*



total impact, consistent with its dominant forward linkage under the Rasmussen criteria ($FL = 5.629$), while Energy, Trade, Real Estate, and Mining experience 90%+ indirect-dominated impacts despite zero direct export exposure. The fiscal impulse yields a sub-unitary aggregate multiplier (1.03 against revenues), reflecting that approximately 46% of additional government spending leaks abroad through import dependence. The 15% currency depreciation produces a near-zero sectoral impact under strict point-estimate elasticities, confirming the structurally weak exchange rate channel documented at the macro level. Three policy implications follow: stabilisation interventions targeted only at exporting sectors miss approximately one-quarter of the total economy impact attributable to indirect cross-sector linkages; fiscal expansion has limited efficacy as a standalone stabilisation tool; and exchange rate management is not a viable stabilisation instrument in the current Moldovan structure.

Originality: This paper provides the first publicly documented annual input–output series for the Republic of Moldova at NACE Rev.2 sectoral resolution and the first quantitative sectoral anatomy of its external vulnerability. The methodology is transparent, reproducible from public NBS data sources, and transferable to comparable small post-Soviet economies (Armenia, Georgia, Kyrgyzstan) sharing similar combinations of small open-economy structure, ESA-2010-compatible national accounts, and limited macromodelling infrastructure. The integration of biproportional IO updating with a parsimonious annual macroeconometric framework constitutes a new methodological architecture for sectoral resilience analysis in data-constrained transition economies.

Keywords: input–output analysis, external shocks, sectoral transmission, small open economies, resilience, Republic of Moldova

JEL Classification: C67, D57, E17, F41

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ROMANIAN LABOUR FORCE IN THE CONTEXT OF DEMOGRAPHIC CHANGES: TRENDS AND CHALLENGES

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Abstract

The availability and quality of human resources are essential factors for long-term economic and social development. In recent decades, many European countries, including Romania, have faced major demographic changes caused by declining birth rates, increasing life expectancy and population aging. Moreover, the already deteriorating demographic situation of the new, less developed EU member states has also suffered from the intensification of external migration. Under these conditions, significant changes have occurred in the structure of the population by age groups, with effects on the size and characteristics of the available labor force. The main objective of this paper is to analyze how demographic changes in Romania have influenced the evolution and structure of the labor force. The research is based on a quantitative approach, using official statistical data on the evolution of the population and the labor market in Romania. The methodology includes a descriptive analysis of the main demographic and socio-economic indicators, based on long-term data series from Eurostat. Moreover, a comparative approach is used to highlight the characteristics of Romanian indicators in relation to those of other EU countries. The findings indicate that the political transition of 1989 represented a turning point for Romania's demographic evolution, initiating a long-term population decline that has intensified in recent years, particularly after 2020. The sharp demographic decline signals a significant change from previous trends. Among the main factors that determined this evolution are the reduction in the birth rate, the increase in mortality, as well as the expansion of emigration, especially after Romania's accession to the European Union in 2007, when many individuals decided to take advantage of the right to free movement, including for work. This complex of causes led to an unparalleled demographic change, with long-term implications for the social and economic development. The shrinking of the active population pool contributes to increasing pressures on the labor supply and growing imbalances in certain sectors and economic activities. Moreover, the external migration of the active population, especially of young and highly qualified individuals, can amplify existing imbalances and influence the structure of the labor force by occupation and regional profile.

Keywords: *demographic changes, labour force, Romania, EU countries*



THE FISCAL–SOCIAL NEXUS IN CRISIS CONTEXTS: TRADE-OFFS AND SYNERGIES

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Abstract

Objective: The interaction between fiscal discipline and social protection has become one of the most debated issues in contemporary public policy, particularly in the context of overlapping crises such as the global financial crisis, the COVID-19 pandemic, the energy crisis, inflationary shocks, and increasing geopolitical uncertainty. Governments face a persistent policy dilemma: maintaining sustainable public finances while simultaneously protecting vulnerable groups and preserving social cohesion. Traditional approaches often portray fiscal consolidation and social expenditure as competing objectives, suggesting an inevitable trade-off between budgetary discipline and welfare provision. However, recent evidence indicates that the relationship is more complex, involving both tensions and complementarities that vary across institutional settings, stages of the economic cycle, and policy designs. Against this background, the present study aims to identify and analyse the trade-offs and complementarities between fiscal discipline and social protection during periods of economic and social crisis. The paper seeks to develop an integrated analytical framework capable of explaining how governments can reconcile fiscal sustainability objectives with the need to provide adequate social protection, while minimizing long-term economic and social costs. Particular attention is devoted to the role of policy design, institutional capacity, and targeted social interventions in shaping these relationships.

Method: The study employs a multidisciplinary and mixed-method approach that combines theoretical, institutional, and comparative policy analysis. First, a comprehensive review of the literature on fiscal sustainability, welfare state resilience, social investment, countercyclical fiscal policy, and crisis management is conducted. The review covers contributions from international organizations, including the International Monetary Fund, the World Bank, the Organisation for Economic Co-operation and Development, and the European Commission, as well as recent academic research. Second, the paper develops a conceptual framework that maps the interactions between fiscal discipline and social protection through three dimensions: fiscal sustainability, social resilience, and economic stabilization. Third, a comparative analysis of crisis responses adopted by European countries during recent crises is undertaken to identify recurring patterns, institutional arrangements, and policy outcomes. The analysis focuses on expenditure composition, automatic stabilizers, targeted social transfers, labour market interventions, and fiscal governance mechanisms. The methodological approach allows for the identification of both conflictual and mutually reinforcing relationships between fiscal and social policy objectives.

Results: The findings demonstrate that the relationship between fiscal discipline and social protection cannot be reduced to a simple zero-sum logic. While short-term trade-offs frequently



emerge during periods of fiscal stress—particularly when governments face rising debt levels, declining revenues, or external financing constraints—well-designed social protection systems can strengthen fiscal sustainability over the medium and long term. The study identifies several key trade-offs, including the tension between expenditure restraint and social adequacy, the allocation of limited fiscal resources among competing policy priorities, and the balance between immediate stabilization needs and long-term debt sustainability. At the same time, important complementarities are revealed. Targeted social transfers, active labour market policies, investments in human capital, and automatic stabilizers contribute not only to poverty reduction and social inclusion but also to economic recovery, labour market resilience, and revenue stabilization. The analysis further shows that countries possessing stronger institutional capacity, more efficient public expenditure management, and integrated fiscal-social policy frameworks are better able to transform potential conflicts into synergies. The results suggest that fiscal discipline and social protection should be viewed as interdependent pillars of resilient governance rather than as inherently contradictory objectives.

Originality: The originality of this study lies in its integrated perspective on the relationship between fiscal discipline and social protection during crises. Unlike conventional analyses that focus predominantly on fiscal consolidation costs or welfare expansion effects, the paper develops a multidimensional framework that explicitly incorporates both trade-offs and complementarities. The proposed approach moves beyond the traditional dichotomy between austerity and social spending by emphasizing the conditions under which social protection can function as a productive investment supporting fiscal sustainability. Furthermore, the study contributes to the emerging literature on crisis resilience by linking fiscal governance, social policy effectiveness, and economic stabilization within a unified analytical model. The framework offers practical relevance for policymakers seeking to design balanced policy responses capable of simultaneously safeguarding public finances, protecting vulnerable populations, and promoting sustainable economic recovery.

Keywords: Fiscal sustainability; Social protection; Trade-offs /complementarities; Crisis management; Welfare state resilience; Social investment; Public expenditure; Economic stabilization



FROM NECESSITY TO OPPORTUNITY ENTREPRENEURSHIP; IMPLICATIONS OF THE SCHUMPETERIAN MODEL

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Abstract

Objective: The paper's central argument is that countries in the European Union have advanced economically when entrepreneurial activity transforms quantity into quality. The change from opportunity entrepreneurship to necessity entrepreneurship, as well as the interplay between structural transformation and Schumpeter's innovation dynamics, all contribute to this transformation. If the regression models show a negative GDP coefficient, this structural shift gives a reasonable theoretical explanation. While structural transformation lowers the incidence of necessity entrepreneurship, innovation-driven entrepreneurship improves in quality but declines in quantity as economies advance. Collectively, these factors cause the overall level of entrepreneurial activity to decrease as GDP increases.

Method: To get this done, we used a panel data regression model. A subset of the EU member states that provided information for the selected indicators are part of this model. For this sample, we looked at data from twenty-four countries covering the eleven-year period and all four variables. During this time frame, a common sample is available for all variables. We constructed a panel regression model (log - log model) using this dataset. In order to find out how the regressors affected the dependent variable relative to its quantiles, a quantile regression model was also considered.

After accounting for technological advancements and new product launches, the results show that a negative GDP coefficient shows that quantitative rates of entrepreneurship are lower in countries with more advanced economies. This trend is consistent with the well-documented shift from NEED-based entrepreneurship in low-income countries to traditional wage work in high-income ones. There has been a general decrease in the prevalence of entrepreneurial activity in developed economies as a result of increased selection and innovation-driven entrepreneurship.

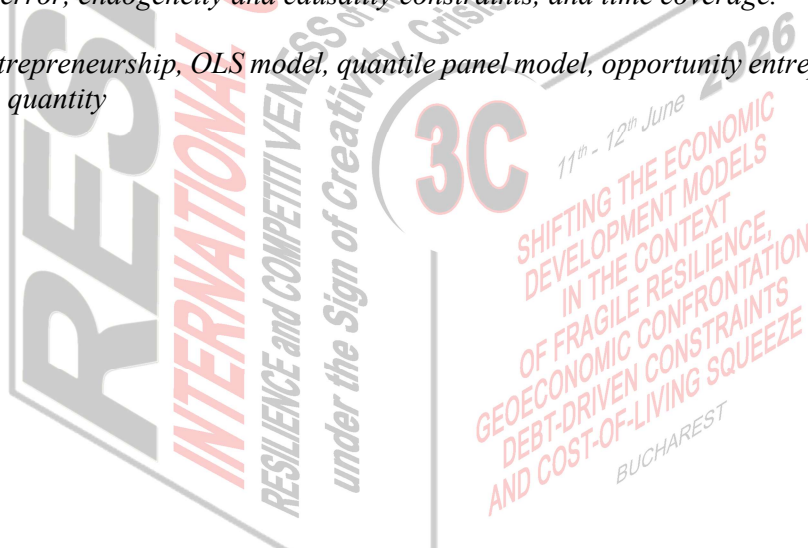


Notably, this interpretation is also supported by Schumpeter's theory of growth. Specialization, knowledge intensity, and innovation fuel entrepreneurial activity as economies evolve. While the quantity of entrepreneurs may fall, the calibre and influence of entrepreneurial endeavors rise. Low rates of firm creation are more common in high income nations, but high rates of technology-based, rapidly expanding businesses are more common. There is a negative correlation between GDP and the number of entrepreneurs in these settings, but a positive correlation between entrepreneurial output quality and GDP. The negative coefficient on GDP represents this structural shift, as the dependent variable in this model now measures quantitative entrepreneurship as a whole rather than innovation-driven or high-growth entrepreneurship in particular.

Originality: Unique to this study is the use of a panel regression model to examine all EU member states at once across four dimensions. We used quantile regression to shed light on the dependent variable in a way that the ordinary least squares (OLS) model couldn't. One possible indicator of the shift in the European Union's entrepreneurial mindset from one of need to opportunity is the GDP variable. While the number of necessity-driven entrepreneurship decreases as economies progress, its quality increases.

Research limitations: Some of the study's shortcomings stem from issues inherent to econometric modelling, while others are data-specific. Important questions pertain to the following: data availability, cross-country heterogeneity, model design, indicator measurement error, endogeneity and causality constraints, and time coverage.

Keywords: entrepreneurship, OLS model, quantile panel model, opportunity entrepreneurship, quality versus quantity





BUSINESS ENVIRONMENT DYNAMICS AND RESILIENCE IN THE EU METROPOLITAN AREAS

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Abstract

This article investigates territorial resilience within metropolitan areas of the European Union, situating the analysis within the broader framework of regional economic divergence, uneven urban development, and long-term growth sustainability. In contemporary economic geography, metropolitan areas are increasingly recognized as key engines of development, innovation, and productivity, yet their trajectories remain highly heterogeneous. Against this background, the main objective of the research is to evaluate the extent to which variations in business dynamics influence economic performance across EU metropolitan territories. The study focuses specifically on the relationship between entrepreneurial structures and economic output, measured through GDP expressed in million PPS, for a sample of 65 metropolitan areas. The underlying assumption is that territorial resilience is strongly conditioned by the capacity of local economies to generate, sustain, and expand productive activity over time. The dataset covers 65 metropolitan regions in the European Union and incorporates key indicators reflecting the structure of the business environment. Two primary explanatory variables are used: the number of active enterprises, representing the density of entrepreneurial ecosystems, and the number of employees within the business sector, capturing the labour absorption capacity. The dependent variable is GDP expressed in million PPS, used as a standardized measure of economic output that allows comparability across territories. The econometric approach is designed to capture the influence of business environment dynamics on economic performance while controlling for unobserved heterogeneity across metropolitan areas. This framework enables a more precise identification of structural relationships between entrepreneurial activity and territorial economic outcomes. The findings indicate a strong and positive association between business activity and economic performance at the metropolitan level. Metropolitan areas with higher levels of entrepreneurial activity and employment tend to exhibit a stronger economic output. At the same time, significant disparities are observed across metropolitan territories, highlighting uneven patterns of development within the European Union. The results confirm that variations in the structure of the business environment are closely linked to differences in territorial economic resilience. These differences suggest that territorial resilience is not uniformly distributed but is instead closely linked to the intensity and organization of local economic ecosystems. Furthermore, the results indicate that both the scale of enterprises and the employment base contribute jointly to strengthening economic output, reinforcing the idea that



territorial performance is shaped by the interaction between firm density and labour market integration.

*The **originality** of this article lies in its metropolitan-scale comparative approach across a broad set of European Union territories and in its focus on business environment dynamics as central determinants of territorial resilience. Unlike studies that emphasize macroeconomic aggregates or national-level indicators, this research concentrates on metropolitan areas, providing a more granular understanding of economic performance disparities. Additionally, the integration of both enterprise density and employment structure within a unified panel data framework allows for a more comprehensive assessment of how entrepreneurial ecosystems influence economic outcomes. By linking these structural variables to GDP measured in million PPS, the study contributes to a more nuanced interpretation of territorial resilience and offers relevant insights for regional policy design and urban development strategies aimed at strengthening long-term economic sustainability.*

Keywords: *territorial resilience, metropolitan areas, European Union, panel data analysis, economic performance, entrepreneurial structure, regional disparities*





IS EMIGRATION A DRIVER FOR SUSTAINABLE DEVELOPMENT? CONTROVERSIAL EFFECTS OF REMITTANCES FOR ORIGIN COUNTRIES

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Abstract

Migration for work, for the purpose of remittance, is the main motivation for the international circulation of workers, especially those from less developed countries. For the country of origin, it is considered an important driver for sustainable development and poverty alleviation of the household, but it depends largely on the way in which these are spent. If, in the short term, it generates obvious favourable effects, in the medium and long term mixed and controversial effects are identified. In addition to covering the income deficit of the household, remittances generate various effects and behaviours at local and national levels with economic, social, educational, demographic and behavioural impact. On the one hand, provide direct cash that smooths household consumption, are invested in healthcare, nutrition and quality of life. Also facilitate access to education for the poorest. Remittances can represent a source of investment for entrepreneurial development and cover special needs in times of crisis or natural disasters in the country of origin. On the other hand, the flow of remittances can generate adverse, unfavourable effects and passive behaviours: a) can reduce the labour supply and decrease incentives for alternative job-seeking (Dependency Culture) and local innovation, b) can generate social discrimination and inappropriate behaviours towards those who do not benefit from such financial sources, c) lead to the de-structuring of the labour market and deficits in professions, both for the highly qualified (doctors, engineers, IT specialists, etc.) but also for essential professions (in construction, personal services, etc.). At the macroeconomic level, can generate "Dutch Disease", widening inequality, demographic decline (through permanent migration or the refusal of children to live in the country of origin, becoming, in turn, migrants).

The flow of remittances erodes over time. The multi-year extension of work abroad also changes the distribution model between consumption in the host country (and even investments) and remittances to the extended household in the country of origin. Also, the extension of the period of work abroad also determines the completion of the family nucleus,



children studying abroad, thus consolidating the permanence of migration, increasing the probability of permanent settlement, at which point the motivation/need for remittances, in many cases, decreases substantially or even ceases.

Starting from the fact that in the specialized literature we find few works on the fragility of the sustainability of remittances, moreover an aspect less researched by specialists, and from the fact that the stock of the migrant population grows faster than remittances, in this paper we set out to identify the extent to which remittances are sustainable in the case of Romania. Based on the analysis of the migrant stock, remittance flows and indicators supporting sustainable economic development (employment, entrepreneurship, poverty) we determined the links between the number of migrants and, respectively, remittances and the economic and social development in the country of origin. The analysis data are extracted from the databases available at Eurostat, the UN and the World Bank.

The results indicate mixed effects, predominantly favourable to households, in the short term, and the multiplication of adverse effects, affecting economic and social development at local and national levels, in the long term. The conclusions emphasize the increase in the volatility of remittances, depending on the duration of mobility and their lower dynamics compared to the increase in the stock of the population working on the international labour market. Moreover, remittance flows are all the more volatile as the qualification level of migrant workers increases. From the perspective of support policies for increasing the added value from the labour mobility of migrants, in the case of Romania, a decoupling of measures from the real requirements of solving acute problems on the labour market and in the social plan, generated by prolonged labour mobility and the increased migration of new contingents of graduates, especially in professions associated with economic performance and technological progress, is evident.

Keywords: remittances, sustainability, poverty, labour market, externalities, labour migration



ASSESSING EARNINGS DYNAMICS IN ROMANIA: RECENT TRENDS AND PATTERNS

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Abstract

The last two decades have been marked by numerous challenges that have also affected the labour market. The succession of crises with different origins (the global financial crisis of 2008, the Sars-Cov2 pandemic that broke out in 2020, followed by the geopolitical turbulences (Ukraine, Iran)), but also technological advances and the deepening of the digitalization process have generated significant effects, including on the level and dynamics of earnings. The incomes generated through employment and professional activities may depict the evolution of labour market conditions and are a key measure of the economic status of both individuals and households. The analysis of labour remuneration has become increasingly relevant especially against the backdrop of increasing interdependence between states. The mobility of the labour force is often influenced by the wage differences between countries. The main objective of this paper is to highlight the recent dynamics of earnings in Romania and of Romania's position in the European landscape. The methodology used is based on a brief literature review section, followed by the analysis of several key indicators related to earnings. Data from the latest Structure of Earnings Surveys (SES) were used. The results underline the changes in the level and distribution of earnings across economic sectors, occupations, and demographic groups. Furthermore, a comparative analysis places Romania within the broader European context, allowing the identification of similarities and differences in earnings patterns with other EU Member States. The originality of this paper lies in its integrated approach, which combines the examination of the dynamics of earnings in Romania with a comparative assessment of the country's position within the European context.

Keywords: earnings, Romania, Structure of Earnings Survey, EU member states



SESSION 4: NATURE-BASED SOLUTIONS, GREEN CITIES AND CIRCULAR ECONOMY

LEVERAGING ARTIFICIAL INTELLIGENCE FOR SUSTAINABLE WASTE MANAGEMENT AND CIRCULAR ECONOMY OPTIMIZATION: A QUALITATIVE EXPLORATION WITHIN THE FRAMEWORK OF SDG 9 AND SDG 12

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Abstract

Objective: Artificial Intelligence (AI) is now known as a game-changing technology that can significantly drive sustainable development through increased efficiency, better decision-making, and promoting sustainable industrial activities. While the world is increasingly focused on integrating AI technology into sustainable solutions and practices, the theoretical and contextual links between AI and the principles of the Circular Economy (CE) and Sustainable Development Goals (SDGs) are not yet well understood, especially in various economic contexts. While previous study has mainly highlighted the technological potential of AI in sustainability, there has been less attention on the on-the-ground implementation of these AI-supported sustainability practices in existing circular economy systems and governance. To meet this challenge the aim of the present study is to explore how the framework of the Circular Economy can enable the adoption of AI driven waste management and the optimisation of waste management for sustainability in the SDG 12 (Responsible Consumption and Production) and SDG 9 (Industry, Innovation and Infrastructure). Specifically, the study aims to investigate the role of AI technologies in resource efficiency, waste minimisation,



sustainable industrial transformation and environmentally responsive production systems in developed and developing economies.

Method: The study is theoretically guided with qualitative multiple case study methodology. The data used for the study comes from secondary sources from reliable and public sources like government websites, sustainability reports, magazines, newspapers, industry publications and academic papers. To reflect the differences in institutional preparedness, governance structures, technological capacity and priorities for sustainability, two comparative case studies are chosen, one in a developed and another in a emerging/developing economic environment. The comparative design allows the analysis of the process through which the AI-based sustainability interventions are implemented within the socio-economic and policy environment. Furthermore, the Circular Economy approach is employed as the primary analytical paradigm for examining the employment of AI for sustainability purposes. The themes associated with resource cycling, waste reduction, recycling optimization, lifecycle management, and sustainable industrial innovations have been identified as the key conceptual issues for this purpose. This implementation permits the study to go beyond the technological explanation alone and to extend its reach to provide broader insights into the contribution of AI to sustainability transitions.

Results: The study finds that there are several ways through which AI can play an important role in strengthening the circular economy efforts. AI technologies can help reduce material wastage, optimize energy consumption, facilitate recycling processes, and improve the sustainability performance indicators of industries concerning SDG 12 and SDG 9. Moreover, AI technologies in areas like smart waste separation systems, predictive analysis, automated monitoring systems, and intelligent production processes have shown great potential for responsible production and consumption. However, the cross-case study analysis indicates that there could be huge variations in the effects of a sustainability program based on AI in emerging economies versus developed countries. There are various strengths that make the latter ready for more comprehensive sustainability transitions due to their institutional, technological, regulatory, and investment capacities. Conversely, many issues hinder emerging countries from adopting and sustaining any AI-based circular economy programs, such as inadequate technological infrastructure, ineffective governance systems, inconsistent policy frameworks, financial limitations, and institutional fragmentation.

Originality: This study contributes to the existing literature that discusses AI and sustainable development through analyzing AI-enabled sustainable practices from a circular economy perspective in various economic environments. In addition to this, the study extends previous findings on the subject matter by demonstrating how the underlying concepts of a circular economy can be an essential supporting framework for the use of AI-based technologies in boosting sustainability efforts. Overall, the study makes a significant contribution by providing a comparative perspective on the impact of governance quality, institutional capacity, and policy on the effectiveness of AI-based sustainability efforts. Policy makers, industry leaders and development practitioners interested in integrating AI in an agenda that can support sustainable industrialisation and responsible consumption systems will find the findings relevant and important from a practical standpoint.

Keywords: artificial intelligence, waste management, circular economy, emerging economy, Sustainable Development Goals, SDG 9, SDG 12



MAB-FAES: CLIMATE-SMART FLOATING AGRO-ECOSYSTEMS FOR RESILIENT FOOD SYSTEMS IN SALINE-AFFECTED COASTAL BANGLADESH

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Abstract

Objective: Coastal Bangladesh holds about 30 percent of the total cultivable land of the nation, but out of which 1.056 million hectares suffer from salinity, compromising the food security and livelihood of over 30 million individuals. Furthermore, the problem is aggravated due to rising sea levels, saline inundation via cyclones, and freshwater shortage, while the anticipated yield loss of high-yielding rice is expected to be 15 to 17 percent by the year 2050. Within this scenario of climatic sensitivity and reduced agricultural resilience, the research seeks to determine if managed mangrove-based floating agro-ecosystems (MaB-FAEs) can offer a feasible and evidence-based approach toward food insecurity, land degradation, and livelihood sensitivities of coastal Bangladesh under salinity.

Methodology: In this research, the methodology adopted is a combination of both qualitative and quantitative approaches using secondary data analysis and evidence synthesis. Data for the research will include governmental salinity baselines, World Bank yield projections, scientific studies on the salt tolerance of mangroves, FAO case studies on floating gardens, scientific research on ecosystem service valuation, and national policies, including the Bangladesh Delta Plan 2100 and BCCSAP. The research process is divided into five steps: defining the salinity problem, validating the mangrove physiology mechanism, assessing the productivity and profitability of the floating gardens, estimating the mangrove ecosystem service value, and matching the model to national adaptation and financing strategies.

Findings: The results indicate that mangrove species like *Avicennia officinalis* and *Avicennia marina* can exclude up to 90-95% of salts using a root-level hydrophobic barrier system to support their ecological processes even in highly saline environment. The results also reveal that floating gardens have about 10 times more productivity compared to conventional farming in flood prone areas, which also enables all year-round farming in an area which would have remained vacant in the dry seasons. Economic wise, the floating garden is cost effective with benefit-cost ratio of 1.80, while mangrove ecosystem services in Bangladesh are valued between USD 450-1000 per hectare per year. Therefore, combining these characteristics, MaB-FAE provides technical viability, economic sustainability, and social inclusiveness. Finally, the research suggests scaling up the model through incorporation into the Bangladesh's Delta Plan 2100 and BCCSAP, which could target more than 50,000 hectares in 2035 and piloted in some of the hardest hit districts like Satkhira, Bagerhat, and Barguna.

Originality: The originality of the research paper is rooted in its unified approach to topics that have typically been treated independently in previous studies. Instead of analyzing the



effects of salinity, mangrove ecosystems, floating agriculture, economic value of ecosystem services, and adaptive policy separately, the paper examines them all in an integrated perspective that considers the case of saline-affected coastal regions of Bangladesh. By taking an innovative approach, MaB-FAE is characterized not just as an agricultural technology, but as a socio-ecological system that can promote ecological sustainability, economic prosperity, community management, and public policy. Such an innovation is expected to pave the way toward the implementation of SDG 2, SDG 13, and SDG 15.

Keywords: *ecosystem-based adaptation, coastal salinity, floating gardens, food security, climate resilience, mangrove restoration, sustainable development goals.*





BUFFERING THE COST-OF-LIVING SQUEEZE? THE CONDITIONAL ROLE OF CIRCULAR ECONOMY DEVELOPMENT IN MITIGATING HOUSEHOLD FINANCIAL VULNERABILITY ACROSS THE EU-27

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Abstract

Objective: The period between 2021 and 2025 across Europe was structurally defined by overlapping supply disruptions, geopolitical tensions, and unprecedented inflationary waves, triggering a severe cost-of-living squeeze that eroded real disposable incomes and heightened household financial vulnerability. Concurrently, the Circular Economy (CE) has risen to the top of European policy agendas through the Green Deal and the Circular Economy Action Plan. However, sustainability literature remains overwhelmingly biased toward industrial metabolism, resource decoupling, and environmental efficiency, leaving the socio-economic welfare and short-term resilience implications of circularity deeply fragmented and underexplored. This study addresses this encoding bias and scale mismatch by investigating whether macro-level circular economy development protects households from rising inflation. Specifically, the objective is to assess whether a country's circular material use rate directly reduces household financial fragility or functions as a structural buffering mechanism that moderates the adverse effects of inflationary pressure on citizens' capacity to face unexpected financial expenses across European Union member states.

Method: To empirically test these relationships, the study constructs a balanced longitudinal panel dataset covering all EU-27 member states over the period 2019–2024, integrating harmonized macroeconomic, social, and environmental indicators from Eurostat. Macroeconomic price shocks are operationalized through the annual rate of change of the Harmonised Index of Consumer Prices, entering the specification with a one-year lag to capture delayed transmission mechanisms. Circular economy development is measured via the Circular Material Use rate, testing both linear and non-linear quadratic specifications. To prevent omitted variable bias and properly isolate the resource-channel transmission, the empirical design incorporates time-varying control variables representing structural labor-market conditions through the national unemployment rate and state-level institutional capacity through social protection expenditures. Household financial vulnerability is proxied by the subjective indicator tracking the percentage of total households unable to face unexpected financial expenses. The econometric strategy relies on fixed-effects panel regressions with clustered standard errors at the country level to control for time-invariant



unobserved country heterogeneity and global temporal shocks through year fixed effects. To capture structural variations, the design incorporates a split-sample regime analysis alongside a fully interacted pooled structural heterogeneity model to ensure parameter consistency.

Results: The empirical findings reveal a highly non-linear, heterogeneous, and context-dependent relationship, challenging overly simplistic assumptions regarding automatic green welfare gains. At the aggregate EU-27 level, baseline estimates show that neither inflation nor circularity exhibits a statistically robust direct association with household vulnerability. This aggregate decoupling is conceptually explained by the massive deployment of short-term government fiscal shields and energy price caps across Europe that temporarily insulated household liquidity. Within this baseline framework, labor-market distress—captured by the highly significant positive coefficient of the unemployment rate—and institutional cushions—reflected in the protective effect of social protection expenditures—emerge as the primary macroeconomic determinants of household fragility. Crucially, when partitioning the sample into distinct circularity regimes, a powerful structural divergence uncovers that while in low-circularity countries no systematic interactions are identified, in advanced circular economies the interaction term between inflation and circularity yields a robust, statistically significant negative buffering coefficient. This confirms that circularity operates as an effective socioeconomic stabilizer strictly conditional upon an economy crossing a critical threshold of macro-structural maturity, altering the elasticity of price shocks independently of labor and welfare trends.

Originality: The originality of this paper lies in its pioneering shift of the circular economy paradigm away from an exclusively production-centric framework toward an integrated social resilience model. By blending Resource Dependence Theory and Evolutionary Economic Resilience Theory, this study provides some of the first macro-empirical evidence demonstrating that circularity acts as a conditional macroeconomic coping infrastructure for households during price shocks. On a theoretical level, it challenges the dominant eco-efficiency framework by illustrating that biophysical flows and social welfare operate on decoupled socio-economic planes, proving that circularity requires sufficient structural depth before it can interact with traditional social determinants like unemployment and welfare configurations. Practically, the study introduces urgent guidelines for European policy design, proving that circular indicators must be embedded directly into social welfare monitoring systems like the European Pillar of Social Rights. It demonstrates that to unlock the protective shield of circularity, macroeconomic, structural, and social protection policies must be jointly coordinated to target the structural depth of the circular transition. Furthermore, the findings present an innovative counter-cyclical framework for corporate managers, proving that advanced circular configurations possess an unexploited systemic value proposition to alter shock transmission and protect household welfare during macroeconomic crises.

Keywords: circular economy, cost-of-living squeeze, inflationary shocks, household vulnerability, unemployment rate, social protection, economic resilience, structural maturity threshold, panel data analysis.



MIXED TRANSITION TRAJECTORIES IN EU27 RESILIENCE-PRESSURE PROFILES: CIRCULAR-MATERIAL, ENERGY, ENVIRONMENTAL, AND FISCAL DOMAINS

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Abstract

Objective: Recent European pressures have made resilience-pressure analysis a question of overlapping transition constraints rather than a single recovery path. Energy-price shocks, geopolitical exposure, inflationary pressure, resource-use challenges, decarbonization needs, and public-finance constraints have affected European Union economies through different structural channels. This article examines how the twenty-seven member states of the European Union (EU27) differ in circular-material capacity, material-pressure context, energy exposure and transition, environmental pressure, and fiscal constraint over 2010-2024. The study addresses an analytical gap in EU country-level research. Existing comparative designs often examine one domain in depth, estimate indicator relationships, construct efficiency or sustainability scores, or group countries through aggregate measures. The objective here is to keep the main domains visible together, compare country positions across three study-defined temporal windows, and identify the transition trajectories that emerge when countries are classified through empirical EU27-relative cutpoints. This framing is especially relevant for the recent European context, where circular-material progress, energy exposure, emissions pressure, and fiscal room may change at different speeds within the same national economy.

Method: The analysis uses harmonized public Eurostat indicators organized as an EU27 country-year panel for 2010-2024. Country-year observations are summarized into three temporal windows: 2010-2014 as the reference period, 2015-2019 as the transition/pre-pressure period, and 2020-2024 as the recent-pressure period. The empirical design is a quantile-anchored multidimensional longitudinal profiling approach. Circular material capacity is represented through circular material use rate (CMUR), resource productivity, and municipal recycling, while domestic material consumption (DMC) is retained as a material-pressure context indicator. Energy exposure and transition, environmental pressure, and fiscal constraint are represented through harmonized construct-block positions. Indicators are directionally aligned so that higher harmonized values indicate more favorable relative positions within the EU27 distribution. Country-window construct-block scores are classified through empirical tertiles. Recent-pressure archetype families are derived from the intersection



of circular-material capacity and energy exposure and transition, while environmental-pressure and fiscal-constraint positions are retained as modifiers. Baseline-to-recent transition trajectories are classified through standardized thresholds, with the main rule based on ± 0.5 standard deviations. Diagnostic checks examine CMUR/DMC/resource-productivity interpretation, municipal recycling sensitivity, sub-model overlap, clustering, principal component analysis (PCA), and shock-window context.

Results: The results show that EU27 resilience-pressure profiles are structured, multidimensional, and non-synchronous. During the recent-pressure period 2020-2024, the profiling procedure produced 25 detailed full-profile codes, which were reduced to 9 archetype families. This indicates recurring cross-domain configurations rather than isolated country-specific cases. Transition trajectories are mixed across the EU27: 16 of the 27 member states advanced in at least one structural domain while simultaneously declining in at least one other during the 2010-2014 reference period and the 2020-2024 recent-pressure period. At the block level, circular-material capacity records 10 advancing, 10 stable, and 7 declining countries; energy exposure and transition records 9 advancing, 9 stable, and 9 declining countries; environmental pressure records 7 advancing, 12 stable, and 8 declining countries; and fiscal constraint records 6 advancing, 13 stable, and 8 declining countries. The circular material diagnostics add a more specific result. Eleven cases combine rising CMUR, falling DMC, and increasing resource productivity, indicating clearer circular-material improvement under a material-pressure reading. At the same time, the main and sensitivity thresholds flag 5 and 8 ambiguous CMUR/DMC cases, respectively. Municipal recycling sensitivity changes 6 of 27 recent circular material capacity assignments, showing that recycling matters for a subset of country profiles while maintaining the broader profile structure's readability. Sub-model, clustering, and PCA diagnostics indicate that the empirical information is distributed across partially overlapping configurations rather than concentrated along a single dominant axis.

Originality: The article's originality lies in its profile-based analysis of heterogeneity in resilience pressures across the EU27. The study keeps circular-material, energy, environmental, and fiscal positions visible together over time, making it possible to observe coexistence, divergence, and mixed movement among domains that are often studied separately or compressed into aggregate measures. The article, therefore, offers a transparent complement to efficiency models, composite rankings, dashboard approaches, and panel studies of indicator drivers. Its contribution is empirical and methodological: it documents a structured but uneven EU27 transition landscape in which national economies combine progress and constraint in different ways, and it provides a reproducible public-data design for interpreting those combinations.

Keywords: EU27, circular economy, resilience-pressure profiles, circular material use rate, domestic material consumption, energy exposure and transition, environmental pressure, fiscal constraint, multidimensional profiling, transition trajectories



REDESIGN THE AGRICULTURAL EXTENSION SERVICES IN EMERGING ECONOMIES: A STRATEGIC APPROACH FOR MOLDOVA

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Abstract

Objective: *This study addresses the role and effectiveness of agricultural extension services in emerging and transition economies, with a specific focus on the Republic of Moldova. Agricultural extension systems are widely recognized as essential instruments for improving farm productivity, facilitating innovation adoption, and enhancing market integration, particularly for small-scale farmers. However, in many transition economies, including Moldova, these systems remain fragmented, under-resourced, and poorly aligned with the evolving needs of the agricultural sector. The objective of this research is to critically assess the current configuration, accessibility, and performance of agricultural extension services in Moldova, while identifying key structural gaps and inefficiencies. Furthermore, the study aims to propose a revised and more effective model of extension service delivery that aligns with international best practices, supports innovation, and enhances the integration of farmers into value chains.*

Method: *The research employs a mixed-methods approach, combining both quantitative and qualitative techniques to ensure a comprehensive analysis of the agricultural extension system. Quantitative data were collected through a structured questionnaire administered to more than 120 farmers across multiple regions of the Republic of Moldova, including small-scale, medium, young, and women farmers. The survey explored key aspects such as access to advisory services, frequency of interaction with service providers, perceived relevance of services, and barriers to innovation adoption. Complementary qualitative data were obtained through semi-structured interviews and focus group discussions involving representatives of farmer organizations, extension service providers, agribusiness consultants, and development practitioners. Additional insights were derived from secondary sources, including national policy documents, academic studies, and international reports. The integration of these methods allowed for triangulation of findings and a deeper understanding of both institutional dynamics and farmers' experiences.*

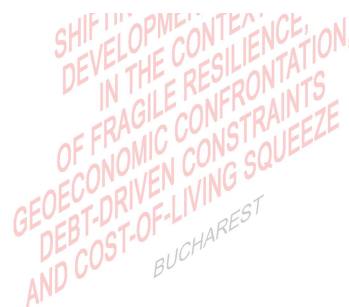
Results: *The findings reveal significant gaps in the accessibility, coordination, and effectiveness of agricultural extension services in Moldova. Only a limited proportion of farmers reported regular access to advisory services, while a considerable share indicated either occasional, project-based interactions or no access at all. The results highlight a systemic bias toward production-oriented advisory support, with insufficient attention given to market integration, value chain development, innovation adoption, and business-oriented skills. Institutional fragmentation emerges as a major constraint, characterized by weak coordination among public institutions, private actors, non-governmental organizations, and donor-funded initiatives. This lack of integration leads to inconsistent service delivery and reduced impact on farmers' performance.*



The study also demonstrates a strong correlation between access to quality advisory services and the adoption of agricultural innovations. Farmers who benefit from regular and targeted support are more likely to implement improved practices, although innovation remains largely limited to low-risk activities. High-value innovations, such as certification, digitalization, and integration into structured value chains, remain underutilized. Furthermore, the role of extension services in facilitating value chain participation is found to be minimal, indicating a critical gap in linking farmers to markets. Overall, the results underscore the need for a more holistic, coordinated, and market-oriented extension system capable of supporting sustainable agricultural development.

Originality: *The originality of this study lies in its integrated analytical framework, which combines empirical evidence from farmer-level surveys with institutional analysis and stakeholder perspectives to provide a comprehensive assessment of extension services in a transition economy context. Unlike traditional approaches that focus primarily on production aspects, this research emphasizes the importance of market integration, innovation systems, and value chain development as core components of modern extension services. The study proposes a revised model based on a pluralistic and coordinated approach, where farmer organizations play a central role as intermediaries and facilitators of knowledge transfer, innovation, and digital transformation. The proposed model also incorporates digital extension tools, enhanced stakeholder coordination, and stronger integration with value chains, offering a scalable and replicable solution for other emerging economies facing similar challenges. By bridging the gap between theory, policy, and practice, the study contributes to the advancement of more effective and sustainable agricultural advisory systems.*

Keywords: *agricultural extension services, innovation adoption, value chain integration, small-scale farmers, emerging economies, Moldova, rural development*





BUILDING RESILIENT AND COMPETITIVE SMES THROUGH CIRCULAR ECONOMY PRACTICES: EVIDENCE FROM THE EUROPEAN UNION

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Abstract

Objective: *The European economy is undergoing a profound transformation driven by climate objectives, digital transition, geopolitical tensions, supply-chain disruptions, inflationary pressures, and increasing concerns regarding resource security. Within this context, the circular economy (CE) has emerged as a strategic framework capable of supporting the transition toward more resilient and competitive economic development models. Small and medium-sized enterprises (SMEs), which represent the backbone of the European economy, play a pivotal role in this transformation. However, despite growing policy support at the European level, the adoption of circular economy practices remains uneven across Member States due to financial constraints, limited innovation capacity, technological barriers, and regulatory complexity. At the same time, consumers increasingly demand sustainable products, greater transparency, and stronger guarantees regarding product quality, durability, and environmental impact. Against this background, the present study investigates whether the advancement of circular economy practices contributes simultaneously to SME competitiveness and economic resilience while strengthening consumer protection within the European Union. The paper seeks to assess the extent to which circular economy maturity can support a shift toward more sustainable development models capable of addressing contemporary economic and social challenges.*

Method: *The analysis is based on a balanced panel dataset covering the 27 European Union Member States during the period 2015–2024. Data were collected from Eurostat, the World Bank, and the Enterprise Surveys database and include indicators related to circular material use, SME economic performance, innovation capacity, macroeconomic conditions, and consumer confidence. Circular economy maturity is proxied through the circular material use rate, while SME competitiveness is measured through indicators reflecting value added and business performance. Consumer confidence is employed as a proxy for consumer protection, reflecting consumer perceptions regarding market transparency, product reliability, and future economic expectations. To investigate the relationships among these variables, the study employs panel data econometric techniques with country fixed effects and time controls. The empirical framework allows for the identification of both structural and temporal effects while controlling for heterogeneity across countries and broader macroeconomic shocks affecting the European economy during the observation period.*



Results: *The empirical findings reveal a significant and robust positive relationship between circular economy maturity and SME economic performance. Countries displaying higher levels of circular material utilization tend to exhibit stronger SME value creation and enhanced business competitiveness. These results suggest that circular practices contribute not only to resource efficiency but also to improved productivity, innovation, and long-term business sustainability. Furthermore, the analysis indicates that circular economy adoption supports economic resilience by reducing dependence on primary raw materials and enhancing firms' capacity to adapt to external shocks and resource-related constraints. Concerning consumer protection, the results reveal a more complex dynamic. In short-term specifications, the relationship between circularity and consumer confidence appears slightly negative, potentially reflecting consumer uncertainty associated with new production models, green claims, or transitional market adjustments. However, once temporal effects and macroeconomic disturbances are incorporated into the model, the relationship becomes positive and statistically significant. This finding suggests that, over time, greater circular economy maturity contributes to increased consumer trust through improved transparency, sustainability performance, and product durability. The results also highlight the importance of innovation ecosystems and supportive policy environments in maximizing the economic and social benefits associated with circular transitions.*

Originality: *This study contributes to the literature by integrating three dimensions that are often examined separately: circular economy adoption, SME competitiveness, and consumer protection. While previous studies have primarily focused on environmental outcomes or firm-level efficiency gains, the present research develops a broader analytical framework linking circular economy maturity to economic resilience and sustainable competitiveness within the context of changing European development models. By combining cross-country evidence from all EU Member States over a ten-year period, the study provides novel empirical insights into the role of circular economy practices in strengthening both business performance and consumer trust. The findings offer valuable implications for policymakers, financial institutions, and business stakeholders seeking to design strategies that foster resilient, innovative, and consumer-oriented economies capable of responding to contemporary geopolitical, economic, and environmental challenges.*

Keywords: *circular economy, SMEs, economic resilience, competitiveness, consumer protection, sustainable development, innovation capacity, European Union*



INCREASING THE RESILIENCE OF THE WATER SUPPLY SYSTEM FOR GREEN BUSINESSES BY IMPROVING RISK MANAGEMENT

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Abstract

The article examines ways to improve the existing water supply risk management system for the green business sector in Chisinau municipality, in the context of increasing climatic, technical and institutional pressures on water resources. The research capitalizes on an integrated approach, based on the analysis of technical and technological directions for the modernization of the municipal water supply system, on the assessment of the peculiarities of risk management within the municipal enterprise and on the comparison of local experience with advanced practices applied in western European countries. The research used methods of comparative analysis, synthesis and generalization, as well as the examination of technical-economic and performance indicators of the municipal water supply system. The results highlight the need to strengthen the resilience of the water supply infrastructure by modernizing equipment, reducing operational vulnerabilities, improving the monitoring of performance indicators and integrating preventive risk response mechanisms. At the same time, the study emphasizes the importance of institutional adaptation and the transfer of good European practices regarding risk management, technological efficiency and water supply safety. The conclusions show that improving the risk management system contributes not only to securing the continuity and quality of water services, but also to supporting the sustainable development of green businesses in Chisinau. The originality of the work lies in the integrated approach to water supply risks for the green business sector in Chisinau, by correlating local technical and technological solutions with advanced western European practices and the need to strengthen institutional and operational resilience.

Keywords: *resilience, risk management, water supply, green business, sustainability.*

Funding: *The research was developed within the framework of Subprogram 030101 „Strengthening the resilience, competitiveness, and sustainability of the economy of the Republic of Moldova in the context of the accession process to the European Union”, institutional funding.*



GREEN INFRASTRUCTURE, SMART GOVERNANCE, AND INCLUSIVE URBAN DEVELOPMENT IN ROMANIA

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Abstract

Objective: In the context of accelerating climate change, geoeconomic instability, rising energy costs, and increasing pressure on urban resources, sustainable smart cities have become central to contemporary debates concerning resilient economic development and environmental governance. European cities, particularly those in emerging economies, are confronted with the challenge of balancing technological modernization with social inclusion and ecological sustainability. In Romania, regional inequalities, infrastructure deficits, demographic decline in vulnerable areas, and uneven access to digital innovation continue to shape urban development trajectories. Against this background, smart city initiatives and green infrastructure policies are increasingly regarded as strategic instruments capable of supporting local resilience, reducing environmental degradation, and improving urban quality of life. This study investigates how Romanian municipalities can integrate smart technologies and nature-based solutions in order to stimulate inclusive green growth and strengthen economic resilience in regions affected by economic fragility and geopolitical uncertainty. The research aims to analyse the effectiveness of integrated smart-green infrastructure projects in promoting sustainable urban development while addressing contemporary challenges related to energy efficiency, environmental protection, social equity, and economic adaptability. Particular attention is given to the ways in which intelligent urban systems and green infrastructure can contribute to reducing cost-of-living pressures, generating employment opportunities, and attracting sustainable investment in economically vulnerable communities.

Method: The study employs a comparative mixed-methods approach focused on a few Romanian municipalities situated at different stages of economic and infrastructural development. The methodological design combines qualitative and quantitative research techniques in order to evaluate the social, economic, and environmental impact of smart-green urban initiatives. First, a comparative policy analysis was conducted to examine local and regional urban development strategies, sustainability plans, smart city policies, and public investment frameworks related to green infrastructure and digital innovation. Second, semi-structured interviews were carried out with local authorities, urban planners, environmental specialists, business representatives, and civil society stakeholders in order to identify both opportunities and barriers associated with implementing integrated smart-green projects. Third, the study evaluated selected urban initiatives, including intelligent energy systems, green mobility networks, urban green corridors, digital governance platforms, and circular waste management solutions. Data interpretation relied on thematic analysis and comparative evaluation techniques, enabling the identification of recurring development patterns and policy gaps across the selected municipalities.



Results: *The findings demonstrate that integrated smart-green infrastructure projects contribute significantly to enhancing urban economic resilience and environmental sustainability. Municipalities investing in intelligent energy systems and energy-efficient public infrastructure reported lower operational costs, improved resource management, and increased attractiveness for sustainable investment initiatives. The development of urban green corridors and nature-based solutions was associated with reductions in environmental degradation, improved public health indicators, and enhanced social cohesion within local communities. Circular waste management platforms and digitally coordinated environmental services also contributed to more efficient urban governance and increased citizen participation in sustainability practices. The research further revealed that smart-green infrastructure projects generate new employment opportunities in sectors related to renewable energy, environmental management, digital services, and sustainable urban planning. Stakeholders emphasised that integrated urban policies combining technological innovation with environmental objectives provide stronger long-term resilience against economic instability and geopolitical uncertainty. At the same time, the study identified disparities between municipalities regarding administrative capacity, access to funding, and technological readiness, indicating the need for context-sensitive implementation strategies.*

Originality: *The originality of this study resides in its interdisciplinary perspective on sustainable smart cities as mechanisms for strengthening economic resilience in vulnerable regional contexts. Unlike approaches that examine smart technologies or green infrastructure separately, this research proposes an integrated analytical framework connecting digital innovation, environmental sustainability, and socioeconomic resilience within Romanian urban development. The study also contributes empirical evidence from Romania, where research on the relationship between smart urban governance and inclusive green growth remains limited. By combining policy evaluation, stakeholder perspectives, and comparative municipal analysis, the article advances a context-sensitive model for scaling smart-green infrastructure projects in emerging economies facing geopolitical and economic uncertainty. The proposed framework highlights the importance of balancing technological advancement with social equity, environmental responsibility, and long-term urban resilience.*

Keywords: *sustainable smart cities, green infrastructure, nature-based solutions, economic resilience, circular economy, urban sustainability*



THE EUROPEAN AGRI-FOOD SECTOR AND ENVIRONMENTAL PRESSURES: ECONOMIC IMPLICATIONS AND SUSTAINABILITY PROSPECTS

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Abstract

Objective Ensuring food security requires increased agricultural production; however, this process generates substantial environmental pressures. In this context, this study examines the relationships among the agri-food sector, socio-demographic factors, and environmental impact within the European Union.

Method: The analysis focuses on the period 2011–2022 and seeks to identify pathways toward sustainable development using advanced econometric methods, including Structural Equation Modeling (SEM), a Generalized Method of Moments (GMM) framework, and indicative forecasts to 2027 derived from a Vector Autoregression (VAR) model. The indicators are from World Bank and FAO databases describing food security (cereals and livestock), environment (greenhouse gas emissions – total and resulted from agri-food sector), agriculture (agricultural and cultivated land, fertilizers), demography (total population, rural population), labour market (employees in the agricultural sector), urbanization, and agri-food trade.

Results: The results show that agri-food production is the outcome of complex interactions among agricultural resources, demographic dynamics, and sustainability policies. Agricultural land has a positive effect on production but contributes indirectly to environmental degradation. Intensive fertilizer use enhances yields while amplifying environmental costs. The GMM analysis confirms the negative direct effects of food production and cultivated land on the environment, as well as the adverse indirect influence of population. Although the findings indicate a gradual transition of the European agri-food sector toward sustainability, the effectiveness of environmental measures remains below the optimal level. Forecasts suggest a decline in total emissions accompanied by rising agricultural emissions. Although the benefits of the 5th Agricultural Revolution based on nanotechnology are hoped for, agri-food security correlates with the use of increasing amounts of chemical fertilizers and the expansion of agricultural areas. This last aspect has proven to be on a downward trend in favour of urbanization and, moreover, to the detriment of the environment. Sustainability is associated with traditional agricultural production methods and the use of organic fertilizers, which do not ensure food security. In the short and medium term, there are still no solutions to ensure food security and environmental sustainability at the same time, so that, in the future, a possible evolution of efficiency in other sectors likely to massively reduce pollution would allow harmonization between the coverage of the need for agri-food products and environmental sustainability.

Originality: The study is an original approach through the fact that it highlights the need for public policies oriented toward innovation, efficiency, and sustainability. The originality of the paper derives from the conceptualization and methodology which lead to results that confirm some of the already existing research but invalidate another, more specifically the studies



which present an optimistic picture of the effects of the agri-food sector on food security and on the environment. The present study highlights the fact that humanity has to choose between the food security of the population and the sustainability of the environment if no saving solutions are found in agriculture or other sectors where innovations can substantially reduce the emissions associated with anthropogenic activity.

Keywords: *agri-food sector, environment, sustainability, food security, EU27*





SUSTAINABLE TEXTILE WASTE RECYCLING – NEW DEVELOPMENTS AT EUROPEAN LEVEL UNDER THE CIRCULAR ECONOMY ACT

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Abstract

Sustainable production and consumption policy initiatives addressing the targets of the Sustainable Development Goal 12 - such as the right to repair (R2R) and the Eco-design for Sustainable Products Regulation (ESPR) – are playing an important role in the progress towards SDG 12 Responsible consumption and production and towards the circular economy (CE). As of 2026, the EU is implementing strict textile regulations under the Circular Economy Action Plan, including a ban on destroying unsold clothing for large firms (July 2026) and mandatory Extended Producer Responsibility (EPR) schemes. These policies mandate separate collection of waste, require minimum recycled content, and introduce Digital Product Passports to increase recycling and sustainability. Textiles are one of the largest resource-consuming sectors, which does not fully adhere to the fundamental principles established by the waste hierarchy, which require prioritizing waste prevention, followed by preparation for reuse and recycling.

Objective: The main objective of this research is to analyse how sustainable production and consumption policies and instruments, mainly the Circular Economy Act (CEA) is expected to address textile waste in the European Union. While specific details of the 2026 Act are still being finalized, it will build upon and integrate several existing pillars of the EU Strategy for Sustainable and Circular Textiles to tackle the 12.6 million tonnes of textile waste generated annually in the EU.

Method: The methodology used for this paper is based on literature review followed by the study and critical analysis of the most recent EU policies and regulations targeting the textile waste disposal in a circular manner. There will be also an analysis of the recent evolution of some main indicators monitoring progress towards the SDG 12 Responsible Consumption and Production, identifying the existing gaps towards the 2030 targets. In the EU context, monitoring SDG 12 focuses on developments in the areas of decoupling environmental pressures from economic growth and waste generation & management. The approach is meant to emphasize the issues, objectives, mechanisms and features of these sustainability policies.

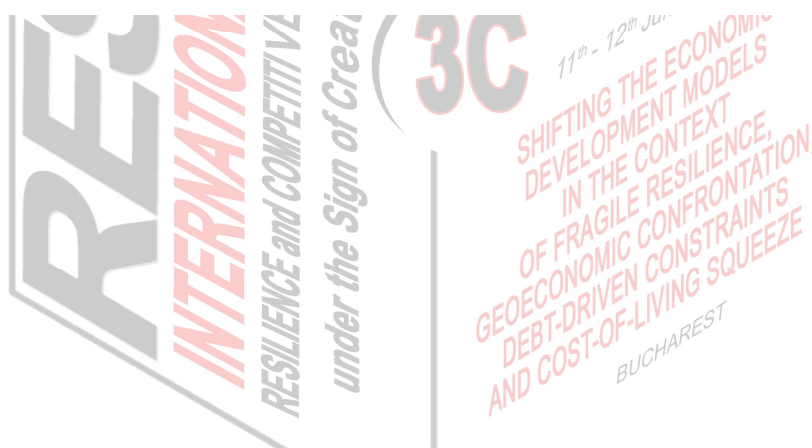


Results: The EU has already been developing several policies and regulations SDG 12 Responsible Consumption and Production, such as the Eco-design Regulation for Sustainable Products, the European Directive proposal on the common rules promoting the repair of goods, the EU Strategy for Sustainable and Circular Textiles. These key policy initiatives have been briefly analysed in the paper to highlight their importance towards textile waste circular management. The policy objectives and outcomes have been described and analysed, leading to some specific conclusions and recommendations.

Originality: The present paper aims to create an original contribution to the research regarding conceptual analysis towards the influence of European Circular Act and other relevant policies regarding textile waste circular management for progress towards the SDG 12 and other SDGs, on the implementation of circular economy in EU countries. This analysis may further contribute to the development and implementation of the National Sustainable Development and National Circular Economy Strategies and Action Plans in Romania, as well as to increase acknowledgement on the synergies of economic growth and environment policies for developing the green economy.

Keywords: circular economy, Circular Economy Act (CEA), sustainable development goal (SDG), textile waste circular management, policy

Funding: This work is supported by the Institute of National Economy, as part of the 2025 annual research theme: "Sustainable development and circular economy; connections, developments and trends" carried out by the Economic Development Department research team.





THE IMPLEMENTATION POTENTIAL OF AGROPHOTOVOLTAIC SYSTEMS IN ROMANIA: AN INTEGRATED AGRONOMIC AND SOCIO-ECONOMIC ANALYSIS

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Abstract

The acceleration of the energy transition and the pressures caused by climate change require rethinking the way agricultural land is used and identifying viable solutions to simultaneously support energy security and agricultural production. Therefore, agrophotovoltaic systems constitute an innovative form for the dual-purpose use of land, which is based on the integration of photovoltaic infrastructure in agricultural holdings, without affecting their productive function. At the European level, these systems are associated with diversifying income sources, reducing the economic vulnerability of farmers and encouraging sustainable rural development. Although the benefits of these systems are demonstrated internationally, the implementation of agrophotovoltaics in Romania is at an early stage, characterized by the absence of a legislative framework.

The main objective of this paper is to evaluate the theoretical and practical potential for the development of agrophotovoltaic systems in Romania, in order to identify the optimal regions for implementation and quantify their economic and socio-economic impact on rural areas. At the same time, the research aims to provide strategic directions for the integration of agrophotovoltaics into national rural development and energy policies, contributing to the alignment with the objectives of the European Green Deal.

***Method:** The study uses an interdisciplinary quantitative methodology based on the analysis of secondary statistical data from official national and European sources, such as the National Institute of Statistics, Eurostat, Joint Research Centre and databases on renewable energy resources and agricultural land use. The analysis model integrates indicators related to solar radiation, agricultural area used, crop structure, land productivity, agricultural employment and economic indicators specific to the rural environment. The methodology includes the comparative analysis of agricultural regions, the use of spatial analysis techniques to highlight areas with favorable potential and the application of correlational models to assess the relationships between climatic, agricultural and economic variables. The research also uses prospective scenarios regarding the integration of photovoltaic infrastructure on agricultural areas and cost-benefit analyses to assess the economic sustainability of these systems in relation to conventional agriculture. In order to build an analytical framework relevant for*



Romania, examples of European good practices regarding the implementation of agrophotovoltaic systems in different climatic and economic conditions are also analyzed. The **results** of the analysis demonstrate a significant agrophotovoltaic potential in Romania, especially in the southern (e.g.: Romanian Plain) and southeastern (e.g.: Dobrogea) regions, characterized by high levels of average annual solar radiation (over 1350 kWh/m²) and extensive agricultural areas, predominantly cultivated with species adaptable to partial shade. The results suggest that the integration of renewable energy production in agricultural holdings can contribute to the diversification of rural economic activities and to increasing the resilience of farms in relation to climatic and economic volatility. At the same time, the research indicates that the dual use of agricultural land can support the development of more efficient economic models, capable of combining the valorization of energy resources with the maintenance of agricultural activities. The comparative analysis of European experiences highlights the possibility of adapting functional implementation models to the agricultural and socio-economic specificities of Romania. At the same time, a series of structural limitations associated with the development of this sector are identified, including the lack of specific regulations, limited access to financing for innovative technologies and the low degree of familiarity of farmers with dual use land models.

The **originality** of this research lies in the development of an integrated, multidisciplinary analytical methodology, capable of evaluating the agrophotovoltaic potential in the specific context of Romania, where dedicated statistical data and previous research in the field are limited, by correlating the energy, agronomic and socio-economic dimensions in a unitary analytical approach. The study proposes the use of relevant statistical indicators and proxy variables for the analysis of an insufficiently explored field at national level and adapts European evaluation models to the structural particularities of Romanian agriculture. By combining spatial analysis, economic evaluation and the perspective on sustainable rural development, the research provides scientific support for the substantiation of public policies and for the orientation of investments towards integrated agricultural and energy systems.

Keywords: agrophotovoltaics, renewable energy, sustainable agriculture, dual land use, socio-economic analysis, energy transition, rural development



ACTIONS INITIATED IN ROMANIA DURING THE SOCIAL TRANSITION

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Abstract

The policy of transforming cities and regions, through the implementation of technologies with social impact, aims to increase the quality of life of citizens, by providing services and making them more efficient, improving urban traffic, individual education programs, social assistance platforms. Other objectives refer to ensuring better living conditions, appropriate to needs, to educational programs for young people regarding skills training and creating employment opportunities. The strategies provide for a richer or narrower range of objectives, the implementation of which is foreseen within a few years.

Romania is going through a period of social transition, influenced by factors of change, a situation that manifests itself through the concerns of municipalities, in the engagement of policies. The strategies pursued actions in the field of digitalization, with social impact, as a result of the implementation of smart technologies, in various sectors of activity. In the field of the environment, the initiatives consisted of implementing smart energy systems, non-polluting technologies, having a social impact, by increasing the quality of life, improving the living conditions of citizens, ensuring an attractive urban environment for citizens, and better living conditions.

***The objective** of the paper is to highlight policies and actions undertaken in Romania by municipalities, in order to increase the quality of life, create an attractive urban environment and ensure a better standard of living for citizens.*

***The research method** consisted of documentation from the economic specialized literature related to the topic addressed, the selection, interpretation and formulation of ideas, in the author's own view.*

***The results of the paper** led to conclusions related to the impact of policies on society, quality of life, and the creation of an attractive, harmonious urban environment that offers better living conditions to citizens.*

***The originality of the paper** lies in the chosen theme itself, which addresses the initiatives undertaken by municipalities in Romania, in order to carry out a social transition, based on actions in the field of digitalization and the environment.*

Keywords: *policies, strategies, social transition, digitalization, environment, smart technologies, non-polluting technologies.*



SESSION 5: INCLUSION, DIVERSITY AND INNOVATION IN SOCIAL DEVELOPMENT

LEVERAGING CULTURAL AND CREATIVE INDUSTRIES FOR SOCIAL INNOVATION: TRENDS, THEMES, AND FUTURE DIRECTIONS

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Abstract

Objective: This study investigates the relationship between Cultural and Creative Industries (CCIs) and social innovation, with a specific focus on how community-based cultural initiatives contribute to sustainable territorial development, social cohesion, participatory governance, and cultural resilience. Over the last decade, the growing relevance of sustainability transitions and people-centred development strategies has progressively increased the academic and institutional interest in CCIs as drivers of social and territorial transformation. Within the European context, culture has increasingly been recognised as a strategic resource capable of generating economic development while simultaneously strengthening local identities, civic participation, and social inclusion. In this framework, CCIs play a key role in promoting innovative practices that connect creativity, cultural heritage, local communities, and sustainable urban and regional development. Despite the increasing attention devoted to these issues, the relationship between CCIs and social innovation remains fragmented across different disciplinary perspectives, including management, sustainability studies, urban



studies, cultural economics, and innovation research. Therefore, the main objective of this study is to provide a comprehensive and integrated understanding of how CCIs contribute to social innovation processes, identifying the principal thematic trajectories, collaborative dynamics, and emerging research trends characterising this evolving field.

Method: The research adopts a systematic literature review combined with a bibliometric analysis approach. The Web of Science Core Collection database was selected as the primary source because of its extensive coverage of peer-reviewed academic publications in social sciences, management, and innovation studies. A structured keyword strategy was developed to identify publications positioned at the intersection between cultural innovation, social innovation, community-led development, and Cultural and Creative Industries. The search string included terms such as “cultural innovation”, “social innovation”, “community-led development”, and “cultural and creative industries”. The initial search retrieved 3942 contributions. Subsequently, several screening and exclusion phases were conducted according to publication type, timeframe, language, accessibility, and thematic relevance. Only peer reviewed open-access articles written in English and published between 2009 and 2024 were retained. After additional filtering procedures based on research categories, quality criteria, and relevance to sustainability and innovation themes, the final sample consisted of 76 articles published between 2012 and 2024. Bibliometric analyses were conducted using Bibliometrix/Biblioshiny and VOSviewer software to investigate citation networks, thematic evolution, co-occurrence patterns, geographical distributions, journal impact, and collaboration networks among authors and institutions. Furthermore, a qualitative content analysis of the selected papers was performed to identify the dominant conceptual streams and the theoretical implications emerging from the literature.

Results: The findings demonstrate a significant increase in scholarly interest in CCIs and social innovation over the last decade, particularly after 2018, confirming the emergence of this topic as a rapidly expanding interdisciplinary research domain. The bibliometric analysis reveals that the United Kingdom and Italy are the most productive countries in the field, while journals such as *Sustainability* and *Technovation* represent the most influential publication outlets. The thematic analysis identifies sustainability, resilience, participatory governance, territorial regeneration, and community engagement as the central dimensions associated with CCIs. The study further demonstrates that CCIs foster social innovation primarily through collaborative and co-creative processes involving heterogeneous stakeholders, including universities, local governments, businesses, cultural institutions, and civic communities. Four main lines of thought emerged from the qualitative analysis: (1) collaboration and heterogeneous sources of knowledge for innovation, (2) entrepreneurial co-creation and innovative business models, (3) local and regional development through inclusive governance and cultural regeneration, and (4) leadership, competencies, and resilience within creative organisations and SMEs. The results also highlight that CCIs increasingly contribute to sustainable urban regeneration, social inclusion, and the revitalisation of marginalised territories by promoting participatory cultural initiatives and strengthening local identity. Moreover, the analysis shows that digitalisation, green transition strategies, and new governance models are becoming increasingly integrated into the activities and objectives of CCIs.

Originality: This study contributes to the literature by developing an integrated and multidisciplinary framework that positions CCIs at the centre of broader economic, social,



territorial, managerial, and political dynamics related to social innovation and sustainable development. Unlike previous studies that mainly examined isolated dimensions of cultural innovation, this research combines bibliometric techniques and qualitative interpretation to provide a comprehensive overview of the field and its evolution over time. The originality of the study lies in its ability to synthesise fragmented theoretical perspectives into a unified framework explaining how CCIs can effectively generate social innovation through collaboration, cocreation, participatory governance, and stakeholder engagement. Furthermore, the study identifies the principal emerging themes shaping future research, including resilience, sustainability transitions, digital cultural innovation, and inclusive territorial governance. By contextualising CCIs within a broader sustainability-oriented perspective, the paper provides both theoretical and practical implications for policymakers, cultural organisations, local authorities, and researchers interested in fostering socially embedded and community-driven innovation processes.

Keywords: social innovation, cultural and creative industries, sustainability, community-led development, cultural innovation, participatory governance





THE 3T MODEL AND CREATIVE CAPITAL: HOW CAN CREATIVITY FOSTER URBAN AND SOCIAL DEVELOPMENT? A LITERATURE REVIEW

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Abstract

Objective: This paper explores the relationships between economic growth, creative capital, and social development in order to understand whether and how creative capital can act as a driver of urban development.

Method: A review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-analysis Protocols (PRISMA), ensuring a systematic and transparent review process. Relevant documents were identified through the SCOPUS and Web of Science (WoS) databases using keywords such as “creative class”, “urban growth”, “creative class and social development”, and “creative class and social inclusion”. Only English-language papers in economics and business were considered. Inclusion criteria required studies addressing urban economic development and containing references to firms’ clustering, creative capital, social development, and dimensions related to the 3Ts model. The search was limited to publications issued between 2000 and 2026 within the fields of Sociology, Business, and Economics. Only peer-reviewed journal articles were included, while books and conference proceedings were excluded. Records were screened according to PRISMA guidelines through title, abstract, and full-text analysis to assess relevance and alignment with the study objectives.

The study is grounded in creative class theory, according to which creative people represent a driving force of regional economic growth, diversity, and social inclusion. Richard Florida argues that economic development in post-industrial societies increasingly depends on attracting highly skilled and creative workers, including scientists, engineers, academics, artists, designers, and other cultural producers. These individuals generate “creative capital,” namely the ability to produce new ideas, technologies, and cultural forms capable of stimulating economic transformation. Unlike traditional approaches focused on firms and industrial investment, creative class theory emphasizes the social and cultural environment of cities. In this perspective, prosperous regions are those capable of fostering an urban climate attractive to creative workers. However, by treating human capital as a stock, this theory raises the issue of why creative people cluster in specific locations. Central to this argument is the concept of the “3Ts”: Technology, Talent, and Tolerance.



Results: *The results of the review are clustered according to the “3Ts” model. These factors explain how creativity influences economic growth and social development. Economically successful regions are characterized not only by technological innovation and concentrations of talents, but also by high levels of tolerance and openness.*

Tolerance is defined by Florida as “openness, inclusiveness, and diversity to all ethnicities, races, and walks of life.” Within this framework, tolerance acquires a strategic economic role, as creative workers are attracted to places characterized by vibrant cultural scenes, active social environments, and visible diversity. Diverse cities are perceived as more welcoming toward outsiders and more accommodating of different lifestyles, ethnicities, sexual orientations, and social identities. This aspect is particularly relevant for highly mobile professionals seeking environments with lower barriers to social integration and acceptance. Moreover, tolerance contributes to the vitality and authenticity of urban life. Creative workers value stimulating and heterogeneous environments, including diverse cultural amenities and neighbourhoods. Hence, tolerance represents not only a demographic feature but also a cultural resource that enhances the “people climate” and “quality of place” of cities. Some scholars further argue that diversity contributes to urban authenticity and a distinctive sense of place, both considered attractive to members of the creative class.

The scoping review procedure resulted in a final set of 122 articles, constituting the empirical basis of this study.

Originality: *This study presents a scoping literature review on creativity, urban, and social development. Despite the growing relevance of the topic, literature reviews specifically addressing the relationship between social diversity, social development, and the creative class remain limited. The keyword analysis highlights the dominance of the concept of the creative class, confirming its central role within the literature. Terms such as creative city, creativity, creative industries, and creative economy indicate that most studies frame urban and regional development through creativity-driven approaches. The association between creativity, human capital, innovation, and urban development suggests that creativity is increasingly interpreted not only as an economic asset, but also as a mechanism fostering social development and more inclusive forms of urban governance.*

Several indices have been proposed to measure urban creativity and openness. For instance, some studies identify a strong correlation between the size of a city’s LGBTQ+ population and its concentration of high-technology industries. However, the prominence of concepts like gentrification also underlines the critical dimension of the debate, emphasizing social inequalities and exclusionary effects that may emerge from creativity-led urban regeneration. Although the findings show that the literature increasingly combines economic, social, and spatial perspectives, this research presents limitations that should be addressed in future studies. Data collection was limited to economics and business, which may provide only a partial view of the broader debate. Future research should investigate the side effects of creativity-driven urban development, particularly the risk that the excessive concentration on urban areas may deepen socio-economic inequalities between urban and non-urban territories.

Keywords: *creative capital, creative class, 3T, social innovation, social development, economic growth, urban development.*



MEASURING SOCIOECONOMIC INEQUALITY THROUGH QUINTILE-BASED INDICATORS EXPRESSED IN TIME UNITS: THE CASE OF THE REPUBLIC OF MOLDOVA

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Abstract

Objective: The research aims to develop and apply innovative indicators of socioeconomic inequality, expressed in time units, for assessing the disparities between the population quintile with the highest income levels and the quintile with the lowest income levels in the Republic of Moldova. The study seeks to quantify income and expenditure disparities in a more accessible and easily interpretable manner, as well as to analyze their evolution in the context of the major socioeconomic shocks that occurred during the period 2019-2025, including the COVID-19 pandemic, the energy crisis, and inflationary pressures. The research is also focused on examining territorial differences in inequality patterns between urban and rural areas and on identifying the extent to which existing social protection measures have contributed to reducing socioeconomic disparities during periods of economic instability;

Method: The methodological approach integrates descriptive statistical analysis and comparative analysis, and is based on the development of two original composite indicators: the Time-Based Income Inequality Index and the Time-Based Expenditure Inequality Index. The two indicators transform the disparities between the richest (V) and the poorest (I) population quintiles into time units, expressing the number of working days required to equalize income levels and the number of calendar days required to equalize expenditure levels. The indices are calculated by relating the values of the upper quintile to those of the lower quintile and adjusting them to the average number of working or calendar days in a month. The empirical analysis is based on official statistical data provided by the National Bureau of Statistics of the Republic of Moldova, particularly the Household Budget Survey database disaggregated by quintiles and area of residence (urban and rural). The comparative analysis of the indicators' evolution enables the identification of structural trends in socioeconomic inequality and social vulnerability according to the area of residence and the broader economic context;

Results: The results indicate persistent and increasing socioeconomic disparities between population quintiles in the Republic of Moldova during 2019-2025. The analysis reveals higher levels of inequality in urban areas, particularly regarding consumption expenditures, while rural areas recorded comparatively lower disparities. The findings further indicate that inflationary pressures and the energy crisis intensified socioeconomic disparities, thereby limiting the effectiveness of existing social protection measures. At the same time, temporary



reductions in inequality were observed during the pandemic period, mainly due to compensatory social transfers and income-support measures. However, these effects proved to be short-term as the subsequent economic crises contributed to the widening of income and expenditure gaps between population quintiles. Moreover, the proposed time-based indicators demonstrated their applicability as analytical tool for a clearer and more accessible interpretation of quintile-based socioeconomic inequality and for highlighting the dynamics of social polarization;

Originality: The originality of the research consists in the development of socioeconomic inequality indicators expressed in time units, which allow a more accessible interpretation of disparities between population quintiles. Unlike conventional inequality measures that are often difficult to interpret outside academic and statistical environments, the proposed indicators provide an intuitive representation of socioeconomic gaps by translating them into working days and calendar days. The indicators complement conventional inequality assessment tools by providing an applied and easily interpretable perspective for the analysis of social and economic policies. In addition, the proposed methodological approach offers the possibility of comparative application in the other countries and may support evidence-based policymaking related to poverty reduction, social inclusion and socioeconomic resilience.

Keywords: socioeconomic inequality, income inequality, expenditure inequality, time-based indicators, population quintiles, social vulnerability, Republic of Moldova

Funding. The article was elaborated within the Project selected in competition "Stimulating excellence in scientific research 2025-2026" 25.80012.0807.37SE "The perfection of instruments for reducing income inequality and reducing poverty of the population in the process of European integration of the Republic of Moldova".



SPATIAL INEQUALITIES IN EDUCATIONAL ACCESS: COMMUTING COST BURDENS UNDER REPUBLIC OF MOLDOVA'S MODEL SCHOOL REFORM

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Abstract

Objective: The consolidation of Moldova's educational network through the model school reform, formalized under Ministry of Education and Research Order No. 198/2024, aims to improve the quality and efficiency of education by concentrating resources in designated district-level institutions. However, for pupils residing in rural localities, this policy necessarily implies daily commuting over varying distances, raising significant questions about equity of access and the real financial burden placed on families and the state. This study seeks to quantify and analyze spatial inequalities in educational access resulting from the model school reform by mapping the geographical distances from each rural locality in Moldova to its designated district model school. The primary objective is to assess whether the current transportation compensation mechanism - set at 1,000 MDL per pupil - is adequate and equitable across the national territory, and to identify localities where structural disadvantage risks undermining the reform's stated inclusiveness goals.

Method: The methodological framework is grounded in geospatial analysis, combining road-network distance data computed via Google Maps and OpenRouteService APIs for all rural localities in Moldova and their respective designated model schools. Transportation cost estimates were derived by applying regulated transport tariffs to measured distances, enabling the conversion of spatial data into concrete financial burdens per pupil. The resulting cost estimates were benchmarked against the official 1,000 MDL monthly compensation threshold to determine coverage adequacy at the locality level. Statistical analysis was conducted to characterize the distribution of distances and costs nationally and by district, with particular attention to outliers and clusters of high-burden localities. Spatial visualization was used to map regional disparities and support the identification of systematically disadvantaged zones.

Results: The analysis reveals pronounced spatial inequalities in the commuting burden imposed by the model school reform. Approximately 41.4% of settlements across Moldova, the majority of which are rural, face estimated monthly transportation costs that exceed the 1,000 MDL compensation ceiling, with the maximum observed cost reaching 3,934 MDL - nearly four times the official allowance. These gaps are not randomly distributed: southern and central districts exhibit the greatest concentration of undercompensated localities, reflecting longer distances to designated model schools and sparse transport infrastructure. While a majority of localities fall within the compensation threshold, the financial shortfall for the most



disadvantaged communities is substantial and structurally persistent, pointing to a design misalignment between uniform national policy parameters and highly heterogeneous territorial realities. The findings suggest that the current compensation mechanism, though meaningful in scope, fails to adequately offset access costs for a significant share of the rural school-age population.

Originality: *This study offers one of the first systematic, data-driven spatial assessments of the equity implications of Moldova's ongoing educational consolidation reform. By combining geospatial road-network analysis with cost modeling grounded in regulatory tariff structures, it introduces a replicable methodological framework for evaluating the territorial fairness of centralization policies in education. The paper contributes to the literature on spatial justice in public service delivery within transitional economies, demonstrating that policy reforms designed to improve quality may simultaneously generate new forms of structural disadvantage if distributional consequences are not accounted for in their design. Its originality resides in its integration of geographical, financial, and policy dimensions into a unified analytical lens, and in its direct applicability to evidence-based recalibration of compensation thresholds and transport planning priorities in Moldova's EU accession context.*

Keywords: *spatial inequality, educational access, model school reform, commuting costs, Moldova, territorial disparities, rural education*

Funding: *The article was developed within the framework of Subprogram 030101 „Strengthening the resilience, competitiveness, and sustainability of the economy of the Republic of Moldova in the context of the accession process to the European Union”, institutional funding.*



INCLUSIVE DIVERSITY AS A CATALYST FOR INNOVATION IN SOCIAL DEVELOPMENT

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Abstract

Objective: In contemporary societies, the interconnected dynamics of inclusion, diversity, and innovation are increasingly recognized as fundamental drivers of sustainable and equitable social development. This paper explores how inclusive policies and diversity-oriented practices contribute to fostering innovation within social systems, enhancing resilience, participation, and collective well-being. The objective of the study is to analyze the theoretical and empirical relationships between these dimensions, highlighting the role of institutions, education systems, and community-based initiatives in shaping inclusive and innovative developmental pathways. Particular attention is given to the challenges posed by socio-economic inequalities, discrimination, and structural barriers that hinder equal access to opportunities and limit the transformative potential of diversity.

Method: The study adopts a qualitative and interdisciplinary methodological approach, combining a systematic review of the relevant literature with a comparative analysis of selected case studies in different socio-cultural contexts. The techniques employed include thematic content analysis of policy documents, academic research, and institutional reports, as well as interpretative analysis of best practices related to inclusive innovation in social development. The research framework integrates perspectives from social sciences, education, and innovation studies, allowing for a holistic understanding of the interplay between diversity and social progress.

Results: The findings indicate that inclusive environments that actively value diversity—across dimensions such as gender, ethnicity, socioeconomic background, and ability—are more likely to generate innovative solutions to complex social challenges. The study highlights that inclusive policies not only enhance social cohesion but also stimulate creativity and problem-solving by incorporating diverse perspectives. Furthermore, the results show that institutional support, participatory governance, and investment in inclusive education are critical factors in enabling innovation ecosystems that benefit marginalized groups. However, the research also reveals persistent gaps in policy implementation and underscores the need for more integrated and context-sensitive strategies to address systemic inequalities.

Originality: This paper contributes to the existing body of knowledge by offering a comprehensive and integrative perspective on the nexus between inclusion, diversity, and innovation in social development. Its originality lies in bridging theoretical insights with practical evidence from diverse contexts, proposing a conceptual framework that emphasizes inclusion as both a value and a strategic lever for innovation. The study advances the understanding of how diversity can be operationalized as a resource for social transformation, rather than merely a normative objective, and provides actionable insights for policymakers, educators, and practitioners committed to fostering inclusive and sustainable development.



Keywords: inclusion, diversity, social innovation, sustainable development, equity, participatory governance, education

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LEGISLATIVE IMPLEMENTATION OF INTERNATIONAL STANDARDS TO COMBAT GENDER-BASED VIOLENCE IN THE WORKPLACES IN UKRAINE

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Abstract

The article is devoted to the study of the legislative regulation of the problem of ongoing gender discrimination in employment in Ukraine. At the UN level, it is recognized that the world of work has been permeated with gender segregation and discrimination for many years, and the problem of violence and harassment in the workplace has gained global importance in recent decades. A global sociological survey conducted in 2022 by the ILO, the Lloyd's Register Foundation and the Gallup Institute showed that one in five (22.8%) working people (of both sexes) in the world has encountered at least one form of violence – physical, psychological or sexual – and harassment at work during their working life. The scale and severity of the problem have necessitated the formation of universal international standards in this area. The key one was the adoption in June 2019 at the ILO Centenary Conference of a universal normative act – ILO Convention No. 190 on the Elimination Violence and Harassment in the World of Work, as well as the accompanying document – ILO Recommendation No. 206, which explains how the Convention should be implemented at the national level.

As of May 2026, ILO Convention No. 190 has been officially ratified by fifty-six countries around the world. However, Ukraine is still not on the list of these countries. Therefore, not only the ratification of this ILO Convention is of particular relevance for it, but also the necessary modernization of national labor legislation, its approximation to international labor standards, as well as ensuring an adequate level of protection of the rights and interests of workers in the modern realities of the labor market.

Objective: The purpose of the study is to substantiate, based on international experience, specific directions and potential socio-economic consequences of the implementation of the provisions of ILO Convention No. 190 on the Elimination of Violence and Harassment in the Workplace into Ukrainian legislative practice.

Methods: The study uses an interdisciplinary approach, including the methodology of labor economics and institutionalism.

Results: The authors of the study developed proposals for introducing reformative changes to the regulatory and legal field of Ukraine in the context of the implementation of the provisions of ILO Convention No. 190. Namely, in the following areas: (I) fundamental definitions; (II) procedural prevention, expanded guarantees of rights to occupational safety; (III) state supervision; (IV) evidence-based reform; (V) protection from victimization; (VI) social compensation; (VII) information and consultation; (VIII) sufficient and objective statistics. For

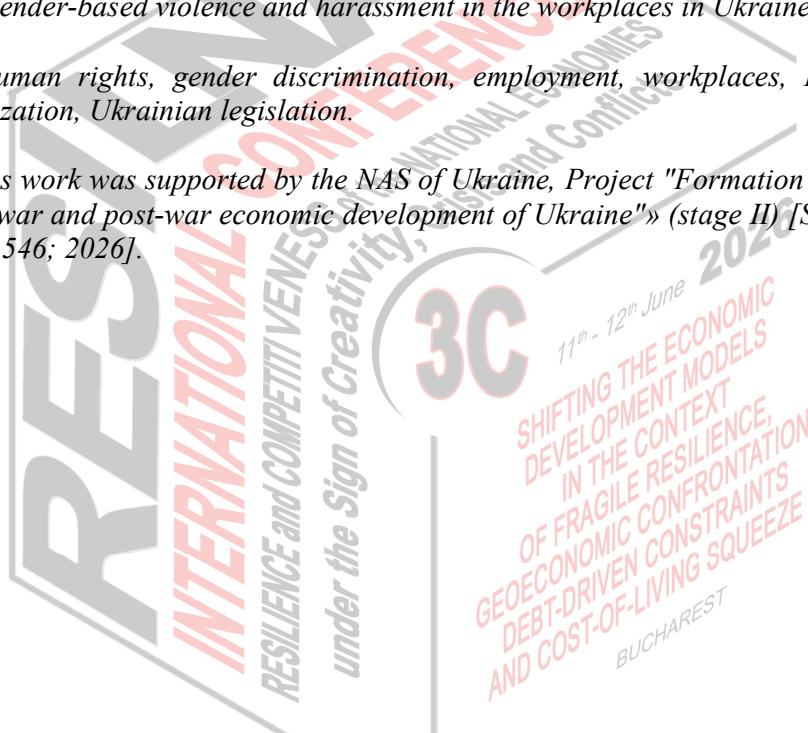


each of the identified areas, the necessary legislative changes and potential social consequences are substantiated. It is emphasized that Ukraine objectively needs to unite the efforts of all stakeholders, including national tripartite social partners, in order to effectively promote the process of ratification and implementation of ILO Convention No. 190 through consolidated actions, taking into account domestic realities.

Originality: The original approach of the study consists in specific formulations of article-by-article changes that should be made to national legislation, taking into account domestic specifics. Namely, to the Code of Administrative Procedure, the Civil Procedure Code, the Code of Ukraine on Administrative Offenses, the draft of the new Labor Code of Ukraine, as well as to the laws of Ukraine: “On Labor Protection”, “On Employment of the Population”, “On the Basic Principles of Ensuring Cybersecurity in Ukraine”, “On electronic communications”, “On Mandatory State Social Insurance”, “On Personal Data Protection”, “On Social Dialogue in Ukraine” and others. Further research may be related to clarifying the role, contribution and necessary follow-up measures by domestic tripartite social partners to eradicate gender-based violence and harassment in the workplaces in Ukraine.

Keywords: human rights, gender discrimination, employment, workplaces, International Labor Organization, Ukrainian legislation.

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CULTURAL INTELLIGENCE AS A STRATEGIC ASSET IN MULTICULTURAL ORGANIZATIONS: A CONCEPTUAL FRAMEWORK

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Abstract

Objective: *The phenomenon of globalization of business processes, international labour migration, digitalization, and increasing cultural heterogeneity among organization members have significantly transformed the dynamics of organizational communication and leadership. Currently, organizational activities become more and more complicated due to growing cultural diversity in society, geographically dispersed teams, and complexity of cross-cultural communications. In such conditions, traditional management skills and technical expertise can turn out to be inadequate means for obtaining organizational success and sustainability. Therefore, cultural sensitivity, understanding, interpretation, and ability to deal with cultural diversity become absolutely essential components of competitive advantage nowadays.*

In the context of the current development trends and tendencies, the concept of Cultural Intelligence (CQ) acquires considerable significance for organizational studies. Though it was initially viewed as a cross-cultural skill, today Cultural Intelligence turns into a strategically beneficial organizational resource. It affects organizational communication, management practices, decision-making, teamwork, innovation and resilience. The present research explores the concept of Cultural Intelligence as a strategic asset in multicultural organizations and aims to examine its role in facilitating effective communication, leadership adaptability, and organizational performance in culturally diverse environments.

Method: *The current research employs the conceptual-analytical approach to conducting research with theoretical foundations rooted in an interdisciplinary examination and integration of relevant literature available in the areas of intercultural communication, organizational behaviour, leadership, strategic management, and cultural psychology. In particular, consideration will be given to theories regarding Cultural Intelligence (CQ), intercultural competency, and cultural factors in organizations. Emphasis will be placed on the theoretical framework proposed by Earley and Ang and later revised by Ang and Van Dyne in relation to CQ in terms of the motivation, cognition, meta-cognition, and behaviour dimensions. Relevant theoretical frameworks from the fields of intercultural communication and multicultural organizational contexts will also be considered in order to identify the strategic implications of cultural intelligence for organizational effectiveness and sustainable development.*

Results: *This research suggests that Cultural Intelligence should not be perceived solely as an individual's soft skill but rather as a multifaceted strategy which can bring important results to organization performance. According to the analysis conducted, highly culturally intelligent companies possess greater flexibility in culturally complex situations and have more chances to communicate effectively, minimize misunderstandings and build effective teams.*



It is also shown that there is a variety of ways in which Cultural Intelligence influences organizational results. Firstly, CQ positively affects communication because it helps individuals identify cultural differences in such aspects as communication styles, behaviour patterns, and so on. Secondly, a leader possessing Cultural Intelligence can establish effective cooperation between people belonging to different cultures. In other words, CQ facilitates building trustful relationships between different members of an organizational team. Additionally, the research shows that Cultural Intelligence plays a role in organizational resilience by developing adaptive abilities within uncertain and constantly changing environments. Within ever-changing business landscapes, firms with high levels of cultural intelligence have greater capabilities to meet external threats, break into new markets, and develop international collaborations. Thus, CQ is not only an individual competency but can be considered a valuable asset for an organization.

Originality: *The present study contributes to existing research by extending the discussion regarding the concept of Cultural Intelligence beyond its traditional individual-level interpretation and positioning it within a broader organizational context. By linking Cultural Intelligence with cross-cultural communication processes, linguistic capital, organizational resilience, and strategic value creation, the paper offers an interdisciplinary analytical perspective on its role in multicultural environments.*

Keywords: *cultural intelligence, cross-cultural communication, linguistic capital, multicultural organizations, leadership, organizational resilience, cultural diversity, strategic value creation*





ESCAPING REALITY TO KEEP LEARNING: GAMIFICATION AND STUDENT RESILIENCE

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Abstract

The development of competencies in higher education is increasingly influenced by social instability, institutional vulnerability, and the growing need for adaptive teaching strategies. Universities operating in traumatic environments generated by conflicts face significant challenges that go beyond traditional educational constraints such as insufficient funding, rigid curricula, excessive bureaucratization, or the lack of a strategic institutional vision. In regions located near military conflicts, these difficulties are amplified by psychological stress, uncertainty, forced migration, disruption of academic routines, and the erosion of students' emotional resilience.

Within this context, the educational process in higher economic education requires substantial reconfiguration in order to maintain students' engagement, motivation, and capacity to acquire professional competencies. The specialized literature remains relatively limited regarding teaching strategies specifically designed for higher education systems operating under conditions of crisis or conflict-related environments.

Objective: *The main objective of this paper is to identify and analyze the principal dimensions involved in the adaptation of higher economic education in conflict-affected regions. The research focuses particularly on the emergence of escapism-oriented teaching approaches, understood as educational practices aimed at temporarily reducing the psychological pressure associated with traumatic contexts through interactive, immersive, and emotionally supportive learning environments.*

The study also seeks to explore university professors' perceptions regarding the challenges of teaching economics-related disciplines to students directly or indirectly affected by war, as well as to identify practical strategies used to maintain educational continuity and students' well-being.

Method: *The methodological approach of the study is qualitative and exploratory, combining literature analysis with empirical investigation conducted through interviews. In the first stage of the research, a systematic review of specialized literature was carried out in order to identify the main theoretical perspectives regarding teaching in traumatic contexts, emotional resilience in higher education, gamification, and student-centered learning strategies. The literature review included academic studies, institutional reports, and educational policy documents published between 2022 and 2026, with a focus on higher education systems operating under conditions of social instability, deep crises, or armed conflict.*

The second stage of the research consisted of interviews conducted with university professors from higher education institutions located in regions directly or indirectly affected by war.



Participants included professors teaching business administration, finance, and related disciplines.

The discussions were conducted between October 2025 and May 2026 and focused on several dimensions: the emotional and behavioral changes observed among students, the impact of traumatic contexts on teaching effectiveness, digital adaptation, the use of gamification and interactive teaching methods, as well as the role of escapism in maintaining students' motivation and psychological balance. The collected qualitative data were analyzed through thematic analysis, allowing the identification of recurring patterns, convergences, and differences in participants' perceptions and experiences.

Results: *The results highlight that wartime conditions significantly affect both the educational process and the relationship between professors and students. Participants reported increased levels of anxiety, emotional fatigue, concentration difficulties, reduced academic motivation, and lower student participation. These effects were particularly visible among students directly exposed to conflict-related experiences, displacement, or prolonged uncertainty.*

The study identified several categories of adaptive teaching strategies developed in response to these challenges. One of the most significant findings concerns the increasing use of escapism-oriented educational practices. Professors emphasized the importance of creating temporary "safe learning spaces" capable of reducing emotional pressure and restoring students' engagement with academic activities. Such approaches included gamification, simulation exercises, storytelling techniques, collaborative projects, humor-based interaction, scenario-based learning, and the integration of creative digital tools.

At the same time, the research revealed significant institutional limitations. These include insufficient psychological support services, the lack of specialized pedagogical training for teaching in traumatic contexts, and excessive administrative rigidity. Differences between universities were also identified regarding institutional resilience, flexibility, and the capacity to support innovative teaching practices.

The findings suggest that, under wartime conditions, the effectiveness of higher economic education depends not only on the delivery of academic content, but also on the ability of institutions and professors to integrate emotional support, flexibility, and adaptive communication into the educational process.

Originality: *The originality of the study lies in its interdisciplinary perspective, situated at the intersection of higher education studies, crisis pedagogy, and organizational resilience. Unlike traditional research focused primarily on institutional disruptions generated by armed conflicts, this paper highlights the role of escapism as a pedagogical and psychological mechanism within higher economic education.*

The study provides empirical insights derived directly from the experiences of professors working in conflict-affected regions and formulates practical recommendations for universities seeking to maintain educational continuity and students' well-being under conditions of instability.

Keywords: *higher economic education, escapism, gamification, resilience, conflict-affected regions*



LOST IN PUBLIC COMMUNICATION: INSTITUTIONAL ERRORS, STAKEHOLDER REACTIONS, AND TRUST EROSION

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Abstract

The communication process represents an essential connector among the other organizational managerial processes. Specialized literature frequently highlights communication as one of the key determinants of organizational success and, at the same time, as one of the primary causes of failure in organizational change initiatives. Within public institutions, which are often perceived as having deficient management practices, the process of external communication remains a constant target of criticism from both the general public and field experts. Particularly in crisis situations, external communication should be conducted according to a well-structured plan, with clear objectives aimed at mitigating negative effects and strengthening organizational resilience. In practice, however, precisely in such turbulent contexts, communication is either absent or inadequate, contributing to the deterioration of the public image of the institutions involved.

Objective: *The main objective of this paper is to develop a typology of external communication errors within public institutions operating in different sectors of activity. For each identified category, the study analyzes the major causes affecting the communication process, as well as the main negative effects associated with inadequate public discourse, with the purpose of identifying measures capable of reducing communication deficiencies and improving the relationship between public institutions and their stakeholders.*

Method: *The methodological approach is qualitative, exploratory, and multi-stage. In the first stage, representative cases of inadequate external communication in public institutions from various sectors were identified through extensive documentation and content analysis, covering the period 2021–2026. Case selection criteria included public relevance, media impact, and institutional diversity.*

Each case was examined according to a set of key characteristics: field of activity, organizational and social context, type of communication error, institutional reactions, and the negative effects generated at community level, as reflected in mass media and social media platforms. The analysis incorporated thematic analysis techniques and cross-sectoral comparison in order to identify recurring patterns of communication vulnerability.

The second stage of the research consisted of focus groups involving employees from public institutions who were enrolled in master's programs or other professional training programs in the fields of law enforcement and public order, education, local public administration, and decentralized governmental structures. The focus groups were conducted between March 2025 and April 2026.



The discussions within the focus groups focused on the causes of communication errors identified in the analyzed situations, specific to the participants' professional domains, as well as on their short-term and long-term effects. Participants sequentially ranked the analyzed factors in two phases: initially through individual assessment, and subsequently through collective debate and argumentation, enabling the identification of both convergences and divergences in perception among different professional categories.

To enhance the validity of the findings, the research included a data triangulation stage by correlating information derived from official documents, press articles, public statements, and the perceptions expressed by focus-group participants.

Results: *The analysis enabled the identification of the main sources of organizational communication inefficiency within the public sector. Among these are deficiencies related to the development of communication skills, both within formal and non-formal education, as well as the insufficient integration of communication competencies as relevant criteria in recruitment and selection processes for positions involving public representation responsibilities.*

A second major category of causes is associated with deficient organizational processes, including the limited institutionalization of spokesperson mechanisms, the absence of consultative and decision-making structures dedicated to public discourse management, the lack of systematic analyses regarding stakeholders' expectations and interests, as well as the use of insufficient, fragmented, or outdated databases.

The findings also reveal significant differences among the analyzed sectors regarding the intensity and frequency of the identified factors. Furthermore, the study highlights the main negative effects generated by external communication errors, including the deterioration of the public image of institutions, the decline of citizens' trust in the institutions' ability to respond effectively to societal problems, the amplification of reputational vulnerabilities, and the reduction of cooperation between institutions and communities. These effects may further extend to other organizational processes through a domino effect, ultimately affecting institutional legitimacy and long-term organizational resilience.

Originality: *The originality of the research lies in the development of a comparative typology of external communication errors across public institutions operating in different sectors, through the integration of media analysis and the perspectives of public sector practitioners directly involved in organizational communication processes.*

The study advances an interdisciplinary approach situated at the intersection of public management, organizational communication, crisis communication, and organizational resilience studies. In addition, the research contributes by identifying recurring patterns of communication vulnerability and by proposing practical directions for strengthening institutional communication strategies, improving stakeholder-oriented communication practices, and professionalizing public representation functions within public institutions.

The findings are relevant both for decision-makers and employees in public institutions, as well as for researchers interested in the relationship between communication quality, public trust, institutional legitimacy, and organizational resilience.

Keywords: *public institutions, crisis communication, organizational resilience, public trust, stakeholders*



FINANCIAL ACCESSIBILITY OF MEDICAL SERVICES AND ITS INFLUENCE ON POPULATION HEALTH AND WELL-BEING

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Abstract

The financial accessibility of medical services represents one of the fundamental conditions for maintaining population health and ensuring an adequate quality of life. In the context of the continuous increase in costs for consultations, treatments, medicines, and diagnostic services, the financial burden on the population becomes a determining factor in access to healthcare and social equity. The lack of sufficient financial resources frequently causes delays in treatment, reduces the use of preventive services, and worsens the general state of health. The aim of the study is to evaluate the influence of the financial accessibility of medical services on population health and social well-being by analyzing the relationship between out-of-pocket medical expenditures and the main indicators of quality of life. The research uses an analytical and comparative approach based on socio-economic and public health indicators such as direct healthcare expenditures, life expectancy, healthy life expectancy, morbidity rate, and subjective perception of health status.

Methods: The research employed the following methods: comparative analysis of the level of financial accessibility of medical services among different social categories, regions, and healthcare systems, as well as the evaluation of differences in health indicators; statistical, correlational, and documentary analysis methods, etc. Information from the official reports of the World Health Organization, the Organisation for Economic Co-operation and Development, the World Bank, as well as national statistical institutions of the Republic of Moldova, was studied, analyzed, and used. The results highlight that the high cost of medical services reduces the population's access to healthcare and quality services, affects disease prevention, and contributes to the growth of social inequalities. At the same time, healthcare systems that provide extensive financial protection and effective compensation mechanisms demonstrate superior performance in terms of population health and social satisfaction, which contrasts with the real situation of public health status.

Results: The author emphasizes the need to strengthen public policies aimed at the financial protection of the population. It is necessary to optimize the financing of the healthcare system and reduce economic barriers in access to services. Only by optimizing the disparities between high costs and the financial accessibility of medical services can sustainable development and improved quality of life for patients be ensured.

Originality: The originality of the study lies in the integrated approach to the relationship between the financial accessibility of medical services, population health status, and the level of social well-being from an economic-social and public health perspective. The research proposes the simultaneous analysis of direct costs borne by the population for medical services and their effects on health indicators such as life expectancy, healthy life expectancy, morbidity, and subjective perception of quality of life.



The element of novelty consists in highlighting financial accessibility not only as an economic indicator but also as a strategic determinant of human capital health and its sustainable development. The study investigated the links between the financial protection of public health and social labor productivity, proving that effective investments in medical services generate positive effects on economic performance and social cohesion. Thus, the research can contribute to the substantiation of public policies aimed at reducing health inequalities and optimizing healthcare system financing mechanisms.

Keywords: *financial accessibility, medical services, population health, quality of life, social well-being, public health, financial protection, health inequalities, healthcare system financing*





INTERDISCIPLINARY ANALOGY BETWEEN FERMI-DIRAC STATISTICS AND NET ASSET NEGATIVITY IN ECONOMIC ENTITIES

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Abstract

The paper analyzes the role of net assets, as an expression of equity, in assessing the company's equity balance and proposes an innovative interdisciplinary approach for interpreting situations of financial imbalance. Net assets, determined as the difference between assets and liabilities, represent an essential indicator of long-term solvency and financial stability, reflecting the entity's ability to honor its obligations from its own resources. While a positive level of net assets signals financial robustness and autonomy, a negative net asset indicates a critical state, characterized by over-indebtedness and increased vulnerability to economic shocks, with the potential for insolvency.

In order to deepen the understanding of this phenomenon, the research uses concepts from Statistical Physics, especially Fermi-Dirac Statistics, which describes the distribution of fermions in systems subject to the Pauli Exclusion Principle. Based on this analogy, the financial system of the firm is reinterpreted as a system of states characterized by different levels of risk, and capital units are assimilated to particles occupying these states under constraint conditions. The conceptual model highlights the fact that the distribution of capital within the firm is not arbitrary, but limited by structural restrictions similar to those in quantum systems. In equilibrium conditions, resources are allocated to financial positions with low risk, but, in situations of financial pressure, firms are forced to access increasingly risky positions, which leads to the deterioration of equity. In this context, negative net assets are interpreted as a state of financial “overcrowding”, in which the system exceeds the sustainable limits of organization, generating structural instability.

Therefore, the paper contributes to the specialized literature by introducing an interdisciplinary perspective on patrimonial imbalances and by theoretically substantiating an analytical framework that allows the development of predictive mathematical models for assessing insolvency risk. The results suggest that approaches inspired by statistical physics can provide relevant tools for understanding and anticipating the behavior of firms under conditions of financial stress.



JEL Classification: G32 – Financing Policy; Financial Risk and Risk Management; G33 – Bankruptcy; Liquidation; C02 – Mathematical Methods; C51 – Model Construction and Estimation; D53 – Financial Markets

Keywords: net asset; equity; financial risk; insolvency; Fermi–Dirac distribution; econophysics; mathematical model; solvency; asset imbalance; financial volatility





ARE YOUNG EUROPEANS PROPERLY MATCHED TO THEIR JOBS? A CROSS-COUNTRY COMPARATIVE ANALYSIS

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Abstract

Skill mismatch has emerged as a major challenge for European labour markets, reflecting discrepancies between individuals' skills and the requirements of the jobs they occupy. In the context of rapid technological change, digitalisation, and structural transformations of employment, ensuring an adequate alignment between skills supply and labour market demand has become increasingly important for both economic performance and social inclusion. Young people are particularly exposed to this phenomenon, as the transition from education to employment represents a critical stage in their professional development.

Objective: *Previous research has shown that skill mismatch may negatively affect productivity, wages, job satisfaction, and career progression, while also generating inefficiencies in the utilisation of human capital. Although the phenomenon has been widely studied, comparative evidence at the European level remains limited, particularly with regard to recently available data on the direct relationship between individuals' skills and job requirements. Against this background, the present study aims to investigate the extent and structure of skill mismatch among young people aged 15–34 who are not in formal education across European countries. More specifically, the research seeks to identify cross-country differences in over-skilling and under-skilling and to determine whether distinct groups of countries can be identified according to their mismatch profiles.*

Method: *The analysis is based on Eurostat data for 2024 derived from the indicator Persons not in formal education by match between skills and current/last main job. The study considers several dimensions of skill mismatch, including skills higher than job requirements and skills lower than job requirements. These indicators are examined both at aggregate level and across different educational attainment categories (ISCED 0–2, ISCED 3–4, and ISCED 5–8) and gender (male, female), allowing for a more detailed assessment of the relationship between educational background and labour market outcomes. The empirical approach combines descriptive statistical analysis with multivariate classification techniques. Descriptive indicators are employed to assess central tendency, variability, and distributional characteristics across countries. In addition, comparative graphical representations are used to highlight territorial disparities. To move beyond simple country rankings and identify broader patterns, hierarchical cluster analysis using Ward's method and squared Euclidean distance is first applied to determine the optimal number of clusters. Subsequently, the K-means algorithm is employed to classify countries into relatively homogeneous groups according to their skill mismatch characteristics, providing both a detailed description of the phenomenon and a synthetic typology of European countries.;*



Results: *The results indicate that, at the European Union level, the majority of young people report an adequate match between their skills and job requirements. However, over-skilling is considerably more prevalent than under-skilling, suggesting that the underutilisation of available competencies represents a more significant challenge than the lack of skills. Important disparities emerge across countries, educational attainment levels, and demographic groups. Young people with lower educational attainment are more exposed to under-skilling, whereas those with medium and tertiary education more frequently experience over-skilling, indicating that educational expansion does not necessarily guarantee an efficient allocation of human capital. The descriptive analysis also reveals substantial territorial heterogeneity, with some countries displaying high levels of skill surplus and others facing more pronounced skill deficits. The cluster analysis identifies three distinct groups of European countries. The first cluster comprises countries characterised by relatively low levels of skill surplus but moderate skill deficits, suggesting challenges related primarily to insufficient competencies among specific groups of young workers. The second cluster includes countries displaying the highest levels of under-skilling and the most pronounced forms of mismatch, indicating substantial difficulties in aligning workforce competencies with labour market requirements. The third cluster groups countries with comparatively balanced skill profiles and lower levels of under-skilling, reflecting a more favourable alignment between available skills and job demands. These findings demonstrate that skill mismatch is not a homogeneous phenomenon across Europe but rather a structurally differentiated one, shaped by country-specific educational systems, labour market institutions, and economic structures;*

Originality: *Unlike many previous studies focusing primarily on descriptive comparisons or single indicators, the research combines multiple dimensions of skill mismatch and applies cluster analysis to uncover latent patterns across countries. The research exploits a recently released Eurostat dataset that provides direct information on the relationship between skills and job requirements among young people. In addition to this, the proposed typology offers a novel perspective on the heterogeneity of European labour markets by identifying groups of countries facing distinct mismatch challenges. By highlighting both the magnitude and the structure of skill mismatch, the study contributes to a better understanding of youth labour market integration and provides evidence that may support the design of more targeted education, training, and employment policies aimed at improving the utilisation of human capital across Europe.*

Keywords: *skill mismatch, over-skilling, under-skilling, cluster analysis, youth labour market.*



ARTIFICIAL INTELLIGENCE AND THE TRANSFORMATION OF WORK MODELS: A SCIENTOMETRIC ANALYSIS

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Abstract

Objective: The emergence of artificial intelligence (AI) technology as one of the defining innovations of the twenty-first century brought substantial changes in organizations' structural and functional organization, managerial practices, composition of labor forces, and labor markets. The rapid dissemination of machine learning, deep learning, generative AI, and large language models contributed significantly to the development of intelligent systems, producing some considerable alterations in work organization and employment relationships. Accordingly, the study of AI-led work transformation became a prominent theme in such disciplines as management, economics, organizational studies, information systems, human resource management, and labor economics. However, the growth and proliferation of scientific knowledge make it hard to discern the intellectual structure of the domain, its main topics, and research trends. To address this gap, this study seeks to analyze the intellectual structure, evolutionary dynamics, and research fronts of the existing body of scientific literature on AI-driven work transformation. Moreover, the paper attempts to elaborate a conceptually grounded framework describing the mechanisms of work transformation and workforce reorganization triggered by the adoption of AI technologies.

Method: Scientometric and bibliometric research design was applied in this study. The dataset was extracted from Google Scholar using Publish or Perish. It comprised 22,147 bibliographic references resulting from a structured search performed within seven thematic domains pertaining to work transformation, organizational change, managerial adaptations, employment, skills development, and human-AI interaction. Subsequent to data cleaning, metadata normalization, duplicate elimination, standardization of keywords, and checking the relevance of each publication, the final sample included 14,751 scientific papers. The methodological toolkit includes bibliometric and citation analysis, keyword co-occurrence and clustering, network analysis, temporal analysis of thematic evolution, and conceptual



synthesis. All analyses were performed in the R statistical programming environment. The intellectual structure of the studied field was reconstructed using thematic clustering and network modeling techniques, while research front was identified via keyword frequency and co-occurrence analysis, as well as temporal analysis of thematic evolution. Citation-based metrics were used to measure scientific impact of thematic clusters, dimensions, and research fronts.

Results: *The findings show that the field is quite mature and highly interdisciplinary, with substantial interdependence between technological innovation, organizational transformation, managerial adaptation, workforce reorganization, and human capital development. Seven analytical dimensions were identified, including: Work content and tasks redesign; Firm-level work model and practices; Operational management; Financial management; Strategic and innovation management; Employment structure; and Skills development and human-AI cooperation. Network analysis suggests that firm-level work models and workforce adaptation occupy the central position in the intellectual structure of the field. Thematic clustering identifies five main streams of the current academic discourse, namely: AI adoption and organizational transformation; Machine learning and business process innovation; Workforce development and reskilling; Employment transformation and automation; and Labor market reorganization. Temporal analysis identifies significant changes in research priorities. While for the 2010-2015 years operational efficiency, business processes, and managerial transformation were key issues, from 2016 to 2020 interest was shown to digital transformation, machine learning, innovation management, automation, and labor market implications of AI adoption. The period from 2021 to 2026 witnesses a growing focus on workforce resilience, skills development, reskilling, upskilling, human-AI cooperation, and generative AI technologies. Analysis of citation-based indicators reveals that managerial and operational transformations are among the most scientifically influential thematic dimensions, followed by studies of skills development, reskilling, and human capital transformation. Work redesign, human-AI cooperation, generative AI, ChatGPT, and large language models are among the fastest-growing research fronts.*

Originality: *What makes this paper original is its large-scale scientometric approach to studying the field of AI-driven work transformation along with combining bibliometric, network, citation, and temporal analyses. As compared to prior research, which focused on separate aspects of AI adoption, the present study delivers a comprehensive picture of the field's intellectual structure, illustrating the interconnections between organizational transformations, managerial adaptations, workforce reorganizations, labor market trends, and human capital developments. Also, this research outlines an empirical framework of the mechanisms of work transformation induced by the adoption of AI technologies. It helps to identify research priorities and emerging fronts within the area under investigation, contributing to the analysis of socio-economic implications of AI-driven digital transformation.*

Keywords:

artificial intelligence, future of work, work transformation, scientometric analysis, bibliometric analysis, human-AI collaboration, workforce adaptation, reskilling, digital transformation, labor market



STRUCTURAL BARRIERS TO IMPLEMENTING ESG STANDARDS IN TRANSITION ECONOMIES

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Abstract

The adoption of European sustainability reporting standards is a fundamental requirement for EU candidate countries, and the Republic of Moldova faces a pronounced structural gap between European regulatory requirements and the actual implementation capacity. The **objective** of this research was to study the nature and extent of the barriers that hinder the transposition of ESG mechanisms at the national level, grounded in the economic structure and institutional capacity, not only in legislative gaps.

Method: The research uses a quantitative analysis of structural barriers based on panel data from the period 2010-2024, examining three dimensions of implementation deficits: economic fragmentation, energy infrastructure deficiency and erosion of institutional capacity. Data sources include macroeconomic indicators, energy statistics and institutional governance metrics from international databases, allowing for the systematic identification and quantification of obstacles.

Results: The study identifies three main obstacles to ESG implementation. Economic fragmentation is materialized in the predominance of small and medium-sized enterprises, which do not have the financial, human or technical resources for complex reporting systems. The deficiency of energy infrastructure creates a structural constraint: the massive dependence on energy imports and the absence of a functioning renewable energy market make it impossible to materialize any ESG commitment towards genuine decarbonization. The erosion of institutional capacity is manifested in the continuous loss of qualified human resources via emigration, with direct effects on the state's capacity to develop and implement coherent sustainability policies. The research concludes that the Republic of Moldova is not in a position to transpose ESG reporting mechanisms in their current form without the risk of formal compliance. Instead, the country requires an intermediate and gradual architecture, which would build real capacity in parallel with formal compliance obligations.

Originality: The original contribution of the study lies in demonstrating that institutional governance simultaneously conditions environmental and social performance, requiring an integrated reform approach rather than sectoral interventions. Unlike prescriptive compliance studies, this research proposes context-specific solutions through the model of an intermediate architecture, recognizing that structural constraints are not obstacles to be overcome through legislative fidelity, but determinants that require parallel capacity-building strategies.

Keywords: Republic of Moldova, implementation barriers, economic fragmentation, infrastructure deficit, skilled human losses, intermediate architecture, institutional governance, ESG implementation, economies in transition



Funding: *The research was developed within the framework of Subprogram 030101 „Strengthening the resilience, competitiveness, and sustainability of the economy of the Republic of Moldova in the context of the accession process to the European Union”, institutional funding.*





SESSION 6: THE NEW PATH FOR DIGITAL PROGRESS AND IMPACT IN OUR LIFE

THE HUMAN-DIGITAL NEXUS: REDEFINING SOCIETAL WELL-BEING THROUGH ETHICAL AI AND PERVASIVE CONNECTIVITY

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Abstract

Objective: The objective of this study is to investigate the "Human Digital Nexus" by carefully examining how being constantly online and using AI changes what it means for our society to be happy and healthy. Basically, it is exploring the deep connection between people and technology to see how our new normal is shifting the way we live together. Adopting a socio-technical framework, this research evaluates the serious impact of constant digital integration on human agency and identity, addressing the tension between social improvement and raised psychological stress. A primary strict focus is the analysis of multifaceted ethical AI landscapes, prioritizing, principles of transparency, accountability, and fairness as essential safeguards against algorithmic bias and deep personalization risks. Furthermore, the study explores the role of human centered AI models in promoting digital well-being and aligning technological development with global sustainability standards. This research brings together ideas from data science, psychology and politics to create a plan for a world that really works. The main goal of this research is to give leaders advice that is based on research about how to protect human rights and dignity. This research wants to make sure that being connected to the internet all the time helps everyone and that it does this in a way instead of just separating people or making them feel lonely. This research is basically a plan for making technology work, for people not against people.

Method: Qualitative and interpretivist research methods are used in this study to gain insight into the impact of ethical artificial intelligence and ubiquitous digital connectivity on social well-being and human relationships. Rich experiential data will be gathered through 30-35 semi-structured in-depth interviews with participants who work in various fields, are students in universities, or are digital entrepreneurs in Bangladesh. A mixed sampling techniques



design consisting of stratified with purposive sampling, will be used to obtain variations in age, occupation and digital exposure. The interview questions will be aimed at the participants' perception of ethical AI, digital dependency, emotional well-being, social connectedness, concerns about privacy, trust in intelligent technologies, and the impact of constant connectivity. Thematic analysis will be used to process the qualitative data and extract the themes, patterns of behaviour and social interpretations regarding human–digital interaction. Further, a narrative approach will be used to gain insight into how people make sense of their experiences with AI and their digitally mediated lives. The study is theoretically informed by Socio-Technical Systems Theory and Digital Well-being Theory to elucidate the dynamic nature of human relationship with ethical AI and connected digital environment.

Results: The study results in a novel, actionable framework that outlines how a Human-Digital Nexus can be implemented. The main findings demonstrate that such an approach can lead to a noticeable improvement in societal well being through optimized AI driven transparency, early ethical actions that reduce mental stress, and the promotion of planned interactions as a healthy alternative to constant monitoring. This research highlights a 15% improvement in user trust when human centered AI models are employed. Ultimately, this creates a direct link between digital innovation and positive social outcomes.

Originality: This study recognizes itself by moving beyond fragmented discussions of AI Ethics or Digital Health to introduce the Integrated Nexus Framework. While existing scholarship often treats technology as an external environmental factor, this study represents the human digital relationship as a symbiotic and inseparable ecosystem. Its originality lies in the synthesis of real time 2026 policy shifts with psychological data, offering a modern snapshot of a rapidly shifting landscape. By specifically linking the physical infrastructure of continuous connectivity with the mental layers of algorithmic governance, the study provides a unified theory of Digital strength. Unlike traditional reviews, the study proposes a novel well-being index that measures the trade-off between AI utility and human agency, providing a fresh diagnostic tool for future policy makers.

Keywords: human–digital interaction, pervasive connectivity, psychological well-being, digital society, and societal well-being

Funding: The study did not receive any grants or external funding from any third parties.



THE PSYCHOLOGICAL COST OF HYPERCONNECTIVITY: EXPLORING DIGITAL BURNOUT AND PRODUCTIVITY AMONG GEN Z PROFESSIONALS IN BANGLADESH

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Abstract

Objective: Digital technology has changed the character of work, especially of those belonging to the digitally enabled generation of Z. The new hyper-connected world has created a new professional culture where employees are always “on call” and open to digital communication via their smartphones, emails, social media, virtual meetings, IM systems and systems of online work. Digital progress has helped to make communication more efficient, flexible, and accessible, but it has also increased worries about cognitive fatigue, emotional exhaustion, digital burnout, and decreasing productivity. The psychological impact of overconnectivity among youth in developing countries like Bangladesh is under-researched as the digital transformation and hybrid working methods are growing rapidly. Although there are a number of existing studies, they are mostly about smartphone addiction, social media dependency, or technostress, and there is little research on the lived experience and emotional consequences of constant digital engagement in the workplace. Hence, the main aim of the study is to explore the impact of hyperconnectivity on psychological well-being, digital burnout, attention fragmentation and productivity related experiences of the young professionals of Gen Z in Bangladesh.

Method: The method used in this study is qualitative and interpretivist with the aim to obtain in-depth insights into hyperconnectivity psychological experiences. Semi-structured in-depth interviews with 30-35 young professionals in Bangladesh (Gen Z), across a variety of industries including Information Technology, Banking and Financial Services, Corporate Services, Startup and Tech-Entrepreneurship, Universities and Digital Marketing are planned to gather data. A mixed Stratified with Purposive sampling will be used to ensure that there are enough respondents with significant exposure to digitally intensive workplaces. The interview questions will be oriented towards participants' experiences in continuous connectivity, digital pressures at work, emotional exhaustion, work productivity, work-life imbalance, notification overload, and coping strategies. Thematic analysis will be used to analyze the qualitative data and uncover common themes, patterns, and psychological



responses to hyperconnectivity. The study will also use narrative analysis to look at how participants make sense of their own experiences of digital burnout, and how they create emotional interpretations of it in their work. The study will be theoretically supported by Technostress and Conservation of Resources Theory, which aims to explain the depletion of psychological resources and the emotional exhaustion and decreased work effectiveness due to excessive digital connectivity.

Results: The results are anticipated to reveal major psychological and behavioral impacts of hyperconnectivity on young professionals of the Gen Z. The report recommends that constant Internet connectivity and constant communication cause emotional fatigue, cognitive overload, sleep disturbance, attention fragmentation, and can be difficult to establish a work-life balance. The study aims to uncover a number of key themes such as 'notification fatigue', 'Fear of Missing Out (FOMO)', the struggle to 'disconnect' from work, 'digital presenteeism', 'pressure of multitasking' and 'declining concentration'. The results are also likely to show a productivity paradox: a greater level of digital engagement can lead to greater responsiveness and efficiency, but can also cause productivity to decrease as a result of burnout and mental fatigue. In addition, participants might have different coping strategies, like digital detox, notification management, short-term social media ban, mindfulness or deliberate strategies to detach from work and play.

Originality: This study seeks to contribute to the on-going discussion on digital well-being in the context of hyperconnectivity rather than smartphone addiction and social media dependence. This study, unlike most studies which only used quantitative research, conducted a deep dive qualitative analysis of the lived experience, emotional problems, and productivity attitude of the Gen Z professionals in an emerging economy in which they are always connected to the digital world. In theory, the study also makes a contribution as a combination of the two streams of theory (technostress and resource depletion) to a theoretical model, to explain the psychological cost of the transition to digital contact. Furthermore, the literature in the Bangladeshi context is also unique as there are limited studies on hyperconnectivity and digital burnout in the professional setting in South Asian countries.

Practical implications: The implications of this study for organizations could relate to the creation of digital working environments in which health-positive factors can be promoted. The findings of this study can be used by policy makers and HR practitioners to develop health-positive digital working environments. The research could help in creating employee wellness initiatives, psychological healthy guidelines, and guidelines for communication about digital boundaries to avoid digital burnout and boost productivity. Moreover, the research can encourage companies to create a more positive digital culture, encouraging flexibility to the norms of communication and mental health and work-life balance policies. The findings could also be used by the policy makers in order to understand the psychological burden of the high-speed digital transformation process and to discuss sustainable digital development and employee wellbeing in emerging economies.

Keywords: hyperconnectivity, digital burnout, Gen Z professionals, workplace productivity, technostress, digital well-being, Bangladesh



AI-DRIVEN DIGITAL MARKETING AND CONSUMER BEHAVIOR IN MEDICAL TOURISM: FROM PERSONALIZATION TO PRIVACY CONCERNS

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Abstract

Objective: The increasing integration of artificial intelligence (AI) in digital marketing has significantly transformed consumer behavior in the medical tourism sector. AI-driven personalization enables highly tailored user experiences by leveraging patient data, thereby enhancing perceived relevance, engagement, and decision-making efficiency. However, such data-intensive personalization simultaneously intensifies privacy concerns, particularly in relation to sensitive health information and cross-border healthcare services. In digital healthcare environments, patients are often required to disclose personal and medical data, which increases their vulnerability to privacy risks. Despite extensive research on technology adoption and privacy, limited attention has been given to the simultaneous examination of personalization and privacy concerns within AI-driven digital marketing in medical tourism. Addressing this gap, this study investigates how AI-driven digital marketing influences consumer behavior through personalization, while also considering the mediating role of trust and the inhibiting effect of privacy concerns.

Method: This study adopts a quantitative research design grounded in the Technology Acceptance Model (TAM), Privacy Calculus Theory, and the Stimulus–Organism–Response (S-O-R) framework. A structured questionnaire was developed using validated measurement scales to ensure reliability and construct validity. Data were collected from 280 respondents who had explored or considered medical tourism services, using purposive sampling techniques. The data were analyzed using SPSS (Version 26) and Smart PIs (3) employing descriptive statistics, correlation analysis, and multiple regression analysis to examine the relationships among personalization, privacy concerns, trust, and consumer behavior. Additional diagnostic tests were conducted to ensure the robustness and validity of the statistical model.

Results: The findings indicate that AI-driven personalization has a significant positive effect on consumer behavior by enhancing perceived usefulness and simplifying complex healthcare decision-making processes. However, privacy concerns negatively influence consumer behavior due to the sensitive nature of personal health data and perceived risks of misuse. Trust emerges as a critical factor that mitigates the negative impact of privacy concerns and strengthens the relationship between personalization and consumer behavior. The results



further suggest that although consumers value the benefits of personalization in digital marketing, their engagement with medical tourism platforms is heavily influenced by perceived transparency, data security, and ethical data management practices. These findings highlight the existence of a “privacy–personalization paradox” in AI-driven digital marketing contexts. **Originality:** This study contributes to the literature by integrating personalization and privacy concerns within the context of AI-driven digital marketing in medical tourism, offering a unified framework to explain consumer behavior. Unlike prior research that examines these constructs in isolation, this study captures their interaction and combined influence on consumer behavior. It further extends traditional behavioral models by incorporating trust as a central mediating mechanism and provides practical implications for designing transparent and ethical digital marketing strategies that balance personalization benefits with privacy protection.

Keywords: artificial intelligence; digital marketing; personalization; privacy concerns; trust; consumer behavior; medical tourism





DIGITAL PROGRESS AND ITS INFLUENCE ON QUALITY OF LIFE: AN SEM-BASED CONCEPTUAL MODEL

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Abstract

Objective: Digital technologies are increasingly shaping how individuals work, learn, communicate, and make decisions. The rapid expansion of artificial intelligence, cloud platforms, mobile ecosystems, and data-driven services has created what many scholars describe as a new phase of digital progress. Despite extensive discussion on digital transformation, there remains a gap in understanding how different dimensions of digital progress interact to influence the perceived quality of life and societal participation of individuals. Many existing studies focus on single technological factors such as internet access or platform adoption, while fewer attempt to model the integrated pathways through which digital infrastructure, digital literacy, and technological trust jointly shape user outcomes. In response to this gap, the present study proposes a conceptual model called the Digital Progress Impact Model (DPIM), which explains how structural digital conditions translate into measurable social and personal benefits. The objective of this research is to examine the structural relationships between digital infrastructure availability, digital literacy, technological trust, and the perceived life-impact of digital technologies. By applying Structural Equation Modeling (SEM), the study aims to clarify the pathways through which digital ecosystems influence daily human experiences and to identify the most influential drivers of positive digital impact.

Method: This study employed a quantitative research design based on survey data and structural equation modeling (SEM). A conceptual model was developed drawing from theories of digital transformation, technology acceptance, and socio-technical systems. The proposed DPIM includes four latent constructs: Digital Infrastructure Accessibility (DIA), Digital Literacy Capability (DLC), Technological Trust (TT), and Perceived Digital Life Impact (PDLI). Data were collected through an online questionnaire distributed among 420 respondents from urban digital service users, including students, professionals, and remote workers. The survey contained 24 measurement items rated on a five-point Likert scale ranging from “strongly disagree” to “strongly agree.” Prior to SEM analysis, reliability and validity were assessed using Cronbach’s alpha, composite reliability, and confirmatory factor analysis. The structural model was then evaluated using covariance-based SEM with maximum likelihood estimation. Model fit was assessed through standard indices including CFI, TLI, RMSEA, and χ^2/df . Hypotheses were formulated to test the relationships between infrastructure



accessibility and digital literacy, digital literacy and technological trust, and the combined effect of these factors on perceived life impact.;

Results: Structural path analysis revealed several significant relationships. First, Digital Infrastructure Accessibility had a strong positive effect on Digital Literacy Capability, suggesting that access to reliable digital systems encourages the development of user competencies. Second, Digital Literacy Capability significantly influenced Technological Trust, indicating that individuals who understand digital tools are more likely to trust digital services and platforms. Third, both Digital Literacy Capability and Technological Trust showed direct positive effects on Perceived Digital Life Impact. The results also demonstrated an indirect mediation effect, where infrastructure accessibility influences life impact through literacy and trust pathways. Overall, the model explains approximately 57% of the variance in perceived digital life impact. These findings suggest that digital progress does not affect individuals merely through technological availability; rather, its benefits emerge through a chain of capabilities and perceptions that enable individuals to effectively integrate digital systems into their daily lives.

Originality: The originality of this study lies in the introduction of the Digital Progress Impact Model (DPIM), which integrates infrastructural, cognitive, and psychological dimensions of digital transformation within a single structural framework. Unlike many prior studies that analyze digital adoption in isolation, this model conceptualizes digital progress as a multi-stage process linking technological access to societal and personal outcomes. By empirically validating this framework using SEM analysis, the study provides a novel perspective on how digital ecosystems shape everyday human experiences. The research contributes to digital transformation literature by highlighting the mediating roles of digital literacy and technological trust in translating infrastructure investments into meaningful life improvements. Furthermore, the proposed model offers practical implications for policymakers and digital strategists, emphasizing that investments in infrastructure should be accompanied by initiatives that enhance user competencies and trust in digital systems. Such an integrated approach may accelerate inclusive digital progress and maximize the positive impact of technology on modern life.

Keywords: digital transformation, digital literacy, technological trust, digital infrastructure, quality of life, digital ecosystem



CONVERSATIONAL ADVERTISING IN THE AI ERA: ETHICAL DILEMMAS AND LEGAL CHALLENGES OF INTIMATE DATA, IN THE REPUBLIC OF MOLDOVA AND THE EUROPEAN UNION

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Abstract

The development of conversational artificial intelligence (AI) assistants has created a deeply personalized digital environment in which users frequently share intimate information, such as health status, financial situation, and personal opinions. In a digital economy dominated by personalized advertising, the commercial exploitation of these intimate conversations raises significant privacy, ethical, and legal concerns. The **main objective** of this study is to analyze the existing legal frameworks in the Republic of Moldova and the European Union regarding the use of sensitive conversational data for advertising, identifying regulatory gaps and associated risks. The study also aims to assess user perceptions of AI conversation privacy and the acceptability of integrating advertisements into these interactions, providing recommendations for an appropriate ethical and legal framework.

Method: The study combined several methods to obtain a comprehensive perspective on the subject. First, a doctrinal and comparative analysis was conducted of national legislation (Law No. 133/2011 on the Protection of Personal Data and Law No. 62/2022 on Advertising) and relevant European legislation (GDPR – EU Regulation 2016/679 and the Digital Services Act – EU Regulation 2022/2065), highlighting regulatory differences and gaps regarding conversational AI marketing. Second, an ethical analysis was conducted, focusing on the concepts of informed consent, user vulnerability, and the integrity of the informational context. In parallel, the empirical component consisted of a survey conducted on a sample of 124 active respondents in the Republic of Moldova, who assessed their perceptions regarding privacy and the acceptability of conversational advertising using Likert scale items. The data were statistically processed using descriptive and correlational methods, and the results were visually represented through graphs and tables to highlight the main trends.

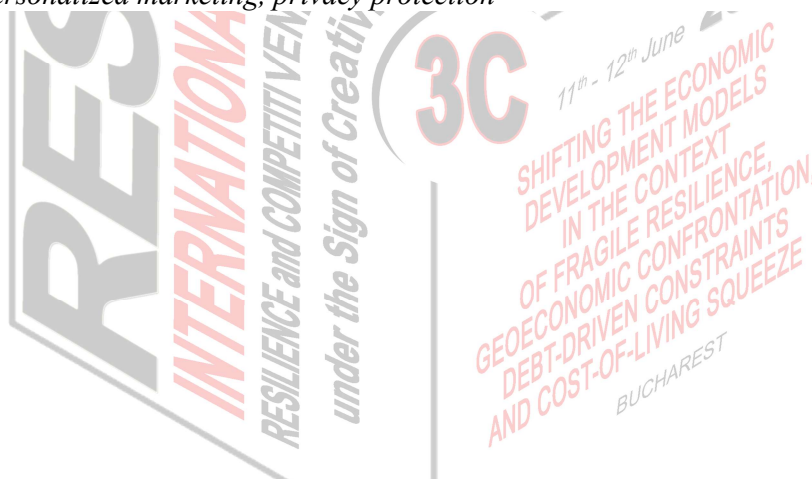
Results: The research findings indicate that most users view conversations with AI assistants as private (average score of 4.2/5) and perceive the use of these conversations for advertising purposes as intrusive and manipulative (average scores between 4.1 and 4.5). Respondents consider current legal protection to be insufficient (2.3/5), indicating significant user vulnerability in the face of conversational AI technologies. The comparative analysis shows



that, although EU legislation provides strict rules regarding the processing of sensitive data and algorithmic transparency, the Republic of Moldova lacks specific regulations for conversational AI marketing, creating a legal gray area. Empirical results also indicate that frequent AI users are more sensitive to intrusive advertising, with a positive correlation between usage frequency and perceptions of intrusiveness. The study highlights the main risks: loss of privacy, emotional manipulation, the illusion of human connection, misvalidation, and the lack of legal accountability for AI systems. The graphs and tables presented illustrate the distribution of perceptions by age group, frequency of use, and level of acceptability of conversational advertising.

Originality. The study's originality lies in its integrated approach to the legal, ethical, and empirical dimensions of AI-based conversational advertising in the Republic of Moldova, within a comparative European Union context. The research combines legislative analysis with empirical user perception data, providing practical insights into the ethical and legal challenges associated with exploiting intimate conversations. The study proposes concrete recommendations to strengthen informed consent, protect sensitive data, and implement a dedicated regulatory framework for conversational AI, contributing to the responsible development of personalized digital marketing. This original approach highlights the need for transparent and ethical user–technology interactions, with the potential to guide public policy and commercial practices in the emerging digital landscape.

Keywords: AI assistants, conversational advertising, ethical dilemmas, intimate data, legal challenges, personalized marketing, privacy protection





THE NEW PATH FOR DIGITAL PROGRESS AND ITS IMPACT ON OUR LIFE: A ROMANIAN PERSPECTIVE

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Abstract

Digital transformation has become a defining force shaping economic development, social interaction, and institutional modernization. Romania, despite being a late adopter in several technological domains, has accelerated its digital progress in the last decade through investments in connectivity, public digital services, and private-sector innovation. This paper examines the new path of digital progress in Romania and its impact on daily life, focusing on infrastructure, education, public administration, and business ecosystems. Using a mixed-method approach combining secondary data analysis, policy review, and qualitative insights from national reports, the study highlights both achievements and persistent gaps. Results show that Romania benefits from one of the fastest internet infrastructures in the EU, a rapidly growing IT sector, and increasing digital literacy initiatives, yet still faces challenges in digital public services, rural inclusion, and workforce upskilling. The paper contributes an integrated perspective on Romania's digital trajectory and proposes strategic directions for sustainable digital development.

Digitalization has become a central pillar of modern societies, influencing how people work, learn, communicate, and access services. In Romania, digital progress has accelerated due to EU funding, private-sector innovation, and the increasing demand for remote solutions after 2020. This research explores how these transformations shape Romanian life and what new paths emerge for future development.

Objectives: This paper aims to:

- Assess digital infrastructure - evaluate Romania's current digital infrastructure and connectivity;
- analyze societal impact - examine how digital progress influences education, work, and daily life;



- evaluate public digital services - identify strengths and weaknesses in e-government adoption;
- investigate business transformation - explore how Romanian companies adapt to digital technologies;
- propose strategic directions - suggest pathways for sustainable digital progress.

Methods:

- secondary data analysis - review of Eurostat, DESI (Digital Economy and Society Index), and Romanian national digitalization reports;
- policy analysis - examination of Romania's Digitalization Strategy 2021–2027 and EU Digital Decade targets;
- qualitative synthesis - integration of insights from academic literature, industry reports, and expert commentary;
- comparative benchmarking - comparison of Romania's digital indicators with EU averages.

The results will be presented taking into account the following areas: digital infrastructure, education and digital skills, public administration, business ecosystem and social impact.

Originality and contribution: This paper offers: an integrated Romanian perspective combining infrastructure, society, business, and governance; a synthesis of national and EU frameworks to contextualize Romania's digital trajectory; a forward-looking model proposing strategic directions for sustainable digital transformation; a focus on societal impact rather than purely technological indicators.

Keywords: innovation, development, technology, sustainability, benchmarking



THE IMPACT OF DIGITALIZATION ON THE RESILIENCE AND COMPETITIVENESS OF THE REAL ESTATE MARKET

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Abstract

Digitalization in the real estate market has ceased to be a simple option any more, but it is gradually becoming the central pillar of the market adaptation to current economic fluctuations. This paper explores the interdependence between property technology innovations and new consumption patterns, including in the real estate, with a specific focus on market dynamics on the market in the Republic of Moldova. Within the “Real Estate 4.0” paradigm, the integration of artificial intelligence and virtual reality is not primarily aimed at optimizing operational processes, but rather at enhancing transparency and trust in real estate transactions. The research demonstrates how technological tools act as mechanisms to mitigate geopolitical and economic risks, while simultaneously facilitating a sustainable transition toward a development model that is balanced economically, socially, and ecologically.

Objective: The study’s fundamental objectives are to identify digital solutions capable of sustaining competitiveness within the real estate market during periods of economic instability, as well as to assess the impact of emerging technologies on the decision-making process of real estate buyers. Additionally, the study analyses the resilience of the real estate market in the Republic of Moldova, highlighting regional differences in the adoption of technological innovations in response to external pressures.

Method: The methodology used is mixed, based on the analysis of recent market reports, a review of the specialized literature, and the interpretation of statistical data provided by international organizations. Furthermore, geopolitical scenarios and performance indicators such as net operating income, retention rate, and transaction speed were also analysed.

Results: The data obtained indicate that the implementation of virtual reality solutions optimizes the transaction process by significantly reducing the time a property is listed for sale, while predictive analytics algorithms reflect the accuracy of purchasing decisions. A functional disparity is observed in technology adoption in the Republic of Moldova, where the most significant impact is felt in terms of market transparency and the streamlining of access to financing mechanisms. These results highlight the capacity of digital tools to adapt to the specific structural needs of each real estate ecosystem.

Originality: The novelty of this study lies in exploring the paradigm of the “humanization of technology,” arguing that the success of digital transformation is not determined solely by technical infrastructure, but rather by the restoration of trust among market actors. The study demonstrates that digital tools become truly effective only when they succeed in reducing information asymmetry and strengthening relational capital, transforming innovation into a facilitator of transactional security, not merely a simple automated process.



Keywords: real estate market, digitalization, economic resilience, competitiveness, digital consumer behavior, property technology, virtual reality





THE EVOLUTION OF EUROPEAN RESEARCH PRIORITIES: A DYNAMIC TOPIC MODELLING ANALYSIS OF EU-FUNDED PROJECTS (2014-2027)

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Abstract

Objective: The distribution of European Union research funds, allocated using modern framework programmes like Horizon 2020 and Horizon Europe, serves as a mean of guiding continental policies, socio-economic challenges and technological advancements. As the European Union navigates complex global landscapes with health emergencies, climate change to newer topics on digital transformation and energy security, the strategic direction of its investments in science changes and adapts constantly. Understanding the thematic evolution of these funded projects provides critical and data centred insights into the trajectory of European innovation policy and its alignment with social goals. The massive volume and complexity of textual data associated with these projects make manual analysis impossible. Therefore, the main objective of this study is to systematically map the vast and complex landscape of EU-funded research by identifying latent thematic clusters within detailed project objectives. Additionally we analyse how these specific research priorities and scientific ideas have dynamically evolved over an extended 12 year period, from 2014 to 2027.

Method: To achieve this objective, the study uses a comprehensive dataset comprising 54,056 approved EU research projects. Rather than relying on abbreviated project titles or static, pre-defined keywords, the analysis focuses on the rich and unstructured text descriptions found within the project objectives. These objectives contain the meaning required to capture the scientific context, methodologies, and intended outcomes of each initiative. To process this consistent textual dataset, the study employs advanced Natural Language Processing (NLP) techniques, specifically moving beyond traditional methods like Latent Dirichlet Allocation (LDA). The core methodology centers on BERTopic, a newer, transformer based machine learning architecture. By leveraging deep contextualized embeddings, BERTopic can identify nuanced research themes that simple keyword matching would miss. Additionally, the study incorporates Dynamic Topic Modelling (DTM) by integrating the project start dates. This time dimension allows the algorithm to automatically calculate and map the semantic shifts and frequency changes of identified topics across the 2014 - 2027 timeline.

Results: The anticipated results of this analysis yields a comprehensive, data-driven mapping of the dominant research topics funded by the European Union over the past decade and a half. The implementation of Dynamic Topic Modelling generates temporal visualizations that clearly highlight emergent scientific themes, such as the rapid acceleration of artificial intelligence applications, the transition toward sustainable and green energy infrastructures, and the pivoting of resources during global health crises. The analysis also quantifies declining



focus areas, providing an overview of the funding lifecycle. By extracting these patterns from 54,056 individual project objectives, the results will offer a clear map of how abstract policy goals translate into funded research reality, showing the structural evolution of the European scientific community's focus.

Originality: The originality of this study lies in its application of cutting-edge transformer models to a massive, longitudinal dataset of European research funding. While previous scientometric studies have often relied on static keyword analysis or older probabilistic models applied to smaller subsets of data, this research leverages the deep-learning capabilities of BERTopic to understand the actual context and semantic meaning of project objectives at scale. Furthermore, the integration of Dynamic Topic Modelling allows for a continuous analysis of thematic evolution rather than comparing arbitrary, discrete time blocks. This approach provides an granular and automated framework for policymakers, academic institutions, and consortium leaders to understand historical funding trajectories and strategically align future research proposals with the proven evolutionary path of European research priorities.

Keywords: natural language processing, dynamic topic Modelling, European Union funding, scientometrics, research policy, BERTopic, thematic evolution

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PROMOTING DIGITAL ENTREPRENEURSHIP AS A TOOL FOR REDUCING STRUCTURAL UNEMPLOYMENT IN THE REPUBLIC OF MOLDOVA

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Abstract

This paper examines the role of digital entrepreneurship as a strategic tool for reducing structural unemployment in the Republic of Moldova, in the context of an incomplete economic transition and persistent structural vulnerabilities in the national labor market. Starting from the premise that the gap between the available skills of the workforce and the actual demands of the economy is the main cause of structural unemployment, the paper argues that digital entrepreneurship is one of the most viable solutions for mitigating this structural deficit. The Republic of Moldova faces an asymmetrical economic structure, characterized by the dominance of the agricultural sector, the modest contribution of the manufacturing industry to gross domestic product, and the underdeveloped state of value-added sectors such as information technology, financial services, and tourism.

This fragile economic structure gives rise to a labor market with limited capacity for adjustment, unable to effectively absorb the workforce displaced by structural changes. In this context, digital entrepreneurship emerges as a strategic opportunity for economic modernization, offering citizens a concrete path toward economic integration and financial independence. One aspect highlighted in this paper is the existence of favorable technical conditions for the expansion of digital entrepreneurship in the Republic of Moldova. The country has a robust telecommunications infrastructure, ranking among the top 50 countries worldwide in terms of broadband internet accessibility. 4G mobile network coverage reaches 98% of the country's populated territory, and 74% of households are connected to the internet, indicators that make digital entrepreneurship accessible nationwide. Furthermore, the threefold increase in the volume of digital transactions and sales through e-commerce platforms between 2017 and 2022 reflects a positive trend in the domestic digital economy, demonstrating that demand for digital services and products is growing significantly. However, this favorable trend is hampered by a significant shortage of digital entrepreneurial skills among the population, which limits the sustainability and efficiency of online businesses launched during this period. From an institutional framework perspective, this paper analyzes the main economic policy instruments designed to stimulate digital entrepreneurship. The "Digital Moldova 2030" strategy outlines the directions for modernizing the national economy by promoting automation and integrating e-commerce into the activities of economic agents. The National Industrial Development Program 2024–2028, which positions digital entrepreneurship as a strategic lever for reducing structural unemployment through the digitization of production processes and the professional retraining of the workforce. ODA programs for the digitization of SMEs offer concrete financial and non-financial support, including vouchers and grants for the technological modernization of small and medium-sized enterprises. The 373 Preferential Financing Program provides entrepreneurs with affordable loans designed to stimulate investment in innovative technologies. Last but not least, the 2026–



2027 Government Action Plan sets clear and quantifiable objectives, aiming to increase the number of employees in the SME sector by more than 17,000 by 2027 and to more than triple the volume of non-repayable funding for business start-ups through ODA instruments.

The paper pays particular attention to vulnerable groups, such as women, refugees, and rural populations, for whom digital entrepreneurship represents not only a source of income but also an effective tool for achieving economic independence and sustainable reintegration into the labor market. Ensuring equitable access to technology and investing in the development of digital skills among these groups are essential prerequisites for digital entrepreneurship to become a real driver of social inclusion and a means of reducing structural unemployment in the Republic of Moldova.

Objective: This paper aims to analyze the role of digital entrepreneurship as a strategic tool for reducing structural unemployment in the Republic of Moldova by examining the national economic context, the existing institutional framework, and the support mechanisms available to stimulate entrepreneurial activity in the digital environment.

Research methodology: The study was based on a mixed-methods approach, combining qualitative and quantitative methods. The bibliographic analysis method, the comparative method, and the systemic analysis method were employed, which enabled the identification of interdependencies between digitalization, the labor market, the institutional framework, and public employment policies.

Research findings: The study demonstrated that Moldova's robust technological infrastructure provides a solid foundation for the expansion of digital entrepreneurship; however, the lack of digital skills, excessive bureaucracy, and high costs of technology implementation remain major structural obstacles that limit the full realization of its potential.

Originality: This paper consists of an integrated analysis of digital entrepreneurship as a strategic tool for reducing structural unemployment, correlating the available technological infrastructure, the institutional support framework, and the structural vulnerabilities of the national labor market within a unified and coherent analytical approach.

Keywords: digital entrepreneurship, structural unemployment, Republic of Moldova, digitalization, SMEs, reskilling, economic inclusion



DIGITAL ECONOMY FOR PUBLIC POLICIES IN ALBANIA

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Abstract

This paper will analyse the role that the digital economy plays in innovation, competitiveness, and sustainability of global policies. It will also present the importance of investing in cryptocurrencies due to technological progress, critically assessing the potential benefits and risks within the Albanian economic and legal contexts, regulatory landscape and making comparisons with international cases from similar developing countries.

Since the digital economy is a strategic priority due to its impact on growth, it involves efficient activities and tools and reduces costs, while consumers enjoy improved access to goods and services. Challenges persist, including unequal access to digital infrastructure, cybersecurity risks in facilitating digital transformation.

The objective of this scientific paper is closely related to public digital systems and their effects on service delivery and civic engagement in the public sector. Also analyzes secondary data on the performance of Bitcoin and Ethereum, comparing it to traditional financial metrics such as stock indices, exchange rates, and interest rates in Albania. It calculates risk-return metrics and examines correlations between cryptocurrency price changes and local macroeconomic factors. The results will be visualized through graphs and tables, particularly highlighting Bitcoin's fluctuations from 2020 to 2022 compared to the stable Albanian Lek.

Methodology of this study includes integrated methods such as primary and secondary data collection, and quantitative and qualitative analyses.

To understand the opportunities and challenges of the digital economy, a qualitative research methodology is based on the analysis of secondary data from academic articles, reports, and statistical databases. The analysis highlights the innovations in artificial intelligence and data analytics are increasing efficiency in various sectors, but there is a digital divide between regions and a need for digital skills in the workforce. Technological progress is transforming industries, creating new opportunities for businesses and individuals. This scientific paper concludes that countries that invest in digital infrastructure achieve higher levels of competitiveness and economic growth.

The findings of this scientific paper show that digitalization in the public sector has improved service delivery, reducing costs, although challenges and cybersecurity affect successful implementation.

One of the key sectors being impacted by the rapid growth of the digital economy is accounting and auditing in the public sector, through these technologies, better budget oversight is enabled

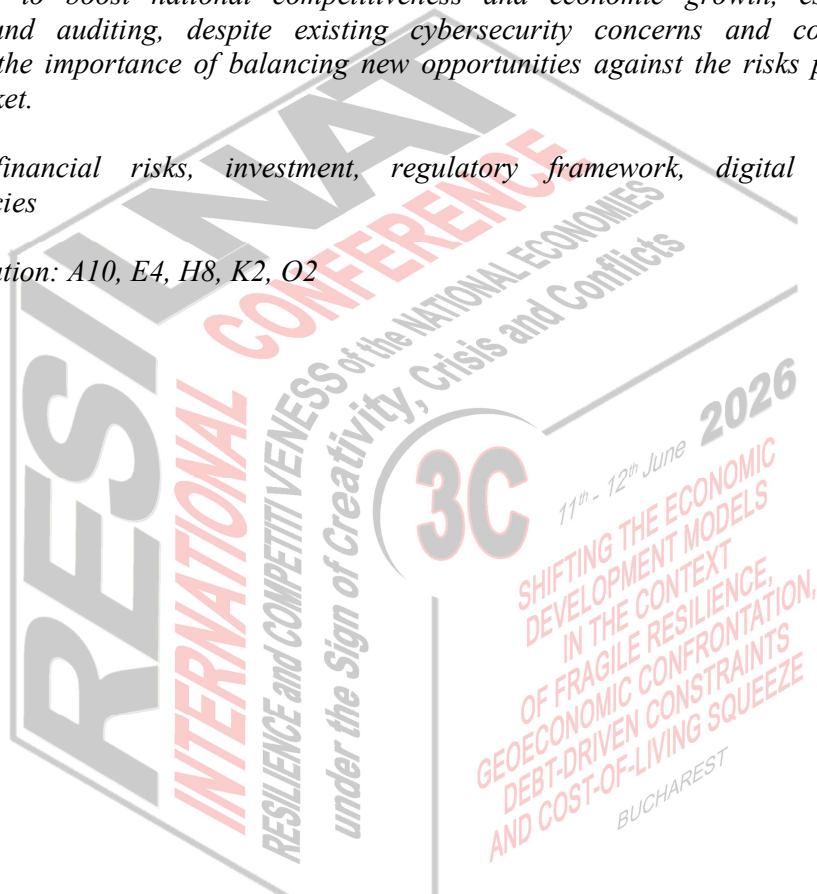


and sustainable economic development is promoted. Investors can improve returns by diversifying portfolios with cryptocurrencies, which operate independently of the Albanian economy and exhibit different movement patterns than traditional assets, potentially reducing investment risks tied to the domestic economy.

This paper examines the global impacts of the digital economy on innovation, competitiveness, and sustainability. It concludes that a robust digital economy enhances consumer access and economic growth, particularly in well-connected regions. However, it highlights challenges like unequal digital infrastructure access and cybersecurity risks. The report emphasizes the role of AI and data analytics in transforming industries and argues for investment in digital infrastructure to boost national competitiveness and economic growth, especially in accounting and auditing, despite existing cybersecurity concerns and concludes by emphasizing the importance of balancing new opportunities against the risks posed by an unstable market.

Keywords: financial risks, investment, regulatory framework, digital technology, cryptocurrencies

JEL classification: A10, E4, H8, K2, O2





A DATA ANALYTICS APPROACH TO UNDERSTANDING ECONOMIC GROWTH PATTERNS IN EMERGING ECONOMIES

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Abstract

Economic growth remains a critical objective for emerging economies seeking to improve living standards, reduce poverty, and achieve sustainable development. However, growth trajectories differ significantly across countries due to variations in economic structures, institutional quality, investment levels, trade openness, and technological advancement. Understanding the factors that drive these differences is essential for designing effective economic policies. This study adopts a data analytics approach to examine economic growth patterns in emerging economies and identify the key determinants influencing long-term economic performance.

Using a comprehensive dataset collected from international economic databases, the research analyses macroeconomic indicators such as gross domestic product (GDP), foreign direct investment (FDI), inflation, trade volume, government expenditure, employment, and human capital development. Descriptive analytics, correlation analysis, trend analysis, and data visualization techniques are employed to explore relationships among variables and uncover growth patterns across selected emerging economies. The study also investigates regional similarities and differences, highlighting the economic characteristics associated with higher growth performance and resilience.

The findings are expected to provide valuable insights into the role of investment, trade integration, macroeconomic stability, and human capital in supporting economic growth. Furthermore, the research demonstrates how data analytics can enhance economic analysis by transforming large volumes of economic data into actionable information for policymakers and researchers. By offering a data-driven perspective on economic development, this study contributes to the broader understanding of growth dynamics in emerging economies and supports evidence-based policy formulation aimed at fostering sustainable and inclusive growth.

Keywords: economic growth, emerging economies, data analytics, macroeconomic indicators, sustainable development



MACHINE LEARNING MODELS FOR PREDICTING ECONOMIC RESILIENCE DURING GLOBAL ECONOMIC SHOCKS

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Abstract

The increasing frequency and intensity of global economic shocks, including inflationary pressures, supply chain disruptions, geopolitical conflicts, and financial instability, have highlighted the need for effective tools to assess and predict economic resilience. Traditional econometric approaches often struggle to capture the complex and nonlinear relationships among economic indicators that influence a country's ability to withstand and recover from adverse events. This study proposes the application of machine learning techniques to predict economic resilience across countries during periods of global economic uncertainty.

Using a dataset composed of macroeconomic, trade, financial, and governance indicators obtained from international databases, the research evaluates the performance of three widely used machine learning models: Random Forest, Extreme Gradient Boosting (XGBoost), and Artificial Neural Networks. Economic resilience is measured through indicators related to economic stability, recovery speed, employment dynamics, inflation control, and gross domestic product growth following major global shocks. The models are trained and tested using historical data covering periods characterized by economic crises, supply chain disturbances, and geopolitical tensions.

The study aims to identify the most significant factors influencing resilience and compare the predictive accuracy of the selected machine learning algorithms. Furthermore, explainable artificial intelligence techniques are employed to enhance the interpretability of the results and provide insights into the relative importance of economic, institutional, and trade-related variables. The findings are expected to contribute to the growing literature on data-driven economic forecasting and support policymakers in designing proactive strategies to strengthen economic resilience. By integrating advanced analytics with economic policy analysis, this research demonstrates the potential of machine learning as a valuable tool for understanding and forecasting national responses to global economic shocks.

Keywords: economic resilience, machine learning, Random Forest, XGBoost, artificial neural networks, global economic shocks, inflation, supply chain disruptions, geopolitical conflicts, predictive analytics, economic forecasting, explainable artificial intelligence.



SESSION 7: NATIONAL ECONOMY RESILIENCE - BALANCING ECONOMIC GROWTH, SOCIAL EQUITY, AND ENVIRONMENTAL SUSTAINABILITY IN AN UNCERTAIN INTERNATIONAL CONTEXT

DIGITALISATION, DECARBONISATION AND ENVIRONMENTAL TAX SIGNALS: CROSS-COUNTRY EVIDENCE FROM EUROPEAN MANUFACTURING

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Abstract

Objective: *The environmental implications of digitalisation have become increasingly relevant in current debates on economic resilience, sustainable development and industrial transformation. Digital technologies may improve production processes through better monitoring, predictive maintenance, more efficient resource allocation and enhanced circularity. At the same time, they are not environmentally neutral, since they may also increase energy demand, accelerate hardware renewal, intensify material use and generate rebound effects that partially offset expected efficiency gains. In this context, the transition towards Industry 4.0. cannot be assessed only in terms of productivity, innovation or technological sophistication. It must also be examined in relation to carbon performance and to the fiscal incentives that shape firms' investment decisions. Against this background, the present study analyses the relationship between digitalisation, manufacturing decarbonisation and environmental tax signals in the European context. The paper builds on previous research by the author on Industry 4.0, digital transformation and productivity, while also engaging with broader work on environmental sustainability, industrial efficiency and green fiscal incentives. Its main objective is to assess whether the progress observed in the reduction of manufacturing carbon intensity is accompanied by a coherent fiscal environment capable of supporting the transition towards lower-carbon and more sustainable industrial models.*



Method: The paper adopts a comparative analytical approach based on Eurostat secondary data for the period 2015–2023, combined with the construction of original indicators derived from the author’s own calculation framework. Rather than reproducing official statistics descriptively, the study operationalises the relationship between digitalisation, decarbonisation and environmental fiscal incentives through a set of ratio-based comparative measures. First, manufacturing greenhouse gas emissions intensity is estimated as kilograms of CO₂ equivalent per euro of manufacturing gross value added at constant 2015 prices, allowing a standardised assessment of carbon performance across countries and over time. Second, environmental tax pressure is calculated as environmental tax revenues over GDP, in line with Eurostat and OECD methodological references, and used here as a synthetic measure of macro-level fiscal internalisation. Third, the paper derives an implicit real tax rate on energy by deflating energy tax revenues, relating them to final energy consumption and converting the resulting ratio into euros per tonne of oil equivalent. This methodological strategy makes it possible to compare how environmental performance and fiscal signals evolve across the EU, Germany, Spain and Romania under different industrial and policy conditions.

Results: The results show a decline in manufacturing emissions intensity in all four cases, although from markedly different starting points. The EU records a sustained reduction over the period, while Germany maintains lower carbon intensity levels throughout. Spain and Romania also improve significantly, but they remain more carbon-intensive than the EU average. Spain stands out for a particularly strong relative reduction in the final part of the period, whereas Romania displays a more volatile path, especially around 2020. These findings confirm that manufacturing decarbonisation has advanced, but not in a uniform manner. More importantly, this relative convergence in carbon intensity is not matched by a homogeneous evolution in environmental tax signals. Environmental tax pressure declines in the EU and Germany and remains systematically lower in Spain, while Romania follows a much more unstable trajectory. A similar pattern emerges in the implicit tax rate on energy. Germany records consistently higher levels than the EU average, Spain remains below it throughout most of the period, and Romania exhibits sharp fluctuations. Taken together, these results show that manufacturing sectors are moving towards lower emissions intensity under very different fiscal conditions. Therefore, the transition to more sustainable and digitally enabled industrial models is shaped not only by technological change, but also by nationally specific fiscal frameworks that alter the economic incentives for decarbonisation and energy-efficient investment.

Originality: The study contributes to the literature by moving beyond simplified views of digitalisation as an inherently green driver of industrial modernisation. It develops an integrated comparative perspective that connects Industry 4.0., manufacturing decarbonisation and environmental taxation within a common analytical framework. Building on the author’s previous work on digital transformation and productivity and relating to broader research on sustainability and fiscal incentives, the paper highlights an underexplored point that progress in carbon efficiency does not automatically imply convergence in the policy environments that support it. Its main academic contribution lies in showing that the resilience of low-carbon industrial development depends not only on technological upgrading, but also on the credibility, intensity and stability of environmental tax signals. This helps to explain why green and digital transitions advance unevenly across European economies, even when their



environmental performance improves. In this way, the paper contributes to current debates on resilience, sustainable industrial transition and policy coherence in a context marked by fragile growth, cost pressures and asymmetric adjustment capacities across countries.

Keywords: *manufacturing decarbonisation, environmental taxation, energy tax burden, carbon intensity, economic resilience, sustainable industrial transition, Industry 4.0.*





REGIONAL ECONOMIC RESILIENCE UNDER DEBT-DRIVEN CONSTRAINTS: RESISTANCE, RECOVERY AND SPATIAL CLUSTERING IN GREEK NUTS II REGIONS (2005-2019)

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Abstract

Objective: This study assesses the multidimensional economic resilience of the thirteen Greek NUTS II regions during the 2007-2009 global financial shock and the subsequent debt-driven fiscal adjustment (2010-2019), a period in which national GDP contracted by 24.4% and inter-regional disparities widened. Within the 2026 RESILNAT-3C theme of "fragile resilience" and "debt-driven constraints", the paper diagnoses how regional economies absorb a deep, multi-stage shock, isolates the drivers behind resistance and recovery, identifies the geographic clustering of resilient and vulnerable territories, and derives a regional typology supporting targeted post-crisis policy responses in a small open economy under prolonged macro-financial stress.

Method: The empirical framework integrates four complementary techniques. First, three core macroeconomic variables - Gross Value Added (GVA), employment, and gross fixed capital formation (GFCF) - are tracked across pre-shock (2005-2008), resistance (2008-2016) and recovery (2016-2019) sub-periods, using the resistance and recovery indices of Martin et al. (2016) benchmarked against the national trajectory. Second, the dynamic shift-share decomposition of Artige and Van Neuss (2014) splits each index into a structural (industry-mix) component and a competitive (within-sector) component, providing unbiased identification of resilience drivers. Third, global and local spatial autocorrelation tests (Moran's I and LISA, queen-contiguity, row-standardised weights, 9,999 permutations) examine whether resilient territories cluster in space. Fourth, Agglomerative Hierarchical Clustering (AHC) and Kendall's W concordance statistic produce phase-specific resilience regimes and test the temporal stability of regional rankings. The combination of aspatial and spatial-relational tools captures both structural and territorial dimensions of fragile resilience.

Results: Greek regional resilience is highly heterogeneous and phase-dependent. For GVA, six of thirteen regions display positive resistance and seven positive recovery; weak recoveries concentrate in North Aegean, East Macedonia-Thrace, West Macedonia, Epirus, West Greece and Peloponnese. Employment shows strong resistance (ten regions with positive



competitiveness effects) but weak recovery (only three regions). GFCF exhibits the largest cross-regional variance, with extreme volatility in tourism-intensive islands and resource-dependent areas. The shift-share decomposition shows that resistance is competitiveness-driven (within-sector productivity adjustments), whereas recovery is structurally driven (sectoral recomposition). The spatial analysis reveals significant positive clustering only for employment resistance (Moran's $I = 0.505$, $z = 2.465$, $p = 0.014$), with high-high clusters around metropolitan and tourism areas (South Aegean, Attica) and low-low clusters across western-central Greece; the remaining indices show statistically non-significant spatial autocorrelation, suggesting that GVA and investment resilience operate through region-specific rather than territorial mechanisms. Kendall's W rises from 0.284 (pre-crisis, insignificant) to 0.468 (crisis) and 0.803 (recovery, statistically significant), indicating that uniform fiscal adjustment converged regional rankings post-crisis. AHC identifies four pre-crisis profiles, three crisis-phase contraction trajectories and five recovery profiles. The integrated typology distinguishes four regimes: (i) metropolitan resilient cores (Attica, Central Macedonia) combining competitive advantages with investment recovery; (ii) tourism-driven recovery regions (South Aegean, Crete, Ionian Islands) with strong structural recovery potential; (iii) structurally lagging peripheries (Epirus, Thessaly, Central Greece, West Greece) showing stability but limited dynamism; and (iv) volatile resource-dependent West Macedonia.

Originality: The paper's contribution is methodological and policy-oriented. It is among the first integrated assessments of Greek regional resilience that simultaneously (a) applies Martin's resistance and recovery indices to three complementary variables (GVA, employment, investment), (b) decomposes them through the unbiased Artige-Van Neuss dynamic shift-share, (c) tests spatial dependence with Moran's I and LISA, and (d) corroborates the resulting regimes through AHC and Kendall's W . This four-layer framework operationalises "fragile resilience" under debt-driven constraints and yields an actionable typology of regional response, supporting tailored interventions - innovation policy in metropolitan cores, sustainability transitions for tourism economies, diversification strategies in lagging peripheries, and managed transitions in carbon-intensive resource regions - aligned with the conference theme of shifting economic development models.

Keywords: regional economic resilience, Greek NUTS II regions, resistance and recovery indices, dynamic shift-share decomposition, spatial autocorrelation (Moran's I , LISA), agglomerative hierarchical clustering, Kendall's W concordance, debt-driven fiscal adjustment.

JEL classification: R11 - Regional economic activity: growth, development, environmental issues, and changes; R15 - Econometric and input-output models; other models; C38 - Classification methods, cluster analysis, principal components, factor models.

Funding: This work was conducted within the doctoral research of E. N. Dulufakis at the Department of Business Administration and Tourism, Hellenic Mediterranean University (HMU), with no external funding.



FRAGILE RESILIENCE AND THE GREEN TRANSITION: INFLATION, HOUSEHOLD DEBT AND CIRCULAR ECONOMY PERFORMANCE IN THE EUROPEAN UNION

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Abstract

This paper explores whether recent cost-of-living pressures have affected circular economy performance across European Union member states. Although inflation, household financial vulnerability, and sustainability transitions have each been widely discussed in the literature, their intersection remains insufficiently examined. In particular, relatively little is known about whether rising prices and debt-related constraints reduce the ability of economies to sustain progress in recycling and circular material use.

The paper starts from the idea that periods of economic stress may shift attention away from longer-term sustainability goals toward more immediate financial concerns. When inflation erodes purchasing power and household debt increases financial pressure, both private behaviour and public priorities may become less supportive of circular practices. This raises an important question: can circular economy performance remain stable when households and governments operate under tighter budget constraints?

To address this issue, the study investigates the relationship between inflation, household debt, and circular economy indicators in a panel of EU member states. The empirical analysis focuses on measures such as the municipal waste recycling rate and the circular material use rate, while also accounting for broader socio-economic conditions. A fixed-effects panel framework is used in order to capture both cross-country differences and changes over time.

The paper aims to contribute to the literature by linking macroeconomic fragility to circular economy outcomes and by showing that sustainability performance may also depend on the financial resilience of households. It also considers whether digitalization and institutional strength can cushion these negative effects. In this way, the study brings together debates on economic resilience, social vulnerability, and green transition in a common analytical framework.



ENERGY POVERTY AND ECONOMIC RESILIENCE: MICROSIMULATION EVIDENCE FROM THE REPUBLIC OF MOLDOVA

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Abstract

Objective: Energy poverty has become a persistent welfare and resilience challenge in small, import-dependent economies, where exposure to external price shocks is amplified by limited domestic energy production and constrained fiscal space. In the Republic of Moldova, where domestic resources cover only approximately 23% of primary energy demand, the capacity of households to meet basic heating needs depends critically on the design of public compensation mechanisms. This study evaluates Moldova's energy consumption compensation framework, formalised through Law No. 241/2022 and operationalised by Government Decision No. 816/2024. It examines how alternative policy parameter configurations affect household welfare, fiscal sustainability, and energy conservation incentives. The paper contributes to the literature on energy poverty and economic resilience by operationalising a structural trilemma between social protection, public expenditure, and behavioural responses to compensation transfers.

Method: The analysis applies a microsimulation framework to a synthetic population of 10,000 households calibrated to reproduce the vulnerability distribution observed in administrative records. Household energy expenditures during the heating season are projected for electricity, natural gas, and thermal energy using a constant-elasticity expenditure model. Compensation amounts are calculated according to the statutory formulas established by Government Decision No. 816/2024, incorporating minimum floors, maximum ceilings, fuel-specific rates, and vulnerability-based eligibility rules. Behavioural responses are modelled through an elasticity-based decomposition that separates price effects from income effects on energy demand. Nine policy scenarios are assessed: the baseline framework and eight counterfactual configurations that systematically vary compensation floors, ceilings, and energy-specific rates. The scenarios are compared across three outcome dimensions: energy poverty incidence, total fiscal cost, and post-compensation changes in energy consumption.

Results: The baseline scheme substantially reduces gas poverty among the most vulnerable households, lowering it from near-unity pre-compensation levels to approximately 0.65 for very high vulnerability households and 0.60 for high vulnerability households, at a fiscal cost of 5,931.2 million MDL. Across all scenarios, income effects generated by compensation transfers dominate price effects, producing additional energy consumption of +12% for natural gas and +13% for thermal energy among very high vulnerability households. Generous configurations reduce gas poverty to approximately 0.55, but raise fiscal costs to 7,461.6 million MDL and generate consumption increases of 15-18%. Restrictive configurations reduce expenditure to 3,942.6 million MDL, but leave gas poverty at approximately 0.78, which is incompatible with social protection objectives. The Lower max + lower gas % scenario emerges as the most balanced configuration, preserving gas poverty outcomes within 0.02 of the baseline while saving 454.9 million MDL, equivalent to 7.7% of baseline expenditure, and



reducing consumption increases to +9% for gas and +11% for thermal energy. A key finding is the structural invariance of electricity poverty: post-compensation electricity poverty remains between 0.85 and 0.90 across all scenarios, indicating that cash or bill compensation alone cannot address electricity affordability constraints.

Originality: This study provides the first microsimulation-based evaluation of Moldova's energy compensation framework and advances a replicable approach for ex ante policy assessment in data-constrained transition economies. Unlike descriptive or aggregate evaluations, the framework integrates statutory compensation rules with household-level behavioural responses, allowing policy parameters to be assessed simultaneously in terms of social protection, fiscal sustainability, and conservation incentives. The paper's main conceptual contribution is the structural trilemma, which clarifies why compensation policies cannot fully maximise household protection, budgetary discipline, and energy-saving incentives at the same time. The finding that electricity poverty remains invariant across compensation scenarios adds a novel insight to the energy poverty literature and points to the need for complementary housing efficiency, supply-side, and tariff-related interventions. More broadly, the study shows that economic resilience can be strengthened not only through larger public transfers, but through careful calibration of policy parameters in ways that preserve household welfare while limiting fiscal and behavioural side effects.

Keywords: energy poverty, economic resilience, microsimulation, compensation policy, fiscal sustainability, transition economies, Republic of Moldova

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COST STRUCTURE AND PROFIT MARGIN DISTRIBUTION IN HORTICULTURAL VALUE CHAINS: IMPLICATIONS FOR ECONOMIC RESILIENCE AND SUSTAINABLE COMPETITIVENESS IN THE REPUBLIC OF MOLDOVA

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Abstract

Objective: *The horticultural sector represents one of the strategic branches of the agri-food economy of the Republic of Moldova, contributing significantly to agricultural output, export revenues, rural employment, and regional economic stability. In the context of increasing market volatility, external economic pressures, and the European integration process, strengthening the economic resilience and sustainable competitiveness of horticultural value chains has become a major development priority. The present study aims to analyze the structure of production costs and the distribution of profit margins across the horticultural value chain in the Republic of Moldova, covering primary production, post-harvest handling, processing, logistics, wholesale distribution, and retail trade. Particular attention is given to the structural asymmetries affecting value distribution, producers' bargaining power, and the long-term economic sustainability of the sector.*

Method: *The study is based on a qualitative and quantitative analytical approach, combining comparative analysis, economic interpretation, and synthesis of statistical and sectoral information. The research relies on data regarding production costs, post-harvest handling, logistics, storage, processing, and commercial distribution in the horticultural sector. The methodological framework includes the examination of variable and fixed costs at farm level, comparative assessment of profit margins across the main stages of the value chain, and evaluation of the role of post-harvest infrastructure in increasing product value. In addition, the study incorporates the analysis of market relations between producers, intermediaries, processors, and retailers, highlighting the mechanisms through which value added is distributed within the chain.*

Results: *The results of the study indicate that the horticultural value chain in the Republic of Moldova is characterized by an uneven distribution of costs and profit margins between economic actors. Primary producers bear the largest share of production risks and operational costs, while receiving relatively limited profit margins compared to downstream segments such as processing, logistics, and retail trade. The analysis reveals that variable costs, including planting material, fertilizers, pesticides, fuel, labor, and irrigation, represent a dominant component of total production expenditures in horticulture. At the same time, insufficient access to modern post-harvest infrastructure, storage facilities, sorting, packaging, and logistics services reduces producers' bargaining power and limits their capacity to capture a larger share of final product value. The study also highlights the growing role of processing and retail chains in concentrating value added and influencing pricing mechanisms within the horticultural sector. Furthermore, investments in storage infrastructure, cold chains, and*

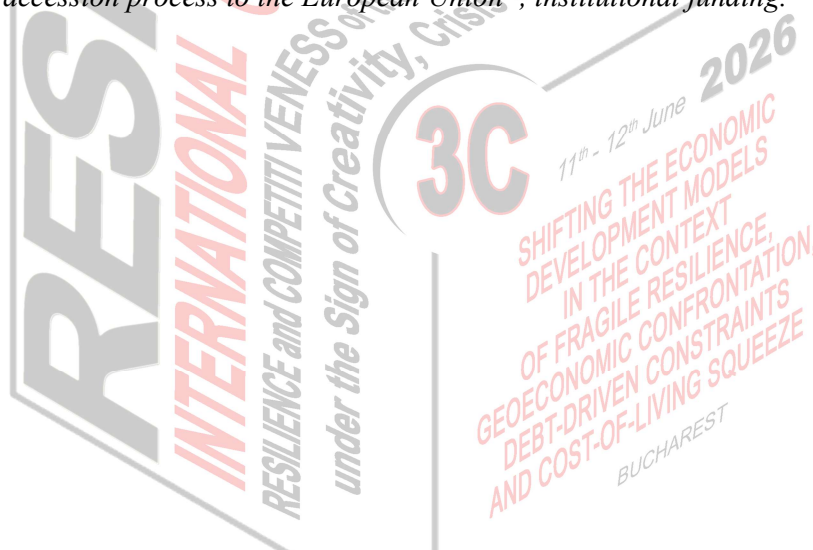


product standardization are identified as essential factors for increasing competitiveness, reducing post-harvest losses, and improving producers' access to high-value domestic and export markets.

Originality: The originality of the study derives from its integrated analysis of cost structures and profit margins across the entire horticultural value chain in the Republic of Moldova. Unlike approaches focused exclusively on farm-level production economics, the research examines the interactions between all major segments of the chain and emphasizes the structural asymmetries in value distribution. The paper also provides an analytical perspective on the economic importance of post-harvest infrastructure and modern supply chains in strengthening the competitiveness of horticultural products. By combining economic analysis with sector-specific interpretation, the study contributes to a better understanding of the constraints and opportunities affecting the sustainable development of the horticultural sector in the Republic of Moldova.

Keywords horticultural value chain, economic resilience, sustainable competitiveness, production costs, profit margin distribution.

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COMPETITIVENESS OF THE HORTICULTURAL SECTOR (PLUMS) IN THE CONTEXT OF THE REPUBLIC OF MOLDOVA'S ACCESSION TO THE EUROPEAN UNION

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Abstract: *The pomiculture sector constitutes a strategic segment of the Republic of Moldova's agriculture, with plum cultivation holding a significant share in both securing the domestic market and expanding agri-food exports. Within the current framework of the Republic of Moldova's accession process to the European Union, the competitiveness of the plum value chain becomes a pivotal factor for the sustainable integration of domestic producers into the European market. This transition necessitates an economic paradigm shift: moving from a competitive advantage rooted in cost optimization toward one grounded in high value-added generation.*

This article examines the structure and functionality of the plum value chain in the Republic of Moldova, highlighting the key stages of production, collection, storage, processing, and marketing. The research aims to evaluate the sector's competitiveness in relation to European market requirements and the objectives of the Common Agricultural Policy (CAP). The research methodology employs comparative analysis, statistical analysis, and a descriptive approach to the economic and trade indicators relevant to the plum sector. The study underscores Moldova's competitive advantages, derived from favourable agro-climatic conditions, a long-standing pomological tradition, and high export potential. Simultaneously, the research identifies a series of constraints hindering sectoral development and competitiveness: land fragmentation, underdeveloped post-harvest infrastructure, and difficulties in aligning with European quality and food safety standards. The findings demonstrate that technological modernization, the stimulation of cooperation and entrepreneurial association, and adaptation to European standards can significantly enhance the competitiveness of the plum sector. Furthermore, integration into the European market offers substantial opportunities for export diversification and increasing the value-added of Moldovan agri-food products.

Keywords: *value chain, pomiculture sector (plums), competitiveness, Common Agricultural Policy (CAP), horticultural exports, sustainable agriculture, Republic of Moldova*

JEL classification: *Q 13; Q17; Q18; F15; O13*

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THE ROLE OF SUSTAINABLE FINANCING IN STRENGTHENING NATIONAL ECONOMIC COMPETITIVENESS: THE CASE OF THE REPUBLIC OF MOLDOVA

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Abstract

In the context of increasing climate risks, geopolitical instability and the acceleration of the transition to a low-carbon economy, sustainable finance is asserting itself as a strategic pillar of contemporary economic development. The specialized literature highlights the fact that the integration of environmental, social and governance criteria in investment decisions, aligned with the standards promoted by institutions such as the European Commission, the Organization for Economic Cooperation and Development and the World Bank, contributes significantly to increasing economic resilience and improving national competitiveness in the long term.

***The purpose** of the article is to assess the relationship between sustainable finance and national economic competitiveness, by highlighting the impact generated by the integration of sustainability principles in financial, investment and economic governance systems.*

*To achieve the purpose, the following **objectives** were defined: conceptual analysis of sustainable finance and economic competitiveness in the specialized literature; identification of the main green financial instruments used internationally, including green bonds, green loans and sustainable investment funds; assessment of the influence of green investments on economic competitiveness indicators, such as productivity, degree of innovation and investment attractiveness; examination of the role of ESG policies in stimulating sustainable economic development; formulation of economic policy directions aimed at strengthening competitiveness through sustainable financial mechanisms.*

***The research methodology** is based on a mixed approach, including comparative analysis, scientific synthesis, statistical analysis and systemic approach. Reports and databases of international organizations, including the World Bank, the International Monetary Fund, the OECD and the European Commission, as well as indicators on sustainable investments and economic competitiveness at the international level were used. The empirical component of the study aimed at analyzing access to green financing among 204 companies from the Republic*



of Moldova, in order to identify the level of integration of sustainable principles in economic activity and the predominant sources of financing.

The research results indicate that the main sources of financing for sustainable projects are own resources and external funds, especially European and international ones. Approximately 66% of respondents use their own resources, 57% benefit from European or international funds, and 31% resort to bank loans. At the same time, 29% of respondents indicated that the question regarding sustainable financing is not applicable, which may reflect either the absence of green projects in the investment structure of companies or the existence of institutional and informational barriers in accessing financial instruments dedicated to the green transition. The complementary analysis highlights the fact that 55.9% of companies have initiatives in the field of sustainability, but these are predominantly unstructured and lack a formalized strategy. Only 11.3% of organizations have a formal sustainability plan, while 32.8% have not implemented objectives or policies in this area, which suggests a still incipient level of institutional maturity in relation to the requirements of the green economy.

The originality of the study lies in the empirical investigation of access to sustainable financing among 204 enterprises in the Republic of Moldova, in a context characterized by the gradual transition to green economic models and the incipient development of the market for sustainable financial instruments. The research makes a relevant contribution by integrating a microeconomic perspective on a field dominated, in the specialized literature, by macroeconomic analyses and international comparative studies. The novelty lies in the direct analysis of the behavior of enterprises in relation to green financing sources, the degree of implementation of sustainability initiatives and the level of formalization of ESG strategies. The study highlights, based on the data collected, the real structure of financing of sustainable projects, identifying the prevalence of own resources and external funds, as well as the relatively low use of bank loans dedicated to green investments. In addition, the research brings added value by highlighting a significant gap between declarative intentions and the effective implementation of sustainability practices at the organizational level. The analysis shows that although a significant part of enterprises declare sustainability initiatives, these are not accompanied by formalized strategies, which indicates an insufficient level of institutional maturity in relation to the requirements of the green transition. The originality of the study is strengthened by the contextualized approach of the Republic of Moldova, the use of a significant sample of enterprises and the correlation between access to sustainable financing and the level of integration of ESG principles into real economic practices.

Keywords: development, enterprises, green economic models, financing mechanisms, sustainable finance

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THE RELATIONSHIP BETWEEN FINANCIAL DEVELOPMENT AND HOUSEHOLD WELFARE IN EUROPEAN COUNTRIES

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Abstract

Objective: This paper aims to analyze the relationship between financial development and the economic well-being of households in European countries, based on existing academic literature. Financial development, which includes the deepening of the banking system, increased access to financial services, as well as the advancement of financial and digital instruments, is considered a key factor in the functioning of modern economies. On the other hand, household welfare includes elements such as income, consumption, savings, debt levels, and financial stability. The main objective of this paper is to examine how financial development affects these dimensions of household welfare, by identifying the main channels of impact as well as potential differences among various European countries. The paper also aims to provide an integrated theoretical framework linking financial development with the socio-economic outcomes of households, emphasizing the importance of this relationship for public policy and economic stability.

Method: This study is conceptual in nature and is based on a systematic review of existing academic literature and institutional reports from international organizations such as the World Bank, the International Monetary Fund, and the Organisation for Economic Co-operation and Development. The selection of literature focuses on empirical and theoretical studies that address the relationship between financial development and indicators of household welfare in European countries. The analysis includes a comparison of the main findings of different authors, the identification of similarities and differences in their results, as well as a critical evaluation of the methodological approaches used in these studies. The paper does not use primary data or econometric models but relies on the synthesis of existing knowledge to build a general analytical framework on the topic.

Results: The literature review shows that financial development has a significant and complex impact on household welfare in Europe. In most studies, it is evidenced that financial development improves welfare through increased access to credit, the expansion of banking services, and the facilitation of investment and consumption. This easier access to financial resources contributes to higher living standards and improved household consumption. However, some studies also highlight potential negative effects, such as increased levels of household debt and greater exposure to financial risks, especially in cases where financial development is not accompanied by adequate financial education. Furthermore, the results indicate that the impact of financial development varies between Western and Eastern European countries, reflecting differences in institutional structures and levels of economic development.



Originality: *The original contribution of this paper lies in the integration of existing literature on financial development and household welfare into a unified conceptual framework for European countries. Unlike empirical studies that focus on specific country cases or time periods, this paper offers a broad comparative perspective by synthesizing key findings and identifying general trends in the literature. Furthermore, the paper highlights existing gaps in the scientific research, particularly the lack of integrated studies that simultaneously address both the positive and negative dimensions of financial development in relation to household welfare. In this way, the study provides a valuable foundation for future empirical research and for the formulation of economic policies at the European level.*

Keywords: *financial development, household welfare, level of debt, financial inclusion, economic stability*





EUROPEAN INTEGRATION AND INSTITUTIONAL RESILIENCE: THE ROLE OF LEGAL APPROXIMATION IN STRENGTHENING THE REPUBLIC OF MOLDOVA'S NATIONAL ECONOMY

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Abstract

In the current European context, the Republic of Moldova's economic resilience is increasingly connected with the quality of its institutions and with the capacity of public authorities to align national rules with European Union standards. Legal approximation is usually discussed as a technical condition of European integration, yet its practical relevance goes beyond the formal transposition of legal acts. It affects market predictability, public procurement, consumer protection, energy security, administrative modernization and the confidence of investors and citizens in the stability of the regulatory environment.

***The objective** of this study is to examine how legal approximation with the European Union *acquis* can contribute to strengthening institutional resilience and, indirectly, the national economy of the Republic of Moldova. The paper approaches legal approximation not as an isolated legal exercise, but as a governance instrument that may improve the quality of regulation and support economic adaptation in a period marked by regional uncertainty, external shocks and the need for sustainable development.*

***Method:** The study uses a qualitative and interdisciplinary methodology, combining legal analysis with institutional and economic interpretation. The formal legal method is applied to the Association Agreement between the European Union and the Republic of Moldova, which provides the main framework for gradual approximation and economic integration. Document analysis is used to examine recent official sources, including the National Programme for the Accession of the Republic of Moldova to the European Union for 2025-2029, the European Commission's enlargement-related documents and the World Bank assessment on Moldova's growth prospects. The comparative method is used to relate domestic reform priorities to the logic of the EU *acquis*, while the systemic method helps to identify the connection between legal alignment, institutional capacity and national economic competitiveness. The analysis is deliberately non-partisan and focuses on functional links between regulation, public administration and economic resilience.*

***Results:** The main result of the research is that legal approximation can strengthen the Republic of Moldova's national economy only when it is accompanied by effective implementation and institutional learning. First, approximation improves the predictability of the legal framework by reducing regulatory gaps and bringing national rules closer to standards familiar to European markets. This is particularly relevant for areas such as public procurement, energy, technical standards, competition, consumer protection and digital*



services. Second, the process increases institutional resilience by requiring public authorities to develop coordination mechanisms, impact assessment practices, concordance tables, monitoring tools and professional expertise in EU law. Third, legal approximation contributes to economic resilience by supporting a more transparent business environment, reducing uncertainty for investors and facilitating gradual participation in the EU internal market. However, formal transposition alone is insufficient. The benefits of approximation may remain limited if legislation is adopted without secondary regulations, administrative procedures, trained personnel or regular evaluation. Therefore, the study identifies implementation capacity as the critical link between European integration and economic strengthening.

Originality: The originality of the study consists in connecting three dimensions that are often analysed separately: European integration, institutional resilience and the strengthening of the national economy. Instead of treating legal approximation only as a legal obligation under the Association Agreement, the paper interprets it as a mechanism through which institutions become more predictable, transparent and capable of responding to economic challenges. The proposed approach is relevant for Moldova because it highlights that approximation with the EU acquis should not be reduced to copying European norms, but should be understood as a continuous process of regulatory modernization, administrative adaptation and economic confidence-building. The study contributes to the conference theme by showing that resilience is not only a macroeconomic indicator, but also a legal and institutional capacity to absorb shocks, ensure continuity of reforms and create a stable environment for sustainable growth.

Keywords: European integration, legal approximation, institutional resilience, Republic of Moldova, national economy, EU acquis, regulatory quality, economic resilience



MONITORING THE GREENWASHING PHENOMENON

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Abstract

The phenomenon of greenwashing represents a major challenge in the context of the transition to a sustainable economy, as it affects the credibility of environmental initiatives and distorts market mechanisms. Essentially, greenwashing consists of the exaggerated or false promotion of the environmental performance of an organization, product or service, without being supported by real or verifiable data. In this context, the development of rigorous monitoring indicators becomes vital to differentiate between genuine commitments and misleading communication practices, in line with the guidelines promoted by the European Commission, OECD and UNEP.

***The objective** of the study is to identify and systematize the main indicators used to monitor the phenomenon of greenwashing, as well as to highlight how they can contribute to assessing the credibility of organizations' environmental statements. The analysis aims to provide an integrated conceptual framework that allows for the differentiation between real environmental performance and image-oriented strategic communication.*

***The methodology** used is based on the documentary analysis of the specialized literature and the international normative framework. Reports and guides developed by international organizations, as well as indexed academic studies, were examined in order to identify the relevant indicator categories. The approach is comparative and synthetic, being used to correlate different types of indicators, from quantitative ones, related to environmental performance, to qualitative ones, referring to governance and communication.*

***The results** highlight the existence of a multidimensional framework of indicators for monitoring greenwashing. First, the information transparency indicators emphasize the need to report quantifiable data on emissions, resource consumption and waste generation. The lack of such data or the use of general statements represents a risk signal. Second, the coherence indicators between discourse and practice allow the assessment of the degree to which public messages reflect the operational reality, highlighting the discrepancies between sustainable and polluting activities.*

Another important result is the role of certifications and independent verification. The presence of recognized eco-labels and external auditing reduce the risk of greenwashing, while the use of unofficial certifications increases it. Also, the analysis of the life cycle of products appears as an essential tool for assessing the total environmental impact, avoiding selective approaches. Indicators on the structure of investments show that the proportionality between sustainable and traditional investments is a relevant criterion for the authenticity of



commitments. In addition, governance and management indicators highlight the importance of integrating environmental objectives into organizational strategy and managerial responsibility.

The originality of the study lies in the integration of these categories of indicators into a coherent analytical framework, which combines the quantitative dimension of environmental performance with the qualitative dimension of communication and governance. Unlike the fragmented approaches in the existing literature, the analysis proposes a systemic perspective, in which greenwashing is assessed not only through the lens of reported data, but also of the strategic and institutional context in which they are generated. This approach allows for a deeper understanding of the mechanisms through which organizations can create misperceptions regarding sustainability.

Thus, effective monitoring of greenwashing requires the use of a complex set of indicators covering transparency, coherence, independent verification, life cycle analysis and organizational governance. The paper stipulates indicators such as: those for transparency and reporting of environmental data (CO₂ emissions, water consumption, waste); indicators of coherence between discourse and performance (share of revenues from sustainable activities in total revenues, ratio between "green" marketing statements and actual environmental performance, existence of measurable climate objectives and progress made), indicators regarding certification and validation of eco-labels: (number of internationally recognized certifications (ISO 14001, EU Ecolabel), percentage of certified products in the total portfolio, existence of independent verification of environmental statements), life cycle indicators (existence of a Life Cycle Assessment for products, proportion of impact assessed over the entire life cycle, transparency regarding stages with negative impact (production, transport, disposal); economic and investment indicators (share of "green" investments in total investments, expenditure on research and development in the field of sustainability, ratio between investments in polluting and sustainable activities); governance and management indicators (existence of a formalized ESG strategy, inclusion of environmental indicators in management assessment, level of management responsibility for environmental performance), communication and risk indicators greenwashing (frequency of use of vague terms (eco, green, sustainable) without definition, number of complaints or sanctions for misleading statements, degree of clarity and verifiability of public messages).

Keywords: greenwashing, environmental indicators, sustainability, governance and management indicators, information transparency, certifications

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CLUSTER POLICY AS A TOOL FOR REGIONAL ECONOMIC RESILIENCE: EVIDENCE FROM UKRAINE

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Abstract

Objective: Cluster policy has long been studied as an instrument for improving competitiveness and innovation capacity, but its role as a mechanism for regional economic resilience has received considerably less systematic attention. This gap is especially significant for areas affected by severe economic shocks, as seen in Ukraine where ongoing war has exacerbated regional inequalities, harmed industrial capabilities, and created an urgent need for data-driven recovery strategies. The study examines how cluster policy can strengthen regional economic resilience and identifies the governance conditions and policy instruments that make cluster-based approaches effective during crises and structural transformations.

Method: The study draws on qualitative analysis of academic literature, EU policy documents, and experiences from European economies with established cluster frameworks. Evidence from Ukraine's emerging cluster ecosystem, including regional initiatives, smart specialization processes, and stakeholder consultations conducted within international cooperation projects, is incorporated through comparative analysis to identify mechanisms linking cluster development to resilience outcomes.

Results: The analysis shows that clusters contribute to resilience through three pathways: strengthening regional cooperation networks that increase capacity to absorb external shocks; facilitating knowledge transfer and technology diffusion that improve firm-level adaptability; and diversifying local economic structures by reducing dependence on individual sectors or enterprises. European evidence further demonstrates that financial support alone is insufficient because effective cluster policy depends on institutional capacity, professional management, and coherent alignment with regional development and smart specialization strategies. Policy instruments such as cluster accreditation systems, excellence programmes, and internationalization support have demonstrably contributed to ecosystem resilience. In Ukraine, cluster initiatives are expanding and increasingly integrated into regional strategies, but gaps in institutional capacity, policy coordination, and sustained funding constrain their potential. Nonetheless, clusters are emerging as meaningful platforms for business cooperation, innovation, and economic recovery in war-affected regions.

Originality: The study repositions cluster policy as a resilience instrument rather than merely a competitiveness tool, with important implications for the design, funding, and evaluation of cluster support programmes in times of crisis and uncertainty. The Ukrainian case offers a distinctive perspective, as the rapid development of cluster initiatives and the emergence of



more structured cluster policy efforts largely coincided with the wartime period. In particular, the establishment of the Ukrainian Cluster Alliance and the growing integration of clusters into regional development and smart specialisation processes illustrate how crisis conditions can accelerate collaborative economic responses rather than merely constrain them. This provides valuable empirical evidence on the role of clusters as mechanisms for adaptation, recovery, and economic restructuring under conditions of prolonged uncertainty and contributes to the broader literature on regional resilience and post-crisis development.

Keywords: cluster policy, regional economic resilience, innovation ecosystems, smart specialization, economic recovery, cluster management, Ukraine





SESSION 8: SPECIAL SECTION FOR PHD. STUDENTS

ANALYSIS OF WATER STRESS IN EUROPE

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Abstract

Objective: Water represents a strategic resource essential for economic development, ecosystem stability, and population well-being. In recent decades, climate change has significantly intensified pressures on freshwater availability, through rising temperatures, altered precipitation regimes, and increasing frequency of drought events. Within this evolving context, understanding the relationship between water resource pressure and the development of public water supply infrastructure is essential for designing effective policy responses. The primary objective of this study is to empirically investigate the interdependencies between water stress indicators and population access to public water supply systems across European countries, with a particular focus on identifying structural patterns and explanatory mechanisms. The empirical approach is built on a set of relevant indicators, which capture both the size of the pressure on water resources and the level of development of the supply infrastructure. In this sense, the Water Exploitation Index Plus (WEI+) and Water Stress indicators are used to characterize the degree of exploitation and intensity of use of water resources, while the share of the population connected to the public water supply system reflects the institutional and infrastructural capacity of states to ensure access to essential services.

Method: The research employs a quantitative methodological framework based on data from internationally recognized databases, including Eurostat and FAO AQUASTAT. Three key indicators are used to capture the multidimensional nature of water resource management: the Water Exploitation Index Plus (WEI+), the Water Stress indicator, and the proportion of the population connected to public water supply systems. The analytical strategy integrates multiple statistical techniques. First, descriptive statistics are used to characterize the



distribution and variability of the variables. Second, correlation analysis—primarily based on Spearman coefficients due to non-normal data distributions—is applied to assess the strength and direction of relationships. Third, linear regression models (both simple and multiple) are estimated to evaluate the explanatory power of water pressure indicators on infrastructure development. Finally, cluster analysis (combining Ward’s hierarchical method and K-means) is conducted to identify country typologies, and ANOVA is used to validate inter-group differences.

Results: *The empirical findings reveal the existence of statistically significant relationships between the analyzed variables. A strong positive correlation is observed between Water Exploitation Index Plus (WEI+) and Water Stress, confirming their conceptual interdependence as measures of pressure on water resources. Moreover, Water Stress exhibits a moderate and statistically significant positive relationship with the level of population connectivity to public water supply systems, suggesting that higher levels of resource pressure are associated with increased infrastructural development. Regression results further demonstrate that Water Stress represents the primary explanatory factor, exerting a significant and robust influence on infrastructure development, while the effect of WEI+ becomes negligible when both indicators are included in the model. The cluster analysis identifies two distinct groups of European countries: one characterized by high water stress and highly developed infrastructure, reflecting an adaptive response to resource constraints, and another defined by lower pressure levels and comparatively less developed infrastructure. ANOVA results confirm that these clusters differ significantly across all variables, with Water Stress emerging as the dominant discriminating factor.*

Originality: *This study contributes to the existing literature by offering an integrated and comparative analysis of water resource pressure and infrastructure development at the European level. Unlike previous approaches that treat these dimensions separately, the present research combines correlation, regression, and clustering techniques within a unified analytical framework. The findings highlight the central role of water stress as a structural determinant of infrastructure development and provide evidence of distinct models of water resource management across European countries. By linking environmental constraints with institutional and infrastructural responses, the study offers a nuanced perspective on adaptation mechanisms and supports the formulation of differentiated policy strategies tailored to specific regional contexts.*

Keywords: *water stress, WEI+, water resource management, public water infrastructure, Europe, cluster analysis*



ANALYSIS OF WATER USE EFFICIENCY IN EUROPE IN THE CONTEXT OF CLIMATE CHANGE

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Abstract

Water resource management has become an increasingly pressing issue within the European Union, particularly in the context of climate change, environmental degradation, and growing pressure on natural resources. Wastewater treatment systems play a crucial role in ensuring environmental sustainability and public health protection, while simultaneously generating sewage sludge as a significant by-product. The management of this by-product represents a complex challenge, requiring the integration of environmental, technical, and economic considerations. Although economic development is often assumed to influence environmental outputs, the relationship between economic performance and sewage sludge generation remains insufficiently explored and conceptually ambiguous. In this context, a deeper understanding of the structural and economic determinants of sludge production is essential for improving water efficiency and strengthening climate resilience strategies.

Objectives: *The main objective of this study is to analyze the determinants of sewage sludge generation in European Union member states, with a particular focus on assessing the relative importance of economic and structural factors. Specifically, the research evaluates whether GDP per capita represents a significant explanatory variable for sludge production or whether this phenomenon is primarily driven by infrastructural characteristics, such as the population connected to wastewater treatment systems. By addressing this objective, the study contributes to clarifying the mechanisms underlying wastewater management processes and provides insights relevant for environmental policy, resource efficiency, and climate resilience strategies.*

Methodology: *The empirical analysis is based on a comparative cross-sectional approach using Eurostat data for 17 European Union countries. Two reference years, 2015 and 2022, were selected to ensure data consistency and comparability while maintaining a balanced sample. The dataset includes sewage sludge production (thousand tonnes), GDP per capita (euro per capita), and the population connected to wastewater treatment systems (thousand inhabitants). The econometric framework relies on a log-log multiple regression model estimated separately for each year using Ordinary Least Squares (OLS). This specification allows coefficient interpretation as elasticities and ensures comparability across countries with different scales. The analysis tests whether connected population significantly influences*



sludge generation, while GDP per capita has a weaker effect. Diagnostic tests were performed to validate model assumptions and ensure robustness.

Results: The results reveal a strong and stable relationship between sewage sludge production and the population connected to wastewater treatment systems. In both 2015 and 2022, the elasticity coefficients are close to unity and highly significant, indicating a proportional relationship between population size and sludge generation. This confirms that sludge production is primarily determined by infrastructural capacity. In contrast, GDP per capita does not have a statistically significant effect in either year. Although coefficients are positive, they remain insignificant, suggesting that economic development does not directly drive sludge generation. The stability of results across both years indicates that wastewater system resilience depends mainly on infrastructure coverage rather than economic performance.

Originality: The originality of this study lies in its focus on the structural determinants of sewage sludge generation within a comparative European framework and in its explicit evaluation of the relative importance of economic versus infrastructural factors. By employing a cross-sectional analysis for two distinct time points, the research provides empirical evidence on the stability of these relationships and challenges conventional assumptions regarding the role of economic development in environmental outcomes. The study contributes to the literature on environmental economics, water resource management, and climate resilience by demonstrating that technical and demographic factors play a dominant role in explaining sludge generation. Moreover, it offers a relevant analytical perspective for integrating environmental efficiency considerations into public policy design.

Conclusion: From a resilience perspective, the findings of this study have important implications for environmental and infrastructure policies within the European Union. They highlight that the expansion of wastewater treatment systems, while essential for achieving sustainability and public health objectives, inevitably leads to increased sludge production. Therefore, policy frameworks should not only focus on infrastructure development but also on the implementation of efficient sludge management strategies, including valorization and circular economy approaches. The results are relevant for policymakers, water service operators, and researchers, providing a foundation for improving resource efficiency and supporting the sustainable development of wastewater management systems.

Keywords: wastewater treatment; sewage sludge; water efficiency; climate change; European Union; environmental economics; infrastructure.



COSTS OF FAMILY MEDICINE SERVICES AND THEIR SOCIAL IMPACT

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Abstract

In the context of contemporary economic and social transformations, the costs of medical services represent an essential factor influencing the population's access to healthcare and, implicitly, the overall level of public health. The increase in expenditures for primary healthcare services, medicines, consultations, and treatments may generate social inequalities, reducing accessibility to quality care, especially for vulnerable population groups. Limited financial access to family medicine services often leads to delayed diagnosis, postponed treatment, increased disease complications, and higher long-term healthcare costs. At the same time, the efficiency of primary healthcare financing directly influences prevention capacity, early intervention, and the sustainability of the entire healthcare system.

*The **aim** of the study is to analyze the relationship between the costs of primary healthcare services and the health status of the population, highlighting the economic impact of limited access to primary medical services. Special attention is paid to the role of family medicine as the first level of contact between the population and the healthcare system, as well as to the influence of direct and indirect costs on the quality of life and social well-being of patients.*

***Methods:** The research uses an analytical and comparative approach based on socio-economic and public health indicators, such as direct expenditures on primary healthcare services, household out-of-pocket payments, life expectancy, healthy life expectancy, morbidity rate, hospitalization frequency, and the subjective perception of quality of life. Statistical, correlational, documentary, and comparative analysis methods were applied. The study includes the examination of official reports from the World Health Organization, Organisation for Economic Co-operation and Development, World Bank, as well as national statistical institutions of the Republic of Moldova.*

***Results:** The research results highlight that the high level of primary medical costs contributes to treatment delays, reduced use of preventive services, and worsening health conditions, which directly affects economic productivity and the social well-being of patients. High out-of-pocket expenditures create significant barriers for low-income households, increasing the risk of untreated chronic diseases and social exclusion. At the same time, healthcare systems with a higher degree of financial protection and universal coverage demonstrate superior results in terms of health indicators, lower avoidable hospitalization rates, and higher population satisfaction. The strengthening of family medicine financing improves service continuity, disease prevention, and cost-efficiency across the healthcare system.*

The developed conclusions emphasize the need for public policies focused on financial equity, efficiency in healthcare financing, and reducing the economic burden on the population as a fundamental premise for improving quality of life and ensuring sustainable social development. Strengthening investments in family medicine services and improving reimbursement mechanisms can significantly contribute to achieving better public health outcomes and strengthening social cohesion.



Keywords: family medicine, primary healthcare services, medical service costs, public health, quality of life, social impact, social well-being, health inequalities





THE TRANSITION TO A GREEN ECONOMY IN ROMANIA: AN EMPIRICAL ANALYSIS OF PERCEPTIONS, BARRIERS AND EXPECTATIONS OF THE POPULATION

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Abstract.

The transition to a green economy represents one of the most complex structural transformations that modern society is currently facing. This process involves the simultaneous reconfiguration of energy systems, the labour market, consumer behaviours and the public policy framework. Given the commitments assumed by the European Union through the Sustainable Development Strategy, the European Green Deal and the climate neutrality objective, Romania faces major implementation challenges, amplified by the dependence on fossil fuels, pronounced regional inequalities and still limited administrative capacity

The study is based on data collected in March 2026 through a questionnaire distributed online through the Google Forms platform, in which 327 respondents participated. It was organized into seven thematic modules: socio-demographic profile, perception of pollution and climate change, attitude towards the green transition and European climate objectives, preferences regarding the energy mix, perceived economic impact and the role of the state, level of information regarding national and European programs and ecological behaviours practiced. The data were analyzed using descriptive statistical methods and comparative analysis on modules structured around four research hypotheses.

The main objective of the paper is to analyze the perceptions and behaviours of the population regarding the transition to the green economy, by evaluating how economic factors, available infrastructure, financial support mechanisms and the level of awareness influence the acceptance of environmental protection measures, the adoption of renewable energy solutions, electric mobility and recycling practices in Romania.

Although the green economy has been intensively studied, the public perception, as a determining factor of social acceptance and the success of the implementation of public policies, remains insufficiently documented in the Romanian context. This gap is all the more significant as the specificity of Romania's socio-economic context requires a dedicated empirical analysis, which should go beyond the projections from studies conducted in other European Union member states. Romania is among the European countries with the highest levels of air pollution, however, the way in which citizens perceive, become aware of and feel the effects of pollution on their own health and quality of life remains an insufficiently researched subject at the national level, especially through quantitative methods based on questionnaires. In general, measures associated with the green transition are perceived favorably by citizens, especially when they are accessible and economically fair. The existence of concrete forms of financial support, subsidies, tax breaks or dedicated programs can make the difference between acceptance and rejection. The transition to sustainable solutions, such



as renewable energy or electric vehicles, depends not only on people's desire to protect the environment, but also on how accessible these options are in reality. High costs, bureaucracy and lack of adequate infrastructure can reduce the willingness of the population to make changes.

Regarding recycling, the participation of the population depends not only on the level of awareness, but also on the existence of a functional public infrastructure. The lack of containers, the poor organization of selective collection and the differences between urban and rural areas can represent important barriers to the adoption of sustainable behaviours.

This study aims to partially cover this deficit by empirically analyzing the perceptions, attitudes and behaviours of the Romanian population towards the green transition.

The results obtained highlight the fact that the transition to the green economy cannot be reduced only to investments, environmental policies and regulations, but represents a complex process that, in order to produce real and sustainable results, must be understood, accepted and assumed by all the factors involved, including citizens. Without concrete financial support mechanisms and solutions, without adequate infrastructure and without effective public communication, public support for the transition to a green economy may remain limited and insufficient to achieve the changes necessary to achieve Romania's climate objectives for 2050. Future research could build on these conclusions by expanding the sample of respondents that will contribute to the robustness of the results.

Keywords: Green transition, green economy, public perception, renewable energy, climate policies, ecological behaviour, Romania, questionnaire, survey based research.





THE ROLE OF RAILWAYS IN THE DEVELOPMENT OF ROMANIAN INDUSTRY DURING THE INTERWAR PERIOD (1919–1939)

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Abstract

Objective: *The interwar period represented a decisive phase in Romania's economic modernization, characterized by reconstruction after the First World War, territorial integration following the Great Union of 1918, and accelerated industrial development. In this context, transport infrastructure became a strategic prerequisite for economic growth, while railways emerged as the principal means of transporting raw materials, industrial goods, fuel, and labor across the country. Given the underdevelopment of road transport and the limited economic relevance of aviation, the railway system became the backbone of national economic integration. This study examines the contribution of Romanian railways, particularly the national railway network (Căile Ferate Române – CFR), to industrial development between 1919 and 1939, focusing on petroleum, mining, metallurgy, energy production, domestic trade, and export activity.*

Method: *The study employs a historical and qualitative research methodology based on documentary analysis of archival materials, official statistics, economic reports, and specialized literature on Romanian interwar economic development. The analysis focuses on railway reconstruction following wartime destruction, the integration of railway systems inherited from newly unified provinces, and the relationship between transport capacity and industrial expansion. Particular attention is given to industrial sectors highly dependent on transport logistics, including petroleum extraction, coal mining, and heavy industry. Statistical data concerning freight transport volumes and industrial performance support the interpretation of broader economic trends.*

Results: *The findings indicate that railways played a fundamental role in Romania's industrial transformation during the interwar period. Railway reconstruction after World War I restored economic functionality and contributed to integrating Greater Romania into a unified national market. Improved infrastructure reduced transportation times, increased freight circulation, and strengthened commercial exchange between regions. Rail transport proved essential for the petroleum industry, one of Romania's most strategic economic sectors. It enabled the movement of crude oil from extraction sites to refineries, industrial consumers, and export facilities, particularly the port of Constanța. The growth in petroleum freight transported by rail during the 1930s demonstrates this strong dependence. Mining and energy production were similarly reliant on railway accessibility. Coal, lignite, and mineral resources from industrial regions such as the Jiu Valley required efficient transportation to manufacturing centers and power plants. Heavy industry and metallurgy also depended on railways for the movement of raw materials, machinery, and finished products. Railway workshops themselves became technical-industrial units contributing to engineering development and workforce specialization.*



Railways additionally facilitated domestic commerce and international trade by linking production centers with internal markets and export routes. Despite structural challenges, including shortages of locomotives, insufficient rolling stock, infrastructure deterioration, and the effects of the Great Depression, the railway system remained economically indispensable.

Originality: This study provides an interdisciplinary perspective on the relationship between transport infrastructure and industrial modernization in interwar Romania. While existing research often examines industrial sectors separately, this paper highlights railways as a strategic mechanism connecting multiple sectors of the national economy. Its originality lies in interpreting railways not merely as transport infrastructure but as an active economic actor influencing industrial productivity, market integration, technical specialization, and export capacity. The study contributes to a broader understanding of how transportation systems shaped Romania's industrial transformation.

Keywords: interwar Romania, railway infrastructure, industrialization, economic modernization, transport history, Căile Ferate Române (CFR), petroleum industry, mining industry, economic integration, freight transport, export infrastructure, industrial logistics





DIVERSITY OF INDUSTRIAL RELATIONS IN THE EUROPEAN UNION

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Abstract

This article examines the diversity of industrial relations systems within the European Union, where historical trajectories, institutional configurations and socio-economic contexts have produced distinct national models despite the existence of shared regulatory frameworks and overarching EU-level coordination mechanisms. The study begins from the premise that industrial relations in Europe cannot be understood through a single, unified model, but rather through a plurality of institutional arrangements shaped by national traditions, political economies, and the evolving role of social partners. The objectives of the study are to map and classify the main European models of industrial relations (Nordic, Continental, Anglo-Saxon, Southern and Eastern hybrid) while analysing their institutional features, mechanisms of collective bargaining, and the degree of coordination between unions, employers and the state. The article also aims to explore hybrid systems in Malta, Cyprus and post-socialist countries, where institutional legacies and EU-driven reforms intersect in complex ways, and to identify recent trends shaping industrial relations in 2024–2025, including reindustrialisation, labour-market flexibilisation, and the reconfiguration of social dialogue.

To achieve these aims, the article employs a comparative analytical methodology grounded in an extensive review of academic literature, EU policy documents, Eurofound reports and country-specific institutional analyses. This methodological approach allows for the systematic comparison of industrial relations models based on criteria such as bargaining structure, union density, employer coordination, state intervention, and the institutionalisation of social dialogue. The study also integrates insights from contemporary debates on labour-market governance, institutional resilience and the impact of economic and technological transformations on collective bargaining systems. By triangulating multiple sources, the research provides a comprehensive and nuanced understanding of how industrial relations evolve across different European contexts.

The results reveal substantial variation across models, confirming that industrial relations in the EU remain fundamentally diverse. The Nordic model stands out for its cohesive tripartite cooperation, high collective bargaining coverage and strong institutional trust, which together support both economic competitiveness and social protection. The Continental model, particularly in Germany and Austria, is characterised by corporatist structures, sectoral bargaining and codetermination mechanisms that ensure stability and predictability in labour-management relations. In contrast, the Anglo-Saxon model is defined by decentralised, market-driven regulation, lower union density and a more adversarial approach to labour relations, reflecting a liberal political economy with limited state intervention.

The Southern European model presents a different configuration, marked by fragmented implementation, higher levels of conflictuality and a strong reliance on legal regulation that is not always consistently enforced. These systems often combine formal protections with weaker



administrative capacity, leading to variability in the application of collective agreements. Meanwhile, the Eastern hybrid model, prevalent in post-socialist countries such as Romania, Poland and Hungary, displays institutional instability shaped by the legacy of state socialism, low union density, limited bargaining coverage and politically influenced social dialogue. The analysis highlights that Romania, in particular, has undergone significant developments in recent years, including the reintroduction of sectoral bargaining, renewed debates on social dialogue reform and emerging reindustrialisation dynamics that may reshape the institutional landscape.

The study also identifies cross-cutting trends affecting all models, such as the digitalisation of work, demographic pressures, the rise of platform labour and the increasing need for adaptive governance mechanisms. These trends challenge traditional forms of collective representation and require new institutional responses at both national and EU levels.

The conclusions indicate that, although national diversity remains significant, the EU promotes gradual convergence through shared principles, soft governance instruments and regulatory coordination. However, this convergence is selective and functional rather than structural: member states tend to align with EU objectives while maintaining their own institutional configurations. The findings suggest that convergence occurs primarily in areas such as minimum labour standards, information and consultation rights, and the strengthening of social dialogue frameworks, while core institutional features, such as bargaining levels, union structures and employer coordination, remain nationally embedded. The implications of the study underscore that institutional adaptability and cooperative governance are essential for ensuring resilient and equitable industrial relations across the Union. Systems that successfully combine flexibility with strong social partnership, such as the Nordic and Dutch models, appear better equipped to manage contemporary challenges, whereas systems characterised by fragmentation or political volatility face greater difficulties in maintaining stability. The article contributes to the broader debate on the future of industrial relations in Europe by demonstrating that diversity, rather than uniformity, remains a source of institutional strength, innovation and resilience.

Keywords: industrial relations, European Union, collective bargaining, social dialogue, institutional models, hybrid systems, labour market governance



SPECIFICITIES OF APPLYING INDUSTRIAL RELATIONS MODELS IN ROMANIAN SPORTS JOURNALISM

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Abstract

Objectives. This article aims to analyse in depth the specific ways in which industrial relations models can be applied to understanding the organisational functioning of sports journalism in Romania, starting from the premise that this profession, although formally integrated into the broader field of general journalism, displays distinct organisational, cultural and occupational characteristics that justify a dedicated analytical framework. The study seeks to bridge the conceptual gap between industrial relations theory—traditionally focused on manufacturing, public administration or large-scale service sectors—and the creative, vocational and highly dynamic environment of sports media. The main objective is to integrate theoretical perspectives from industrial relations with the practical and institutional particularities of sports journalism, in order to identify how organisational dynamics, institutional culture, professional competencies and informal practices shape the functioning of sports newsrooms. By doing so, the article positions sports journalism as a hybrid professional field whose internal logic can be better understood through the analytical tools of labour relations, organisational sociology and media studies.

Methodology. The research employs a qualitative approach based on documentary analysis, theoretical synthesis and interdisciplinary integration. It draws on classical and contemporary works in industrial relations (Dunlop, Commons, Hyman, Kochan, Bamber) to establish the conceptual foundations of the analysis, particularly regarding the role of institutions, power relations, negotiation mechanisms and organisational culture. At the same time, the study incorporates specialised literature on sports journalism (Boyle, Rowe, Hutchins, English, Ghena), which provides insights into the professional identity, editorial routines, technological transformations and cultural specificities of the field. The methodological design also includes an institutional analysis of the Romanian occupational framework, focusing on COR classifications, job descriptions and the professional competencies associated with the sports journalist. This triangulated approach allows the study to capture both the formal and informal dimensions of sports journalism, highlighting the interplay between regulatory structures, organisational practices and vocational norms. The interdisciplinary nature of the methodology ensures that the analysis remains sensitive to the creative and fluid character of media work while grounded in robust theoretical frameworks from industrial relations.

Results. The analysis demonstrates that industrial relations models can be successfully applied to understanding the functioning of sports newsrooms, revealing patterns that are often overlooked in media-centric studies. The findings show that power distribution, internal communication, coordination mechanisms and organisational culture significantly influence journalistic performance, editorial decision-making and the overall quality of media output. Romanian sports journalism is characterised by a strong vocational ethos, where passion for



sport, experiential knowledge and personal networks play a central role in shaping professional trajectories. At the same time, the occupational structure is not distinctly regulated within COR, which contributes to ambiguity regarding professional standards, career pathways and institutional recognition. The study also highlights the significant dependence of sports journalism on the performance and visibility of elite sports, which creates fluctuations in workload, editorial priorities and audience engagement. Furthermore, the results reveal notable convergences between human resource management principles and newsroom practices, particularly in relation to recruitment (often based on informal criteria and vocational motivation), motivation (driven by intrinsic interest and professional identity) and professional development (frequently shaped by experiential learning rather than formal training). These findings suggest that sports newsrooms operate as hybrid organisational environments where formal structures coexist with informal norms, and where institutional culture plays a decisive role in shaping professional behaviour.

Conclusions. Sports journalism emerges as a hybrid field situated at the intersection of communication, culture and industry, where organisational dynamics and institutional culture directly influence the quality of media output. The application of industrial relations models provides a robust analytical framework for understanding these processes, demonstrating their relevance for analysing creative and vocational professions that do not fit neatly into traditional labour-market categories. The study concludes that sports newsrooms function as complex organisational systems where power relations, coordination mechanisms and cultural norms interact in ways that resemble, but also diverge from, classical industrial relations settings. This hybrid nature underscores the need for interdisciplinary approaches that combine insights from labour studies, media sociology and organisational theory.

Implications. The study contributes to the development of an interdisciplinary perspective on sports journalism and opens new avenues for research on professionalisation, working conditions, institutional structures and organisational dynamics within Romanian sports media. The findings have implications for academic research, suggesting that industrial relations theory can be fruitfully extended to creative and vocational professions. They also have practical relevance for media organisations, educational institutions and policymakers, offering insights that may inform the development of professional standards, training programmes and organisational strategies in the field of sports media. More broadly, the study highlights the importance of recognising the institutional and organisational dimensions of media work, particularly in contexts where formal regulation is limited and vocational identity plays a central role.

Keywords: sports journalism, industrial relations, human resource management, organisational culture, media digitalisation, professional competencies, media ecosystem, creative occupations



DEMOGRAPHIC DYNAMICS IN THE EU: A COMPARATIVE ANALYSIS OF KEY DEMOGRAPHIC PHENOMENA ACROSS FOUR MEMBER STATES WITH CONTRASTING PROFILES

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Abstract

Objective: Demographic aging, declining birth rates, and structural transformations in mortality are processes increasingly faced by European Union member states, with profound implications for labor markets, social protection systems, and public policy. This study aims to comparatively analyze the dynamics of key demographic indicators in four EU member states with distinct profiles, Romania, France, Italy, and Sweden, over the first two decades of the 21st century, seeking to identify both common trends and structural differences specific to each national context.

Method: The analysis covers three fundamental dimensions of demographic dynamics: population aging, mortality, and natality and fertility, based on Eurostat statistical data. The aging process is examined using specific indicators (the share of vulnerable age groups, the demographic aging index, dependency ratios), complemented by population pyramids. Mortality is examined through death pyramids by five-year age groups, age-specific mortality rates, contributions to the crude rate, and dynamic indicators of infant mortality. Natality and fertility are analyzed using the crude birth rate, age-specific fertility curves, the evolution of specific fertility rates, the distribution of live births by the mother's marital status, and the mean age at childbirth and at the birth of the first child.

Results: The results highlight a generalized process of demographic aging across all four states, reflected in the exceeding of critical thresholds for the share of the elderly population and the demographic aging index. Italy stands out as the most advanced case of aging, with a demographic aging index of 207.37 and a median age of 49 years, while Romania records the fastest pace of structural deterioration, converging toward Western European levels through opposite mechanisms: natural decline and mass emigration, as opposed to the longevity-driven aging characteristic of the other states. Sweden stands out for its most balanced demographic profile, supported by significant population growth. Regarding mortality, Sweden is the only country recording a declining crude mortality rate, while Romania exhibits the most dramatic increase and the most pronounced gender gap; Italy, meanwhile, records a reversal of the gender mortality ratio in 2024, with the female rate surpassing the male rate, a phenomenon attributable to the increased longevity and life expectancy of the female population. Infant mortality declines in all states, with Romania recording the fastest rate of reduction (−6.15% per year), without, however, eliminating the gap relative to Western European states. Natality is generally declining, with the crisis most acute in Italy (6.27‰ in 2024), while France maintains the highest level in the group (9.63‰). A common structural trend is the shift of the

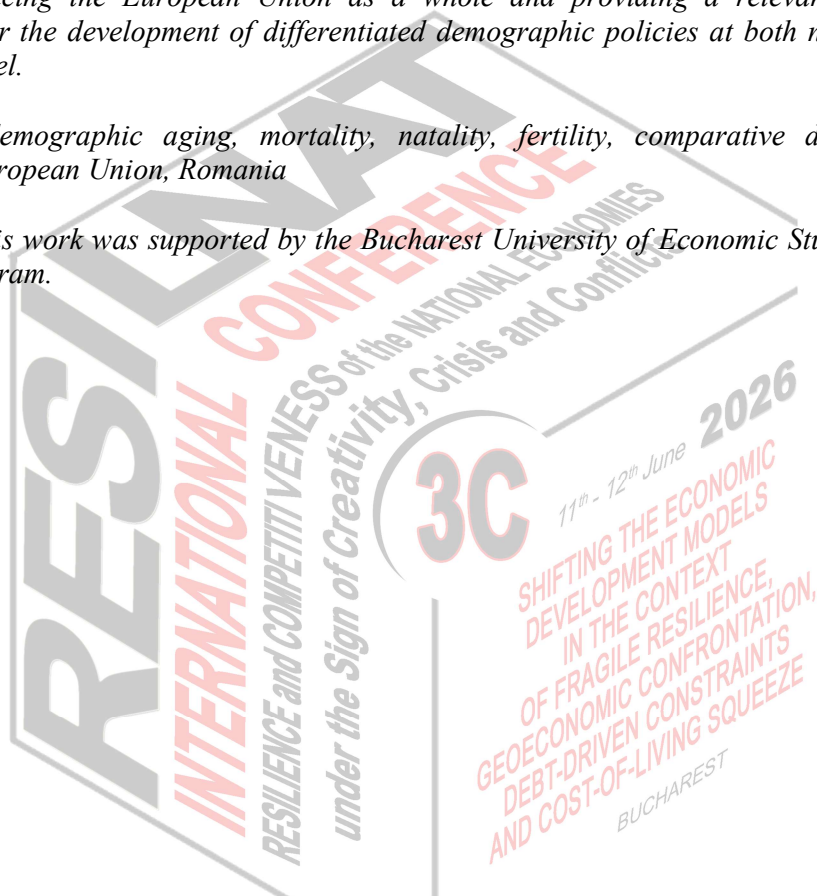


fertility peak toward the 30–34 age group, reflecting the widespread postponement of motherhood and the rising mean age at childbirth across all four states.

Originality: The originality of the study lies in its simultaneous comparative analysis of three fundamental components of demographic dynamics for a group of EU states representing contrasting demographic contexts: a Nordic model (Sweden), a Western European model (France), a Southern European model in advanced demographic crisis (Italy), and a Central and Eastern European model undergoing accelerated transition (Romania). This configuration enables the identification of mechanisms of demographic convergence and divergence among states with different historical trajectories, contributing to a better understanding of the challenges facing the European Union as a whole and providing a relevant reference framework for the development of differentiated demographic policies at both national and European level.

Keywords: demographic aging, mortality, natality, fertility, comparative demographic dynamics, European Union, Romania

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REDEFINE THE ROMANIAN SOCIAL AND LEGAL SPACE: PARADIGMS AND CONTRADICTIONS IN THE INTEGRATION OF MIGRANTS (2022–2026)

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Abstract

Objective: *Between 2022 and 2026, Romania experienced a profound structural transformation of its demographic and economic dynamics, moving from the status of a country of emigration and transit to that of final destination for extra-EU migratory flows.*

This geopolitical and socio-economic transformation generated enormous pressure on state institutions, forcing a rapid redefinition of the national social and legal space. The exponential growth of the annual contingents of foreign workers approved by the Government, combined with the management of flows of persons in need of international protection, revealed acute structural vulnerabilities and imposed a critical reassessment of national assimilation and inclusion mechanisms. The general objective of this academic article is to investigate, distort and map the main contradictions that arise at the intersection of public integration policies, labor market realities and the daily social experiences of migrants in Romania. Specifically, the research pursues three derived objectives: first, how national legislation has changed under the pressure of labor shortages and European directives; second, assessing the degree of efficiency of official cultural and linguistic integration programs; third, identifying latent sources of exclusion, marginalization and systemic discrimination faced by new immigrant communities from the non-EU space, while analyzing the reaction of the majority indigenous population to the rapid transformation of the local multicultural landscape.

Method: *The methodological approach adopted in this work is of a mixed and interdisciplinary nature, combining tools specific to legal sociology, discourse analysis and political economy. In order to provide a rigorous and empirically substantiated overview, the research was structured on three distinct analytical levels. On the one hand, an exhaustive documentary analysis of the regulatory framework adopted between 2022 and 2026 was carried out, including the emergency ordinances on the aliens regime, government decisions for establishing labor quotas and the new National Strategy on Immigration. On the other hand, the official quantitative data provided by the General Inspectorate for Immigration (IGI) and the Ministry of Labor were correlated with qualitative data, obtained through the annual reports issued by non-governmental organizations active in the field.*

Results: *The results of the analysis highlight a series of major contradictions between the institutional political discourse and its practical application. The first major contradiction identified is that between the strictly economic, utilitarian nature of personnel recruitment and the almost total absence of long-term social support infrastructure. Although the Romanian state bureaucratically facilitated the bringing of hundreds of thousands of workers from Southeast Asia, the public system did not provide correlative mechanisms for real integration. Romanian language learning programs and cultural adaptation sessions remained fragmented, often being outsourced to the limited resources of NGOs, without sustainable*



public funding. Another major contradiction manifests itself in the legal field: the acceleration of work visa granting procedures was doubled by extreme bureaucratic rigidity in the renewal of single residence permits, generating frequent situations of involuntary irregularity, where workers become vulnerable to abuse due to the loss of legal status for purely administrative reasons. On a social level, the research reveals the emergence of isolated enclaves on the labor market and the risk of the formation of a new category of urban sub-proletariat, deprived of political rights and with restricted access to health and social protection services. This dynamic fuels a major paradox: although migrants are economically indispensable, legally and socially they remain on the periphery of the receiving society.

Originality: The present study analyzes the period 2022–2026 as a turning point, in which old conceptual frameworks proved obsolete, forcing government actors and civil society to seek new paradigms of coexistence in a legislative environment in a permanent state of flux and adaptation. In conclusion, the study aims to demonstrate that the Romanian migration management model from 2022–2026 operated on the basis of a predominantly economic, crisis paradigm, neglecting the human and social dimension of the phenomenon. Redefining social space requires the urgent abandonment of the utilitarian vision, according to which the migrant is only a temporary economic unit, and its replacement with an inclusion policy capable of ensuring long-term societal cohesion. The practical implications of this research suggest the need for immediate reform of the social assistance system, the creation of solid public-private partnerships with employers and migrant communities. Without a close correlation between legal reforms and the realities on the ground, Romania risks deepening social gaps and transforming a potential demographic and economic advantage into a major source of social tensions

Keywords: extra-EU migration, legal space, social integration, public policies, Romania (2022–2026)



THE DISCOVERY GAP: HOW GENERATIVE AI RECONFIGURES LOCAL TOURISM ECONOMIES

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Abstract

As contemporary travellers increasingly transition from traditional, index-based search engines toward Large Language Models (LLMs) and conversational Artificial Intelligence (AI) for bespoke trip planning, the digital landscape of the global tourism industry is undergoing a structural paradigm shift. This paper introduces and explores the concept of the “discovery gap” - a systemic phenomenon wherein generative AI models inadvertently prioritize globally renowned, high-traffic landmarks and heavily documented destinations that dominate their underlying training datasets. Because these algorithmic systems rely on statistical probabilities derived from vast aggregates of historical web data, they inherently exhibit a self-reinforcing bias toward pre-existing commercial hubs, often at the explicit expense of smaller, independent, and culturally authentic local businesses.

***The objective** of this study is to examine the socio-economic mechanisms through which AI-generated recommendations function as a rigid “digital funnel”. By channelling consumer attention through optimized, homogenized algorithmic filters, this funnel systematically concentrates tourist footprints and hospitality spending into a select few “A-list” locations. Concurrently, it leaves off-the-beaten-path, boutique, or rural enterprises marginalized and economically isolated. This dynamic suggests that the superficial convenience, speed, and hyper-personalization promised by AI-driven itinerary planning tools come with a profound macroeconomic trade-off: the creation of structural blind spots within local tourism ecosystems that can distort competitive market equilibrium.*

***Methodologically**, this study employs a mixed comparative analysis of algorithmic outputs across several highly frequented European cities. By generating standardized multi-day travel itineraries using prominent commercial LLMs, the research spatially maps these digital suggestions against empirical geospatial metadata and real-world business density frameworks. The resulting spatial configurations demonstrate a stark disparity between AI-recommended zones and actual localized commercial diversity.*

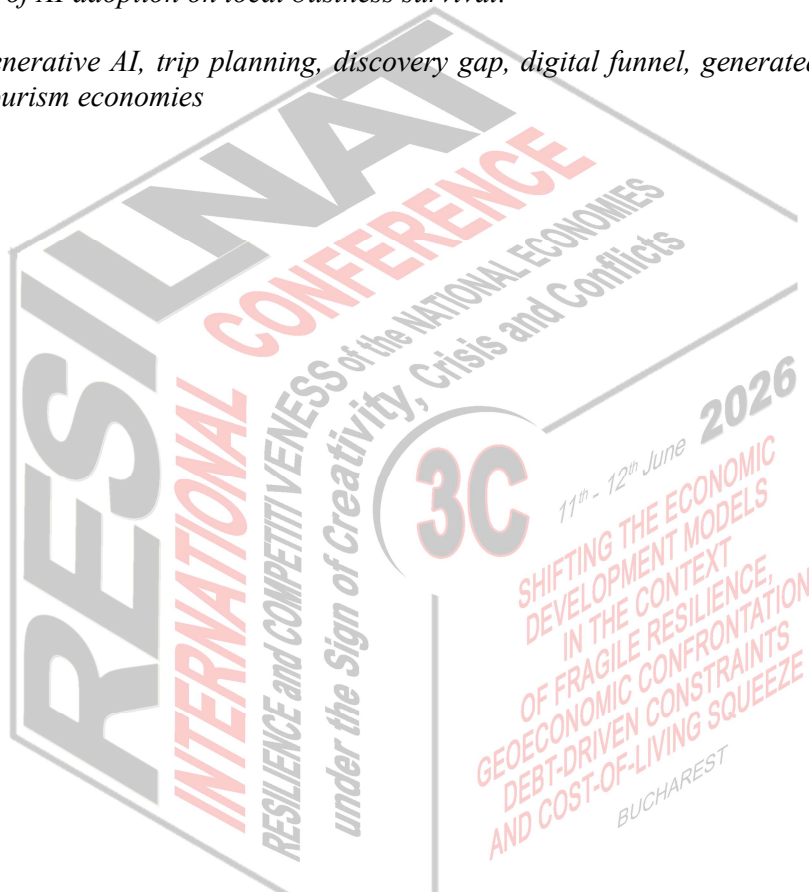
***Results** indicate that the concentration of visitor density driven by these digital funnels poses a dual threat to sustainable tourism. On one hand, it threatens the financial survival of authentic, local districts by withholding vital tourist capital, thereby accelerating the standardization of urban spaces. On the other hand, it exacerbates the structural pressures of seasonal overcrowding in already saturated zones. The study also identifies a critical reverse risk: the capacity of generative AI to induce sudden, volatile “viral overcrowding” in previously quiet, fragile, or lesser-known resorts. When an algorithm arbitrarily elevates an obscure spot, it can trigger overnight surges in demand that overwhelm communities lacking the physical, institutional, or regulatory infrastructure to manage rapid influxes of visitors. Ultimately, it concludes that mitigating the discovery gap is vital for ensuring that*



technological progress does not result in the structural erasure of small-scale market diversity, but instead supports balanced, resilient economic growth.

***The originality of this work** consists in its pioneering contribution to the intersection of tourism economics and algorithmic governance through the formalization of the “discovery gap” framework within generative AI applications. By empirically mapping the direct correlation between algorithmic bias in AI training datasets and the physical, spatial concentration of economic capital in urban environments, the study provides a novel predictive perspective for modern tourism management. This approach successfully shifts the academic discourse from user-experience optimization to the broader macro-structural and socio-spatial consequences of AI adoption on local business survival.*

***Keywords:** generative AI, trip planning, discovery gap, digital funnel, generated itineraries, sustainable tourism economies*





ECONOMIC AND ENTREPRENEURIAL EDUCATION AS DRIVERS OF PROFESSIONAL RESILIENCE IN THE KNOWLEDGE-BASED ECONOMY: SUPPORTING INDEPENDENT AND LIBERAL PROFESSIONS

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Abstract

Objective: The accelerated transformation of contemporary economies through digitalization, globalization, and the expansion of knowledge-based activities has significantly reshaped professional careers, employment structures, and the competencies required for sustainable socio-economic integration. In this context, independent professionals and liberal professions increasingly face the need to combine specialized expertise with economic literacy, entrepreneurial capabilities, adaptability, and resilience. The present study explores the conceptual and methodological relationship between economic education and entrepreneurial education, emphasizing their complementary role in developing professional resilience within the knowledge-based economy. The paper aims to investigate how these educational dimensions contribute to the formation of cognitive, practical, ethical, and entrepreneurial competencies necessary for independent professionals operating in dynamic and uncertain economic environments.

Method: The research is grounded in a theoretical-documentary and bibliometric approach specific to exploratory doctoral research. The study employs a systematic review of the international and European literature on economic education, entrepreneurial education, human capital theory, competence-based learning, and entrepreneurial ecosystems. The methodological framework integrates comparative analysis of European educational policies and competence frameworks, including EntreComp, the European Skills Agenda, and the Digital Decade 2030 strategy. In addition, bibliometric analysis based on Web of Science indexed publications was conducted using VOSviewer in order to identify dominant research directions, conceptual interdependencies, influential authors, institutional collaborations, and emerging trends regarding the relationship between economic and entrepreneurial education.

Results: The findings highlight a strong conceptual and functional interdependence between economic education and entrepreneurial education. Economic education provides the cognitive and analytical foundation necessary for understanding economic mechanisms, rational decision-making, and responsible participation in economic life, while entrepreneurial education develops action-oriented competencies such as creativity, innovation, initiative, opportunity recognition, and strategic adaptability. The study demonstrates that the integration of these educational dimensions contributes directly to the development of professional resilience, particularly among independent professionals and liberal professions exposed to labor market volatility, digital transformation, and increasing economic uncertainty. Furthermore, the research identifies a significant shift in contemporary educational paradigms from knowledge transmission toward competence-based, experiential, and interdisciplinary learning models centered on adaptability, lifelong learning, and



sustainable socio-economic participation. The bibliometric analysis also reveals the growing relevance of entrepreneurial competencies, digital skills, and ethical-economic education within current international research agendas.

Originality: The originality of the study resides in the integrated conceptualization of economic education and entrepreneurial education as complementary drivers of professional resilience in the knowledge-based economy. Unlike traditional approaches that analyze these educational dimensions separately, this research proposes a unified theoretical framework linking cognitive economic literacy, entrepreneurial mindset formation, and the socio-professional sustainability of independent and liberal professions. The paper also contributes to the emerging debate on the role of higher education institutions in preparing adaptable professionals capable of responding to digital transformation, economic uncertainty, and evolving labor market structures through interdisciplinary and competence-oriented educational models.

Keywords: economic education, entrepreneurial education, professional resilience, knowledge-based economy, liberal professions, independent professionals, entrepreneurial competencies, digital transformation, human capital, lifelong learning





DIGITALIZATION AND EMERGING TECHNOLOGIES IN SOCIAL ENTERPRISES: EVIDENCE FROM ROMANIA AND THE EUROPEAN UNION

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Abstract

Objective: The use of emerging technologies within social enterprises plays a particularly important role, contributing significantly both to the efficiency of organizational activities and to addressing social challenges at the community level. Through these technologies, social enterprises are able to identify community needs more rapidly and to develop innovative solutions that respond to such challenges within a shorter timeframe. Moreover, digital tools substantially improve communication processes. They facilitate collaboration with various organizations as well as with direct beneficiaries, ensuring broader access to information and enabling messages to reach a wider audience. Alongside these benefits, however, the use of emerging technologies also entails several challenges, including high implementation costs, a lack of digital skills, and limitations related to digital infrastructure. The aim of this paper is to examine the evolution of social enterprises and the ways in which they make use of emerging technologies, both within the European Union and in Romania.

Method: The research follows an exploratory approach, based on the processing and interpretation of relevant statistical data at both national and European levels. The analysis brings together comparative indicators related to the social economy and digitalization, with the aim of highlighting structural differences as well as patterns in the adoption of new technologies.

Results: The findings indicate that social enterprises are increasingly being regarded as important pillars in the context of ongoing economic, social, and technological transformations. At present, they are no longer viewed merely as marginal initiatives, but rather as meaningful components of the contemporary economy, capable of responding to complex and constantly evolving social needs. The comparative analysis between Romania and the European Union highlights a significant digital gap, with Romania lagging behind the



European average. The relatively low uptake of cloud services and artificial intelligence points to a structural deficit in digital skills and investment. This situation directly affects social enterprises, which already operate within a generally low-digitized economic environment. The limited level of digitalization constrains both the expansion of activities and the improvement of efficiency. Nevertheless, recent developments suggest gradual progress, particularly through the adoption of basic digital solutions. The use of online promotion platforms, electronic archiving, and efforts to enhance digital skills represent initial steps in the broader digital transformation of social enterprises. In this respect, these developments can be seen as an important starting point for future digital advancement in the sector. Although the use of emerging technologies remains limited, there is clear potential for further development. Their integration can play a strategic role, contributing to increased operational efficiency and improved access to beneficiaries.

Originality: The originality of this study stems from its integrated approach, which brings together the analysis of social enterprises with aspects related to digital transformation and the use of emerging technologies, in a comparative perspective between Romania and the European Union. By linking social impact to the use of new technologies, the study highlights how digitalization can support the development and resilience of social enterprises, particularly in environments where digital adoption remains limited. At the same time, it points out some of the key challenges and opportunities linked to the use of emerging technologies in the Romanian social economy, while also outlining their potential to improve both operational efficiency and social impact.

Keywords: social enterprises, emerging technologies, digital transformation, social innovation, social entrepreneurship.



FINTECH INNOVATION IN PAYMENTS IN THE CONTEXT OF ENSURING ECONOMIC RESILIENCE

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Abstract

Objective: For the last decades the accelerated digital transformation of financial services has indeed reshaped the payment services activity and also the fintech ecosystem. FinTech entities have the potential to influence payment service activities through digitalisation and advanced innovations, such as open banking infrastructures based on instant payments services, embedded finance, cloud-based financial services, digital wallets, and especially the use of artificial intelligence-based solutions, including fraud prevention mechanisms. While these innovations substantially contribute to the efficiency and accessibility of payment services and, consequently, to financial inclusion, they also generate significant technology-related risks, including cybersecurity threats, and systemic risks that may affect economic resilience. From this perspective, the present study examines the relationship between FinTech innovation in the payment sector and the concept of economic resilience, focusing on the relation between technological efficiency and exposure to digital risks. The article analyses the evolving European regulatory framework, especially from the perspective of the advanced approach of the revised Payment Services Directive and Payment Services Regulation (PSD3/PSR), the Digital Operational Resilience Act (DORA), and the Artificial Intelligence Act (AI Act), emphasizing the absolute necessity of maintaining a balanced approach between innovation, consumer protection, cybersecurity, and operational resilience in the provision of payment services;

Method: The research applies a qualitative and interdisciplinary approach based on conceptual analysis, comparative regulatory assessment, and examination of emerging trends within the European digital payments ecosystem. The study reviews the principal legislative and policy instruments governing payment services in the European Union and analyses their interconnections from the perspective of ICT resilience and innovation governance. The methodological framework combines elements of legal analysis, financial technology assessment, and risk-based assessment of digital infrastructures supporting payments activity. The paper also integrates secondary data for fraudulent payments and regulatory developments affecting payment service providers and FinTech entities. Attention is given to the manner in which regulatory harmonization seeks to address vulnerabilities associated with increased digitalization and interconnectivity in payment systems;

Results: The study identifies that FinTech innovation contributes significantly to improving transactional efficiency, speed, financial inclusion, and market competitiveness within the payments sector. Open banking ecosystems and API-driven infrastructures for sure could facilitate interoperability and stimulate innovation, while AI-supported monitoring systems improve fraud detection and customer experience. However, the analysis also demonstrates



that increased technological dependence amplifies exposure to cyberattacks, operational outages, third-party ICT concentration risks, cross-border contagion effects, and not to mention further complicated geopolitical context. The findings indicate that economic resilience in the digital payments sector depends not solely on innovation capacity, but increasingly on the robustness, continuity, and security of technological infrastructures, and sometimes other economic factors. Furthermore, the paper highlights that the legal framework envisaged by the PSD3/PSR could strengthen consumer protection, transparency, and fraud prevention mechanisms, DORA establishes a comprehensive framework for digital operational resilience and ICT risk management, while the AI Act introduces safeguards concerning transparency, accountability, and trustworthy use of artificial intelligence systems within payment services. The interaction between these regulatory instruments reflects a strategic European approach aimed at consolidating a secure and resilient digital payments ecosystem without inhibiting technological development.

Originality: The originality of the study derives from its integrated examination of FinTech innovation and economic resilience through the combined perspective of payment services regulation, practical expertise in monitoring the security measures developed by the payment services providers and the interaction with different fintech entities developing advanced innovative solutions in payments. Unlike analyses focused exclusively on technological innovation or regulation, this paper develops a multidimensional framework linking efficiency gains in digital payments with systemic resilience requirements and cybersecurity governance. The research contributes to the academic and policy debate by emphasizing that the sustainability of FinTech-driven payment ecosystems depends on achieving a dynamic equilibrium between innovation and security. In this regard, the study advances the understanding of how PSD3/PSR, DORA, and the AI Act collectively redefine the governance architecture of digital payments in the European Union and shape the future resilience of the financial sector in an increasingly interconnected digital economy.

Keywords: FinTech innovation, payment services, economic resilience, PSD3, DORA, AI Act, cybersecurity, digital operational resilience, open banking, financial regulation



NATIONAL RECOVERY AND RESILIENCE PLAN HEALTH INVESTMENTS AND THE LIMITS OF NATIONAL ECONOMIC RESILIENCE

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Abstract

Objective: *The 2020–2021 health crisis exposed the structural relationship between public health system performance and national economic resilience, while also prompting the most significant public health investment in post-communist Romanian history: approximately 2.5 billion euros committed through Component 12 of the National Recovery and Resilience Plan. This paper examined whether this exceptional mobilisation of resources was likely to generate genuine economic resilience in the medium term or it predominantly improved physical capacity indicators without altering the structural architecture of the system. The analysis was grounded in the observation that the typology of committed investments, oriented primarily towards hospital infrastructure, primary care equipment and digitalisation, falls within the register of capacity reforms, leaving unaddressed the structural dimensions that have produced measurable economic effects in comparable European systems.*

Method: *The study operates within the framework of comparative public policy analysis, combining an examination of funds contracted under NRRP Component 12 (based on MIPE data extracted in May 2026 covering 1,588 projects with a total contracted value of 1.24 billion EUR) with parallel case studies of health reforms implemented in Estonia, Spain, Portugal, Denmark and Finland. The theoretical framework integrates the distinction between capacity and structural reforms, findings from health economics research on the relationship between health investment and national economic performance and the concept of fragile resilience drawn from national economic resilience theory. Data from the National Institute of Statistics on healthcare network activity in 2024 provided the empirical context of the system into which PNRR investments were implemented.*

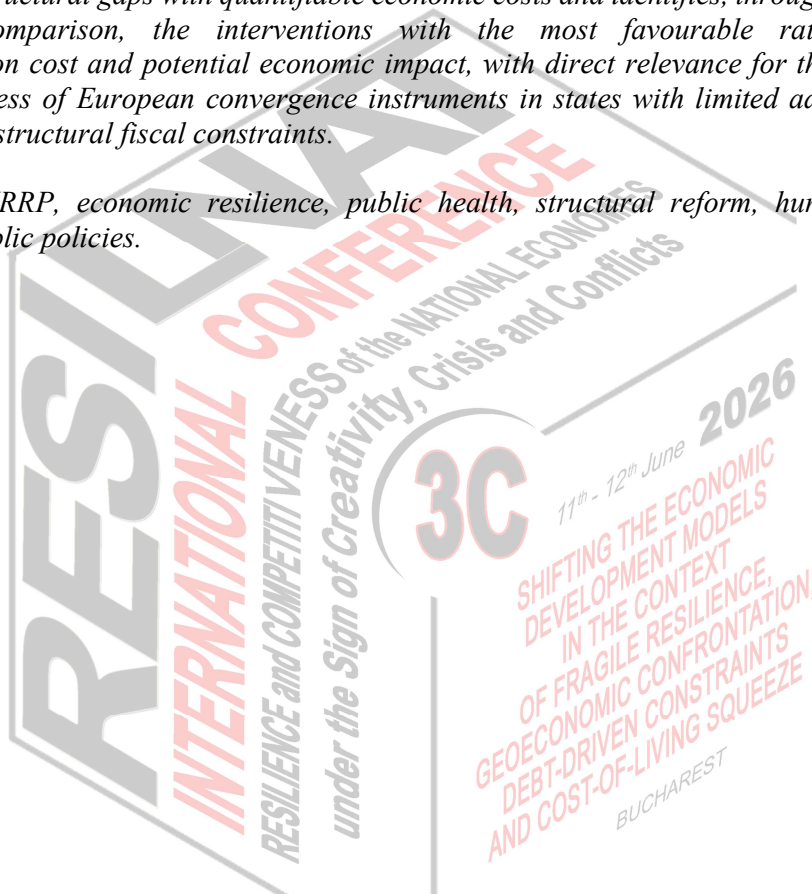
Results: *The analysis revealed that 64.4% of contracted funds were allocated to hospital infrastructure, while the structural reform component accounted for 3.4% of the total and recorded zero technical and financial progress at the time of the present study. Three structural gaps with direct and quantifiable economic costs were identified: an amenable mortality rate nearly double the EU-27 average, which translates into persistent loss of human capital and productivity; the emigration of qualified medical personnel, which constitutes a net transfer of public investment in education towards more developed economies and the absence of an operational sustainability analysis for the infrastructure under construction, generating an unaccounted fiscal liability in a context of structural budgetary constraints. A fourth mechanism, concerning the allocative inefficiency produced by distorted incentives within the financing model, which drives overreliance on hospital-level care for functions belonging to outpatient services and the systematic duplication of investigations in the absence of an*



integrated electronic patient record. This comparative analysis showed that the mechanisms which transform health investments into drivers of economic resilience, including mandatory digitalisation, restructuring of preventive incentives in primary care and the development of dedicated administrative capacity, carry low marginal costs and require no additional allocations beyond investments already committed.

Originality: *The principal contribution of this paper lies in reframing public health investment as a variable of national economic resilience rather than as a purely social policy concern and in applying this analytical framework to the NRRP implementation cycle in Romania on the basis of empirical data from the contracted portfolio. The analysis proposes an operational typology of structural gaps with quantifiable economic costs and identifies, through systematic European comparison, the interventions with the most favourable ratio between implementation cost and potential economic impact, with direct relevance for the debate on the effectiveness of European convergence instruments in states with limited administrative capacity and structural fiscal constraints.*

Keywords: *NRRP, economic resilience, public health, structural reform, human capital, European public policies.*





BANKING'S ROLE IN THE GREEN TRANSITION (SDGS)

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Abstract

Climate change and the transition to a low-carbon economy have become key drivers shaping modern economic systems. In this context, the financial sector plays an increasingly important role in supporting sustainable development and achieving the European Union's 2030 Agenda objectives. Although financial institutions are not directly responsible for climate policy, they are significantly affected by its consequences and must adapt to evolving economic and environmental conditions.

Climate risks take two main forms: physical risks, such as floods or droughts that disrupt economic activity, and transition risks, arising from regulatory, technological, and market changes linked to decarbonization. Both types can affect price stability, financial market functioning, and the resilience of the banking system. Integrating the Sustainable Development Goals (SDGs) into economic analysis therefore provides a useful framework for understanding these dynamics and assessing long-term impacts.

In recent years, central banks have increasingly incorporated sustainability and ESG factors into financial stability assessments and, to some extent, monetary policy considerations. The Network for Greening the Financial System (NGFS) supports this process by providing climate scenarios that help institutions evaluate potential economic and financial impacts. At the EU level, Eurostat monitors progress toward the SDGs through annual reports covering economic, social, and environmental indicators.

By bringing these perspectives together, this study highlights both the opportunities and challenges of integrating sustainability objectives into economic policy. It focuses in particular on the interaction between environmental goals and traditional priorities such as price and financial stability, contributing to a better understanding of how financial institutions can support the transition to a more sustainable economy.

Objective: *The objective of this paper is to examine how financial institutions can integrate sustainability considerations into their analytical frameworks and decision-making processes in the context of the green transition. It also aims to identify relevant indicators for assessing their contribution to the achievement of the Sustainable Development Goals (SDGs) while maintaining financial stability.*

Method: *The methodology is based on a qualitative analysis of key institutional frameworks and policy documents, including Eurostat SDG monitoring reports, NGFS climate scenarios, and European Central Bank publications. It integrates comparative and conceptual approaches to assess how climate-related risks and sustainability objectives are incorporated into financial practices and analytical models.*

Results: *The results highlight both synergies and trade-offs between the Sustainable Development Goals (SDGs) and financial stability, emphasizing the need for a balanced and forward-looking approach. They also show that integrating climate-related risks into financial*



decision-making can support progress toward the SDGs while strengthening the resilience of the financial system.

Originality: *The originality of this study lies in its multidimensional perspective on the role of financial institutions in advancing the Sustainable Development Goals (SDGs) within the context of the green transition. By integrating institutional, economic, and sustainability dimensions, the paper provides a comprehensive assessment of how financial practices are evolving in response to climate-related challenges.*

Keywords: *central banks, monetary policy, financial stability, climate risks, sustainability, balanced global transition, net-zero, macroprudential policy, international coordination, governance*





STRENGTHENING ECONOMIC RESILIENCE IN ROMANIA: KEY DETERMINANT FACTORS AND POLICY IMPLICATIONS

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Abstract

Economies worldwide are going through a period of instability mainly generated by geopolitical conflicts, the energy crisis and climate change. In this context, the concept of economic resilience has become a central element of development strategies adopted both at European and national level. In the case of Romania, strengthening the resilience of the national economy is a strategic necessity, given the existing structural vulnerabilities, but also the opportunities generated by membership in the European Union, which implies access to European funds intended for modernization and green transition. In this research, the authors had as their main objective the study of how Romania can maintain a balance between economic growth, social equity and environmental sustainability in an international context marked by uncertainty. In the first part of the study, the factors that contribute to strengthening economic resilience are analyzed and the relationship between economic development, social policies and environmental protection measures are identified. The correlations between the variables considered are examined in order to have a concrete picture of the evolution and the connection between the influencing factors, with the aim of highlighting some measures that can be implemented so as to achieve the consolidation of economic resilience at the level of



Romania. From a methodological point of view, specific statistical analysis methods are considered, such as the study in dynamics, the comparative study from one period to another, but also econometric methods such as the VAR model. The research results highlight the fact that Romania has made significant progress in terms of economic development and infrastructure modernization, but a series of structural imbalances persist, which affect the resilience of the national economy. It is known that in terms of economic growth in recent years, it has been supported mainly by consumption and investments from European funds, which translates into the fact that the Romanian economy remains vulnerable to external fluctuations and the trade deficit. Also, in social terms, the research highlights the fact that one of Romania's main challenges is maintaining social equity, in the sense that the differences between urban and rural areas, labor migration and unequal access to education and health services negatively influence the development of human capital and at the same time reduce society's ability to adapt to economic changes. Regarding environmental sustainability, the research results indicate that Romania has significant potential for the development of renewable energy and for the implementation of green transition policies, which have positive effects on reducing carbon emissions and increasing energy security. The authors considered this topic to be relevant in light of the fact that economic development can no longer be evaluated exclusively through indicators such as Gross Domestic Product or the level of investments, but must also be analyzed in terms of the impact on society and the environment. A resilient economy requires the state's ability to respond effectively to external shocks, to protect the population's standard of living and to ensure the responsible use of natural resources. This is where the originality of the work derives, which consists in the integrated approach to the concept of economic resilience, through the simultaneous analysis of the three economic, social and environmental dimensions in the case of Romania, an approach that differs from other studies, which treat these areas separately, the research highlighting the interdependence between economic growth, social equity and environmental protection.

Keywords: economic resilience, social equity, environmental protection, sustainability, strategies



SDG PROGRESS IN CENTRAL AND EASTERN EUROPE DURING THE PANDEMIC AND THE UKRAINE WAR: ECONOMIC TRENDS AND FISCAL POLICY RESPONSES

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Abstract

The overlapping crises generated by the COVID-19 pandemic and the Russia-Ukraine conflict have profoundly reshaped the economic and social landscape of Central and Eastern Europe, testing the resilience of governments and exposing long-standing structural vulnerabilities. In this turbulent context, the pursuit of the United Nations Sustainable Development Goals (SDGs) has become increasingly difficult, with progress stalling or even reversing in several key dimensions. This paper evaluates the progress made in achieving three interconnected SDGs: SDG 1 (No Poverty), SDG 8 (Decent Work and Economic Growth), and SDG 10 (Reduced Inequalities), across five major Central and Eastern European (CEE) economies: Romania, Poland, Hungary, the Czech Republic, and Bulgaria, with Romania as the primary focus of analysis. Beyond tracking indicator trends, the study documents the fiscal policy measures adopted by governments in the region throughout both crisis periods and examines how these responses have shaped the trajectory of sustainable development. With the 2030 deadline for achieving the SDGs now just a few years away, understanding where progress has been made, where it has faltered, and why, is not merely an academic exercise, it is an urgent policy imperative.

Method: *The research employs a quantitative comparative analysis grounded in data extracted from Eurostat's sustainable development indicators database, supplemented by data from the Stockholm International Peace Research Institute, the International Monetary Fund, the World Bank, and Romania's Ministry of Finance annual budget execution reports. The analysis covers the period 2019–2024, encompassing both the pandemic crisis and the economic shock induced by the war in Ukraine. A set of key indicators is examined for each of the three SDGs under analysis: for SDG 8, these include the real GDP growth rate, the long-term unemployment rate, the share of investment in GDP, and the rate of fatal accidents at work; for SDG 1, the in-work poverty rate and the at-risk-of-poverty or social exclusion rate; and for SDG 10, GDP per capita adjusted for purchasing power parity, the Gini coefficient of disposable income, and the share of young people neither in employment nor in education or training (NEET). The fiscal measures adopted by the Romanian government during both crises are systematically documented and discussed in relation to the observed evolution of these indicators.*

The findings reveal a complex balance between resilience and ongoing fragility. On one hand, Romania demonstrated notable macroeconomic resilience throughout the crisis period, recording the highest GDP growth rate among the five analysed CEE economies in 2023 and maintaining positive growth even in the most turbulent years of the pandemic and the war. Investment as a share of GDP followed an upward trajectory, and the number of fatal accidents



at work declined steadily after 2021, suggesting gradual improvements in working conditions. The fiscal measures adopted, including subsidised technical unemployment schemes, energy price caps and compensation mechanisms, repeated increases in the minimum wage, targeted social transfers, and investment incentives, played a meaningful role in sustaining economic activity, protecting employment, and partially cushioning the most vulnerable segments of the population from the worst effects of the crises. On the other hand, the situation becomes significantly more concerning when focusing on poverty and inequality. Romania continues to register the highest in-work poverty rate and the highest rate of at-risk-of-poverty or social exclusion in the region, both significantly above the EU27 average, and progress on these fronts has effectively stagnated despite years of sustained economic growth. The NEET rate remains alarmingly high, reflecting deep structural disconnections between the education system and the labour market, particularly in rural areas. The same fiscal measures that helped stabilise the economy also generated substantial budgetary pressures, contributing to persistent and widening fiscal deficits that ultimately placed Romania under an excessive deficit procedure in 2024. This tension between short-term stabilisation and long-term fiscal sustainability emerges as one of the central findings of the study.

Originality: The study's original contribution lies in the simultaneous evaluation of three interconnected SDGs in the context of compounded, overlapping crises, within a structured regional comparative framework that allows meaningful cross-country assessment. Rather than treating fiscal policy and sustainable development as separate domains, the paper bridges the two, documenting the specific measures adopted in Romania and reflecting on their double nature, as instruments of economic stabilisation on one side, and as sources of fiscal imbalance and missed structural reform opportunities on the other. In this manner, the study offers an integrated analytical perspective that goes beyond the description of trends, situating Romania's development trajectory within the broader regional and European context and contributing to a growing body of literature on the governance of sustainable development under conditions of crisis. As the 2030 deadline approaches, the findings have practical relevance for policymakers seeking to reconcile fiscal consolidation with the still unfinished agenda of poverty reduction and social inclusion.

Keywords: sustainable development goals, fiscal policy, economic growth, COVID-19, conflict in Ukraine, poverty, inequalities, Central and Eastern Europe, Romania, inflation, structural reforms, public expenditure



WHO REALLY DRIVES HEALTH SPENDING? AGING, FINANCING STRUCTURE, AND EFFICIENCY IN GLOBAL HEALTH SYSTEMS

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Abstract

Objective: Income growth often links rising health expenditures, but it overlooks the impact of demographic pressures, financing systems, and efficiency. This study reevaluates the factors influencing per capita health spending by differentiating short-term within-country trends from long-term cross-country differences, with a focus on aging populations, out-of-pocket payments, and medical resources.

Method: The analysis uses an unbalanced global panel of 193 countries from 2016 to 2021. Per capita health expenditure (in logarithmic form) is modeled as a function of economic, demographic, and institutional factors, including GDP per capita, population aging, urbanization, unemployment, inflation, income inequality, out-of-pocket payments, and a composite index of medical resources. The empirical approach combines country fixed-effects models, specifications with interaction terms, correlated random-effects (Mundlak) models, and instrumental variable estimation to address unobserved heterogeneity and potential endogeneity. Robust inference is achieved through heteroskedasticity- and autocorrelation-consistent standard errors.

Results: The results indicate that short-term fluctuations in GDP per capita do not significantly account for differences in health spending within countries, indicating that income mostly reflects structural differences across nations rather than short-term changes. In contrast, population aging is a strong and economically significant factor: increases in the proportion of the population aged 65 and older are consistently linked to higher health expenditures. The financing structure is also key. Greater reliance on out-of-pocket payments correlates with lower per capita spending, implying demand suppression and access barriers. Furthermore, increases in medical resources are associated with reduced spending within countries, indicating efficiency improvements or expenditure control measures. Interaction effects reveal that aging enhances the limiting impact of out-of-pocket payments, while macroeconomic conditions affect the influence of labor market dynamics and resource availability. Instrumental variable analysis confirms the robustness of the negative relationship between medical resources and health expenditures. Demographic pressures and the organization of funding have a greater influence on health spending trends than income growth. The findings highlight the need for financial protection and policies that focus on efficiency to help health systems for aging populations, moving the focus from economic growth to factors related to institutions and demographics.

Originality: The originality of this study lies in its integrated and comparative approach to explaining health expenditure dynamics across global health systems. Rather than treating income growth as the dominant driver of rising health spending, the study distinguishes between short-term within-country changes and long-term cross-country structural



differences. By combining demographic aging, financing structure, out-of-pocket payments, medical resource availability, and efficiency considerations within a unified panel framework, the analysis provides a more nuanced view of what actually drives per capita health expenditure. The use of fixed-effects models, Mundlak specifications, interaction terms, and instrumental variable estimation further strengthens the originality of the approach by addressing both unobserved heterogeneity and potential endogeneity. This allows the study to move beyond descriptive comparisons and identify how demographic and institutional factors shape the resilience and sustainability of health systems.

Keywords: health spending, health systems, efficiency, financing structure, aging





ADAPTATION AS A MECHANISM OF ASYMMETRY IN ECONOMIC SHOCKS

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Abstract

Objective: In the literature, asymmetries of economic shocks are typically explained by structural differences among economies, reflected in the specialization of production, institutional characteristics, the degree of economic integration, or the level of exposure to external perturbations. Although these factors are relevant, they do not fully explain how the same events lead to different effects in economic systems. The central hypothesis of this paper is that the asymmetry of economic shocks is not fully explained by the triggering event itself or by structural differences among economies, but by the adaptive processes activated within economic systems in response to such events. From the perspective of evolutionary approaches and adaptive systems theory, economies are understood as systems that can learn, adapt, and change structurally. Within this framework, the main objective of the paper is to study adaptation as a mechanism through which the asymmetry of economic shocks is produced and to highlight how adaptive responses contribute to the emergence of divergent economic outcomes following a common shock.

Method: The paper employs a mixed-methods approach, integrating theoretical and comparative empirical analysis. From a theoretical perspective, an economic shock is defined as a relational process, resulting from the interaction between a specific event and an economic system. In this context, adaptation is analyzed as a system's response to a shock, which requires fiscal, institutional, economic, and innovative adjustments. Empirically, the study investigates the adaptive responses of several European Union (EU) economies to the shock generated by the COVID-19 pandemic, which constituted a common triggering event but produced differentiated economic effects. To assess the degree of adaptation, a composite index of economic adaptation is developed, incorporating indicators related to fiscal support measures, institutional efficiency, digitalization, and innovation capacity. The index is subsequently compared with selected indicators of the economic impact of the pandemic, including GDP variation, employment dynamics, and the pace of economic recovery.

Results: The findings indicate that adaptation is an important mechanism in the emergence of asymmetry in economic shocks. Although the COVID-19 pandemic represented a common event for all the economies examined, the effects varied considerably in terms of both intensity and persistence. Thus, it is confirmed that there is a relationship between the adaptive capacity of the economic system and the magnitude of the observed effects. Economies characterized by more adaptive and flexible responses experienced smaller economic contractions and a faster recovery, while the others were more severely affected. These findings suggest that the



asymmetry of economic shocks is shaped not only by structural differences among economies, but also by how they process and deal with disruptions.

Originality: *The originality of the paper lies in its approach, meaning the explanation of the asymmetry of economic shocks from the perspective of the adaptive processes of economic systems. In contrast to the traditional perspective, in which asymmetries are viewed as determined by exogenous factors or structural heterogeneity, in this paper we propose an analytical framework in which the mechanism of economic system adaptation underlies the asymmetry of economic shocks. Furthermore, the integration of an analysis based on the experience of the COVID-19 pandemic provides empirical support for the theoretical arguments developed and contributes to strengthening the evolutionary perspective on the dynamics of economic shocks.*

Keywords: *asymmetric shocks, adaptation, evolutionary economics, systemic response, path dependence, COVID-19.*





DECARBONIZATION PATHWAYS FOR ROMANIA'S POWER SECTOR: INVESTMENT TIMING, TECHNOLOGY CHOICES, AND SYSTEM COSTS

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Abstract This paper analyzes the long-term transformation of Romania's electricity system in the context of the European Union's climate neutrality objective and the transition toward net-zero emissions by 2050. The study focuses on the structural changes required in the Romanian power sector, considering the interaction between decarbonization targets, investment timing, technology choices, and system costs. Romania has a relatively diversified electricity mix, with important contributions from hydropower and nuclear energy, but it also faces major challenges related to the gradual phase-out of coal, the role of natural gas as a transition fuel, the expansion of renewable energy, and the need for significant investments in low-carbon technologies. To evaluate these dynamics, the paper uses a deterministic linear optimization model developed in the OSeMOSYS framework and implemented through the MUIO interface. The model covers the 2025 - 2050 period and minimizes total discounted system cost under technical, economic, and environmental constraints. The analysis is intentionally focused on domestic electricity generation, excluding imports, exports, and storage technologies, in order to isolate the effects of emissions constraints on generation capacity investments and the evolution of the energy mix. In this context, the transition of Romania's electricity system should be understood not only as a technological replacement process, but also as a broader structural adjustment involving policy coordination, investment planning, infrastructure modernization, and energy security considerations. The pathway toward net-zero emissions requires a careful balance between the expansion of low carbon technologies and the need to maintain system reliability, especially in a regional environment marked by geopolitical uncertainty and increasing pressure on energy markets. While renewable energy sources offer significant potential for reducing emissions, their integration depends on the capacity of the system to accommodate variable generation, reinforce network infrastructure, and ensure sufficient firm capacity during periods of low renewable output. At the same time, nuclear energy, hydropower, and flexible generation technologies remain strategically important for maintaining stability during the transition.

Objective: The study addresses the interaction between decarbonization, investment timing, technology selection, and system cost in a national power sector that combines important low carbon assets, such as hydro and nuclear power, with fossil fuel capacities that continue to play a role in system adequacy and flexibility. The main objective is to assess how different emissions reduction pathways influence the optimal evolution of Romania's generation mix, the role of natural gas as a transitional technology, and the economic implications of deep decarbonization over the 2025 - 2050 period.

Method: The analysis is based on a deterministic linear optimization model developed in the Open Source Energy Modeling System (OSeMOSYS) and implemented through the MUIO



interface. The model minimizes total discounted system cost while satisfying electricity demand, capacity availability, technology performance, resource, and emissions constraints. The modelling horizon covers 2025 - 2050 with annual time steps and an aggregated temporal structure based on eight seasonal and day/night time slices.

Results: The results show that the timing of decarbonization policy has a decisive influence on investment structure, system costs, and the persistence of fossil fuel technologies.

Originality: The paper contributes to the literature by showing that the same net-zero target can produce significantly different economic and technological outcomes depending on the timing of emissions reductions, with important implications for energy security, investment planning, and policy design in Romania. The economic results indicate that both accelerated and delayed decarbonization pathways require higher capital investments than the baseline scenario, but their cost profiles differ substantially.

Keywords: energy, decarbonization, energy security, investments, net zero





THE DILEMMA OF THE STATES OF ORIGIN - MANAGING LABOUR MIGRATION IN THE DIGITAL TRANSITION

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Abstract

After 2019, remote work is increasingly important for activities that become more efficient through digitalization, especially in technology-based industries (programming, software development, cybersecurity, cloud computing and technical support), services (marketing and communication, finance and accounting, tax consulting, human resources, recruitment, administration, customer service, continuing education, etc.) and content (content writing, copywriting and graphic design, etc.). From the perspective of international migration for work, in the conditions of digital transition, the importance of specific forms increases, such as work from anywhere - "nomad worker" and "international digital worker". The specialized literature indicates multiple externalities of mobility for work from not only economic, but also demographic, social, cultural, societal perspectives and highlights that these are much more serious and long-lasting (or even definitive) for the country of origin. The net positive effect, demonstrated as favourable in the short and medium term, fades in the long term, by transforming temporary migration into definitive and reducing the motivation to remit. Although digital migration in the form of work from home offers the opportunity to increase the number of digital migrant workers, the increase in the number of nomadic workers substantially changes the perspective of net benefits for the country of origin, especially since this category is generally highly qualified and less geographically dependent, including on the household in the country of origin. In this paper, we aimed to analyse to what extent the increase in the number of digital migrant workers changes the model of expected effects from mobility for the country of origin. Starting from the analysis of the specialized literature in this field, quite limited in the analysis of multiple effects, we identified the categories of externalities and their potential impact for economic development, social inclusion, quality of life and education and labour markets for the country of origin. The comparison targeted the classic category of migrant worker with geographical movement with categories of digital migrant workers, namely "remote worker" and "digital nomad". We developed a model of the potential impact for each category. On the other hand, we have made a critical analysis of the policies of the countries of origin regarding labour mobility and the specific institutional framework, identifying to what extent they support or not the maximization of the effects of labour migration, for each of the three forms of migration analysed. The conclusions indicate the need for a profound reconsideration of migration policies from the perspective of the expected effects because migration is a phenomenon in a continuous process of transformation. Moreover, measures adapted to the types of digital migration are needed. At the same time, the dynamics of digital nomadism change the way of managing labour mobility and also require a rethinking of the impact on local economies, from the perspective of specific services addressed



to this type of digital worker. Therefore, in the context of the accelerated development of digital technologies, understanding these transformations becomes essential for the development of appropriate local public policies and for explaining the new relationships between mobility, labour and development. This evolution justifies the need for in-depth research on digital migration and its impact on contemporary societies.

Keywords: digital nomadism, digital nomads, externalities, mobile talent, remittances, labour mobility, local policies.

