Romanian Academy
INSTITUTE OF NATIONAL ECONOMY

Valentina Vasile Marius Surugiu
Raluca Mazilescu Andreea Constantinescu
(editors)

BOOK OF ABSTRACTS

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

2025 Edition: RD&I and new entrepreneurship models for sustainable development

Bucharest, Romania

June 12-13, 2025

Book of Abstracts
of the
International Conference

"Resilience and competitiveness of the national economies - under the sign of creativity, crisis and conflicts" - RESILNAT-3C

2025 Edition: RD&I and new entrepreneurship models for sustainable development

ISSN: 3045-2937
ISSN-L: 3045-2937

Institute of National Economy

PARTNERS

CHAIR OF THE CONFERENCE

Valentina Vasile, Institute of National Economy, Romania

CO-CHAIR OF THE CONFERENCE

Mirela Panait, Institute of National Economy, Romania & Petroleum-Gas University of Ploiesti, Romania
Raluca Mazilescu, Institute of National Economy, Romania
Marius Surugiu, Institute of National Economy, Romania

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

INTERNATIONAL COMMITTEE

Carolina Machado, University of Minho, Portugal
Gregory Makrides, Pedagogical University of Krakow, Poland & Cyprus Mathematical Society, Cyprus
Ahmet Öztaş, Epoka University, Albania
Maria Palazzo, Universitas Mercatorum, Italy
Dorothea Papathanasiou-Zuhrt, Open University of Cyprus, Cyprus
Félix Puime-Guillén, University of A Coruña, Spain
Lukman Raimi, Universiti Brunei Darussalam, Brunei
Nelson Jorge Ribeiro Duarte, Porto Polytechnic, Portugal
Murat Sari, Istanbul Technical University, Turkey
Arshian Sharif, Sunway University, Malaysia
Gagan Deep Sharma, University School of Management Studies & Guru Gobind Singh Indraprastha University, India
Alfonso Siano, University of Salerno, Italy
Satyendra Singh, University of Winnipeg, Canada
Alexandru Stratan, Academy of Economic Studies of Moldova, Republic of Moldova
Laslo Vasa, Metropolitan University, Hungary
Agostino Vollero, University of Salerno, Italy

SCIENTIFIC COMMITTEE

Daniela Antonescu, Institute of National Economy, Romania
Cristina Boboc, Institute of National Economy, Romania
Marin Dinu, Bucharest University of Economic Studies, Romania
Tudor Edu, Romanian American University, Romania
Simona Frone, Institute of National Economy, Romania
Simona Ghita, Institute of National Economy, Romania
Otilia Manta, "Victor Slăvescu" Financial and Monetary Research Center, Romanian Academy, Romania
Raluca Mazilescu, Institute of National Economy, Romania
Adrian Micu, "Lower Danube" University in Galati, Romania
Florian Marcel Nuţă, Danubius University, Romania
Mirela Panait, Petroleum-Gas University of Ploiesti, Romania
Răzvan-Mihail Papuc, University of Bucharest, Romania
Florin-Marius Pavelescu, Institute of National Economy, Romania
Victor Platon, Institute of National Economy, Romania
Gabriela Prelipcean, Ștefan cel Mare University of Suceava, Romania
Irina Rădulescu, Petroleum-Gas University of Ploiesti, Romania
Marian Siminică, University of Craiova & Institute of Financial Studies, Romania
Marius Surugiu, Institute of National Economy, Romania
Daniel Ștefan, “George Emil Palade” University of Medicine, Pharmacy, Science, and Technology of Târgu Mureş, Romania
Emilia Titan, Bucharest University of Economic Studies, Romania
Ioan Dan Topor, “1 Decembrie 1918” University of Alba Iulia, Romania
Valentina Vasile, Institute of National Economy, Romania

ORGANIZING COMMITTEE

Raluca Mazilescu, Institute of National Economy, Romania, Senior Researcher - Technical Coordinator
Andreea Constantinescu, Institute of National Economy, Romania, Senior Researcher - Publication Coordinator
Sorina Jurist, Institute of National Economy, Romania, Research Assistant - Communication Coordinator

KEYNOTE SPEAKERS

Chrysanthi BALOMENOU, Epoka University, Tirana, Albania

Chrysanthi Balomenou is a Lecturer at Epoka University, Professor Advisor at Hellenic Open University and Director of Academics in European International University (EIU). She has a MSc. in Regional Development (Pantheon University) and a PhD in Banking and Regional Economics (Pantheon University).

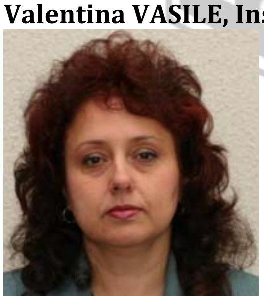
Regarding her professional profile, Chrysanthi Balomenou used to be an executive specialized staff (Marketing Analyst Manager) at the National Bank of Greece. She has published many scientific articles, has written a book and has participated at a lot of scientific conferences (Chair, Plenary speaker and Reviewer). She is also General Secretary of the Hellenic Regionalists Association.

Research Interests: Monetary Economics, Banking, Regional Economics, Entrepreneurship, Knowledge Economy

Mariana LUPAN, ”Stefan cel Mare” University, Suceava, Romania

Mariana Lupan is Associate professor Ph.D, Vice-Dean of the Faculty of Economics and Public Administration, University "Stefan cel Mare" of Suceava. The main areas of expertise are: globalization of the economy, funding investment decisions, econometric modelling, and international investments. She received a postdoctoral fellowship at the Romanian Academy. Academic and Professional Background 20-year academic experience, doctoral degree and postdoctoral degree in the field of economics. Author and co-author of 7 books, more than 60 papers published in professional journals and conference proceedings. She has experience in managing research contracts, is part of various research teams in 20 research contracts, including three international contracts.

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., Hitotshubashi 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).

Bjarne ULDAL, Nordic Edge - Smart City Innovation Cluster, Norway

Bjarne Uldal is Chief Innovation Officer and one of the founders of Nordic Edge. He has extensive experience within branding, communication, and innovation and business development processes. He has also invested in various startups and is co-founder of, among others, Point Carbon, Hey-Ho Lets go and Wenn.

Bjarne Uldal is at his best when identifying new opportunities and ideas. He is motivated by working together with creative people on innovative solutions, starting new projects and companies, and challenging set ideas.

Specialties: Brand development & management, Entrepreneurship, Seed capital investments, Innovation processes, Marketing & Advertising.

Victor PLATON, Institute of National Economy, Romanian Academy, Romania

Victor Platon is PhD in economics, senior researcher first degree at the Institute of National Economy – Romanian Academy. He is PhD advisor in economics at the Doctoral School of Economic Sciences of the Romanian Academy. He has a wide experience as researcher in economics, who participated in international interdisciplinary research projects, main topics of research being sustainable development economics, waste management and circular economy. Victor Platon is the author and co-author of 5 books, more than 40 papers published in professional journals and conference proceedings.

Marius SURUGIU, Institute of National Economy, Romanian Academy, Romania

Marius Surugiu is a senior researcher at the Institute of National Economy, Romanian Academy, Bucharest, Romania. Holding a Ph.D. in economics, his research portfolio primarily focuses on key elements that significantly impact socio-economic development: foreign trade and tourism as factors, the scarcity of natural resources, and the necessity of environmental protection as constraints, along with taxation as a challenge. His scientific, professional, and academic achievements can be structured along four major directions: exploring the complex interactions between fiscal policy and economic development, addressing challenges of socio-economic development in the context of climate change, examining determinants of intra-industry trade, and investigating the role of tourism in stimulating economic growth.

PLENARY SESSION: KEYNOTE SPEAKERS

Keynote speaker: Chrysanthi Balomenou, *Epoka University, Tirana, Albania*

Title:

DIGITAL TRANSFORMATION AND SUSTAINABLE DEVELOPMENT THROUGH THE LENS OF INSTITUTIONAL THEORY: A FRAMEWORK FOR FUTURE SOCIETIES

Authors:
Jora Banda, *European University of Tirana, Tirana, Albania; jora.banda@uet.edu.al, ORCID ID: 0009-0004-8497-2903*
Iges Banda, *Western Balkans University, Tirana, Albania; iges.banda@wbu.edu.al, ORCID ID: 0000-0001-6789-0771*
Chrysanthi Balomenou, *Epoka University, Tirana, Albania; cbalomenou@epoka.edu.al, ORCID ID: 0000-0001-8149-891X*

Abstract
As societies confront growing challenges stemming from environmental degradation, economic inequality, and rapid technological shifts, the discourse on sustainable development has become increasingly intertwined with digital transformation. This paper proposes a theoretical framework grounded in Institutional Theory to analyze how digital transformation can both enable and hinder sustainable development across different socio-economic contexts.
Institutional Theory posits that organizations and actors operate within a set of formal and informal rules, norms, and structures that shape their behaviors and decisions. Applying this lens, we argue that the digital transformation of economies is not merely a technical shift, but a process deeply embedded in social, political, and institutional contexts. Institutions—such as regulatory bodies, educational systems, and market structures—play a critical role in either fostering or obstructing the integration of digital innovations that support environmental sustainability, social inclusion, and economic resilience.
We synthesize literature across multiple domains, including green technology adoption, digital governance, and innovation systems, to propose a conceptual framework that identifies three institutional dimensions that mediate the relationship between digitalization and sustainable development: (1) Regulative Institutions (e.g., laws, standards, and policies), (2) Normative Institutions (e.g., cultural norms and values), and (3) Cognitive Institutions (e.g., shared understandings and mental models). The framework is applied to real-world cases, including how certain countries successfully leverage digital platforms for energy efficiency and how others face resistance due to institutional inertia or misalignment.

Our theoretical model helps to diagnose why digital transformation initiatives in support of sustainability often yield uneven outcomes across regions, industries, and populations. For instance, while advanced economies might benefit from data-driven energy management or smart urban planning, developing economies may struggle due to weak institutions or limited access to digital infrastructure. Moreover, we emphasize the need for institutional innovation—the restructuring of existing rules and practices—as a precondition for sustainable digital transformation.

This paper contributes to both academic and policy discourses by offering a theoretically rich and context-sensitive understanding of how digital transformation interacts with institutional arrangements to affect progress toward the United Nations Sustainable Development Goals (SDGs). The findings are especially relevant for policymakers, development practitioners, and business leaders looking to align digital strategies with sustainability objectives.

The study concludes by offering policy recommendations, including the design of multi-level governance systems, investment in digital capacity-building, and the establishment of inclusive policy-making processes. We also call for further empirical research to validate the proposed framework in different national and sectoral contexts, with a focus on long-term societal impact.

***Keywords**: digital transformation; sustainable development; institutional theory; regulative institutions; innovation systems; SDGs; policy design; digital governance; institutional innovation; development studies*

Keynote speaker: Valentina Vasile, *Institute of National Economy, Bucharest, Romania*

Title:

THE NEW PARADIGM OF THE SUSTAINABLE CITY. CONTROVERSIES REGARDING SOCIAL IMPLICATIONS AND CONSIDERATIONS REGARDING A SMART "ROADMAP" FOR DESIGNING THE FUTURE DEVELOPMENT MODEL

Authors:

Valentina Vasile, *Institute of National Economy, Bucharest, Romania; valentinavasile2009@gmail.com, ORCID ID: 0000-0002-2368-1377*

Marius Surugiu, *Institute of National Economy, Bucharest, Romania;* marius.surugiu@ien.ro, ORCID ID: 0000-0002-9599-4540

Raluca Mazilescu, *Institute of National Economy, Bucharest, Romania; ralucamazilescu@gmail.com, ORCID ID: 0000-0001-6373-5387*

Răzvan Vasile, *National Institute of Economic Research "Costin C. Kiritescu"-Romanian Academy, Bucharest, Romania; vasile.razvan89@gmail.com*

Abstract

Recent literature increasingly approaches the concept of the "smart city" from a dual perspective: as a framework for robust and resilient local development, and as a pathway to inclusive sustainability. While large, multidimensionally developed cities—highly attractive for investment—have already outlined the general contours of the city of the future, the situation is notably different for small cities. These urban areas face a broader range of challenges, from limited development potential and the need to capitalize on local resources, to issues related to their social and cultural environment.

After analysing the evolution of the concepts of "smart city," "green city," and "sustainable city," as well as the interconnections among them, this paper presents the main findings of a qualitative research study focused on the dynamics and development prospects of small cities, based on three thematic surveys conducted in selected small cities in Romania, specifically within the Bucharest-Ilfov and South-Muntenia regions.

While designing the roadmap, we incorporated best practices from Northern Europe and examined potential funding sources to support sustainable development. Our findings underscore the importance of re-evaluating regional development drivers, rethinking spatial planning approaches, and harnessing the value of local social and cultural heritage.

Keywords: *smart city, local development, sustainability, small city, Romania*

Keynote speaker: Victor Platon, *Institute of National Economy, Bucharest, Romania*

Title:

CIRCULAR ECONOMY AND JOB CREATION IN THE EU

Authors:
Victor Platon, *Institute of National Economy, Bucharest, Romania; victor.platon54@gmail.com, ORCID ID: 0000-0002-8313-3639*
Andreea Constantinescu, *Institute of National Economy, Bucharest, Romania; andreeaconstantinescu7@gmail.com, ORCID ID: 0000-0001-6757-711X*
Simona Frone, *Institute of National Economy, Bucharest, Romania; frone.simona@gmail.com, ORCID ID: 0000-0002-9020-7069*

Abstract
The four guiding principles of the circular economy are risk reduction, resource optimization, natural capital preservation, and the flow of resources and goods in a renewable manner. This research focuses on the second one, resources optimization. Out of the many resources that can be considered, labour force is one of the most important. The variation in the number of employees is one of the key indicators analysed in economic research. Circular economy transition in the EU and for that reason in Romania can be one of the main boosters of job creation for the next period.
Objective: *One of the objectives of the paper is to identify and analyse the mechanisms through which the determinants of the circular economy influence the circularity of the economy in Romania and the EU. The national strategy on the circular economy adopted by the Romanian Government established the vision, mission and high-level objectives for the transition process to the circular economy in Romania as well as the action plan that proposes and describes concrete actions to orient the Romanian economy towards circularity. Among these actions, the workforce and information technology play a very important and efficient role for the transition to the circular economy but also for the progress of sustainable development or adaptation and mitigation of climate change, as demonstrated by studies and good practices in some EU member states that are already relatively advanced in the implementation of the CE (Netherlands, Belgium, France, Italy).*
Method*: The analysis performed in this research includes literature review of papers that previously tackled the subject of job creation through circular economy followed by an econometric analysis of the most influential indicators for this research. Panel analyses will be conducted on an extended sample of 27 EU countries, quintet regression analyses (including LAD) and the identification of regression rights specific to each country and the group of 27 member states.*
Results*: At European level, the aim is to create the right policy and regulatory framework that can ensure a level playing field for circular economy business models, by eliminating subsidies that reward linear behaviour and by fully setting prices that include risks and externalities associated with the production and use of a linear economy. It is also important to facilitate and accelerate the allocation of capital for circular investments and activities, stimulating private sector financing and creating an optimal effect for the upskilling of personnel in circular activities. Several expected impacts of strategic employment policies can be used for*

promoting the circular economy in the EU, as adapted and applied at different levels of the governance. Several particular findings and recommendations have been drawn from the description and analysis of the policy's goals and results.
Originality*: The paper creates an original contribution to the research of circular economy in EU countries, considering that the job creation is a very stringent and always actual problem. The topic is useful for the relevant authorities to boost the introduction of economic instruments with a direct influence on the circular economy. Among the potential beneficiaries we can mention: Ministry of Environment, Media Fund, Ministry of Finance, National Environment Agency.*
Keywords*: circular economy, job creation, panel analysis, quintet regression.*

Keynote speaker: Marius Surugiu, *Institute of National Economy, Bucharest, Romania*

Title:

TAXATION CHALLENGES IN ADVANCING THE SUSTAINABLE DEVELOPMENT GOALS

Authors:
Marius Surugiu, *Institute of National Economy, Bucharest, Romania;* marius.surugiu@ien.ro, ORCID ID: 0000-0002-9599-4540
Valentina Vasile, *Institute of National Economy, Bucharest, Romania; valentinavasile2009@gmail.com, ORCID ID: 0000-0002-2368-1377*
Raluca Mazilescu, *Institute of National Economy, Bucharest, Romania; ralucamazilescu@gmail.com, ORCID ID: 0000-0001-6373-5387*

Abstract
Taxation is a field that has changed significantly over time. Also, it is a necessary tool in economic policy. Reaching the SDGs also depends on taxes. Tax revenues support initiatives for social inclusion, poverty reduction, and so on.
Fiscal policy can help lower inequalities through redistribution systems. Many nations have adopted policies to reduce disparities, including progressive taxation, expanding social programs, and investments in health and education.
Taxes fund public health and education systems. Thus, citizens will have access to essential services. However, equitable access depends on how the funds are allocated and managed. Particular challenges can refer to poor infrastructure or collection inefficiency, which perpetuates inequalities and reduces the favourable impact of fiscal policy on sustainable development.
Keywords*: taxation, fiscal policy, sustainable development goals, tax revenues*

SESSION 1: UNLOCKING GROWTH THROUGH RESEARCH FOR SUSTAINABLE DEVELOPMENT

FINANCIAL CYCLES AND POLICY COORDINATION IN CENTRAL, EASTERN, AND SOUTH-EASTERN EUROPE: AN EMPIRICAL INVESTIGATION

Meri Papavangjeli
Charles University, Prague, Czech Republic; Bank of Albania, Tirana, Albania
meripapavangjeli@gmail.com, ORCID ID: 0000-0003-4799-9432

Abstract
Understanding the coordination between monetary and macroprudential policies and their interaction with financial cycles in the Central, Eastern, and South-Eastern Europe (CESEE) region is crucial, particularly in the face of global uncertainties amplified by recent economic disruptions, such as the COVID-19 pandemic and geopolitical tensions. These events have underscored the need for robust policy frameworks that effectively safeguard financial stability and bolster economic resilience. Financial cycles play a significant role in shaping macroeconomic stability, influencing key indicators such as credit growth, asset prices, and systemic risk. The fluctuations in these cycles necessitate appropriate policy responses, particularly through monetary and macroprudential tools, to mitigate financial instability and ensure sustainable economic growth. Given the increasing interconnectedness of financial markets, understanding how these policies interact with financial cycles within the CESEE economies is of paramount importance.
This study investigates the relationship between financial cycles, macroprudential policies, and monetary policies across 17 economies in the CESEE region, including Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Montenegro, North Macedonia, Poland, Romania, Serbia, Slovak Republic, and Slovenia. A Principal Component Analysis (PCA) is employed to construct a financial cycle index based on three key indicators: annual credit growth, the credit-to-GDP ratio, and house price index growth. The Christiano-Fitzgerald band-pass filter is then applied to extract cyclical components from these indicators, providing a comprehensive measure of financial cycles in the region. Furthermore, a composite macroprudential policy index is regressed on the estimated financial cycle to evaluate the responsiveness of macroprudential tools to financial fluctuations. The empirical analysis is based on extensive datasets sourced from national statistical offices, central banks, and international institutions such as the International Monetary Fund (IMF), World Bank, and Eurostat. By incorporating a regression framework, the study quantifies the impact of financial cycles on macroprudential policy adjustments,

shedding light on the extent to which policymakers actively respond to financial imbalances. Additionally, the study examines the interaction between monetary policy and macroprudential measures by regressing interest rate decisions on the residuals from the macroprudential policy regression.

The findings reveal a significant and positive relationship between financial cycles and macroprudential policy adjustments, suggesting that policymakers actively respond to cyclical fluctuations through tightening or loosening macroprudential measures. Additionally, the inverse relationship observed between the residuals of macroprudential policy and monetary policy highlights a coordination mechanism wherein central banks adjust interest rates in response to broader economic conditions and financial stability concerns. These results underscore the importance of policy coordination in maintaining economic stability and mitigating systemic risks in the CESEE region.

This study contributes to the existing literature by providing a comprehensive assessment of financial cycle dynamics and policy coordination within CESEE economies. Unlike previous studies that focus solely on individual macroeconomic indicators, this research takes a broader perspective by analyzing both macroprudential and monetary policy responses to financial fluctuations. The results offer valuable insights for policymakers seeking to enhance financial stability and economic resilience, particularly in light of the challenges posed by global financial integration and regional economic interdependencies.

Keywords: *financial cycles, macroprudential policy, monetary policy coordination, economic stability, CESEE region*

THE CSR-HRM RELATIONSHIPS IN LIGHT OF WORK-LIFE BALANCE AND TECHNOLOGICAL ADVANCEMENT

Iza Gigauri*
The University of Georgia, Tbilisi, Georgia
i.gigauri@ug.edu.ge, ORCID ID: 0000-0001-6394-6416
Simona Apostu
Bucharest University of Economic Studies & Romanian Academy, Institute of National Economy, Bucharest, Romania
simona.apostu@csie.ase.ro, ORCID ID:0000-0003-1727-0114
Mirela Panait
Petroleum-Gas University of Ploiesti, Romania, Institute of National Economy, Romanian Academy, Bucharest, Romania
mirela.matei@upg-ploiesti.ro, ORCID ID: 0000-0002-5158-753X
**Corresponding author*

Abstract
Objective: *Under the current circumstances of a volatile, uncertain, complex, and ambiguous environment, the focus on employees and recognition of their dominance plays a pivotal role in business models. Advancing digitalization and the recent pandemic impacted the workplace causing changes in jobs, tasks, work-life balance, and consequently, employee well-being. Organizations worldwide have been forced to accelerate the transition to digital business processes. Flexible and remote work has been introduced to almost all organizations irrespective of their size, type, or industry after the pandemic. Accordingly, these transformations and unexpected alterations triggered various changes in the nature of jobs and ultimately, affected employees' and their families' well-being.*
New technological advancements from digital platforms and digital communication tools to Augmented Reality, Artificial Intelligence (AI), Blockchain and Chat GPT impact human resources management (HRM) systems and strategies changing HR functions. Moreover, the corporate social responsibility (CSR) effort of companies demanded by various stakeholders requires the sustainability transformation of business strategies. In this light, the importance of CSR has been heightened as internal CSR activities within organizations can ensure employee health, safety, and well-being. Thus, the digital, sustainable, human-centric industry is emerging leading to alterations in human resources management (HRM).
Method: *Therefore, a bibliometric analysis was applied to explore the complex relationships between CSR and HRM. This research examines the implications of CSR and digitalization on HRM, which is related as well to work-life balance and employee well-being considering the rise of remote working due to the increased digitalization. This bibliometric analysis identified research gaps in the CSR-HRM nexus.*
Results: *The research demonstrates that although the interest towards the CSR-HRM interconnection has been expanded, there are still research gaps, since this interrelationship must also reflect the ongoing trends in digitalization and employee well-being. In addition, frequent word networks revealed that digitalization, digital technologies, AI, and related keywords are missing in the CSR-HRM link. However, the bibliometric analysis did not capture any keywords related to employee well-being and remote working in the relationship studied.*

Originality: *The study of the relationship between CSR and HRM provides scientific insight regarding the role of internal CSR in achieving work-life balance and ensuring the well-being of employees and their families, which ultimately contributes to sustainable development goals. The research results particularly contribute to the theory and practice by intertwining CSR with HRM and providing recommendations for organizations. Advanced technologies, specifically AI requires comprehensive research with reference to CSR and HRM.*
Keywords: *corporate social responsibility, CSR, human resource management, HRM, work-life balance, employee well-being, digitalization, technological advancements*

CENTRAL AND EASTERN EUROPEAN TOURISM IN THE CONTEXT OF GLOBALIZATION

Alina Haller
"Gheorghe Zane" Institute for Economic and Social Research, Romanian Academy, Iași Branch, Romania
alina_haller@yahoo.com

Abstract
This study explores the relationship between tourism and globalisation in Central and Eastern European (CEE) countries, considering sustainability, digitalisation, trade openness, and economic resilience. Using panel data and regression analysis based on data from the World Bank, the United Nations World Tourism Organization, and the KOF Index (1999–2021), the findings reveal that globalisation dynamics are influenced by tourism, though patterns vary across countries. Tourism, trade openness, and digitalisation are not universally decisive factors of globalisation. Sustainability lacks statistical significance, while tourism expenditures positively impact the CEE region overall, especially in Poland, but show a negative effect in Lithuania. Foreign tourist flows enhance globalisation in Bulgaria and Estonia but slow it in Slovenia and Hungary. Occupancy rates in accommodation units drive globalisation in Lithuania, Slovenia, Hungary, and Latvia. Digital adaptation plays a key role in globalisation, with Poland, Bulgaria, Slovenia, Hungary, and Croatia benefiting from digital technologies. Economic growth positively affects globalisation in Lithuania and Romania, but for the CEE region as a whole, it slows market integration. The findings highlight the non-uniform nature of globalisation through tourism in CEE and underscore the need for tailored policies to enhance global market integration via inbound tourism.

***Keywords**: inbound tourism, globalisation, Central and Eastern Europe, digitisation, growth*

AN INTERNET OF THINGS (IOT)-BASED FRAMEWORK FOR SUSTAINABLE SOILLESS AGRICULTURE IN DEVELOPING COUNTRIES

Salma Akter*
East West University, Dhaka, Bangladesh
drsalma@ewubd.edu, ORCID ID: 0000-0003-0109-645
Khondoker Munim Salehin
East West University, Dhaka, Bangladesh
2020-1-60-164@std.ewubd.edu, ORCID ID: 0009-0002-5507-9978
Tajia Afroz
East West University, Dhaka, Bangladesh
2020-1-10-363@std.ewubd.edu, ORCID ID: 0009-0006-7191-803X
**Corresponding author*

Abstract

Context for the study: Producing sufficient food is crucial for every country to ensure the food security of the population. Efficient farming can be a solution for ensuring sustainability and food security. Developing countries such as Bangladesh, which is the 7th most populous country in the world with a population estimated at close to 160 million, averaging more than 1000 people per square kilometre throughout the country. Based on recent data, this country needs approximately 70 million metric tons of food in 2025. However, Bangladesh has less land for agriculture, according to the last survey in 2021. With this amount of land, it would be difficult to ensure that the food demanded is supplied smoothly.

To address this problem, alternatives, such as soilless farming, can ease the process. Soilless farming provides an opportunity to grow plants in a controlled environment with fewer resources. This ensures the efficient use of scarce resources such as land and water. The Internet of Things (IoT) is a modern technology that facilitates soilless farming more efficiently and effectively. This framework includes sensors, automation, and monitoring facilities. From different studies, it has been found that using soilless farming productivity increased yield by 20 %–30% compared to traditional farming, which shows the opportunity to choose alternative ways.

SDG -2 aims to achieve zero hunger in developing countries. By implementing IoT-based soilless farming, yield productivity can be increased compared to traditional farming. Over 1.6 million persons' food security by implementing technology in soilless farming.

***Objective**: This study aimed to develop an Internet of Things (IoT) device framework for soilless farming. By implementing this framework, food production will become a more sustainable, efficient, and alternative solution for ultimate food production.*

***Methodology**: This study aimed to develop an IoT framework for soilless farming. For the framework sensors, Arduino was used to set up the system. Raspberry pi can be used as a replacement for Arduino, but it will make the system more expensive. Secondary sources are used for the framework, such as previous research and conference papers.*

Several sensors are used to control the environment in farming facilities. Sensors for water flow that will monitor the efficient use of water, temperature controlling sensors, and nutrition monitoring sensors will be established by compiling all the equipment.

In addition to this qualitative approach, a quantitative approach was adopted. Twenty industry experts were thoroughly interviewed using semi-structured questionnaires so that an overall in-depth scenario of the actual industry could be shown.

***Results**: The results of this study show that the IoT framework for soilless farming increases productivity with fewer resources. Qualitative study focuses on different methods of IoT devices, and by combining these methods, a new framework is proposed. The quantitative approach shows the opinions of industry experts and the specific industry changes.*

***Originality**/Value: This study clarifies the concept of modern technology used in farming to boost production. Developing countries mostly depend on traditional farming techniques. This can be challenging, sometimes owing to the adverse effects of weather changes. Environmental changes may challenge the production of specific crops, leading to market crises. This became a normal scenario for countries such as Bangladesh. If the amount of production can be maximised, the effects of climate change can be eliminated, leading to market stability.*

These techniques have much more potential than traditional farming, despite the fact that less than 1% of the research work has been done in these fields in developing countries. Developed countries have improved their farming techniques by searching for alternatives; however, in developing countries, new technologies are not widely practiced and available because of their affordability.

Practical Implications: The framework of this study can be used in various sectors, such as coastal areas, urban rooftop gardening, educational farms, food processing factories, and smart farms. As soilless farming does not require fields, it will save production costs and provide a solution to farming in small spaces, which will lead to more efficiency. If resources are used in an effective and efficient manner, they will also lead to economic stability and growth. This technology allows for less dependency on the climate and produces more crops with the maximum use of resources. Moreover, urban families can fulfil their vegetable demand by implementing these technologies in rooftop gardening. Businesses provide customers with healthy food options at reasonable prices.

***Keywords**: IoT, soilless farming, sensors, Arduino, sustainability, efficiency, food security.*

Funding: This study did not get any grants from any third party.

EXPLORING THE ROLE OF WASTE MANAGEMENT PRACTICES IN PROMOTING SUSTAINABLE ECONOMIC GROWTH IN URBAN COMMUNITIES

Salma Akter*
East West University, Dhaka, Bangladesh
drsalma@ewubd.edu, ORCID ID: 0000-0003-0109-645
Rushnun Mahbub
East West University, Dhaka, Bangladesh
2020-1-10-040@std.ewubd.edu
**Corresponding author*

Abstract
The sustainable economic development of urban areas depends on efficient waste-management systems. Global urbanisation creates escalating waste management challenges for cities, especially in developing nations, where population growth exceeds the pace of infrastructure development. A total of 55% of the worldwide population resided in urban areas by 2020, yet experts have predicted that this number will reach 68% by 2050. The increasing urban population has created immense stress on waste disposal systems because they must handle extensive waste output.

Dhaka Bangladesh produces more than 5500 tons of waste from its 20 million population but scraps from improper waste recycling or disposal procedures. The waste management system's deficient performance causes environmental contamination, creates health risks, and reduces the possible financial value of recyclable resources. The global economy faces a significant financial burden because of improper waste management, amounting to approximately $370 billion per year.

The strategic implementation of sustainable waste management practices such as recycling, composting, and waste-to-energy technologies creates environmental benefits and boosts economic growth. The implementation of these sustainable waste management methods will stimulate job market development and minimise waste-generated pollution, thus fulfilling the requirements of SDG 12 for Responsible Consumption and Production. Modern waste management techniques function as a fundamental force for green economies by producing both financial advantages and health benefits along with technological innovations and price reductions. This study analyzes current waste management operations to discover solutions that will develop sustainable economic sustainability in urban environments.

Objective*: This study aims to determine how effectively managing waste affects ongoing economic growth among metropolitan residents. This study examines the possibilities for environmental sustainability while promoting metropolitan economic development through the assessment of present waste management practices and their resource optimisation capabilities.*

Methodology*: This study employs previous research gathered from existing research, reports, case studies on waste management practices, and economic effects in urban areas. The research combines secondary data sources with first-hand interviews with 20 industry experts using semi-structured questionnaires comprising urban planners, waste management professionals, sustainability consultants, and others. The interviews aimed to obtain expert knowledge about present waste management strategies, together with insights into improvement opportunities and financial advantages from sustainable urban practices.*

The evaluation of waste management practices and sustainable economic growth relationships in urban communities is possible through the analysis of secondary data with expert interviews.
Results*: The results of this study show how competent waste management strategies drive urban economic growth and reveal the potential of a sustainable development strategy to achieve its goals of creating employment while reducing pollutants and maximising resource efficiency to ensure metropolitan financial stability.*
Originality*/Value: This study clarifies the distinct knowledge about waste management strategies and their economic significance toward sustainable urban community progress. This research establishes economic potential as its key focus, since most investigations concentrate on the environmental analysis of waste management systems. The combination of secondary information with expert analysis demonstrates how efficient waste management produces economic rewards through new employment opportunities, preserved resources, and diminished public health expenses.*
The 2020 estimate of $370 billion indicates the necessity for better waste management systems due to discarded waste mismanagement. The analysis will deliver concrete policy solutions to urban waste managers, who can use them to build economic stability that leads to the long-term growth of their communities. This study establishes a foundational resource which helps urban establishments pursue sustainable environmental growth along with economic development.
Practical Implications: The research framework presents valuable operational benefits to urban policymakers along with business entities that want to advance their waste management frameworks. Sustainable waste management practices, including recycling along with composting and waste-to-energy technologies, enable cities to lower environmental pollution while stimulating economic progress. Integral waste management will produce 18 million worldwide employment opportunities by 2030, as it meets both SDG 8 (Decent Work and Economic Growth) goals and SDG 12 (Responsible Consumption and Production). The study presents specific recommendations which enable improved waste management systems and optimal resource utilisation that support the achievement of Sustainable Cities and Communities (SDG 11). The proposed plan promotes sustainability in urban areas, with the added benefits of economic development and enhanced public wellness.
Keywords*: waste management, sustainable economic growth, urban communities, recycling, waste-to-energy, environmental sustainability, urbanization, waste management practices, sustainable development goals (SDG).*
Funding: This study did not receive any grants from any third parties.

EVALUATING THE PROFITABILITY OF AGRICULTURAL BUSINESSES—APPLYING THE BCC (BANKER, CHARNES & COOPER) MODEL WITHIN THE DEA (DATA ENVELOPMENT ANALYSIS) METHOD

Aurelia Damian*
Petroleum - Gas University of Ploiesti, Romania
aura.damianec@gmail.com, ORCID ID: 0009-0001-3907-7449
Daniela Rodica Iov
Petroleum - Gas University of Ploiesti, Romania
driov@upg-ploiesti.ro
Dorian Florin Damian
"Virgil Madgearu" Economic College, Ploiesti, Romania
dorian_dam@yahoo.com, ORCID ID: 0009-0003-1800-8158
**Corresponding author*

Abstract
Agriculture is a field characterized by high variability, including production factors such as: agricultural land, physical labor, water and added fertilizers on the one hand, and on the other hand the results obtained, such as crop yield and their profitability. Evaluating the profitability of agricultural businesses is essential for optimizing resources and increasing sustainability in the agricultural sector. The agricultural sector plays a fundamental role in the global economy; therefore, the challenges related to the use of limited resources and the optimization of agricultural processes require the existence of rigorous analysis methods.
Objective*: he DEA (Data Envelopment Analysis) method is a powerful tool for measuring the relative efficiency of production units, and this paper aims to identify efficient agricultural units and those that require improvements by determining the main factors that influence profitability in the agricultural sector;*
Method*: The BCC (Banker, Charnes & Cooper) model uses a non-parametric approach based on linear programming to compare similar production units and assumes a variable efficiency frontier, which means that production units can operate under increasing, constant or decreasing returns to scale. A number of 18 agricultural farms were selected for this study, and the economic indicators used include: inputs-total production costs, number of employees, outputs, net income, total production, net profit. Applying the method in the agricultural sector involves completing the following steps: 1. Defining decision-making units, 2. Choosing inputs and outputs, 3. Choosing the DEA model, 4. Collecting and normalizing data, 5. Calculating performance using DEA, 6. Interpreting the results;*
Results*: The analysis of relative efficiency highlighted the following aspects: efficient farms are characterized by optimal use of inputs and high productivity; low-efficiency farms have high costs or low yields, indicating the need for restructuring measures. The BCC model allowed the identification of farms operating at decreasing returns to scale, suggesting the need for a reconfiguration of production and comparing them with efficient ones in order to highlight the structural and operational differences that bring profitability. The results of the study can be used by farmers and decision-makers to optimize agricultural management strategies;*
Originality*: Most traditional financial analyses use indicators such as ROI, ROA or profit margin. DEA allows a comparative assessment of farm efficiency, taking into account several*

factors simultaneously, such as inputs (land, labor, capital) and outputs (production, income, profit). Unlike classical methods, DEA does not impose a pre-established production function, but determines efficiency in relation to the best performing units in the sample. This aspect provides a more realistic picture of the performance of each agricultural business. Moreover, this method not only identifies sources of inefficiency but also provides indications where improvements can be made, either by optimizing inputs or by increasing production. The DEA method can be applied to both small farms and large agricultural holdings, providing a flexible framework for analyzing profitability according to the specifics of each business. Combining this method with econometric techniques provides a robust approach on the one hand by correcting possible calculation errors (sensitivity to extreme data), and on the other hand increases the methodological value of this scientific work.
Keywords*: Data Envelopment Analysis, the impact of precision agriculture, input-output analysis, DEA models (CCR; BCC, SBM), sustainability in agriculture*

A REVIEW OF MEASURES AND POLICIES TO COMBAT ENERGY POVERTY AT THE EUROPEAN UNION LEVEL

Alina Georgeta Ailincă
"Victor Slăvescu" Financial and Monetary Research Centre, NIER, Romanian Academy
alinageorgetaailinca@gmail.com, ORCID ID: 0000-0002-2086-8275

Abstract
The European Union is among the most advanced regions of the world in terms of climatic ambitions, especially through well-defined legislation such as the European Green Deal and European Climate Law. The target of climatic neutrality by 2050 of the European Union can prove extremely difficult and with multiple challenges and often difficult to carry in the medium and long term. In this context, the energy system at the European Union (EU) level requires a sustainable approach, with major economic, political, social and cultural implications. The consequences of this transition require special measures, so that the energy transition is distributed as fair as possible between the various social categories, so that the prosperity is not affected, especially of the households with low incomes, often generating energy poverty. Energy poverty is a relatively young concept, appearing at the end of the last century and focusing on defining and exploring fuel poverty. Currently, there is a variety of identified energy poverty. According to the EU, energy poverty occurs when a household must reduce its energy consumption to an extent that negatively affects the well-being and health of its inhabitants. More recent studies include aspects related to measured and perceived energy poverty, poverty identified in the classic and hidden sense, urban and rural energy poverty, poverty related to accessibility and financial possibilities, income. The crisis triggered in 2008-2009 in the United States, and with powerful reverberations in the EU, the 2012 sovereign debt crisis, but especially the Covid-19 crisis, based on home insulation, has led to the inability of an increasing number of households to not be able to maintain their homes at an adequate temperature, either against the background of the work, or against the fund Access to technology and the impossibility of teleworking (especially in the case of Covid-19 crisis), creating low living comfort and real difficulties in time and integral energy invoices. In this framework, beyond defining and outlining the problem of energy poverty, the article has the objective to identify measures and policies to combat energy poverty at the EU level, including by taking into account the changes generated by climate change, but also by fair ecological transition.
The ***method*** *of study takes into account an exploratory approach to the specialized literature through a comparative investigation of the various case studies at the level of the European Union countries on measures to combat energy poverty.*
The ***results*** *indicate, on the one hand, that where the problems are relatively correct identified public policy measures are well targeted and efficient. Energy poverty, fair transition, climate problems and energy infrastructure if they are viewed together as integrated as possible, they can lead, through correct policies, to a higher level of simultaneous solving and can be potentiate on each other in solving these problems. On the other hand, a longer experience in combating energy poverty makes some states do better than others in combating energy poverty.*
The ***originality*** *of the study comes mainly from the fact that the theme of energy poverty and its control is relatively fresh and slightly addressed today, although there is a huge opening*

against the increasingly visible climatic changes, of energy infrastructure problems from the level of the European Union, but also on the basis of public funds, with some highly reduced nature, with some of the social funds Aspects such as energy poverty are not observed, analyzed and taken into account in public policies.
***Keywords**: energy poverty, social inequity, climate change, fair transition, public policies*

INDUSTRIAL RELATIONS AND SUSTAINABLE DEVELOPMENT GOALS

Cristian-Nicolae Ghena
Romanian Academy, Doctoral School of Economic Sciences, National Institute for Economic Research "Costin C. Kirițescu"; Institute of National Economy, Bucharest, Romania
crfrisk@gmail.com

Abstract
The paper analyzes the impact of industrial relations on the sustainable development goals set out in the 2030 Agenda. Industrial relations retain a key role in terms of work performed under pressure of economic performance and competition. Although less known in the specialized literature, the term industrial relations is a vast one, with different connections to everything that means, through work, the performance of a public or private institution. The sustainable development objectives are, in turn, very diverse, and the closest to connecting with industrial relations is SDG 8 – Decent work and economic growth. Decent work and economic growth are targets that can be achieved through industrial relations techniques, but also through the use of artificial intelligence, an increasingly present factor in 21st century work. Social dialogue also remains a necessary constant regardless of the context of sustainable development and labor development, vertically and horizontally.
***Objectives** of the paper: To analyze the relationship between industrial relations and the Sustainable Development Goals (SDGs) outlined in the 2030 Agenda, with a particular focus on SDG 8 – Decent Work and Economic Growth. To examine the role of industrial relations in the context of increasing pressures from economic performance and global competition. To highlight the importance of social dialogue as a key mechanism in promoting sustainable development and decent labor conditions. To investigate how emerging technologies, especially artificial intelligence, are transforming industrial relations and the nature of work in the 21st century. To identify the connections between institutional performance (both public and private) and industrial relations practices in achieving sustainable development objectives.*
This paper adopts a qualitative and analytical approach, based on the review and synthesis of relevant academic literature, policy documents, and international frameworks related to industrial relations and sustainable development. The analysis focuses on the intersection between industrial relations mechanisms (such as social dialogue and institutional performance) and the objectives of Sustainable Development Goal 8 (Decent Work and Economic Growth).
The analysis reveals that industrial relations play a significant and multifaceted role in advancing the objectives of Sustainable Development Goal 8 (Decent Work and Economic Growth). Effective social dialogue, collective bargaining, and participatory decision-making processes are identified as key mechanisms that contribute to fair labor conditions and inclusive economic growth.
Furthermore, the study finds that artificial intelligence (AI) introduces both opportunities and challenges for labor markets. While AI has the potential to enhance productivity and innovation, it also raises concerns about job displacement, skills mismatches, and the weakening of traditional labor protections.
The results suggest that integrating AI into the framework of industrial relations—through collaborative approaches between employers, workers, and policymakers—can support

sustainable labor practices. Institutional performance, both in the public and private sectors, is shown to be closely linked to the strength of industrial relations systems, which in turn influences progress toward the broader 2030 Agenda.
This paper offers a novel conceptual perspective by linking industrial relations—a traditionally labor-focused domain—with the broader, multidisciplinary framework of the 2030 Sustainable Development Agenda, particularly SDG 8 (Decent Work and Economic Growth). While existing literature tends to address labor issues and sustainability separately, this study bridges the gap by highlighting how industrial relations mechanisms can serve as active drivers of sustainable development. By proposing a multi-level framework—combining technology, labor policy, and social dialogue—the paper contributes to the academic and policy-oriented understanding of how future labor systems can align with global sustainability goals.
***Keywords**: industrial relations, artificial intelligence, social dialogue, sustainable development, decent work, economic growth*

EXAMINING THE ROLE OF FINANCIAL INNOVATION IN ECONOMIC GROWTH: EVIDENCE FROM ALBANIA

Meril Canameri
University of Tirana, Faculty of Economy, Tirana, Albania
meril.canameri1@gmail.com, ORCID ID:0009-0006-4663-1408
Dorina Koçi (Janku)
University of Tirana, Faculty of Economy, Tirana, Albania
dorinajanku@feut.edu.al, ORCID ID: 0000-0003-2650-6205

Abstract
Objective: *This study aims to explore the relationship between financial innovation and economic growth in Albania. Over the past few decades, significant changes have been seen in Albania's financial sector, particularly with the rise of mobile banking, digital payment systems, and other financial technologies in recent years. While these innovations have been pivotal in enhancing access to financial services, there is limited research on how they directly influence the country's economic growth. The objective of this study is to assess the role of financial innovations in contributing to Albania's economic growth.*
Method*: A quantitative approach is used, employing time-series data from 2000 to 2023, sourced from the World Bank, the International Monetary Fund (IMF), and the Bank of Albania (BoA). The real GDP per capita is selected as the indicator of economic growth, which is widely used in economic studies. Key financial innovation proxies include domestic credit to the private sector by financial institutions, mobile cellular subscriptions and the money multiplier. The model also incorporates other variables that explain GDP growth. The study applies the Autoregressive Distributed Lag (ARDL) bound testing method to identify long-term relationships between financial innovation and economic growth. The Granger causality test is conducted to examine the directional effects between the variables, providing insights into whether financial innovations drive economic growth or if economic growth encourages further innovations in the financial sector.*
Results*: The presence of a long-term relationship between economic growth and the selected financial innovation proxies is confirmed. The findings indicate that financial innovation plays a significant role in supporting economic growth over time. The money multiplier and domestic credit to the private sector were found to be statistically significant in the long run. In the short run, the results show that both mobile cellular subscriptions and domestic credit to the private sector by financial institutions are statistically significant, suggesting that these forms of financial innovation have a more immediate impact on economic activity, likely by increasing financial inclusion and facilitating quicker access to financial services. The Granger causality tests revealed a complex and asymmetric relationship among the variables. Specifically, the Money Multiplier was found to Granger-cause GDP growth, suggesting that improvements in monetary efficiency can directly drive economic expansion. In contrast, the other proxies were primarily influenced by economic growth, reflecting the broader economic conditions that stimulate financial innovation. These results underline the multifaceted nature of financial innovation's impact on economic growth.*
Originality*: The topic of financial innovation and its impact on economic growth remains relatively underexplored in the existing literature, particularly within the context of Albania. This research is the first to investigate the relationship between financial innovation and*

economic growth in Albania, offering a unique contribution to the academic field. The results not only contribute to the broader academic conversation but also provide practical insights for policymakers and financial institutions striving to foster sustainable economic development through innovative financial solutions.
Keywords: *financial innovation, economic growth, financial development, ARDL, Granger causality*

THEORETICAL APPROACH OF INVESTMENTS AS A FACTOR IN ENSURING THE MODERNIZATION OF THE WINE SECTOR

Tatiana Iațișin
National Institute for Economic Research, Academy of Economic Studies of Moldova, Chisinau, Republic of Moldova
tatianaiatisin@yahoo.com, ORCID ID: 0000-0002-8339-795X

Abstract
The wine sector is a strategic pillar of the national economy and a real business card of the Republic of Moldova, contributing significantly to the income of the population, especially in rural areas. In recent years, this sector has been affected by multiple challenges such as climate change, international market fluctuations, geopolitical instability and, last but not least, insufficient sustainable investments and modern infrastructure. All these difficulties have had a negative impact on export volumes, economic profitability and the financial performance of producers in the sector.
In this context, the modernization of the wine sector is no longer an option but a strategic necessity, supported by well targeted public policies and investment interventions. Increasing productivity, adapting to new quality and sustainability requirements, and penetrating external markets require attracting efficient investment. In this respect, public policies, external funds and private initiative need to work together in an integrated way to revitalize and sustainably develop the sector.
The importance of investing in the re-engineering of production processes, the transition to intensive and super-intensive forms of agriculture, and the digitalization of agriculture is undeniable. They meet the current requirements of the national economy and are in line with global development trends. In the contemporary economy, investments are a determining factor in the progress of the wine sector, having a direct impact on its modernization, increasing its economic efficiency and strengthening its sustainability. Thus, a coherent investment strategy, coupled with effective public policies and well-functioning public-private partnerships, is essential to realize the full potential of the wine sector, both nationally and internationally.
This paper aims to investigate the complexity of investment strategies oriented towards the modernization of the wine sector, analyzing their importance and impact on the competitiveness and sustainability of production. As theoretical-scientific support was used numerous works and publications of established researchers in the country and abroad. At the same time, the research was based on the analysis of relevant public policy documents, normative acts and national strategies, such as: the National Strategy for Agricultural and Rural Development 2023-2030, the National Strategy for the Development of the Information Society "Digital Moldova 2020" and the National Development Strategy of the Republic of Moldova until 2030. These documents outline development objectives, quantitative and qualitative indicators and intervention plans for the modernization of the rural economy and agriculture, including the wine sector.
The research utilizes a combined theoretical-applicative approach, based on established scientific methods such as documentary analysis, systemic analysis and tabular and graphical methods for data presentation.

The obtained results allow the definition of an investment strategy adapted to the wine sector, oriented towards modernization and sustainable development. The study also proposes a categorization of the necessary investments, highlighting those investments are essential for an intelligent and sustainable development of the sector.

***Keywords**: wine sector, investment strategies, investments, modernization, sustainable investments.*

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"

BUILDING RESILIENT RENTAL FASHION: OPPORTUNITIES, CHALLENGES, AND THE FUTURE OF INDIA'S RENTAL CLOTHING FIRMS

Shweta Malti*

School of Business, UPES, Dehradun, Uttarakhand, India

Shweta.125373@stu.upes.ac.in

Devkant Kala

School of Business, UPES, Dehradun, Uttarakhand, India

Devkant.kala@ddn.upes.ac.in, ORCID ID: 0000-0003-4539-4608

**Corresponding author*

Abstract

Objective*: The fashion industry stands at a critical juncture, accounting for 10% of global carbon emissions and generating 92 million tons of waste annually. As synthetic fibres dominate 65% of textile production, their environmental consequences - from microplastic pollution to resource depletion - demand urgent sustainable alternatives. Clothing rental has emerged as a potential circular economy solution, particularly in developing markets like India where the sector is projected to reach approximately $1.45billion. However, existing research remains disproportionately focused on consumer behavior, creating a significant knowledge gap regarding supply-side dynamics. This study addresses this imbalance by systematically examining the operational ecosystem of India's rental clothing market from the seller's perspective. The primary objective of the study is to identify key operational challenges, opportunities and future of the rental clothing industry.*

Method*: The present study is qualitative in nature. Semi-structured interviews were conducted with sellers from a few chosen rental clothing firms in the Delhi NCR region - the capital city of India. We selected these rental clothing firms after searching for them on Google Maps. We chose companies with a sizable customer base, a number of years of experience, and a history of positive reviews using purposive sampling. Businesses with poor communication responses, fewer followers, or unfavourable reviews were not included. Based on the previous studies (Brand et al., 2023; Kala & Chaubey, 2024; Mishra et al., 2024) we prepared interview questions focused on important aspects of the business. These questions were primarily centred around business operations, challenges, and future perspectives of the rental clothing market in the Indian market. We selected 10 rental clothing firms after applying all inclusion and exclusion criteria. Three business founders and seven store managers were interviewed. Interviews averaged 20-25 minutes, conducted in hybrid mode (physical and virtual) between February-April 2025. For thematic analysis, employing both inductive and deductive coding techniques, we used the Braun and Clarke (2006) method to identify, analyze, and report patterns within the data.*

Results*: Our analysis of rental clothing firms - Stores from South Delhi, Gurgaon, and Delhi (Pritam Pura) revealed specific and consistent patterns across three major themes: opportunities, challenges, and future outlook. A major opportunity lies in the shifting mindset of the younger generation, which is increasingly sustainability-oriented and more open to the idea of reuse. This change, though gradual, has begun to reflect in consumer behavior, particularly among youth and repeat customers. Further, the rise of digital and social media platforms such as Instagram and Google Ads- reaching up to 99% of potential customers-has made customer outreach easier and more targeted. Businesses also benefit from a lifestyle shift*

in urban society where convenience, affordability, and eco-conscious choices are gaining ground. The increasing digital accessibility of stores and seamless return logistics further support customer acquisition and retention. However, challenges persist. From the consumer side, hygiene concerns, discomfort with used clothing, and a post-pandemic mindset regarding personal safety continue to act as barriers. On the business front, extreme seasonality in demand, particularly the sharp drop in rentals from April to September, leads to financial stress. Further complications arise due to changing fashion trends, accumulation of outdated or dead stock, and high refurbishment costs. Despite these issues, businesses remain optimistic and believe that crossing a significant amount of revenue threshold is key to achieving financial sustainability and future scalability.

***Originality**: This study is among the first of its kind to explore the seller's perspective in the growing rental clothing market of India. While many studies examine why buyers choose rental fashion, this research uniquely investigates the supply-side realities, capturing the lived experiences of rental business owners / Store managers across urban India. By doing so, it fills a crucial gap in sustainable fashion literature, offering a ground-level view of the challenges and opportunities faced by sellers. India, with its massive youth-driven consumer base and growing interest in eco-conscious lifestyles, presents a high-potential yet complex landscape for circular fashion models. This study not only examines how businesses are assisting this shift from traditional to sustainable consumption, but also reveals the operational pressures, cultural resistance (e.g., stigma around pre-worn garments), and financial hurdles (e.g., high refurbishment costs, low investor confidence) that affect long-term viability. Importantly, it introduces the idea of a "circular paradox" - where rental fashion promotes environmental goals but struggles to stay financially sustainable.*

***Keywords**: Rental clothing, sellers, environmental sustainability, business sustainability.*
Funding: This work was supported by the UPES, Dehradun, India.

SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES IN ROMANIA'S FOREIGN TRADE: CHALLENGES AND OPPORTUNITIEs

Elena Bănică*
Institute of National Economy, Romanian Academy, Bucharest, Romania
elenabanica77@gmail.com, ORCID ID: 0000-0002-5349-1486
Valentina Vasile
Institute of National Economy, Romanian Academy, Bucharest, Romania
valentinavasile2009@gmail.com, ORCID ID: 0000-0002-2368-1377
**Corresponding author*

Abstract
This paper examines the interaction between Romania's foreign trade and the sustainable use of the country's natural resources. Romania, as a country with considerable natural resources and production potential, faces significant trade deficits, especially in areas where value-added processing of natural resources takes place. The study focuses on three critical subsectors of the economy: the wood industry, the agri-food industry and the chemical industry, where deep structural problems of the Romanian economy related to poor performance, inefficient value chains and environmental imbalances are manifested. This research explores to what extent Romania's trade discrepancies are the result of global market dynamics and what is the impact of the inconsistent integration between economic policy and sustainable resource management.
This study uses international trade in goods data from national and international statistical sources, together with reports, policy documents and sustainability analyses from Romanian and European institutions. The statistical data cover the period 2008 - 2024. The methodology consists in analysing the performance of Romania's trade transactions and assessing their environmental impact. Qualitative data were extracted from reviews and specialized literature on sustainable development policies, circular economy concepts and industrial modernization. The paper integrates data and information from the institutional, environmental and economic sectors to describe in detail the trade vulnerabilities and resource governance issues in Romania.
The export structure in the context of Romania's vast forest resources continues to be dominated by low value-added products. This strategy causes significant economic under-opportunity, job losses in domestic processing sectors, and environmental damage due to inadequate reforestation and poor enforcement of legal regulations. The value of natural resources must be accompanied by sustainable investments in forestry to achieve economic benefits.
Romania holds strategic positions with agricultural lands as well as the climate, but there exists a trade deficit for agri-food products.
The food processing industry is not sufficiently developed, so Romania exports raw agricultural products and imports processed foods. This dependence on external suppliers increases Romania's exposure to global price shocks and supply chain disruptions. Furthermore, the agricultural industry suffers from land fragmentation, outdated infrastructure, and a lack of application of sustainability principles in the field.
Rising energy costs and deindustrialization have led to the decline of the chemical industry, especially in the fields of fertilizers and plastics. There is now a high dependence on imports

of goods that were previously produced domestically. The trade imbalance is just one of the results, as Romania is also losing its capacity to innovate and move towards a chemistry based on ecological principles. In addition, the low level of spending on clean technologies and the slow adoption of circular economy initiatives deepens the erosion of competitiveness.

All these sectoral aspects analysed together suggest that Romania's trade imbalances are not simply due to a lack of external competitiveness, but rather to a fundamental misalignment between natural resource use, industrial potential and sustainability objectives. Those three sectors analysed represent an important part of foreign trade of Romania (i.e. 1/3 from total export in 2024). The lack of an integrated approach to trade, as well as environmental sustainability, leads to losses of added value, an additional ecological burden and multiplied strategic vulnerability.

Unlike many studies that only analyse market access, exchange rate or labour productivity, this study incorporates green economic principles and policy coherence to identify the nature of Romania's trade imbalances. The paper underlines the need for a comprehensive multi-sectoral approach. It highlights that if trade policy is not aligned with sustainability objectives, Romania will suffer from persistent economic inefficiencies, ecological deterioration and weakened resilience to global shocks.

Furthermore, the study presents policy proposals focused on green industrialization, modernization of existing technologies and principles of the circular economy. The proposals are based on elements of the European Green Deal and the recommendations are aligned with international sustainability objectives in order to place Romania's trade structural transformation within the framework of competing global efforts and increase the exports of the products that incorporate higher added value and capitalise the natural resources potential. The need to integrate environmental conservation into Romania's trade strategy is highlighted. The study argues that sustainable trade cannot be perceived only as an environmental objective but also as an imperative for robust economic growth, strategic sovereignty and smart natural resources management.

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

EFFICIENCY OF PUBLIC EXPENDITURE MANAGEMENT THROUGH A HUMAN RIGHTS APPROACH

Iulian Secrieru
State University of Moldova, Chișinău, Republic of Moldova
iulian.secrieru@math.md, ORCID ID: 0009-0007-7429-0417
Angela Secrieru*
Academy of Economic Studies of Moldova, Chișinău, Republic of Moldova
secrieru.angela@ase.md, ORCID ID: 0000-0002-5782-8840
**Corresponding author*

Abstract
The issue of public expenditure management from the perspective of respecting human rights is of particular significance for triggering growth processes favorable to sustainable development. The efficient allocation of budgetary resources directly affects the realization of economic, social and cultural rights, namely - the right to education, health, social security, to a decent standard of living. Transparency and accountability in the budgetary process determine, among other things, equal access of citizens to public goods. At the same time, the improper or corrupt use of budgetary resources frequently leads to the violation of the rights of the most vulnerable segments of society. The results of the research presented in this paper allow us to identify the mechanisms through which public finances, in general, and public expenditure management, in particular, can serve as an instrument for the protection and consolidation of human rights.

***Objectives**: The objectives of the research carried out in this article are directed towards analyzing the impact of public expenditure management on the respect and protection of human rights. Special attention is paid to the efficiency of public finance management as a determinant in ensuring the economic, social and cultural rights of citizens. The study aims to investigate the relationship between the transparency of the budget process and the level of realization of economic, social and cultural rights; to identify mechanisms that promote the equitable and efficient use of public resources; to assess the role of civic participation and accountability mechanisms in strengthening human rights through fiscal policy; to formulate recommendations for improving the effectiveness of budget management, taking into account human rights standards.*

***Method**: in the research process, in order to identify and explore the relationship between the efficiency of public expenditure management and the level of respect for human rights, the authors resorted to the comparative analysis of budget policies in different countries. The case study method was also used to examine in detail successful and problematic practices related to the management of public expenditure from a human rights perspective. Quantitative methods were used, including analysis of statistical data on public expenditure. In order to assess various aspects related to the topic addressed, the authors used different aggregate indicators: the Human Development Index, the Open Budget Index, etc. The legislative and institutional mechanisms that ensure civil control and public participation in the budget process were analyzed. In order to identify general trends and risks in the field of public expenditure and human rights, reports of various international organizations (World Bank, International Monetary Fund, PEFA, SIDA, etc.) and human rights structures were examined.*

***Results**: As a result of the research, the authors reached the following results: the existence of a direct correlation between the transparency of the budget process and the level of respect for economic, social and cultural rights was established; the conclusion was argued that efficient management of public expenditures improves citizens' access to education, healthcare and social protection, etc. Countries with high levels of public accountability have a better situation in terms of the level of respect for human rights. The results demonstrated that civil society participation in the budget development process improves the efficiency of spending and reduces corruption. The elements and factors of budget policy that play a key role in ensuring the equitable distribution of resources were identified. The conclusions formulated in this article suggest that sound and transparent management of public finances is a powerful tool for protecting human rights.*

*The **originality** of this article lies in the interdisciplinary approach applied by the authors, which combines economic and financial assessments associated with the efficiency of public expenditure management and the issue of its impact on the level of respect for human rights. Compared to traditional research that focuses only on budgetary efficiency, this work focuses on the relationship between public finance management and the realization of human rights. The article proposes a new conceptual approach that explains how components of fiscal policy, in this case – public expenditure, can be instruments for the protection of human rights. The work explains how certain elements of budgetary governance (e.g., transparency, accountability, citizen participation) become institutional guarantees of human rights.*

***Keywords**: accountability, efficiency, expenditure public management, human rights, public budget, public finance, transparency.*

STRATEGIES FOR THE TRANSFER OF CONTAINER TRANSPORT FROM LAND TO RIVERS AND INLAND WATERWAYS IN EUROPE

Florin Iordănoaia
florinioranoaia@gmail.com

Abstract
One of the main problems of freight transport on roads and motorways in European countries is the very large number of container trucks, which carry out this transport, over short, medium, long and very long distances. These have a number of advantages, but also disadvantages, which have created numerous problems, from heavy traffic, to serious accidents or destruction of the road surface on roads and motorways. This paper analyzes the possibility of transferring container transport from land, on roads and railways, to rivers and inland waterways. The study in this paper represents the first part of the project that follows the situation and possibilities of transfer, from the port of Constanta to Vienna. The other parts of the project will be presented later.
***Objective**: the first objective is represented by the search, study and proposal of ports, which offer a series of technical, logistical and economic solutions, for the realization of this transfer of container transport. These ports must offer the optimal connections with the main, current routes, on which containers are transported in European countries.*
The second objective is the creation of an information system model, which will facilitate the employment of river vessels, for the transport of containers. This system will also include road and rail transport operators, for the takeover of containers from ports and their transport, on optimal routes, to the final destination.
***Method**: The research was organized to obtain information and data from official documents of the European Union; of the ministries of transport and naval authorities of the riparian states of the Danube and Rhine; from official documents of the Administrations of river ports; from other documents of river navigation, rail and road transport companies. Then we used the "concept transfer" method to transfer ideas in the field of research and we looked for solutions to achieve the established objectives.*
***Results**: I had determined the ports that can be used immediately for the transfer of containers from land to rivers. I have created the model of the information system, which can be created and then implemented to connect all those interested in this field.*
***Originality**: The work is original, it was not taken from someone else, and there are no other works with the same objective.*
Keywords: *transport, containers, river, strategy.*

COMPARATIVE ANALYSIS OF THE PURCHASING ACTIVITY VERSUS THE SELLING ACTIVITY WITHIN ELECTRONIC COMMERCE

Ana-Maria Teodorescu*
Petroleum-Gas University of Ploiesti, Romania
anamaria.teodorescu@upg-ploiesti.ro, ORCID ID: 0000-0002-4743-3271
Ileana Dumitru
Petroleum-Gas University of Ploiesti, Romania
ileana.dumitru@upg-ploiesti.ro, ORCID ID: 0009-0009-6849-4143
**Corresponding author*

Abstract

E-commerce contributes to achieving a sustainable economy, a goal for all European states. A sustainable economy must integrate economic growth with measures focused on environmental protection. By removing geographical barriers, the Internet enables the connection of sellers and buyers every day. With advantages such as accessibility and low costs, as well as challenges related to security and logistics, e-commerce remains an essential sector for the global economy. E-commerce is categorized into several types based on the participants involved in transactions, whether they are individuals or companies. Thus, types such as Business to Consumer (B2C), Business to Business (B2B), Consumer to Consumer (C2C), Consumer to Business (C2B) are distinguished. The article presents an analysis of the indicators regarding the percentage of the population that uses the Internet to buy goods versus the percentage of the population that uses the Internet to sell goods.

***Objective:** comparative analysis of purchasing activities versus selling activities by Europeans using electronic commerce in the period 2020-2024.*

***Method:** The data used in the study are the indicators presented on the Eurostat website. Collected in an Excel file, the data were subjected to statistical analysis. The sale/purchase ratio, mean, median, simple linear regression, and Pearson coefficient were calculated.*

***Results:** According to the analyzed data, the values regarding the percentage of Europeans who shop online have recorded considerable increases. The percentage of people selling products online is experiencing a slight year-on-year increase. For the year 2024, countries with the highest sales-to-purchase ratio have been highlighted (Norway, the Netherlands, Belgium, Croatia, Finland). The lowest sales-to-purchase ratio has been noted in countries such as Serbia, Romania, Greece, and Ireland. The median at the European level for online purchasing activity is 68.94%, while for sales activity, the median is 20.93%. In the context of the indicator concerning online sales, Serbia has recorded a steady increase in the sales-to-purchase ratio during the period 2020-2024 (from 5.73% to 9.44%), while in Romania the indicator has recorded declines (from 10.34% to 8.87%). The Dutch and Norwegians primarily use online platforms to sell their products or services. Greece, Romania, Montenegro, Albania, and Serbia are countries with the lowest results on the internet sales indicator.*

***Originality:** The study presents a comparison of selling and buying activities within electronic commerce.*

***Keywords:** Internet, e-commerce, selling, purchasing, sustainable development*

***Funding:** This work was supported by a grant from the Petroleum-Gas University of Ploiesti, Romania, project number GO-GICS-30707/10.12.2024, within the Internal Grant for Scientific Research.*

REGIONAL FINANCIAL INTEGRATION OF THE REPUBLIC OF MOLDOVA FROM THE PERSPECTIVE OF STIMULATING SUSTAINABLE DEVELOPMENT

Eduard Keni

Academy of Economic Studies of Moldova, Chișinău, Republic of Moldova

editlv@mail.ru, ORCID ID: 0009-0007-7429-0417

Angela Secrieru*

Academy of Economic Studies of Moldova, Chișinău, Republic of Moldova

secrieru.angela@ase.md, ORCID ID: 0000-0002-5782-8840

**Corresponding author*

Abstract

For the Republic of Moldova, a country classified by the IMF as emerging, anchored in the dynamics of the Eastern European region, regional financial integration is becoming of strategic importance in order to ensure sustainable economic development. The relevance of the research is determined by the urgent need to understand how the financial and economic policies of the Republic of Moldova can be harmonized with those of regional partners, especially the EU, the Eastern Partnership countries and other neighboring states, in order to stimulate responsible investments, improve the efficiency of capital markets and increase financial inclusion. Against the background of the structural vulnerabilities faced by the Moldovan economy, financial integration represents not only a strategic option, but also a functional necessity for achieving sustainable development goals. Moreover, global trends related to climate, energy and health crises put additional pressure on governments to create policies that are coherent and convergent with international standards on financial sustainability. In this context, it is essential to analyze the interdependence between regional financial integration and the dimensions of sustainable development, including equitable economic growth, environmental protection, macroeconomic stability and social well-being.

The purpose and ***objectives*** *of the research. The main purpose of the research is to investigate and evaluate the process of international regional financial integration of the Republic of Moldova from the perspective of sustainable development, with an emphasis on identifying the mechanisms through which this integration can contribute to strengthening economic stability, increasing financial inclusion and promoting socially and environmentally responsible investments. The proposed goal is translated into a series of specific objectives that guide the structure of the scientific investigation: (i) conceptual and theoretical research of the process of international financial integration, with the delimitation of its regional particularities and highlighting its implications for emerging countries, with an emphasis on those in Eastern Europe; (ii) assessment of the current level of financial integration of the Republic of Moldova within the region, through the lens of relevant economic and financial indicators (capital flows, foreign direct investment, integration of banking markets, harmonization of regulations, etc.); (iii) analysis of the correlation between financial integration and sustainable development objectives; (iv) identification of barriers and vulnerabilities that hinder efficient and sustainable financial integration of the Republic of Moldova, including analysis of systemic risks, institutional limitations and regulatory discrepancies; (v) formulation of proposals and recommendations for public policies and regional cooperation mechanisms that support financial integration in line with the sustainable development objectives of the Republic of Moldova.*

The ***methodology*** *applied in the elaboration of the article is based on an interdisciplinary approach, which combines quantitative and qualitative tools from the field of international economics, finance, sustainable development and regional integration studies. The choice of this methodology arises from the complexity of the analyzed topic, which determines the need to evaluate financial integration and place it in a broader framework of sustainable development. In the research process, the authors resorted to theoretical and conceptual analysis on international financial integration, starting from the specialized literature, international strategic documents, as well as relevant case studies from the Eastern European region. Quantitative analysis was used based on the processing of statistical data from official sources, such as the National Bank of Moldova, the National Bureau of Statistics, the World Bank, the IMF, Eurostat and other international databases. The indicators analyzed include: the volume of foreign direct investment, the degree of financial intermediation, the integration of banking and capital markets, the degree of financial convergence with the EU, fiscal sustainability, and performance in achieving the relevant SDGs. Descriptive and inferential statistical methods were used to process these data. In parallel, the research included a qualitative analysis, focused on examining the regulatory framework, public policies and relevant strategic documents in the Republic of Moldova and in countries with a more advanced degree of financial integration in the region.*
Results *obtained. The research highlighted a series of significant results regarding the interaction between regional financial integration and the sustainable development of the Republic of Moldova, results that contribute both to the understanding of the phenomenon and to the formulation of relevant strategic recommendations. In the research process, the authors reached the following results: finding a moderate level of financial integration of the Republic of Moldova within the Eastern European region; identifying a positive, but weak correlation between financial integration and progress in achieving sustainable development goals; identifying systemic deficiencies in the financial regulatory framework and in the institutional capacity to absorb the benefits of regional integration; highlighting underused opportunities in regional cooperation, especially through the financial support initiatives of the European Union.*
Originality *of the research. The present research is distinguished by an integrated approach to a critical topical topic for the Republic of Moldova: international regional financial integration analyzed through the lens of sustainable development*

URBAN ECOLOGICAL TRANSITION

Ana-Maria Severin
Institute of National Economy, Romanian Academy, Bucharest, Romania
ana_maria_ned@yahoo.com, ORCID ID: 0000-0001-6755-070X
Ivona Răpan*
Institute of National Economy, Romanian Academy, Bucharest, Romania
stradivonas@gmail.com, ORCID ID: 0000-0001-8436-9494
**Corresponding author*

Abstract
Contemporary society is currently marked by three ongoing transitions. These are: the ecological, digital and energy transitions. Urbanization plays a key role in the human activities that cause and fuel climate change. Today, these and other environmental problems are directly or indirectly linked to the metabolism of cities.
Global urban growth involves increasing consumption of resources, goods and services. The specular aspect of the city is that of a "spatial unit of collective consumption" (Castells, 1972). The functions of the urban system are arranged in huge areas of activities aimed at reproducing the system itself. More than half of the global population lives in cities and faces the challenges of climate change and urban development. This situation requires a change in current governance in order to generate long-term, flexible and sustainable policy instruments to address the problems. Policymakers need to consider the different challenges and opportunities that climate change may bring and make decisions under conditions of increased uncertainty in order to create resilient cities.
In general, climate change can be addressed in two ways, namely by reducing its causes, for example, through renewable or sustainable energy systems, or by adapting to climate change, more precisely by reducing the negative effects it may bring. The challenge for cities is therefore to design viable governance instruments to support the low-carbon energy transition and to stimulate urban transformation with the aim of achieving sustainable and resilient cities. The energy consumption pattern and the reduction of greenhouse gases depend to a large extent on urban characteristics (e.g. urban form). In turn, cities should take measures both to reduce greenhouse gas emissions and to adapt their system to reduce the negative impacts of climate change. Last but not least, in order to develop effective governance for the transition, barriers and drivers need to be taken into account. In this context, barriers are social factors and conditions that prevent proactive adaptation to future environmental changes. The European Union is pursuing a paradigm shift at the economic level. This aims to move from the current linear economy to the circular economy and, implicitly, to the emergence of circular cities
The circular economy is a way of achieving the Sustainable Development Goals (SDGs). The transition to the circular economy is closely linked to improving the level of civic and environmental education among citizens who must actively contribute to its implementation. Environmental and energy transitions are iterative processes of accumulation and breakdown over a period of decades. In a transition model, change agents – for example pioneering regions and cities – start experimenting with ideas, technologies and practices towards a circular and climate-neutral economy. Furthermore, the circular economic model is based on lower-cost materials, the absence of externalities, as well as considerable automation. This

type of economy constitutes an overarching vision of all Industry 4.0 initiatives that are based on reuse and recycling. It aims to generate knowledge-based jobs.
***Objective**: The main objective of the paper is to create a framework for understanding the way in which ecological transition impacts the urban environment.*
***Method**: The study conducted within this paper consists of an exploratory analysis of the ecological transition in urban environments which aims to a better understanding of the process of sustainable transformation and emergence of smart cities.*
***Results**: The results comprise insights regarding the way in which cities can adapt to climate change by using disruptive technologies and evolving into smart cities that are environment-oriented. The study consists of a conceptual foundation for future research and informs regarding sustainability and city resilience in times of crisis.*
***Originality**: This paper brings a touch of novelty and value illustrating urban ecological transition both at the European Union level, as well as globally. It also has a multi-disciplinary approach which includes technologies brought by Industry 4.0, sustainable development, urban development and change of paradigm with the help of policy measurements.*
***Keywords**: ecological transition, urban environment, sustainable development, Industry 4.0, digitalization*

SOCIAL WELFARE BETWEEN OBJECTIVE AND SUBJECTIVE: A MULTIDIMENSIONAL ASSESSMENT OF QUALITY OF LIFE IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT

Maria-Magdolna Macula

The School of Advanced Studies of the Romanian Academy, Doctoral School of Economic Sciences, National Institute of Economic Research "Costin C. Kirițescu", Institute of Economic Forecast, Bucharest, Romania

magdamacula@gmail.com

Abstract

Social welfare is a current and globally relevant concept that reflects the overall well-being of a society, encompassing not only economic aspects but also social equity, access to basic services, citizen security, and respect for human rights. It aims to increase living standards, reduce poverty and inequalities, promote solidarity and social cohesion, and create a safe and respectful environment for all. Social welfare can be measured by indicators such as poverty rates, access to health and education, unemployment rates, and citizens' satisfaction with their lives. Promoting social welfare is essential not only as an end in itself, but also as a means to build a harmonious, supportive, and sustainable society. The main objective is to ensure equal access to resources and decent living conditions for all members of society, eliminating discrimination and exclusion. Statistical data on social welfare are fundamental for governments and organizations in the decision-making process and in developing policies aimed at improving quality of life.

The concept of social welfare is based on sustainable development and a broad vision of societal progress, which includes social equity, inclusion, and mental health. Modern welfare systems aim to create resilient and equitable societies by using evidence-based policies and innovative technologies. Evaluating these policies involves measuring their effectiveness in reducing poverty, improving health, and promoting social mobility, while also ensuring long-term financial sustainability. The economic model of social welfare seeks to optimally distribute resources to maximize overall well-being, balancing equity with efficiency. In a globalized world, international cooperation is essential to address transnational challenges such as climate change and poverty.

Social welfare reflects the satisfaction of a population's needs and is analyzed through a specific system of social indicators. These indicators are not just simple variables, but are explicitly value-oriented, representing aspects of good or bad life, and can thus be considered value-dimensions of welfare. Indicators include, for example, social expenditures as a percentage of GDP, measures of social differentiation, social organization, as well as indicators of social conditions and concerns.

Welfare expresses how well the needs of the population are met and is assessed using both objective and subjective social and economic indicators. While GDP remains the most widely used economic metric, it does not capture aspects such as happiness or sustainability. Therefore, additional complementary indicators are required to provide a comprehensive understanding of true welfare.

Among the ***objective*** *indicators reflecting concrete socio-economic reality, we analyzed GVA (Gross Value Added), unemployment rate, life expectancy at birth, infant mortality rate, access*

to education, crime rate, income inequality, and poverty rate. Subjective indicators based on individual and collective perceptions must also be considered, as they provide a perspective on quality of life: levels of happiness and life satisfaction, social justice and equity, community involvement, trust and sense of security, job satisfaction, and work-life balance.
The ***methods*** *used include bibliographic analysis, comparative methods, statistical correlation analyses, and trend analyses to highlight relationships among the determinants of social welfare. The scientific reasoning employed was the deductive method. Quantitative research was used to generate a comprehensive picture of the complexity of the indicators that compose welfare from both economic and human perspectives.*
The ***results*** *of this analysis highlight that socio-economic welfare is a complex phenomenon in which education and the population's health status are key factors.*
Keywords*: welfare, health, education, inequality*

THE CHALLENGES OF SUSTAINABLE DEVELOPMENT BETWEEN DEMOGRAPHIC CHANGES AND THE TRANSITION TO A GREEN ECONOMY: A COMPARATIVE ANALYSIS ROMANIA - EU27

Mihaela- Irma Vlădescu

Center for Demographic Research, National Institute for Economic Research "Costin C. Kirițescu"; School of Advanced Studies of the Romanian Academy, Doctoral School of Economic Sciences, National Institute for Economic Research "Costin C. Kirițescu", Institute of National Economy Bucharest, Romania

mihaela.vladescu@ince.ro, ORCID ID: 0000-0001-8066-4875

Abstract

This paper aims to analyze the challenges faced by Romania, but also by other European Union member states, in terms of the interplay between sustainable development, green transition and demographic changes. In recent years, against the background of accelerating climate change, pressure on natural resources and social inequalities, policies, programmes and economic growth models geared towards decarbonization, reduction of greenhouse gas emissions, conservation of natural resources and reduction of inequalities have been promoted at global level. Given the complexity of the global challenges, sustainable development needs to be considered in an integrated manner, alongside environmental, economic and demographic changes, as they influence each other. The European Union has promoted the transition toward a sustainable economy through several strategic initiatives, such as the 2030 Agenda for Sustainable Development, the European Green Deal, and the Just Transition Action Plan. However, the transition to sustainability is not a uniform process across European space. There are still regional disparities in terms of economic development, population structure and dynamics, innovation capacity and environmental pressures. These differences generate distinct approaches for each country, and Romania is in a transition phase, simultaneously facing structural challenges (demographic decline, regional inequalities) and strategic opportunities (low CO_2 emissions per capita, high share of renewable energy). In order to better understand the current state of play as well as the structural adaptability to new sustainable development models, we considered it important to develop a comparative analysis based on three global composite indicators, which are correlated in the study with key quantitative variables: the Sustainable Development Goals Index (SDG Index), the Human Development Index (HDI), R&D expenditure (% of GDP), CO_2 emissions per capita, population size and structure. Based on these data, research hypotheses were formulated on the relationship between the level of economic development and sustainability performance. To explore this relationship, the Agglomerative Hierarchical Clustering (AHC) method was used, which allowed us to identify similarities between countries based on selected indicators. The indicators used in the analysis were selected from recognized international statistical sources such as the Eurostat database, the Our World in Data platform, the United Nations Development Programme (UNDP) and the Sustainable Development Solutions Network (SDSN), thus ensuring the comparability and relevance of the data for assessing sustainable development. The aim of this study is not only to compare performance levels between Romania, the EU average and other Member States, but also to highlight the potential for sustainable transformation, depending on the structural context and public policies adopted. The transition towards a green economy cannot be separated from the demographic and

economic context of each country, and the novelty of this study lies in the integrated and applied approach to the concept of sustainable development, by linking sustainable development indicators with concrete economic, environmental and demographic data. The conclusions aim to provide a perspective on how Romania can move towards balanced and sustainable development in line with the principles of the green economy and just transition. The analysis shows that Romania has a high potential compared to other countries at a similar level of development. Romania can capitalize on this potential to shape its own sustainable development model, adapted to its specific challenges and resources. The results obtained can help to underpin coherent public policies and integrated adaptation strategies anchored in the national demographic and economic realities.
Keywords*: sustainable development, human development index (HDI), SDG Index, demographic changes, environmental sustainability, research and development, Romania, EU27, CO_2 emissions, cluster analysis.*

INSTITUTE OF NATIONAL ECONOMY

THE ROLE OF ECONOMIC AND FINANCIAL PARAMETERS IN ACHIEVING ECONOMIC GROWTH DECARBONIZATION

Alina Cristina Nuță*

Danubius International University, Galati, Romania; Women Researchers Council, Azerbaijan State University of Economics (UNEC), Baku, Azerbaijan

ORCID ID: 0000-0003-3248-644X

Florian Marcel Nuță

Human and Social Sciences Doctoral School, Ştefan cel Mare University of Suceava, Suceava, Romania

floriann@univ-danubius.ro, ORCID ID: 0000-0001-8663-4183

**Corresponding author*

Abstract

Objective: Climate change pressure determined specific actions in Europe and various environmental targets were set. Countries were asked to actively participate in the climate action in a transformative trend involving their energy patterns, industrial structure, and investment priorities. The decarbonization goal of cutting emissions by 55% by 2030 will be implemented by adopting various instruments, such as regulations, climate-friendly innovation adoption, and sustainable finance. However, numerous European countries struggle to keep under control their budgets and to finance chronic deficits. At the same time, having limited financial resources and in some cases an over-stretched fiscal framework, these nations have to cope with the sustainability targets, ensure energy autonomy, and increase their defense spending. Altogether, the international trade uncertain context can further harm the European countries economic potential, especially in the case of emerging nations, highly dependent on imports to push forward their systemic development. This study aims to evaluate the impact of public debt, fiscal burden, and institutional quality in the context of the targeted goals of decoupling the economic growth from carbon emissions;

Method: We use the cointegration regression (CCR), fully modified OLS, and dynamic OLS (FMOLS–DOLS) approach as the primary models. Moreover, we used Driscoll–Kraay estimation regression to test the robustness of the results. While FMOLS transforms the regressand, CCR estimation is based on transforming the regressand and the regressors;

Results: The main results indicate a significant relationship between the public financial indicators and the potential to follow the path towards a full-scale decoupling of the economic growth from carbon emissions. First, the chronic budgetary deficits significantly hinder green transition efforts and investments meant to increase renewable energy generation capacity. Second, energy market volatilities and multiple dependencies create an uncertain context increasing the pressure on public financial resources. Additionally, an important share of resources is redistributed to increase the military spending which will also affect public budgets in a manner difficult to gauge at the moment;

Originality: This research addresses a critical issue, namely the European countries public budgets constraints, in a complex context. The main findings promote valuable policy recommendations meant to help the policymakers mix environmental, economic, and defense priorities.

***Keywords**: public debt, fiscal burden, GDP, decarbonization, institutional quality*

SESSION 2: FINTECH FOR ECONOMIC RESILIENCE

ASSESSMENT OF ADAPTIVE ECONOMIC RESILIENCE OF GREEK REGIONS

George J. Xanthos
Hellenic Mediterranean University, Heraklion/Crete, Greece
xanthosg@hmu.gr, ORCID ID: 0009-0004-7250-3296
Georgios Konteos
University of Western Macedonia, Kozani, Greece
gkonteos@upwm.gr, ORCID ID: 0000-0002-0634-9612
Nikolaos Sariannidis
University of Western Macedonia, Kozani, Greece
nsariannidis@uowm.gr, ORCID ID: 0000-0002-6950-8801
Evangelos N. Dulufakis*
Hellenic Mediterranean University, Heraklion/Crete, Greece
dulufakis@hmu.gr, ORCID ID: 0009-0009-9258-5379
**Corresponding author*

Abstract
This study examines the resilience of Greek regions during the 2007-2009 Greek debt crisis. It compares regions based on changes in Gross Value Added (GVA), using a simple resilience index. The research framework also includes an empirical assessment of regional resilience, calculated as the percentage change in Gross Value Added (GVA) before (2005-2007) and after (2008-2019) the crisis, along with an evaluation of a simple resilience index based on this variable and the Finger-Kreinin index to estimate the degree of regional re-orientation. Methodologically, it involves statistical indices, techniques, models, regional analysis, and econometric models.
Literature identifies three main categories to conceptually define regional economic resilience: engineering, ecological, and adaptive. The engineering approach focuses on how quickly a region returns to its original state after a disturbance without significant changes or collapse. Ecological resilience refers to the ability of a region to reach a new level of economic performance without undergoing structural reorganizations and functional adaptations and/or changes. Adaptive resilience pertains to the capacity of a region to reorganize its operations, redefine development objectives, and reconfigure infrastructure to maintain its desired growth trajectory despite disturbances. In other words, it is defined as the ability of the regional economy to undergo structural, functional, and organizational changes to absorb shocks and recover while maintaining or enhancing core performance. This involves the reconfiguration of firms, industries, technologies, and institutions to ensure sustained growth in output, employment, and wealth over time.

The study of resilience encompasses various aspects such as risk, shock, resistance, recovery, and adaptability. These factors are essential for understanding resilience within specific regional contexts. The Gross Value Added (GVA) variable will be utilized to formulate a (simple) resilience index, which will then be used to evaluate the resilience of Greek regions in response to the economic shock of 2007. The reliability of the index will be assessed by comparing numerical results with the empirical evaluation of Greek regions based on percentage (%) changes in Gross Value Added (GVA) before and after the 2007-2009 financial crisis. Subsequently, an analysis will be conducted to examine the contribution of regional restructuring to empirical research, focusing on the role of economic re-orientation in regional economic resilience.
Basic research outputs and results emphasize the fact that no Greek region demonstrated a post-2007 resilient behavior, with all (regions) experiencing GVA declines (2008–2019). The region of Peloponnese performed the best reaction among the Greek regions, showing the smallest contraction (-18.9%), while Western Greece region suffered the largest (-29.5%) experiencing the worst resilient behavior. Structural adaptation occurred in only one of ten economic sectors, and regions transitioned to lower economic equilibria post-crisis. Among the main drivers that enhanced these performances are debt overhang (public, private, external), austerity policies that deepened recession and institutional erosion (weakened property rights) amplified vulnerabilities. Future strategies require regional differentiation in fiscal approaches, structural reforms at national and regional level (e.g., market liberalization), and institutional stability to mitigate (economic) shocks. Uniform austerity measures exacerbated disparities, underscoring the need for tailored and focused robust policies.
Keywords*: adaptive regional resilience, economic crisis, reorientation, simple resilience index, F-K index, NUTS II regions.*

HYBRID FINANCING FOR THE GREEN ECONOMY: THE ROLE OF PUBLIC-PRIVATE PARTNERSHIPS AND CROWDFUNDING IN SUSTAINABLE DEVELOPMENT

Fisnik Morina
University "Haxhi Zeka", Peja, Kosovo
fisnik.morina@unhz.eu , ORCID ID: 0000-0003-1071-0439

Abstract
Objective*: In the context of persistent climate-related challenges and increasing financial constraints associated with green investments, this paper critically examines the evolving role of public-private partnerships (PPPs) and crowdfunding platforms as integrated financial instruments for advancing sustainable economic development. The central objective of the study is to investigate how strategic collaboration among public institutions, private sector entities, and citizens can generate synergistic effects in the financing of sustainable infrastructure and facilitate the broader transition toward a green economy. Moving beyond a compartmentalized treatment of these financing mechanisms, the paper conceptualizes and analyzes hybrid financing models in which public resources are strategically deployed to mitigate investment risks and to catalyze citizen participation in green funding initiatives through digital crowdfunding platforms.* ***Method****: The research adopts a qualitative, comparative case study methodology, drawing on secondary data, including official documents, institutional reports, and publicly available sources. Three cases from European countries are analyzed in detail. The German case investigates the application of participatory green budgeting in mid-sized cities, where local governments co-finance sustainability-oriented projects supported by citizen contributions through dedicated environmental funds. The Spanish case focuses on the Goteo platform, which applies a matched-funding approach in which every euro raised from citizens is supplemented by public funds for projects that meet specific social and environmental criteria. The Dutch case explores the collaboration between municipalities and local energy cooperatives, where crowdfunding campaigns raise capital for renewable energy initiatives with additional guarantees or partial subsidies provided by local authorities.* ***Results****: The findings indicate that hybrid financing models effectively mitigate the risks associated with green projects, enhance citizen engagement in decision-making, and distribute the financial burden across multiple actors. The blended financing approach yielded tangible benefits in all three cases, such as increased social acceptance of sustainability initiatives, improved transparency, and trust-building between public institutions and communities. Moreover, these models demonstrate high adaptability, offering transferable frameworks that can be applied in other contexts, including in developing countries seeking inclusive approaches to green transition financing.* ***Originality****: The originality of this study lies in its conceptual integration of PPPs and crowdfunding within a unified analytical and practical framework—an intersection largely underexplored in existing academic literature. Instead of treating crowdfunding solely as a private sector tool, this research repositions it within a broader collaborative paradigm involving public authorities and community stakeholders. This integrated approach contributes to building a new narrative for democratizing sustainable finance and promotes the development of resilient, citizen-supported green infrastructure.*

Keywords*: public-private partnerships, crowdfunding, hybrid financing, green economy, sustainable development, citizen investors, green infrastructure.*

ECONOMIC AND SOCIAL COHESION POLICY IN THE EU

Petru Roșca
Free International University from Moldova, Chisinau, Republic of Moldova
petrurosca08@gmail.com, ORCID ID: 0009-0000-5300-7394

Abstract
The article studies various aspects of the economic and social cohesion policy that is promoted in the European Union, being considered as the main investment policy, addressed to all regions, cities, localities in EU member countries, supporting job creation, competitiveness of companies, economic growth, sustainable development and improvement of the quality of life. Economic and social cohesion policy has been at the centre of the EU's attention over time, being promoted through three funds: the European Regional Development Fund (ERDF), the European Social Fund (ESF) and the Cohesion Fund, investing in green growth and sustainable development and improving interconnection between Member States. with a GDP below 90% of the EU average. The directions and positioning elements regarding the future of cohesion policy are described. It also argues the need to study the EU's experience in promoting the cohesion policy for the Republic of Moldova in the context of the country's accession to the European Union.
***Keywords**: cohesion, solidarity, budget, strategy, research and innovation, investment, economic growth, sustainable development, competitiveness, education, quality of life*

MONETARY INNOVATION IN A FRAGMENTED WORLD: THE RISE AND TRANSFORMATION OF STABLECOIN

Tetiana Krychevska
Institute for Economics and Forecasting of the National Academy of Sciences of Ukraine, Kyiv, Ukraine
tetyanakrychevska75@gmail.com , ORCID ID: 0000-0003-1940-6820

Abstract
Objective*: Stablecoins - emerging at the intersection of the crypto space and traditional finance - have become one of the most promising yet controversial financial instruments. This study traces the evolution of the stablecoin concept from its origins to current forms and reveals its hybrid nature: centralization and decentralization, crypto and fiat, anarchism and regulation, globalism and geopolitical rivalry.*
Method*: This study employs historical analysis and comparative typology to examine the development of stablecoins. It draws on examples from both centralized and decentralized financial infrastructures, highlighting the socio-economic and political drivers of their adoption and transformation.*
Results*: The speculative volatility of crypto markets created demand for stable value instruments, leading to the emergence of stablecoins. Historically, three main types of stablecoins have emerged: off-chain asset-backed stablecoins, overcollateralized crypto-backed stablecoins, and algorithmic stablecoins that rely on code-based mechanisms to maintain price stability without direct collateral. Unlike other crypto assets, stablecoins are pegged to sovereign currencies or liquid real-world assets, serving both as a store of value and a medium of exchange in digital ecosystems. Users increasingly prefer stablecoins to the very fiat currencies backing them, choosing virtual over traditional finance. Centralized stablecoins backed by off-chain assets dominate the market. Tether (USDT), despite its legal and transparency issues, became the "people's digital dollar," particularly in countries with high inflation or weak financial infrastructure (e.g., Argentina, Turkey, Nigeria). Its use is prevalent in unregulated markets, on crypto exchanges, and among OTC dealers. In contrast, USD Coin (USDC) was designed for transparent and regulator-friendly environments, targeting Western markets and institutional platforms. Precursors to modern stablecoins include E-gold (1996), which used a centralized ledger backed by physical gold, and Eurodollars, which allowed states like the USSR and China to operate beyond U.S. financial jurisdiction. These precedents underscore how stable value instruments have long existed outside domestic regulatory perimeters. Decentralized stablecoins attempt to solve the problem of price stability through smart contracts and crypto collateral. As early as 2011, Bitcointalk users discussed algorithmic supply adjustment. In 2014, Ethereum's white paper proposed a model based on hedging contracts and market incentives rather than issuer guarantees. DAI emerged from this logic: an overcollateralized, decentralized stablecoin backed by volatile crypto assets. Yet even DAI has gradually integrated centralized collateral, including tokenized U.S. Treasuries. Stablecoins have expanded far beyond their original use cases. They are now integral to remittances, mass payments in developing countries, and as a tool for dollarization outside U.S. legal reach. Amid rising geopolitical tensions, stablecoins serve as instruments of financial soft power. The U.S., EU, and UK have each adopted differing strategies. The EU,*

via MiCA, aims to balance consumer protection and innovation by treating stablecoins like electronic money. The U.S., especially under the Trump administration, seeks to cement the dollar's global reserve status via regulated private stablecoins, viewing them as strategic tools. The UK aims to become a hub for tokenized finance, offering favorable conditions to foreign stablecoin issuers. Nation-states may not only regulate but also participate directly in the stablecoin sector. In the U.S., Trump's Executive Order prohibits a state-run CBDC, advocating instead for privately issued dollar stablecoins under government oversight. This approach envisions stablecoins as extensions of state monetary power rather than alternatives. These shifts are forcing early stablecoin pioneers to adapt. Tether declined to seek EU licensing under MiCA but is maneuvering to entrench itself in U.S. markets on terms it helps shape. It may be accepted by regulators as a semi-controlled alternative to foreign stablecoins or CBDCs from geopolitical rivals such as BRICS or the UAE. Regulation currently focuses on fiat-backed payment stablecoins. By contrast, decentralized stablecoins like DAI, algorithmic models, and hybrid forms remain in regulatory gray zones. Nevertheless, even decentralized projects are integrating with traditional finance, often at the cost of full decentralization. Stablecoins illustrate how crypto innovation blends with traditional finance, geopolitical agendas, and regulatory evolution. From cypherpunk ideals to instruments of statecraft, their development reflects the broader hybridization of global finance. The future of stablecoins will likely be shaped by the tension between decentralized code and centralized control - and by the struggle over who gets to define monetary trust in the digital age.

Originality*: The paper offers a multi-dimensional perspective on stablecoins as not only technical or financial tools but also instruments of geopolitical strategy and socio-economic adaptation. It uncovers the dynamic interrelation between crypto-native innovations and state-led financial architectures.*

Keywords*: off-chain asset-backed stablecoins, overcollateralized crypto-backed stablecoins, algorithmic stablecoins, decentralization, regulation, geopolitics, state monetary power*

INCLUSIVE BY INNOVATION: FINTECH'S ROLE IN GLOBAL STABILITY AND THE ARCHITECTURE OF RESILIENT ECONOMIES

Otilia Manta

Romanian Academy," Victor Slăvescu" Center for Financial and Monetary Research, Bucharest, Romania; Romanian Academy, Mountain Economy Centre CE-MONT Vatra Dornei, Romania; Romanian-American University, Bucharest, Romania

otilia.manta@icfm.ro , ORCID ID: 0000-0002-9411-7925

Abstract

***Objective**: In an increasingly volatile global economy marked by geopolitical tensions, pandemic aftershocks, climate-related disruptions, and systemic inequality, financial resilience has emerged as a cornerstone of sustainable development. At the nexus of this transformation lies fintech—an evolving ecosystem of digital financial technologies with the potential to reshape access, transparency, and adaptability within global financial systems. This paper aims to explore how fintech innovation, when designed with an inclusive mindset, contributes not only to individual financial empowerment but also to macro-level economic stability. The objective is to analyze the transformative role of fintech in building resilient economic architectures, particularly in underserved regions and fragile economies.*

***Method**: The study adopts a mixed-methods approach, combining a qualitative analysis of policy frameworks and fintech use cases across various economies with quantitative modelling of fintech adoption metrics, financial inclusion indices, and economic resilience scores. Comparative case studies from both emerging markets and developed economies are presented to illustrate how different regulatory environments and innovation ecosystems influence fintech's contribution to stability and inclusion. Data sources include World Bank financial inclusion data, IMF economic resilience indicators, and proprietary datasets from regional fintech incubators.*

***Results**: The findings indicate that countries with a high degree of fintech penetration—especially in mobile payments, decentralized finance (DeFi), and digital identity systems—tend to demonstrate greater economic resilience in times of crisis. Notably, fintech solutions that target historically marginalized populations (e.g., women, rural communities, informal sector workers) show the strongest correlation with systemic benefits, such as reduced volatility in consumption and increased household savings. Moreover, policy environments that foster public-private partnerships, regulatory sandboxes, and open banking initiatives are significantly more likely to produce inclusive innovation with macroeconomic impact.*

***Originality**: This paper offers a novel conceptual framework that positions inclusive fintech innovation not merely as a tool for financial access but as a structural mechanism for enhancing global economic stability. Unlike previous studies that assess fintech in isolation or primarily through a technological lens, this research integrates a systems-level perspective that aligns digital financial innovation with broader goals of economic resilience, equity, and sustainability. The study also contributes new empirical evidence to the emerging discourse on "resilience by design" within financial systems, highlighting the importance of intentional inclusivity in technological development and policy implementation.*

***Keywords**: fintech, economic resilience, financial inclusion, global stability, digital innovation, inclusive finance*

THE IMPACT OF ARTIFICIAL INTELLIGENCE ON THE DEVELOPMENT OF FINTECH PRODUCTS FOR A SUSTAINABLE ECONOMY

Duresa Kilaj*
South East European University - Tetovo, North Macedonia
dk32331@seeu.edu.mk , ORCID ID: 0000-0002-6331-2234
Aulonë Cenaj
South East European University - Tetovo, North Macedonia
ac32332@seeu.edu.mk , ORCID ID: 0009-0008-8758-4710
**Corresponding author*

Abstract

***Objective**: This study aims to analyze the impact of the development of Artificial Intelligence (AI) on the development of Financial Technology (FinTech) products and their contribution to sustainable economic growth. In an era marked by digital transformation, the intersection of AI and FinTech is creating new avenues for addressing critical challenges such as financial exclusion, inefficiency in capital allocation, and climate-related risks. The main objective of this research is to analyze how AI-enabled financial solutions - such as robo-advisors, algorithmic credit scoring, automated financial planning, and ESG-based investment vehicles - are advancing the goals of financial inclusion, economic efficiency, and environmental sustainability. The study aims to identify not only the opportunities arising from this integration, but also the constraints and risks that need to be addressed. Another important element is environmental sustainability, which is also linked to the green economy.*

***Method**: Methodology: A qualitative research design was used to conduct the methodology in this research, based on the review and synthesis of secondary data sources. The methodology includes a systematic literature review covering a large number of academic articles, scientific research papers, articles published in international journals, reports published by OECD, FinTech and World Banks as well as industry publications published over the years. These materials were collected from well-known databases such as Scopus, JSTOR, Google Scholar and SSRN. The research also included a comparative analysis of selected international case studies from developed and developing economies, including digital banking initiatives in Kenya, AI-driven green finance platforms. In addition, a number of case studies were analyzed to observe real-world applications of AI in FinTech and their socio-economic impacts. This research will also include a meta-analysis that will include a significant number of papers that address topics similar to our topic and from here we will be able to make comparisons of the results.*

***Results**: The findings show that AI significantly enhances the potential of FinTech to foster sustainable economic development. Specifically, AI enables more inclusive financial systems by incorporating non-traditional data into credit scoring models, allowing underserved countries to gain access to financial services. AI-driven ESG analytics improve the accuracy and transparency of sustainable investment decisions, helping to direct capital towards environmentally and socially responsible projects. In addition, predictive results and analytics contribute to reduced operational costs, real-time fraud detection, and better risk assessment. However, the study also identifies several challenges, such as the lack of strong regulatory frameworks, digital infrastructure gaps in low-income regions, risks of algorithmic bias, and data privacy concerns. These barriers could hinder the equitable implementation of AI-enabled FinTech tools if not adequately addressed.*

***Originality**: This research contributes a unique and interdisciplinary perspective by linking the fields of AI, FinTech, and sustainable development – areas that are typically explored in isolation. It provides a new framework for understanding how emerging financial technologies, when guided by the principles of responsible AI, can support the realization of the United Nations Sustainable Development Goals (SDGs). The study offers actionable recommendations for policymakers and industry leaders, including the need for transparent AI governance, inclusive digital infrastructure, and cross-sector collaboration to ensure that technological innovation in finance serves broader societal and environmental goals.*
***Keywords**: artificial intelligence (AI), FinTech, sustainable economy, innovation, digital transformation*

UNDERSTANDING THE IMPORTANCE OF THE INTERNAL PUBLIC FINANCIAL CONTROL FOR LOCAL GOVERNMENTS

Blerta Mjeda
Polis University, Tirana, Albania
blerta_mjeda@universitetipolis.edu.al , ORCID ID: 0000-0001-7767-5741
Elsa Toska*
Polis University, Tirana, Albania
elsa_toska@universitetipolis.edu.al
**Corresponding author*

Abstract
The internal control system in local governments is a comprehensive and essential process that integrates management and internal audit functions, ensuring the effective and responsible use of public funds in line with established governance objectives and the broader mission of the public unit. This system is designed to promote a high level of ethics, efficiency, and economy in the execution of municipal activities. Its core objectives are to guarantee the integrity of public finances by fostering accountability, ensuring compliance with relevant laws and regulations, providing reliable and complete financial and operational information, and safeguarding public assets from potential loss, damage, or misuse. The internal control framework encompasses a broad range of policies, procedures, and activities that guide the management and control of financial resources, including income, expenditures, assets, and liabilities. The effective implementation of this system is crucial for ensuring the transparency and reliability of all financial transactions within local government operations. It contributes significantly to the overall health and stability of municipal management by making sure resources are allocated according to priorities and risks are managed proactively. The Internal Control, Audit, and Financial Reporting component provides targeted technical support to local government units by improving the managerial responsibility of municipal leaders and enhancing their capacity to self-assess the quality of internal control systems within their respective municipalities. The primary objective of this study is to examine the effectiveness of the internal control system in local governments, focusing on its role in ensuring the ethical, efficient, and accountable management of public funds. The study aims to evaluate how the integration of risk management, internal audits, and financial reporting processes contributes to the achievement of governance objectives, such as compliance with legal regulations, resource protection, and transparent financial reporting. This study employs a qualitative approach, using case studies and interviews with municipal leaders, internal auditors, and risk management teams. The analysis focuses on the internal control processes implemented in several local government units, examining the procedures for financial planning, auditing, and risk assessment. Additionally, a review of relevant legal frameworks and regulations is conducted to assess the alignment of these controls with national standards. The study also evaluates training programs and their impact on the professional capacity of municipal staff. The results indicate that the implementation of a comprehensive internal control system significantly enhances managerial responsibility and accountability within local governments. Municipalities that have adopted risk management processes, including the establishment of risk coordinator teams, report a higher level of preparedness in identifying and mitigating risks. Furthermore, the professionalization of internal auditors and improvements in financial

reporting practices have led to more reliable and transparent municipal financial data. These advancements contribute to better decision-making and improved public trust in local governance. This study contributes to the existing literature by highlighting the integration of risk management and internal audits as central components of local government internal control systems. Unlike previous research that focuses mainly on financial reporting, this study underscores the importance of a holistic approach that combines risk assessment, legal compliance, and professional capacity-building. The study's findings offer new insights into how local governments can improve governance practices through a more cohesive and proactive internal control framework, enhancing both financial management and accountability.
Keywords*: accountability, internal control system, local government, legal compliance, risk management*
Funding: This work is not supported by the University

BLOCKCHAIN-BASED REMITTANCE PLATFORMS: SOFTWARE DEVELOPMENT FOR SECURE TRANSACTIONS AND BIG DATA ANALYTICS OF IMPACT ON ECONOMIC STABILITY IN REMITTANCE-DEPENDENT ECONOMIES

Jora Banda
European University of Tirana, Tirana, Albania
jora.banda@gmail.com , ORCID ID: 0009-0004-8497-2903
Artem Aleksandrovich Pugachuk*
European University of Tirana, Tirana, Albania
**Corresponding author*

Abstract
Objective: *Remittances play a vital role in the economic stability of many developing countries reliant on these financial inflows. However, traditional remittance systems face significant challenges such as high costs, slow transaction processing, limited transparency, and risks of fraud. This study aims to explore how blockchain technology can address these issues by developing a novel remittance software platform and employing big data analytics to assess its broader economic impact.*
Method: *The research proposes a hybrid blockchain architecture designed to optimize both transparency and performance. Key components include decentralized identity verification, smart contracts to automate transactions, and compliance modules to ensure regulatory adherence across various jurisdictions. The platform is engineered to support high transaction volumes with minimal latency and incorporates advanced cryptographic techniques to guarantee security. In parallel, big data analytics techniques are applied to real-time remittance flow data. Machine learning algorithms analyze this data to identify emerging trends and predict economic outcomes in remittance-dependent economies.*
Results: *The study finds that a reduction in transaction fees by 3-5% leads to a 7-12% increase in remittance volumes, which subsequently has a positive impact on local economies. Furthermore, the adoption of blockchain technology is associated with greater stability in exchange rates within recipient countries. These results suggest that integrating blockchain with data analytics not only enhances the efficiency and security of remittance transfers but also contributes to macroeconomic stability and financial inclusion.*
Originality*: This study presents an original integrated approach combining a hybrid blockchain-based remittance platform with advanced big data analytics to monitor and evaluate its economic effects. Unlike previous research that addresses these components separately, this work offers a scalable, secure, and compliant remittance solution alongside predictive tools to support economic resilience in remittance-dependent countries worldwide.*
Keywords: *Blockchain, Remittances, Secure Transactions, Big Data Analytics, Economic Stability*

GLOBAL TRENDS IN THE EVOLUTION OF PAYMENT SYSTEMS

Ivan Luchian*
Moldova State University, Chisinau, Republic of Moldova
ivan.luchian@usm.md , ORCID ID: 0000-0002-8683-7228
Angela Filip
Moldova State University, Chisinau, Republic of Moldova
filipangela05@gmail.com , ORCID ID: 0000-0003-2359-860X
**Corresponding author*

Abstract

Objective: *The current imperative of the payments industry is to provide consumers with more control, speed, and transparency in payments. Currently, payment systems have become a field with quantitative and qualitative development at the global level, actively absorbing various advanced technologies. The purpose of this article is to present the basic trends of this process.*

Method*: The research was conducted by examining statistical data presented by specialized companies and expert opinions on the continuous development of payment systems globally, followed by the creation of a summary table of the studied topic. The information base for determining the basic trends within the core systems was formed based on reports from specialized companies, such as Global Payments, Juniper Research, Smartico, Statista, Straits Research, etc. Then, the publications of various authors in the field were studied, including groups of authors led by Philip Bruno and Kevin McKeever, experts Jamie Dimon, Gautam Pillai, Merchant Savvy, Moradpour Meysam, Ahmet Kaya, Caitlin Mullen, etc. The accumulated information was subjected to generalization and synthesis, which allowed the creation of a complex landscape of payment system development trends at a global level.*

Results*: Currently, important processes of transformation of payment systems are taking place worldwide under the influence of the growing demand for payment services from global commerce, including electronic commerce, as well as opportunities for technological improvement. The basic global trends in the evolution of payment systems can be considered the reduction in the use of cash, the expansion of the application of new payment instruments, the increase in cross-border transactions, the continuous increase in the implementation of information technologies, the strengthening of security systems, the expansion and improvement of the related infrastructure. Payment systems, through their expansion and integration, have become important elements of the globalization process, contributing to the formation of a global financial system and the amplification of cross-border financial flows. Now, payment systems are evolving under the influence of two basic processes: the deepening of the digitalization of financial activities and the geopolitical fragmentation of the world. The digitization of payment systems functions is linked to the implementation and development of various technologies, such as the application of artificial intelligence and embedded payments. Geopolitical fragmentation is driven by political instability, tensions and military conflicts between countries, terrorist threats or geographical events with regional or global impact. It can directly and indirectly affect the global economy through financial, trade and commodity price channels. In financial terms, it can result in increased uncertainty, higher risk premia or rising asset prices. In trade terms, restrictions imposed due to tensions between countries can disrupt trade flows, cause supply chain problems even in third countries and affect commodity prices and lead to shortages of key resources. Inevitably, these processes can affect the* *functionality of payment systems. Today, customers prefer a frictionless experience, and payment service companies must ensure the confidentiality of customer transactions. With the development of payment technologies, security and privacy have become priorities. The future of the development of payment systems belongs to the continued replacement of other payment methods by instant payments, growing adoption of digital public infrastructures, investment in next-generation payment infrastructure and technologies and intensifying the fight against money laundering. The implementation of central bank digital currencies will bring certain changes to the functioning of payment systems.*

Originality*: The article demonstrates a particular view of the essence, basic directions and determinants of the process of the development of payment systems.*

Keywords: *payment system, payment instrument, digitalization*

ENHANCING FINANCIAL EDUCATION, LITERACY, AND INCLUSION: STAKEHOLDER CHALLENGES AND SOLUTIONS

Liviu-Gelu Drăghici

Romanian Academy, School of Advanced Studies of the Romanian Academy, Doctoral School of Economic Sciences, National Institute for Economic Research "Costin C. Kirițescu", Institute of National Economy, Bucharest, Romania

liviu-gelu.draghici@ince.ro , ORCID ID: 0009-0009-4389-4669

Abstract

Lately, in Romania, more emphasis has been placed on financial education, which plays an important role in improving the financial well-being of individuals, fostering responsible financial behavior, and promoting economic inclusion. This paper examines the current state of financial literacy in Romania, highlighting both progress made and obstacles faced in increasing financial literacy and inclusion. Romania's financial education efforts have gained momentum, marked by the introduction of the National Financial Education Strategy (2023–2030), the inclusion of financial education in the 8th-grade curriculum, and accredited teacher training programs. However, a substantial portion of the population remains financially illiterate, with 92% lacking essential financial knowledge. The findings show that 53% of the population does not save or invest, and impulsive financial behaviors are still prevalent.

Despite advancements, challenges such as the public's reluctance to engage with financial institutions, lack of trust in the financial sector, and the limited long-term impact of current financial education initiatives persist. Research reveals that while financial education programs may initially impact knowledge and behavior, these effects often diminish over time, particularly among low-income populations and rural areas.

To improve the effectiveness of financial education and foster greater financial inclusion, the paper proposes a shift from information-heavy approaches to more action-oriented strategies, focusing on practical decision-making and behavioral change. Furthermore, the collaboration between the public and private sectors in developing social service programs can significantly enhance the sustainability and reach of these initiatives. Continuous measurement of educational outcomes, better teacher preparation, and targeted financial education for young people are key to advancing financial literacy and inclusion. By addressing these challenges, Romania can cultivate a more financially literate and inclusive society, supporting broader economic and social development.

Keywords: *financial education, financial literacy, financial inclusion, public-private partnerships (PPPs), sustainability of social services*

Acknowledgements: *This research was supported by a grant from the Petroleum-Gas University of Ploiesti, Romania, project number GO-GICS-30707/10.12.2024, within the Internal Grant for Scientific Research*

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

INTEGRATING CIRCULAR ECONOMY PRINCIPLES INTO THE SHARING ECONOMY: BUSINESS MODEL INNOVATIONS

Iges Banda*
Western Balkans University, Tirana, Albania
iges.banda@wbu.edu.al , ORCID ID: 0000-0001-6789-0771
Jora Banda
European University of Tirana, Tirana, Albania
jora.banda@uet.edu.al, ORCID ID: 0009-0004-8497-2903
**Corresponding author*

Abstract
The sharing economy has emerged as a transformative business model that emphasizes access over ownership, promoting resource efficiency and reducing waste. However, despite its sustainability potential, it often overlooks long-term product life cycles and resource recovery, which are fundamental to achieving a fully sustainable system. This paper explores the integration of circular economy principles into the sharing economy by focusing on innovative business models that emphasize product life extension, re-manufacturing, and material recovery. Through a comprehensive analysis of existing sharing economy platforms, this study examines how businesses can redesign their models to not only facilitate resource sharing but also optimize product longevity and reduce environmental impact. By incorporating circular practices, such as repairing, refurbishing, and recycling shared goods, these businesses can contribute to a more sustainable and regenerative economy. The research highlights key challenges and opportunities in merging these two economic systems, with a focus on scalability, consumer behavior, and the technological advancements required to enable circular practices within the sharing economy. The findings suggest that the convergence of circular and sharing economy principles has the potential to create new business opportunities, reduce resource consumption, and foster a more sustainable future.

Keywords: *circular economy, sharing economy, business model innovation, product life extension, resource recovery*

THE IMPLICATIONS OF THE EUROPEAN COMMISSION'S FUNDING PROGRAMS IN INCREASING NATIONAL SAFETY AND SECURITY, WITH A FOCUS ON THE REGIONS ADJACENT TO THE DANUBE

Teodor Emanuel Petreanu

Romanian Academy, School of Advanced Studies of the Romanian Academy, Doctoral School of Economic Sciences, National Institute of Economic Research "Costin C. Kirițescu", Center for Financial and Monetary Research "Victor Slăvescu", Bucharest, Romania

teodor.emanuel.petreanu@gmail.com

Otilia Manta

National Institute of Economic Research "Costin C. Kirițescu", Center for Financial and Monetary Research "Victor Slăvescu", Bucharest, Romania

otilia.manta@rgic.ro , ORCID ID: 0000-0002-9411-7925

Abstract

The European Commission's funding programs have significant implications for enhancing national safety and security in the Danube River region.

The Danube River region, encompassing several countries, faces diverse security challenges, including cross-border crime, environmental risks, and potential instability. The European Commission's funding initiatives play a crucial role in addressing these issues. Funding programs often focus on strengthening institutional capacity, improving infrastructure, fostering regional cooperation, and promoting cross-border initiatives. For example, funding might support the development of joint police operations targeting organized crime, the implementation of advanced surveillance technologies, or the creation of early warning systems for natural disasters. Furthermore, funding can support projects focused on environmental protection, thereby enhancing the region's resilience to climate change and related security risks. However, the effectiveness of these programs is subject to various factors, including the quality of project implementation, the level of political will among participating states, and the adaptability of initiatives to evolving security threats. A key challenge lies in ensuring the coordination and coherence of various funding streams, avoiding duplication of effort, and maximizing the overall impact on national safety and security.

During this study I will focus on the Danube as the spine of Europe and a former route of migrations and conquests, I will search for all the streams of foreign investments, EU funds and indoor income considering that the country is receiving EU funds, but also grants from private states. I will use a descriptive method, with a focus on understanding more deeply the mechanism for financing this domain of security and defence.

Keywords: *security, defence, EU programs, EU funds, regional development*

EXPLORING TOP MANAGEMENT'S INFLUENCE ON THE INTERNATIONALIZATION OF ALBANIAN SMES: AN EMPIRICAL STUDY

Elona Karafili
Polis University, Tirana, Albania
elona_karafili@universitetipolis.edu.al , ORCID ID: 0000-0002-1769-8367
Emi Hoxholli*
Polis University, Tirana, Albania
emi_hoxholli@universitetipolis.edu.al , ORCID ID: 0009-0003-3166-1776
**Corresponding author*

Abstract
Companies undertake various internationalization processes to achieve their strategic objectives, but the opportunities offered by foreign markets also influence a firm's decision to internationalize. However, despite the advantages these markets may present, companies can only exploit them if they possess the necessary resources to enter foreign markets. SMEs often initiate the internationalization process due to internal or external incentives that influence management decision-making and encourage the company to expand internationally. Therefore, before planning internationalization, management must make three key decisions: (1) which market to enter, (2) when to begin conducting business activities in the foreign market (3) the extent to which the company will enter the foreign market. This study focuses on identifying the relationship between the internal factor of management decision-making and the internationalization of SMEs. The analysis is based on the data collected through structured questionnaires delivered to a sample of 200 small and medium enterprises registered in Albania and have met our criteria: the company should have 5 – 249 employees, the company should be registered in the Republic of Albania, have been excluded the NGOs, government institutions, farmers and construction companies, excluded part of companies 50+ size, we have excluded micro companies that represent the major numbers of entities in Albania. To identify the relationships that existed between the internal factor of SMEs' "management decision-making" and internationalization, we conducted an in-depth analysis, which went through two phases: The first phase of the study examined the bivariate relationships between each independent variable taken separately and the dependent variable, internationalization, without considering the influence of other independent variables unrelated to the management decision-making process. The second phase of the analysis was related to the multivariate relationship of the hypothesis raised. We developed a multiple linear regression model to examine the relationship between the dependent variable, "internationalization," and SME management decision-making regarding internationalization. The independent variables taken into the analysis to test this relationship are business strategy, target market segment, objectives set for international activities, the form used to internationalize, information on the target market, and the number of trips that SME's management makes to foreign markets. The findings of this study aim to contribute to a better understanding of the internationalization process of Albanian SMEs and provide practical recommendations for SME's management to support their international expansion.
***Keywords**: internationalization, top management, SME, Albania, empirical, regression, model*

THE IMPACT OF THE MODERN CRISIS-MILITARISTIC STAGE IN THE CYCLICAL DYNAMICS OF THE WORLD-SYSTEM ON BUSINESS

Vasylyna Podliesna
Institute for Economics and Forecasting, National Academy of Sciences of Ukraine, Kyiv, Ukraine
podlesnw2019@gmail.com, ORCID ID: 0000-0002-8435-1013

Abstract

***Objective**: Nowadays, the growing instability in the capitalist world-system due to the aggravation of geopolitical contradictions indicates the beginning of crisis-militaristic phases of global cycles. Their development leads to a cyclical change of the world-system leader, reformatting of the world geopolitical system, and this means – to a change in the economic conjuncture, that is, the conditions and opportunities for doing business. In the modern world-system, socio-economic and institutional transformations have begun that meet the requirements and challenges of the crisis-militaristic stage of its cyclical development. Namely, these are: activation of the processes of formation of opposing geopolitical blocs, militarization of the economy and public consciousness, actualization of the mobilization form of public life, strengthening of militaristic tendencies in the development of Metaverse technologies. The research purpose is to systematically reveal the influence of the crisis-militaristic stage of the world-system's cyclical development on business, considering the modern geopolitical context and evolution of the Metaverse. **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. To achieve the research goal, data from the Stockholm International Peace Research Institute and the Ukrainian State Statistics Service were used. **Results**: The study substantiates that the development of crisis-militaristic phases of global cycles, in particular long cycles of world politics and hegemonic cycles, occurs in the form of "thirty-year wars", after which a new global leader appears, or the primacy of the old leader of the world geopolitical system, who has changed the strategy of his dominance, is preserved. However, in any case, there is a reformatting of institutional practices of interaction between geopolitical actors and a redistribution of spheres of influence, which changes the conditions for doing business at the global, macro- and meso-levels. The hypothesis has been proven that the crisis-militaristic phases of global cycles plunge the world geopolitical system into the strongest instability, while at the same time it undergoes a test of strength. After the completion of the crisis-militaristic phases, the world-system temporarily stabilizes, due to the fact that the new leader of the global geopolitical system or the old leader who has retained his dominance establishes the guiding principles and development guidelines for the entire world, which creates more stable conditions for doing business. The study results give grounds to assume that in the next 30 years the world-system will remain unstable, sometimes turbulent. Therefore, the response of states participating in geopolitical competition to the challenges generated by the crisis-militaristic phase will be their transition in one form or another to a militaristic-mobilization mode of functioning. This means that business will have to obey the demands of militarism and reorient itself to meet its needs.*

We have also proven that at the current stage of historical dynamics, conditions are being formed that stimulate the concentration of global social forces, including transnational business, on support and active participation in transformations associated with:

- *reformatting of the world geopolitical order established after the completion of the "macro-solution" phase (1914–1945) of the 9th long cycle of world politics;*
- *further implementation of technologies of the Fourth Industrial Revolution, including military technologies, which changes the structure of the economy by transferring an increasing part of it to the space of the Metaverse, and also radically changes the military sphere due to the increasingly active use of AI and the strengthening of the role of information and psychological warfare.*

The study results confirmed our hypothesis that such an innovative direction of economic activity as business using Metaverse technologies is already responding to the beginning of the crisis-militaristic stage in the cyclical development of the world-system. Recently, leading technology corporations have stepped up their activities to develop industry metaverses focused on further digitalization of the political and military spheres of public life. This serves as an argument for the final statement that the deployment of the crisis-militaristic stage of the cyclical development of the world-system has accelerated the formation of "military metaverses" and new types of weapons based on the use of artificial intelligence and advanced VR technologies; competition between leading states in the development and application of information-cognitive practices in the military sphere has intensified.

The research also discloses that during the period of development of crisis-militaristic phases of global cycles, prerequisites are formed for the world-system to emerge from the crisis in a revolutionary way, opening the next wave of socio-political, technical-technological, cultural-ideological innovations. It is shown that for cardinal social innovations, a certain form of emergency and mobilization of society are necessary for the implementation of revolutionary actions and further overcoming of their consequences, after which a period of relatively stable evolutionary social development begins. The formation of a mobilization society means the formation of a certain ecosystem of interaction between the state, business, and civil society, committed to a certain main idea, for the implementation of which it is necessary to mobilize funds, resources, and efforts.

Previously, the classics of political economy science proved that in a global capitalist society, the leading role in determining development guidelines belongs to the owners of capital. At the current stage of the cyclical development of the world system, transnational business demonstrates support for the militaristic path (in the form of local-global conflicts) to resolve aggravated geopolitical contradictions. On this basis, our forecast assessment is built that in the next 20-30 years, that is, during the "macro-solution" phase of the 10th long cycle of world politics, militaristic tendencies in business development will intensify; today, leading actors in geopolitics are already increasing their military budgets and actively developing the militaristic component of the economy.

***Originality**: This study presents an original formulation of the problem of determining the essence of the influence of the crisis-militaristic stage of the world-system cyclical development, formed by a set of crisis-militaristic phases of global cycles, on business; it is substantiated that militarization has been chosen by leading actors in geopolitics, primarily transnational business, as a tool for resolving aggravated geopolitical contradictions by military means, therefore business as a whole must submit to the requirements of the*

militaristic-mobilization regime in the conditions of the 30-year phase of "macro-solution" of the 10th long cycle of world politics. Unlike other studies, our study proves that the technological basis for the deployment of the above-mentioned phase is the Fourth Industrial Revolution, which gave birth to the technologies of the Metaverse, the militaristic component of which is becoming increasingly relevant for modern business.
Keywords*: crisis-militaristic phases, global cycles, world-system, military metaverses, fourth industrial revolution, Metaverse, transnational business.*

TRADE WARS AND SANCTIONS: DISRUPTIONS AND ADAPTATIONS IN GLOBAL SUPPLY CHAINS –INSIGHTS FROM THE LITERATURE

Arba Golemi*
Western Balkans University, Tirana, Albania
a.golemi23@wbu.edu.al
Iges Banda
Western Balkans University, Tirana, Albania
iges.banda@wbu.edu.al, ORCID ID: 0000-0001-6789-0771
**Corresponding author*

Abstract
In recent decades, global supply chains have faced increasing disruptions due to the resurgence of protectionist policies, escalating geopolitical tensions, and a rise in the implementation of trade wars and economic sanctions. These developments have altered the dynamics of international trade, production networks, and corporate strategies worldwide. This research aims to investigate the theoretical foundations and practical implications of trade wars and sanctions on global supply chains, with a specific focus on the causes, scale, and consequences of such disruptions. The study emphasizes emblematic cases such as the U.S.–China trade war and international sanctions imposed on countries like Iran and Russia. These cases serve to illustrate how such policies can profoundly reshape global production patterns, influence domestic and international business strategies, and affect logistical operations across industries.
The ***method*** *employed in this study is a comprehensive literature-based analysis, integrating findings from peer-reviewed academic journals, policy papers, and recent books related to international trade, geopolitical risk, and supply chain management. Through a qualitative synthesis of existing theoretical and empirical work, this paper explores the short-term and long-term effects of trade-related conflicts and sanctions on key business dimensions such as operational efficiency, cost structures, market accessibility, and supply chain resilience. Furthermore, the study evaluates how firms across different sectors have responded to these shocks by reconfiguring their sourcing strategies, diversifying supplier networks, nearshoring or reshoring production, and incorporating digital technologies, including artificial intelligence and predictive analytics.*
The ***results*** *of the review highlight that trade wars and sanctions exert significant and multifaceted impacts on global supply chains. In the short term, firms face increased uncertainty, higher operational costs, and logistical delays. In the long term, these disruptions lead to strategic realignments in supply chain design and the emergence of new trade corridors and regional production hubs. The analysis also shows that companies that adopted flexible and digitally integrated supply chain models were better equipped to withstand these shocks. Another key finding is the growing importance of political risk assessment and scenario planning in corporate strategy, especially in sectors heavily dependent on cross-border supply chains such as technology, automotive, and pharmaceuticals.*
The ***originality*** *of this study lies in its synthesis of diverse academic perspectives to provide a holistic understanding of how geopolitical disruptions influence supply chain structures and*

business adaptation strategies. Unlike previous works that focus on economic outcomes or political motivations in isolation, this paper integrates both theoretical insights and practical examples to offer a more nuanced perspective. Moreover, by exploring the role of technological tools such as AI in mitigating supply chain risks, the study contributes to a growing body of literature that examines how digital transformation can enhance organizational resilience in the face of global instability.

Ultimately, this paper aims to answer several pivotal questions: Why do trade wars and sanctions have such a profound impact on supply chain management? What theoretical models or frameworks can businesses adopt to navigate these challenges? And what role will emerging technologies, particularly AI, play in building future-proof supply chains? By addressing these questions, the study not only underscores the ongoing vulnerability of global trade networks but also provides a foundation for further research into sustainable and adaptable supply chain strategies amid evolving geopolitical realities.

***Keywords**: trade wars, sanctions, geopolitics, supply chain management, economics*

SHIFTING CAPITAL FRONTIERS: THE RISE OF DEFENCE AS AN INSTITUTIONAL INVESTMENT THEME IN EUROPE

Răzvan Alexandru Rusu*

The Bucharest University of Economic Studies, Bucharest, Romania

razvan.a.rusu@gmail.com

Daniela-Ioana Manea

The Bucharest University of Economic Studies, Romania; Institute of National Economy, Bucharest, Romania

daniela.manea@csie.ase.ro , ORCID ID: 0000-0002-7655-1541

Dorel Mihai Paraschiv

The Bucharest University of Economic Studies, Bucharest, Romania

dorel.paraschiv@ase.ro , ORCID ID: 0000-0002-4559-346

**Corresponding author*

Abstract

Objective*: The Russian invasion of Ukraine in 2022 triggered a reassessment of Europe's security strategy and the role of capital in supporting it. Alongside increased defense spending and renewed NATO commitments, institutional investors—especially pension funds—have begun reexamining long-standing exclusions of defense from Environmental, Social, and Governance (ESG)-aligned portfolios. This paper explores the emergence of defense as a legitimate institutional investment category, analyzing how evolving attitudes, new financial instruments, and regulatory reinterpretations are reshaping capital allocation to align with security imperatives.*

Method*: The study draws from policy documents, fund disclosures, regulatory statements, and media reports to track post-2022 developments across five key areas:*

1. *Attitudinal Shifts: Evaluating changes in pension fund sentiment in Denmark, Sweden, the Netherlands, and the UK.*
2. *Investment Vehicles: Reviewing the rise of defense-focused ETFs, mutual funds, and sovereign bonds between 2022–2025.*
3. *Regulatory Developments: Analyzing updated guidance from the European Commission, FCA, and EIB on defense compatibility with sustainable finance.*
4. *Eastern European Imperatives: Highlighting Romania and CEE's push to integrate defense within ESG as a response to elevated regional threats.*
5. *Capital Flow Potential: Assessing projected reallocation volumes based on estimates from EFAMA, Bruegel, and other institutions.*

Results*: Europe is undergoing a structural shift in how defense is perceived within institutional finance. Long viewed as ethically off-limits, defense is being reframed as a public good essential to democratic stability. This evolution is seen in several notable pension fund actions. PensionDanmark, for example, invested in naval vessel construction for national security, treating it as part of its sustainability strategy. In Sweden, SPP announced that defense-related investments supporting democracies can be ESG-compliant if controversial weapons are excluded. In the Netherlands, political leaders have encouraged pension funds to revise their exclusion policies. While hesitations remain, particularly around nuclear arms, discussions are increasingly oriented toward ethical filters rather than outright bans.*

Simultaneously, the investment product landscape is expanding. The number of global defense-focused funds doubled by 2024. Europe launched its first dedicated defense ETF in 2025, and major asset managers are responding to client demand for portfolios that integrate security and sustainability. Bloomberg reports that several large investors have quietly reversed long-standing divestment policies targeting defense. On the regulatory front, the UK's FCA confirmed that well-governed defense companies can align with sustainability mandates. The EIB—traditionally averse to defense—revised its policy in 2024 to finance dual-use technologies and strategic supply chains. These moves have opened the door to co-investment and increased market legitimacy for the defense sector. At the EU level, proposals have emerged to issue "European Rearmament Bonds" worth €100–200 billion. These would fund industrial defense projects across the bloc and be marketed to pension funds as secure, ESG-aligned investments. Such initiatives mirror the model used during post-pandemic recovery and signal the mainstreaming of security finance. In Eastern Europe, especially Romania, Poland, and the Baltics, the alignment between defense and sustainability is more urgent. Romania raised its defense spending to 2.5% of GDP in 2023 and plans to reach 3%. While Romanian pension funds currently lack direct exposure to defense due to legal and prudential barriers, they already support defense indirectly through government bonds. New mechanisms—such as state-guaranteed defense bonds and joint public-private projects—are under discussion as potential vehicles for stable, long-term pension fund engagement in national security infrastructure. Analysts estimate that if ESG restrictions were revised, European funds could channel an additional €100–120 billion into defense, marking a significant reallocation of capital in support of EU strategic autonomy. This shift is grounded in the recognition that sustainability without security is untenable, and that peace is a precondition for environmental and social progress. ***Originality****: This study identifies a critical inflection point in ESG investing: the reclassification of defense from exclusionary sector to strategic necessity. Unlike past defense cycles driven solely by government procurement, today's transformation is shaped by fiduciary duty, ethical complexity, and geopolitical urgency. The novelty lies in positioning defense as convergent with ESG principles—particularly within the "social" pillar—through the lens of democratic protection and societal resilience. Through institutional case studies, emerging financial instruments, and Eastern European policy initiatives, the paper illustrates how defense is becoming a viable and justifiable asset class within responsible investing. It argues for a shift away from rigid exclusion lists toward nuanced, values-based frameworks that reflect contemporary threats. Conclusion: The defense sector's reemergence as an investable theme marks a new frontier in sustainable finance. No longer framed solely through a moral lens of exclusion, defense is increasingly seen as a foundational component of societal sustainability. European pension funds and asset managers are cautiously reengaging, supported by regulatory clarity, ethical screening, and new investment platforms. As geopolitical volatility continues, the ability to finance peace and stability through responsible defense investments may define the next evolution of ESG. The integration of defense into sustainable finance is not a departure from ethical investing—it is its adaptation to a changed world.*

Keywords*: institutional investment, defense sector, pension funds, ESG adaptation, security finance, European trends*

Funding: This paper was co-financed by The Bucharest University of Economic Studies during the PhD program.

FROM TRADITIONAL PUBLIC ADMINISTRATION TO NEW PUBLIC MANAGEMENT, COMPARATIVE ELEMENTS

Florina Popa
Institute of National Economy, Bucharest, Romania
florinapopa289@gmail.com , ORCID ID: 0009-0006-9079-4933

Abstract
Objective: *The present study reveals a review of the transformations that the public administration had to face, amid the criticism of the bureaucratic system of its organization, considered inflexible, due to the pyramidal hierarchical model of rules and decision-making, in relation to the requirements of citizens.*
The traditional public administration, designed for a stable environment, has been subject to changes in the last decades, globally, which were demanding reforms in the public sector and to which it had to adapt. The objective was a governance characterized by efficiency, responsibility, ethics, transparency.
In order to ensure an efficient, responsible and transparent governance, a solution was the adoption by some countries of the New Public Management, the implementation modalities being different. In this respect, states have chosen and adapted reform processes to ensure the removal of unproductive elements of the public sector and to lead to streamlining administration. The emergence of New Public Management at the end of the last century brought changes, the reform initiatives being oriented towards the development of the activity of governments, in countries with industrialized economies and, less, for developing countries.
Method*: The methodology of the research was the documentation from the scientific literature, corresponding to the chosen theme, the processing of selected ideas and the interpretation in the author's own view.*
Results*: There are similarities and distinctions between the two forms of organization of the public administrative system, respectively, the traditional public administration and the New Public Management, based on the fundamental ideas and principles of the two models.*
Originality*: The originality character of the paper is given by the very conception of the subject on this topic, by studying and interpreting in the author's own view, of the papers of different authors, with concerns in the field, detailed on several aspects: the appearance of the two models of organization of the public administrative system, tracing of the elements characteristic of them, the approach of the transformations of traditional public administration getting through in order to move to the New Public Management, the presentation of the aspects that differentiate them.*
Keywords*: traditional public administration, New Public Management, characteristics, distinctions, comparative elements.*

EXPLORING SUSTAINABLE INVESTMENT OPPORTUNITIES IN PRIVATE PENSION FUND PORTFOLIOS IN ROMANIA: THE CASE OF THE AGRIVOLTAIC SECTOR

Mădălina-Gabriela Anghel*
Artifex University of Bucharest, Bucharest, Romania; Romanian Academy, Institute of National Economy, Bucharest, Romania
madalinagabriela_anghel@yahoo.com , ORCID ID: 0000-0001-8705-034X
Denis-Arthur Strijek
Bucharest University of Economic Studies, Bucharest, Romania
denis.strijek@gmail.com , ORCID ID: 0009-0003-2997-8571
**Corresponding author*

Abstract
In the context of the accelerating transition to a green economy and the growing interest in sustainable finance, private pension funds are in a strategic position to support the development of emerging sectors, with both economic and ecological potential. In Romania, these funds manage significant capital, over 150 billion RON at the end of 2024, representing over 9% of GDP, thus being an important reservoir of domestic financing. By their nature, pension funds are major institutional investors, characterized by a long-time horizon, an orientation towards stability and diversification, and a prudent exposure to risk. These factors give them the potential to become key players in financing the energy transition and sustainable agriculture.

***Objective**: In this study, the authors aimed to investigate the opportunities for integrating investments in agri-photovoltaic projects into the portfolios of private pension funds in Romania, analysing in particular the compatibility between the specific requirements of this type of funds (yield, risk, time horizon, liquidity) and the characteristics of the agrivoltaic sector (stability, sustainability, long-term returns).*

The main objective of the research is to assess the extent to which agri-photovoltaic projects can represent a viable and attractive asset class for private pension funds, in relation to the performance and regulatory compliance requirements imposed on administrators, while contributing to achieving ESG (Environmental, Social, Governance) objectives, but also to Romania's energy and food security. At the same time, the authors also aimed to identify the current barriers to these investments and market or regulatory conditions that could favour such capital allocation.

***Method**: To achieve the proposed objectives, this study used a mixed methodology, combining a qualitative analysis and a quantitative analysis. In this sense, the research integrates the documentary analysis of the national and European legislative framework on private pensions, as well as of the relevant policies on renewable energy and sustainable agriculture. Thus, the authors conducted a study on the investment profile of private pension funds in Romania, with a focus on Pillar II, which currently holds approximately 97% of the total assets of the private pension system. The period analysed is 2008–2024, which covers both the early phase of development and accumulation of assets of the private pension system in Romania, as well as the stages of maturation and consolidation of portfolios, reflecting economic developments, legislative changes and recent trends in investment diversification, including the emerging interest in sustainable assets. In parallel, a comparative analysis of European agri-photovoltaic projects is carried out, with a focus on Germany, France and Italy. A series of* *financial simulations were also carried out on the integration of agrivoltaic projects into investment portfolios of private pension funds. Alternative allocation scenarios were evaluated, based on assumptions regarding the estimated annual return (IRR), project volatility, degree of liquidity and investment duration. The simulations were carried out using portfolio optimization methods (Markowitz model) and risk-adjusted performance indicators (Sharpe). The data source includes official reports published by the Financial Supervisory Authority, as well as international databases, such as IRENA or Eurostat.*

The research **results** *indicate that agrivoltaic projects can constitute attractive alternative assets for pension funds, especially in a volatile investment environment and a growing demand for green assets compliant with ESG standards. Simulations show that, in a diversified portfolio, the inclusion of a moderate share of agrivoltaic projects can reduce the systemic risk associated with traditional assets (listed shares), without significantly affecting the average annual return. Agri-photovoltaic projects have a lower risk profile than investments in emerging markets and with low correlation with traditional financial markets.*

However, the study identifies a number of significant structural barriers. Among the most important are the limitations imposed by the current regulations, which provide for strict exposure caps on asset classes and prohibit or significantly restrict direct access to illiquid investments or green infrastructure. Also noteworthy are the lack of mechanisms to guarantee sustainable investments in Romania, the legislative uncertainty regarding the mixed use of agricultural land, and the absence of a liquid secondary market for renewable assets.

The **originality** *of the research lies in the topic studied, which explicitly explores the compatibility between private pension fund investments and the agrivoltaic sector, with an integrative approach from a financial, sustainable and regulatory perspective. This paper makes an interdisciplinary contribution, exploring the concrete opportunities for connecting private pension capital to financing the green transition in agriculture. Through this approach, the article offers an applicable economic policy proposal, which supports the use of domestic capital for strategic sustainable development purposes.*

The integration of agrivoltaic projects into the portfolios of the private pension funds in Romania is feasible and beneficial in the long term, but requires a clear regulatory framework, adapted to the specifics of these investments, as well as the creation of intermediary financial instruments (such as green infrastructure funds) that reduce the perceived risk and improve liquidity.

Keywords: *private pensions, agrivoltaic, portfolio diversification, green finance, sustainability, profitability, risk*

IMPACT OF BEHAVIOURAL FACTORS ON THE PURCHASE OF RESIDENTIAL REAL ESTATE IN CHISINAU MUNICIPALITY

Olesea Rotaru
Academy of Economic Studies of Moldova, Chisinau, Republic of Moldova
olesea.ro@gmail.com, olesea.rotaru@ase.md, ORCID ID: 0000-0003-1399-7586

Abstract
This article aims to analyse and highlight the behavioural factors that influence the decision-making process when purchasing real estate, with a particular focus on the residential real estate market in the municipality of Chisinau. Buyers' decision-making processes are commonplace activities in which individuals make the best choices in different circumstances under the influence of various factors. While the decision-making process for consumer goods is relatively simple, as the value of the investment increases, the decision becomes more complex. Therefore, it is essential for the main actors in the real estate market, such as property developers, marketing agencies, and policymakers, to understand these influences in order to adapt marketing strategies to buyer behaviour requirements and needs.
Objective*: These objectives are derived from the paper's primary purpose and are based on previous research highlighting the importance of behavioural factors in buyers' decision-making processes in the real estate market. This research emphasises the necessity of a detailed analysis in this area. Against this backdrop, identifying, classifying and evaluating the impact of behavioural factors on residential real estate purchases in Chisinau, analysing the interaction between behavioural factors, economic and demographic variables in real estate purchase decisions and formulating practical recommendations for the main actors in the real estate market (real estate developers, sales agents and policymakers) is essential to understanding buyer behaviour.*
Method*: The research was carried out through a quantitative study, based on a structured questionnaire consisting of 28 questions on a sample of 628 respondents (individuals) from the municipality of Chisinau and other localities in the Republic of Moldova, randomly selected to ensure adequate representativeness and to collect quantifiable data on preferences, purchase intentions, buyer's motivations and determinants of purchase decisions. At the same time, analysis using statistical techniques was used to identify correlations and trends in the collected data and documentary analysis. A review of relevant literature and previous relevant studies will also be conducted to contextualise the results obtained.*
Results*: This research will contribute to a deeper understanding of buyer behaviour in the rental property market, providing business development insights for developers, real estate agents, and other decision-makers. It will also help to develop strategies that cater to the needs and preferences of residential real estate buyers. Analysing the data, we can conclude that social factors, such as the influence of the reference group and the social status of the potential buyer, play a particularly important role in the decision to purchase a real estate property. Additionally, cultural and personal factors, including motivation, individual values and previous experiences influence the intention to purchase, economic factors such as disposable income and environmental factors, as well as the conditions in which the real estate market operates, have a significant influence on the ability and willingness to purchase a house.*

***Originality**: The paper's originality lies in its integrated and contextualised approach to buyer behaviour in the residential real estate market in Chisinau, highlighting relevant theoretical and practical aspects of this field. As a multidimensional study, it provides a comprehensive perspective on the interaction and influence of various behavioural factors on purchase decisions, offering a deep understanding of how these factors influence buyer behaviour in residential real estate purchases.*
***Keywords**: buyer behaviour, purchase intention, behavioural factors, personal factors, preferences, social factors, cultural factors, actors in the real estate market, the residential real estate market, the purchase decision, trends in the development of the residential real estate market.*

REGIONAL SECURITY AND ECONOMIC DEVELOPMENT: VULNERABILITIES AND OPPORTUNITIES IN ROMANIA'S AGRICULTURE

Florentina-Ștefania Neagu
Institute of National Economy, Romanian Academy, Bucharest, Romania
stefanianeagu15@yahoo.com, ORCID ID: 0000-0003-4823-5848

Abstract
In recent years, regional security has emerged as a critical dimension in shaping economic trajectories across Europe, particularly in countries located at the eastern borders of the European Union. Romania, situated at the crossroads of Eastern and Central Europe, faces growing security pressures due to geopolitical tensions, regional instability (notably in Ukraine and the Black Sea region), and hybrid threats that affect both state and non-state actors. These factors have significant implications for the country's economic stability, especially in key sectors like agriculture, which remains a cornerstone of Romania's GDP, employment, and rural livelihoods.

***Objective**: This study aims to analyze how regional security challenges influence Romania's economic development, with a particular focus on agriculture. It seeks to identify both the vulnerabilities generated by these security threats ranging from disrupted trade routes to cyberattacks on supply chains, as well as the potential opportunities that could emerge from strategic adaptation and European integration efforts. The paper places agriculture at the center of this analysis due to its sensitivity to external shocks, its strategic role in national food security, and its potential for sustainable economic growth under the right policy and security frameworks.*

***Method**: The research employs a mixed-method approach, combining qualitative and quantitative analysis. Firstly, a review of recent literature, policy papers, and EU and NATO strategic documents provide a theoretical and contextual foundation. Secondly, the study conducts a macroeconomic analysis using available data from national and international databases (Eurostat, World Bank, Romanian National Institute of Statistics) to assess trends in agricultural productivity, investment, and export flows in the context of regional insecurity. Complementing this, a series of semi-structured expert interviews were conducted with stakeholders from the Ministry of Agriculture, defense and security analysts, representatives of agricultural associations, and local farmers. These interviews aimed to capture the lived experiences, strategic concerns, and adaptive practices at different levels of the agricultural sector in response to security developments. Finally, a scenario-based analysis is included to project potential future outcomes under varying degrees of regional stability and security cooperation.*

***Results**: The study identifies multiple layers of impact that regional security challenges have on Romania's agriculture: regional conflicts and instability have significantly affected traditional trade corridors, particularly in the Black Sea, resulting in delays, increased insurance costs, and redirected exports. Perceptions of risk among investors in Eastern European markets have led to fluctuating investment patterns, particularly in rural infrastructure, logistics, and agri-tech, undermining long-term development potential. A rise in cyber threats, especially targeting supply chain logistics and agri-data platforms, poses systemic risks to productivity and distribution. Regional insecurity has contributed to further*

out-migration of the rural labor force, intensifying labor shortages and pressuring small and medium farms.
On the opportunity side, the study finds that Romania can capitalize on: strategic funding and policy support tied to regional stability can help modernize Romanian agriculture and align it with European green and digital transitions. Romania's location could be leveraged to become a logistical hub for food distribution in Eastern Europe, provided infrastructure and security investments are strengthened.
***Originality**: The originality of this study lies in its interdisciplinary approach bridging security studies and agricultural economics and its specific focus on the intersection between regional geopolitical dynamics and agricultural development in Romania. While previous studies have assessed the economic effects of regional security in broader terms or focused solely on industrial sectors, this research zeroes in on agriculture as a strategically vital yet under-examined area.*
Furthermore, the inclusion of scenario-based analysis tied to security developments adds a forward-looking dimension, enabling policymakers and stakeholders to better prepare for diverse futures. The study's insights are especially relevant in the context of shifting European priorities on food sovereignty, green transition, and strategic autonomy, offering a timely and grounded contribution to both academic and policy debates.
***Keywords**: regional security, economic development, agriculture in Romania, geopolitical risks, food security*

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

FUNCTIONAL SPATIAL PLANNING FOR SUSTAINABLE REGIONAL DEVELOPMENT: A COMPARATIVE POLICY PERSPECTIVE

Mariam Jibuti
Ivane Javakhishvili Tbilisi State University, Tbilisi, Georgia
Mariami.Jibuti382@eab.tsu.edu.ge, ORCID ID: 0000-0001-6420-5791

Abstract
Sustainable regional development is a fundamental pillar of inclusive economic growth, environmental stewardship, and long-term social cohesion. As Georgia continues to transition within dynamic political and economic conditions, spatial and territorial planning becomes an essential tool for unlocking growth potential while safeguarding natural and social capital. This study aims to evaluate the role of functional spatial planning in promoting regional sustainability through integrated land-use strategies, data-driven policy mechanisms, and equitable development frameworks. Positioned within the broader goal of sustainable development, the research investigates how planning systems can support balanced growth, reduce intra-regional disparities, and ensure that economic expansion aligns with environmental limits and community needs.
The study employs a qualitative comparative ***methodology****, combining cross-country analysis with empirical research in Georgia. Four EU member states—Germany, France, the Netherlands, and Sweden—are examined for their effective spatial planning models that integrate economic, ecological, and social objectives. The research is based on the analysis of policy documents, legal frameworks, and spatial governance tools. To contextualize these models, expert interviews and stakeholder surveys were conducted in Georgia, revealing local challenges and opportunities for reform. This dual approach ensures that both best practices and grounded realities inform the recommendations, with a particular focus on sustainable development indicators such as land-use efficiency, environmental resilience, and inclusive participation.*
The comparative ***findings*** *demonstrate that spatial planning, when aligned with sustainability goals, can serve as a powerful lever for unlocking regional development potential. European models show that integrating ecological constraints into zoning regulations, incentivizing green infrastructure investment, and promoting compact urban forms leads to more efficient*

resource use and long-term economic vitality. In Georgia, however, planning systems remain fragmented, with limited data utilization, weak policy enforcement, and minimal integration of sustainability metrics. The study proposes a restructured spatial planning framework for Georgia that includes: (1) mandatory inclusion of environmental impact assessments in all regional plans; (2) implementation of data-driven land-use modeling to forecast sustainable growth scenarios; (3) development of fiscal tools to reward sustainable land practices and penalize degradation; and (4) participatory governance structures to ensure stakeholder inclusion in planning decisions. These measures can foster sustainable growth by aligning economic development with environmental and social priorities.

This research offers a novel contribution by framing spatial planning as a catalyst for sustainable development and not merely as a technical or administrative exercise. Its originality lies in the integration of comparative European insights with localized Georgian data, producing a hybrid policy model that is both aspirational and achievable. Moreover, by directly linking land-use governance with the Sustainable Development Goals (SDGs)—particularly SDG 11 (Sustainable Cities and Communities), SDG 9 (Industry, Innovation and Infrastructure), and SDG 13 (Climate Action)—the study underscores the transformative potential of research-informed planning. The incorporation of expert and stakeholder perspectives adds unique value by rooting the study in real-world challenges, thus ensuring that the proposed policy interventions are both practical and aligned with the principles of sustainable, inclusive, and resilient growth.

Keywords*: sustainable development, spatial planning, regional growth, comparative analysis, policy integration*

Funding: This research was supported by the Shota Rustaveli National Science Foundation of Georgia (SRNSFG) [grant number: YS-24-308, 2025]

QUANTIFYING EXTERNALITIES IN THE VALUATION OF IMPACT-DRIVEN STARTUPS

Ion-Matei Dumitrescu
Romanian Academy, School of Advanced Studies of the Romanian Academy
Doctoral School of Economic Sciences; National Institute for Economic Research "Costin C. Kirițescu", Institute for World Economy, Bucharest, Romania
mateidumitrescu@me.com

Abstract

Objective: *In traditional venture capital models, a company's value is typically driven by quantifiable financial performance indicators such as revenue, profit, and cash flow. However, in the case of impact startups, this narrow view fails to account for external benefits that such companies create for stakeholders beyond shareholders. These include social, environmental, and governance (ESG) outcomes that align with Sustainable Development Goals (SDGs). The objective of this study is to explore how impact-driven startups generate both micro-level externalities (e.g., easier talent attraction, lower customer acquisition costs) and macro-level externalities (e.g., contributing to local development, green transition, inclusive economies) and how these influence firm valuation. We propose that impact metrics, often perceived as "intangibles," can be analytically integrated into startup valuation frameworks. The study aims to examine whether higher ESG performance correlates with higher company valuations, especially in the context of favorable public policy environments or when investment is made by impact-oriented venture capital funds.*

Method: *The paper will employ a mixed-method approach. First, it builds a conceptual framework to define and differentiate between micro and macro externalities in impact investing, drawing from economic theory (externalities, signaling, and intangibles in valuation) and existing impact finance literature (IRIS+, GIIN, ESG scoring). Second, the paper proposes a quantitative model where the dependent variable is firm valuation, and explanatory variables include selected ESG metrics from publicly available impact reports, SDG alignment disclosures, and investment origin (impact VC vs. traditional VC). A preliminary dataset will be built using Dealroom, Crunchbase and other data sources. If data quality allows, a stochastic model or multivariate regression analysis will be employed to estimate the influence of impact indicators on valuation. The paper also reviews policies enabling or discouraging the capitalization of impact externalities (e.g., tax incentives, LP regulations, public co-investment schemes).*

Results: *While the final regression and statistical analysis will be included in the full paper, we hypothesize that the data will show a positive correlation between ESG performance and startup valuation, particularly in later-stage funding rounds or exits where reputational momentum and public policy alignment become more relevant. We expect that startups demonstrating stronger impact indicators will also exhibit lower friction in scaling (e.g., reduced recruitment and marketing costs), higher investor interest (especially from institutional or EU-aligned funds), and higher probability of being acquired or expanding cross-border. At the portfolio level, these dynamics could result in higher aggregate returns for impact VCs, once positive externalities are recognized and priced in.*

Originality: *This study contributes to the limited but growing literature on quantifying impact in early-stage investment. While macroeconomic studies have evaluated the role of ESG at the corporate or public equity level, few studies have connected micro-level startup operations to systemic externalities in a data-driven valuation model. By attempting to bridge the gap between social impact metrics and financial valuation, this paper provides a theoretical and empirical basis for redesigning how we assess risk-adjusted returns in the impact startup space. It also introduces a policy-relevant perspective, exploring how governments and pension funds might stimulate impact investments by accounting for public goods generated by private ventures.*
Keywords*: startups, impact investing, impact metrics, SDG, CSR, ESG*

CHALLENGES IN IMPLEMENTING CO_2 CAPTURE AND STORAGE TECHNOLOGIES

Silvia Elena Isachi
Centre of Financial and Monetary Research "Victor Slăvescu", Bucharest, Romania
silvia.isachi@gmail.com, ORCID ID: 0009-0004-5404-9050
Georgiana Chițiga
Centre of Financial and Monetary Research "Victor Slăvescu", Bucharest, Romania
georgiana_chitiga@yahoo.com, ORCID ID: 0009-0006-8439-5231

Abstract
Objective: *Carbon capture and storage technologies (CCS – Carbon Capture and Storage) have become a topic of utmost interest in international debates on combating climate change. These technologies, which are considered essential for decarbonising heavy industries and achieving global climate goals, have significant potential in reducing net CO_2 emissions. However, at a global level, the deployment of CCS remains limited, and the transition from pilot projects to large-scale commercial application is rather slow and uneven. The aim of this study is to analyse the main challenges that impede the uptake of CCS technologies, identifying barriers at the different stages of implementation and proposing an analytical framework for their evaluation in various contexts (technological, economic, and social).*
Method: *The study adopts a qualitative methodology, based on a systematic review of scientific and technical literature, selecting relevant published sources over the last decade. The analysis includes articles from international databases such as Scopus and Web of Science, documents from environmental agencies, and reports from energy institutions. The thematic analysis technique is used to classify challenges into three main categories: technical, economic, and socio-institutional. Data on the technological maturity (TRL—Technology Readiness Level), implementation costs, and public acceptability are also extracted and correlated to provide an overview of the current state of CCS.*
Results: *The analysis highlights the bottlenecks affecting the implementation of carbon capture and storage (CCS) technologies. From a technical point of view, the challenges include the limited efficiency of capture processes, especially for diffuse industrial emissions, difficulties in transporting and injecting carbon dioxide, and uncertainties regarding the safety of long-term geological storage. Economically, CCS remains an expensive technology, difficult to justify without well-defined carbon pricing policies or financial support mechanisms. Regarding social and institutional aspects, the lack of transparency, insufficient public information and environmental concerns contribute to low acceptability among local communities. Regulatory instability and long-term legal liability create reluctance among investors and operators. A comparative analysis of existing projects shows that the success of implementation is strongly influenced by the collaboration between the public and private sectors, the integration of carbon capture and storage (CCS) in national innovation strategies and the existence of fiscal policies or support for applied research. The study highlights that projects that integrate well into existing industrial ecosystems, such as high-emission clusters or areas with developed energy infrastructure, have a higher probability of success. There is also a trend among some countries to correlate investments in CCS with the development of negative emissions technologies (NETs), thus extending the role of CCS beyond simple emission reduction. This complementarity creates opportunities for the development of*

innovative business models, capable of transforming climate challenges into long-term competitive advantages.

Originality: *The originality of the study lies in the creation of an interdisciplinary analytical framework that links the challenges identified to the implementation stages of CCS projects. At the same time, it can support future research in the development of solutions adapted to the regional and sectoral context, thus facilitating the acceleration of the adoption of this technology in carbon emission reduction strategies. Therefore, the research contributes to shaping an applied perspective on how CCS can support economic competitiveness and ecological resilience in the context of contemporary multiple crises.*

Keywords: *carbon capture and storage, CCS, technological challenges, economic barriers, climate change, energy transition.*

THE ROLE OF CCS TECHNOLOGIES IN THE TRANSITION TO CLIMATE NEUTRALITY

Georgiana Chițiga
Centre of Financial and Monetary Research "Victor Slăvescu", Bucharest, Romania
georgiana_chitiga@yahoo.com, ORCID ID: 0009-0006-8439-5231
Silvia Elena Isachi
Centre of Financial and Monetary Research "Victor Slăvescu", Bucharest, Romania
silvia.isachi@gmail.com, ORCID ID: 0009-0004-5404-9050

Abstract
Objective: *The paper takes as its starting point the current context of intensifying global efforts to combat climate change, in which carbon capture and storage (CCS) technologies are gaining particular strategic importance in achieving the goal of climate neutrality. These technologies offer a complementary solution to the decarbonization of energy sources and industries with high emissions, contributing significantly to the reduction of net* CO_2 *emissions. The study aims to investigate the role of CCS in the energy transition, analyzing how these technologies can be integrated into European and global strategies to achieve climate neutrality. The objective is to highlight the benefits, limitations and conditions necessary to accelerate the adoption of CCS, in relation to the current technological, economic and social challenges.*
Method: *The research is based on a qualitative analysis of the specialized literature, including scientific articles, public policy reports and strategic documents from the last ten years. International databases such as Scopus, Web of Science, as well as publications of the International Energy Agency (IEA), the European Commission and other relevant organizations are consulted. The aim is to identify and classify the main dimensions of CCS integration in the energy transition: technological maturity, economic feasibility, social impact and institutional integration. Case studies of existing CCS projects are also analyzed to extract relevant data.*
Results: *The results show that CCS technologies play a key role in the decarbonization of industrial sectors such as the cement, steel and chemical industries - sectors that contribute significantly to global* CO_2 *emissions and, therefore, CCS technologies are an essential solution for reducing emissions in these areas, but also in the production of low-emission hydrogen, the so-called "blue hydrogen", by capturing the carbon resulting from the hydrogen production process based on fossil fuels. From a technological point of view, the maturity of CCS technologies varies and integration into existing energy infrastructure remains a significant obstacle. For example, carbon capture from concentrated industrial sources, such as gas or coal-fired power plants, is already more advanced than the capture of diffuse emissions, which come from industrial processes, such as cement or steel production. From an economic point of view, the high costs of capture, transport and storage require public support schemes and coherent and clear carbon pricing mechanisms. Without a favorable financial framework, CCS investments are not viable in the short to medium term and widespread adoption will be slow. From a social point of view, community acceptability is essential, especially in areas where underground storage facilities are to be built. Concerns about the long-term safety of geological storage and the lack of public information contribute to widespread reluctance regarding the implementation of these technologies. Also, the legal framework and long-term liability regulations play a critical role in attracting investment.*

Clear legislation can encourage confidence in CCS and attract the necessary funds for implementation. The study highlights the importance of integrated policies, combining CCS technologies with other negative emission technologies (NETs), such as bioenergy with carbon capture (BECCS), to offset residual emissions and enable the achievement of climate neutrality. Successful projects involve public-private partnerships, long-term planning and alignment of CCS technologies with innovation and sustainable development goals.
Originality: *The originality of the study lies in addressing the role of CCS technologies in the climate transition, by correlating the technological, economic and social dimensions with climate policies at European and international level. It is also proposed to assess the opportunities for implementing CCS technologies depending on the specific context of different regions or industries. The study provides a contribution on climate neutrality, demonstrating how CCS technologies can become a pillar of the climate transition with the potential to create sustainable competitive advantages.*
Keywords: *climate neutrality, net zero emissions, energy transition, decarbonization, CCS technologies, climate policies*

BLUE ECONOMY STARTUPS: SUSTAINABLE INNOVATION IN THE MARINE INDUSTRY AND COASTAL DEVELOPMENT

Elena Harka
"Aleksandër Moisiu"University of Durrës, Albania
harkaelena@gmail.com, ORCID: 0009-0002-9123-5560
Elena Boja
"Aleksandër Moisiu"University of Durrës, Albania
elenaboja2000@gmail.com

Abstract

Objective: *In recent years, the Blue Economy has emerged as a critical paradigm for rethinking the sustainable use of ocean and coastal resources. As global attention turns to climate resilience and low-carbon transitions, marine-based sectors such as fisheries, aquaculture, maritime tourism, and ocean energy are increasingly viewed not only as sources of economic value but also as levers for environmental protection and inclusive development. Within this context, innovative startups have taken on a pivotal role in driving change by leveraging technology, circular economy principles, and stakeholder engagement to address the unique challenges facing marine ecosystems. This study focuses on the transformative role that Blue Economy startups play in promoting sustainable development, especially in coastal regions that are ecologically sensitive yet socioeconomically underdeveloped. The main objective of the study is to analyze how these startups contribute to sustainability goals while simultaneously fostering job creation, innovation, and coastal resilience. Special attention is given to the context of the Adriatic and Mediterranean regions, with Albania as a key case study, due to its long coastline, growing tourism sector, and strategic interest in marine sustainability.*

Method: *This study adopts a qualitative, literature-based methodology, grounded in secondary research from peer-reviewed academic publications, policy reports, and international blue economy frameworks. The research design is structured around a systematic review and comparative analysis of existing studies focusing on sustainable entrepreneurship within the marine and coastal sectors. Key sources include case studies published by international organizations such as the European Commission, UNCTAD, and the OECD, as well as academic articles from journals specializing in marine policy, environmental economics, and innovation systems. The methodological approach consists of three main steps: (1) identification of the main components of blue economy startups as reflected in global and regional literature; (2) classification of sustainable business models across sub-sectors such as fisheries, eco-tourism, and ocean energy; and (3) comparative synthesis of success factors and challenges across different geographical and institutional contexts, with special attention to Albania and the Western Balkans. Through this desk-based research method, the study draws lessons from documented experiences and established theoretical models, allowing for the construction of a conceptual framework that links innovation ecosystems, policy environments, and startup development in marine industries. This approach offers a comprehensive understanding of how blue entrepreneurship is advancing sustainable development goals in coastal areas.*

Results: *The research identified multiple startups successfully applying innovative models to traditional marine industries. In the fisheries sector, startups are using data analytics and AI* *to track fish populations and promote sustainable harvesting practices, reducing overfishing and waste. In marine tourism, digital platforms have been developed that connect tourists with community-led ecotourism experiences, ensuring local benefit sharing and the preservation of marine biodiversity. In the renewable energy sector, emerging enterprises are experimenting with wave and tidal energy systems adapted to small-scale or off-grid applications, particularly relevant for island communities or remote coastal areas. In Albania specifically, a rising number of coastal startups are focusing on beach-cleaning robotics, marine waste recycling, and cultural heritage tourism linked to underwater archaeology, combining environmental awareness with entrepreneurship. Common to all successful cases was a high level of collaboration with academic institutions and NGOs, access to marine and environmental data, and support through national or EU-funded blue accelerators. The findings also show that where appropriate legal frameworks and financial instruments were in place—such as blue bonds, green credit lines, or seed funding for ecological innovation—startups had higher success rates and greater socio-environmental impact.*

Originality: *This study makes an original contribution by bridging the gap between marine sustainability discourse and entrepreneurial practice through an interdisciplinary lens. Unlike traditional studies that focus on sector-specific solutions (e.g., fisheries alone or tourism alone), this research offers a systems-level understanding of how startup culture, environmental priorities, and innovation policy interact within the Blue Economy. It emphasizes entrepreneurship not just as a business activity but as a transformative mechanism for sustainability, community empowerment, and ecosystem stewardship. Moreover, the study contextualizes Blue Economy entrepreneurship within the unique socio-economic and regulatory landscape of South-East Europe, particularly Albania, offering region-specific insights into opportunities and barriers for sustainable innovation. The analysis also introduces a practical framework for evaluating blue startup ecosystems, which can serve as a policy tool for governments and development agencies aiming to enhance marine innovation capacities. This novel approach opens new pathways for policy, research, and investment in fostering resilient, inclusive, and sustainable coastal economies.*

Keywords: *Blue Economy, sustainable entrepreneurship, marine innovation, coastal development, eco-tourism, fisheries technology, ocean energy, Albania, startup ecosystems, environmental governance.*

CONSOLIDATION OF RESOURCES TOWARDS INCREASING THE ADDED VALUE OF NATURE RESERVES

Oleksandra Vorobiova
Institute of Market and Economic & Ecological Researches of National Academy of Sciences of Ukraine, Odessa, Ukraine
vorobiova.od@gmail.com, ORCID ID: 0009-0002-5520-242X

Abstract

Objective. *In the context of the post-war reconstruction of Ukraine, nature reserve areas (NRA) are gaining new importance as a strategic resource for sustainable development, biodiversity conservation, strengthening environmental security and activating domestic economic potential. At the same time, the existing fragmentation of NRA's resources, both tangible and intangible, does not allow for the full realization of their socio-economic and ecological value. The purpose of the study is to substantiate approaches to the consolidation of protected areas' (PA) resources, which will allow increasing the level of added value of their functioning through the integration of managerial, financial, natural and information resources on the basis of systematization and efficiency.*

Method. *The study uses an interdisciplinary approach that combines methods of economic analysis, a systems approach, and institutional analysis. Elements of structural-functional modeling are used to identify key relationships between types of nature reserve areas' resources and mechanisms for creating added value.*

Results. The results of the study demonstrate that the added value of the NRA activity can be significantly increased by integrating resource potential within a single management and economic model. The concept of resource consolidation is proposed, which involves the formation of horizontal and vertical networks of interaction between PA's objects, management bodies, scientific institutions, business and communities. Within the framework of this concept, basic resources (natural) and supporting resources (human, material and technical, financial, intellectual) are distinguished, each of which should be involved in the process of forming environmentally and economically effective models of territory use.

Therefore, the unification, coordination and optimization of the use of the above groups of nature reserve areas' resources is a modern requirement to achieve the common strategic goal of the functioning of NRA, increase the efficiency of their use and increase the added value of the total PA's product. Consolidation of the resources of nature reserves will help not only to preserve unique ecosystems, but also to ensure their sustainable development for future generations (figure).

Consolidation of resources, despite the existing risks, is a powerful tool for increasing the efficiency of using the potential of the PA and achieving their sustainable development, especially under conditions of rational management and coordinated cooperation between participants. But it should be noted that everything should be preceded by an assessment of resources and the potential for their use. We consider this to be the most important, "zero" stage of consolidation. In order to consolidate and use certain types of resources, you need to know their "volumes", condition (quality), which determine their value, as well as the prospects and consequences of this process.

It is clear that there is no and cannot be a single, common approach to assessing all NRA's resources, since they exist in different dimensions and require different criteria and assessment

methods. The choice of these criteria and methods should depend on the type of resource, the level of resource use, PA's category, assessment objectives, available data, etc. Thus, there can be a lot of these criteria and methods. At the moment, they (criteria and methods) are fragmentary, not systemic in nature. And most importantly, today in Ukraine there are no approved methods for assessing nature reserve areas' resources. For this reason, as well as due to the great complexity of the issue, the assessment of NRA's resources is not carried out today.

Therefore, the issue of developing a list of criteria and methods for assessing the resources of the PA is extremely relevant, which is very complex and voluminous and requires the involvement of specialists from various fields. It is clear that despite the complexity and scale of the problem of the lack of an orderly list of criteria and approved methods for assessing the resources of the nature reserve areas, it must be solved. And in our opinion, it would be logical to start with an attempt to assess the natural resources of the NRA, which, as we have already noted, are the "base" for the development of the NRA - without them there would be no need to attract other, "supporting" resources, and therefore their consolidation.

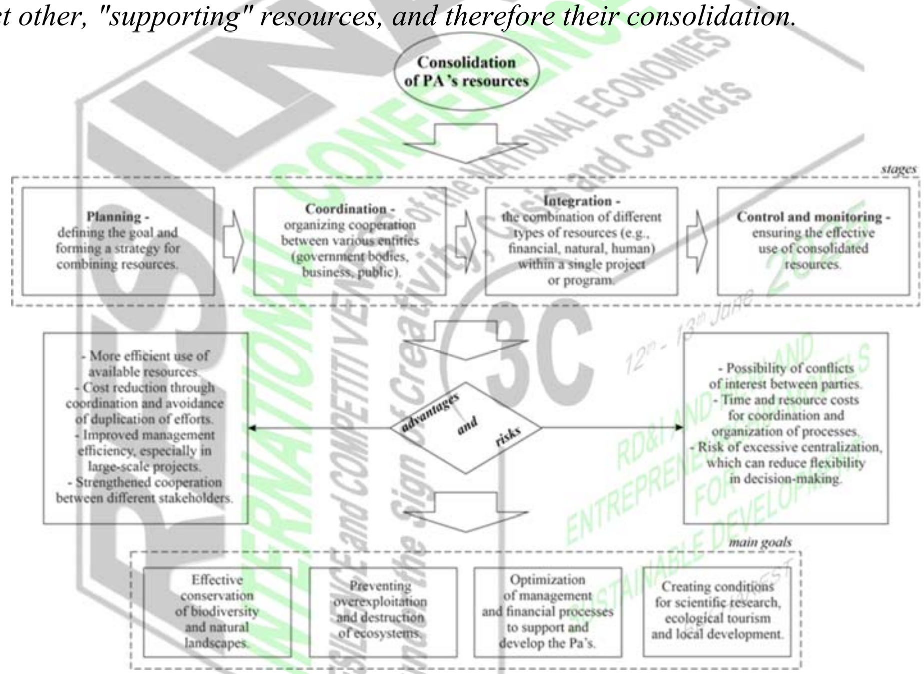


Fig. Consolidation of resources of nature reserve areas

Based on the above, the study concluded that assessment of natural resources of the protected areas is a basic and logically primary stage of consolidation, which makes it possible to clarify the potential, prospects and risks of using these territories within the framework of sustainable nature management.

Particular attention in the work is paid to the development of approaches to the capitalization of natural resources of the nature reserve areas through mechanisms of ecosystem services, the development of sustainable tourism, recreational infrastructure and ecomarketing. It is proved that the formation of added value should occur not only due to the growth of financial performance indicators, but also through social and environmental effects - increased *environmental awareness, improved quality of life of the population, reduced risks of territorial degradation.*

Another important outcome was the proposal to create a single information and analytical environment for the PA, which will provide resource monitoring, transparent reporting, access to digital assessment and planning tools. This, in turn, will become the basis for strategic management focused on results, taking into account the priorities of recovery and sustainable growth.

Originality. *The originality of the study lies in the proposed systemic vision of the consolidation of nature reserve areas' resources as a tool for increasing their added value, which combines economic logic with the principles of environmental sustainability. NRA's resources are considered not as isolated components, but as an integrative system, the potential of which is realized through interaction and coordination.*

Unlike existing approaches that focus primarily on protection or recreational use, the study demonstrates the possibility and feasibility of resource consolidation within a single management space that simultaneously meets the objectives of environmental safety, economic efficiency, and social cohesion.

Keywords: *nature reserves, protected areas, added value, resource consolidation, protected area management, sustainable development.*

SYNERGIZING NATURE-BASED SOLUTIONS AND CIRCULAR ECONOMY STRATEGIES: PIONEERING PATHWAYS TO URBAN SUSTAINABILITY

Benjamin Paul Nyaga*
Western Balkans University, Tirana, Albania
n.paul23@wbu.edu.al , ORCID ID: 0009-0001- 2189-4539
Iges Banda
Western Balkans University, Tirana, Albania
iges.banda@wbu.edu.al, ORCID ID: 0000-0001- 6789-0771
**Corresponding author*

Abstract

In the context of escalating environmental pressures and rapid urbanization, cities around the world are increasingly exploring innovative pathways to enhance sustainability, resilience, and quality of life. The objective of this paper is to examine the potential of integrating Nature-Based Solutions (NBS) and Circular Economy (CE) strategies as complementary approaches to achieving urban sustainability. This research aims to uncover how these two frameworks—often treated in isolation—can be jointly leveraged to address pressing urban challenges such as climate change, resource scarcity, biodiversity loss, and environmental degradation. By highlighting the synergies between ecological restoration, resource circularity, and climate-resilient urban development, this study contributes to a more holistic understanding of sustainable urban transitions.

The ***method*** *employed in this research is a literature-based analysis that synthesizes academic studies, interdisciplinary reports, and practical case examples from diverse geographical contexts. The review encompasses publications from fields such as environmental planning, urban ecology, waste management, and climate adaptation. In addition to scholarly articles, the study draws upon recent policy documents and real-world applications to assess how the co-implementation of NBS and CE principles is unfolding in practice. Through thematic analysis, key patterns, benefits, and barriers related to the joint deployment of these strategies are identified and critically discussed.*

The ***results*** *of the study reveal that the convergence of NBS and CE can significantly amplify the effectiveness of urban sustainability interventions. Case studies demonstrate that strategies such as green infrastructure development, organic waste composting, closed-loop water reuse systems, and urban agriculture initiatives not only enhance ecosystem services but also reduce urban emissions, improve air and water quality, and build community resilience. Importantly, the integration of NBS and CE supports regenerative design thinking by shifting the urban development paradigm from linear to circular and from fragmented to ecosystem-based approaches. However, the findings also highlight persistent challenges, including institutional silos, lack of regulatory alignment, and limited cross- sectoral collaboration, which often impede the scaling of such integrative strategies.*

The ***originality*** *of this paper lies in its cross-disciplinary synthesis and its focus on the intersection between two transformative sustainability paradigms. While both NBS and CE have been widely studied independently, this research brings a novel perspective by exploring their combined application within urban contexts. It emphasizes the importance of systemic thinking, integrated governance, and participatory planning in realizing the full potential of these approaches. Moreover, by identifying key leverage points and success factors from* *existing projects, the study provides actionable insights for urban policymakers, planners, and practitioners seeking to implement synergistic, nature-positive, and circular strategies.*

Ultimately, this paper contributes to the emerging discourse on regenerative urbanism by proposing an integrated framework that aligns ecological integrity with resource efficiency. It argues that cities must embrace interconnected planning solutions that go beyond traditional sustainability models to thrive in a rapidly changing global environment. Through this comprehensive review, the paper lays the groundwork for future research and practical innovation aimed at building greener, more resilient, and inclusive cities.

Keywords: *nature-based solutions, green cities, circular economy, urban planning, climate resilience, ecosystem services*

PRACTICAL GREEN TECHNOLOGIES AND THEIR POTENTIAL FOR SUSTAINABLE GROWTH IN GEORGIA

Giuli Keshelashvili
Ivane Javakhishvili Tbilisi State University, Tbilisi, Georgia
giuli.keshelashvili@tsu.ge, ORCID ID: 0009-0007-2887-3507
Marine Chavleishvili
Ivane Javakhishvili Tbilisi State University, Tbilisi, Georgia
marina.chavleishvili@tsu.ge, ORCID ID: 0009-0002-5902-9206

Abstract
This study explores the integration of sustainable technologies into the value chains of small and medium-sized enterprises (SMEs) in Georgia, with a specific focus on enhancing environmental resilience and economic viability within the framework of nature-based solutions and circular economy principles. Emphasis is placed on the applicability of low-cost, accessible, and scalable technologies suitable for SMEs operating in both urban centers and rural areas. The overarching **objective** *is to evaluate the potential of sustainable value chain development to support green transition strategies and promote inclusive growth, particularly in underserved and ecologically sensitive regions*

The **research** *methodology combines an extensive review of scholarly and grey literature on sustainable supply chain models, eco-innovation, and green technologies with qualitative empirical evidence gathered through in-depth interviews and fieldwork involving Georgian SMEs across various sectors. This dual approach enables the identification of practical tools, processes, and governance mechanisms that facilitate environmental integration at different stages of the value chain—including procurement, production, packaging, transportation, and waste management.*

Findings *reveal that while awareness of sustainable practices is increasing, the implementation of green technologies remains constrained by structural limitations such as inadequate financing, fragmented infrastructure, and a lack of specialized skills within local labor markets. Despite these challenges, the study identifies a set of context-sensitive technologies—ranging from decentralized renewable energy systems to biodegradable packaging and circular waste recovery solutions—that are feasible for SME adoption. The research also highlights the importance of multi-level policy coordination and ecosystem-based planning in enabling more inclusive and resilient urban-rural economic networks.*

This study offers a novel contribution by bridging theoretical constructs of circular economy and green transition with grounded empirical insights from a transitioning economy. By focusing on the operational realities of Georgian SMEs, the research articulates a pragmatic framework for embedding nature-based and circular principles into local economic development. The context-specific analysis provides actionable pathways for scaling sustainable innovation in resource-constrained settings, thus reinforcing the relevance of green entrepreneurship as a driver of ecological and social regeneration.

Keywords: *Green technologies, sustainable development, circular economy, value chain, local innovation*

URBAN HEAT AND ECONOMIC VULNERABILITY: A CLIMATE RISK FOR EUROPEAN CITIES

Răzvan Gh. V. Ionescu

Romanian Academy, School of Advanced Studies of the Romanian Academy, Doctoral School of Economic Sciences, National Institute for Economic Research "Costin C. Kirițescu", Institute of National Economy, Bucharest, Romania

razvanx_ray@yahoo.com

Mirela Panait

Institute of National Economy, Bucharest, Romania; Petroleum-Gas University of Ploiesti, Romania

mirela.matei@upg-ploiesti.ro , *ORCID ID: 0000-0002-5158-753X*

Abstract

With climate change accelerating, European cities are increasingly exposed to extreme heat events that are becoming more severe with each passing year. Urban environments are particularly vulnerable due to the urban heat island effect, where dense infrastructure, the prevalence of heat absorbing materials such as concrete, limited vegetation, and intense human activity increase local temperatures, especially during summer. This is a well-documented phenomenon that poses serious risks not only to public health and environmental quality but also to urban economic stability. In particular, the economic impacts of prolonged heat exposure, which range from reduced labor productivity and higher energy consumption to increased costs for healthcare and infrastructure maintenance, disproportionately affect the most vulnerable populations (children and the elderly, those required to do physical labor outside, the homeless, etc.).

Objective. *The aim of this study is to explore how rising urban temperatures intersect with economic vulnerability across European cities. While the physical dimensions of climate change and urban heat have been widely studied, less attention has been paid to how these environmental stress factors translate into economic hardship, especially for vulnerable individuals. This research aims to address that gap by examining how the distribution of heat risk overlaps with indicators of economic precarity, and how this combination amplifies inequality and raises risks in urban environments.*

Method The approach taken in this study is to assess patterns of urban heat alongside socioeconomic indicators such as income levels, housing quality, energy expenditure, and labor force characteristics. By comparing different urban contexts across Europe, the study seeks to identify where and how climate stress intensifies existing social and economic divides, and what types of interventions might be best suited for mitigating these negative effects. The analysis employs quantitative and qualitative methods, which allows for a broad comparative perspective while also taking into account local nuances that shape vulnerability and adaptation capacity.

Results. *The initial findings suggest that European cities are particularly vulnerable to extreme heat events: a combination of rapidly rising summertime temperatures, an aging population, and a lack of infrastructure to deal with these types of scenarios will pose serious challenges in the future. Within the cities themselves, the heat burden tends to fall unequally across neighborhoods, with less affluent districts often suffering from a lack of tree cover and green spaces, poor building insulation, and higher rates of energy poverty. These are often the places which also house the most vulnerable individuals. Patterns like this are closely linked to*

broader questions of environmental justice and spatial inequality. Moreover, the study highlights how climate related heat risks affect different sectors of the urban economy in distinct ways. Outdoor workers, especially in construction, transport, and informal labor markets, face declining productivity and increased health risks under prolonged high temperatures. Households already struggling with energy costs are more likely to experience thermal discomfort or even health crises during heatwaves, especially when talking about older individuals or those with preexisting health conditions. At the same time, urban infrastructure such as transport networks and public services comes under increasing strain, adding financial pressure to local governments and service providers.

Originality. *This study emphasizes the intersection of environmental and economic vulnerabilities, which are expected to become a matter of great concern in European cities in the next few decades. Rather than treating heat exposure as a purely physical or technical issue, the research frames it as a socioeconomic challenge that affects both cities and the people that work and live in them unequally. By linking climate risk to economic fragility, the study contributes to a more integrated understanding of urban resilience.*

Keywords: *climate change, urban heat island, inequality, labor productivity, European cities, heatwaves*

Funding: This research was supported by a grant from the Petroleum-Gas University of Ploiesti, Romania, project number GO-GICS-30707/10.12.2024, within the Internal Grant for Scientific Research

SUSTAINABLE PRODUCTION AND CONSUMPTION POLICIES PROMOTING THE CIRCULAR ECONOMY IN THE EUROPEAN UNION

Simona Frone
Institute of National Economy, Bucharest, Romania
frone.simona@gmail.com , ORCID ID: 0000-0002-9020-7069
Victor Platon
Institute of National Economy, Bucharest, Romania
victor.platon54@gmail.com , ORCID ID: 0000-0002-8313-3639
Andreea Constantinescu*
Institute of National Economy, Bucharest, Romania
andreea_constantinescu07@yahoo.com , ORCID ID: 0000-0001-6757-711X
Sorina Jurist
Institute of National Economy, Bucharest, Romania
sorinaj2005@yahoo.com , ORCID ID: 0009-0005-2666-2576
**Corresponding author*

Abstract
The transition to the circular economy is one of the strategic directions for sustainable economic development and green growth, promoted by the European Green Deal and, implicitly, by the current cohesion policies of the European Union. Policies aimed at sustainable development, creating jobs, developing infrastructure and protecting the environment could also be used to support the circular economy. Ideally, this is done through appropriate policies and instruments, which are designed taking into account CE requirements, so that many challenges to circular economy projects are addressed through the design of the policy. In particular, 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) - can play an important role in the progress towards SDG 12 Responsible consumption and production and towards the circular economy (CE), since these are policies designed from a green and circular economy perspective.

Objective: *The main objective of this research is to identify and analyse whether and how sustainable production and consumption policies and instruments may also promote implementation and development of a circular economy in the European Union countries.*

Method: *The methodology used for this paper is based on literature review followed by the study and critical analysis of some recent EU policies and regulations targeting the transition to the circular economy (CE) as well as progress towards the SDG 12 Responsible Consumption and Production. There will also be 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, the green economy, and waste generation & management. The approach is meant mainly for emphasizing and analysing the issues, objectives, mechanisms and features of these sustainability policies.*

Results: The EU has developed a wide range of policies and rules addressing the different aspects of the sustainable development goals, in particular of the 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 main features and potential impact of sustainable development from the circular economy (CE) perspective. They are quite innovative and meant to support the qualitative and quantitative 2030 targets of the SDG 12: to significantly decrease the EU consumption footprint; a progressive dematerialization of the production processes; to significantly reduce the total amount of waste generated by 2030. Several expected impacts of such strategic responsible production and consumption policies may be used for promoting the circular economy in the EU, as adapted and applied at different levels of the product life-cycle or of the governance. 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 and synergies of the sustainable production and consumption policy initiatives 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: *sustainable development, sustainable development goal (SDG), responsible consumption and production, policy, circular economy*

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.*

SESSION 5: INCLUSION, DIVERSITY AND INNOVATION IN SOCIAL DEVELOPMENT

LEADERSHIP IN THE ALBANIAN SOUTH REGION PUBLIC SECTOR

Terida Mehilli
The University of Rome "Tor Vergata", Rome, Italy
terida.mehilli@uniroma2.it , ORCID ID: 0009-0000-8183-248X

Abstract
A new concept that is widely discussed today is the so-called leadership. Leadership gives the idea of the concrete need for human beings to have a leader. The object of leadership study is the analysis of the management of procedures for creating a goal, such as that of work in a company, which depends on individual initiatives, the creation of collective symbols, and the continuous search for group identity. In this aspect, in recent years, we have seen the progressive affirmation of a new leader figure, increasingly committed to creating economic values by defining the company's values. Therefore, a leader is not a concept related to the role of the person, but to what is done and above all how it is done. This is why we find this concept related not only to managers but to every other field of our lives.
This study aims to reach local conclusions for the Albanian South Region regarding the leadership style in the public sector, attempting to discover what type of power and power source these organizations have. From the interpretation of the data, we can derive three important conclusions regarding leadership in the public sector in the Southern Region of Albania: a) an authoritarian leadership style predominates in the public sector, b) the source of power stems from the job position, c) the type of power is legitimate authority/power, which presupposes that the group sees in the leader the existence of norms and values that make it accept the leader's influence and guidance.
Keywords: *leadership style, decision-making, organizational leadership, public sector, authoritarian leadership*

LANGUAGE LEARNING AS A VEHICLE FOR EDUCATION FOR SUSTAINABLE DEVELOPMENT

Irena Shehu
University College Beder, Tirana, Albania
ishehu@beder.edu.al, ORCID ID: 0000-0002-5408-9982

Abstract
***Objective**: The concept of Education for Sustainable Development emphasizes the imperative for individuals to acquire the knowledge, skills, attitudes and values necessary to shape a sustainable future. Education for Sustainable Development (ESD) has evolved as a vital interdisciplinary framework to prepare learners for a sustainable future in today's environmental, cultural, and social challenges. While ESD is widely integrated into disciplines such as environmental science and policy studies, its intersection with language education remains underexplored. This research addresses this gap by examining how language education, specifically foreign and second language teaching, can serve as a vehicle for sustainability education. Generally, language teaching is considered as a discipline focused only on the development of linguistic competence, but language education has the potential to shape informed, responsible global citizens capable of engaging meaningfully with issues such as climate change, inequality, and cultural diversity. The main objectives of this study are to investigate whether language teachers incorporate sustainability themes into their curricula, how these themes enhance both language and life skills, and which pedagogical strategies are most effective in aligning language learning with ESD principles. By positioning language educators as facilitators of global competencies, this study highlights their crucial role in cultivating informed, responsible citizens capable of engaging with pressing global challenges.*
***Method**: This study employs a qualitative methodological approach, integrating document analysis and classroom observations to evaluate the role of language education in promoting Education for Sustainable Development (ESD). The classroom observations were conducted over four months in English language courses at Havzi Nela High School, focusing on lessons that incorporated sustainability themes. A total of 20 lessons were observed, each lasting approximately 45 minutes. Observations followed a structured protocol, assessing factors such as student engagement, interaction patterns, integration of sustainability topics, and the effectiveness of pedagogical strategies.*
To ensure consistency in analysis, observation data were categorised using predefined criteria, including the presence of sustainability discussions, the use of task-based learning techniques, and student responses to content-based materials. Additionally, triangulation was applied by comparing findings across different classes and teaching contexts, minimising potential bias. The study also analysed lesson plans and teaching materials, with particular attention to the On Screen textbook series, to assess how sustainability elements were embedded in instructional content.
Sample: The study was conducted at Havzi Nela High School in Kukës, which has approximately 800 students and 5 English language teachers. The focus was on English language courses, which are held for 4 hours per week per class.
***Results**: The findings reveal that language learning environments can successfully promote Education for Sustainable Development (ESD) competencies when sustainability topics are meaningfully integrated into instruction. At Havzi Nela High School, where the On Screen*

textbook series is used, students responded positively to lessons incorporating authentic materials, real-world themes, and communicative tasks related to environmental and intercultural issues. Activities such as debates on climate change, group projects on the UN Sustainable Development Goals, and analysis of media texts on global challenges enhanced learners' motivation and engagement.
Students demonstrated improved critical thinking, cross-cultural awareness, and the ability to express informed opinions in English. Teachers reported that connecting textbook content to sustainability themes made lessons more relevant and stimulating. However, some sustainability topics—particularly those requiring advanced environmental knowledge—proved more challenging for students with lower language proficiency, indicating a need for careful scaffolding. Additionally, while the On-Screen textbook series provided opportunities for sustainability discussions, certain structural constraints within the curriculum limited deeper engagement with more complex sustainability issues, suggesting the need for supplementary materials to fully explore interdisciplinary connections. Despite these challenges, the integration of content-based and task-based approaches supported both language development and the cultivation of values such as empathy, responsibility, and active citizenship.
***Originality**: This research bridges the gap between language pedagogy and ESD implementation by providing practical strategies for educators to integrate sustainability themes into foreign and second language instruction. While existing studies often focus on ESD within science or environmental education, this study highlights how language teaching can serve as a transformative tool for fostering global competencies. It offers a practical model for educators to incorporate the United Nations Sustainable Development Goals (SDGs) into both content and methodology, emphasizing interactive and reflective learning practices. This study contributes to a growing interdisciplinary discourse that connects linguistic education with broader social and ecological awareness by demonstrating how communicative and content-based approaches can align language development with sustainability education.*
***Keywords**: education for sustainable development, language teaching, critical thinking, intercultural dialogue, environmental awareness, communicative approach, global citizenship*

EUROPEAN INTEGRATION AND DYNAMICS OF INDUSTRIAL PRODUCER PRICES IN ROMANIA

Florin Marius Pavelescu*
Institute of National Economy, Romanian Academy, Bucharest, Romania
pavelescu.florin@yahoo.com , ORCID ID: 0000-0001-8994-6190
Cornelia Dumitru
Institute of National Economy, Romanian Academy, Bucharest, Romania
cornelia.dumitru@gmail.com , ORCID ID: 0000-0002-9766-4262
**Corresponding author*

Abstract

***Objective**: The paper analyses the behaviour of the industrial producer prices in Romania in the context of the stages of the country's integration in the European Union. In fact, the respective process of integration started already before, in the context of the second transition to the market economy, and had several stages. Therefore, we can detect the intensification of the economic relationship between Romania and the European Union, already in the early 1990s, at the same time with the implementation of the most important measures and the most painful, as well, from the social point of view, which were aimed at obtaining the economic transformation aligned with the operation of the market mechanisms. The last stage of the second transition to the market economy (2000-2004) was accompanied by measures designed to ensure Romania's accession to the European Union. After the completion of the second transition to the market economy, over the period 2005 – 2006, the efforts were focused on preparing for admission in the European Union which was successfully achieved. Therefore, Romania was admitted to the European Union (2007). From 2007 onwards, Romania's economy has experienced a higher rate of economic growth compared to the whole European Union but also important structural changes. Industry's contribution to the creation of the gross value added tended to decrease. Under these conditions, the dynamics of the industrial producer prices considerably fluctuated. The respective fluctuations were caused both by the particularities of Romania's economic growth and by the trends manifested in the framework of the European Union. Hence, the authors consider that the analysis of the characteristic features of the dynamics of the above-mentioned type of prices in correlation with the fluctuation of the rate of economic growth can contribute to a better understanding of the correlations between the rate of economic development, structural change and inflationary pressures.*

***Method**: The analysis considers the economic cycles of Romania's economy during the 2001-2019 period. This period was chosen to be analyzed having in view both the available statistical data and the structural changes of the economy. The above-mentioned time interval can be seen as a Kuznets cycle in the evolution of Romania's economy. In this context, it is also possible to identify two Juglar cycles and five Kitchin cycles. Considering the respective cycles, the authors have analyzed the fluctuations of rates of growth for the industrial producer prices not only in the case of the whole industrial activity but also in the case of its components (capital goods, intermediate goods, durable consumer goods, non-durable consumer goods, energy). The correlation between the indices of industrial producer prices and the gross domestic product deflator was estimated, as well. Considering the available statistical data,*

the authors make some international comparisons regarding the behavior of the considered type of prices in Romania, the European Union and the Euro Area.
Results*: Each of the considered Juglar or Kitchin cycles had their particularities from the point of view of the annual changes of the rate of the industrial producer prices. We can observe the persistence of high inflationary pressures over the last stage of the second transition to market economy (2001-2004), The acceleration of the economic growth rate and implicitly of the extension of the industrial production during the 2005–2008-time interval was obtained in the context of a decrease of the annual indices of industrial producer prices, which have remained higher by European standards. The inflationary pressures continued to diminish, so that during the 2015-2019 period, in the context of high rate of economic growth, the indices of industrial producer prices in Romania were comparable to those registered in the European Union and Euro Area. Based on these findings, we are able to conclude that each of the above-mentioned short -economic cycles have their own peculiarities from the point of view of the dynamics of the gross domestic product and also from the point of view of structural changes and stages of Romania's integration in the European Union economy.*
Originality*: The present paper has elements of originality generated by its objectives, respectively, the study of the behaviour of the industrial producer prices during a period of ample transformation of Romania’s economy. The proposed methodology is original because it considers the study of the prices dynamics in the context of short economic cycles, on the one hand, and the correlations between the industrial producer prices and the gross domestic deflator, on the other hand. Also, the greater volatility of the price dynamics in Romania is underpinned, as compared to the European Union and Euro Area.*
Keywords*: economic cycles, structural changes, gross domestic product deflator, energy, non-durable goods, intermediate goods, capital goods, durable goods, external shocks,*
Funding not applicable

STRUCTURAL SOCIAL PILLAR FOR POST-WAR DEVELOPMENT OF UKRAINE: OVERCOMING SOCIO-ECONOMIC INEQUALITIES

Tetiana Burlay

Institute for Economics and Forecasting of NAS of Ukraine, Kyiv, Ukraine

btv2008@ukr.net , ORCID ID: 0000-0003-4530-9151

Abstract

The article examines the issue of constructing for Ukraine's post-war development such a social pillar, which is of a structure-forming nature and appeals to the basic approaches provided by the European pillar of social rights. The evidence of this study's relevance is related, firstly, to the preparation of the thematic block "Human Capital" of the High-Level Ukraine Recovery Conference, which will be held in July 2025 in Rome. And, secondly, to the need to improve the very modest assessments of the results of Ukraine's European integration in the area of "Social Policy and Employment", which are presented in the European Commission's 2024 Report on Ukraine's progress within the EU Enlargement Package. In this context, it is important that already a year after the deep military-economic shock of 2022, Ukraine, thanks to the huge support of the collective West, was able to demonstrate macroeconomic resilience, including the social dimension. This was once again confirmed in March 2025 following the next IMF review of the Extended Fund Facility program for Ukraine. For the purposes of successful post-war recovery, the country needs to preserve and strengthen its social resilience, which requires the formation of its own structural social pillars.

Objective*: The purpose of the study is to identify the essential elements of the structural social pillar for Ukraine's post-war recovery, related to socio-economic inequalities, and ways to activate such elements through state governance. According to the academic justification, equal access to the labor market, fair employment and income distribution, as well as an effective system of social support are among the structural pillars of the socio-economic development of Ukraine during the period of martial law and post-war recovery. While, in order to prevent social unrest, the attention of domestic legislative, political and scientific-expert circles should be to the factorial influence of the national labor market on the inequality dynamics in Ukrainian society.*

Methods: To achieve the research objective, a comprehensive interdisciplinary approach is used, including the method of time series analysis, factor analysis, and institutional methodology.

Results*: Based on institutional theory, it has been proven that in transitional societies with high corruption and a large shadow segment of the economy, such as the Ukrainian society, a necessary component of building a structural social pillar is the reduction of high-level inequality. It is also shown that today inequality is a multidimensional phenomenon, that is, objectively it refers to a set of socio-economic inequalities, incl. equal access to vital resources and goods, gender, age, wealth, disability status, etc. The decisive influence of serious unresolved inequalities on the dynamics of development of countries with economies in transition is proven, in particular, by the experience of Central and Eastern European EU states, which is of interest to Ukraine as a candidate country for EU membership. Based on the results of the analysis of this experience, it was established that reducing inequalities requires overcoming the destruction of national labor markets. The study identifies the main* *destructions of the Ukrainian labor market of the (pre)war period, which deepen inequalities in society and generate potential threats to the post-war reconstruction of Ukraine. It is substantiated that among the key destructions are huge gaps in wages in the domestic public sector. Using data from the Ministry of Finance of Ukraine, it is shown that in 2024, the gaps in average wages: civil servants of ministries and employees in the formal economy reached more than 4 times; employees of the judiciary and employees in the formal economy reached 18 times; top managers of state-owned enterprises and employees of the relevant industry of Ukraine were from 14 to 175 times. The results of the study suggest practical regulatory steps to overcome the destruction of the national labor market. The implementation of these measures will contribute to the reduction of inequalities in Ukrainian society and, accordingly, the formation of a structural social pillar for post-war Ukraine.*

***Originality**: The originality of the research is connected with the social and societal objectives of post-war reconstruction of Ukraine on the basis of human-centeredness, reducing inequality in the context of the SDGs, strengthening social justice and social resilience, as well as overcoming social divergence between Ukraine and the EU in the post-war period. The originality is also evident in the consideration of the specifics of the socio-economic development of Ukraine under martial law and the key objects of its reconstructive recovery after a full-scale military conflict.*

***Keywords**: Russian-Ukrainian war, post-war recovery, inequalities, social pillar, labor market, destruction.*

***Funding**: This work was supported by the NAS of Ukraine, Project "Formation of structural pillars of the war and post-war economic development of Ukraine" [State Registr. No 0125U000280; 2025].*

ASSESSMENT OF THE EFFECTIVENESS OF THE PENSION SYSTEM IN THE CONDITIONS OF AGING POPULATION IN THE REPUBLIC OF MOLDOVA

Anatolii Rojco
National Institute for Economic Research, Academy of Economic Studies of Moldova, Chisinau, Republic of Moldova
rojco@mail.ru, ORCID ID: 0000-0003-2089-696X
Ecaterina Heghea
National Institute for Economic Research, Academy of Economic Studies of Moldova, Chisinau, Republic of Moldova
heghea.ecaterina@ase.md, ORCID ID: 0000-0002-7677-8295

Abstract
Objective*. The demographic aging process in the Republic of Moldova has a negative impact on the effectiveness of the pension system, which is based on the principle of intergenerational solidarity. This situation creates the need to reform the system to ensure an adequate level of pensions while maintaining an acceptable financial burden for contributors. The objective of this study is to assess the main indicators of the socio-economic effectiveness of the pension system under the pressure of an aging population.* ***Method****. The study employed a combination of monographic, statistical, comparative, and analogy-based research methods. The demographic aging of the population was analyzed through the dynamics of several indicators: the aging coefficient, the old-age dependency ratio, and the intergenerational support ratio. To evaluate the effectiveness of the pension system, the research applied World Bank criteria, calculating indicators such as the ratio of the average pension to the subsistence minimum for pensioners, pension purchasing power, the insured workers-to-pensioners ratio, and pension expenditures as a percentage of GDP. Special attention was given to the replacement rate, calculated according to internationally recognized methodological approaches.*
Results*. The results confirm the deepening of demographic aging in the Republic of Moldova, reflected in the deterioration of key indicators. The ratio of insured workers to pensioners is steadily declining, contributing to increased financial pressure on the system. The average pension remains insufficient in relation to the minimum subsistence level, and its purchasing power has been eroded by inflation. The replacement rate, a key measure of adequacy, falls short of international benchmarks. Overall, the findings indicate a decreasing efficiency of the pension system, calling for immediate improvement measures in the face of demographic constraints.* ***Originality****. This study provides a structured and multi-indicator evaluation of the Moldovan pension system within the framework of demographic aging. Its originality lies in the integration of demographic trends with internationally recognized efficiency criteria. The application of World Bank indicators to the Moldovan context offers a new perspective on systemic weaknesses and highlights the need for proactive and sustainable pension reforms.*
Keywords*: efficiency of the pension system, demographic aging of the population, population aging rate, subsistence minimum, replacement rate, ratio of the number of insured workers and pensioners.*
Funding*: This work 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.*

CONSUMER COOPERATIVES IN TRANSITION: STRUCTURAL CHALLENGES AND STRATEGIC PATHWAYS IN THE REPUBLIC OF MOLDOVA

Larisa Savga

Trade Co-operative University of Moldova, Chisinau, Republic of Moldova, Dunarea de Jos University of Galati, Romania

savga.larisa@gmail.com , larisa.savga@ugal.ro , ORCID ID: 0000-0002-9691-7475

Abstract

Objectives: *Consumer cooperatives play a growing role in addressing socio-economic challenges through inclusive, community-based solutions. In Moldova, this sector has over 155 years of history and continues to be relevant, especially in light of the country's EU accession process. Global megatrends and national priorities call for a strategic rethinking of the cooperative development model by 2030.*

This study explores the evolution and strategic perspectives of consumer cooperatives in the Republic of Moldova, emphasizing their potential to contribute to sustainable socio-economic development in alignment with European integration objectives. Despite numerous challenges, including demographic decline, geopolitical instability, economic crises, and shifts in consumer behavior, consumer cooperatives have maintained their relevance. The research aims to analyze current development trends, identify internal and external obstacles, weaknesses, and opportunities, assess the sector's capacity for transformation, and define strategic priorities for strengthening cooperative enterprises by 2030.

Methods: *A multidisciplinary methodology, based on a mixed-methods approach combining quantitative and qualitative techniques, was adopted to ensure comprehensive research. This included the analysis of national policy documents (such as the National Development Strategy "European Moldova 2030"), sectoral strategies, and evaluation reports; the review of the European and global normative framework on cooperatives; and the examination of relevant international recommendations in the field of cooperatives development. Additionally, a SWOT and PESTEL analysis of the consumer cooperative system was conducted, along with economic and statistical analyses, field visits, interviews, surveys, and stakeholder consultations involving cooperative members, managers, and public authorities. Benchmarking against international best practices and forecasting tools were also employed to define strategic priorities. Data from the Central Union of Consumer Cooperatives of Moldova (Moldcoop) served as a primary empirical foundation.*

Results: *The findings reveal that Moldovan consumer cooperatives have demonstrated resilience despite unfavourable conditions, maintaining a stable network of economic and social activities. However, the sector faces several structural and operational challenges: aging infrastructure, limited access to modern technologies, insufficient financial instruments, lack of human capital, and a low level of innovation. The study highlights the need for reorganization, digitalization, and investment in capacity-building. Additionally, it underscores the importance of aligning cooperative policies with EU practices to ensure competitiveness and long-term sustainability. The research provides a roadmap structured around five strategic priorities: modernization and innovation; financial sustainability; human capital development; institutional reform; and European integration alignment. These* *priorities form the basis of the proposed "Consumer Cooperatives Development Strategy of the Republic of Moldova towards 2030".*

***Originality**: This study provides the comprehensive strategic framework for the development of consumer cooperatives in Moldova, grounded in both empirical evidence and European best practices. Its originality lies in the integrative approach that combines local realities with the strategic imperatives of EU alignment. The proposed roadmap offers policymakers, cooperative leaders, and development partners a practical tool to guide the transformation of the sector in a dynamic and uncertain environment.*

***Keywords**: consumer cooperatives, strategic development, sustainable growth, cooperative governance, socioeconomic impact, European integration*

THE ROLE OF SOCIAL ENTREPRENEURSHIP IN ENHANCING EMPLOYMENT OPPORTUNITIES FOR YOUTH, ROMA, AND REFUGEES IN ROMANIA

Diana-Margareta Morișcă
"Stefan cel Mare" University of Suceava, Suceava, Romania
dianamorisca96@gmail.com , ORCID ID: 0009-0005-2495-0814

Abstract

Objective*: Social entrepreneurship has increasingly become a strategic mechanism to promote labor market inclusion for vulnerable groups, particularly youth, Roma communities, and refugees. In the context of growing inequality, demographic challenges, and geopolitical instability in Eastern Europe, these groups are disproportionately affected by economic marginalization. In Romania, they continue to face systemic barriers such as high unemployment rates, limited access to vocational training, educational disadvantages, and social stigma. Young people often struggle with the school-to-work transition, Roma communities experience intergenerational poverty and discrimination, while refugees face linguistic, administrative, and cultural challenges.*

This paper explores the role of social enterprises as facilitators of inclusive employment strategies. It investigates how social entrepreneurship can mitigate these inequalities by creating tailored job opportunities, upskilling programs, and supportive ecosystems. The study aims to highlight successful models, identify policy gaps, and assess the potential for scaling such initiatives at national and regional levels.

Method*: The study employs a qualitative and quantitative synthesis of secondary data collected from public sources and institutional reports covering the period 2022–2024. These include Eurostat, UNHCR, NESsT, as well as research papers and policy briefs from NGOs and academic institutions engaged in labor market integration and social innovation.*

A descriptive statistical analysis is applied to examine key labor market indicators such as youth unemployment (ages 15–24), Roma employment estimates, and types of economic support provided to refugees. Additionally, a comparative review of social entrepreneurship initiatives and their outcomes is presented. Case studies include the NESsT–IKEA Social Entrepreneurship initiative and UNHCR-supported vocational integration projects.

The analytical framework is grounded in inclusive development theory and social innovation methodology, aiming to connect empirical evidence with structural policy implications.

Results*: Findings reveal that youth unemployment in Romania rose significantly during the analyzed period, reaching 26.3% in 2024, compared to 20.3% in 2022, placing Romania among the EU countries with the highest rates. Structural factors such as poor career guidance, limited apprenticeship systems, and skill mismatches contribute to this trend.*

Although official data on Roma unemployment is limited, national and European reports estimate that Roma employment rates are 20–30 percentage points lower than the national average, with pronounced rural-urban disparities and minimal participation in formal education or vocational training. Many Roma youth are classified as NEET (Not in Employment, Education, or Training), placing them at high risk of long-term exclusion.

Regarding refugee integration, UNHCR reports that over 9,200 refugees in Romania received economic inclusion support in 2024, including job counseling, training, and employment

facilitation. However, access to stable jobs remains a challenge due to legal, cultural, and logistical barriers.

The NESsT–IKEA Social Entrepreneurship initiative serves as a notable good practice. Supported by Cisco Foundation, the program has helped develop 15 social enterprises in Romania and Poland, providing over 5,000 refugees with access to employment, training, mental health support, language courses, and childcare services—thus contributing to multidimensional and sustainable integration.

***Originality**: This study offers an up-to-date synthesis of labor market trends and social innovation practices, providing an original contribution to understanding how social entrepreneurship can address structural inequalities. By taking a cross-cutting view of vulnerable groups and combining quantitative data with case-based evidence, the study highlights scalable approaches that can inform both public policy and grassroots practice.*

Unlike studies that focus on a single population or national case, this research adopts an intersectional and regional perspective, advocating for integrated employment strategies backed by public-private partnerships. The study reinforces the idea that social enterprises are not merely economic actors, but also agents of equity, resilience, and sustainable development in marginalized communities.

Policy recommendations include: expanding funding schemes for social enterprises, simplifying employment frameworks for migrants, offering tax incentives for inclusive hiring, and developing national monitoring systems to track social impact effectively.

***Keywords**: social entrepreneurship, youth unemployment, refugees, Romania, social innovation*

ROMANIA'S PRIVATE PENSION SYSTEM AND ITS IMPACT ON THE ELDERLY

Ștefan Virgil Iacob

Petroleum – Gas University of Ploiesti, Romania; Institute of National Economy, Romanian Academy, Bucharest, Romania

stefaniacob79@yahoo.com

Abstract

The research, which focused primarily on the pension system in Romania and secondarily on the situation of the elderly, was initiated on the basis of the observation that Romania has recently been experiencing a profound demographic transition. This transition is characterised by a decline in the birth rate and a concomitant acceleration in the elderly population's share. This phenomenon of population aging thus represents a serious problem, with significant effects on both the pension system and public health. According to data sourced from authorised bodies such as the National Institute of Statistics and Eurostat, Romania is facing a marked phenomenon of population ageing. In Romania, the proportion of the population that is over 65 years of age is practically 19%, a figure which is increasing. Concurrently, the birth rate is declining, and the migration of the young workforce to other countries that offer more favourable conditions further exacerbates this imbalance. This is indicative of an imbalance between the active population, which contributes to the pension budget, and the number of pensioners, in the sense that in 2024, according to statistical data, approximately 1.2 employees support 1 pensioner, which exerts significant pressure on Pillar I, the public pension. In this research, the focus was directed towards the evolution of the mandatory private pension system in the Romanian pension system, Pillar II, which was introduced in 2008 as part of the reform that aimed to ensure the sustainability of the pension system in the context of an ageing population and the pressure on the public budget. Additionally, the evolution of optional private pensions in the Romanian pension system, Pillar III, was examined. This pillar can be regarded as a form of voluntary savings intended to supplement income at retirement age, alongside the public pension Pillar I and the mandatory private pension Pillar II. Another sensitive aspect pertains to the level of pensions in Romania. According to data from the National House of Public Pensions, the average pension in Romania in 2024 was approximately 2,289 lei, while the minimum consumption basket for a decent living was estimated at 3,972 lei according to the Friedrich Ebert Foundation Romania and Sydex Romania. The discrepancies between the level of pensions and the real costs of living engender an elevated degree of vulnerability among the elderly, particularly in rural areas. In a similar manner, the elderly population constitutes the most vulnerable demographic with regard to chronic diseases and social isolation. It is evident that the Romanian healthcare system is not adequately adapted to meet the needs of this category. In many regions, access to specialised medical services and home care for the elderly is limited, underfunded or non-existent. The study employs dynamic analysis, comparative analysis from one period to another, and the use of statistical-econometric methods and models to draw future development perspectives for the variables considered, which characterize the considered socio-economic phenomenon. A thorough examination of the study's findings necessitates a re-evaluation of the existing public pension system. This re-evaluation should encompass a recalibration of the retirement age and the introduction of measures to invigorate the Third Pension Pillar. Furthermore, the

promotion of active economic participation among the elderly through part-time employment policies, alongside the expansion of the network of social and medical services by establishing community centres and home care, has the potential to enhance the situation of the elderly. Concurrently, the implementation of measures designed to stimulate the birth rate and to counteract migration, including the implementation of family policies, the provision of tax incentives, and the allocation of investments in infrastructure for young people, has the potential to exert a favourable influence on the circumstances of the elderly population.
***Keywords**: pensioners, pension system, active population, economy, developments.*

MANAGERIAL MODELS FOR REDUCING SOCIAL EXCLUSION OF ELDERLY PEOPLE: AN INNOVATIVE AND INTERSECTORAL APPROACH

Ecaterina Heghea
National Institute for Economic Research, Academy of Economic Studies of Moldova, Chisinau, Republic of Moldova
heghea.ecaterina@ase.md, ORCID ID: 0000-0002-7677-8295
Iulia Garabajii
National Institute for Economic Research, Academy of Economic Studies of Moldova, Chisinau, Republic of Moldova
garabajii.iulia@ase.md, ORCID ID: 0009-0000-9634-6281

Abstract
Objective: *Social exclusion of elderly people is a significant issue in the Republic of Moldova, requiring innovative managerial solutions. This study proposes a public policy management model aimed at reducing the social exclusion and inequality among elderly people, focusing on collaboration between public authorities, non-governmental organizations, and economic agents. The main objective is to develop a strategy that addresses the specific needs of elderly people and utilizes available resources to mitigate their social exclusion and reduce inequality.*
Method*: To develop the proposed model, the study is based on an analysis of the institutional mechanisms and structures involved in elderly social protection. It includes an evaluation of current public interventions, as well as an analysis of the interactions between the various organizations involved, such as public authorities, non-governmental organizations, and economic agents. The study employs theoretical analyses and models of social exclusion management processes, aiming to identify feasible solutions within the current context of the Republic of Moldova.*
Results*: The results of the study suggest that reducing social exclusion and inequality among elderly people in Moldova can be achieved through an integrated approach that combines efforts from public authorities, the private sector, and non-governmental organizations. The study identifies solutions in the economic, social, and healthcare sectors, including increasing elderly incomes and improving access to social protection and healthcare services. Furthermore, it emphasizes the importance of creating a more efficient legislative and institutional framework to support these initiatives.*
Originality*: This study offers an innovative approach by integrating public, non-governmental, and private sector actors into a public policy management model for reducing social exclusion and inequality among elderly people. The originality of the proposal lies in its focus on intersectoral collaboration and optimizing the use of available resources to create a significant impact on the social inclusion and reduction of inequality for elderly people.*
Keywords*: social exclusion, inequality, elderly people, public policy management, intersectoral collaboration, inclusion*
Funding*: This work 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.*

TERRITORIAL RESILIENCE. A DYNAMIC AND MULTIDISCIPLINARY APPROACH

Daniela Antonescu*
Institute of National Economy, Bucharest, Romania
daniela.antonescu25@gmail.com, ORCID ID: 0000-0003-3785-9022
Ioana Cristina Florescu
Institute of National Economy, Bucharest, Romania
ioanaflorescu2001@yahoo.com, ORCID ID: 0000-0002-2582-4140
**Corresponding author*

Abstract

In regional economics, resilience refers to a region's ability to tolerate certain disruptions, preceded by a process of reorganization around new structures. A resilient economic system can rely on the reaction of the economy, institutions, and social organizations that can perform the following actions: utilizing innovations that explore new processes and organizational models, applying external information with innovative effects, developing formal and informal networks between people and institutions, and implementing adaptive and efficient development strategies, estimating resilience to economic crises based on the speed of recovery of economic indicators to pre-crisis levels, implementing a strategy to increase regional resilience involves a major collaborative effort between institutions and other stakeholders. Research on adaptive governance of complex social systems shows that increasing resilience in such systems is a difficult and complex activity that cannot be easily planned and controlled by a single institution (government). Local or regional authorities aiming to increase territorial resilience to economic shocks need to collaborate with a range of other territorial actors and develop response measures to disturbances within a collaborative and fluid governance network.

This study aims to analyze the resilience of development regions in the context of multiple crises. This analysis will measure the sensitivity of regions to shocks caused by various crises (pandemic, geopolitical, environmental, etc.). It will also show the extent to which these development regions have adapted to these newly emerged situations and whether they are capable of absorbing and receiving extreme impulses without significant changes. Composed of a multitude of firms and economic, social institutions, universities, research centers, etc., regional systems can recover quickly through innovative activities. Moreover, these crises are considered, in themselves, a process of cumulative growth, adaptation, or resistance to new global transformations, regardless of their nature. Currently, analyzing various forms of resilience and the capacity of territorial systems (regions, urban areas, cities, etc.) is of particular interest, especially from the perspective of regional economic theory.

The territorial resilience approach is of particular importance in the post-health crisis period, as some areas may adapt better and faster to situations, recovering more quickly, while others face structural changes, unemployment, migration, business bankruptcies, etc., which ultimately lead to inevitable decline and a difficult and sluggish recovery. Last but not least, understanding and addressing the factors that determine faster territorial resilience remains an interesting and timely subject.

***Objectives**:*

1. review of the scientific literature;

2. analysis of the resilience of the regions in the European Union and Romania;

3. identification of the main economic and financial instruments supporting territorial resilience (cohesion and regional development policy, Regional Operational Programmes, the National Recovery and Resilience Plan – NRRP, other Operational Programmes, etc.);
4. identification of the influence (econometric relationship) between wage income, the total number of commercial enterprises, and the number of employees on regional GDP, both in the short and long term;
5. presentation of successful regional models;
6. conclusions.

***Method**: review of the scientific literature, searching for keywords in the title and abstract, going through the most cited articles and studies, text analysis, analysis of context and data, focusing on objectives and results, graphical methods for presenting statistical data, the method of interpreting structures and structural changes over time or across regions, presentation and interpretation of development trends, of selected indicators, forecasting and development of an econometric model, analysis of research results; recommendations; conclusions; compilation of the bibliography; data verification.*

***Results**:*

- *Presentation and analysis of significant scientific literature, as well as the main theories and theoretical approaches regarding general and territorial resilience..*
- *Analysis and interpretation of the main theoretical currents that have focused on territorial resilience, the factors influencing this concept, the primary assessment methods, the strategies that can contribute to achieving a certain level of resilience, and the most recent studies and articles that have enriched the scientific literature.*
- *Development of an econometric model to analyze the effects of wages, the total number of commercial enterprises, and the number of employees on regional GDP, both in the short and long term, based on data from the National Institute of Statistics (NIS) for the period 2000–2021.*
- *Regional analyses aimed at assessing territorial inequalities in order to identify the level of resilience during the two major crisis periods.*
- *Identification of the main funding sources at the regional level, as well as the programs and strategies necessary to ensure dynamic resilience from the perspective of future developments.*

***Originality**: The subject addressed contributes to the development of new concepts and perspectives of territorial resilience. The way in which the regions reacted to the impact of the crisis, the supporting actions, the specificity of the territorial measures are presented in a scientific and academic manner. The overall picture that the authors present is characterized by originality and an innovative character.*

***Keywords**: territorial resilience, multiple crisis, development regions, sustainable development, regional policy, convergence*
Funding: no applicable

A PANEL ANALYSIS OF THE TERRITORIAL RESILIENCE IN ROMANIA AT THE METROPOLITAN LEVEL

Daniela Antonescu*
Institute of National Economy, Bucharest, Romania
daniela.antonescu25@gmail.com, ORCID ID: 0000-0003-3785-9022
Ioana Cristina Florescu
Institute of National Economy, Bucharest, Romania
ioanaflorescu2001@yahoo.com, ORCID ID: 0000-0002-2582-4140
**Corresponding author*

Abstract

A metropolitan area, or metropolitan region, refers to a densely populated urban core and its surrounding territories, often including suburbs and other areas with significant economic and social ties to the central city. These areas are characterized by high levels of urbanization, infrastructure, and a mix of residential, commercial, and industrial zones. Urban resilience, from the perspective of the transformative approach, has become a central paradigm in the definition and design of territorial planning and development policies. This paradigm has multiple implications, ranging from using the right resilience approach for urban systems to defining an appropriate assessment framework to address all the characteristics of territorial resilience. Metropolitan areas have benefited disproportionately from the digital revolution in Europe, with a high rate of knowledge-based and service-based jobs. Existing research on a number of metropolitan areas has shown that they have high employment rates (2022), most of which are found in particular in the Nordic countries or the Benelux. Furthermore, these regions have seen the strongest employment growth between 2019 and 2022, especially in well-paid jobs. A study by Eurofound and the European Commission's Joint Research Centre has published a report on the Regional Transformation of Employment and the Geography of Remote Work in Europe, which provides a detailed analysis of regional aspects of employment and economic resilience in the wake of the COVID-19 pandemic. Around 90% of EU regions exceeded their pre-pandemic employment levels by 2022; however, significant regional inequalities are reported. EU regions have performed differently, depending on their economic specialisation and in particular in terms of the concentration of jobs in knowledge-intensive services that can be performed remotely. As employment and economic activity increase in urban areas, sparsely populated areas continue to face economic decline and long-term depopulation. This is despite the fact that rural areas generally have more affordable and spacious housing, less pollution and more natural amenities. It is noted that territorial policies targeting industry and innovation have the potential to modify demographic and economic inequalities between rural and urban areas, allowing regions to capitalise on their unique characteristics and by deepening their understanding of place-specific opportunities. In Romania, metropolitan areas are private agencies of public utility which were established by Law no. 351 of 6 July 2001 with the aim of encouraging the development of neighbouring towns and communes within a radius of 30 km. The first to be established was the metropolitan area of Iasi, on 8 April 2004. There are nine metropolitan areas in Romania that have been constituted as of 2019. In Eurostat statistics, Romania has nine metropolitan areas: Bucharest, Cluj-Napoca, Timisoara, Craiova, Constanta, Iasi, Galati, Brasov and Ploiesti. The area of metropolitan regions represents 51.72% of the total area of Romania, with a density of 242 *inhabitants/km2, significantly higher than that at the national level (81 inhabitants/kmp, year 2023). This study investigates the relationship between the number of enterprises, the number of employees, and the gross domestic product (GDP) per capita in Romania's metropolitan areas, in the context of regional economic resilience. As metropolitan areas are increasingly recognized as engines of economic development, understanding the structural factors that support their economic performance becomes essential. The analysis is based on the data gathered from Eurostat, covering 9 of the metropolitan areas of Romania over a multi-annual period.*

Objective*: The objective of this research is to assess how enterprise density and labor force distribution influence economic output per capita, providing insights into territorial disparities and resilience-building factors across Romanian metropolitan regions.*

Method*: The methodological approach employs a panel analysis for the metropolitan regions of Romania in order to identify the strength and direction of associations between the independent variables (number of enterprises and number of employees) and the dependent variable (GDP per capita).*

Results*: The main results indicate a statistically significant positive impact of both variables on GDP per capita, with stronger effects observed in regions with diversified economic structures and higher levels of urban agglomeration. These findings suggest that the enterprises and employment levels are key drivers of economic resilience at the metropolitan scale.*

Originality*: The originality of this study lies in its metropolitan-level focus, a relatively underexplored spatial scale in the Romanian context. By integrating economic resilience theory with empirical territorial analysis, the paper offers a novel perspective on the role of local economic structures in shaping regional adaptive capacity.*

Keywords*: metropolitan resilience; GDP per capita; number of enterprises; employment; regional development*

Funding: no applicable

DEVELOPING THE INDEX OF SOCIAL RESILIENCE FOR MOLDOVA: A MULTIDIMENSIONAL APPROACH

Mihail Ciobanu

National Institute for Economic Research, Academy of Economic Studies of Moldova, Chisinau, Republic of Moldova

ciobanu.mihail.s@gmail.com , ciobanu.mihail@ase.md ,

ORCID ID: 0000-0003-1193-6018

Abstract

Objective*: In the context of increasing socioeconomic instability, public health crises, environmental pressures, and global uncertainty, the concept of resilience has become a critical component of sustainable development strategies. For the Republic of Moldova - a country undergoing structural reforms and striving for European integration - understanding and enhancing social resilience is essential to reducing vulnerability and promoting inclusive growth. This study aims to develop and apply a comprehensive and multidimensional Index of Social Resilience (ISR) that captures the capacity of different regions to respond to and recover from adverse shocks. The main objective is to provide a practical and evidence-based tool for policymakers to monitor resilience trends, assess disparities, and prioritize interventions. Additionally, the study seeks to support Moldova's efforts to harmonize its social resilience indicators with European standards.*

Method*: The methodological approach involves the construction of a composite index based on six key dimensions considered essential for social resilience: economic stability, educational capacity, social welfare, living standards and infrastructure, food security, and community safety. Each dimension includes a set of measurable indicators selected based on availability, relevance, and comparability. Data normalization was performed using the min-max method to standardize indicators on a scale from 0 to 1, accommodating both positive and negative influences on resilience. The aggregated index was calculated using an equal weighting scheme and applied at the regional level, allowing for spatial analysis of resilience across Moldova. Comparative analysis was conducted using data from two reference years - 2019 and 2023 - to examine the dynamics of regional resilience over time.*

Results*: The findings reveal a moderate but measurable improvement in the national Index of Social Resilience between 2019 and 2023. The municipality of Chisinau consistently achieved the highest resilience scores, increasing from 0.630 to 0.673, driven primarily by improvements in education and infrastructure. However, marked regional disparities remain, particularly in central and southern districts, where resilience levels are significantly lower due to persistent challenges in employment, income security, and access to services. The analysis also highlights areas of progress, such as improvements in educational attainment and food availability, but underscores persistent weaknesses in social protection and employment stability. These results suggest that while national-level policy reforms have had some impact, targeted regional measures are still required to address inequality and structural vulnerability. Moreover, the data indicate a growing need for locally tailored resilience strategies that go beyond uniform national policies.*

Originality*: This study is among first to propose a structured and data-driven Index of Social Resilience tailored to Moldova's national and regional contexts. It contributes an original methodological framework for multidimensional resilience assessment, combining*

socioeconomic and infrastructural indicators into a unified measurement tool. The ISR not only enables cross-regional comparison but also provides a dynamic monitoring mechanism aligned with European policy frameworks for resilience and sustainable development. Its originality lies in its adaptability to other contexts, its policy relevance, and its capacity to inform evidence-based interventions aimed at building a more equitable and resilient society. Additionally, the study highlights the strategic role of resilience indices in facilitating international benchmarking and resource prioritization within transitional economies.
***Keywords**: resilience, Moldova, index, multidimensional, economic, social*

ECONOMIC DYNAMICS OF THE WATER SERVICE OPERATORS IN ROMANIA: AN ARDL APPROACH

Octavia Moise*

Romanian Academy, School of Advanced Studies of the Romanian Academy, Doctoral School of Economic Sciences, "Costin C. Kirițescu" National Institute for Economic Research; Institute of National Economy, Bucharest, Romania

moctavia2005@yahoo.com , ORCID ID: 0009-0002-3443-4109

George Banghiore

Romanian Academy, School of Advanced Studies of the Romanian Academy, Doctoral School of Economic Sciences, "Costin C. Kirițescu" National Institute for Economic Research; Institute of National Economy, Bucharest, Romania

george.banghiore@gmail.com , ORCID ID: 0009-0006-3461-0431

**Corresponding author*

Abstract

Objective*: This paper presents a comprehensive econometric analysis of the public water supply and sanitation sector in Romania, with a focus on the key factors influencing operational profitability. The primary objective is to assess the impact of economic and technical factors on the operating profit margins of water utilities. This study highlights the relevance of applying the Autoregressive Distributed Lag model to the analysis of Romania's water supply and sanitation sector. The sector is characterized by significant regional disparities and complex interdependencies between operational, financial, and commercial variables. The ARDL methodology enables the estimation of long-run equilibrium relationships while allowing short-run dynamics to vary across regional utilities, reflecting the heterogeneous operational conditions across the country. This is particularly important in a context where national policy objectives are uniform-such as ensuring infrastructure expansion and financial sustainability-but where local implementation and consumer behavior differ widely.*

Method*: This study investigates the key determinants of profitability in Romania's water sector using an econometric approach based on the Autoregressive Distributed Lag (ARDL) model. Using the ARDL methodology, developed by Pesaran, Shin, and Smith (1999) it is analyzed the dynamic relationships between operational, financial, and commercial factors and profitability in Romania's water sector. The ARDL framework allows the inclusion of both I(0) and I(1) variables without requiring prior differencing, as long as none of the series are integrated of order two (I(2)). The ARDL model is particularly suitable for panel data with a moderate time dimension, where it is assumed that a long-run equilibrium relationship exists among the variables, while short-run dynamics may vary across cross-sectional units (e.g., different water utilities or regions).*

Results*: The findings reveal a significant positive association between infrastructure expansion and profitability, while higher tariffs and increased water losses are linked to reduced financial performance. By identifying these causal relationships, the study enhances the understanding of the economic mechanisms governing the sector and provides evidence-based insights to support the development of more sustainable and efficient public policies in water service management. Conversely, average water tariffs exhibit a negative long-run association with profitability, highlighting consumer sensitivity to price changes and the need* *for balanced tariff-setting policies that ensure both financial sustainability and service accessibility. From a managerial standpoint, reducing water losses and the frequency of system failures proves essential for improving financial performance. Moreover, the ability to rapidly adjust infrastructure operations in response to tariff shifts underscores the importance of operational adaptability. The results also point to the beneficial impact of adopting modern monitoring and metering technologies, which contribute to revenue optimization. Ultimately, this research offers a detailed understanding of how economic, operational, and policy-related variables interact within the water sector, providing a robust foundation for developing strategies that support both sustainability and equitable service provision.*

Originality*: This study offers an original contribution to the analysis of the Romanian water sector by applying the ARDL methodology, an approach not previously explored in this context. Its novelty lies in the ability to distinguish between short-run and long-run effects of key variables such as network length, tariffs, non-revenue water, and pipe failures on operational profitability. A key advantage of the ARDL model lies in its ability to handle a mix of stationary and non-stationary series without requiring full differencing, thus preserving valuable long-term information. By employing this model, the study captures both structural impacts-such as the role of network length, tariffs, non-revenue water, and system failures-and region-specific short-term responses. The findings contribute to a deeper understanding of sector performance and support evidence-based decision-making for public policy, investment planning, and operational optimization within Romania's water sector. Furthermore, by integrating economic, managerial, and social dimensions, the study supports more nuanced, evidence-based policy development aimed at balancing financial sustainability with equitable access to water services.*

Keywords*: water sector, operational profitability, tariff policy, Romania-public utilities, econometric modelling.*

INVESTMENTS IN ROMANIA'S WASTEWATER INFRASTRUCTURE: TECHNICAL AND ECONOMIC DETERMINANTS IN THE PUBLIC WATER SECTOR

George Banghiore*

Romanian Academy, School of Advanced Studies of the Romanian Academy, Doctoral School of Economic Sciences, "Costin C. Kirițescu" National Institute for Economic Research; Institute of National Economy, Bucharest, Romania

george.banghiore@gmail.com , ORCID ID: 0009-0006-3461-0431

Octavia Moise

Romanian Academy, School of Advanced Studies of the Romanian Academy, Doctoral School of Economic Sciences, "Costin C. Kirițescu" National Institute for Economic Research; Institute of National Economy, Bucharest, Romania

moctavia2005@yahoo.com , ORCID ID: 0009-0002-3443-4109

**Corresponding author*

Abstract

Investments in wastewater treatment infrastructure constitute a fundamental pillar in ensuring the sustainability of public water services, as well as in fulfilling the obligations imposed by European environmental protection legislation. In a context marked by climate change, rapid urbanization, and increasing pressure on natural resources, there is a pressing need to rethink how public utility services are managed. The development and modernization of wastewater treatment systems have become imperative. Wastewater infrastructure not only plays a role in protecting the environment but also in safeguarding public health by preventing the contamination of water resources and soil with harmful substances from wastewater.

Objectives*: This study aims to conduct an in-depth analysis of the evolution of investments made by regional water and sewage operators in Romania, focusing on wastewater treatment systems. The emphasis is on identifying and understanding the key operational and financial factors that contribute to the medium- and long-term efficiency and sustainability of these investments. In a sector characterized by high investment needs and constant financial challenges, it is essential to understand how pricing policies, operational performance, or revenue structures influence investment decisions. The study uses data collected over an 11-year period from the activities of 43 regional operators in Romania, providing a comprehensive and longitudinal view of the sector's developments. This approach seeks to identify both general trends and regional particularities that may influence investment strategies.*

Methodology*: The research employs an advanced econometric method based on the use of a dynamic panel model, which allows for the analysis of causal relationships and the time-based effects of the studied variables. This type of model captures both cross-sectional (between operators) and temporal (over the 11 years analyzed) variations, leading to a more accurate estimation of the impact of investment-related factors. Specifically, the model aims to determine the direct and indirect effects of variables such as the volume of treated wastewater, operational cost levels, user tariffs, operators' revenues, and the number of users served. By analyzing these factors, the research offers a detailed and interconnected perspective on how financial and operational elements influence development and modernization strategies for wastewater infrastructure.*

***Results**: The findings indicate a strong correlation between operational performance, particularly the efficiency of treatment processes and the volume of investments made in wastewater treatment infrastructure. Operators that demonstrate higher operational performance tend to attract and use financial resources for infrastructure modernization more effectively. Furthermore, the analysis highlights the critical importance of self-generated revenues and applied tariffs in strengthening the investment capacity of operators. An adequate tariff level, combined with efficient revenue management, can generate sufficient financial resources for the co-financing of projects with European or national funds. The study also emphasizes that investment decisions are influenced by the size of the user base: operators serving a larger number of consumers may benefit from economies of scale, granting them greater capacity for long-term investment planning and execution.*

***Originality**: One of the innovative aspects of this study lies in the application of a dynamic panel model to a relatively underexplored field in Romanian economic literature—that of wastewater infrastructure investments. This methodological approach allows for a rigorous and detailed analysis of the interdependencies between operational and financial variables, offering a valuable diagnostic and strategic decision-making tool. By identifying the main investment drivers, the research contributes to the development of better-oriented public policies that support the sustainable growth of the sector. Moreover, the study makes a relevant contribution to water resource management strategies, particularly by emphasizing the importance of responsible financial planning and efficient administration of existing infrastructure.*

Conclusion: The study provides valuable recommendations for policy development and implementation in water resource management, emphasizing that efficient administration and responsible financial planning are fundamental to the long-term viability of wastewater infrastructure.

The results of this study are useful for decision-makers, local and central public authorities, water service providers, and researchers interested in infrastructure and public service domains. They offer practical guidance for optimizing investments and improving the quality of water services, thereby contributing to the sustainable development of communities.

***Keywords:** wastewater infrastructure; public water sector, investment determinants, technical and economic analysis, sustainable development*

THE GEOGRAPHY OF WORKFORCE CHANGES IN AN AGING SOCIETY: DEMOGRAPHIC CHALLENGES AND LABOUR DYNAMICS

Simona Toma
Romanian National Institute of Statistics, Bucharest, Romania
simona.toma@insse.ro

Abstract
The demographic aging phenomenon in Romania constitutes a critical and multifaceted challenge with profound socio-economic implications. Unlike many developed countries where increased life expectancy predominantly drives aging, in Romania this process is chiefly accelerated by a sustained decline in fertility rates combined with substantial emigration of the young and economically active population. The resulting demographic imbalance exerts significant pressure on social welfare systems, healthcare infrastructure, and the labor market. This study aims to provide a comprehensive analysis of the territorial dynamics of population aging and its impact on labor force structures between 1992 and 2023. The objective is to identify spatial and temporal trends in demographic shifts, examine the resulting labor market constraints, and offer evidence-based insights for the formulation of adaptive public policies that promote economic sustainability, social equity, and the optimal utilization of human capital in the context of an aging society.
The research employs a longitudinal quantitative approach utilizing official demographic data from the Romanian Population and Housing Censuses conducted in 1992, 2001, 2011, and 2021. Key indicators analyzed include the size and composition of the economically active population (aged 15–64) and the old-age dependency ratio, which measures the number of individuals aged 65 and over relative to every 100 working-age persons. A disaggregated territorial analysis at the county level enables the identification of heterogeneous patterns of aging and workforce evolution across different geographic contexts. Statistical methods, including descriptive statistics, trend analysis, and demographic pyramids, are employed to capture the magnitude and velocity of demographic transformations. The study also considers qualitative aspects, such as the gender dimension of aging, labor market participation disparities, and sectoral employment shifts, particularly in health and social care services. This comprehensive methodology facilitates a robust understanding of the demographic-economic nexus in a spatially differentiated framework.
The findings reveal a persistent and accelerating demographic aging process throughout Romania, characterized by a notable inversion in the age structure, whereby in several counties the elderly population (65+) outnumbers the youth cohort (0–14 years). This inversion signals a profound restructuring of the demographic pyramid, precipitating a contraction of the working-age population and consequently a shrinking labor supply. Such demographic dynamics are directly linked to labor market challenges, including skill shortages and increased demand for workers in age-sensitive sectors such as healthcare, social assistance, and eldercare. The aging workforce introduces complexities related to productivity, adaptability to technological and organizational changes, and potential early retirements, thereby affecting economic growth prospects. Moreover, the escalating old-age dependency ratio intensifies the fiscal burden on pension funds, healthcare provision, and social protection mechanisms, threatening the long-term sustainability of these systems.

Territorial disparities are pronounced: counties in the southern and southwestern regions experience acute depopulation, economic stagnation, and heightened vulnerability, whereas counties like Ilfov, Suceava, and Iași exhibit relatively younger demographic profiles, contributing to regional economic resilience and offering potential hubs for demographic stabilization. Furthermore, the gendered nature of aging emerges as a significant concern. Women, who tend to have longer life expectancies, face compounded disadvantages due to interrupted career trajectories, primarily for caregiving responsibilities, resulting in lower pension entitlements and increased risk of poverty in old age. This gender imbalance necessitates targeted policy interventions to promote equitable labor market participation and social protection for elderly women.

The analysis also underscores the need for flexible employment policies that accommodate the capacities and limitations of older workers, including opportunities for professional retraining, part-time work, and phased retirement schemes. These measures are essential for maximizing the contribution of older individuals to the economy, mitigating labor shortages, and fostering intergenerational equity.

This study offers an original contribution by integrating a territorial perspective with demographic and labor market analyses, thereby moving beyond aggregate national-level assessments to illuminate spatial heterogeneities in the aging process and labor force dynamics in Romania. The multi-dimensional approach, which encompasses longitudinal demographic data, labor market indicators, and gender-specific considerations, provides a nuanced understanding of the complex interplay between population aging and economic structures. By highlighting the regional disparities and sectoral implications, the research informs policymakers of the necessity to tailor interventions according to local demographic realities and labor market conditions. Moreover, the inclusion of gender dynamics and labor market flexibility strategies distinguishes this work, emphasizing the importance of inclusive and adaptive policies in the face of demographic transitions. This comprehensive analytical framework serves as a foundation for developing sustainable labor market strategies and social policies that can effectively address the challenges posed by population aging while promoting economic vitality and social cohesion

Keywords: *population aging, labor force dynamics, demographic transition, old-age dependency ratio, territorial disparities, economic sustainability, gender inequality, census*

THE EUROPEAN SPECTRUM: MAPPING MEMBER STATES' SOCIO-ECONOMIC DIFFERENCES THROUGH MULTIDIMENSIONAL CLUSTER ANALYSIS

Ana-Maria Ciuhu*
Institute of National Economy, Romanian Academy; Romanian Institute of Statistics, Bucharest, Romania
dobre.anamaria@hotmail.com, ORCID ID: 0000-0002-2195-8985
Valentina Vasile
Institute of National Economy, Romanian Academy, Bucharest, Romania
valentinavasile2009@gmail.com , ORCID ID: 0000-0002-2368-1377
Raluca Mazilescu
Institute of National Economy, Romanian Academy, Bucharest, Romania
ralucamazilescu@gamil.com , ORCID ID: 0000-0001-6373-5387
Marius Surugiu
Institute of National Economy, Romanian Academy, Bucharest, Romania
marius.surugiu@ien.ro , ORCID ID: 0000-0002-9599-4540
Cristina Boboc
Institute of National Economy, Romanian Academy; Bucharest University of Economic Studies, Bucharest, Romania
cristina.boboc@csie.ase.ro , ORCID ID: 0000-0002-7397-4821
Simona Ioana Ghiță
Institute of National Economy, Romanian Academy; Bucharest University of Economic Studies, Bucharest, Romania
simona.ghita@csie.ase.ro , ORCID ID: 0000-0002-5634-8570
**Corresponding author*

Abstract
In the contemporary European context, understanding the socio-economic heterogeneity among EU-27 member states has become increasingly important for effective policy formulation and implementation. The diversity of economic development trajectories, poverty patterns, and social conditions across European Union member states necessitates a systematic approach to identifying natural groupings that can inform targeted policy interventions. This study addresses the fundamental question of how EU-27 member states cluster based on their socio-economic characteristics, with particular emphasis on tracking the evolution of these groupings over time. The primary objective is to identify the economic and social characteristics that determine the natural grouping of countries and to analyze how these configurations evolved between 2021 and 2023, a period marked by significant economic challenges including post-pandemic recovery and inflationary pressures. Special attention is devoted to Romania's position within these groupings, examining its socio-economic profile in relation to other member states and assessing whether its development trajectory aligns with Western European patterns or follows distinct Eastern European characteristics. The analysis aims to provide empirical evidence for understanding the underlying dimensions of socio-economic differentiation across the European Union, thereby contributing to the development of robust comparative frameworks for policy evaluation and supporting arguments for building group-specific strategies to address diverse socio-economic challenges across different clusters of member states.

This research uses cluster analysis techniques to examine socio-economic groupings among EU-27 member states, focusing on two critical time points: 2021 (corresponding to the most recent Population and Housing Census round) and 2023 (the most recent year with complete data availability across all selected indicators). The methodology employs the K-Means clustering algorithm implemented in R software, employing the tidyverse library for data manipulation, the cluster package for K-Means application, and factoextra for visualization and optimization procedures. The analysis is based on four key socio-economic indicators extracted from Eurostat databases within the European Statistical System: GDP per capita index (measuring relative economic growth), At Risk of Poverty rate index (AROP - reflecting the proportion of population below the poverty threshold), in-work poverty rate index (measuring the proportion of workers at risk of poverty), and Severe Material and Social Deprivation index (SMSD - indicating critical socio-economic deficiencies). All indicators are expressed as indices to ensure comparability and eliminate scale effects. The methodological process involves several systematic steps: data extraction and conversion to data frame format, variable standardization using z-score normalization to eliminate scale influence, determination of optimal cluster numbers using the within-cluster sum of squares (WSS) method by fviz_nbclust function, application of K-Means algorithm with multiple random starts to ensure stability, and comparative analysis between the two time periods to identify cluster stability and country transitions. The standardization procedure ensures that no single variable dominates the clustering results due to measurement scale differences, while the K-Means algorithm partitions countries into homogeneous groups based on similarity in their socio-economic profiles.

The cluster analysis identifies three distinct and well-defined socio-economic groupings among EU-27 member states, each showing specific patterns of economic development with different characteristics regarding poverty risk and material deprivation. Cluster 1 encompasses countries characterized by relatively high GDP per capita levels but elevated in-work poverty rates and material deprivation indices, suggesting the presence of significant internal inequalities where economic growth does not translate uniformly into improved living conditions for all population segments. This cluster includes countries such as Austria, France, Slovakia, and Slovenia (in 2023), representing a paradoxical development pattern where aggregate prosperity coexists with persistent social challenges. Cluster 2 comprises member states with moderate GDP per capita performance, low levels of absolute and in-work poverty, but a dramatic increase in material deprivation by 2023, possibly reflecting the impact of inflation and rising living costs that affect the population's capacity to maintain minimum living standards despite relative economic stability. This group includes Germany, Denmark, Finland, Luxembourg, and Sweden, representing established economies facing new challenges in maintaining social cohesion. Cluster 3 represents the most dynamic group, characterized by the highest average GDP per capita growth combined with lower levels of in-work poverty and material deprivation, suggesting successful economic development with relatively equitable benefit distribution. Romania consistently belongs to this cluster alongside Poland, Hungary, Czech Republic, Ireland, and other Eastern European and Baltic states, indicating that Romania's development trajectory aligns with rapidly growing economies rather than following traditional Western European patterns. The comparative analysis between 2021 and 2023 reveals notable transitions, with countries like Belgium, Greece, Portugal, and Latvia

moving between clusters, reflecting the dynamic nature of socio-economic development and the impact of external economic shocks on different national contexts.
This study's original contribution lies in its systematic application of cluster analysis to reveal the underlying structure of socio-economic differentiation within the EU-27, moving beyond traditional East-West to identify empirically groupings based on multiple socio-economic dimensions. Unlike previous research that typically relies on predetermined country classifications or single-indicator analyses, this methodology allows for the emergence of natural groupings that reflect the complex interplay between economic growth, poverty patterns, and social conditions. The temporal comparison between 2021 and 2023 provides insights into the stability and fluidity of socio-economic groupings during a period of significant economic uncertainty, revealing both persistent structural differences and dynamic transitions among member states. The finding that Romania clusters with other rapidly developing Eastern European economies rather than transitioning toward Western European patterns challenges conventional assumptions about convergence trajectories and suggests the emergence of distinctive development models within the European Union. The research contributes to European policy discourse by demonstrating that effective policy interventions must account for the heterogeneous nature of socio-economic challenges across different country groupings, rather than assuming uniform responses to common policies. The methodology's strength lies in its ability to identify counterintuitive patterns, such as the coexistence of high economic growth with persistent social challenges in certain clusters, thereby informing more nuanced approaches to European integration and cohesion policy design that recognize the diversity of development pathways within the contemporary European Union.
***Keywords**: cluster analysis, K-Means, socio-economic indicators, comparative policy analysis, country classification*

ECONOMIC PREDICTORS OF POPULATION TRENDS IN THE EUROPEAN UNION

Ana-Maria Ciuhu*
Institute of National Economy, Romanian Academy; Romanian Institute of Statistics, Bucharest, Romania
dobre.anamaria@hotmail.com, ORCID ID: 0000-0002-2195-8985
Valentina Vasile
Institute of National Economy, Romanian Academy, Bucharest, Romania
valentinavasile2009@gmail.com , ORCID ID: 0000-0002-2368-1377
Raluca Mazilescu
Institute of National Economy, Romanian Academy, Bucharest, Romania
ralucamazilescu@gamil.com , ORCID ID: 0000-0001-6373-5387
Marius Surugiu
Institute of National Economy, Romanian Academy, Bucharest, Romania
marius.surugiu@ien.ro , ORCID ID: 0000-0002-9599-4540
Ioana Bărbulescu
School of Advanced Studies of the Romanian Academy, Doctoral School of Economic Sciences, National Institute for Economic Research "Costin C. Kirițescu"; Institute of National Economy Bucharest, Romania
ibarbulescu.ioana@gmail.com
**Corresponding author*

Abstract

Contemporary European demographic trends reveal complex challenges regarding population sustainability, particularly in the context of economic transformations and evolving social conditions across EU-27 member states. The intersection between economic development, poverty dynamics, and demographic stability has become increasingly critical for policy formulation and long-term strategic planning. This study addresses the fundamental question of how economic and social factors influence population sustainability across European Union member states, with particular emphasis on identifying the determinants of demographic resilience in an era of economic volatility and social transformation. The research specifically examines the relationships between GDP growth trajectories, poverty indicators including the At Risk of Poverty or Social Exclusion (AROPE) indicator and its components, and population dynamics. Special attention is devoted to Romania's position within the broader European demographic landscape, analyzing its convergence patterns with EU averages and identifying distinctive characteristics that influence its demographic sustainability. The objective is to evaluate through econometric modeling which economic and social variables most significantly affect population stability across EU member states, thereby contributing to evidence-based demographic and public policy development that supports sustainable population growth and enhances economic and social cohesion across the European Union.
This research employs panel regression techniques to examine population sustainability dynamics across EU-27 member states for the period 2016-2023. The primary data source is the European Union Statistics on Income and Living Conditions (EU-SILC), conducted within the framework of the European Statistical System and coordinated by Eurostat, which provides harmonized and internationally comparable socio-economic indicators. The methodological approach involves converting raw data into indices using 2015 as the base year to analyze relative evolution over time. This transformation resulted in analyzing the period 2016-2023

after losing the first year of the series. The panel regression analysis employs both fixed effects and random effects models implemented in R software using the plm package. The dependent variable is the total population index, while independent variables include GDP per capita index (measuring relative economic growth), At Risk of Poverty rate index (AROP - measuring monetary poverty below 60% of national median income), in-work poverty rate index (measuring the proportion of workers at risk of poverty), and Severe Material and Social Deprivation index (SMSD - measuring severe socio-economic deprivation affecting at least 7 of 13 deprivation elements). Hausman testing is employed to determine the optimal model specification between fixed and random effects approaches, with the selection criterion based on the consistency of estimates.

The panel regression analysis reveals significant insights into the determinants of population sustainability across EU-27 member states. The Hausman test yields a p-value indicating that the random effects model is preferred over the fixed effects specification. The selected random effects model demonstrates overall statistical significance and explains approximately 13% of the variation in population indices. The model reveals that 72% of population variation is explained by differences between countries, while only 28% is attributed to temporal variations within countries GDP per capita demonstrates a statistically significant positive effect on population sustainability, confirming that economic growth supports demographic resilience - a one-point increase in the GDP index is associated with an increase in the population index. Counterintuitively, in-work poverty shows a significant positive association with population levels, suggesting that states with higher in-work poverty rates do not necessarily experience population decline, possibly due to limited emigration alternatives or economic barriers to mobility. Similarly, severe material and social deprivation demonstrates a statistically significant positive relationship with population, indicating that populations experiencing material hardship may not emigrate due to economic constraints rather than preference. The absolute poverty rate (AROP) shows no significant impact on population dynamics, contrary to theoretical expectations. The intercept value indicates that when all independent variables are at their reference level, the population stands at approximately 90% of the baseline value. This study's original contribution lies in its comprehensive panel econometric approach to analyzing population sustainability determinants across EU-27 member states using harmonized EU-SILC indicators. Unlike previous research that typically employs cross-sectional analyses or focuses on individual country studies, this methodology provides a longitudinal perspective that captures both cross-national differences and temporal dynamics in demographic sustainability patterns. The research innovatively operationalizes population sustainability through the integration of multiple poverty dimensions with economic growth indicators, revealing counterintuitive relationships that challenge conventional assumptions about migration patterns and demographic responses to economic hardship. The finding that in-work poverty and material deprivation are positively associated with population levels represents a significant departure from traditional migration theory, suggesting that economic barriers may paradoxically contribute to population retention rather than facilitating mobility. The study's methodological rigor, evidenced by the systematic application of Hausman testing and the preference for random effects modeling, ensures robust statistical inference while accounting for unobserved heterogeneity across member states. The temporal coverage of 2016-2023 captures both pre-pandemic and post-pandemic economic dynamics, providing insights into demographic resilience during periods of significant economic uncertainty.

Furthermore, the research contributes to European demographic policy discourse by demonstrating that traditional poverty indicators may not predict population movements as expected, thereby informing more nuanced policy interventions that consider the complex interplay between economic constraints, social conditions, and demographic behavior across diverse European contexts.
***Keywords**: population sustainability, panel regression, EU-SILC, demographic policy, economic development, poverty indicators*

THE PAPER AND THE REVIEWER - JUST A MEMORY

Ioan-Silviu Vîrva
Romanian National Institute of Statistics, Bucharest, Romania
silviu.virva@insse.ro
Silvia Pisică
Romanian National Institute of Statistics, Bucharest, Romania
silvia.pisica@insse.ro
Andoria Ioniță
Romanian National Institute of Statistics, Bucharest, Romania
andoria.ionita@insse.ro
Ana-Maria Ciuhu*
Institute of National Economy, Romanian Academy; Romanian Institute of Statistics, Bucharest, Romania
dobre.anamaria@hotmail.com, *ORCID ID: 0000-0002-2195-8985*
**Corresponding author*

Abstract

In contemporary society, individuals demonstrate increasingly reduced willingness to participate in surveys, regardless of their relevance or social importance. Daily obligations and temporal pressures diminish citizens' availability for activities perceived as non-essential, leading to a constant decline in response rates for traditional data collection methods. This trend poses a major challenge for national statistical institutes, which face increasing costs and declining accuracy in conducting population censuses. Simultaneously, the digital era highlights the development of extensive administrative registers and databases containing large volumes of structured information about citizens. These administrative sources - from fiscal registers and social security systems to educational and health databases - provide a comprehensive picture of population activities and characteristics. This study addresses the fundamental question: "Why collect new data when existing administrative sources could be used instead?" The objective is to develop and validate a methodology for producing census-type indicators without direct contact with the population, utilizing the wealth of administrative data already available in modern governmental systems.

This research proposes an innovative methodology for Romanian official statistics based on the "signs-of-life" technique, integrated within a cascading framework of administrative data sources. The approach employs a complex algorithm structured in progressive record linkage steps, beginning with the main database derived from the National Register of Person Evidence, which contains information about the population with permanent residence. This database is progressively enriched through successive linkage with multiple administrative sources, i.e. databases for income and social contributions, for pensioners, for educational systems, for medical services, and other specialized registers including employment agencies, social benefits, agricultural payments, and immigration records. The algorithm logic is based on well-defined assumptions: employed persons registered in the Romanian fiscal system are considered residents if they earn wages in at least four of the 12 months of a calendar year; persons receiving medical services or pensions by postal mandates with the same frequency are also considered residents; minor children of these persons are automatically included in the resident population. The "signs-of-life" technique enables identification of effective *presence of persons on national territory by tracking their activities recorded in administrative systems, transcending traditional permanent residence definitions and approaching the European concept of usual residence.*

The methodology demonstrates significant potential for transforming census operations through several key findings. The approach achieves substantial reduction in operational costs by eliminating traditional field operations and data collection infrastructure. It completely addresses non-response issues that plague conventional censuses, as administrative data is generated through mandatory reporting requirements rather than voluntary participation. The system enables more frequent data updates, potentially allowing annual population estimates rather than decennial censuses. Coverage completeness is achieved for all persons registered in administrative systems, potentially providing more accurate counts than traditional methods affected by undercounting. The Romanian implementation reveals the algorithm's capability to process approximately 22.3 million records, linking information across fiscal, pension, education, health, and social benefit systems. The progressive record linkage approach successfully identifies resident population by systematically applying residence criteria across multiple data sources, with each step capturing additional population segments missed by previous sources. The methodology produces not only population counts but also rich demographic and socioeconomic characteristics derived from the linked administrative records.

This study's original contribution lies in its comprehensive integration of multiple administrative data sources within a unified algorithmic framework specifically designed for population enumeration. Unlike previous approaches that typically use single administrative sources or simple data matching techniques, this methodology employs a complete cascading logic that systematically explores all available evidence of residence across governmental systems. The "signs-of-life" concept represents an innovative operationalization of the European usual residence definition, moving beyond static address-based concepts to dynamic activity-based indicators. The research pioneers the transition from reactive data collection (asking people for information) to proactive data usage (extracting insights from existing administrative activities). This paradigm shift fundamentally reconceptualizes how modern society can monitor and understand its population, marking the transition toward an era of official statistics based on administrative big data. The methodology's originality also extends to its practical implementation considerations, addressing complex inter-institutional agreements, data protection challenges, and quality assurance protocols necessary for operational deployment. This comprehensive approach provides a blueprint for statistical offices worldwide seeking to modernize their census operations while maintaining statistical quality and international comparability standards.

Keywords*: census, record linkage, administrative sources, signs-of-life, resident population, modern statistical methodologies*

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

THE TWO FACES OF CASHLESS ECONOMIES: A COMPARATIVE ANALYSIS OF SOUTH KOREA'S DIGITAL LEAP AND NIGERIA'S CASHLESS POVERTY, AND ITS IMPLICATIONS FOR NIGERIA

Temitayo Shenkoya

Chungnam National University, Daejeon, South Korea

tshenkoya@dr.com , ORCID ID: 0000-0003-3988-1274

Abstract

Objective: *This study critically examined the divergent outcomes of cashless policies in South Korea and Nigeria. While South Korea's cashless policy is enhancing financial inclusion, the roll out of these policies in Nigeria is deepening (cashless) poverty amongst those who are unbanked and banked. This study examined Korea's model to propose context-sensitive adaptations for Nigeria. Additionally, this study understood the reasons why the monetary policies of the Nigerian government to ensure a reduced use of cash in transactions, and the digitalization of its financial sector is leading to illiquidity of cash. This illiquidity in turn is exasperating poverty within the society. On the other hand, the study examined the reason for the success of this same policy in South Korea. The best approach to tailor the policy properly to the Nigerian need - from a case analysis of the Korean economy was achieved.*

Method: *The methodology that was adopted in this study is qualitative. Specifically, a review of literature was used to analyse the approach to cashless policy used in both countries. This is because a literature review is an appropriate method to examine studies that involve detailed analysis of policies and seek to derive information from existing contributions. Contribution from several databases - such as the Web of Science, Google Scholar, Korea Citation Index, SCOPUS, and other sources were considered. To help identify the most suitable contributions to this study, several inclusion and exclusion criteria were set. Only articles in peer reviewed journals, conference proceedings, and government reports, white papers, brief reports, discussion papers, specific guidelines, dissertations, and information from international organizations, all published after 2020 were considered. Additionally, these contributions were all written in English.*

Results: *Through a systematic literature review of studies, papers, conference proceedings, government report, white papers, discussion papers, reports, specific guidelines, dissertations, information from international organizations (2020-2025), this study identified critical* *divergences in cashless policy outcomes between Nigeria and South Korea. The literature review revealed three consistent findings. First, since the implementation of the cashless policy in Nigeria, cash liquidity rate has reduced to below 60%. The number of transactions as a result of this reduced significantly leading to a significant rise in the rate of poverty. On the other hand, South Korea's success factors of this policy emerged as a result of incremental implementation, parallel cash-digital systems and a robust digital literacy program. The comparative policy analysis showed that effective cashless transitions require a 70% financial inclusion baseline, at least 5-year phased implementation and an integrated formal sector strategy. Based on this, four lessons were derived for Nigeria. These four lessons include the need for – infrastructure development, policy flexibility, targeted education and monitored piloting.*

Originality: This study presents itself as one of the earliest research projects to examine the monetary policy of the central bank of Nigeria that tries to ensure digitalization of transitions in Nigeria and a reduced reluctance in cash-based transactions. It makes several novel contributions to literature on digital financial policies in emerging economies. First, it pioneers a systematic comparative analysis between Nigeria's cashless policy challenges and South Korea's successful implementation – a crucial yet understudied position in monetary policy research. Within this study, an original concept of cashless poverty was introduced to characterize the paradoxical exclusionary effects of digital transactions observed in Nigeria. While the aim of introducing digitalization to finance is to promote digital transactions, in Nigeria, cashless poverty is introduced via the marginalization of unbanked population and banked population through reducing cash liquidity.

Methodologically, this study develops an innovative evaluation framework that correlates policy outcomes with four key contextual dimensions, which include – technological infrastructure maturity, financial literacy levels, informal sector integration and regulatory flexibility. This framework challenges conventional one-size-fits-all policy transfer approaches. Furthermore, this research breaks new ground by proposing context-sensitive adaptation strategies specifically designed for large informal sectors. This includes a phased implementation model, hybrid cash-digital systems, and grassroots financial education programs.

Keywords: *digital divergence, cashless model, cashless poverty, policy inefficiency, exclusion risks*

DOUBLE-EDGES OF AI-ASSISTED FAST LEARNING IN ENTREPRENEURIAL ECOSYSTEM

Behzad Mohammadian*

University of Tehran, Tehran, Iran

B.Mohammadian@ut.ac.ir, ORCID ID: 0000-0003-2157-5113

Marzieh Tahmasebi

University of Tehran, Tehran, Iran

M.Tahmasebi1368@ut.ac.ir , ORCID ID: 0009-0001-2368-7066

**Corresponding author*

Abstract

***Objective**: This study investigates the dual nature of AI-assisted fast learning within entrepreneurial ecosystems. It aims to explore the opportunities and challenges posed by the integration of Artificial Intelligence (AI) in entrepreneurial learning processes, particularly its impact on knowledge acquisition, decision-making speed, and the potential risks of superficial understanding and over-reliance on AI.*

***Method**: As methodology, this research is a review based on articles published in the Scopus database. Using relevant keywords, the researcher identified 96 initial articles. After applying the PRISMA framework for screening and eligibility assessment, a total of 12 articles were thoroughly reviewed and analyzed.*

***Results**: Findings suggest that AI-assisted fast learning offers significant advantages in entrepreneurial contexts, including enhanced speed, adaptability, and information processing. However, it also raises concerns related to shallow learning, reduced critical thinking, and decreased experiential engagement. The review highlights these contrasting effects and underscores the importance of a balanced approach to integrating AI in entrepreneurial learning.*

***Originality**: This study contributes to the literature by conceptualizing AI-assisted fast learning as a double-edged phenomenon in entrepreneurship. It proposes a balanced framework for entrepreneurs to harness AI tools effectively while maintaining depth in learning and decision-making.*

***Keywords**: artificial intelligence, AI-Assistants, fast learning, entrepreneurial ecosystems, dark side*

THE IMPACT OF DIGITAL FINANCIAL LITERACY ON FINANCIAL BEHAVIOUR IN SRI LANKA: EVIDENCE FROM GENERATION Z OF EMERGING ECONOMY

Shanika Wijerathne
Wayamba University of Sri Lanka, Kuliyapitiya, Sri Lanka
shanidilhani99@gmail.com , ORCID ID: 0000-0002-3390-5936
Hiranya Dissanayake*
Wayamba University of Sri Lanka
hiranya@wyb.ac.lk , ORCID ID: 0000-0002-4963-5125
Anuradha Iddagoda
University of Sri Jayewardenepura, Gangodawila, Nugegoda, Sri Lanka
anurdhaiddagoda@sjp..ac.lk , ORCID ID: 0000-0003-2586-430X
**Corresponding author*

Abstract
***Objective**: This study addresses the escalating global and local significance of digital financial literacy (DFL), particularly in the context of Sri Lanka, where the adoption of digital financial services has accelerated. In an era where technological advancements increasingly shape financial interactions, understanding how individuals navigate and utilize digital financial tools is paramount. This research endeavors to outline the critical role of DFL in shaping personal financial management. The overarching objective is to meticulously examine the significant association between digital financial literacy and the financial behavior of households, specifically focusing on Generation Z within the Ratnapura District of Sri Lanka. Furthermore, the study aims to delineate how distinct dimensions of DFL—such as basic financial knowledge, digital knowledge, application usage, decision-making capabilities, and self-protection—interact with and influence overall financial behavior. Concurrently, it seeks to explore the specific impact of DFL on various facets of financial behavior, including saving habits, shopping patterns, and both short-term and long-term financial planning, providing a nuanced understanding of these relationships within the unique socio-economic landscape of Sri Lanka.*
***Method**: A robust quantitative research methodology was adopted, underpinned by a positivist research philosophy and a deductive approach. The study employed a mono-method quantitative choice, primarily utilizing a cross-sectional survey. Data were collected via a structured questionnaire with 37 questions, administered online to 219 Generation Z individuals (aged 19-27) in the Ratnapura District, drawn from an initial target of 379. The Technology Acceptance Model (TAM) served as the theoretical framework. Data analysis was conducted using SPSS and Smart PLS 4.0 software, incorporating descriptive analysis, frequency analysis, correlation analysis, and Partial Least Squares Structural Equation Modeling (PLS-SEM) to assess measurement and structural models, and to test hypotheses.*
***Results**: The empirical analysis yielded several significant findings. Firstly, a strong positive and statistically significant relationship was established between overall digital financial literacy and financial behavior among Generation Z in the Ratnapura District (Standard Beta = 0.709, t-statistic = 13.680, p-value = 0.000). This indicates that higher DFL levels correlate with more prudent financial behaviors. Secondly, while basic financial knowledge, digital knowledge, application usage, and self-protection dimensions of DFL did not show a statistically significant association with overall financial behavior, awareness (Standard Beta*

= 0.349, t-statistic = 2.969, p-value = 0.003) and decision-making (Standard Beta = 0.301, t-statistic = 1.975, p-value = 0.048) within DFL were found to have a significant positive impact. Thirdly, overall DFL demonstrated significant positive impacts on specific financial behaviors: saving behavior (Standard Beta = 0.486, t-statistic = 6.226, p-value = 0.000), shopping behavior (Standard Beta = 0.248, t-statistic = 2.151, p-value = 0.031), long-term financial planning (Standard Beta = 0.599, t-statistic = 12.010, p-value = 0.000), and short-term financial planning (Standard Beta = 0.650, t-statistic = 9.367, p-value = 0.000). The R-squared value for the primary model was 0.503, indicating that DFL explains 50.3% of the variance in financial behavior.

***Originality**: This study makes a distinct and original contribution to the existing body of knowledge by comprehensively examining the impact of digital financial literacy on household financial behavior specifically targeting Generation Z within the Ratnapura District of Sri Lanka by using theory of technology acceptance model (TAM). While prior research in Sri Lanka has touched upon DFL's influence on small businesses, entrepreneurial performance, or university undergraduates, a dedicated focus on the household unit and this specific demographic within a developing country context has been notably absent. By filling this crucial research gap, the study provides unique empirical evidence and actionable insights relevant to the Sri Lankan socio-economic landscape, offering a foundation for targeted financial education programs and policy interventions aimed at fostering financial stability and inclusion among the younger generation.*

Finding: The core finding of this research underscores the critical role of digital financial literacy in fostering sound financial behavior among Generation Z households in Sri Lanka. The holistic construct of DFL, particularly through enhanced awareness and improved decision-making skills, significantly contributes to better financial habits. This implies that as individuals become more digitally and financially literate, they are more likely to engage in effective saving, make informed shopping choices, and undertake both short-term and long-term financial planning. The positive correlation observed across various financial behavior facets highlights the potential for DFL initiatives to empower individuals, leading to improved financial well-being and resilience within households, especially in economies facing instability.

***Keywords**: digital financial literacy, financial behavior, generation Z, financial literacy, digital knowledge, technology acceptance model*

Funding: This work was supported by the Wayamba University of Sri Lanka [2024].

ALGORITHMIC PEDAGOGIES IN THE ATTENTION ECONOMY: AIXR, EMPLOYABILITY, AND THE GLOBAL AI ARMS RACE

Osman Koroglu

Epoka University, Tirana, Albania

okoroglu@epoka.edu.al, ORCID ID: 0000-0002-6337-4144

Abstract

***Objective**: The rapid fusion of Artificial Intelligence (AI) and Extended Reality (XR) is redefining classrooms as immersive attention-economy arenas where student focus becomes data to optimize pedagogies. This study examines how such "algorithmic pedagogies" can enhance graduates' employability by aligning learning paths with emergent job-market skills, while also interrogating how automated résumé-screening systems (ATS) already disqualify 75 % of candidates before human review. Against the backdrop of a West–China AI arms race—highlighted in national-security strategies and congressional hearings on technology competition, we ask: What ethical, social-justice and policy frameworks must undergird AI-XR adoption to protect learner agency and data sovereignty?;*

***Method**: We conducted a mixed-methods investigation combining: Literature review of global reports on AI-driven futures of work and XR adoption. Analysis of ATS filtering rates using industry data. Policy mapping of national AI strategies. Case studies of universities piloting AI-XR modules, assessing engagement metrics versus algorithmic governance risks;*

***Results**: Engagement gains: XR-enhanced learning environments boosted sustained attention, but only when transparency tools were embedded. Employability alignment: Graduates from AI-XR cohorts reported higher job-offer rates in digital-skills roles, confirming market demand for algorithm-savvy professionals. ATS exclusion: Despite higher readiness, 75 % of these graduates' digital portfolios were initially filtered out by ATS lacking semantic parsing for XR credentials. Geopolitical variance: Western institutions emphasized data-privacy safeguards; Chinese counterparts prioritized integration with social-credit architectures, signaling divergent regulatory trajectories. Data sovereignty concerns: Institutions lack clear policies on cross-border student data storage, heightening risks to institutional autonomy.;*

***Originality**: This study uniquely intersects three domains—graduate employability metrics, ATS-mediated gatekeeping, and the West–China AI arms race—to propose an ethical "algorithmic literacy" framework that empowers learners to decode, contest and co-design their educational technologies. By synthesizing labour-market analytics with national-security policy analysis and immersive-learning case studies, it forges a novel roadmap for sustainable, transparent and justice-oriented AI-XR adoption in higher education.*

***Keywords**: Artificial Intelligence (AI), Extended Reality (XR), AIXR, Algorithmic Pedagogies, Attention Economy, Graduates' Employability, Applicant Tracking Systems (ATS), AI–China Arms Race, Algorithmic Literacy, Data Sovereignty, Immersive Learning*

CASHLESS ECONOMY: OPPORTUNITIES AND CHALLENGES IN THE DIGITAL AGE

Sara Shurdhi*
University of Tirana, Tirana, Albania
sara.shurdhi@hotmail.com
Ingrid Konomi
University of Tirana, Tirana, Albania
ingridkonomi@gmail.com
**Corresponding author*

Abstract

The concept of a cashless economy refers to an economic system where financial transactions are conducted through digital rather than physical currency. The global shift toward a cashless economy represents a fundamental transformation in how financial transactions are conducted, driven by the rapid advancement of digital technologies and evolving consumer behavior. A cashless economy is characterized by the minimal use of physical cash for transactions, with a preference for digital payment systems such as credit and debit cards, mobile wallets, internet banking, and contactless payments. In a cashless economy, individuals and businesses rely on digital payments for transactions, and physical cash is gradually phased out. The paper is focused on the impact of the cashless transaction on the economy. Firstly, it analyzes the advantages and disadvantages of a cashless economy and then analyzes the digital payments for the Albanian sector. Usage of a cashless system offers lots of advantages for the economy. One of the primary benefits of a cashless economy is enhanced efficiency in financial transactions. Digital payments reduce the cost and time associated with handling physical cash, both for individuals and businesses. They enable faster processing, automated record-keeping, and easier integration with financial services. Cashless transactions improve transparency and traceability, as they are documented and can be traced at any moment. Also, the data and information transferred using online transactions are secured. Consumers benefit from not having to carry physical money, and advanced encryption and authentication technologies help prevent theft and fraud. While the adoption of cashless systems promises numerous advantages, it also introduces a range of challenges that must be carefully addressed to ensure an inclusive and resilient financial ecosystem. Usage of online payments makes the financial system vulnerable to cyberattacks, technical failures, and data breaches, which can have far-reaching consequences for both users and institutions. A cashless economy offers exclusion issues as some individuals may not know how to use smartphones or may not have internet connection. These problems affect older populations, rural communities, and low-income individuals. Privacy concerns are another critical issue. In a cashless system, every transaction can be tracked and stored, raising questions about data ownership, surveillance, and the potential misuse of personal information. Using a multiple regression model, we examine the relationship between the number of online transactions, volume of transactions and numbers of digital point-of-sales. The model is focused on the Albanian economy and aims to analyze the total number of online transactions and the factors that influence them. To perform this analysis, the data are collected by Albanian Association of Banks, Bank of Albania, and other national institutions and then are processed in EViews 10, a statistical software, used for general statistical analysis, time series estimation and econometric analyses. Based on the results of the model, we have identified the conclusions and prepared some

recommendations on how to improve digital transactions in the Albanian economy. The findings suggest a positive and statistically significant association between online transaction volume and the number of online transactions, indicating that greater monetary activity in the digital space encourages transactional frequency. Moreover, the density of POS terminals emerges as a critical enabler, reinforcing the infrastructure's role in facilitating digital payments.
***Keywords**: cashless economy, online banking, digital payments, volume of transactions, monetary activity*

DEVELOPING AI CONVERSATIONAL AGENTS FOR RESTAURANTS: PRACTICAL IMPLEMENTATION OF CHATBOTS AND VOICE RECEPTIONISTS

Onil Begaj*

Western Balkans University, Tirana, Albania

o.begaj22@wbu.edu.al

Iges Banda

Western Balkans University, Tirana, Albani

iges.banda@wbu.edu.al , ORCID ID: 0000-0001-6789-0771

**Corresponding author*

Abstract

This study aims to explore the design and implementation of AI-based conversational agents specifically tailored for the restaurant industry, addressing the growing demand for automation in customer service and operational functions. By focusing on both a chatbot for menu inquiries and a voice receptionist for call handling, this paper aims to enhance customer engagement while reducing the workload for small to mid-sized restaurants with limited resources.

Objective*: We design and implement AI-based conversational agents for the restaurant domain. The goal is to service increasing demand for automation amongst customer service and operational functions, notably in small to mid-sized restaurants that don't have the financial or staffing resources to hire a full-time employee to answer repetitive questions. This study will focus in particular on the implementation and refinement of two AI capabilities: a chatbot for menu-based inquiries, and a conversational AI for call-handling and information dissemination that can improve customer engagement.*

Method*: The project used Natural Language Processing (NLP) methods, machine learning models, and speech synthesis APIs. The chatbot was implemented as a web-based tool to be used as a conversational assistant system, able to answer questions about ingredients, allergens, and diet needs, and to suggest dishes given specified user preferences. For the voice receptionist, the speech technology-based automatic speech recognition (ASR) and text-to-speech (TTS) services were based on an interactive logic designed to "walk" a caller through stock audio prompts with stimuli relevant to frequently asked questions and pertinent restaurant information that only the restaurant could provide, like hours of operation and how to make a reservation. Tools such as Dialogflow, OpenAI API, and Text-to-Speech (TTS) engines were used to simulate human-like conversations.*

Results*: The prototype AI agents were tested in simulated restaurant environments, demonstrating their effectiveness in reducing manual workload and improving user satisfaction. Preliminary user testing showed that the chatbot could answer up to 95% of menu-related questions without human intervention, while the voice receptionist managed to complete basic inquiry calls with over 90% accuracy. These results underscore the potential of AI to streamline operations and improve customer engagement in restaurant settings.*

Originality*: Unlike generalized virtual assistants, this project focuses entirely on the restaurant domain, offering a dual-application AI solution specifically tailored to industry needs. By combining text-based and voice-based interfaces under a unified framework, the system provides a scalable model adaptable to different types of restaurants. The inclusion of a short industry survey from local restaurant stakeholders also ensures that development aligns*

with real-world expectations and limitations, providing valuable insight into adoption barriers and desired features.
The developed solution highlights the transformative impact of conversational AI in hospitality. By reducing response times, ensuring 24/7 availability, and minimizing the reliance on staff for repetitive tasks, such systems can lead to enhanced customer satisfaction and operational efficiency. Moreover, this study offers a foundation for future research in domain-specific AI assistants and their application in regional markets.
Keywords: *AI conversational agents, restaurant automation, chatbot, voice receptionist, NLP, speech synthesis*

LANGUAGE, CULTURE, AND ARTIFICIAL INTELLIGENCE IN HIGHER EDUCATION: RETHINKING ENGLISH AS THE LINGUA FRANCA IN AN EVOLVING INTERNATIONAL LANDSCAPE

Adi Edlira Subashi Kahani
University of Salento, Lecce, Italy
edialon@gmail.com
Eglantina Hysa*
Independent Researcher, Brussels, Belgium
eglantinalaci@gmail.com , ORCID ID: 0000-0002-3429-5738
**Corresponding author*

Abstract
Objective*: In recent years, the push for internationalisation in higher education has reshaped academic landscapes, fostering greater student mobility, cross-border collaborations, and the global circulation of knowledge. A key component of this process has been the widespread use of English as the primary medium for instruction, research, and institutional communication. While this linguistic standardisation has streamlined global interactions, it also raises critical concerns about access, inclusion, and cultural representation. This paper examines the growing tension between the efficiency of English as a global academic language and its potential to marginalise non-native speakers. It further explores how emerging technologies, particularly artificial intelligence, can support more inclusive, multilingual models of international engagement. The study's objective is to assess whether AI can help overcome linguistic and cultural barriers in higher education and contribute to achieving the European Higher Education Area's 2030 mobility goals.*
Method*: This article is based on a qualitative review of interdisciplinary sources, including policy documents, academic literature, and technological case studies. It draws on existing research in linguistics, educational technology, and international education policy to critically evaluate the role of English and the possibilities presented by AI. The analysis includes a synthesis of developments in real-time translation tools, language-learning applications, and AI-assisted academic writing platforms to understand how these tools are currently shaping student experience and mobility.*
Results*: The paper identifies several challenges stemming from the dominance of English in international education, including reduced access for students from disadvantaged linguistic and economic backgrounds. It highlights how AI technologies, such as adaptive learning platforms, intelligent chatbots, and real-time translation systems, can mitigate these issues by supporting multilingual communication and personalised learning. The findings suggest that integrating AI tools into higher education systems could expand opportunities for students who are traditionally excluded from international mobility pathways. By embracing AI, institutions can promote a more balanced and culturally responsive approach to mobility and learning.*
Originality*: What sets this study apart is its combined focus on language policy and digital innovation, offering a forward-thinking perspective on how higher education systems can move beyond English-only paradigms. Unlike previous research that treats language and technology separately, this paper positions AI as a bridge between linguistic diversity and global academic inclusion. It contributes a novel framework for reimagining internationalisation as both a*

multilingual and technologically supported endeavour, capable of meeting ambitious targets like the EHEA's 2030 benchmark for student mobility.
Keywords: *internationalisation, higher education, English-medium instruction, linguistic equity, artificial intelligence, multilingualism, student mobility, EHEA policy, digital innovation, inclusive education*

RETHINKING DIGITAL CONSUMER BEHAVIOUR: A QUALITATIVE EXPLORATION OF STRATEGIC MARKETING ADAPTATION IN A HYPERCONNECTED ERA

Sepideh Bashang*

Mangalore University, Karnataka, India

sepidehbashang@gmail.com , ORCID ID: 0000-0003-2188-1006

Puttanna K

Mangalore University, Karnataka, India

puttannakk@hotmail.com , ORCID ID: 0009-0009-7029-7667

Mohammadsadegh Omidvar

Kharazmi University, Tehran, Iran

m.sadeghomidvar@gmail.com , ORCID ID: 0000-0003-3304-2656

**Corresponding author*

Abstract

***Objective**: Rapid advancements of digital technology and the wide leveraging of social media platforms change the nature of consumer behavior in today's hyperconnected world. The days of the passive consumer of marketing messages are over; they have become actual participants in online conversations with brands and peers around digital content. The complexities introduced by the digital environment have not been captured by traditional (linear) models of consumer decision making which show a simple and straightforward chain from awareness to purchase. The purpose of this study is to rethink digital consumer behavior by exploring how digitally distributed consumers from diverse or multiple cultural backgrounds interface with and respond to, digital marketing content. It does so specifically, focusing on the nonlinear, iterative processes that emerge through the interplay of real time peer interactions, algorithmic content curation and deep(ly) held cultural norms. The goal is to formulate such insights that marketers use to design culturally adaptive digital approaches that allow them to better engage consumers in a globally connected world.*

***Method**: A qualitative research approach was taken because of the richness and diversity of consumer experiences needed to be captured. 20 digitally active consumers, from two culturally differentiated regions – one characterized with collection cultural values, the other individualist orientations – were interviewed semi structure. Participants were purposely selected who were actively using digital platforms like social media, e- commerce sites and mobile apps where they often face different digital marketing variations. Interviews explored participants behaviors, attitudes and cognitive responses to digital marketing campaigns and peer recommendations. Thematic analysis of data collected allowed us to identify recurring themes and patterns in consumers decision making. Through this method, we were able to gain in-depth understanding of how cultural context and platform mechanisms contingently shape consumer behavior in the digital space.*

***Results**: The analysis found that digital consumer decision making is much more complex and fluid than conventional models imply. Consumers enter a 'non linear, often cyclical' process of ongoing information seeking, social validation and iterative evaluation, rather than a linear funnel. Thus, peer influence turned out to be one of the significant factors, since consumers, most often, are under the influence of recommendations and reviews of their social connections. We found that algorithmic curation of content by platforms such as digital platforms significantly mediates what marketing messages consumers see and how they interpret what they see. In addition, cultural differences matter considerably: collectivist* *cultures' consumers tend to value group consensus, social harmony and shared experience and build on these, while individualist cultures' consumers prioritize personal preferences, independence and expression of self. This first insight identified three consumer archetypes: an 'influencer follower' who tends to trust social media personalities first as a source of information; a 'algorithm skeptic,' who is critical in the way they interact with algorithm produced content and sometimes resist; and a 'cultural curator,' who selectively engages with marketing content for maintaining his/her cultural identity and other values. Digital marketing cross cultural archetypes bring nuanced understandings of the different ways consumers interact with digital marketing.*

***Originality**: Bringing together cultural perspectives and the dynamicity of digital consumer interactions, this study offers original theoretical and practical insights. This work provides a model other than the linear and heavily decision-making based models of previous research to account for the nonlinear, socially mediated and algorithmically influenced pathways along which consumers travel. Cross cultural qualitative methodology in particular underscores the importance of cultural context for the data shaping digital consumption behaviors and call marketers to a culturally responsive demeanor. Through identification of digital consumer 'archetypes' in their early formative stages, as well as how they make decisions, the study provides marketers with deeper insights into the unique complexities in the digital marketplace. These results suggest the need for the design of adaptive digital marketing strategies that tap into true authenticity within varied cultural settings through the strength of peer networks and platform algorithms.*

***Keywords**: digital platforms, cultural marketing, peer influence, algorithmic curation, consumer archetypes, nonlinear decision making, digital consumer behavior*

EMERGING PATTERNS AND INNOVATIONS IN CONSUMER BEHAVIOUR

Sepideh Bashang*
Mangalore University, Karnataka, India
sepidehbashang@gmail.com , ORCID ID: 0000-0003-2188-1006
Puttanna K
Mangalore University, Karnataka, India
puttannakk@hotmail.com , ORCID ID: 0009-0009-7029-7667
Mohammadsadegh Omidvar
Kharazmi University, Tehran, Iran
m.sadeghomidvar@gmail.com , ORCID ID: 0000-0003-3304-2656
**Corresponding author*

Abstract
Objective*: Consumer behavior is undergoing a transformative shift in 2025, influenced by rapid technological progress, heightened environmental awareness, and changing lifestyle preferences. This study investigates these emerging patterns through qualitative insights from scholarly articles, market analytics, and online consumer feedback. It identifies several core developments, including a marked inclination toward AI-powered product recommendations, the integration of online and offline experiences, and a growing demand for brands to demonstrate ethical and sustainable practices. Consumers are no longer passive buyers but active participants who seek value alignment, emotional resonance, and interactive engagement with brands. Additionally, the proliferation of social media platforms has enabled social commerce to become a key driver of purchasing behavior, while innovations in payment systems offer enhanced convenience and flexibility. The analysis also notes a rise in experience-driven consumption, where personalization and authenticity are prioritized over traditional marketing approaches. As the boundaries between digital and physical retail continue to blur, businesses must recalibrate their strategies to maintain relevance and customer trust. This study contributes to a deeper understanding of the factors redefining consumption in the current era and offers practical implications for organizations aiming to adapt in a consumer-centric and tech-driven marketplace.*
Method*: This qualitative study's design relies on a thorough literature review and content analysis. This strategy was used to synthesize academic and practical sources to find consumer behavior patterns, trends, and innovations from 2023 to 2025. This study is ideal for qualitative research methodologies, which allow for in-depth analysis of evolving ideas and contextual factors that affect customer behavior. Scholarly publications, books, and other peer-reviewed academic works provided retail strategy, digital transformation, marketing innovation, and consumer behavior research. User inputs and conversations from Reddit and marketing forums helped us understand consumer sentiment and practitioner perspectives, making the study more relatable to the real world. Content analysis helped us identify similarities, contrasts, and conceptual linkages across our sources. This method allowed us to classify and evaluate emerging trends by frequency and consumer impact.*
Results*: The emerging trends identified in this study offer a comprehensive picture of how consumer behavior evolves between 2023 and 2025. These changes reflect technological disruption and broader shifts in consumer values, expectations, and emotional needs. The most salient findings are organized under the following subtopics: 1. AI is changing customer*

interactions with brands across industries. 2. Hyper-personalization creates individual marketing messages for each user based on their behaviors, interests, and environment. 3. As online and offline shopping blend, omnichannel retail experiences integrate physical and digital elements. 4. In recent years, "social commerce," or online purchasing on social media, has risen quickly. Social media platforms like Facebook, Instagram, and TikTok have become marketplaces that go beyond advertising. 5. Sustainability is no longer a niche buying criterion. Behavioral economics research shows consumers are more likely to choose environmentally friendly products when offered an easy-to-understand and personal-values choice. 6. With the rise of AI-generated content, brand marketing legitimacy is crucial. Customers nowadays, especially Generation Z and Millennials, value honesty, authenticity, and self-congruence. 7. Customers want more flexible and convenient payment choices; therefore, they're changing their buying habits. 8. Traditional competitive advantages, including product qualities, pricing, and marketing, are less successful at brand differentiation. Emotional connections underpin brand loyalty in 2025. Brands that promote self-discovery, meaningful immersion, and personal connection are growing in popularity.

***Originality**: This study's findings can help businesses, marketers, researchers, and policymakers navigate 2023–2025's evolving consumer landscape. Companies must change their strategy to reflect the growing relevance of digital ecosystems, ethical values, and emotionally powerful experiences to meet consumers' changing expectations. Hyper-personalization, omnichannel purchasing, sustainability, and AI integration are among the consumer behavior trends affecting brand engagement that this report illuminates. The study shows how TAM and AIDA might be improved in modern, technologically complex situations. It opens up new areas of investigation, such as the mental health repercussions of AI-generated material and the morality of digital marketing. Data privacy, ethical advertising, and environmental responsibility are significant consumer issues, and our research might help legislators understand them. Finally, the research equips everyone to innovate and stay ahead of modern customer behavior.*

***Keywords**: consumer behavior, digital transformation, personalization, sustainability, authenticity*

ENHANCING ENGLISH FOR SPECIFIC PURPOSES LEARNING THROUGH ARTIFICIAL INTELLIGENCE AND DIGITAL TOOLS

Enkeleda Jata
Agricultural University of Tirana, Tirana, Albania
ejata@ubt.edu.al , ORCID ID: 0009-0002-2013-9707

Abstract
Digital technology has profoundly transformed every aspect of life, including education. In an increasingly globalized world, mastering English has become an essential skill. With the development of artificial intelligence, online platforms have created new opportunities for students to enhance their English proficiency through personalized learning tailored to their pace and needs. English is the dominant language used in international communication, business, and technology. Proficiency in English equips students not only with linguistic competence but also with global knowledge. Mobile learning apps are becoming widely used among students and AI- powered tools like ChatGPT, Grammarly, and Elsa Speak offer tailored learning experiences. These tools not only correct grammar mistakes, but even stimulate real conversation to improve speaking skills, providing instant feedback, and help learners acquire technical terms in their respective fields.
Nowadays, educators should encourage the use of AI tools to make the learning process more engaging. Digital tools serve as powerful bridges to acquire knowledge and equip students with the ability to effectively utilize them. Methodologically, the study presents findings from recent literature and case studies, highlighting how these tools enhance language learning. In conclusion, AI platforms can improve students' performance and make the learning process more dynamic.
Keywords*: artificial intelligence, English for Specific Purposes, digital tools*

ASSESSING THE COMPETITIVENESS AND ENSURING THE RESILIENCE OF HEALTHCARE ORGANIZATIONS IN THE HEALTH SYSTEM

Corina Cauşan*
University of Political and Policy Studies, Economic Policy and Political and Economic Studies "Constantin Stere", Chisinau, Republic of Moldova
kausankorina@gmail.com
Svetlana Gorobievschi
Technical University of Moldova, Chisinau, Republic of Moldova
gsvetic@gmail.com
Ghenadie Radu
Technical University of Moldova, Chisinau, Republic of Moldova
dacii@mail.ru
**Corresponding author*

Abstract

Contemporary conditions of climate change, influenced by natural phenomena and the intervention of techno-technological factors in the environment, cause environmental pollution and affect the average life span at global and regional levels. In the context of the increasing challenges facing health systems in various countries - from financial pressures, staff shortages, to global health crises - the issue of assessing the competitiveness and resilience of healthcare organizations is of fundamental strategic importance. Complex health problem-solving is becoming an important and emerging need.

Objective*: The aim of this paper is: to explore the methodological dimensions of various interrelated health concepts, proposing an integrated approach to the objective of health system sustainability, proving its impact.*

In the view of the authors, the health system is a macroeconomic category and its management presents an amalgam of diversified, autonomous and complex activities, therefore it is proposed that its performance be characterized by a set of indicators grouped by sub-domains, which will correspond to the respective activity directions and health services requirements. The developed study was based on data analysis for the period 2021-2024 using contemporary scientific methods. The paper presented and analyzed the main conceptual views, expressed by methods, techniques and tools (performance indicators) used in assessing the competitiveness of the healthcare system at the national level and other countries. Among the scientific methods used in the paper are benchmarking, SWOT method, composite scores, as well as methods of quantifying organizational resilience - adaptive capacity, operational continuity and resource flexibility.

The paper examines the role of digitalization in assessing the competitiveness and ensuring the resilience of healthcare organizations in the context of climate change and global pressures on health systems. The study focuses on the period 2021-2024 and proposes a methodological framework that integrates digital technologies (healthcare information systems, analytic platforms, electronic databases) in the process of assessing the performance of healthcare activities.

The ***originality*** *of the research lies in the integration of the dimensions of competitiveness and resilience with the digital transformation of the health system, in a context dominated by climate, economic and health uncertainties. The paper adds value by proposing an innovative* *methodological framework that uses digital tools (IT platforms, centralized databases, digital reporting systems) in the process of collecting, analyzing and interpreting performance indicators of healthcare organizations. It also highlights the application of digital technologies to quantify organizational resilience, through real-time monitoring of resilience, operational continuity and resource flexibility.*

By integrating the dimensions of competitiveness and resilience in a unified framework, a renewed strategic vision is outlined to support the sustainable development of healthcare institutions and the strengthening of the health system as a whole.

***Methods**. In the realization of the article, documentation methods were used: selection and synthesis of information from national and international medicine; for data analysis - graphical, tabular and comparative techniques, as well as methods of grouping and inference of statistical data. The research methods and techniques used in this article allow a detailed and comprehensive assessment of the competitiveness and resilience of healthcare organizations, taking into account both objective aspects - economic indicators, treatment performance; and subjective aspects - patient satisfaction and staff feedback.*

***Results**. The use of existing scientific concepts, statistical data in dynamics and the use of advanced research methods provided us with a solid basis for the development of the managerial concept of developing effective strategies for improving the performance and sustainability of health care institutions, thus contributing to the long-term resilience of the health care system. The research confirms that integrating the dimensions of competitiveness and resilience into a unified framework allows for a more comprehensive and realistic assessment of health systems performance, particularly in the face of instability generated by health, economic and climate crises. The international and national comparative analysis highlights the need to reform health management models, emphasizing adaptability, sustainability and operational efficiency. The tools and methods used, such as benchmarking, SWOT analysis and composite scores, have demonstrated their usefulness in identifying the strengths and vulnerabilities of the systems analyzed. The study emphasizes the importance of developing public policies based on clear and regionally adapted performance indicators that will support the strategic and sustainable development of the health system in the long term.*

The multidimensional and digitized approach responds to the current requirements of modern health systems, oriented towards efficiency, transparency and sustainability. Digitization is a key strategic vector in assessing the competitiveness and strengthening the resilience of healthcare organizations. The use of digital technologies in the analytic process - from data collection through electronic health records (EHR) to the use of big data analytics tools - enables more accurate, rapid and predictive monitoring of the performance of healthcare institutions. Digitization also facilitates data-driven decision-making, ensuring operational continuity and rapid adaptation to crises or major changes. By implementing a set of standardized digital indicators, health systems can become more transparent, efficient and resilient to the complex challenges of the 21st century.

***Keywords:** research methods, organizational competitiveness, healthcare resilience, systemic sustainability, digitization, institutional performance, integral methodology.*

DIGITALIZATION AND EDUCATION: MODELLING SPATIAL INTERACTIONS IN ROMANIA

Irina-Denisa Munteanu*

Institute of National Economy, Bucharest, Romania; Bucharest University of Economic Studies, Bucharest, Romania

irinadmunteanu@gmail.com , ORCID ID: 0000-0002-9030-7772

Zizi Goschin

Institute of National Economy, Bucharest, Romania;

ORCID ID: 0000-0002-0997-1538

**Corresponding author*

Abstract

Objective: *Education is a key factor for both short-term and long-term economic and social development of a country. Not only does human progress depend largely on the advancement of education, but improvements in education have a significant impact on a country's economic growth and condition resilience to crises, as well as balanced regional development and the reduction of disparities. Digitalization also plays an important role in promoting innovation, economic growth and sustainable development of society. Given that the education system in Romania has undergone significant changes during the COVID-19 pandemic due to intensive interaction with digital technologies, our goal is to illustrate the spatial effects that digitalization has had on education.*

Method*: The purpose of this paper is to analyse from a territorial perspective, at the level of development regions, the factors that contribute to the improvement of the educational system in Romania, with a focus on digitalization. To this end, a database was built including specific indicators for both the educational and socio-economic sectors and specific spatial analysis methods were applied, which facilitated the highlighting of regional connections impossible to identify with classical econometric methods.*

Results*: The results obtained from the econometric models indicate statistically significant spatial effects, the spatial lag of the dependent variable education being positive and strongly significant. It means that there are strong interdependencies in the field of education between neighbouring regions: a region with a high educational index tends to be surrounded by regions that also have a high level of education. Conversely, a region with a low educational index tends to be surrounded by regions that also have a low level of education. In other words, groups of neighbouring regions exhibiting similarities in terms of education level tend to form throughout Romania.*

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. Results are useful for both the members of the education system, or any other person interested in this subject.*

Keywords: *education, digitalization, spatial econometric models, COVID-19, Romania*

ANALYZING REGIONAL TOURISM DEVELOPMENT AND SERVICE QUALITY IN ROMANIA: A WEB SCRAPING-BASED APPROACH

Cristina Rodica Boboc
Bucharest University of Economic Studies, Bucharest, Romania; Institute of National Economy, Bucharest, Romania
cristina.boboc@csie.ase.ro , ORCID ID: 0000-0002-7397-4821
Simona Ioana Ghiță*
Bucharest University of Economic Studies, Bucharest, Romania; Institute of National Economy, Bucharest, Romania
simona.ghita@csie.ase.ro , ORCID ID: 0000-0002-5634-8570
Ana Maria Babaligea
Bucharest University of Economic Studies, Bucharest, Romania
babaligeaana19@stud.ase.ro
**Corresponding author*

Abstract
In recent years, the tourism industry has seen a rapid expansion of digital platforms that provide rich, real-time data regarding traveller behaviour, preferences, and trends. Traditionally, tourism research has relied on official data sources such as government statistics, national tourism boards, and industry reports. While these sources have played a crucial role in shaping tourism policy and strategies, their limitations—such as delayed reporting, limited granularity, and the absence of specific market segments—have prompted the exploration of alternative data sources. One such promising alternative is web scraping, a technique that allows for the extraction of large volumes of data from websites, social media platforms, and online travel agencies in real-time.

***Objectives**: The primary objective of this research is to analyze the spatial distribution and characteristics of tourism accommodation supply in Romania by utilizing a web scraping method to gather real-time data from an online booking platform. By examining variables that characterize the dimension, type, and quality of the tourism supply in Romania, this study aims to identify regional patterns and clustering of counties based on these factors. Additionally, through principal component analysis (PCA), the research seeks to identify patterns and trends within Romania's tourism market, providing insights into the typology and quality of the country's tourist supply. Finally, another objective of the research is to offer a comprehensive understanding of the tourism landscape, supporting both academic research and practical decision-making for stakeholders in Romania's tourism industry.*

***Method**: In this research, a custom-designed Python program was developed to collect data using the web scraping method from an online booking platform, focusing on all counties in Romania during the peak summer season. The dataset includes variables such as the number of accommodation units, average price per night, number of reviews, and the average ratings provided by tourists for various services, including cleanliness, location, facilities, amenities, comfort, and value for money. To analyze these data, a clustering technique was applied to categorize the counties based on these variables, allowing for the identification of distinct patterns across the regions. Additionally, Principal Component Analysis (PCA) was employed to uncover underlying behavioural patterns and to reduce the dimensionality of the dataset, facilitating the identification of key factors that define the typology and quality of the tourist* *offering in Romania. These methods together provide a comprehensive understanding of the regional tourism landscape and the factors influencing tourist satisfaction.*

***Results**: The cluster analysis highlighted significant differences in the perception of tourism service quality by grouping the counties into four distinct clusters, for which the strengths and weaknesses of the regional tourism offerings were identified. Cluster 1 (Bucharest, Constanta) stands out due to the popularity and wide availability of its tourism offerings, with options accessible to both locals and tourists, but also with variability in service quality. Cluster 2 (Calarasi, Buzau, Giurgiu, Ilfov, Ialomita, Botosani, and Tulcea) is characterized by a very small number of accommodation units, reviews, and by the lowest prices and ratings, yet holds potential for growth and development. Cluster 3 (24 counties) stands out for its balance between the number of accommodation units, reviews, and relatively low prices, distinguishing itself from other counties through superior quality, as reflected in high ratings across all categories. Cluster 4 (Cluj, Mures, Bihor, Brasov, Timis, Alba, Arad, Sibiu, and Prahova) is distinguished by a significant number of accommodation units and reviews, higher prices, and the highest ratings across all categories. With a focus on excellence, these counties offer unique experiences, and their higher prices are justified by the high-quality services and products provided, with customer satisfaction reflected in the high ratings. Through PCA, the set of variables was reduced to two main components: Component 1 – called the Tourism Development Index, and Component 2 – called the Tourism Service Quality Index. The positioning of the counties in relation to these two components was analyzed to highlight the disparities and similarities between Romania's counties in terms of tourism development and service quality, aiming to identify counties with superior infrastructure and services, as well as those that need improvements in these areas.*

***Originality**: The originality of this research lies in its innovative use of web scraping to collect real-time, granular data from an online booking platform, offering a fresh, dynamic perspective on Romania's tourism landscape. Unlike traditional studies that rely on official statistics or limited datasets, this approach provides comprehensive, region-specific insights, capturing both the quantity and quality of tourism services across all Romanian counties. Additionally, the application of advanced analytical techniques, such as clustering and Principal Component Analysis (PCA), allows for a detailed understanding of regional disparities and patterns in tourism development and service quality. This novel combination of methodologies, alongside the focus on real-time data, distinguishes the research from existing studies in the literature, which often rely on more static or aggregated data sources.*

***Keywords**: web scraping, tourism supply, Principal Component Analysis, Cluster Analysis, regional tourism development, Python programming language.*

FROM DATA TO DECISIONS: THE ROLE OF EXPLAINABLE AI IN HEALTHCARE TIME SERIES

Daniela-Ioana Manea*

The Bucharest University of Economic Studies, Romania; Institute of National Economy, Bucharest, Romania

daniela.manea@csie.ase.ro , ORCID ID: 0000-0002-7655-154

Andreea-Maria Arginteanu

Auxologico CardioRec, Bucharest, Romania

arginteanu.andreea1@gmail.com

**Corresponding author*

Abstract

Objective*: Contemporary digital progress is reflected in the adoption of artificial intelligence for time series analysis in healthcare, where the need for transparency and interpretability of predictive models becomes essential to support data-driven medical decision-making. Artificial Intelligence (AI) is charting a new path in healthcare, where digital tools don't just support clinicians—they help reshape how care is delivered in real time. Nowhere is this more evident than in the analysis of time series data like EEGs, ECGs, and continuous vital signs. These data streams, rich in moment-to-moment detail, offer a window into the patient's condition that was previously difficult to interpret at scale. What truly defines the impact of this digital evolution is not only its predictive power, but its ability to explain those predictions in a meaningful way.*

Method*: As we embrace this new digital frontier, the convergence of AI and healthcare is redefining how we interpret complex clinical data. Among the most promising breakthroughs are explainable AI (XAI) techniques—tools that make opaque, black-box models more transparent and trustworthy. Leading this evolution are four primary approaches: SHapley Additive exPlanations (SHAP), Local Interpretable Model-Agnostic Explanations (LIME), attention mechanisms in deep learning, and counterfactual explanations.*

SHAP, based on cooperative game theory, offers both local and global interpretability by assigning predictive influence to each input feature. It acts as a vital bridge between AI logic and human reasoning. For example, the IT-SHAP model, developed by Escudero-Arnanz et al. (2024), extended SHAP to irregular ICU data. By linking predictions to specific treatments and patient histories, it not only delivered strong performance (AUC of 78.27%) but also valuable clinical insights in the fight against multidrug resistance.

LIME represents another step forward. Originally designed for static datasets, LIME has evolved to explain predictions in time series data, such as identifying critical EEG segments linked to seizures or sleep stages (Aziz et al., 2024). Its visual, case-specific explanations make it accessible to clinicians, enhancing real-time decision-making even for users without technical expertise.

Attention mechanisms in deep learning offer dynamic interpretability. These systems can prioritize key time points, such as rapid physiological shifts indicating sepsis, thereby improving both performance and usability in time-sensitive settings like ICU monitoring (Di Martino & Delmastro, 2023). Unlike static models, attention mechanisms provide a clear view into what the model "focuses on," making its logic more intuitive and usable during critical care.

Counterfactual explanations add a unique and impactful layer. By posing "what-if" scenarios, such as whether slightly improved oxygen saturation might have averted an apnea episode, these methods empower clinicians to explore personalized and ethically informed treatment options (Aziz et al., 2024). This perspective helps bridge the gap between data-driven prediction and compassionate, forward-thinking medical planning.
The most recent innovation comes from C-SHAP, introduced by Jutte et al. (2025). This method converts raw time series into higher-level clinical concepts like trend shifts before applying SHAP. It aligns machine output with the natural reasoning of healthcare professionals, closing the cognitive gap between model outputs and clinical interpretation. It has shown notable promise in areas like glucose monitoring and respiratory care, where understanding evolving patterns is more useful than isolated feature scores.
***Results**: Among the XAI methods reviewed, SHAP emerged as the most robust and adaptable, thanks to its strong theoretical foundation and ability to handle complex clinical models. The IT-SHAP variant stood out for enabling interpretable and actionable insights directly tied to treatment outcomes (Escudero-Arnanz et al., 2024).*
Attention-based models demonstrated high utility in real-time scenarios. By identifying critical time windows, they not only improved performance metrics but also made the model's internal logic visible and actionable to clinicians (Di Martino & Delmastro, 2023).
LIME, while praised for its immediacy and simplicity, occasionally fell short in unstable data environments. Nonetheless, its approachable format made it a valuable tool for bedside applications where rapid, understandable feedback is essential (Aziz et al., 2024).
Counterfactual explanations added depth to the interpretability landscape by offering clinicians the ability to explore alternate trajectories. This was particularly relevant in uncertain or high-risk settings, reinforcing AI's role as a collaborative partner in clinical judgment (Aziz et al., 2024).
C-SHAP stood out for its cognitive usability—translating machine output into the narrative-driven logic clinicians rely on. By working with patterns, not just point-in-time data, it provided richer, more meaningful explanations (Jutte et al., 2025).
Across all methods, XAI tools were shown to significantly enhance clinician trust in AI systems. By delivering explanations embedded in a clinical context, they supported decision-making and reduced resistance to AI adoption. However, challenges remain, including the lack of standardized evaluation metrics and the cognitive demands of some explanation formats, which could limit broader integration into healthcare workflows.
***Originality**: This study synthesizes current research on XAI in medical time series analysis, with a particular focus on how explanation quality shapes trust, usability, and ethical application in real-world care. It highlights that digital progress isn't merely a matter of model performance—it's about fostering collaboration between human intelligence and machine learning.*
Ultimately, the integration of explainable AI into clinical settings represents more than just a technical upgrade. It marks a cultural shift toward intelligent tools that are transparent, ethically grounded, and aligned with how clinicians think and act. This is the essence of the new path for digital progress: transforming data into trustworthy, life-improving insights.
***Keywords**: digital progress, medical decision-making, time series, Explainable AI, SHAP*

URBAN DIGITAL TRANSITION - THEORETICAL BACKGROUND AND PERSPECTIVES IN THE FRAMEWORK OF THE NEW SHIFT

Anamaria – Cătălina Radu*
Institute of National Economy, Romanian Academy, Bucharest, Romania
anamaria_radu15@yahoo.com
Ivona Răpan
Institute of National Economy, Romanian Academy, Bucharest, Romania
stradivonas@gmail.com , ORCID ID: 0000-0001-8436-9494
**Corresponding author*

Abstract
The digital transition of the urban environment is a complex and multidimensional concept. It emerges as a result of the interplay between emerging market technologies, urban infrastructure, and public policies. This transition refers to the ways in which digital technologies, such as artificial intelligence, the Internet of Things, big data, and robotics, are capable of transforming urban spaces. The digital transition illustrates how these technologies can reshape the operation of public services, ranging from transportation and energy to sanitation and street lighting. Through their integration, cities can evolve into "smart cities", where infrastructure becomes automated, interconnected, and oriented toward efficiency and sustainability. A critical aspect of the digital transition lies in analyzing its impact on urban governance, forms of civic participation, and the exercise of the right to the city. At the same time, it highlights the risks associated with digital fragmentation and the exclusion of certain social groups from the new technological ecologies shaping urban space. Currently, the digital transition of urban environments brings forth a number of benefits. One of the most significant is the increased efficiency of public services. Digital platforms facilitate interaction with citizens and reduce bureaucratic barriers. Citizens gain faster access to various documents, can make payments more easily, and can schedule appointments at public institutions with greater convenience. As a result, communication processes become more transparent and direct, thus reducing waiting times and associated costs. The digital transition contributes to the development of smart cities by integrating emerging technologies that can ultimately enhance urban quality of life. Cities may implement urban sensors, adopt intelligent transportation systems, utilize adaptive public lighting, and deploy environmental monitoring applications. These innovations aim to improve the functionality of urban environments. In this regard, digital activity plays a vital role in reducing pollution, optimizing traffic flows, and enhancing overall quality of life. Another key advantage of the digital transition is the reinforcement of participatory governance. Digital platforms enable citizens to actively engage in decision-making processes, provide timely feedback, and propose solutions to issues affecting them. The implementation of emerging technologies in this context can increase public trust in institutions and foster more transparent and effective governance. Furthermore, the digital transition plays a crucial role in the collection and analysis of urban data. The use of such data supports evidence-based policymaking. This allows municipal administrations to better manage information regarding city traffic, public safety, and urban planning.
Objective*: The primary objective of this paper is to offer an integrative perspective on how digitalization can improve the functioning of urban environments.*

Method: *This study conducts an exploratory analysis of the digital transition in urban contexts, contributing to a deeper understanding of this process as a socio-technical transformation. It introduces the concept of the "digital transition of the urban environment" and outlines the main benefits it brings to both citizens and public administrations.*

Results: *The findings provide insights into how emerging technologies are currently enhancing urban operations and services. The study establishes a conceptual foundation for future research and informs public policy initiatives aimed at fostering sustainability, equity, and digital resilience.*

Originality: *This paper provides a significant contribution to the academic literature by synthesizing and illustrating key theoretical concepts related to urban digital transformation. It offers a comprehensive analysis of how technological innovation can enhance urban infrastructure and explores the ways in which such infrastructure should be developed to generate tangible benefits for both citizens and public administration. The study emphasizes the strategic role of innovation in promoting more efficient, inclusive, and sustainable urban environments.*

Keywords: *urban digital transition, digital transformation, urban innovation, smart cities, sustainability*

MARKINGS OF THE QUALITY ASSESSMENT CONCEPT OF MEDICAL SERVICES IN THE CONTEXT OF ENSURING THE FEASIBILITY OF PUBLIC HEALTH

Corina Causan
"Constantin Stere" University of European Economic and Political Studies, Chisinau, Republic of Moldova
kausankorina@gmail.com

Abstract

Objective*: In the modern world, health problems are becoming more and more acute and multifaceted. Population growth, increasing life expectancy, epidemics of infectious and chronic diseases, and changes in people's lifestyles are permanent challenges for existing health systems. At the same time, the social and economic aspects of health care are becoming increasingly important, as the health of the nation directly affects social stability and economic development.*

Objectives*. In order to evaluate the quality of medical services from the beginning, the authors have drawn their main objective to study the differences between the medical categories of medical assistance and medical services in the context of economic categorization and determining their roles in ensuring public health.*

The author's vision reveals the fact that in addition to the present similarities between these two categories, there are fundamental differences, from the point of view of the economic concept. The deviation of these two categories deeply reveals their economic diversification using their analysis through indicators of structure, execution process and the way of determining effectiveness.

The recommended indicators are required to be used at the regional and national level, dividing the affiliation of each medical institution, both public and private.

Methods*: The development of the concept of the quality of medical assistance at the regional level was carried out based on the approach proposed by A. Donatabedian, namely, the method is based on the analysis of three components - structure, process and result. The evaluation of the structure involves determining the potential capabilities of a medical subject (institution or medical worker) to provide medical care that corresponds to its functions. In this case, the resource base is analyzed: staff, equipment, conditions of stay for patients, etc. When evaluating the process, the compliance with the medical technologies applied to the established diagnosis is analyzed; when the outcome is evaluated - the degree to which the intentions are achieved at each stage of medical care. This approach can be the theoretical basis for the formation of quality indicators, which should reflect the more significant elements of the structure and process and the degree to which the desired result is achieved.*

Results*: In our opinion, the quality of health care should be assessed by means of indicators specific to this field, and not by means of the general health status of the population, which is an outcome influenced by multiple factors, often external to the health system. Relevant indicators include the effectiveness of health interventions, the satisfaction of beneficiaries and also cost-effectiveness evaluation.*

The relevance of this article is to highlight the fact that there is currently no well-defined system of criteria, indicators and concepts that would allow a comprehensive and standardized assessment of the quality and efficiency of health care in accordance with the requirements of

the World Health Organization. Assessing quality based on the health status of the population is often inadequate, as health status is determined by socio-economic, environmental, lifestyle, genetic risk and epidemiologic factors, which cannot be directly controlled by the health system. In addition, evaluations based solely on patient satisfaction provide limited insight into the quality of care. A comprehensive and relevant analysis requires an approach that combines objective indicators with subjective perceptions, as only by integrating both dimensions can a realistic and detailed picture of health system performance be obtained.
Keywords*: economic category, public health, medical services, quality of life, life expectancy, economic security, quality of medical services, economic indicators.*

GENERATIVE AI AND THE IMPACT ON CREATIVITY AND CRITICAL THINKING

Monalisa Andreea Gheorghe*
Bucharest University of Economic Studies, Bucharest, Romania
gheorghemonalisa17@stud.ase.ro
Adrian Oțoiu
Bucharest University of Economic Studies, Bucharest, Romania
ORCID ID: 0000-0001-5830-5462
**Corresponding author*

Abstract

Objective*: Artificial intelligence (AI) becomes an increasingly integral part of modern society, its influence is reshaping industries, redefining workflows and transforming human interaction with technology. As artificial intelligence becomes increasingly prominent in public discourse, it is essential to evaluate both its benefits and limitations, particularly in relation to its impact on human skill development. In particular, generative AI—a subset of AI capable of producing text, images, code, and other forms of content—has emerged as a powerful force in redefining how individuals access, process, and create information. Among the most widely recognized generative AI tools is ChatGPT, a conversational tool developed by OpenAI. Its versatility across various domains—including education—positions it as a transformative technological advancement. In the context of evolving educational needs, it is imperative that teaching methods and classroom tools adapt accordingly to meet the demands of modern learning environments. In the context of education, generative AI represents both an opportunity and a challenge. On one hand, it enables students to receive instant feedback, generate ideas, enhance their writing, explore complex topics more interactively than traditional methods allow, can break down complex topics into simpler terms, assist with language learning, generate examples and offer personalized explanations based on student queries. This immediacy can empower students to take ownership of their learning and deepen their understanding outside the constraints of classroom hours. Students who struggle in traditional settings can benefit from step-by-step guidance, repetition or alternative explanations. For gifted learners, AI can offer enrichment opportunities, encouraging exploration of more advanced topics beyond the standard curriculum. On the other hand, it raises concerns about over-reliance resulting in bypassing the cognitive processes necessary for deep learning and can hinder the development of critical thinking, problem-solving, and independent research skills, ultimately weakening their academic foundation. Moreover, it raises concerns about authenticity of student work and the potential erosion of critical thinking and problem-solving abilities if not used thoughtfully.*

Method*: This paper explores the dual-edged nature of generative AI by examining the extent to which tools like ChatGPT influence the development of key academic skills, particularly creativity, critical thinking and information literacy. It also adopts a theoretical framework to provide a comprehensive understanding of generative AI, its underlying mechanisms and its role in supporting students' daily academic activities. The study further explores the potential outcomes of integrating such tools into the learning process, with particular emphasis on how educators can utilize ChatGPT to design lesson plans, create engaging activities, develop evaluation tools and apply innovative methods for reinforcing new knowledge in a dynamic and modern manner.*

***Results**: The findings suggest a deeper understanding of the influence ChatGPT has on fostering student creativity and critical thinking skills. As the landscape of education continues to evolve in tandem with technological innovation, it becomes crucial to reassess and recalibrate the methodologies and tools used to prepare students for the demands of a digitally-driven future.*

***Originality**: This paper approaches the subject with a direct and unfiltered lens, offering fresh insight into the tangible shifts generative AI has introduced into the educational landscape.*

***Keywords**: ChatGPT, generative AI, education, over-reliance, creativity, critical thinking, information literacy.*

DIGITAL COMPETENCE FOR LIFELONG LEARNING: TOWARDS AN INCLUSIVE AND IMPACTFUL DIGITAL TRANSFORMATION

Georgiana Popescu*
Petroleum-Gas University of Ploiești, Romania
georgiana.popescu@upg-ploiesti.ro , ORCID ID: 0009-0008-7323-7013
Ileana Dumitru
Petroleum-Gas University of Ploiești, Romania
ileana.dumitru@upg-ploiesti.ro , ORCID ID: 0009-0009-6849-4143
**Corresponding author*

Abstract
Objective*: It is no news to anybody that among today's society transformations, the digital one is one of the most radical and with, sometimes, hard to comprehend manifestations and consequences. It happens fast, affects everybody, keeps changing, eludes rigid traditional analysis and understanding, mechanisms and procedures. Chances are even thorough and grounded research and regulations, by the time they are being processed or implemented, will become partially obsolete. It is however a challenge that has to be met, if we are to help the educational system adapt to the ever shifting and volcanic process of digitalization. Learners and educators alike need directions, guidelines and deep understanding of what digital competence and lifelong learning could mean. Digital competence is, of course, the survival skill needed by all if we are to stand a chance when dealing with the effects of the world's digital transformation. It is the key that can open the vault of educational, true fair social equity and lifelong learning. This paper will focus on how the educational systems can adapt through the integration of digital competences in various national curricula and teacher education policies. At its core lie comprehensive data from five European countries. We aim at assessing how coherent the policies integration is, highlight the best approaches and last, but not least, suggest recommendations for better implementation procedures.*
Method*: Our analysis is qualitative content oriented and conducted on national curriculum documents, subject syllabi, teacher education curricula and standards from Estonia, Finland, Germany, Spain and Romania. We also took into account these countries' national educational strategies and also the European Commission and OECD evaluation reports insights. In order to define cross-domain key competences, i.e. information literacy, digital content creation, communication, safety, problem solving for citizens and to take into account pedagogical aspects for educators, we used the European Digital Competence Framework for Citizens (DigComp) and the Digital Competence Framework for Educators (DigCompEdu). Our procedure meant that documents were sorted by references to digital competence components, educators training and assessment criteria, by means of qualitative content analysis. As a consequence, we were able to identify detailed information concerning, for example, the coherence between digital education strategies and curricula, how well-rooted digital competences are in curricula, to what degree teacher education is aligned with DigCompEdu domains. This layered methodological approach also allowed us to identify strengths and weaknesses and thorough understanding of the systemic settings of Estonia, Finland, Germany, Spain and Romania.*
Results: *Results show a good degree of variability across the five national education systems conceptualization and its practical implementation. Estonia and Finland provide*

comprehensive teacher education programs aligned with DigCompEdu, and that includes modules on digital pedagogy, formative technological assessment and ethics. Digital competence is integrated across subjects and grade levels while curricula specify digital literacy goals and critical and creative use of technology. In Germany digital competence is gradually integrated with some subject-specific digital skills emphasized; however, Germany's programs vary by state, some provide extensive digital training and standards, while others are less specific. Spain has improved teacher training curricula, increasingly emphasizing digital competences and skills but still faces implementation inconsistency. In Romania, teacher education only shows limited digital competence coverage, digital skills have limited integration while practical training and pedagogical focus are often faulty. Across all five countries there is a lack of continuous professional development with educators, the digital competence assessment guidelines have severe gaps, for both learners and educators. There are also inequities when it comes down to infrastructure and resources. Overall, our comparative analysis revealed a major disparity between the overly ambitious statements and their practical implementation, especially when we take into account the initial phase of teacher education, but also their continuous professional formative development. Of course, the less than coherent assessment frameworks and the uneven availability of resources or their allocation play a major role, but we firmly believe that curriculum content, as well as assessment practices, should be aligned, while teacher training imposes itself as the star factor that can provide effective digital competences.

Originality: *Our study's originality lies in examining systemic policy design and coherence, providing perspective and insights at a macroscopic level, while using publicly available secondary data rather than small scale random empirical studies. As a consequence, not only have we mapped national approaches and their integration into the European frameworks, but we have also identified several key points relevant to policy and decision makers in education. Our study does not ignore the traditional distance between policy statements and practical realities and also provides recommendations aimed at sustainable digital transformation within education systems.*

Keywords*: digital competence, lifelong learning, curriculum policy, teacher education, DigComp, educational technology, comparative education*

Funding*: This research was supported by a grant from the Petroleum-Gas University of Ploiesti, Romania, project number GO-GICS-30707/10.12.2024, within the Internal Grant for Scientific Research*

ETHICS AND BIAS IN AI: A POTENTIAL CHALLENGE TO FAIR ECONOMIC PROGRESS

Bogdan Mirea*
The Bucharest University of Economic Studies, Bucharest, Romania
mireabogdan17@stud.ase.ro , ORCID ID: 0009-0001-6839-059X
Giani-Ionel Grădinaru
The Bucharest University of Economic Studies, Bucharest, Romania; Institute of National Economy-Romanian Academy, Bucharest, Romania
gianigradinaru@gmail.com , ORCID ID: 0000-0003-3336-1737
**Corresponding author*

Abstract
The swift integration of Artificial Intelligence (AI) into economic systems has fundamentally transformed and redefined decision-making processes across sectors such as finance, healthcare, and employment. However, this continuous innovation in emerging technologies also leads to the emergence of ethical challenges, particularly in terms of bias, transparency, and fairness. This study explores the potential of AI systems to enhance operational efficiency and democratize service access. However, it also examines the possibility that these systems might inadvertently perpetuate social and economic inequalities. The objective of this study is to investigate the implications of the integration of artificial intelligence (AI) models in financial decision-making processes on the promotion of equitable economic growth. By focusing on a real-world use case in the banking sector, we highlight the ethical implications of biased AI decisions and contribute to the wider academic and societal conversation on responsible digital transformation.
The study uses the publicly available Bank Marketing dataset, which contains information on client profiles and past campaign outcomes from a Portuguese banking institution. We train an XGBoost classification model to predict the likelihood of a customer subscribing to a term deposit. To interpret the model's behavior and identify the leading and most impactful factors driving its predictions, we apply SHAP (SHapley Additive exPlanations), a state-of-the-art interpretability technique. By assigning an importance value to each input variable for a given decision, SHAP enables transparent, model-agnostic explanations, highlighting the presence and impact of potential bias, both direct and indirect through correlated or proxy variables. This approach allows us to analyze the marginal impact of each feature, such as age, job, marital status, or education on the model's outputs, thus revealing potential ethical concerns regarding sensitive variables.
Our SHAP analysis reveals that certain socio-economic attributes significantly influence the model's predictions and certain categories are often favored or penalized in ways that may not be economically or ethically justified. The results demonstrate that even highly accurate models can embed latent biases derived from historical data patterns. Furthermore, we show that omitting or transforming sensitive features alters the model's behavior, but not always in predictable or fair ways. These findings suggest that algorithmic decision-making in finance must be continuously audited for fairness and transparency to prevent systemic discrimination. This study contributes a novel intersection between explainable machine learning, ethical evaluation, and economic policy. While a lot of other studies delves on model performance and accuracy or predictive power, our research focuses on the interpretability and socio-economic consequences of AI predictions. By combining SHAP with XGBoost in the context of financial

inclusion, we offer a practical framework to diagnose and visualize potential biases in AI systems that influence economic access and equity. This finding is consistent with the emerging imperative for digital tools that not only facilitate progress but also ensure the maintenance of ethical standards in the governance of artificial intelligence (AI) in a world where the implementation of AI may exceed the capacity to comprehensively grasp the underlying processes. Our research encourages policymakers, developers, and economists to critically assess how AI affects equity and economic opportunity.
Keywords*: AI ethics, algorithmic bias, economic fairness, credit scoring, SHAP, XGBoost, digital progress, machine learning fairness, responsible AI, financial inclusion*
Funding*: This paper was co-financed by The Bucharest University of Economic Studies during the PhD program and was funded by the EU's NextGenerationEU instrument through the National Recovery and Resilience Plan of Romania - Pillar PNRR-III-C9-2022 – I8, managed by the Ministry of Research, Innovation and Digitalization, within the project entitled „CauseFinder: Causality in the Era of Big Data and AI and its applications to innovation management", contract no. 760049/23.05.2023, code CF 268/29.11.2022*

SKILLS FOR THE FUTURE: REDEFINING ROMANIAN EDUCATION IN THE AGE OF ARTIFICIAL INTELLIGENCE

Emilia Țițan
The Bucharest University of Economic Studies, Bucharest, Romania; Institute of National Economy, Bucharest, Romania
emilia.titan@csie.ase.ro , ORCID ID: 0000-0003-0614-1958
Mihaela Mihai*
The Bucharest University of Economic Studies, Bucharest, Romania; Institute of National Economy, Bucharest, Romania
mihaela.mihai@csie.ase.ro , ORCID ID: 0000-0003-0326-5402
Bogdan-Andrei Bînă
The Bucharest University of Economic Studies, Bucharest, Romania
binabogdan19@stud.ase.ro
Alexandru Marian Petrișor Tănase
The Bucharest University of Economic Studies, Bucharest, Romania
alexandru.tanase@csie.ase.ro
**Corresponding author*

Abstract
The acceleration of technological progress and the emergence of artificial intelligence (AI) are causing a profound rethinking of educational paradigms globally, questioning traditional teaching and learning models and emphasizing the need to develop adaptable, transferable and relevant skills for new socio-economic realities.

***Objective**: The profound transformations generated by artificial intelligence require a fundamental rethinking of educational systems globally. In recent years, Romania has been faced with an increasingly acute need to adapt its educational system to these transformations. Competency-based education (CBE), based on the development of practical, transferable skills and critical thinking, is becoming a priority in contemporary educational reforms. This study aims to analyze the challenges and opportunities associated with the implementation of CBE in Romania, in the context of the transformations brought by AI, with a focus on redefining the curriculum and updating it to the requirements of the labor market.*

***Method**: The paper is based on a documentary and conceptual analysis of the main national and European educational policies, digitalization strategies and curriculum reform initiatives relevant to the Romanian context. Strategic documents, digital competence frameworks – such as the Digital Competence Framework for Citizens (DigComp), international recommendations – case studies and reports from UNESCO, OECD and examples of good practices from other educational systems are examined. The analysis focuses on how AI can support the development of key competences in school and contribute to the modernization of the educational process.*

***Results**: The results highlight major challenges such as: the rigidity and outdated nature of the national curriculum; insufficient training of teachers in the field of new technologies; the gap between the skills developed in school and the real requirements of the labor market; limited collaboration between the educational and economic environment; uneven digital infrastructure, especially in disadvantaged areas. Promising perspectives are also outlined: the integration of AI in teaching-learning processes, the expansion of micro-certifications and*

flexible educational routes, as well as curricular reform oriented towards transversal skills – critical thinking, digital implementation, collaboration and adaptability.
Originality*: The integrated analysis of the relationship between AI, future skills and curriculum reform in the Romanian context brings an original contribution to the educational literature in Eastern Europe. Instead of a classic, strictly technical or purely pedagogical approach, the article proposes a strategic framework for educational interpretation and intervention, based on the convergence between technological transformations and the need to update curricular policies. Thus, the study offers concrete directions for the modernization of education in a society undergoing accelerated digital transition.*
Through this analysis, the paper contributes to shaping a strategic vision of Romanian education, in which future skills and emerging technologies become essential pillars of sustainable curricular reform.
Keywords*: competency-based education, artificial intelligence, curriculum reform, labor market, Romania*

THE RELATIONSHIP BETWEEN EDUCATION AND ECONOMIC GROWTH

Andreea-Oana Begu*

Institute of National Economy, Romanian Academy, Bucharest, Romania; The Bucharest University of Economic Studies, Bucharest, Romania

begu_andreeaoana@yahoo.com, ORCID ID: 0009-0001-9485-7173

Bogdan Zainea

The Bucharest University of Economic Studies, Bucharest, Romania

zaineabogdan23@stud.ase.ro

Maria-Cristina Zorilă

The Bucharest University of Economic Studies, Bucharest, Romania

zorilamaria23@stud.ase.ro

**Corresponding author*

Abstract

Through this paper, we aim to address a topic whose origins date back to the 1960s, when the economist Theodore W. Schultz laid the foundations of human capital theory and argued that: if both physical capital and human capital develop together, then economic capital can also grow (T.R. Breton, 2014). In line with this statement, the present study aims to highlight the extent to which certain indicators, closely related to education, are connected to a country's economic growth. Our analysis will focus on two Eastern European countries that have undergone a period of both economic and social transition, namely Romania and Poland. The main hypothesis from which we start our research, is that the educational component of human capital has a positive relationship with economic growth. Thus, in the first part of the paper, we will present a comparative overview of the values for the selected indicators of education and economic growth for both countries. Subsequently, we will test two more auxiliary hypotheses, based on the primary one, through simple linear regression models, which will provide some interesting perspectives.

Keywords: *education, economic growth, simple linear regression models, Romania, Poland*

CONTENTS