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"MODERN FINANCE FROM THE PERSPECTIVE OF SUSTAINABILITY OF NATIONAL ECONOMIES"

November 28-29, 2025, Chișinău, Moldova

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FOREWORD

On November 28-29, 2025, the Faculty of Finance of the Academy of Economic Studies of Moldova (ASEM) successfully hosted the 2nd edition of the International Scientific and Practical Conference on "Modern Finance from the Perspective of Sustainability of National Economies". The event, held in a hybrid format, brought together renowned experts from academia, the public and private sectors, including representatives of central and local public administration, as well as the banking and financial sector. The conference provided a platform for debate on key aspects of modern finance, with a focus on economic sustainability. The presentations were structured on four thematic panels, addressing topics such as: applying innovative business models in national economies; modernizing the financial sector and accelerating the EU accession process; accessing European funds and making strategic investments; challenges in the financial field at the macroeconomic and microeconomic levels; financial sustainability of the insurance sector; increasing the resilience of the economy and improving access to financing for companies.

Panel I
Financial convergence and EU accession - the pillars of economic sustainability in the Republic of Moldova

In the first panel, the participants debated topical issues, that included particularities of financial inclusion, trends in financial intermediation, modernization of banking infrastructure through the implementation of MIA and SEPA payment systems, as well as the importance of sustainable capital growth. Also, an important role was played by discussions on the priorities of the National Bank of Moldova in the process of adjusting the legislative framework to European Union standards. We express our appreciation and sincere thanks to all participants who contributed with valuable presentations and communications, especially to the *National Bank of Moldova, the Association of Banks of the Republic of Moldova, OTP Bank, as well as the teaching staff from the "Alexandru Ioan Cuza" University, Iași, Romania.*

Panel II
Financial sustainability of the insurance sector through the lens of innovations

Participants in Panel II had the opportunity to attend presentations and debates on topics such as: the evolution of the institutional and regulatory framework of the insurance sector, the dynamics of the insurance sector and adaptation to market changes, the digitalization process in order to modernize the insurance sector, the taxonomy of sustainable financing, insurance market trends and the challenges of the insurance sector in the Republic of Moldova.
We express our sincere gratitude to all participants who contributed with presentations and interesting interventions, especially to representatives of the *Ministry of Finance, Moldasig SA, Rapidasig - BAR MGP Broker SRL, as well as the teaching staff from the "Alexandru Ioan Cuza" University, Iași, Romania.*

Panel III
European funds and investment strategies for economic sustainability

At the level of the third panel, the participants had the opportunity to attend presentations and debates focused on topics of interest, such as: accessing European funds by applying to programs, specifying project eligibility criteria, cooperation programs with the EU at the regional level, the particularities of the regional development strategy, the importance of investments in economic sustainability, investments in green energy, the circular economy, the challenges of implementing sustainability plans in the Republic of Moldova. We express our sincere gratitude to all participants who contributed with valuable presentations and communications, especially the *Ministry of Finance, Regional Development Agency, Chisinau and MAIB.*

Online communication session

New academic and professional collaborations were established during the event, representing an important framework for interdisciplinary dialogue, in which concrete solutions for integrating sustainability principles into the development of the national economy were analyzed. The topics discussed focused on: economic education, digital transformations, financial policy related to climate and systemic risk, the impact of governance on the economic results of European funds, the use of REGTECH in the banking sector. *We express our sincere thanks to participants from National Institute for Economic Research, Romanian Academy, Alexandru Ioan Cuza University of Iasi, Romania, Stefan cel Mare University of Suceava, Romania, Universitatea de Vest din Timisoara, Romania, National Academy of Sciences of Ukraine (Kharkiv, Ukraine), State University of Moldova for the interactive discussions, valuable contributions, exceptional research and the interest shown in the future of modern finance in a context oriented towards sustainability.*

We sincerely thank the organizers BUȘMACHIU Eugenia, PhD, Associate Professor, SECRIERU Angela, PhD, Associate Professor, Associate Professor, members of the scientific and organizational committees, who contributed with dedication to the realization of this event, as well as all the participants for their valuable contributions to the success of this conference.

MOLDOVA'S GREEN FINANCE CONVERGENCE: REGULATION AND INVESTMENT

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Abstract: *The Republic of Moldova is currently navigating a complex transformation of its financial architecture, driven by the dual imperatives of national sustainability objectives and European Union (EU) accession. This study analyzes the harmonization of Moldova's financial sector with EU standards, focusing specifically on the National Bank of Moldova's (NBM) Sustainable Finance Roadmap (2024–2028) and the critical role of International Financial Institutions (IFIs) in de-risking private capital. We examine the structural shift from a conservative, liquidity-rich banking sector toward active green lending, evidenced by a 127% growth in specific green portfolios between 2022 and 2025. The analysis identifies key structural impediments—primarily administrative capacity deficits and energy storage limitations—and argues that despite regulatory progress, the €30 billion investment gap required for the Nationally Determined Contribution (NDC 3.0) cannot be closed without sovereign intervention in physical infrastructure.*

Keywords: *green finance, sustainable finance, climate risk.*

JEL Classification: *G28, Q54, F35.*

INTRODUCTION

For decades, the financial stability framework of the Republic of Moldova, governed by the National Bank of Moldova (NBM), adhered to a traditional "market-neutral" mandate focused strictly on price stability. That paradigm is shifting now and involves a broader integration of climate resilience into central banking, a move necessitated not by aspirational policy but by severe macroeconomic and environmental vulnerabilities.

The theoretical basis for this shift lies in the recognition that climate change is a source of financial instability. Climate-related disasters, costing an estimated 1.3% of GDP annually, threaten borrower solvency and banking system stability. Consequently, the formal integration of climate resilience into the stability mandate has become an economic imperative rather than an elective strategy [9].

Moldova's commitment under the Paris Agreement is robust, formalized in its updated Nationally Determined Contribution (NDC 3.0), which targets a greenhouse gas emission reduction of over 70 percent by 2030 [2]. Achieving this objective requires a substantial capital injection, estimated at over €30 billion [8]. However, mobilizing this capital faces a structural hurdle: Moldova's financial sector is dominated by banking assets (87% of the sector), yet these institutions have historically exhibited a high "liquidity preference," allocating over 35% of assets to low-risk government securities rather than private sector lending [7]. The challenge, therefore, is to alter the

transmission mechanism of monetary policy so that liquidity flows toward sustainable capital formation rather than sovereign debt recycling.

MACROECONOMIC CONTEXT AND FINANCIAL STRUCTURE

The macroeconomic environment in Moldova remains highly sensitive to geopolitical volatility. The 2022 invasion of Ukraine precipitated significant economic disruption, characterized by supply chain shocks and persistent double-digit inflation [11]. Despite an expanded program from the International Monetary Fund (IMF), economic recovery has been protracted, with growth registering a marginal 0.1 percent in 2024 [11].

A significant structural impediment to investment is the financing gap for micro, small, and medium enterprises (MSMEs), estimated at 14 percent of GDP [12]. This credit rationing is reinforced by the conservative asset allocation of domestic banks. Despite ample liquidity—well above regulatory requirements, their preference for sovereign securities limits the flow of funding to bankable green projects. Government securities carry a zero-risk weight and offer high yields in an inflationary environment, whereas lending to the private sector—composed largely of low-productivity micro-enterprises—involves high due diligence costs and significant credit risk. Asymmetric information constrains banks' ability to differentiate between viable green innovations and high-risk ventures without external verification mechanisms [12], and, in response, the government has outlined measures in the Moldova 2030 National Development Strategy to advance a sustainable economy [2].

THE REGULATORY FRAMEWORK: THE NBM ROADMAP

The foundation of Moldova's sustainable finance framework is the *Sustainable Finance Roadmap (2024-2028)*, approved by the NBM Executive Board on May 28, 2024 [4]. This document establishes the central bank's proactive role in mobilizing finance, aligning with commitments made under the Memorandum of Economic and Financial Policies with the IMF [11]. The strategy is operationalized through four interconnected pillars designed to address specific institutional deficits.

Pillar I: Increasing Awareness and Capacity Building addresses the critical "human capital deficit" within the sector. Unlike traditional credit risk assessment, which relies on historical financial data, environmental risk analysis requires forward-looking modeling and climate literacy—competencies historically absent in the Moldovan banking system. Consequently, the NBM has prioritized the institutionalization of internal governance structures and technical training to ensure that both regulators and commercial bankers possess the technical competence to evaluate complex ESG models before strict mandates are enforced.

Pillar II: Sustainable Finance Flows aims to standardize the definition of sustainable activities through a National Sustainable Finance Taxonomy [10]. This is not merely a classification exercise; it is a signaling device. By aligning this taxonomy with the EU Taxonomy Regulation (2020/852), the NBM provides the regulatory certainty required for cross-border capital flows. Crucially, the taxonomy establishes "Technical Screening Criteria" that allow banks to verify if an agricultural loan qualifies as "adaptation finance" (e.g., drought-resistant crops) or merely standard working capital. This distinction is vital for the issuance of credible green bonds [4].

Pillar III: ESG Integration and Risk Management mandates the embedding of climate-related risks—both physical and transition risks—into financial institutions' core risk-assessment frameworks [9]. The NBM is transitioning from qualitative surveys to mandatory quantitative stress testing. This involves modeling hypothetical scenarios, such as the introduction of a carbon border adjustment mechanism by the EU, which would impact the repayment capacity of Moldovan exporters. By forcing banks to quantify these risks within their Internal Capital Adequacy Assessment Process the regulator effectively increases the cost of capital for "brown" (polluting) assets [3].

Pillar IV: Transparency and Market Discipline includes mandatory ESG disclosures for financial institutions to enforce market discipline [4]. The NBM is working to align these requirements with the International Sustainability Standards Board protocols. However, the efficacy of this pillar is currently constrained by the limited administrative capacity within the NBM, specifically regarding staff experienced in ESG analysis and the lack of a centralized digital data repository [5].

DE-RISKING MECHANISMS AND CAPITAL MOBILIZATION

Due to the conservative nature of the local financial system, Moldova relies on International Financial Institutions (IFIs) to activate the market. Partners such as the EBRD, EIB, and World Bank provide guarantees that "de-risk" lending for local banks, effectively substituting private credit risk with sovereign-backed or AAA-rated security [7].

The primary instrument utilized to operationalize this strategy is ***Blended Finance***, which strategically deploys public funds to mitigate the risk profile of private lending. The efficiency of these mechanisms is quantifiable; for instance, the EBRD, backed by the EU's EFSD+ program, has launched portfolio guarantee facilities that cover 50 percent of credit risk on new SME loans [7]. The leverage mechanics of this instrument are significant and function through two distinct channels. First, the IFI guarantee typically acts as a "First-Loss Cover" for a specific tranche of the portfolio. By absorbing the initial tier of default risk, this mechanism reduces the economic capital that the local bank must hold against these loans under Basel III regulations. Second, this regulatory relief generates a potent multiplier effect: analysis indicates a high leverage ratio where, for every €1 of donor guarantee provided, approximately €8 of total capital is mobilized into the real economy [7].

Translating this macro-level efficiency into micro-level impact requires a differentiated approach. Consequently, the strategy deploys the following examples of distinct financial instruments designed to solve the unique structural problems of specific sectors:

- *MSME Collateral Substitution*: EIB Global provided a €50 million loan to *maib*, secured by a European Commission-backed partial guarantee. This mechanism allows the bank to lend to service-based or tech MSMEs that lack tangible collateral (machinery/real estate) by using the EU guarantee as a substitute security [12].
- The *Green Economy Financing Facility*, backed by the EBRD, utilizes Capital Investment Grants. A borrower receives a grant (typically 10-15% of the principal) only *after* independent verification of the energy-efficient installation. This structure incentivizes borrower behavior and ensures the integrity of the green claim [13].
- The Organization for Entrepreneurship Development (ODA) manages a credit guarantee fund for renewable energy producers. This addresses the "maturity mismatch" problem: banks prefer short-term lending (1-3 years), while solar projects require long-term amortization (7-10 years). The guarantee gives banks the confidence to extend loan tenors.

DOMESTIC IMPLEMENTATION OF GREEN FINANCE INSTRUMENTS

The abstract regulatory shifts and international guarantees are translating into tangible changes in the operational behavior of Moldova's domestic financial institutions. The market is witnessing a bifurcation, where "first-mover" banks are rapidly capturing the green market share, effectively creating a new competitive frontier.

Maib, the country's largest bank, has demonstrated a rapid expansion of its sustainable portfolio. By the third quarter of 2024, the bank surpassed MDL 760 million in green loans, with the portfolio exceeding MDL 1.3 billion by the second quarter of 2025—a 127 percent increase since 2022 [12]. This expansion was not accidental but structural; maib developed an internal green taxonomy ahead of the national legislation to guide financing decisions and align with EIB requirements.

Market activity is shifting from simple working capital loans to complex capital expenditure in energy security. Local capacity for project finance is maturing, evidenced by maib's financing of

a 50 MW solar plant in Rădeni scheduled for 2025 [12]. This represents a significant deepening of the financial sector; previously, a project of this scale would have required direct cross-border lending from a development bank.

In the agricultural sector, which is most exposed to physical climate risks, ProCredit Bank has introduced "EcoCredit" products utilizing satellite data analysis. By partnering with ag-tech firms like Farmonaut, the bank can assess credit risk based on historical crop yield data and soil health rather than relying solely on traditional financial statements. This reduces the information asymmetry that typically creates high collateral requirements for farmers.

Complementing banking reforms, preparatory work is underway to integrate the capital market with EU standards. A September 2025 memorandum with the Bucharest Stock Exchange (BVB) aims to establish the infrastructure necessary for future sovereign and corporate green bond issuances. This linkage is critical for providing the long-term liquidity—often 10 to 15-year horizons—that the domestic deposit-based banking system cannot easily supply [14].

STRUCTURAL IMPEDIMENTS: THE INFRASTRUCTURE AND CAPACITY BOTTLENECK

While the regulatory framework accelerates and initial capital deployment is underway, the execution of green finance in Moldova faces a "hard reality" check. The barriers to closing the €30 billion investment gap are no longer purely financial (i.e., lack of liquidity); they have mutated into profound physical, administrative, and structural constraints.

A. The Physical-Technical Barrier

The most acute non-financial systemic risk is the technical limitation of the national energy grid. Financial decarbonization is strictly bounded by physical laws; banks cannot finance energy generation that the grid cannot physically absorb.

- *The Balancing Deficit*: The Moldovan grid lacks domestic flexible generation and battery storage. It relies heavily on the Russian-owned MGRES plant in the Transnistrian region for balancing services. This creates a geopolitical dependency that complicates the risk assessment for long-term infrastructure projects.
- *Curtailment as Credit Risk*: Without Battery Energy Storage Systems, the transmission system operator may be forced to disconnect renewable energy producers during peak generation hours to maintain frequency stability. For a lender, this creates "revenue uncertainty." If a solar plant cannot sell its power due to grid constraints, it cannot service its debt. Consequently, banks view large-scale renewable projects without storage components as inherently unbankable [6], [14].
- *Interconnection Delays*: While interconnection with Romania (and the ENTSO-E system) is progressing, the current cross-border capacity is insufficient to export excess renewable energy, locking producers into a small, easily saturated domestic market.

B. The Administrative Barrier and Human Capital Crisis

While the NBM Roadmap is sophisticated, the administrative apparatus required to execute it is facing a saturation point. The simultaneous demands of EU accession negotiations have strained public sector resources.

- *Specialized Skills Shortage*: There is a chronic "brain drain" of technical talent to the private sector or abroad. The NBM and relevant ministries struggle to recruit staff with dual competency in financial supervision and climate science (e.g., ESG auditing, carbon accounting).
- *Supervisory Lag*: This capacity deficit leads to implementation lags. While primary legislation is passed, the drafting of detailed secondary legislation—such as specific technical screening criteria for niche agricultural sectors—is delayed.
- *The Data Vacuum*: Effective green financing requires historical data to model risk. Moldova lacks a centralized, digital repository of environmental data (e.g., granular flood maps, historical crop yield volatility). Without this data, banks cannot accurately price risk, leading to conservative, high-collateral lending policies [5].

C. Climate losses and Insurance Gaps

Financial policy is currently focused on mitigation (reducing emissions), but the economy is immediately exposed to physical climate risks (droughts, floods).

- *The Solvency Threat*: With the annual funding gap for disaster recovery standing at $146 million, climate volatility is a direct threat to borrower solvency. A severe drought does not just ruin a harvest; it impairs the non-performing loan ratios of the entire agricultural banking portfolio.
- *The Insurance Void*: Current insurance penetration is too low to act as a shock absorber. This leaves the state budget—and by extension, the sovereign balance sheets the "insurer of last resort."

CONCLUSIONS AND RECOMMENDATIONS

The Republic of Moldova has established a comprehensive regulatory pathway, driven by the NBM Sustainable Finance Roadmap, to align its financial sector with sustainability goals [4]. Significant progress is evident in the leveraging of IFI financial instruments to de-risk private capital, creating a nascent but rapidly growing market for green finance [12]. However, the realization of Moldova's extraordinary climate ambition is threatened by structural bottlenecks, particularly administrative capacity constraints and critical infrastructure deficits [1].

To bridge the multi-billion euro investment gap required to achieve NDC 3.0 targets, the following strategic actions are recommended:

1. **Legal Finalization:** The government must finalize and legally implement the National Sustainable Finance Taxonomy. This should be done via primary legislation to ensure regulatory certainty, prevent greenwashing, and facilitate the aggregation of projects for green bond issuance [10].
2. **Mandatory Risk Integration:** The NBM should transition from guidelines to mandates, requiring systemic financial institutions to conduct quantitative climate risk stress tests. This will explicitly quantify systemic risks, forcing institutions to price climate externalities and incentivize capital reallocation away from brown assets [9].
3. **Infrastructure Investment:** Financial mechanisms cannot succeed in isolation. Sovereign resources and grant funding must be prioritized for **battery storage and smart grid technologies**. Resolving the technical barriers to renewable energy absorption is a prerequisite for unlocking private project finance [14].
4. **Capacity Building:** Technical assistance budgets should be front-loaded to establish a dedicated implementation unit within the NBM. This unit should focus specifically on digitalizing ESG data reporting to reduce the compliance burden on banks and improve supervisory visibility [5].
5. **Sovereign Risk Transfer:** Given the low insurance penetration, the state is exposed to unabsorbed climate losses. The Ministry of Finance must explore and establish **sovereign risk transfer mechanisms** (e.g., catastrophe bonds or public-private insurance schemes) to shift the burden of large-scale disaster recovery away from the state budget and secure fiscal stability against physical climate shocks.

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ECONOMIC EDUCATION – A FORM OF SUPPORT AND FINANCIAL INSURANCE OF THE YOUNG GENERATION

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Abstract: ***Purpose of the article:*** *The trend and role of education in multilateral development has been increasingly highlighted in the Republic of Moldova, with a focus on economic education. In this educational wave, financial education, entrepreneurial education, and lifelong learning activities which offers the possibility of selecting and planning the educational path of each young citizen. The research is directed towards the need and training of competencies and skills within entrepreneurial education (not as a course), which also includes the financial education of young people who are members of a university environment and feel the need to accumulate skills in this educational field. Obtaining a level of education selected by the younger generation continues to be a solution to financial freedom and a possibility to diversify personal income and financial sources.*
Methodology: *The following research methods were used in the research: the questionnaire method, developed by the project team and placed on the moodle.usm platform. During the survey period of the 2021–2022 academic year, the direct method was also applied, at the request of the interviewed individuals who were studying in the fields of economic sciences, social and behavioral sciences, and educational sciences etc. After the data collection was complete, the results obtained from the conducted survey were analized.*
Conclusions: *Financial education and entrepreneurial education, being essential elements within economic education, represent important pillars in obtaining competencies and skills in the formation of critical thinking, of financial freedom and becoming part of the entrepreneurial environment which are currently extremely (very) necessary in the formation of young citizens, who represent the core of a healthy society.*
Originality: *The study is conducted in examining the need and role of entrepreneurial education and financial education as important components in the training and development of skills that can be obtained within the university environment and are necessary for young people throughout their lives.*

Keywords: *education, financial education, entrepreneurial education, young generation, economic education.*

JEL Classification: *A22*

INTRODUCTION

The present shapes our actions. It highlights the importance of developing valuable skills and abilities gained in university and academic settings. The skills we acquire can be put to use based on our chosen specialties and individual paths. As globalization becomes more complex and challenging, people are increasingly aware of how vital economic education is to the overall educational curriculum (Thao, 2024). The foundation of economic education includes essential areas such as financial education, tax education, financial psychology, and entrepreneurial education. These areas open up new opportunities, letting everyone in society build a set of important skills and abilities that will be useful throughout their lives. Economic education has a significant influence. It fosters critical and analytical thinking while promoting a deeper understanding of market dynamics and practical skills (Bonal, González, 2020). The current unstable environment demands active participation, learning, and skills that match the needs of society. "The goal of economic education is not just to train a workforce but also to develop responsible citizens who can integrate into a new society," as noted by researchers Birman A. and Vasiliev Iu. (Lupu, 2004).

In the vision and statements of researcher Novac A., changing the way of thinking and the possibility of obtaining knowledge, skills and abilities that will develop entrepreneurial culture in the future can be entrepreneurial education. At the same time, this can provide a step towards to motivate the younger generation to be inspired, create and develop business ideas taking into account current requirements. (Novac, 2022)

Because it is not known a theoretical explanation of fundamental financial concepts, the population largely has neither the capacity nor the possibility to make correct financial decisions which are directed towards the management and administration of financial resources, primarily those available. (Nitoi and other, 2022) At the same time, the diversified offer of financial and informational resources present stops it due to the operational and qualitative impossibility of selecting the optimal option for various needs.

Financial education, explained by Gediminas Šimkus G., the bank governor of Lithuania, being as a systemic aspect, highlights the need for the active involvement of all institutions, such as ministries, banks, etc., as it is a task and responsibility of every member of a society and a state.

Definition provided by the Organization for Economic Cooperation and Development (OECD) highlights that financial education is not limited to knowledge acquired in the financial field, but offers the opportunity to acquire certain skills which allow them to be adapted in exploring the financial dimension. We are referring to the skills to perceive how the processes involving money, certain "how money is earned, managed and invested?".

To be more explicit "financial education helps people maintain financial balance, (learns) them how to manage their income and minimize expenses, how to save for unplanned situations, how to accumulate money or use various financial instruments". (Strategy, 2023) The most recent study available from 2023 on the level of financial education (literacy), with the specification among young people (18-29 years old), was conducted by OECD/INFE. The average financial literacy score in participating countries is 63 out of 100 points (67 out of 100 in participating OECD countries). Financial education levels are highest among young people (selected according to the annexes in the report) in Germany (70), Spain (55), Ireland (52), Poland (45), Romania (43), Estonia (40), France (36), Italy (33). (OECD, 2023)

The Global Entrepreneurship Monitor report, which provides us a detailed analysis of graduates and non-graduates aged 18 to 34 who manage start-up businesses. In countries such as Lithuania, Greece, Egypt, non-graduates are more likely than graduates to start or manage a business/enterprise. Analyzing the results obtained on graduates, countries such as Bosnia and Herzegovina, Romania and the United Kingdom have a percentage rate of at least twice as high in starting a business. (GEM, 2025)

We tend to emphasize the fact that according to the implementation program of the "Education 2030" Development Strategy the objectives of supporting the entrepreneurial environment through the development of education in the medium and long term were highlighted through: promoting entrepreneurial, economic and financial education in the curriculum for all levels of the education system.

Simultaneously, the approval by the Government of the Republic of Moldova of the national program for promoting entrepreneurship and increasing competitiveness 2023-2027, which highlights key competences for lifelong learning including entrepreneurial and financial skills, demonstrate that state institutions synchronously monitors the situation and activity of the entrepreneurial and academic environments.

The expert Shaun Mundy from Great Britain, is the person who developed the National Financial Education Strategy (NFES). According to the example of this document taking into account the necessary requirements and conditions, the NFES in Romania was approved until 2030.

We would like to mention that in the Republic of Moldova, within the framework of the National Financial Education Forum, the process of developing the Financial Education Strategy was launched. (Fiscal Monitor, 2023)

This monitoring by public institutions allows in real terms to modify or adapt some requirements according to the need for the European rules to improve and/or have the possibility to adapt processes that are in continuous adjustment and performance.

All three previously mentioned concepts on which education persists, certainly allow citizens (for all age groups) to select those factors with direct or indirect impact which are missing in the individual educational path and which directly influence personal financial security.

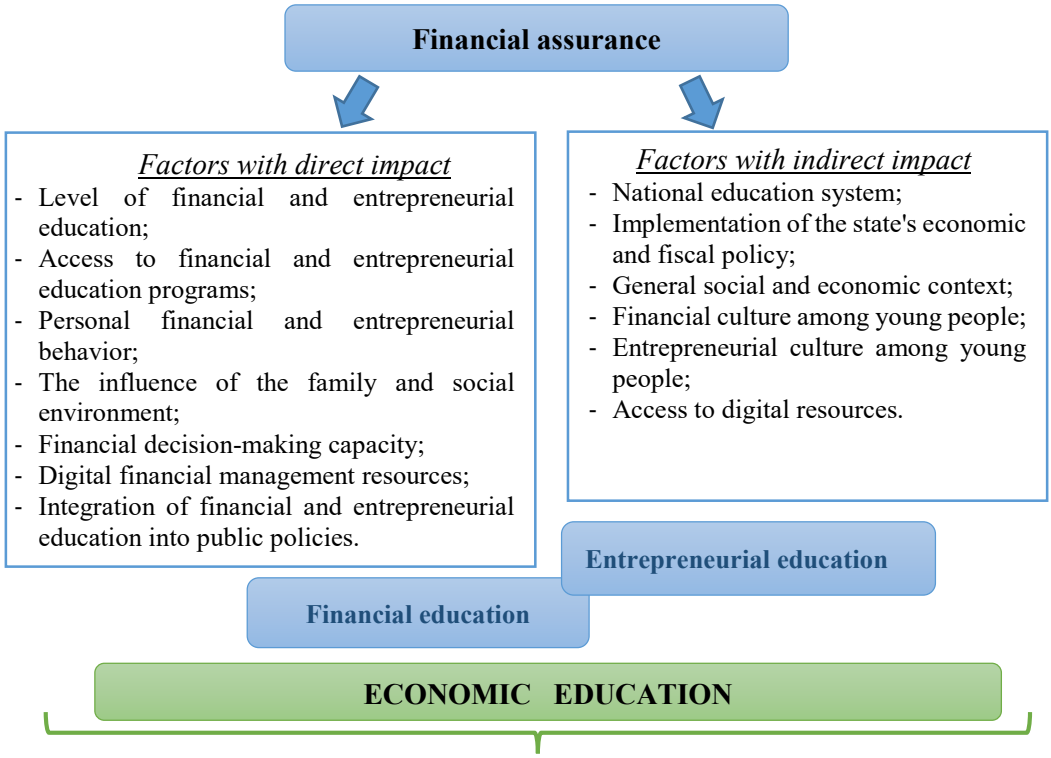

Figure 1. Impact factors of financial security of citizens (especially young people).
Source: developed by the author

Applying entrepreneurial education and financial education as elements of economic education in the structure of the educational system, highlights certain factors with a direct impact on the financial security of young people, namely:

- *The level of financial and entrepreneurial education*, the skills that contain the following concepts: budgeting, saving, investments, loans, taxation, entrepreneur, enterprise, influence correct financial decisions;
- *Access to financial and entrepreneurial education programs*, courses/training, universities or private/public initiatives that develop financial and entrepreneurial skills and abilities;
- *Personal financial and entrepreneurial behavior*, formed through education at different levels of the system that influences the management of financial resources: the tendency to save, avoid debt, plan ahead and start your own business;
- *The influence of the family and social environment*, young people accumulate experience in financial processes and economic values from the core of the family and the social environment;
- *Financial decision-making capacity*, financial education provides the opportunity to acquire risk avoidance skills, comparison of financial offers and financial planning;
- *Digital financial management resources*, budget management applications, investment platforms, distance financial education using online platforms;
- *Integration of financial and entrepreneurial education into public policies*, state support for the development of financial and entrepreneurial skills through national programs.

Factors with an indirect impact that influence the financial security of young people, in the context of economic education, are factors that do not immediately affect the financial situation. We mention the following factors:

- *National education system*, the quality level and application of financial and entrepreneurial education within the educational system that influences the skills of the young generation for economic life;
- *Application of the state's economic and fiscal policy* influences the financial opportunities of young people (inflation, taxes, subsidies), regardless of their level of education;
- *General social and economic context*, the state's level of economic development, the youth unemployment rate or social mobility may limit the applicability of financial knowledge;
- *Financial literacy among young people*, the values in society directed towards saving, financial responsibility or planning, young people (the population) can be negatively influenced (manipulated), regardless if they have financial education;
- *Access to digital sources* influences how young people (the population) can benefit from financial education resources or applications that offer the possibility of managing money.

MATERIALS AND METHODS

Obtaining the research results proposed and presented in the article guides the author towards evaluation in order to train the skills and competencies of potential entrepreneurs in higher education students (case study - USM) with the application of entrepreneurial education.

This research was possible to carry out by using research methods, such as: the analysis method, the method of synthesis of the information used, the comparative method, the logical method.

The data presented in the research allowed us to structure official information based on legislation, the Ministry of Economic Development and Digitalization, publications and analytical materials. Also, the moodle.usm platform database, which was used to place the questionnaire, apply it in the second semester (March-June) of the 2022 academic year, and store, process, and generalize information from student interviews.

RESULTS AND DISCUSSIONS

In the interview process participated 232 students, of which 140 from the Faculty of Economic Sciences, 23 students from the Faculty of Letters (FL), 10 students from the Faculty of Mathematics and Informatics (FMI), the Faculty of Psychology and Educational Sciences, Sociology (FPE) with 43 students and the Faculty of International Relations, Political and Administrative Sciences (FRPA) – 16 students.

By examining the structural element of the Curriculum for non-financial specialties, we found that the courses representing a key part of Economic Education are included in this document. These courses will give students in higher education skills that are vital for their lives. We want to highlight that the units are adjusted to the changes happening in various processes within the financial system. The courses that form a fundamental part of the economic education concept, listed from the faculties selected for the questionnaire, include:

- ✓ Within FL: Financial Education (U-course of socio-humanistic orientation) in the 1st and 2nd years, and Innovative Entrepreneurship (U) in the 2nd year;
- ✓ Within FMI: Innovative Entrepreneurship (F-fundamental course units / U) in the 2nd year;
- ✓ Within FPE and FRPA: Financial Education (U) in the 1st year, and Innovative Entrepreneurship (U) in the 1st and 2nd years.

Table 1. Course units that students would participate in the educational process

Cours	FL	FMI	FPE	FRPA
Finance	3.4	3.0	3.4	4.2
Accounting by application areas	3.8	3.2	3.0	4.1
Business planning and management	3.9	**4.2**	3.0	**4.6**
Marketing and sales techniques	3.6	4.0	**3.7**	4.5
National and international project management	**4.0**	3.2	3.4	4.1
Financial planning. Attracting financial sources, negotiating and managing them	3.9	3.8	3.5	4.3

Note: 1 – none; 2 - low; 3 - moderate; 4 - high; 5 – very high.
Source: based on the results of the survey within the moodle.usm platform

Based on the results obtained, we can mention that the request of students from FMI and FRPA shows a common interest in selecting the course Business planning and management with a result of 4.2 and 4.6 points, having a characteristic between high and very high.

This request arises from the fact that the current instability raises questions among young students about the possibility of obtaining an additional source of income from starting their own business, without analyzing the field of specialization.

As well, great interest comes from FL students who are interested in participating in the educational process with the inclusion of the course National and international project management, which is currently very practical and useful, resulting from the offers from both the state budget and European funds in various fields of activity.

Those mentioned offer the flexible opportunity for young students to structure their individual educational path by highlighting priorities in the accumulation of personal skills and abilities.

Within economic education, the following dimensions of the educational process can be used as a foundation: cognitive focused on the transmission of information and pertinent knowledge, the value one directed towards the formation of beliefs, attitude, student support and practice that forms certain skills, behaviors with certain value requirements. (Lupu, 2004)

Table 2. General knowledge and skills in the educational process – entrepreneurship education

General skills	FL	FMI	FPȘE	FRISPA
Ability to work alone	3,4	3,7	3,4	3,9
Ability to work in an interdisciplinary team	4,0	3,6	3,5	3,9
Attention to detail	4,0	3,7	3,6	3,6
Basic general business knowledge	3,5	3,3	3,0	3,8
Ability to analyze and synthesize	3,8	3,5	3,6	4,1
Ability to apply knowledge in practice	3,8	3,6	3,6	3,9
Decision making	3,9	3,5	3,7	3,8
Interpersonal skills	3,9	3,6	3,7	3,8
Leadership	3,7	3,3	3,3	4,0
Comuniction	4,1	3,5	3,8	3,9
Solving challenges	3,7	3,5	3,9	3,9
Project design and management	3,5	3,4	3,4	3,9
Research skills	3,8	3,5	3,6	3,9
Working under stressful conditions	3,4	3,4	3,7	3,9

Note: 1 – none; 2 - low; 3 - moderate; 4 - high; 5 – very high.
Source: based on the results of the survey within the moodle.usm platform

We note that the high-scoring competencies selected by students during the semester are: attention to detail; ability to analyze and synthesize; communication and solving challenges which allow them to understand and approach complex difficulties related to the economy primarily at the national level.

Competencies with a moderate score are: the ability to work alone, basic general business knowledge, working under stressful conditions.

These results allow us to review and improve some content units specifically for the business environment and also to emphasize the importance of subdivisions: the expected product and the strategies for achieving it what are part of the student's individual study compartment within the curriculum.

Table 3. Specific knowledge and skills in the educational process – entrepreneurial education

Specific skills	FL	FMI	FPȘE	FRISPA
Accounting standards and techniques	3,3	3,0	2,7	4,0
Data analysis, business analytics	3,5	3,4	2,8	4,2
Practice tax laws	3,3	2,9	2,8	3,9
Budgeting and financial planning	3,5	3,1	2,8	4,0
Financial management	3,4	3,2	2,9	4,2
Cash flow management	3,3	3,2	2,8	3,8
Financial analysis and reporting	3,3	3,3	2,7	4,0
Investment	3,0	3,4	2,8	3,8
Marketing and sales	3,2	3,2	2,9	3,9
Risk analysis and management	3,2	3,3	2,8	4,1
Understanding the banking process and services	3,4	3,1	2,7	4,0

Note: 1 – none; 2 - low; 3 - moderate; 4 - high; 5 – very high.
Source: based on the results of the survey within the moodle.usm platform

By examining case studies, students can improve their critical and strategic thinking skills in situations where outcomes are uncertain and by using scenario-based learning. It is important for students and (potential) entrepreneurs to fully understand the factors contributing to uncertainty and economic decision-makers. The above directs them to focus on improving their innovative and strategic thinking capacity. (Thao, 2024)

CONCLUSIONS

We can say that the value of the population's financial well-being is indispensably driven by the realities of the educational system (level) and the policies developed at the state level. Studies have shown that the higher the level of economic education, with its components, is superior, at the same time they have a direct impact on the financial well-being of the students and highlights its importance in the life of every person.

We highlight that the main skills needed for lifelong learning include developing entrepreneurial skills by incorporating practical experiences into education in line with EU recommendations. These skills focus on building economic abilities through active learning and practical application. They promote the use, evaluation, and realization of business ideas with an innovative approach, which helps individuals adapt to sustainable changes in society.

Economic education provides various financial and entrepreneurial knowledge, information, and skills. It enables people to recognize and use these skills in tough financial situations, ensuring financial security and effective management of available resources in different life scenarios. Economic education is crucial in preparing future generations to tackle economic and financial

challenges at the national level. By understanding basic economic concepts, preparing for difficulties, and developing diverse skills like critical thinking, economic education helps reduce risks during economic downturns and encourages active participation in a changing economy.

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THE IMPACT OF EUROPEAN FUNDS ON THE ECONOMIC SUSTAINABILITY OF THE REPUBLIC OF MOLDOVA: AN EMPIRICAL ANALYSIS OF INVESTMENT STRATEGIES

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Abstract: *This research analyses the impact of European funds on the economic sustainability of the Republic of Moldova, exploring the country's transition from a remittance-dependent growth model to one based on strategic investments and alignment with European Union standards. In the context of obtaining candidate country status in 2022 and the launch of the Growth Plan for Moldova (2025-2027), the article assesses the quality of the convergence process through the lens of 25 fundamental bibliographic sources and recent strategic documents.*
The methodology used is based on the SDG Mapping technique, which allows the correlation of European funding pillars with the Sustainable Development Goals (SDGs) of the 2030 Agenda, in particular SDG 8 (economic growth), SDG 9 (industry and innovation) and SDG 13 (climate action). The analysis of the specialized literature highlights the fact that the efficiency of EU funds is not an automatic process, but is strictly conditioned by institutional quality and administrative absorption capacity.
The results indicate that while EU financial assistance has strengthened Moldova's macroeconomic resilience to geopolitical shocks, long-term sustainability depends on modernizing business ecosystems and reducing regional disparities. The paper contributes to the literature by providing a framework for monitoring real convergence, demonstrating that European integration functions as a catalyst for the structural transformation of the Moldovan economy.

Keywords: *economic growth, employment, european funds, investment strategies, sustainable development.*

JEL CLASSIFICATION: *E22, F02, G2, O11, Q01*

INTRODUCTION

In recent decades, the European integration process has become the main vector of structural transformation for the states of Central and Eastern Europe, with the Republic of Moldova today finding itself at a historical turning point. Obtaining the status of candidate country to the European Union in 2022 has reconfigured not only the diplomatic priorities, but also the financial and economic architecture of the country. In this context, European funds are no longer just an instrument of technical assistance, but are becoming the central pillar of the strategy for ensuring economic sustainability.

Context and relevance of the topic. The economic sustainability of the Republic of Moldova is frequently tested by external shocks, the volatility of energy markets and the need for a rapid transition to a green and digitalized economy. The specialized literature emphasizes that the efficiency of non-reimbursable funds depends fundamentally on the absorption capacity and the strategic targeting of investments towards sectors with high added value. However, in the case of transition economies, a gap is often observed between the volume of allocated financing and the real impact on long-term sustainable development indicators.

Research issues and the SDG Mapping Approach. A major challenge in evaluating external assistance is translating macroeconomic figures into tangible progress on multidimensional sustainability. The critical research question is: To what extent are EU-funded investment strategies aligned with national sustainable development priorities?

To answer this question, this study introduces a methodological approach based on SDG Mapping. This technique allows for the visualization and quantification of how European financial

flows (such as the Eastern Partnership Economic and Investment Plan) catalyse the achievement of the 2030 Agenda targets. The analysis focuses mainly on the resilience pillars: SDG 7 (Clean Energy), SDG 8 (Decent Work and Economic Growth) and SDG 9 (Industry, Innovation and Infrastructure), providing a clear picture of the convergence between EU cohesion policies and the sustainability objectives of the Republic of Moldova.

Objectives and scientific contribution

This paper aims to empirically analyse the correlation between European fund flows and sustainability dynamics through the following objectives:

1. Evaluation of the investment structure: Identifying the priority areas that benefited from European support in the pre-accession period.

2. Strategic mapping (SDG Mapping): Determining the degree of coverage of the Sustainable Development Goals through EU-funded projects.

3. Impact analysis: Using proxy indicators to measure the efficiency of these investments in strengthening a resilient economy.

By using the SDG Mapping technique, this study makes an original contribution to the literature, providing an assessment framework that goes beyond linear GDP analysis. The results are essential for policymakers to recalibrate investment strategies to ensure a sustainable transition and accelerated European integration.

LITERATURE REVIEW

Contextualizing the analysis: From financial assistance to structural resilience

Understanding the impact of European funds on the Republic of Moldova requires an analysis that goes beyond simple budget execution, focusing on the quality of reforms and their alignment with international sustainability standards. The current moment is defined by a dual paradigm: on the one hand, the need to manage external shocks caused by regional instability, and on the other hand, the imperative to accelerate convergence with the European Single Market.

In this sense, the present research investigates eight documentary and strategic pillars that underpin the country's current economic trajectory. These works, ranging from monitoring reports of international financial institutions (World Bank, OECD) to government action plans and industrial impact studies, provide the empirical basis for the SDG Mapping process. The following analysis is not limited to a simple description of the financing programs, but seeks to identify to what extent these resources are directed towards the sectors with the highest sustainability potential and how they contribute to reducing the historical vulnerabilities of the Moldovan economic model.

Critical analysis of the strategic pillars of sustainability

The analysis of the corpus of documents reveals a paradigm shift in the management of European funds, moving from emergency budget support to strategic investments conditional on reforms. The European Parliament Study (2025) and the Reform Agenda (2025-2027) emphasize that the new "Growth Plan for Moldova" is not just a financial package, but a tool for alignment with SDG 8 (Decent Work and Economic Growth) through integration into European value chains. This direction is supported by data from the FDI Study (2024), which demonstrates that although the number of companies with foreign capital has fluctuated due to geopolitical risks, their productivity remains 3.5 times higher than that of local firms, validating the role of European capital as a vector of efficiency.

On the dimension of ecological sustainability (SDGs 7 and 13), the OECD (2022) and USAID (2023) documents highlight an imminent pressure: the need to adapt to the Carbon Border Adjustment Mechanism (CBAM). Critical analysis of these sources indicates that European funds are directed primarily towards decarbonisation and energy efficiency in order to maintain the competitiveness of Moldovan exports. In parallel, the Economic Reform Program of the Ministry of Finance and the World Bank Update (2025) warn of limited "absorption capacity", identifying it as the main risk to transforming assistance into real sustainability.

Finally, the Investor Guide (2025) and the NRC report (2023) complete the picture by highlighting the resilience of the digital sector and the need to protect human capital from external

shocks. In conclusion, the eight sources converge on the idea that EU funds function as a catalyst for SDG 9 (Industry, Innovation and Infrastructure), but their long-term success depends on the perfect synchronization between capital infusions and the institutional capacity to implement the assumed structural reforms.

The analysis of the impact of EU funds on economic sustainability represents a central pillar in the specialized literature dedicated to the convergence processes in Central and Eastern Europe (CEE). Current research goes beyond the simple paradigm of financial absorption, investigating the quality of institutional reforms, innovation capacity and alignment with the Sustainable Development Goals (SDGs).

2.1. Institutional conditionality and the quality of governance

A major consensus in recent literature is that the efficiency of European funds is directly proportional to the level of institutional maturity of the recipient state. Augusztin et al. (2023) demonstrate that the impact of structural and pre-accession funds on economic growth is conditioned by the "quality of governance". Using a 30-year time series, the authors emphasize that in the absence of a solid rule of law and an efficient bureaucracy, capital infusions can generate marginal effects or even economic distortions.

This view is nuanced by Surubaru (2021), who analyzes whether European funds in Romania and Bulgaria have functioned as "engines of change" or just as simple budgetary transfers. His conclusion points to an asymmetric Europeanization, where success is limited by the politicization of local administration. In this context, Zajaczkowski and Smolaga (2023) observe an interesting evolution: as CEE states integrate, they adopt OECD standards and become donors of development assistance (ODA), which validates the transfer of good institutional practices as a form of political sustainability.

2.2. Convergence models and the impact on competitiveness

The macroeconomic dimension of EU funds is explored through the lens of the β and σ convergence theories. Romanowski et al. (2023) demonstrate that funds directed towards innovation accelerate local convergence, provided that functional regional ecosystems exist. This approach is empirically supported by Török László (2025), who confirms that although integration into the Single Market has reduced the gaps in GDP per capita between East and West, the sustainability of this process is threatened by the "middle income trap".

Furthermore, Blazhko et al. (2025) use correlation analyses to prove the positive impact of structural funds on exports and external competitiveness, but warn that inflation volatility can erode these gains. Correspondingly, Stoilova (2025) shows in her study on Bulgaria that, although EU funds contribute to GDP and employment growth, they tend to favour already developed regions, exacerbating internal disparities – a major risk for social cohesion included in SDG 10.

2.3. Digitalization, innovation and the business environment

An emerging research direction focuses on the role of EU funds in microeconomic modernization. Panait et al. (2025) use topic modelling techniques to highlight how the absorption of EU funds has become synonymous with the development of business ecosystems and digitalization. This trend is supported by Abalașei, Maha and Viorică (2022), who demonstrate the success of operational programs in increasing the competitiveness of urban SMEs in Romania.

However, the literature also introduces elements of caution. Rácz et al. (2025) discuss "dependent capitalism" in the CEE region, arguing that reliance on foreign direct investment (FDI) and EU funds, in the absence of indigenous innovation capacity, creates structural vulnerability. Brodny and Tutak (2024) complete this picture with a multi-criterion assessment (TOPSIS), demonstrating that innovation potential is unevenly distributed and heavily depends on intellectual capital and R&D investment (SDG 9).

2.4. Green transition and environmental sustainability as a new conditionality

With the launch of the European Green Deal, sustainability is no longer just an economic objective, but an ecological imperative. The UNCCD report (2021) highlights the need to restore ecosystems in CEE as part of the "green recovery", while O'Sullivan and Fazio (2023) provide strict recommendations for the allocation of funds based on the "Do No Significant Harm" (DNSH) principle.

Research by Shkolnykova and Wedemeier (2025) indicates that for transition economies, such as the Republic of Moldova, alignment with these environmental standards is not optional, but represents the access ticket to European capital markets. Furthermore, Davidescu et al. (2023) argue that European policies must address the social inequities generated by the costs of the green transition, ensuring a just transformation (SDG 13).

2.5. Republic of Moldova: From resilience to shocks to structural convergence

The analysis of strategic documents and reports of international financial institutions for the period 2022-2025 reveals a paradigm shift in the economic trajectory of the Republic of Moldova. According to the European Parliament Study (Hagemejer and Dąbrowski, 2025), the Moldovan economy has demonstrated remarkable resilience in the face of overlapping crises (pandemic, energy crisis and war in Ukraine), achieving a massive trade reorientation towards the European Union, which currently absorbs over 65% of exports. However, this success is overshadowed by a growth model that remains vulnerable due to dependence on remittances and reduced investment in fixed capital.

The World Bank (2025) emphasizes in its economic update report that obtaining the status of candidate country represents a historic window of opportunity for the modernization of infrastructure and the professionalization of the public service. However, the authors warn that the success of the Growth Plan for Moldova (2025-2027) is directly conditioned by increasing the absorption capacity and reducing the labour market constraints generated by massive emigration. In this regard, the Economic Reform Program (Ministry of Finance, 2025) proposes an ambitious agenda of fiscal consolidation and digitalization, aimed at attracting foreign direct investment (FDI) in high value-added sectors, such as IT and renewable energy.

The environmental sustainability dimension has become a central element in financing conditionalities. The USAID (2023) study on carbon pricing mechanisms indicates that the Republic of Moldova needs to rapidly align its environmental policies with the EU Border Adjustment Mechanism (CBAM) in order to remain competitive. This process of "greening" is supported by initiatives such as EU4Environment (OECD, 2022), which promotes the circular economy and efficient management of natural resources as pillars of sustainable development.

Finally, research by Invest Moldova (2024) shows that although FDI flows have increased by 28% in absolute terms over the past decade, their impact on local productivity is still fragmented. The recommendations in the Norwegian Policy Brief (2023) make a clear point: The Republic of Moldova needs to transition from crisis assistance to long-term resilience investments, integrating the principle of "doing no significant harm to the environment" into all national infrastructure projects to ensure real and sustainable convergence with the EU bloc.

2.6. Summary of Research Gaps

Despite the wealth of studies on the member states (Poland, Romania, Bulgaria), the academic literature presents a significant gap regarding the Republic of Moldova. Most of the works analysed treat Moldova either tangentially, in the context of the Eastern Partnership, or through technical reports of international organizations (USAID, 2023; World Bank, 2025).

There is a lack of academic studies integrating SDG Mapping as a tool for assessing the quality of investments from European funds in the post-2022 pre-accession period. The present research aims to fill this gap, using the theoretical foundations of institutional quality (Augusztin, 2023) and innovation (Brodny, 2024) to assess how the "Growth Plan for Moldova" (Agenda 2025-2027) transforms financial assistance into multidimensional sustainability.

Thus, the paper contributes to the specialized literature by proposing a convergence monitoring framework based on SDG indicators, offering a new empirical perspective on the transition from an economy dependent on remittances to one based on strategic and sustainable investments.

METHODOLOGY

The analysis of the impact of European funds on the economic sustainability of the Republic of Moldova was carried out through a qualitative-quantitative documentary approach, complemented by a

thematic mapping analysis (SDG Mapping). The methodology aims to identify the degree of alignment of interventions financed from European funds with the Sustainable Development Goals (SDGs) and their specific targets, in order to assess the structural contribution to economic sustainability.

The research is based on a corpus consisting of 25 relevant documents on European funds intended for the Republic of Moldova. The corpus included strategic documents, official reports, funding programs, partnership agreements, programming documents, research papers, as well as implementation reports. The selection of documents was carried out based on the criteria of thematic relevance (direct correlation with European funds), topicality and official character, so as to reflect recent interventions and strategic priorities of cooperation between the Republic of Moldova and the European Union.

The analysis of the alignment with the SDGs was carried out by applying the SDG Mapper tool, a thematic mapping system based on automatic natural language processing (NLP), which identifies correspondences between the analysed textual content and the standardized formulations of the Sustainable Development Goals and their associated targets. The tool operates by identifying the frequency and semantic relevance of key terms and conceptual expressions associated with each goal and target, generating a percentage distribution of thematic correlations.

The methodological process involved several stages. In the first stage, the selected documents were collected and organized into a unitary corpus, being subjected to a preliminary check to eliminate duplications and irrelevant content. In the second stage, the corpus was introduced into the SDG Mapper tool, where each document was processed individually, and subsequently the results were aggregated to obtain a cumulative distribution at the level of the 17 SDGs and their associated targets. In the third stage, the results were exported and graphically represented in the form of percentage distributions and bubble charts, which allow highlighting the relative weight of each objective and target.

The analysis of the results was carried out at two complementary levels. At the macro level, the distribution of weights between the 17 Sustainable Development Goals was assessed, in order to identify the dominant strategic directions of European funding. At the micro level, the distribution by specific targets was analysed, in order to highlight the concrete mechanisms through which the funds contribute to economic sustainability, such as stimulating economic growth, institutional consolidation, infrastructure modernization or integrating climate measures into public policies. The approach used has several methodological advantages. First, it allows for a systematic and replicable assessment of the strategic alignment with the SDGs, reducing the subjectivity inherent in purely qualitative analysis. Second, it facilitates comparability with other studies using SDG Mapping, ensuring the integration of the research into an international framework of analysis. Third, the analysis at the target level offers a greater degree of granularity, allowing the identification of priority areas of intervention.

At the same time, certain methodological limitations should be mentioned. The results depend on the textual content of the analysed documents and the formulations used, which means that some indirect contributions to sustainability may be underestimated if they are not explicitly formulated. Also, the analysis reflects thematic correlations and does not measure the actual quantifiable impact of the funds on economic or social indicators. Therefore, the results should be interpreted as an assessment of strategic and conceptual alignment, not as a direct measurement of economic performance. Overall, the adopted methodology ensures a rigorous, transparent and replicable approach to assessing the impact of European funds on the economic sustainability of the Republic of Moldova, integrating documentary analysis with modern thematic mapping tools and providing a solid basis for interpreting the results presented in the following section.

RESULTS AND DISCUSSIONS

In order to highlight the degree of strategic alignment of European funds with the Sustainable Development Goals, an aggregate analysis of the corpus of 25 documents was carried out using the SDG Mapper tool. The results obtained allow the identification of priority areas of intervention and dominant directions of contribution to the economic sustainability of the Republic of Moldova. The distribution of weights on the 17 SDGs is presented in Figure 1.

The figure obtained by applying the SDG Mapping tool provides a synthetic, but extremely relevant, picture of how interventions financed from European funds align with the Sustainable Development Goals and, implicitly, on the directions through which they contribute to the economic sustainability of the Republic of Moldova. The distribution of weights highlights both the structural priorities of European funding and the multidimensional nature of their impact.

First, the results show a significant focus on SDG 8 - "Decent work and economic growth", which has a share of 24.1%, representing the highest value of all the objectives analysed. This dominance confirms that European funds are mainly oriented towards stimulating sustainable economic growth, developing the entrepreneurial environment, supporting SMEs, creating jobs and increasing productivity. In the context of the Republic of Moldova, characterized by structural vulnerabilities, labour migration and dependence on remittances, investments aimed at strengthening the domestic economic base have an essential role. The high share of SDG 8 suggests that European funds are not only instruments of financial assistance, but mechanisms of structural transformation, contributing to strengthening the economy's capacity to generate added value and support long-term growth.

Secondly, the results indicate a considerable relevance of the institutional dimension, reflected by SDG 16 - "Peace, justice and effective institutions" (11.0%) and SDG 17 - "Partnerships for the goals" (8.3%). These weights underline the fact that economic sustainability is not approached exclusively through the lens of productive investments, but also by strengthening the institutional framework and governance mechanisms. European funds contribute to reforming public administration, strengthening the rule of law, increasing transparency and increasing the administrative capacity to absorb and manage external resources. In the absence of efficient institutions and a predictable environment, the impact of economic investments would be limited. Therefore, the strong correlation with SDG 16 and SDG 17 highlights the systemic nature of European interventions, which aim to strengthen the institutional infrastructure necessary for sustainable economic development and progressive integration into the European space.

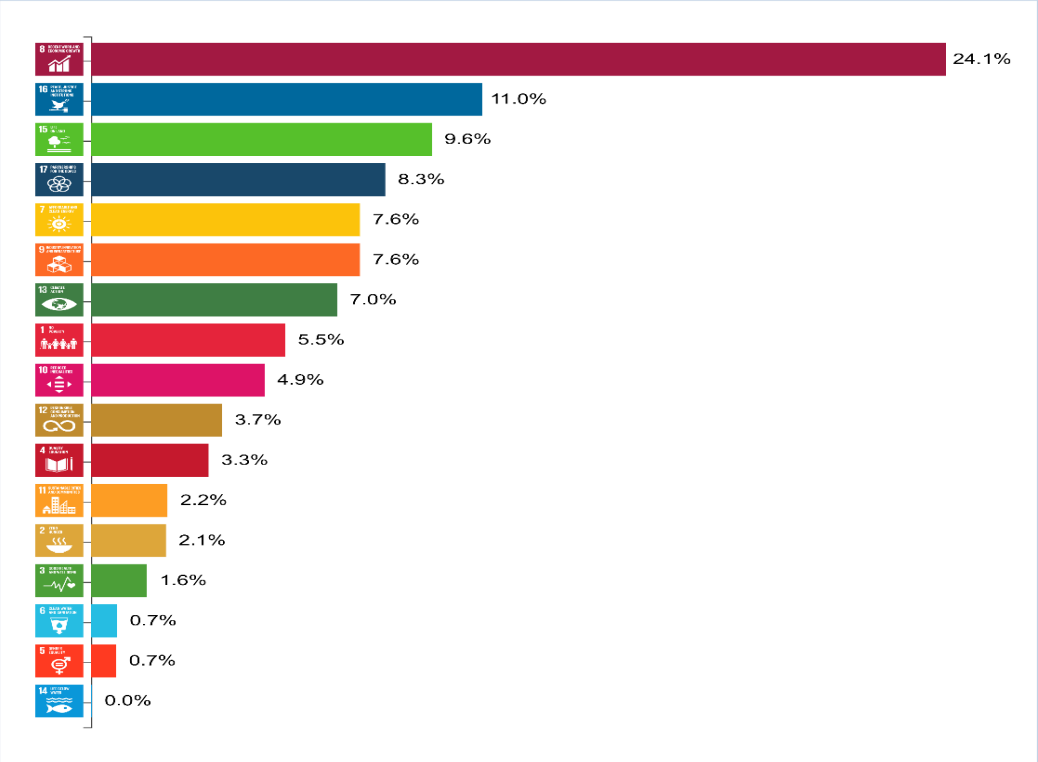

Figure 1. Alignment of European funds with the Sustainable Development Goals, SDG Mapping analysis

Source: own elaboration based on the results obtained by applying the SDG Mapper tool to the corpus of 25 analyzed documents.

The environmental and green transition dimension is also well represented. SDG 15 - "Life on Land" records 9.6%, SDG 7 - "Affordable and Clean Energy" 7.6%, and SDG 13 - "Climate Action" 7.0%. These values indicate that European funds support the transition towards an economic development model less dependent on traditional resources and more adapted to the requirements of the European Green Deal. Investments in energy efficiency, renewable sources, environmental protection and sustainable management of natural resources contribute to reducing the energy and climate vulnerabilities of the Republic of Moldova. From the perspective of economic sustainability, these interventions have a double effect: on the one hand, they reduce the costs and risks associated with energy dependence, and on the other hand, they stimulate the development of new economic sectors and investment opportunities.

Another important pillar highlighted by the analysis is SDG 9 - "Industry, innovation and infrastructure", with a weight of 7.6%. This reflects the support given to the modernization of economic infrastructure, digitalization, technological development and increased competitiveness. For an economy in the process of convergence, physical and digital infrastructure are essential factors of productivity and integration into European value chains. European funds thus contribute to creating a favourable environment for investments, reducing regional disparities and stimulating innovation, all of which are fundamental components of long-term economic sustainability.

The social dimension, although present, has more moderate weights. SDG 1 - "No poverty" records 5.5%, SDG 10 - "Reduced inequalities" 4.9%, SDG 4 - "Quality education" 3.3%, and SDG 3 - "Health and well-being" 1.6%. This distribution suggests that the social impact of European funds is, for the most part, indirect, achieved through economic and institutional mechanisms. Job creation, income growth and improvement of public infrastructure implicitly contribute to the reduction of poverty and inequalities. However, the relatively low weight of social objectives indicates that the main orientation of the analysed funding is structural-economic, and the social components are integrated transversally rather than as autonomous priority areas.

Some objectives have very low or non-existent weights. SDG 6 - "Clean water and sanitation" and SDG 5 - "Gender equality" have 0.7% each, and SDG 14 - "Life below water" does not register any correlations (0.0%). The absence of SDG 14 is explainable by the geographical specificity of the Republic of Moldova, a landlocked state. In the case of SDG 5, the low weight may indicate that gender equality is approached as a cross-cutting principle rather than as a distinct direction of intervention.

Overall, the figure reveals that the impact of European funds on the economic sustainability of the Republic of Moldova is complex and multidimensional, but with a clear economic-institutional dominance. The emphasis on economic growth, institutional consolidation, infrastructure and green transition suggests that the development model promoted by these funds is oriented towards structural modernization and European convergence. The social and environmental dimensions are integrated into this framework, but do not represent the centre of the interventions analysed.

Therefore, the SDG Mapping results confirm that European funds contribute not only to the financing of specific projects, but to the gradual reconfiguration of the foundations of the Republic of Moldova's economy, strengthening the premises of sustainable, resilient and compatible development with the standards and objectives of the European Union.

In order to deepen the analysis and identify the concrete mechanisms through which European funds contribute to economic sustainability, the evaluation was extended to the level of specific targets of the Sustainable Development Goals. This approach allows highlighting detailed thematic directions and the intensity of correlations at the micro-structural level. The distribution of results at the target level is illustrated in Figure 2.

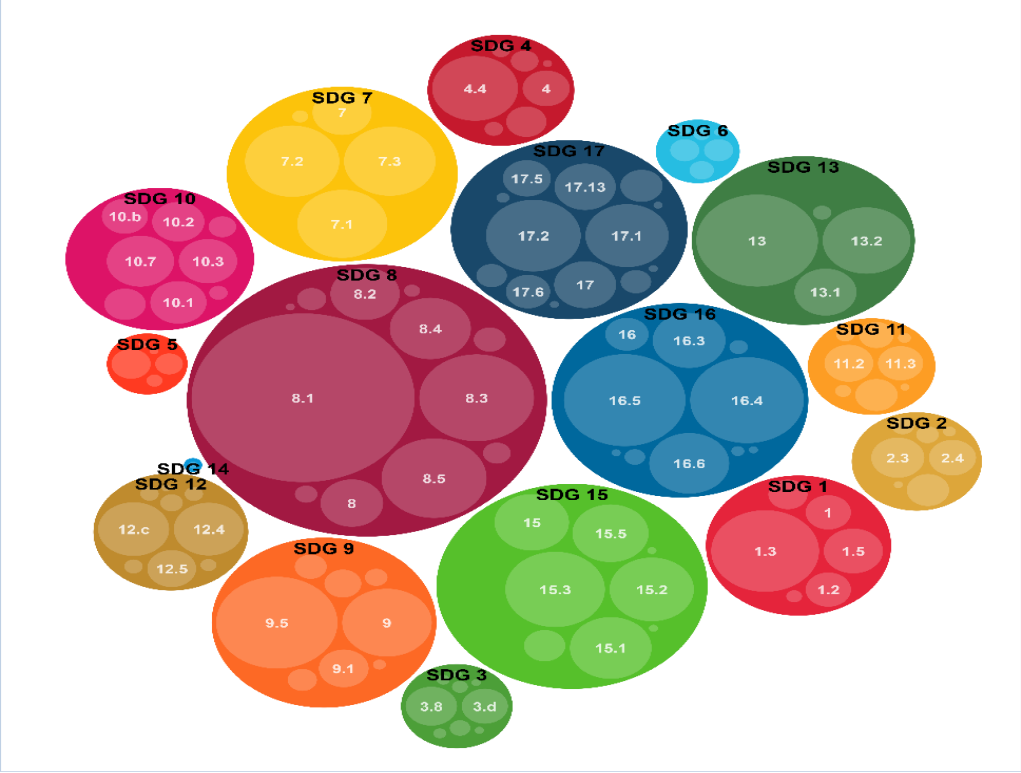

Figure 2. Distribution of specific targets of the Sustainable Development Goals within the framework of European funds intended for the Republic of Moldova (SDG Mapping analysis, 25 documents)

Source: own elaboration based on the results obtained by applying the SDG Mapper tool on the corpus of 25 analysed documents.

The figure, created in the form of a bubble chart using the SDG Mapping tool, offers a much more granular perspective on the alignment of European funds with the specific targets of the Sustainable Development Goals. While the first figure highlighted the aggregate distribution of the 17 SDGs, this representation allows for an in-depth analysis of the concrete directions of intervention, reflecting not only which objectives are priorities, but also through which thematic mechanisms they are supported.

The structure of the graph clearly shows that SDG 8 dominates not only at the general objective level, but also at the level of specific targets. The considerable size of the bubble associated with target 8.1 (maintaining economic growth per capita and, in particular, sustainable economic growth) indicates that European funds support sustainable economic growth as a priority. The importance of targets 8.3 (promoting development-oriented policies that support productive activities and entrepreneurship), 8.4 (improving resource efficiency) and 8.5 (full and productive employment) confirms the orientation of interventions towards strengthening the entrepreneurial environment, resource efficiency and job creation. This distribution suggests that economic sustainability is addressed structurally, by stimulating productivity and the economy's capacity to generate domestic value added.

Another significant area is represented by SDG 16, where targets 16.4 (reducing illicit financial flows and strengthening institutions), 16.5 (fighting corruption) and 16.6 (effective and accountable institutions) have visibly consistent weights. This distribution confirms that European funds contribute to strengthening the governance framework, an essential element for the efficient absorption of resources and for creating a stable investment climate. In the context of the Republic of Moldova, where institutional reforms are a central pillar of the European integration agenda, the impact on SDG 16 becomes fundamental for long-term economic sustainability.

Regarding SDG 17, the significant weight of targets 17.1, 17.2, 17.5 and 17.13 indicates the emphasis on strengthening fiscal capacity, mobilizing domestic and external resources, attracting investment and macroeconomic stability. This suggests that European funds are integrated into a broader framework of partnership and co-financing, contributing to the creation of a more robust financial architecture. The impact on economic sustainability is not limited to the allocation of grants, but also involves developing the state's capacity to generate and manage its own resources efficiently.

The infrastructural and innovative dimension, reflected in SDG 9, highlights the importance of target 9.5 (stimulating scientific research and modernizing technological capacities), as well as targets 9 and 9.1 (developing reliable and sustainable infrastructure). This indicates that European funds contribute to digitalization, modernizing economic infrastructure and increasing competitiveness. In a converging economy, these investments are essential for integration into European value chains and for reducing development gaps.

The green transition is illustrated by the consistent weight of SDG 13, in particular targets 13.1 (strengthening climate resilience) and 13.2 (mainstreaming climate action into policies).

SDG 7 is also well represented by targets 7.1, 7.2 and 7.3, indicating investments in energy access, renewable energy and energy efficiency. These interventions directly contribute to reducing the energy vulnerability of the Republic of Moldova and to aligning with the objectives of the European Green Deal.

The impact on economic sustainability is twofold: reducing structural costs and stimulating the development of new economic sectors. SDG 15, through targets 15.1, 15.2, 15.3 and 15.5, highlights the component of ecosystem protection and sustainable management of natural resources. This indicates the integration of the environmental dimension into economic policies, contributing to a growth model that avoids the degradation of natural capital. Economic sustainability, in this logic, is closely linked to resource conservation and preventing future costs associated with environmental degradation.

The social dimension appears through SDG 1 (especially target 1.3 on social protection), SDG 10 (10.1, 10.2, 10.3, 10.7, 10.b) and SDG 4 (4 and 4.4). Although these bubbles are smaller compared to those associated with SDG 8 or 16, they indicate that European funds also contribute to poverty reduction, the reduction of inequalities and the development of skills. In particular, target 4.4 (the development of skills relevant to employment) is relevant for economic sustainability, as it strengthens the human capital necessary for a modern economy. Some goals, such as SDG 5 (gender equality) or SDG 6 (water and sanitation), appear with low weights, suggesting either their cross-cutting integration or a lower priority within the interventions analysed. SDG 14 is almost absent, an aspect that can be explained by the geographical specificity of the country.

Overall, the figure highlights that the impact of European funds on the economic sustainability of the Republic of Moldova is built on a combination of economic growth (SDG 8), institutional strengthening (SDG 16), partnerships and macroeconomic stability (SDG 17), infrastructure modernization (SDG 9) and green transition (SDG 7 and 13). The social and environmental dimensions are integrated into this framework, contributing to balanced development, but the core of interventions remains oriented towards the structural transformation of the economy.

Therefore, the analysis at the target level confirms and details the conclusions obtained at the aggregate level: European funds do not act only as instruments of punctual financial support, but as vectors of a systemic reform, oriented towards European convergence, economic resilience and long-term sustainable development.

CONCLUSION AND STRATEGIC RECOMMENDATIONS

This research has highlighted that the European integration of the Republic of Moldova, supported by financial instruments such as the "Growth Plan for Moldova 2025-2027", represents a fundamental catalyst for long-term economic sustainability. However, the analysis of the literature and strategic reports indicates that the mere absorption of funds does not guarantee success, as it is

conditioned by institutional quality and the capacity to adapt to new climatic rigors.

Recommendations for political decision-makers and the economic environment in the Republic of Moldova:

- Strengthening absorption capacity and governance: Given the direct correlation between the quality of institutions and economic growth, it is imperative to professionalize public administration and digitalize the monitoring processes of EU-funded projects to minimize the risks of corruption and inefficiency.
- Rigorous integration of the principle of "do no significant harm to the environment" (DNSH): All infrastructure investments must pass through the filter of environmental sustainability. Early alignment with European environmental standards and carbon pricing mechanisms will protect the competitiveness of Moldovan exports in the Single Market.
- Stimulating innovation and intellectual capital: To avoid the "middle income trap", the Republic of Moldova needs to direct pre-accession funds towards research and development (R&D) and the digitalization of SMEs, moving from a model based on cheap labor to one based on high added value.
- Reducing regional disparities: It is necessary to implement financial decentralization mechanisms that ensure the equitable distribution of funds to rural areas and small towns, thus preventing economic and social polarization.

In conclusion, the Republic of Moldova is at a turning point. The strategic use of European assistance, coupled with deep structural reforms, can transform the current resilience into real and sustainable convergence, definitively anchoring the country in the European prosperity space.

ACKNOWLEDGEMENTS

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THE ULTIMATE BENEFICIAL OWNER – A PILLAR OF FINANCIAL TRANSPARENCY AND CORPORATE INTEGRITY IN THE CONTEXT OF THE REPUBLIC OF MOLDOVA'S ALIGNMENT WITH EUROPEAN STANDARDS

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Abstract: *The paper examines the role of the Beneficial Ownership (BO) regime as an infrastructure for financial integrity and corporate governance, in the context of the Republic of Moldova's alignment with European and international standards in the field of AML/CFT. Methodologically, the paper employs a qualitative doctrinal analysis of national legislation and implementing acts, triangulated with comparative and policy analysis of international standards and guidance and a structured review of recent reports to assess institutional design choices and implementation dynamics. The analysis combines: (i) a theoretical synthesis of the concepts of beneficial ownership, control, and fiduciary responsibility; (ii) a comparative normative assessment of FATF standards R.24 and R.25; Directive (EU) 2015/849 and subsequent amendments; case law developments on public access to information about beneficial owners, and (iii) an institutional examination of the reform trajectory of the BO legal regime in the Republic of Moldova over the last two decades based on normative acts, EU, MONEYVAL, and IMF reports.*

The results of the study indicate that the public value of the BO register derives not only from the existence of a register, but also from the quality of the data (adequate, accurate, up-to-date), risk-based verification capabilities, interoperability, and the intelligent use of data in supervision, public procurement, company registration, licensing, authorization, and financial investigations. At the same time, there is a structural tension between transparency and the protection of personal data, accentuated by the limitation of public access to information about beneficial owners in the EU following the CJEU rulings.

The paper proposes an implementation framework for Moldova centered on three pillars: (1) BO data governance and strengthening verification mechanisms, (2) interoperability and cross-agency operational use of data from the BO Register, and (3) proportional and auditable access architecture that maximizes the deterrent effect and usefulness for legitimate actors while minimizing the risks of abuse.

Keywords: *beneficial ownership, BO register, AML/CFT, financial transparency, corporate governance, integrity, interoperability, Republic of Moldova, EU*

JEL Classification: *G28, K22, K42, H83, D73, O17*

INTRODUCTION

Beneficial Ownership (BO) refers to the natural person who ultimately owns or controls a legal entity or on whose behalf a transaction is carried out. In modern AML/CFT regimes, BO is a basic requirement for due diligence, for preventing the abuse of legal personality, and for protecting market integrity.

For the Republic of Moldova, strengthening the BO regime also has a strategic dimension: moving closer to the EU acquis and building a credible economy for investment. This paper aims to clarify the following: (i) what an BO means as a quality standard, (ii) what mechanisms create operational (not just formal) effect, and (iii) what lessons are relevant for the Republic of Moldova in the period 2007–2025.

CONCEPTUAL FOUNDATIONS:BO AS FINANCIAL-INTEGRITY INFRASTRUCTURE

1. Definitions and Analytical Perspective

According to the FATF, states must ensure adequate, accurate, and up-to-date information on the beneficial owners of legal entities, which must be readily accessible to the competent authorities (FATF, 2025). In EU law, Directive (EU) 2015/849 defines the beneficial owner as the natural person who ultimately owns or controls the customer, including, as a rule, through a holding threshold (e.g., 25%), without the threshold being a mechanical rule (Directive (EU) 2015/849, 2015/2018). Analytically, BO should be understood as infrastructure: a set of rules, processes, and data that reduce information asymmetry and verification costs for the market and the state.

The BO regime can be defined as an institutional and informational infrastructure: a durable configuration of legal rules, responsible authorities, operational processes, and data systems that collectively enable the collection, verification, updating, and controlled disclosure of information on ultimate ownership and control.

As an infrastructure for financial integrity, it operationalises the AML/CFT requirement that competent authorities have rapid access to adequate, accurate and up-to-date BO information, including through registries or other "multi-pronged" mechanisms, thereby increasing the system's capacity to deter and detect misuse of legal persons (IMF, 2025; OECD and IDB, 2024; Vermeulen, 2013; FATF, 2023).

As an infrastructure for corporate governance, BO disclosure and enforcement improve transparency about control, strengthen accountability of those who ultimately direct corporate decisions, and support market discipline and stakeholder scrutiny—especially where ownership structures are complex. (IMF, 2025; OECD and IDB, 2024; Vermeulen, 2013; FATF, 2023).

2. Value Channels: Transparency, Integrity, and Trust

The BO regime generates public value through three main channels (author's synthesis, based on IMF, 2025; OECD and IDB, 2024; Vermeulen, 2013; Castro Orduna and Fraiha Granjo, 2023):

(1) *The preventive channel*: it increases the expected cost of using shell companies, reducing the attractiveness of money laundering and corruption;
(2) *The compliance channel*: improves the quality of customer due diligence at reporting entities and the effectiveness of supervision;
(3) *Governance channel*: strengthens the accountability of controlling shareholders and market discipline, including in public procurement and in relations with external partners.

We note here that public value is distinct from private value, focusing particularly on societal benefits rather than financial profit (OECD, 2019).

METHODOLOGY

The study adopts a qualitative research design combining doctrinal legal analysis, comparative policy analysis, and an economic–financial perspective. First, it examines Moldova's primary and secondary legislation on beneficial ownership, focusing on definitions, scope, data obligations, verification arrangements, access rules, and sanctions. Second, it benchmarks these elements against international standards and toolkits (notably FATF Recommendation 24 and related guidance, the OECD/IDB toolkit, and IMF sectoral transparency work) to identify convergence, gaps, and implementation trade-offs. Third, it applies an economic–financial lens to interpret how BO transparency affects incentives, compliance costs, risk allocation, and market behaviour (e.g., CDD quality, access to finance, and procurement integrity). Finally, it triangulates findings through a structured review of recent international and domestic reports and publicly available implementation data, enabling a practical assessment of progress, bottlenecks, and governance implications.

EUROPEAN AND INTERNATIONAL STANDARDS: CONVERGENCE AND TENSIONS

1. FATF and Effectiveness Requirements

The FATF has recently strengthened its standards, including by updating its Recommendations (2025) and guidance on beneficial ownership transparency (FATF, 2014; FATF, 2024; FATF, 2025). The emphasis is shifting *from the formal existence* of mechanisms *to effectiveness*: verifiability, proportionate sanctions, and operational use. In fact, public value does not derive from the existence of the register, but from the quality of the data in the register.

2. EU Framework and The Privacy-Transparency Trade-off

Directive (EU) 2018/843 extended access to BO registers, in line with the "sunlight as disinfectant" logic. However, the CJEU (CJEU, 2022) invalidated the provision on unconditional general public access, citing disproportionate interference with the fundamental rights to privacy and data protection. The practical consequence of the CJEU ruling is a shift towards access models based on "legitimate interest" and auditability, without abandoning the objective of transparency (Jones Day, 2023; eucrim, 2022).

3. MOLDOVA'S BO REGIME (2007-2025): Evolution, Gaps, and Implementation Challenges

The trajectory of the BO legal regime in the Republic of Moldova reflects the transition from fragmented know-your-customer measures to a more robust AML/CFT framework, anchored in Law No. 308/2017 (as amended), sectoral supervision, and cooperation with external partners (Parliament of the Republic of Moldova, 2017/2023). European Commission reports indicate progress in strengthening the AML framework and the need for a track record of investigations and convictions, including for the use of information on beneficial owners (European Commission, 2023; 2024; 2025). MONEYVAL continues to monitor the implementation and effectiveness of the system in place (Council of Europe – MONEYVAL, 2025).

Table 1: Key milestones relevant for BO/AML-CFT reforms in the Republic of Moldova (2007-2025)

Period	Milestone (illustrative)	Relevance for BO
2007	Strengthening of the financial regulatory framework and beginning of AML convergence with international standards. Adoption of the first AML law: Law No. 190 of 26.07.2007 on the prevention and combating ofmoney laundering and terrorist financing	Introduces the concept of beneficial owner into national legislation in accordance with FATF terminology; Establishes identification and reporting obligations Only creates the premises for the BO register, as the requirements for the register are not provided for in the law
2014-2015	The country was rocked by a series of major financial corruption scandals (the "theft of the billion" from the banking system in 2014, the Laundromat money laundering scheme involving shell companies, etc.).	These cases highlighted how opaque ownership of banks and companies facilitated fraud: the real shareholders were hidden behind offshore or nominal entities, making it very difficult to hold them accountable. These harsh lessons prompted authorities to strengthen their corporate transparency framework. For example, the National Bank of Moldova initiated

		rigorous checks on bank ownership, and banking legislation was amended to prevent anonymous ownership of shares in banks. These events served as a catalyst for extending the concept of beneficial ownership to other sectors.
2017	Adoption of the new AML law: Law No. 308/2017 on the prevention and combating of money laundering and terrorist financing in accordance with Directive (EU) 2015/849 (AML4)	The law explicitly defines the beneficial owner in a manner similar to the definition in the EU acquis (the natural person who ultimately owns or controls, directly or indirectly, at least 25% of an entity or otherwise benefits from control (definition pending amendments); It defines institutional roles; obligations and bases for transparency of beneficial owners; Requires reporting entities (such as banks, notaries, insurance companies, casinos, etc.) to identify, verify, and retain information about the beneficial owners of their customers
2018-2019	Moldova, having an Association Agreement with the EU, begins preparations for the transposition of Directive (EU) 2018/843 (AML5)	Amendments to Law 308/2017 are being drafted to incorporate new European requirements, including the obligation to increase transparency regarding the actual owners of companies. At the same time, initiatives are being formulated to create a Register of Beneficial Owners integrated with the State Register of Legal Entities, administered by the Public Services Agency; The legislative process is progressing slowly amid political changes.
2020	Governance and transparency commitments in the context of emergency financing (IMF)	and the beneficial owners of contracting companies. In July 2020, a Government Decision was adopted that amended public procurement rules, requiring bidders in public tenders to disclose data on their beneficial owners—this step, directly attributed to IMF conditionality, marked an important step forward in the transparency of public spending/integrity of public expenditure.
2021	Continuing the series of reforms, Parliament adopts Law No. 150 of 28.10.2021, which amends the disclosure	According to Law 150/2021, starting December 5, 2021, when registering any new legal entity in the State Register, founders must submit documents

	requirements for beneficial owners for legal entities	regarding the identification and verification of the beneficial owner (copies of identity documents, powers of attorney, extracts, etc.); In practice, registrars in the field of state registration of legal entities at the Public Services Agency have become obliged to refuse to register new companies if they are not provided with information about the beneficial owner; At the same time, the state registration authority refuses/blocks the registration of any changes in the documents and data of registered entities (e.g., changes in administrators, share capital) if the documentation regarding the beneficial owner is not provided.
2023	Amendments to the AML law through Law No. 66/2023 (extension/clarification of certain definitions and mechanisms)	Adjustments for alignment with standards and improved applicability; Alignment of the Moldovan regulatory framework with the 5th EU Anti-Money Laundering Directive and introduction of new beneficial owner reporting requirements for all legal entities in Moldova; Establishment of a compliance deadline for all entities registered in the State Register by the end of 2024; In December 2024, the compliance deadline was extended to December 31, 2025, to give companies time to comply; The amendments provide for the updating of BO information within a maximum of 30 days of any change; In accordance with the CJEU decision and national policy, BO information collected will not be public (access being reserved for competent authorities and institutions); Penalties for non-compliance introduced: companies that fail to comply risk fines of up to MDL 75,000 (~€3,700), and administrators may be personally fined up to MDL 40,000 (~€2,000) (Contravention Code of the Republic of Moldova, 2008/2023). Such legislation is essential in establishing a robust defense against financial crimes.
2024-2025	Submission of a series of reports to the EU on the progress made by the Republic of Moldova	There is an effective shift in focus towards effective implementation, sanctions, and operational use of data from

	and the implementation of AML/UBO recommendations. Sectoral supervisory updates	the beneficial ownership register.

Source: authors' compilation based on Parliament of the Republic of Moldova (2007-2024), IMF (2020), European Commission (2023–2025), Council of Europe – MONEYVAL (2025).

The evolution from almost no provisions in the first AML law to a system with registers, mandatory declarations, and sanctions in 2025 reflects the profound transformation of the Republic of Moldova's financial integrity paradigm. European authorities recognize the progress made – the European Commission's 2025 report notes "good progress" in the area of money laundering prevention through the strengthening of the AML Office's capacity and alignment with FATF recommendations (FATF, 2024; FATF, 2025).

POLICY DESIGN: WHAT MAKES AN 'ULTIMATE' BO SYSTEM

1.1. Data Governance and Verification

An effective BO register is not just a declarative database. A data governance model is needed: rules for data quality, traceability (who declared, when, what evidence), updating, and justified corrections. Also, verification of all information, with enhanced measures based on the implementation of risk-based approach principles, combines automated checks (interconnections with registers, sanctions lists, inconsistencies) with targeted controls, especially for high-risk sectors and typologies (FATF, 2014b; FATF, 2024).

1.2. Interoperability and Operational Use

The value of the BO register increases exponentially when the data is used in key state processes: public procurement, company registrations and changes in the State Register of Legal Entities, financial supervision, licensing, approval of investments important to state security, authorization of external trade of strategic and dual-use goods; investigations and international cooperation. In economic terms, interoperability reduces the marginal cost of verification and increases the probability of detecting inconsistencies.

1.3. Proportional Access and Accountability

Following the post-CJEU European reconfigurations, the optimal access architecture is a layered one: full access for authorities and reporting entities; extended access for actors with legitimate interests (journalists, NGOs, and contractual partners), with logging, auditing, and abuse protection mechanisms. In the Republic of Moldova, these provisions have already been incorporated into the regulatory framework, which is the way to maintain transparency while complying with data protection standards.

DISCUSSION: ECONOMIC AND INSTITUTIONAL IMPLICATIONS FOR REPUBLIC OF MOLDOVA

From an economic perspective, BO reduces country risk by decreasing the likelihood of sanctions, banking de-risking, and blockages in cross-border relations. In the context of AML/CFT, de-risking is defined as the phenomenon whereby financial institutions terminate or restrict business relationships with customers or categories of customers in order to avoid, rather than manage, risk in a manner consistent with the risk-based approach set out in international standards (FATF, 2014a). The rationale for this behavior is to reduce exposure to sanctions, compliance costs, and reputational risks.

From an institutional perspective, the greatest gains come from moving from formal compliance to operational efficiency: shorter investigation times, fewer ghost entities in the economic ecosystem, and increased trust in public services (European Commission, 2025). To increase

efficiency, BO data will be used in the area of state aid, subsidies, and other regulated areas. At the same time, the implementation costs are real: IT investments, training, processes, litigation, and privacy risk management. The decisive criterion is whether these costs are managed as investments in trusted infrastructure, with outcome metrics (e.g., correction rate, response time to requests, cases investigated) and clear accountability. In this context, trusted infrastructure should be seen as the set of public mechanisms (regulation, quality data, performance metrics, institutional accountability) that make actors in the economy, finance, and society believe that the transparency system is working properly, reducing the risks of sanctions, blockages, or de-risking (Ho, 2024)

CONCLUSION

BO becomes a pillar of financial transparency and corporate integrity only when the regime is built and governed for effectiveness—ensuring high-quality data, risk-based yet strict verification, interoperability across competent authorities, and proportional, auditable access.

For the Republic of Moldova, the 2007–2025 trajectory shows meaningful progress in regulatory alignment while highlighting a universal implementation challenge: converting reporting duties into institutional capabilities that generate measurable outcomes. The next phase should therefore prioritise BO data governance (quality controls, update discipline, sanctions enforcement), systematic operational use across institutions (FIU, supervisors, tax/customs, procurement bodies, and law enforcement), and an access architecture that is transparent-by-design yet privacy-conscious, fully traceable, and compatible with EU and FATF requirements. Finally, policy should extend beyond compliance to sustained capacity-building and public communication—equipping private-sector actors and civil society to use BO information responsibly, thereby reinforcing trust, market discipline, and integrity in business.

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RECENT DEVELOPMENTS AND PROSPECTS OF EXCISE TAX REVENUES RELATED TO PRODUCTS IMPORTED INTO THE REPUBLIC OF MOLDOVA

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Abstract: *Moldova's participation in Customs and Fiscalis programmes is an important step in further strengthening operational cooperation in the areas of customs and taxation and is emblematic of the mutual commitment towards closer ties. The Customs programme also promotes cooperation between authorities, particularly through its support for the development and operation of the central IT systems for EU customs. The programme helps customs administrations to deal more efficiently with increasing trade flow and emerging trends and technologies, while providing a better response to security threats.[3] Starting with July 1, 2024, the Customs Service launched the first transit operations at the national level in the NCTS (New Computerized Transit System) system, and from October 1, 2024, a single electronic system is used in the Republic of Moldova for submitting transit declarations. [7] Customs harmonisation and the adoption of the system make the import process (and therefore the collection of excise duties on imports) more transparent, predictable and efficient. This can influence the volume of imports, compliance costs and the potential for evasion. At the same time, in the context of tax harmonisation with the EU (and especially for excisable products such as tobacco, alcohol, energy products) there is an obligation to align with EU standards — which may change the tax base, excise duty rates, or the way of administration.*

The Republic of Moldova has committed to progressively harmonizing its national legislation with that of the European Union, in accordance with Annex VI to Chapter 8 (Taxation) of Title IV of the Association Agreement between the Republic of Moldova and the European Union. In this regard, the Ministry of Finance has developed a draft amendment to Title IV of the Tax Code no. 1163/1997.The provisions will regulate harmonised excise duties, which are special taxes levied directly or indirectly on the consumption of the following products: alcohol and alcoholic beverages; processed tobacco and energy products and electricity. Excisable products will be subject to the excise duty regime at the time of their production, including, where applicable, at the time of their extraction; their import or their irregular entry into the customs territory. [6]

Keywords: *Customs programme, excise tax harmonization, legislative changes, import excise duties*

JEL Classification: *H27, H71, H72â*

INTRODUCTION

Excise duties on imported products represent an essential component of the budget revenues of the Republic of Moldova. They contribute not only to the financing of public spending, but also to fiscal and environmental policy, by adjusting consumer behavior and stimulating national production. The analysis of recent trends in these revenues provides an important perspective on how domestic and external economic developments affect the state's budgetary sources.

It is known that a large part of the state budget revenues consists of taxes and fees. A large part of these come from indirect taxes. Most indirect taxes are value added tax and excise duties, predominantly those collected on imports.

Table 1: Revenues from indirect taxes for the years 2019-2025, mil lei

	2019	2020	2021	2022	2023	2024	2025
Taxes and duties	40054,2	39752,2	49388,8	57524,2	63006,1	68481,3	75894,3
Indirect taxes	28340,7	28142,3	35242,5	39310,9	42746,1	47332,0	52648,4
VAT, total	20183,3	19775,3	25508,8	29056,7	30209,3	33410,1	37410,7
VAT on goods produced and supplied on the territory of the R.M	7633,5	7813,3	8918,4	9532	11626,6	12669,7	15151,7
VAT on imported goods	**15454,4**	**14914,2**	**19614,6**	**24058,5**	**23348,4**	**25449,8**	**27403,5**
VAT refund	-2904,6	-2952,2	-3024,2	-4533,8	-4765,7	-4709,4	-5144,5
Excise duties, total	6222	6468,8	7608,3	8012,5	10138,1	11447,6	12588,3
Excise duties on goods produced on the territory of the R.M.	555,1	570,9	903,8	886,1	1143,2	1205,9	1601,1
Excise duties on imported goods	**5693,1**	**5909,8**	**6731,5**	**7144,7**	**9025,8**	**10265,9**	**11011,8**
Excise duty refund	-26,2	-11,9	-27	-18,3	-30,9	-24,2	-24,6
Other taxes on goods and services	1935,4	1898,2	2125,4	2241,7	2398,7	2474,3	2649,4

Source: developed by the author based on the Reports on the execution of the PNB

Based on the table above, we can see that the revenues from VAT and excise duties on imported goods exceed 74 percent as a share of total indirect taxes. **The role of the Customs Service** in the administration of **VAT and excise duties on imported goods is essential, as it represents the authority that ensures the correct and timely collection of indirect** taxes at the time of entry of goods into the customs territory of the state. At the same time, customs duties are also taken into account here, which as a whole represent import duties. When import operations are carried out in the country, taxation is carried out according to the customs regime, which serves the economic growth of the country and ensuring the well-being of the population. The procedure for calculating and paying import duties applied to goods during import operations is carried out in accordance with customs regulations**.** [5]

Among the main duties of the Customs Service are:

• ensuring state budget revenues;
• compliance with tax and customs legislation;
• combating smuggling and undervaluation of goods;
• harmonizing tax and customs policies, including in the context of European integration.

At the same time, the Customs Service:

- is the main administrator of VAT and import excise duties;
- ensures the efficient collection of indirect taxes;
- plays a decisive role in the stability of budgetary revenues;
- contributes to the economic security of the state. [1]

Regarding the role of the Customs Service in the **administration of VAT on imports**, it is responsible for calculating, controlling and collecting VAT on imported goods, in accordance with tax and customs legislation. Main responsibilities:

- Determining the VAT tax base, which includes:
  – the customs value of the goods;

- customs duties;
- excise duties (if applicable);
- other taxes and charges related to the import.

- Calculating VAT at the legal rate in force (standard or reduced).
- Verification of the correctness of the declaration of goods (value, origin, tariff classification).
- Collection of VAT at the time of customs clearance or application of the deferral/exemption regimes provided by law.
- Preventing and combating tax evasion, through customs and documentary control.

Thus, the Customs Service acts as a fiscal intermediary between the importer and the state budget.

If we talk about **the administration of import excise duties**, the Customs Service has a direct and determining role for goods subject to excise duties (alcohol, tobacco products, energy products, automobiles, etc. Specific responsibilities:Identificarea mărfurilor accizabile conform legislației fiscale.

- Application of excise duty rates (specific, ad valorem or mixed).
- Control of imported quantities, essential in the case of specific excise duties.
- Verification of fiscal markings (excise stamp), where required by law.
- Collection of excise duties before the release of goods into free circulation.
- Supervision of specific fiscal regimes (tax warehouses, transit, customs warehouses).

During 2025, **the state budget received revenues administered by the Customs Service in the amount of 41,150,478.3 thousand lei (over 41.15 billion lei),** 2,873,566.0 thousand lei more (+7.5%) compared to the same period in 2024.

The main share in the revenue structure is held **by VAT, with about 66.6%, followed by excise duties – 26.8% and customs duties – 6.4%.**

Import excise duties – 11,011.77 million lei, which represents 26.8% of the total payments collected to the state budget. Compared to the same period of the previous year (when 10,265.98 million lei were accumulated), there is an increase of 745.79 million lei or +7.3%.

Structure of excise duties collected:

- **Excise duties on imported petroleum products** – 4,619.93 million lei (42.0% of total excise duties), up 14.4% (+581.53 million lei) compared to the same period of the previous year (4,038.40 million lei);
- **Excise duties on tobacco products** – 3,649.26 million lei (33.1%), up 0.1% (+2.62 million lei) compared to the previous year (3,646.64 million lei);
- **Excise duties on imported means of transport** – 2,150.72 million lei (19.5%), reflecting an increase of 8.2% (+163.47 million lei) compared to the same period of the previous year (1,987.24 million lei);
- **Excise duties on imported liquefied gases** – 229.30 million lei (2.1%), down by 2.4% (-5.70 million lei) compared to the same period of the previous year (234.99 million lei);
- **Excise duties on imported beer** – 119.28 million lei (1.1%), up by 19.5% (+19.47 million lei) compared to the previous year (99.81 million lei);
- **Excise duties on brandy, liqueurs, divinities and other alcoholic beverages** – 190.20 million lei (1.7%), down by 7.8% (-16.09 million lei) compared to the same period of the previous year (206.30 million lei);
- **Excise duties on other goods** – 48.26 million lei (0.4%), up by 3.6% (+1.67 million lei) compared to the previous year (46.59 million lei);
- **Excise duties on imported wines** – 4.82 million lei (0.04%), down 19.7% (-1.18 million lei) compared to the same period of the previous year (6.00 million lei). [11]

The positive developments recorded in most payment categories confirm the efficiency of revenue collection and the measures of the Customs Service.

In order to highlight the significant role of excise tax revenues on imported products, a comparative analysis of them with excise tax revenues collected for goods manufactured on the territory of the Republic of Moldova is proposed.

Table 2: Excise tax revenues for 2025, million lei

Order No.	Type of income	Amount of excise duties on imported products	Amount of excise duties on goods manufactured on the territory of the Republic of Moldova
1.	excise duties on brandy, liqueurs, divins and other spirits	190,2	293,8
2.	excise duties on wines	4,82	0,35
3.	excise duties on beer	119,28	274,9
4.	excise duties on tobacco products	3 649,26	1030,1
5.	excise duties on petroleum products	4 619,93	0,06
6.	excise duties on other goods	48,26	1,9
7.	excise duties on imported means of transport	2 150,72	----
8.	excise duties on imported liquefied gases	229,30	----
	Total	**11 011,77**	**1601,17**

Source: developed by the author based on Customs Service data and Information on NPB receipts administered by STS for the period 01.01-31.12.2025 (source [4])

At the top of the imported excise products that have the greatest impact on the state budget are **petroleum products**, with a share of revenues of over 42%. In 2025, the contribution of petroleum products amounted to 4619.93 million lei, 581.53 million less than the same period in 2024.

Taking into account the war in Ukraine, **tobacco imports** have begun to decrease. If during 2024, state budget revenues from tobacco product imports amounted to about 3,646.64 million lei, then in the same period of 2025 a decrease of 2.62 million lei is recorded.

In third place are **means of transportation**, with a contribution to the state budget of 2,150.72 million lei compared to 1,987.24 million lei compared to the same period in 2024. [10]

FACTORS INFLUENCING EXCISE TAX REVENUES:

- Digitalization of Customs: according to the Customs Service, the modernization process, better targeted controls and the use of technology contribute to more efficient collection. Thus, excise duties reflect both *the mix of imports* (e.g. fuels, means of transport, etc.) and *the effect of control on sensitive products*. [13]
- Frequent *adjustments to excise duty rates* or fiscal and customs policies can affect the share of excise duties on imported goods and the mix of imported products. In the last 5 years, excise duty rates have been increasing.
- Volume of imports of excisable goods. As mentioned above, in recent years excise tax revenues on imports of petroleum products, tobacco products and means of transport have had an increasing trend.

Table 3:Evolution of excise duty rates in the Republic of Moldova

Product name	Unit of measurement	Year					
		2020	2021	2022	2023	2024	2025
Beer made from malt	liter	2,63 lei	2,76 lei	2,90 lei	3,05 lei	3,05 lei	3,05 lei
Vermouths and other wines made from fresh grapes	liter	15,00 lei	15,75 lei	16,54 lei	17,37 lei	17,37 lei	17,37 lei
Brands, liqueurs, divins and other spirits	liter of absolute alcohol	104,33 lei	109,55 lei	111,02 lei	132,27 lei	132,27 lei	132,27 lei
Tobacco products	1000 pieces /value in lei	540 lei + 13%, but no less than 700 lei	621 lei+13%, but no less than 834 lei	715 lei+13% but no less than 959	893,75 lei+13% but no less than 1198,75	983,12 lei +13%, but no less than 1318,62 lei	1081,43 lei +13%, but no less than 1450,48 lei
Diesel	ton	2508 lei	2734 lei	2980 lei	3248 lei	3475,36 lei	3718,64 lei
Gasoline intended for use as a motor fuel or heating fuel ex. 290220000	ton	5960 lei	6496 lei	7082 lei	7719 lei	8259,33 lei	8837,49 lei

Source: developed by the author based on the source [2]

The volume of imports is significantly influenced by domestic demand, GDP level, exchange rate and trade policies. In the Republic of Moldova, imports constitute a substantial part of GDP, being driven by the need for energy resources and consumer goods. In January-September 2025, the increase in domestic demand determined an increase in the value of imports, totaling 7,848.6 million dollars, which stimulated the acquisition of goods from abroad intended both for final consumption and for economic and investment activity. Imports were 3 times higher than exports, and the degree of coverage of imports by exports was only 33.5%.

The increase in imports in January - September 2025 (+18.7% compared to 2024), which amounted to 7,848.6 million dollars, was mainly determined by the relaunch of domestic demand, which stimulated the acquisition of goods from abroad intended for both final consumption and economic and investment activity. Imports of goods from EU countries and other countries increased. Half (53.6%) of the goods imported during January - September 2025 came from EU countries, increasing by 28.9% compared to the same period of 2024. Imports from the other countries group increased by 10.4%, holding a share of 43.4% in total. At the same time, imports from CIS countries decreased by 11.7% and held a share of 2.9%.

From the top 10 countries - main trading partners of the Republic of Moldova, about 74.6% of goods were imported. **Romania** ranked first in the development of imports. Imports from this country increased by 1.7 times and amounted to 1,755 million dollars, with a total share of 22.4%. The degree of influence on the evolution of imports was 10.8 p.p. Approximately 35.7% of the total value of imports is represented by the import of well gas and other gaseous hydrocarbons, the value of which increased by about 9 times compared to January - September 2024. The value of electricity imports increased by 2.8 times, with a total share of 10%, the import of petroleum oils or oils from bituminous minerals increased by 1%. Cumulatively, these 3 sections represented 75.9% of the total goods imported from this country.

China is in second place, imports from this country increased by 18.5% (1,062.5 million dollars) and held a share of 13.6% of total imports. The degree of influence on the evolution of imports was 2.5 p.p. The largest share in total imports is held by telephones and other equipment for the mobile telephone network, about 9.5%, with an increase of 10% compared to the same period last year. Cars and other motor vehicles had a share of 5.8% and an increase of 38.4% compared to January - June 2024. In third place in total imports were semiconductor devices, with a share of 4.2% and an increase of 15.6%.

The third position belongs to **Ukraine**. Imports from this country decreased by 2.0% in January - September 2025. With a share of 10.5% (825.7 million dollars) of total imports, it negatively contributed to the evolution of imports by 0.3 p.p. The largest decreases were recorded in the following product categories: well gas and other gaseous hydrocarbons (-87.9%), sunflower seed oil (-61.4%), milk and cream from milk, not concentrated, without added sugar or other sweeteners (-12%). On the other hand, certain categories of goods recorded significant increases, and the largest share of imports from Ukraine was electricity, which increased in the period January - September by about 7.8 times and had a share of 10.1%, followed by sawn or split wood, which had a share of 4.75 and increased by 1.3 times compared to the same period last year. Goods in the category of other bars and rods of iron or non-alloy steel with a share of 4.5% and an increase of 1.5 times.

There was an increase in imports from Turkey ($557.5 million) – by 12.1%, Germany ($522 million) – by 6.4%, Italy ($381.7 million) – by 8.9%, Poland ($275.1 million) – by 3.2%, France ($184 million) – by 8.2%, Czech Republic ($143.1 million) – by 10.2%, but imports from Russia ($145.9 million) – by 8.5% decreased.

The commodity sections that recorded increases in the value of imports in January-September 2025 and, respectively, positively influenced the evolution of imports:

- mineral products increasing +51.4% compared to the same period in 2024 (22.3% of total imports), of which: mineral fuels, mineral oils and products resulting from their distillation – by 51.4%, the degree of positive influence on the evolution of imports constituting +8.8 p.p., salt; sulfur, earths and stones – by 55.2% (0.2 p.p.);
- live animals and animal products: +25.4%, of which: live animals – 2.9 times (0.2 p.p.), products of animal origin – by 42.4% (0.1 p.p.), milk and dairy products, bird eggs, natural honey – by 22% (0.4 p.p.);
- base metals and articles of base metals: +20.3%, of which: cast iron, iron and steel – by 27.9% (+0.6 p.p.), articles of cast iron, iron or steel – by 19.9% (+0.4 p.p.);
- plant products: +20.2% including: edible fruits and nuts – by 46.3% (+0.5 p.p.), vegetables, plants, roots and edible tubers – by 30.3% (+0.3 p.p.), coffee, tea, mate and spices – by 23.7% (+0.1 p.p.);
- food industry products; beverages, tobacco: +16.9% including sugars and sugar products – by 50.6% (+0.2 p.p.), cocoa and cocoa preparations – by 45.2% (+0.2 p.p.), beverages, alcoholic liquids and vinegar – by 18.6% (+0.2 p.p.);
- vehicles, aircraft: +16.3%, of which land vehicles – by 15.6% (+1.4 p.p.);
- machinery and apparatus, electrical equipment, sound recording or reproducing apparatus: +10.2% of which nuclear reactors, boilers, machinery, apparatus and mechanical devices; parts thereof – by 14.7%, (+1.2 p.p.), machinery, apparatus and electrical equipment - by 6.5% (+0.7 p.p.). [8]

The European Union is undoubtedly the most important economic partner of the Republic of Moldova, representing 53.7% of the country's total trade in 2023. Moldovan exports to the EU have grown steadily over the last decade, reaching 65.4% of total national exports in 2023. Moldova ranks 65th among the EU's trading partners, with a trade volume of 7.2 billion euros in 2023, of which 2.4 billion are Moldovan exports and 4.8 billion euros are imports from the EU (an increase of 2% compared to 2022).

Moldova's main trading partners in the EU

• *Romania – 1.3 billion euros (53% of total Moldovan exports to the EU)*

• *Italy – 240 million euros*

• *Germany – 204 million euros*

Moldovan products, such as plums, grapes and cherries, have become increasingly present on the European market. [12]

EU-Moldova trade relations are determined by **the free trade area established through the Deep and Comprehensive Free Trade Area** (DCFTA), part of the Association Agreement. Thanks to the DCFTA, which has been in force since 2016, the EU is Moldova's main trading partner. In 2024, the EU accounted for 54% of Moldova's total trade in goods, and 65.6% of Moldovan exports are destined for the EU market.

The DCFTA establishes a free trade area between the EU and Moldova in accordance with the principles of the World Trade Organization.

The DCFTA allows for:

• Elimination of import duties on most goods traded between the EU and Moldova

• Ensuring broad reciprocal access to trade in services for both partners

• Both EU and Moldovan companies can set up a subsidiary or branch on a non-discriminatory basis. This means that when a company is set up, it receives the same treatment as domestic companies in the partner's market.

An important part of the DCFTA is the alignment of Moldovan trade legislation with certain EU legislation. The aim of Moldova's adoption of EU approaches to policy-making is to improve governance, strengthen the rule of law and provide more economic opportunities by expanding the EU market for Moldovan goods and services. [14]

In the same time, regarding indirect taxation, the Association Agenda between the European Union and the Republic of Moldova also provides that the parties will strengthen cooperation aiming to improve and develop the tax system and administration of the Republic of Moldova based on EU and international standards. This will include preparation to gradually bring legislation in the Republic of Moldova more in line with EU law and the international instruments mentioned in annex to the Association Agreement, and in particular work to short-term priorities and medium-term priorities. [9]

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MAIN DIRECTIONS OF PRICING IMPROVEMENT IN THE CONTEXT OF DEVELOPING A SUSTAINABLE ECONOMY

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Abstract: *One of the key characteristics of modern EU economic development is its focus on creating a socially and environmentally oriented society. The promoted sustainable development agenda involves a comprehensive linkage between economic, social and environmental components. In the current conditions, the problem of improving pricing arises, where the applied approaches and methods have to be modernized in accordance with the market evolution in order to remain competitive. This paper deals with the main aspects of sustainable pricing, which involves setting prices for goods and services that take into account not only the costs of production and the achievement of profit maximization objectives, but also the wider environmental and social impacts throughout the value chain. Research revealed that pricing improvement in a sustainable economy should be based on factors such as: environmental and social costs associated with production, including the costs of using environmentally friendly materials, reducing energy consumption, and complying with environmental standards; consumer awareness, their desire to consume healthy products, and their willingness to pay producer costs aimed at supporting the environment; consideration of internal and external costs, such as those aimed at compensating for environmental damage caused by production; incentives for the transition to more sustainable forms of production, such as organic farming or the use of "green" transport; and the product life cycle and its impact on the environment at all stages of its existence, from production to use and final disposal*

Keywords: *sustainable pricing, socially and environmentally oriented society*

JEL Classification : *E31, F18, L11*

INTRODUCTION

Climate change and environmental degradation in the modern world are critical factors hindering improvements in the quality of life, poverty reduction, unemployment, the creation of decent working conditions, sustainable development and social justice. Under current conditions, one of the defining tools for the transition to a socially oriented type of global development is its greening [7]. The key international documents establishing new directions for human development include the *2030 Agenda for Sustainable Development,* which set seventeen Sustainable Development Goals (SDGs) and *Paris Agreement* adopted at the UN Climate Change Conference, the purpose of which is to unite the efforts of all countries to combat climate change and develop common strategies to minimize its negative consequences. These documents are the result of agreements reached at the global level on the transition to sustainable development based on the formation of a green economy, they are based on the concepts approved in the declarations (Agendas) of United Nations Conference on the *Human Environment* in Stockholm in 1972 and on United Nations *Earth Summit* in Rio de Janeiro in 1992.

A green economy is one of the key pathways to sustainable development and a means of achieving it. The transition to such an economy facilitates the replacement of fossil fuels with clean energy and green technologies, reduces the negative impact on the environment and climate, eradicates poverty, and stimulates increased employment and population income [11].

In the concept of a sustainable economy, pricing is no longer simply a tool for covering costs and generating profits. Sustainable pricing is the practice of setting prices that considers the environmental and social costs associated with production and includes such costs as the use of environmentally friendly materials, reduced energy consumption, and compliance with environmental standards [4]. Pricing becomes a mechanism that takes into account the environmental and social impacts of production and encourages responsible consumption.

APPLIED METHODS AND SOURCES OF INFORMATION

Presented in this article investigation was implemented based on such research methods as: general-scientific methods of cognition, logical analysis of theoretical and practical materials, documentary method, analogy and grouping of quantitative and qualitative data method, graphical method, method of synthesis and comparative analysis method. Analyses are founded on the data obtained from International Federation of Organic Agriculture Movements (IFOAM) and Research Institute of Organic Agriculture (FiBL), Statista, Deloitte, PricewaterhouseCoopers (PwC) etc.

The scope of the current research is identification the main directions of pricing improvement in the context of developing a sustainable economy.

RESULTS AND DISCUSSIONS

In today's changing business environment, influenced by different geopolitical factors, problems with logistics and climate change, the market of organic products demonstrates growth. The organic sector represents an integrated system that promotes the restoration, maintenance and development of healthy agricultural ecologic systems, whose components are biological diversity, biological cycles and soil biological activity. [6]. The most significant growth in the sector was recorded in 2013-2022, when the annual increase in retail sales of organic foods and the area of land use in organic agriculture exceeded 10% (figure 1).

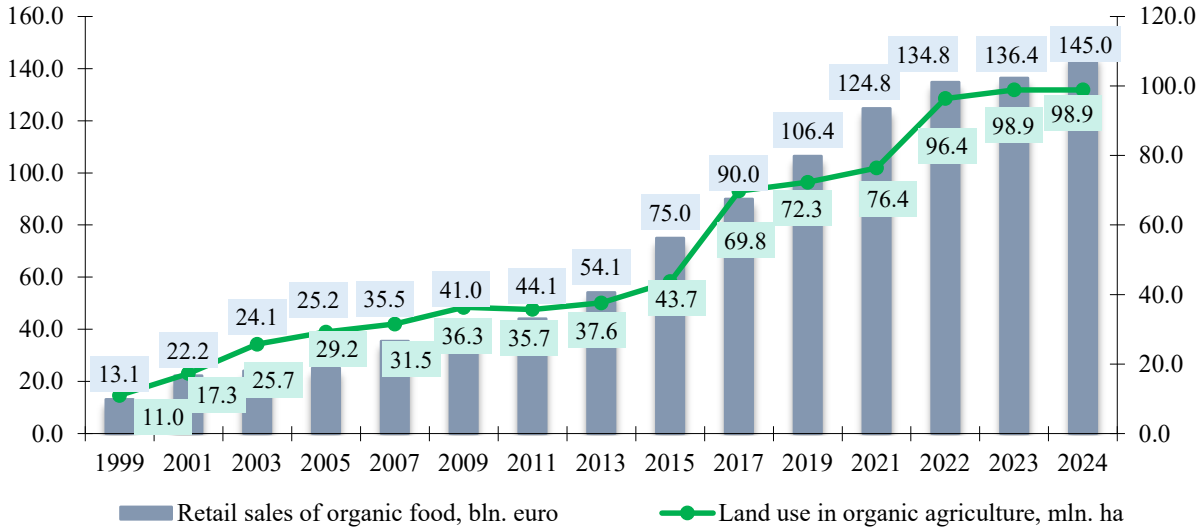

Figure 1. Retail sales of organic foods, land use in organic agriculture, 1999-2024
Source: elaborated by the author based on FiBL-AMI survey 2026 [5]

In 2023-2024, the growth rate decreased slightly, but the registered before positive dynamics still exists. In total, during 1999-2024, the value of organic foods market increased more than 11-fold (from €13.1 billion to €145.0 billion). Research shows that a higher proportion of consumers of organic food are registered in the countries with most developed economy, high incomes and education levels (Figure 2).

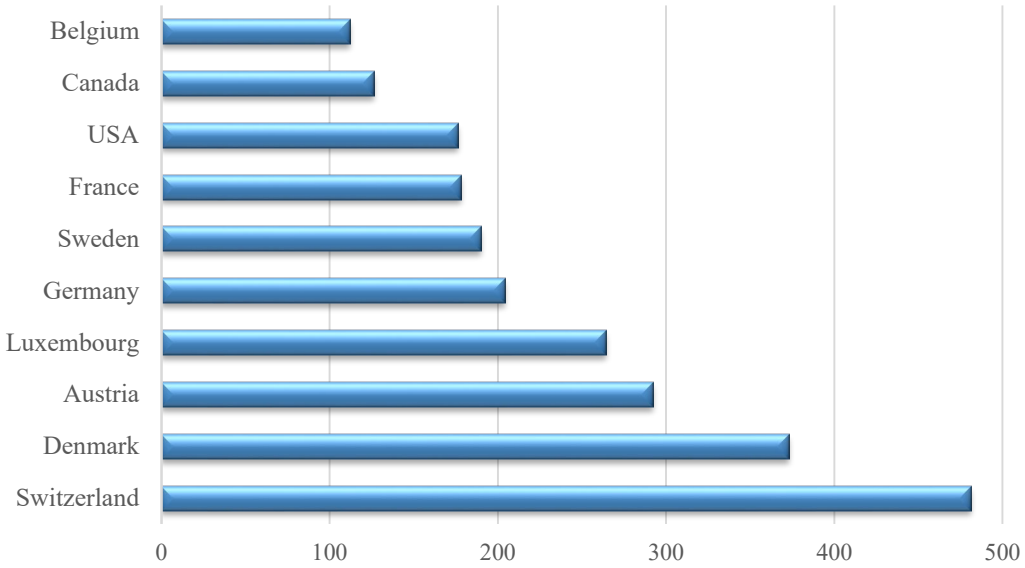

Figure 2. The countries with the highest per capita consumption of organic food, 2024, euro
Source: elaborated by the author based on FiBL-AMI survey 2026 [5]

The highest level of organic consumption food per capita was registered in Switzerland, Denmark, Austria, and Luxembourg. At the global level, the largest market of organic food was recorded in United States, with consumption of €58.6 billion (43% of global consumption), Germany is in second place in terms of consumption of organic products (€15.3 billion, 11% of global consumption) and China is in third (€12.4 billion, 9%).

Research demonstrates that the development of eco-friendly product markets depends on a combination of a wide range of economic, social, technological, and institutional factors. The key drivers of industry development are:

- *Growing environmental awareness among consumers.* The more people become aware of environmental problems (climate change, pollution, resource depletion), the higher the demand for eco-friendly products.

- *The increase in the population's income.* As incomes rise, consumers are more willing to pay extra for environmentally friendly and safe products.

- *State support and regulation of the sector.* To stimulate market development, the state provides subsidies and tax breaks to producers of organic products, sets environmental standards, organizes certifications and labeling, imposes restrictions on the production and sale of not healthy goods (through the additional excise duties, taxes, etc.), implements regulations that ensure the transparent activities of entrepreneurs in the industry and supports consumer protection.

- *Changing consumer preferences.* The trend toward a healthy lifestyle and responsible consumption is driving demand for organic products, biodegradable packaging, and natural cosmetics.

- *Technological innovations.* They facilitate the development of new environmentally friendly materials and production processes, waste recycling technologies that do not disrupt ecosystems, and "green" production processes, which reduce the cost of production of ecological goods and stimulate the growth of market supply.

- *Globalization and international trade.* Facilitates companies sell their products in international markets, promotes the development of international standards and systems of certification, and makes it possible the optimization of production of organic products taking into consideration specific characteristics of countries, including natural flora and fauna, local climate, water resources, etc.

- *Education and culture* forms sustainable habits, healthy consumption, and ensure an increase

the amount of environmentally responsible buyers. Marketing and information providing, different social events, and the influence of the media contribute to the active promotion of ecological goods and stimulate growth of demand for ecological products.

- *Infrastructure development.* It helps to reduce the cost of production, to optimize logistics of the companies, to develop online trading, retail industry and increases the availability of ecological products.

At the same time, there are obstacles for development of markets of ecological goods, including:

- *High prices for organic products.*
- *Decline in real disposable income of the population* and inflation.
- *Counterfeits,* including the provision of incomplete or false data, the use of eco-labels on products that are not actually certified. Low share of certified organic products.
- *The unavailability of some imported organic products,* and at the same time problems with entering international markets for exporters from developing countries, in particular due to the difficulty of obtaining the relevant internationally recognized certificates.
- *Problems with the physical availability of goods* (goods are available mainly in the largest cities and more developed regions), insufficient understanding of retail chains regarding the specifics and responsibilities involved in selling eco-friendly products.
- *Lack of awareness among potential buyers* about the benefits of eco-friendly products, lack of advertising and educational programs, reluctance of consumers to change their established habits, inconsistency with organic food to usual taste preferences, short shelf life.
- *Little financial support for the industry,* insignificant subsidies, underdeveloped infrastructure, difficulties with introducing innovations to the market.
- *The faultiness of the regulatory framework* [1].

According to research by PwC [9], the price of eco-friendly products is one of the determining factors in consumer purchasing decisions; only 44.5% of potential buyers are willing to incur additional costs for such products, 43.5% of consumers are unsure whether they are willing to bear the additional costs, and 12% of respondents said they are categorically unwilling to pay extra. Moreover, surveys show [2] that in a situation where the price of eco-friendly products can be 220% higher than the cost of identical conventional products, buyers are willing to pay only an additional 20% of the original price (Figure 3).\

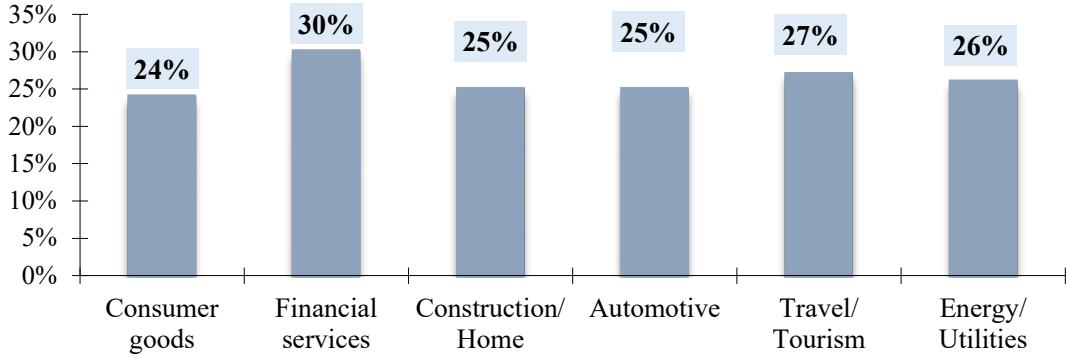

Figure 3. Average sustainability premium consumers would consider acceptable and be willing to pay, worldwide in 2023, by category

Source: elaborated by the author based on https://www.statista.com

As the green economy develops and eco-friendly products being relatively expensive, sustainable pricing becomes especially important. It allows for consideration not only the product's cost but also its environmental value, reducing the consumer's perceived price premium. These approaches allow companies to distribute additional costs more flexibly, for example through long-term benefits, subsidies, or subscription models to make eco-friendly products more accessible.

In pursuit of sustainable development goals and building a green economy, businesses that struggle to set competitive prices for eco-friendly products may experience significant challenges in profit growth. To avoid such situations, it's essential to implement new pricing methods and approaches that align with the rapidly evolving eco-friendly market to remain competitive.

According to research, to improve pricing methods in order to ensure the development of a sustainable economy, the market must take into account the following factors: the consumers readiness to use environmentally friendly products and the buyers' willingness to compensate producers for the costs incurred from agricultural techniques that protecting the environment; additional costs of producing environmentally friendly goods, including higher costs of purchasing environmentally friendly raw materials, implementing measures to switch to renewable energy sources (water, wind, solar) or purchasing equipment to reduce energy consumption and which complies with international environmental standards; considering additional costs aimed at reducing the negative impacts on nature in the production of environmentally friendly products and at eliminating potential negative impacts on the environment; incentives for the introduction of more environmentally friendly forms of production, such as organic farming; the use of environmentally friendly transport; as well as the life cycle of the product and its impact on the environment at all stages of its existence, from production to use and the final stage.

The analysis revealed that setting prices based on the objectives of developing a sustainable economy requires a systematic approach that includes several key steps:

1. *Conducting marketing research.* To optimize sustainable pricing, companies need to understand consumer demand, preferences, and willingness to pay more for environmentally friendly products.

2. *Analyzing the production cost structure.* To set prices that objectively reflect the value of ecological goods, companies must understand the actual cost of their products, that can help them to include in the price all costs incurred in the production of an environmentally friendly product, the added value made by sustainable factors, and at the same time to generate profit. Understanding the specific cost structure of ecological products can also facilitate the development of measures aimed at reduction of costs, making ecological products more competitive in the market and increasing sales.

The main factors that influence on the formation of increased cost on environmentally friendly products:

- relatively small volume of product sales, which makes it impossible to reduce production costs through economies of scale in conditions of high specific fixed production costs;
- the high cost of agricultural raw materials, which is a consequence of cultivating organic food using organic farming methods (without pesticides, synthetic fertilizers, plant growth regulators, etc.), which requires great effort, creates high risks (in particular, due to low protection against harmful insects), and often leads to lower yields compared to traditional farming;
- the high cost of industrial components, as their production places additional demands on the organization of the production process and the creation of favorable working conditions. More attention is paid to environmental protection, which requires a transition to waste-free or low-waste processes, the use of renewable energy sources, additional costs for the installation of filters, waste recycling, etc.
- costs for processes related to certification of environmentally friendly products (audit, laboratory analysis) and regular quality control of raw materials and finished products;
- costs of environmentally responsible logistics, the use of more expensive recyclable or biodegradable packaging, and reduction of emissions during transportation;
- additional costs for marketing, information about the benefits of eco-products, and building trust in the brand;
- costs of research and development (R&D), including costs of creating environmentally friendly products, projects to minimize environmental pollution, which require investments in research, design, testing, etc.

3. *Price formation based* on pricing methods that support business profitability while also considering environmental, social, and ethical impacts. The main difference between the traditional approach to pricing and sustainable pricing lies in the goals, planning horizon, and factors considered (Table 1).

Table 1. The main differences between the traditional approach to pricing and sustainable pricing

Characteristic	Traditional economy	Sustainable economy
Target	Profit maximization Focus on costs, demand and competitors	• Balancing profit, ecology and social responsibility • Long-term business sustainability and profitability
Price basis	Direct and indirect production costs + profit	Full costs (including environmental costs) Perceived value of a product considering sustainability benefits.
Planning horizon	Short and medium term	Long-term
The role of the state	Limited intervention	Regulation through • taxation (carbon tax), sanctions, and fines; • subsidies, financial support for green technologies; • establishing mandatory environmental requirements, standards, and norms; • eco-product certification; • requirements for product information transparency and labeling (eco-labeling); • infrastructure development; • - implementing information policy, improving public literacy.
Focus of consumption	Stimulating sales growth	Product sustainability and rational consumption

Source: elaborated by the author

To improve the processes of price setting in a sustainable environment economy, it is recommended to apply the following pricing methods:

a. *Cost-based pricing.* The classic method is based on the price of the product and the company's costs of adhering to sustainable economic principles, including the costs of environmentally friendly materials, waste recycling, energy-efficient technologies, and social costs.

The main advantages of this method are ease of use, transparency for consumers, and accounting of all total costs.

The main disadvantages are that the prices established on the market and the value of the product for potential consumers are not considered.

b. *Value-based pricing.* Price is determined by the value of a product for consumers and society, determined by its environmental impact (use of eco-friendly raw materials, reduced CO2 emissions, waste minimization) and social benefits [2]. Within this method, *premium pricing* can be applied for consumers willing to pay more for products with a high ESG profile.

The main advantages of this method are: the prospect of increased profits for the manufacturer if the product is in demand by the market, the ability to position the company as a premium or unique quality producer, and incentives for improved product quality to maximize sales. For consumers, the advantage of this method lies in the ability to pay only for the provided quality and demanded quality.

The main disadvantages of this method are the need to convince consumers of the high quality and environmental friendliness of the product; as well as potential problems in purchasing goods for consumers with lower incomes in the context of limited sales volumes.

c. *Life-cycle pricing is* an approach in which product pricing is formed and adjusted throughout the entire product lifecycle: from development and market launch to growth, maturity, and end-of-life stages. In a sustainable economy, this method considers not only financial costs but also environmental (minimizing environmental damage, reducing carbon footprint, waste-free recycling and disposal) costs, the possibility of transitioning to closed production and processing cycles, as well as social costs.

The main advantages of this method are a more accurate reflection of the product's real cost in its price, the possibility of a more detailed cost assessment considering the product's life cycle and the financing of appropriate measures to comply with environmental standards.

The main disadvantages of the method are the difficulty of predicting the duration of each stage of the life cycle, the corresponding costs, future demand, and the behavior of competitors.

d. *Differentiated pricing*. This is a strategy whereby a company sets different prices for the same product for different customer segments, goods, or consumption conditions. In the context of a sustainable economy, this model may set lower prices for socially vulnerable groups (pensioners, large families) and for "green" products, while higher prices are set for resource-intensive goods or goods whose production may cause polluting or other negative environmental impacts.

The main advantages of this method are the optimization of product sales among a wide range of consumers, the reduction of inequality in consumption, the provision of greater access to quality goods and services for different segments of the population, the stimulation of sustainable behavior, and the support of the transition to a sustainable economy.

The main disadvantages of this method include potential problems with pricing opacity for certain consumer groups, the threat of significantly inflated prices for solvent buyers, and, consequently, a decrease in trust in the company. Additional difficulties in implementing this method are determined by high operational costs associated with the need to collect data for specific target consumer groups, processing significant amounts of data and analytics, which requires the introduction of modern digital technologies into the pricing process.

e. *Dynamic pricing* is a method in which the price of a product or service changes in real time or with high frequency depending on supply, demand, customer behavior, environmental conditions and natural factors [10], requirements of market regulators regarding compliance with environmental and social standards, solving social problems, seasonality, and demand for "green" products and other factors.

The main advantages of the method are the ability to maximize profits by optimizing prices depending on changing market conditions and ESG factors, as well as ensuring more effective demand management.

The main disadvantages of the method are the low predictability of the company's pricing in the context of changing realities, which complicates planning for consumers and can destabilize demand.

5. *Informing customers* about the added value and environmental benefits of their products, justifying high prices for goods and promoting increased sales volumes.

CONCLUSIONS

The current development of the global economy, based on the increasing role of environmental, social, and governance (ESG) factors, requires a fundamental revision of approaches to pricing. Traditional pricing models focused on costs, demand, and competition are no longer relevant in the context of the transition to a sustainable economy. Therefore, improving pricing is becoming not only an economic but also an institutional challenge. Under current conditions, a key area for improving pricing is the integration of environmental and social costs into product prices, which requires consideration of factors such as environmental pollution, carbon emissions, natural resource depletion, climate challenges, and social impacts. Important factors determining improved

pricing include the development and modernization of pricing methods and strategies. In this regard, classical pricing methods such as cost-based pricing and value-based pricing are undergoing significant development. In the cost-based pricing, the main changes concern the cost structure and the specific impact of these costs on the established price, while in the value-based pricing the criteria for assessing the quality and premium status of a product are changing. A significant area of pricing improvement is the wider application of pricing methods such as differentiated pricing and dynamic pricing. These methods, based on product, market, and consumer differentiation, consider the dynamics of supply and demand, environmental and natural factors, and regulatory requirements, and use prices to stimulate demand for eco-friendly products, create new market segments, and maximize revenue. Modernizing pricing based on life-cycle pricing makes it possible to update prices throughout a product's entire life cycle, considering its reuse, recycling, and disposal potential.

Improving pricing is impossible without improving government regulation, which plays a key role in creating the necessary institutional environment through infrastructure development, appropriate tax policies, subsidies, standards and regulations, and product certification. Greater market transparency, eco-labeling, non-financial reporting by manufacturers and higher disclosure standards contribute to strengthening the trust of potential consumers and fostering sustainable consumer behavior. A significant factor in improving pricing is the wider adoption of modern digital technologies, which enable significant analytical work and consideration of multiple aspects, including environmental risks, supply chain sustainability, changes in consumer behavior, and other social and environmental factors, thereby increasing the adaptability of pricing decisions. In conclusion, it should be noted that pricing improvement in today's environment requires a comprehensive approach involving collaboration between business, government, and society. This will help create a more efficient, fair, and ESG-oriented sustainable economy capable of ensuring long-term development without compromising the well-being of future generations.

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THE PROPORTIONALITY OF FISCAL SANCTIONS AND THEIR IMPACT ON COMPLIANCE: BETWEEN TAX LAW AND FISCAL ETHICS

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Abstract: *The concept of proportionality in fiscal sanctions constitutes an essential element of fairness and efficiency in the modern tax system. In the context of the Republic of Moldova—where the sanctioning regime has evolved within a framework situated at the intersection of tax law, public ethics principles, and budgetary imperatives - this study examines how the proportionality of fines and penalties influences taxpayers' level of voluntary compliance. The paper advances an integrated approach, combining legal-normative analysis with a behavioural perspective, in order to identify the optimal balance between the coercive function and the preventive–educational function of sanctions. Through a comparative analysis of national and European tax legislation, the criteria of proportionality, predictability, and procedural fairness are assessed. In parallel, the research explores taxpayers' perceptions of tax justice and the role of ethics in the relationship between the state and the taxpayer. Preliminary findings suggest that a sanctioning system perceived as disproportionate diminishes compliance and public trust in the tax administration, whereas a framework grounded in proportionality and transparency strengthens tax discipline and the legitimacy of authority. The paper's conclusions provide recommendations for recalibrating tax policies towards a compliance model based on trust, tax education, and moral responsibility.*

Keywords: *proportionality of tax sanctions, tax ethics, tax law, voluntary compliance, procedural fairness, institutional trust*

JEL Classification : *H20, H25*

INTRODUCTION

The tax sanction constitutes an essential instrument through which the state ensures compliance with tax rules and maintains budgetary balance, having a dual nature - legal and economic. In legal terms, a tax sanction is defined as a coercive measure applied to taxpayers who breach obligations prescribed by tax legislation, its purpose being both punitive and preventive. From an economic perspective, the sanction is understood as a mechanism for correcting deviant behaviours that undermine the collection of public revenues and distort the principles of tax equity (Musgrave, 1959; Tanzi, 2017).

Contemporary tax doctrine emphasizes that the role of sanctions is not merely to punish non-compliance, but also to contribute to shaping responsible taxpayer behaviour, thereby strengthening the relationship of trust between the state and society (Kirchler, 2007). In this regard, the tax sanction cannot be analysed in isolation from the moral and institutional context of the tax system. An effective tax administration does not rely exclusively on coercion, but rather on a balanced mix of enforcement and cooperation, in line with the "slippery slope framework," which argues that voluntary compliance depends on the interplay between the authority's power and taxpayers' trust (Kirchler, Hoelzl & Wahl, 2008).

In the Republic of Moldova, the tax sanctions regime is grounded in a set of legal norms aimed at ensuring compliance with tax obligations, safeguarding the interests of the national public budget, and strengthening tax discipline. This regulatory framework is governed primarily by the Tax Code of the Republic of Moldova, the Contravention Code, and the Criminal Code, each assigning distinct competences depending on the nature and severity of the violation (Ciobanu, 2020).

From a legal standpoint, tax sanctions derive from the principle of legality, according to which no penalty may be imposed in the absence of a clear legal basis. Such sanctions may be: pecuniary in nature - fines, penalties, and late-payment surcharges - typically applied for failure to submit tax returns, delays in settling liabilities, or understatement of the taxable base (Tax Code, Arts. 260–264); administrative in nature - such as the suspension of certain tax-related rights or denial of access to budgetary incentives - applied for procedural breaches or contraventions of medium severity, regulated by the Contravention Code, Arts. 293–301, and taking the form of warnings, fines, and, in serious cases, suspension of the taxpayer's activity; and, lastly, criminal in nature - reserved for particularly serious misconduct, such as large-scale tax evasion or falsification of accounting documents (Criminal Code, Arts. 241–244). These may entail custodial sentences, confiscation of assets, or bans on engaging in certain economic activities.

In national doctrine, tax sanctions are often classified also according to their ***functional*** purpose:

1. *compensatory sanctions*, which aim to recover the budgetary loss;
2. *coercive sanctions*, which pursue punitive and preventive objectives.

In practice, these two functions often converge, which calls for a more refined assessment of proportionality, as well as of the cumulative use of the measures involved (Bîrsan, 2016).

From an economic standpoint, it is widely acknowledged that the effectiveness of tax sanctions is closely linked to their proportionality and predictability. Sanctions that are excessively severe may, paradoxically, produce undesirable outcomes, including the expansion of tax evasion or informal economic activities. On the other hand, sanctions that are proportionate, clearly defined, and aligned with the seriousness of the offence tend to support higher levels of compliance and contribute to strengthening fiscal discipline (Alm & Torgler, 2011). In this light, proportionality can be regarded as a cornerstone for both the fairness of sanctioning practices and the legitimacy of the tax system as a whole (OECD, 2022).

At the same time, the literature points to the educational dimension of tax sanctions, highlighting their role in fostering a culture of compliance and in discouraging repeated non-compliant behaviour (James & Alley, 2009). In countries where tax morale is relatively high and fiscal institutions are well developed, sanctions are typically embedded within a broader framework that also includes communication, guidance, and preventive measures. This integrated approach reduces the reliance on strictly punitive interventions. Therefore, tax sanctions should not be seen exclusively as coercive tools, but rather as part of a wider system of fiscal governance oriented toward fairness, transparency, and social responsibility.

The responsibility for applying tax sanctions lies with the State Tax Service, which operates under the principles of administrative autonomy and individual accountability of its officials. Sanctioning decisions are required to be issued in written form, supported by appropriate reasoning, and communicated to the taxpayer within a maximum of five working days from the date of their adoption. At the same time, taxpayers are entitled to challenge such decisions either through administrative review procedures or before the competent courts, in accordance with the Law on Administrative Litigation (No. 793-XIV of 10 February 2000).

Where the amount of the tax liability does not exceed MDL 500 (for an individual taxpayer who does not carry out entrepreneurial activity) or MDL 5.000 (for a legal entity or an individual taxpayer who carries out entrepreneurial activity), the breach of tax legislation is considered minor, and the tax authorities apply a sanction in the form of a warning - a preventive measure with an informational role. When a violation exceeds the statutory threshold, it is regarded as significant and is sanctioned through the imposition of a fine. This type of sanction consists in obliging the person

who committed a breach of the law to pay a sum of money. In this context, the fine becomes part of the tax liability and is collected in accordance with the procedure established for tax assessment and collection.

Violations sanctioned by fines (in a fixed amount or as a percentage) include, inter alia:

- obstructing the activity of the State Tax Service;
- failure to use cash register and control equipment;
- failure to submit information regarding the registered office;
- non-compliance with taxpayer registration rules, with the procedures for preparing and submitting tax returns and tax invoices, and with the rules governing the enforced collection of tax liabilities;
- breaches of accounting and tax record-keeping rules, as well as rules on the calculation and payment of tax liabilities and the use of excise stamps;
- breaches by banks (branches) and/or payment institutions and other payment service providers of settlement procedures;
- etc.

A tax sanction does not have a definitive character, and where the person held liable submits evidence confirming the lawfulness of all actions (omissions) - or of certain actions (omissions) previously deemed unlawful - the sanction is considered annulled. At the same time, where a person has committed two or more breaches of the legislation, a tax sanction is applied for each breach and for each tax period separately.

The current system, although grounded in modern principles, is frequently criticised for a lack of uniformity in the application of sanctions, as well as for a low degree of predictability in administrative decisions (Ciobanu, 2020). The OECD assessment report (2022) indicates that inconsistent enforcement contributes to the erosion of taxpayers' trust and discourages voluntary compliance, thereby highlighting the need to reform the sanctioning framework towards a more transparent and proportionate administration.

The preceding discussion suggests that the Republic of Moldova has developed a relatively sophisticated and tiered legal framework governing the use of tax sanctions. However, the performance of this framework cannot be assessed solely in formal terms. Its real effectiveness is largely determined by the consistency of enforcement practices and by the extent to which administrative action incorporates behavioural and ethical considerations. From a policy perspective, a sanctioning regime that is proportionate, predictable, and perceived as fair plays a critical role in sustaining tax discipline and reinforcing trust in public institutions (Tănăsescu, 2014; Frey & Torgler, 2007; OECD, 2022).

Equally important is the institutional dimension. The overall credibility and functionality of the sanctioning system depend on how effectively fiscal and judicial authorities interact, particularly in ensuring the consistent application of proportionality and safeguarding procedural fairness. In Moldova, this coordination primarily involves the State Tax Service (STS), the court system, and the Constitutional Court. In more complex cases - especially those involving large-scale tax evasion - additional actors such as the National Anti-Corruption Centre (NAC) and the Prosecutor's Office for Combating Organized Crime and Special Cases (PCCOCS) become engaged, reflecting the multi-agency nature of enforcement in high-risk areas (Ciobanu, 2020).

Within this architecture, the State Tax Service functions as the key operational authority. It is responsible for detecting non-compliance, quantifying the associated fiscal impact, and issuing sanctioning decisions. Its mandate is framed by principles such as efficiency, proportionality, and transparency, as provided for in the Law on the State Tax Service (No. 157 of 8 July 2021). Notably, recent institutional developments indicate a gradual reorientation of the STS away from a predominantly punitive approach toward a compliance-oriented model. This shift aligns with broader international trends emphasizing assisted compliance, where prevention and taxpayer engagement are prioritized over ex post enforcement.

In line with this transition, several digital and procedural instruments have been introduced, including early-stage notifications, the taxpayer's Personal Account interface, and electronic reporting systems such as e-Declaration and e-Invoice. These tools are designed to facilitate self-correction and reduce the immediate reliance on sanctions. Empirical evidence highlighted in OECD reports (2022) indicates that such measures contribute to lowering administrative costs while improving voluntary compliance rates. This supports a growing consensus in the economic literature that preventive and facilitative approaches tend to be more cost-effective and sustainable than enforcement strategies based predominantly on coercion (Alm & Torgler, 2011).

The fiscal sanctioning system of the Republic of Moldova is based on a set of fundamental principles derived from European tax and administrative law: legality, proportionality, individualisation, and transparency (Tănăsescu, 2014):

1. *The principle of legality*, which entails that no sanction may be imposed in the absence of an explicit legal provision, and that extensive interpretation to the detriment of the taxpayer is prohibited (Bîrsan, 2016);
2. *The principle of proportionality*, which requires that the sanction be commensurate with the gravity of the act, the degree of culpability, and its effects on the public budget, avoiding excessive measures that could lead to the taxpayer's insolvency (Alexandru, 2018);
3. *The principle of individualisation*, which obliges the tax administration to assess the specific circumstances of each case, including the taxpayer's compliance history and whether the breach was intentional or unintentional (Frey & Torgler, 2007);
4. *The principle of transparency*, which refers to the obligation of tax authorities to clearly communicate the legal basis, the calculation method, and the available appeal rights related to the imposed sanction (OECD, 2022).

The need to comply with these principles is indispensable; nevertheless, practice shows that the STS's sanctioning decisions are often challenged on grounds of disproportionality or insufficient reasoning. Although the норматив framework provides for the possibility to individualise sanctions, the application of this principle sometimes remains formal, due to the lack of standardised criteria for assessing intentionality and the severity of the breach (Ciobanu, 2020).

The proportionate application of tax sanctions presupposes effective cooperation among fiscal, judicial, and supervisory institutions. At present, the Republic of Moldova faces difficulties in ensuring the consistency of inter-institutional decisions and in maintaining effective information exchange between tax authorities and judicial bodies (OECD, 2022). The absence of a unified database on taxpayers' infringements and the sanctions imposed generates uncertainty and divergent interpretations.

At the same time, judicial reform and the digitalisation of tax processes create opportunities to implement an intelligent sanctioning system based on behavioural risk assessment and the differentiated application of corrective measures. In this direction, the Republic of Moldova could draw on good practices from Estonia and Lithuania, where inter-institutional cooperation and database interoperability have increased transparency and reduced administrative disputes (European Commission, 2023).

CONCEPTUAL AND THEORETICAL FRAMEWORK OF THE PROPORTIONALITY OF TAX SANCTIONS

In a setting where tax sanctions are increasingly regarded as key instruments for ensuring compliance and maintaining fiscal discipline, it becomes essential to examine more closely the boundaries and conditions governing their use. While earlier discussions have focused on the multifaceted nature of tax sanctions - namely their punitive, preventive, and educational roles - the emphasis here shifts toward a critical aspect of their design: the alignment between the intensity of the sanction and the policy objective pursued by the tax authorities. In the absence of a coherent regulatory framework capable of balancing the state's revenue interests with the protection of

taxpayers' rights, sanctions may become excessive and, ultimately, undermine their intended purpose (James & Alley, 2009; Tănăsescu, 2014). Within this analytical framework, the principle of proportionality can be understood as a natural continuation of the doctrinal evolution in the field, offering both legal and economic benchmarks for calibrating state intervention in a manner consistent with tax fairness and institutional credibility (Alexandru, 2018; Alm & Torgler, 2011).

The principle of proportionality occupies a central position in modern tax law, serving as a constraint on the exercise of public authority while ensuring an appropriate balance between fiscal objectives and individual rights (Alexandru, 2018). Its conceptual foundations are rooted in European legal doctrine, where the Court of Justice of the European Union (CJEU), through its jurisprudence, has established the requirement that tax measures adopted by Member States must be proportionate to the aims they pursue, thereby excluding the use of excessive or arbitrary sanctions (Craig & de Búrca, 2021).

At the domestic level, this principle is reflected in the requirement that sanctions be tailored to the seriousness of the offence, the specific circumstances under which it occurred, and its impact on public finances (Tănăsescu, 2014). Accordingly, the effectiveness of a sanction should not be equated with its severity, but rather with its capacity to preserve a reasonable balance between the damage inflicted on the public interest and the burden imposed on the taxpayer (Șova, 2017). This reasoning underpins the broader concept of tax justice, which implies that taxpayers should be treated in a fair and differentiated manner, with sanctions calibrated according to both the intent and the magnitude of the violation (James & Alley, 2009).

Modern legal doctrine highlights three dimensions of the principle of proportionality in tax matters:

1. *proportionality in the strict sense*, which requires a direct relationship between the gravity of the act and the sanction imposed;
2. *necessity*, which entails choosing the least intrusive measure capable of achieving the lawful objective;
3. *appropriatene*ss, which concerns the compatibility between the means employed and the objectives of tax policy (Tridimas, 2015).

The proportionality of tax sanctions is assessed by courts (including the CJEU and the European Court of Human Rights - ECtHR) through the proportionality test, also known as the three-step test (Table 1). The proportionality test is grounded in the provisions of the Treaty on European Union, which stipulate that EU measures must:

- be suitable for achieving the intended objective;
- be necessary to achieve the intended objective;
- not impose an excessive burden on the taxpayer in relation to the objective pursued (proportionality stricto sensu).

From this perspective, the stages of the test comprise suitability (relevance), necessity (subsidiarity), and proportionality stricto sensu.

In European case-law, the CJEU has emphasized that tax measures may not go beyond what is necessary to protect the state's financial interests, even where the taxpayer has committed a serious infringement. For instance, in *Bonda (C-489/10)*[1], the Court held that the cumulative application of criminal and administrative sanctions for the same conduct may breach the principle of proportionality and the right to a fair trial (Craig & de Búrca, 2021).

Accordingly, a tax sanction is considered disproportionate where the amount of penalties corresponds to the value of the deductible tax (or even exceeds it), which would effectively deprive

[1] In *Bonda (C-489/10)*, the Court of Justice of the European Union held that administrative sanctions of a punitive nature fall within the scope of the ne bis in idem principle, and that the cumulative application of administrative and criminal sanctions for the same conduct is permissible only insofar as it respects the principle of proportionality and does not exceed what is necessary to protect the Union's financial interests.

the taxpayer of the right to deduct. The authorities may refuse the right of deduction (in the case of value added tax) only if they demonstrate fraud or complicity in fraud, and the refusal measure must be proportionate. At the same time, the use of enforcement measures that would fully paralyse the taxpayer's economic activity in order to recover a minor claim is prohibited.

In this way, the application of the proportionality test by the courts is mandatory in order to ensure that tax sanctions are assessed in a fair and equitable manner vis-à-vis taxpayers.

Table 1. Proportionality Test (Three-Step Test) Applied to Tax Sanctions

Stage of the test	Assessment criterion	Objective pursued in tax law
Proportionality	The measure must not impose a disproportionate and excessive burden on the taxpayer. A balance must be maintained between the severity of the measure and the public benefit obtained	The individual burden imposed (the amount of the sanction) must not be excessive in relation to the public interest (the value of the fiscal harm)
Necessity	The measure must be the least intrusive among all possible measures capable of achieving the same objective	If a measure exists that is less burdensome for the taxpayer yet equally effective, the state must choose that measure
Appropriateness	The measure must be suitable for achieving the legitimate objective	The tax sanction must contribute to achieving the intended objective (reducing the gap between assessed tax liabilities and collected revenues)

Source: compiled by the author

From an economic perspective, the proportionality of tax sanctions is analysed through the lens of the utilitarian theory of optimal deterrence, according to which the level of the sanction should be calibrated so that the expected benefit of tax evasion is lower than the perceived cost of the sanction (Allingham & Sandmo, 1972). However, recent research in behavioural economics shows that perceived disproportionality of sanctions generates distrust and reduces voluntary compliance; taxpayers are more willing to cooperate when the system is perceived as fair and predictable (Kirchler, 2007; Alm & Torgler, 2011).

ANALYSIS OF THE RELATIONSHIP BETWEEN THE SEVERITY OF SANCTIONS AND VOLUNTARY COMPLIANCE

The analysis of the relationship between the severity of tax sanctions and the level of voluntary compliance is a central topic in contemporary behavioural economics, as it challenges the limits of coercion-based effectiveness and highlights the role of non-financial motivations in taxpayers' decisions (Alm & Torgler, 2011). The classical compliance theory, derived from the model developed by Allingham and Sandmo (1972), assumes that the decision to report income accurately results from a rational utility calculation, in which the taxpayer compares the gains from evasion with the probability of detection and the level of the sanction. In other words, compliance is driven by fear of punishment and by the anticipated economic cost of non-compliance (Becker, 1968).

Building on the specialised literature in behavioural economics and European tax law, the present study approaches the proportionality of tax sanctions as a functional relationship between the severity of the sanction and the taxpayer's behavioural response, expressed through the level of tax compliance. This perspective goes beyond the classical deterrence model based on coercion and

incorporates dimensions such as perceptions of fairness, institutional legitimacy, and compliance history, in line with the approaches developed by Kirchler, Frey, and Torgler.

In this context, a conceptual model for assessing the proportionality of tax sanctions is proposed, tailored to the specificities of the Republic of Moldova and analysed dynamically for the period 2022-2024**.**

The model begins by defining the severity of the tax sanction (S) as a relative indicator, calculated as the ratio between the totality of sanction-related consequences and the principal tax liability assessed, according to the following relationship:

$$S = \frac{A+P+D}{B} \quad (1)$$

where:
A – the fine imposed*;*
P – penalties and late-payment surcharges;
D – other quantifiable administrative consequences;
B – the principal tax liability.

This formulation enables an assessment of the proportionality of sanctions beyond absolute amounts and ensures comparability across different categories of taxpayers and tax periods.

The degree of tax compliance (C) is introduced as an essential explanatory variable of the model and is defined as the ratio between voluntarily declared revenues and total estimated revenues:

$$C = \frac{Vd}{Vt} \quad (2)$$

where:
Vd – voluntarily declared revenues;
Vt – total estimated revenues.

Given the limited access to official estimates of the tax gap in the Republic of Moldova, this indicator is approximated using operational proxies employed in OECD and TADAT assessments, such as the timely filing rate of tax returns, the share of voluntary corrections, and the effectiveness of tax audits.

To incorporate the behavioural dimension and to ensure an individualised analysis, the model introduces a taxpayer behaviour coefficient (Bc), which reflects the intentionality of the breach and the compliance history. This coefficient ranges from 1 (consistent compliance) to values close to zero in cases of tax fraud, in line with the proportionality principle as established in the case-law of the Court of Justice of the European Union, including Bonda (C-489/10).

On the basis of these variables, the Fiscal Proportionality Indicator (FPI) is constructed, expressed by the following relationship:

$$IPF = \frac{S}{(1-C)*Bc} \quad (3)$$

The indicator makes it possible to assess the extent to which the applied sanction is proportionate to the level of non-compliance and to the taxpayer's behaviour. FPI values close to one indicate an optimal level of sanctioning, whereas markedly above-one values reflect excessive sanctions with the potential to erode voluntary compliance; conversely, persistently below-one values may signal a risk of incentivising non-compliance.

To test the practical relevance of the proposed proportionality model, the empirical analysis is grounded in official data from the State Tax Service regarding the outcomes of tax audits, collection efficiency, and the evolution of revenues from fines and sanctions over the period 2022–2024.

For each year analysed, these components are aggregated into a synthetic compliance indicator with values ranging from 0 to 1, where higher values denote a higher level of compliance. Over the analysed period, the resulting values are 0,58 for 2022, 0,63 for 2023, and 0,68 for 2024, reflecting a gradual improvement in compliance behaviour, against the background of digitalisation and increased audit selectivity.

Table 2. Primary indicators of tax audits in the Republic of Moldova (2022–2024) and the estimation of the compliance level (C) and the severity of sanctions (S)

Year	Fines and sanctions (million MDL)	Assessed liabilities (million MDL)	Recovery rate (%)	Compliance level (C)	Severity index (S)
2022	360,77	800	25	0,58	1,20
2023	385,39	850	27	0,63	0,90
2024	402,90	968,30	22	0,68	0,85

Source: compiled by the author based on data published on the State Tax Service website (www.sfs.md).

The severity of tax sanctions is expressed in relative terms, as the ratio between the volume of sanctions imposed and the tax base assessed following audits, in order to avoid distortions generated by absolute values. Based on official data, the resulting values for relative severity are 1.20 in 2022, 0.90 in 2023, and 0.85 in 2024, indicating a gradual reduction in sanctioning pressure, alongside improvements in selection mechanisms and assisted compliance.

Table 3. Calculation of the Fiscal Proportionality Indicator (FPI)

Year	Compliance level (C)	Severity index (S)	Behavioural coefficient (B_n)	$(1 - C) \times B_n$	Fiscal Proportionality Indicator (FPI)
2022	0,58	1,20	0,75	0,315	3,81
2023	0,63	0,90	0,75	0,2775	3,24
2024	0,68	0,85	0,75	0,2400	3,54

Source: compiled by the author

This approach enables a direct correlation between the severity of sanctions and tax compliance indicators, as well as the effectiveness of revenue collection mechanisms.

The data show that, over the analysed period, audit effectiveness increased from 65% in 2020 to 75% in 2024, indicating an improved capacity to identify non-compliance. However, the ratio between assessed amounts and amounts actually collected deteriorated significantly, with the recovery rate falling from 47% in 2020 to only 22% in 2024. This discrepancy suggests a moderate level of effective tax compliance, despite intensified audit activity.

To incorporate the behavioural dimension, the author applied an aggregated taxpayer behaviour coefficient that reflects the dominant profile of tax infringements. Given the structure of infringements identified in the Republic of Moldova - predominantly characterised by errors, negligence, and unintentional breaches- the behavioural coefficient is set at $B_n = 0.75$ for the entire period analysed. This value corresponds to imperfect yet predominantly cooperative tax conduct and allows the maintenance of intertemporal comparability of results.

The application of the model yields FPI values of 3.81 for 2022, 3.24 for 2023, and 3.54 for 2024, indicating a structurally disproportionate sanctioning regime, despite the gradual reduction in severity and the improvement in tax compliance.

Applying the proportionality model of tax sanctions to the Republic of Moldova for the period 2022–2024 allows for the formulation of conclusions that are relevant both from a theoretical perspective and from the standpoint of tax administration practice. The results confirm that the

effectiveness of the sanctioning regime cannot be assessed solely by the intensity of sanctions or the volume of assessed liabilities; rather, it must be analysed in relation to the actual level of tax compliance and the behavioural profile of taxpayers.

First, the consistently high values of the Fiscal Proportionality Indicator across all three years analysed highlight the existence of a structural gap between the severity of sanctions and the real capacity for compliance. In 2022, an FPI of 3.81 points to a strongly disproportionate sanctioning regime characterised by heightened coercive pressure, in a context of low recovery of assessed tax liabilities. This situation suggests that increasing the severity of sanctions was not accompanied by a corresponding increase in voluntary compliance, which limits the effectiveness of the deterrence mechanism and generates high administrative costs.

Second, the reduction in the FPI value in 2023 to 3.24 reflects a partial improvement in the calibration of sanctions, in the context of a lower number of audits and increased audit selectivity. Nevertheless, the indicator's persistence at a markedly above-one level demonstrates the continuation of an excessive sanctioning regime relative to the aggregated level of compliance. This finding confirms the hypothesis that a purely quantitative adjustment of sanctions is insufficient to optimise tax discipline in the absence of institutional mechanisms oriented towards cooperation and prevention.

Third, the evolution of the FPI in 2024, although reflecting a slight improvement in relative proportionality, keeps the indicator at 3.54, suggesting that the transition towards an assisted compliance model remains incomplete. Despite progress in digitalisation, risk analysis, and assisted compliance, the severity of sanctions remains structurally high relative to the level of compliance achieved. This situation points to a degree of institutional inertia within the sanctioning architecture, which constrains the full potential of reforms oriented towards cooperation and trust.

From a theoretical perspective, the results confirm the validity of behavioural approaches according to which the effectiveness of tax discipline does not stem from maximising sanctions, but from optimising the relationship between control, sanctioning, and voluntary compliance. The proposed model demonstrates that excessive sanctions may generate saturation and demotivation effects, reducing institutional legitimacy and eroding taxpayers' trust in the tax system.

From a methodological perspective, the fiscal proportionality indicator proves to be a useful tool for the dynamic assessment of the sanctioning regime, enabling the identification of situations of excessive sanctioning and supporting evidence-based fiscal policy decisions. Integrating sanction severity, compliance level, and behavioural profile into a unified analytical framework represents an original contribution with potential for comparative application in other jurisdictions.

From an applied perspective, the findings suggest the need for a structural recalibration of the sanctioning regime in the Republic of Moldova, aimed at strengthening voluntary compliance and reducing reliance on punitive mechanisms. In this regard, fiscal policies should prioritise prevention, assisted compliance, transparency, and the predictability of sanctions, alongside the development of risk-analysis tools and mechanisms for inter-institutional cooperation.

In conclusion, the proposed proportionality model highlights that the transition from a coercive regime to a cooperative one is not merely a fiscal policy option, but an essential condition for the sustainability of tax discipline and for strengthening the state's legitimacy. The results obtained provide solid empirical support for reforms oriented towards balance, proportionality, and fiscal responsibility.

THE PROPORTIONALITY OF TAX SANCTIONS THROUGH THE LENS OF ETHICS AND BEHAVIOURAL ECONOMICS. EFFECTS ON TAXPAYER COMPLIANCE.

Therefore, the proportionate application of tax sanctions depends not only on the normative framework, but above all on the institutional quality of control and justice mechanisms. The State Tax Service, the courts, and the Constitutional Court play complementary roles in ensuring tax fairness; however, their collective effectiveness is contingent upon professionalism, transparency,

and cooperation. Strengthening institutional capacity and integrating digital technologies into the sanctioning process can transform the tax administration from a coercive actor into a trusted partner of the taxpayer (Kirchler, 2007; OECD, 2022; Ciobanu, 2020).

The applicability of the proportionality principle becomes increasingly relevant in the context of the digitalisation of tax administration, where the automation of detecting and sanctioning breaches may reduce or eliminate the human element of judgement. Accordingly, the strictly algorithmic application of sanctions without consideration of individual circumstances may violate procedural fairness and the principle of proportionality (OECD, 2022). A balanced tax system should combine technological efficiency with contextual analysis in order to preserve the legitimacy of sanctions in the eyes of taxpayers.

The ethical dimension of tax sanctions occupies a central place in contemporary debates on justice and the legitimacy of state action in taxation. While the legal approach explains sanctions through the necessity of enforcing the rule, and the economic approach justifies them through efficiency and deterrence of unlawful behaviour, the ethical perspective focuses on the moral legitimacy of fiscal coercion and on the extent to which it reflects values of fairness and public responsibility (Rawls, 1971; Torgler, 2007).

From a normative perspective, tax fairness presupposes that sanctions are applied in a proportionate and non-discriminatory manner, within a framework that is sufficiently transparent to be understood and accepted by taxpayers. In practice, however, the acceptance of sanctions is not determined exclusively by their deterrent effect. Rather, it is closely linked to how taxpayers perceive the fairness and legitimacy of the system itself (Kirchler, 2007). Where such perceptions are fragile or inconsistent, sanctions tend to lose part of their preventive capacity and may instead generate scepticism, or even resistance, at the societal level (Alm & Torgler, 2011). In this respect, tax ethics cannot be reduced to the individual conduct of taxpayers alone; it also reflects the behaviour of public institutions, which are expected to act in a manner that is coherent, responsible, and credible (Bovi & Cerqueti, 2014).

At the same time, public morality - understood in its collective dimension - has a visible influence on the degree of voluntary compliance and on the broader social acceptance of sanctioning practices. When citizens perceive that public resources are managed with a reasonable degree of efficiency and fairness, a certain sense of reciprocity tends to emerge, reinforcing civic responsibility (Frey & Torgler, 2007). By contrast, in contexts marked by corruption, unequal treatment, or limited transparency, sanctions - even when legally justified - are often perceived in a more critical light, sometimes as expressions of institutional arbitrariness rather than legitimate enforcement (Alasfour, 2017).

In this line of reasoning, the ethical dimension of tax sanctions cannot be examined in isolation from the cultural and institutional environment in which they operate. The legitimacy of the tax system is shaped not only by the strict application of legal rules, but also by the consistency and moral credibility of public action. Fairness, proportionality, and public morality thus appear as defining elements of what is often described as the modern fiscal contract - a tacit arrangement between the state and taxpayers, where compliance is supported, to a significant extent, by trust rather than by coercion alone (Feld & Frey, 2007; Torgler, 2011).

Ultimately, tax sanctions may be interpreted not only as instruments designed to enforce fiscal discipline, but also as indicators of a society's level of institutional maturity. They reflect, in a broader sense, both the development of tax culture and the quality of interaction between public authorities and citizens. To the extent that the state manages to act in a manner perceived as fair and responsible, sanctions are more likely to achieve their role through guidance and reinforcement, rather than through pressure or constraint (Rawls, 1971; Sen, 2009; Kirchler, 2007).

However, subsequent research has shown that a mechanical increase in the severity of sanctions does not automatically lead to higher compliance. In many cases, excessive penalties may generate adverse effects - reducing trust in authorities and increasing avoidance behaviours (Kirchler, 2007). Behavioural economics incorporates psychological variables into this analysis, such as

perceptions of fairness, loyalty to the state, and internalised moral norms, which help explain why individuals often choose to comply even in the absence of a significant risk of sanction (Frey & Torgler, 2007).

A key element of this perspective is the theory of institutional trust, according to which voluntary compliance is grounded in the reciprocal relationship between the taxpayer and the tax administration. Kirchler (2007) formulates the *slippery slope framework*, according to which tax compliance increases when the tax authority combines legitimate coercive power with a high level of trust and fair treatment. Thus, fear of sanctions is only one component of compliance, whereas perceptions of fairness and respect for state institutions become essential determinants of fiscal cooperation (Wahl, Kastlunger & Kirchler, 2010).

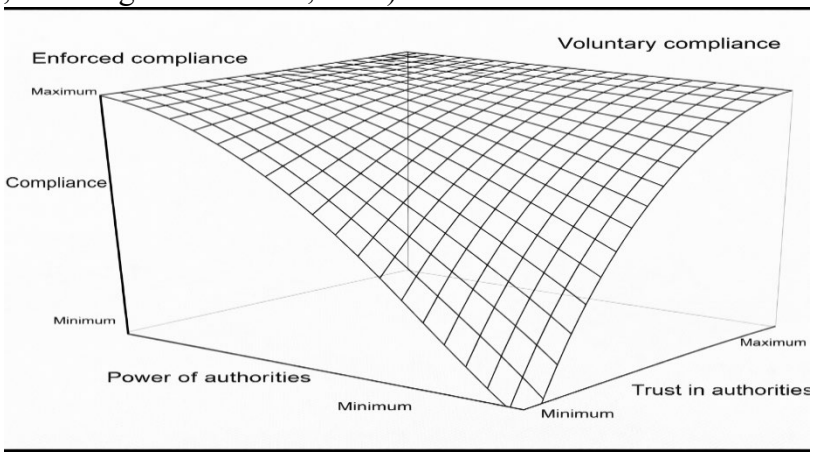

Figure 1. The "Slippery Slope" Model

Source: adapted by the author after Kirchler, Hoelzl & Wahl, 2008, p. 212

Increasing voluntary compliance is based on optimising the balance between the tax authority and the taxpayer's responsibility. This balance is captured by the behavioural model of taxpayer behaviour. Proposed by Kirchler, Hoelzl, and Wahl, the *slippery slope framework* (Figure 1) explains fiscal behaviour through two dimensions: trust in the authorities and the authorities' power.

According to the model, the relationship between taxpayers and tax authorities may be characterised by antagonism or synergy. In an antagonistic climate, tax authorities perceive taxpayers as rational individuals seeking to maximise benefits and willing to evade tax obligations whenever an opportunity arises. Consequently, tax authorities behave like "police officers" and treat taxpayers as potential "offenders". In turn, taxpayers feel persecuted and reject the actions of the tax authorities. By contrast, in a climate based on synergy, mutual respect and trust prevail, and tax authorities adopt a "service–client" attitude towards taxpayers. Taxpayers, in turn, are less inclined towards tax fraud and comply voluntarily with the payment of tax obligations.

Accordingly, taxpayer education and training, high-quality service delivery through the establishment of a constructive dialogue based on trust, as well as reducing pressure on honest taxpayers, contribute to the creation of a synergistic climate and, implicitly, to an increase in voluntary compliance.

From an empirical perspective, OECD studies show that in countries with a mature tax culture - such as Sweden, Estonia, or the Netherlands - voluntary compliance reaches high levels even under moderate sanctions, due to a fiscal climate grounded in transparency and mutual respect. By contrast, in emerging economies, where perceptions of corruption and the arbitrariness of fiscal decisions persist, taxpayers tend to react defensively, and the severity of sanctions is perceived as abusive (Alasfour, F., Samy, M., & Bampton, R., 2017).

Furthermore, behavioural experiments confirm the existence of a saturation point in the deterrence effect: beyond a certain threshold, increasing the severity of punishment no longer generates additional compliance, but rather resistance and distrust (Feld & Frey, 2007). This dynamic

highlights the need to rethink the sanctions paradigm from the perspective of "tax cooperation" rather than a strictly punitive logic.

Thus, the severity of tax sanctions should be understood as part of a broader behavioural ecosystem in which perceptions of fairness, institutional legitimacy, and public morality play a decisive role. An effective tax system does not maximise sanctions; instead, it optimises the relationship between control and trust, moving towards a model of voluntary compliance grounded in mutual respect and civic responsibility (Kirchler, 2007; Frey & Torgler, 2007; OECD, 2022).

Consequently, the behavioural and ethical principles of tax compliance must be aligned with the normative framework that operationalises them. Any modern tax system bases its effectiveness not only on the legal rationality of sanctions, but also on the extent to which they reflect values such as fairness, proportionality, and institutional legitimacy. Hence, there is an interdependent relationship between the behavioural architecture of compliance and the legal structure of sanctions: the law provides the formal foundation of tax discipline, while ethics and taxpayers' perceptions provide its moral content and practical effectiveness. In this context, analysing the sanctioning framework of the Republic of Moldova becomes indispensable for understanding how the theoretical principles of proportionality and trust materialise in legal and administrative practice.

At the national level, the efforts of the State Tax Service are reflected in the "Taxpayer Compliance Programme", approved and updated annually. By annually identifying five priority segments of the national economy and monitoring taxpayers within these sectors, the STS succeeded in increasing tax liabilities paid to the National Public Budget by up to 21% in 2024, 17% in 2023, and 23% in 2022, compared to previous years.

EUROPEAN PRACTICES AND RELEVANT COMPARISONS

Comparing the fiscal sanctioning regimes of the Republic of Moldova with those of European Union Member States provides an essential perspective on the degree of legislative convergence and the level of institutional maturity in the field of tax compliance. The comparative analysis shows that, although core principles - legality, proportionality, and transparency - are shared, the modalities of enforcement and the intensity of sanctions differ significantly, reflecting legal traditions, tax culture, and the level of digitalisation of public administration (OECD, 2022).

Romania places strong emphasis on the individualisation of sanctions and on tax prevention. Accordingly, Romania's tax system, regulated by the Fiscal Procedure Code (Law No. 207/2015), is based on a balanced approach combining punitive measures with preventive mechanisms. Romanian tax authorities prioritise the tailoring of sanctions to the specifics of each case, taking into account the taxpayer's individual circumstances and the degree of cooperation displayed during the tax audit (Tănăsescu, 2014). For example, unintentional errors are often addressed through warnings rather than fines, in accordance with the proportionality principle. Romania has also introduced assisted compliance mechanisms - such as tax good-practice guidelines and prior notification - aimed at reducing minor infringements and promoting tax education.

Lithuania prioritises digitalisation and automated, proportionate sanctions and is widely regarded as a good-practice example in digital enforcement due to the full integration of its tax administration into a unified digital system (i.MAS – Intelligent Tax Administration System). This model enables the automated application of sanctions proportionate to the gravity of the breach by using risk algorithms and the taxpayer's behavioural history (OECD, 2022). Pecuniary sanctions are moderate, but the probability of detection is high, which supports strong voluntary compliance. A distinctive feature is that Lithuanian authorities typically apply a sanction only after issuing a voluntary compliance notice, thus giving the taxpayer an opportunity to correct the error before being penalised.

In Poland, sanctions are firm but graduated according to intentionality. In this respect, Poland maintains a more stringent sanctioning regime, yet one that is adjusted to the intentional nature of the offence and to the value of the harm inflicted on the public budget. Polish tax legislation provides for

distinct administrative-offence and criminal sanctions, while also introducing the concept of tax self-correction, whereby taxpayers may avoid penalties if they voluntarily rectify their returns prior to the initiation of an audit (Wysocki, 2020). This mechanism encourages individual responsibility and reduces the administrative burden on control institutions. Moreover, Poland has introduced a tax rating system that classifies taxpayers according to their compliance history, enabling the differentiated application of sanctions (OECD, 2022).

Estonia represents a benchmark model in terms of a sanctioning philosophy grounded in cooperation and trust. Rather than relying on a punitive logic, the Estonian tax administration promotes trust-based compliance, whereby severe sanctions are reserved only for cases of intentional fraud (Torgler, 2011). The Estonian tax system transparently integrates financial and accounting data through the X-Road platform, thereby narrowing the scope for evasion and errors. Voluntary compliance reaches levels above 95%, despite moderate financial sanctions. This supports the thesis that transparency and fairness can substitute excessive coercion as a means of ensuring tax discipline (Kirchler, 2007; Feld & Frey, 2007).

The comparative analysis highlights a clear tendency towards the Europeanisation of the Republic of Moldova's sanctioning policies, oriented towards proportionality, prevention, and accountability. While traditional models (such as the Polish one) retain a pronounced coercive dimension, modern trends - reflected in Lithuania and Estonia - promote a balance between sanctioning and cooperation, between fear of punishment and institutional trust.

Therefore, for the Republic of Moldova, convergence towards European standards entails a shift from a predominantly coercive sanctioning model to a behavioural and educational one, grounded in digitalisation, predictability, and procedural fairness. Such a transformation would contribute to strengthening tax culture and increasing the level of voluntary compliance (OECD, 2022; Alm & Torgler, 2011).

CONCLUSIONS

The efficiency of the tax system is an essential criterion for the proper functioning of the state and for the optimal exercise of its responsibilities. However, such efficiency does not depend exclusively on the severity of coercive measures, but rather on the balance between the state's public interest and the protection of taxpayers' rights. Modern tax law, anchored in the general principles of European law, requires that any intervention by tax authorities be proportionate to the gravity of the conduct and necessary to achieve the legitimate objective of preventing and correcting tax violations.

The analysis of the impact of tax sanctions on voluntary compliance has shown that, in the context of the Republic of Moldova, the effectiveness of the tax system depends not only on the severity of penalties, but above all on how taxpayers perceive the fairness, transparency, and predictability of the tax administration. The study highlights that sanctions play a key role in deterring tax evasion; nevertheless, a lasting impact on compliance is achieved through a balance between coercive measures and behavioural instruments, such as tax education, transparent communication, and the digitalisation of services.

Tax sanctions are an indispensable instrument for maintaining tax discipline, yet their effectiveness is achieved only when they are applied in accordance with the principle of proportionality. By applying this principle, authorities are required to identify a reasonable relationship between the objective pursued and the means employed, avoiding excessive or arbitrary measures. In this regard, the proportionality test - based on the criteria of suitability, necessity, and proportionality stricto sensu - constitutes an essential benchmark for assessing the legality and fairness of tax sanctions.

In practical terms, compliance with proportionality has direct implications for the level of tax compliance. A tax system perceived as fair and predictable fosters voluntary compliance, as taxpayers are more willing to fulfil their obligations when sanctions are viewed as just and transparent. By contrast, excessive, disproportionate, or unpredictable measures generate distrust, resistance, and evasive behaviour, thereby reducing the effectiveness of tax collection and undermining social cohesion.

Moreover, the ethical dimension of tax sanctions is indispensable for strengthening tax culture and public trust. Within this framework, the state must avoid turning sanctions into an excessively punitive instrument or a source of budgetary revenue and should instead orient them towards educating the taxpayer and reinforcing civic responsibility.

Accordingly, the principle of proportionality acquires a dual significance: a legal one, by guaranteeing legality and limiting abuses of power, and a moral one, by strengthening mutual trust between the state and the taxpayer. Only through a balanced application of tax sanctions - grounded in transparency, fairness, and administrative rationality - can a sustainable fiscal climate be achieved, in which financial discipline coexists with respect for citizens' fundamental rights.

In conclusion, the proportionality of tax sanctions is not merely an abstract legal principle, but an essential pillar of a modern, ethical, and efficient tax system that promotes voluntary compliance and strengthens the relationship of trust between the taxpayer and the tax authority.

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EXPANDING GREEN FINANCING INSTRUMENTS: INNOVATION AND INTEGRATION STRATEGIES FOR ACHIEVING SUSTAINABLE DEVELOPMENT GOALS

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Abstract: *The urgent global transition toward sustainable development has catalyzed the emergence and diversification of green financing instruments. This research investigates the expansion of green financial tools—including green bonds, sustainability-linked loans, blended finance mechanisms, and climate resilience bonds—and evaluates their effectiveness in mobilizing capital for environmental and social outcomes. By examining their design, implementation, and performance across various economic contexts, the study assesses how these instruments contribute to climate mitigation, adaptation, and inclusive growth. Furthermore, it explores the integration of green finance into national and international policy frameworks, emphasizing the role of ESG metrics, digital technologies, and regulatory innovations in enhancing transparency and accountability.*

Keywords: sustainable development, green financing, green bonds, investment projects.
JEL Classification: *E22, F02, G2, O11, Q01*

INTRODUCTION

The growing urgency of the global climate crisis has accelerated the development of financial instruments specifically designed to support sustainable development objectives. Among these instruments, green finance mechanisms have become increasingly important in directing capital toward projects that generate measurable environmental benefits, such as renewable energy infrastructure, energy efficiency improvements, sustainable agriculture, and biodiversity protection.

In recent years, the range of available sustainable finance tools has expanded significantly. Green bonds remain the most widely used instrument, allowing issuers to raise capital that is explicitly allocated to environmentally beneficial projects. At the same time, new mechanisms such as sustainability-linked loans, transition bonds, and blended finance structures have emerged in order to address the limitations of traditional project-based financing models. These instruments link financial conditions to sustainability performance targets or combine public and private funding sources to reduce investment risks.

Beyond their role as financial innovations, these mechanisms have become strategically important for governments, corporations, and international institutions seeking to mobilize large volumes of capital for climate mitigation and adaptation. International frameworks such as the Paris Agreement and the United Nations Sustainable Development Goals (SDGs) have established ambitious environmental targets, but achieving these objectives requires investment levels that far exceed the capacity of public budgets alone.

Recent estimates illustrate the scale of this challenge. In 2024, global issuance of labeled sustainable bonds reached approximately USD 1.1 trillion, while cumulative sustainable debt issuance exceeded USD 6.2 trillion (World Bank Treasury, 2025). Despite this rapid growth, the financing gap for climate action and SDG implementation remains substantial. As a result, the effectiveness of green finance instruments increasingly depends not only on their market expansion but also on the credibility of the governance frameworks that regulate their use.

Along to market expansion, governance frameworks have also evolved. Disclosure regimes are converging toward standardized climate-related reporting requirements, including the IFRS S2, which enhances comparability and decision-usefulness of climate-related financial information. Simultaneously, regulatory taxonomies—most prominently the EU Taxonomy Regulation—have formalized definitions of environmentally sustainable activities, aiming to reduce fragmentation and mitigate greenwashing risks. Nevertheless, the credibility and effectiveness of green finance instruments depend on robust verification systems, transparent reporting mechanisms, and harmonized standards across jurisdictions.

This study examines green finance instruments from an integrated perspective that combines market dynamics, regulatory developments, and institutional governance structures. By analysing both the evolution of sustainable debt markets and recent regulatory innovations, the article seeks to clarify the role of green finance instruments in facilitating the transition toward climate-resilient economic systems.

LITERATURE REVIEW

The literature on sustainable and green finance originates in earlier scholarship on socially responsible investment (SRI) and ESG integration, which emphasized the incorporation of non-financial criteria into portfolio allocation. Initial debates centered on whether ESG screening compromised financial returns or enhanced long-term risk-adjusted performance. Over time, empirical evidence increasingly suggested that environmental and governance risks may be financially material, particularly in sectors exposed to regulatory change, carbon pricing, and technological disruption.

Following the adoption of the Paris Agreement, academic discourse shifted from ethical investing toward systemic risk and macro-financial stability considerations. Climate change began to be framed as a source of transition risk, physical risk, and liability risk, affecting asset valuation and long-term economic resilience. Within this context, green finance instruments emerged not merely as voluntary ethical tools, but as structural components of financial system adaptation to climate-related risks.

Green bonds represent the most extensively researched segment of sustainable finance. Empirical studies have analyzed issuance trends, investor composition, pricing behavior, liquidity characteristics, and certification standards. A prominent focus concerns the existence of a "greenium," referring to potential yield differentials between green and conventional bonds. As sustainable finance markets expanded, academic attention shifted toward governance structures underpinning market credibility. Literature highlights the importance of transparency and impact reporting. Variability in reporting standards and external verification practices has raised concerns regarding greenwashing and credibility. These concerns have motivated calls for harmonized disclosure requirements and taxonomic classification systems to enhance comparability across markets.

Disclosure frameworks are viewed as critical for reducing information asymmetry and enhancing investor confidence. The introduction of the IFRS S2 marked a significant milestone in establishing globally comparable climate-related financial reporting standards (ISSB, 2023). Similarly, sustainable finance taxonomies have become central to regulatory debates. The EU Taxonomy Regulation formalizes science-based technical screening criteria to define environmentally sustainable economic activities (European Commission, 2020). Scholars argue that taxonomies provide a "common language" that reduces fragmentation and mitigates greenwashing risk.

METHODOLOGY

This research adopts a mixed-methods analytical approach that combines qualitative institutional analysis with descriptive quantitative assessment of sustainable debt markets. The purpose of this methodological framework is to examine both the structural evolution of green finance instruments and the regulatory environments that shape their implementation.

The analysis focuses on two main dimensions. The first dimension examines market dynamics, including the growth of sustainable bond issuance, the diversification of financing instruments, and the increasing participation of both public and private actors in sustainable finance markets. The second dimension evaluates the institutional and regulatory architecture that supports these instruments, particularly disclosure frameworks, sustainability taxonomies, and supervisory mechanisms.

Empirical evidence used in the study is derived from publicly available data published by international financial institutions, regulatory authorities, and multilateral organizations. These sources include aggregated sustainable bond market statistics, regulatory documentation associated with the IFRS S2 climate-related disclosure standard, and technical materials related to the European Union Taxonomy Regulation.

In addition, the study examines selected policy frameworks and case studies in order to illustrate how green finance instruments operate in practice. By combining market data with institutional analysis, the research aims to provide a more comprehensive understanding of how financial innovation, regulatory governance, and policy coordination interact in the development of sustainable finance systems.

RESULTS AND DISCUSSIONS

A finding of this study is that regulatory innovation in sustainable finance is shifting from a model based primarily on market "encouragement" toward one centered on **governed credibility**. In the early stages of green bond market development, governance relied heavily on voluntary principles—such as the Green Bond Principles—and reputational incentives. While these mechanisms facilitated rapid market growth, they also contributed to definitional fragmentation and increased exposure to greenwashing risks.

Recent regulatory developments indicate a structural shift toward legally embedded standards and supervisory oversight. The EU Taxonomy Regulation was explicitly designed to reduce fragmentation and greenwashing risk by defining science-based technical screening criteria for environmentally sustainable activities (European Commission, 2020; European Commission, 2025). By establishing a harmonized classification system and providing operational tools—such as the Taxonomy Compass—the framework moves beyond voluntary alignment and creates a legally grounded reference for market participants. Academic analyses highlight that such taxonomies enhance transparency and reduce information asymmetry, thereby strengthening market integrity.

A complementary institutional innovation is the European Green Bond Regulation, which establishes the European Green Bond Standard (EuGB). Although the standard is voluntary for issuers, it embeds a formal supervisory architecture. Under the regulation, external reviewers must be registered and are subject to oversight by the European Securities and Markets Authority (ESMA). The regulation applies from 21 December 2024, while registration requirements for external reviewers apply from 21 June 2026 (European Commission, 2023; ESMA, 2026).

This supervisory embedding marks a qualitative evolution in sustainable finance governance. Rather than relying predominantly on reputational discipline and market signaling, regulatory authorities are institutionalizing verification mechanisms and compliance structures. The literature suggests that such formalization enhances investor confidence, reduces regulatory arbitrage, and supports cross-border comparability. At the same time, scholars caution that increased regulatory rigor may raise compliance costs and potentially limit access for smaller issuers, indicating a trade-off between credibility and inclusiveness.

Overall, the transition toward governed credibility reflects the maturation of sustainable finance markets. It underscores recognition that scaling green finance requires not only expanding issuance volumes but also embedding robust institutional safeguards capable of ensuring environmental integrity and long-term financial stability.

A core finding of this study is that "instrument expansion" in sustainable finance is best conceptualized not as simple product diversification, but as the construction of an interoperable governance stack composed of four mutually reinforcing layers:

- Eligibility layer – science-based classification systems defining what qualifies as environmentally sustainable activity (taxonomies);
- Incentive layer – performance-linked key performance indicators (KPIs), covenants, and pricing mechanisms that embed sustainability targets into contractual structures;
- Capital structure layer – risk allocation mechanisms, including senior–subordinated tranching, guarantees, and blended finance risk layering;
- MRV layer (Monitoring, Reporting, and Verification) – digital disclosure systems, third-party assurance, and standardized reporting frameworks.

This layered architecture aligns definitional clarity, financial incentives, risk mitigation, and accountability mechanisms. The eligibility layer is operationalized through regulatory taxonomies such as the EU Taxonomy Regulation, which provides technical screening criteria and common sustainability definitions. The incentive layer is increasingly shaped by sustainability-linked performance targets and disclosure standards such as IFRS S2, which enhance comparability and decision-usefulness. The capital structure layer is frequently supported by blended finance arrangements and public risk-sharing facilities. Finally, the MRV layer is strengthened through supervisory mechanisms embedded in frameworks such as the European Green Bond Regulation, including oversight by the European Securities and Markets Authority (ESMA).

Table 1. Comparative Instrument Design and Implementation Features

Layer	Green Bonds	Sustainability-Linked Bonds/Loans	Blended Finance	Transition Finance
Eligibility (Taxonomy Alignment)	Use-of-proceeds aligned with taxonomy criteria	Broader corporate scope; KPI-linked rather than activity-based	Project-level eligibility; often taxonomy-informed	Sector-specific decarbonization pathways
Incentive Mechanism (KPIs / Covenants)	Reporting covenants; limited pricing linkage	Explicit KPI targets; step-up/step-down pricing	Risk-sharing incentives; concessional tranches	Emissions intensity or transition benchmarks
Capital Structure (Risk Layering)	Standard fixed-income structure	Conventional debt with performance triggers	Senior/subordinated tranches; guarantees; concessional capital	Conventional or hybrid debt structures
MRV (Monitoring, Reporting, Verification)	Allocation & impact reports; external review	KPI verification; sustainability performance reporting	Donor monitoring requirements; impact metrics	Transition plan disclosure; third-party verification
Integrity Risk Exposure	Medium (dependent on reporting rigor)	Medium–High (target credibility critical)	Low–Medium (institutionally monitored)	High (risk of weak transition criteria)
Scalability Potential	High in developed markets	Increasing globally	Constrained by structuring complexity	Emerging; policy-dependent

Source:autor's

The findings indicate that scalability and integrity are interdependent. Where any layer, particularly MRV and independent verification, is weak, rapid market growth may increase greenwashing exposure and reputational risk faster than it increases measurable SDG impact. Conversely, strong interoperability across layers enhances credibility, investor confidence, and long-term capital reallocation effectiveness.

This comparative analysis underscores that sustainable finance effectiveness depends less on the proliferation of labeled instruments and more on the coherence and interoperability of their governance stack. Robust MRV systems, digital disclosure infrastructure, and supervisory oversight are decisive determinants of long-term credibility and systemic impact.

DISCUSSION WITH RECENT CASE STUDIES

The European Commission's green bond issuance under the NextGenerationEU (NGEU) program provides an illustrative example of how scale, taxonomy alignment, and audited reporting can be integrated within a multi-country developed-market context. As part of the EU's post-pandemic recovery instrument, NGEU incorporates a substantial green financing component designed to support climate-related investments across Member States, aligned with EU climate objectives and sustainable finance standards.

As of 1 August 2025, total NGEU green bond issuance reached EUR 75.1 billion (European Commission, 2025). The framework aligns with the Green Bond Principles and incorporates annual allocation and impact reporting subject to limited assurance. This structure embeds transparency and external verification within the issuance model, reinforcing credibility and investor confidence.

Reported realized climate impact under the program was estimated at approximately 14.0 million tonnes of CO_2 equivalent (CO_2e) avoided per year as of the reporting cut-off date. Upon full implementation of quantifiable measures financed under the framework, total expected impact is projected at approximately 53.39 million tonnes of CO_2e avoided annually (European Commission, 2025). These figures indicate a structured approach to ex ante and ex post impact estimation, linking capital mobilization to measurable climate outcomes.

Importantly, the NGEU green bond program operationalizes a model of **results-linked budgeting at scale**. Proceeds are explicitly tied to eligible expenditures reported by Member States under the Recovery and Resilience Facility (RRF). This mechanism strengthens the connection between financing, budgetary allocation, and policy execution, effectively integrating the capital structure layer (bond issuance), eligibility layer (taxonomy-aligned expenditure categories), and MRV layer (audited allocation and impact reporting).

The case illustrates that scalability and integrity need not be mutually exclusive. When embedded within strong fiscal governance and supranational oversight, green bond issuance can achieve both substantial volume and measurable climate linkage. However, the model's replicability depends on institutional capacity, centralized fiscal coordination, and high disclosure standards—conditions more readily available in advanced economies than in emerging markets.

Overall, the NGEU green bond program represents an advanced example of governed credibility in action: a large-scale issuance platform combining taxonomy alignment, structured expenditure tracking, and verified impact reporting within a unified fiscal-financial framework.

Indonesia's Just Energy Transition Partnership (JETP) provides an illustrative example of **blended finance deployed at programmatic scale in an emerging market context**. Unlike single-instrument approaches, the JETP functions as a policy-program "container" that combines grants, concessional loans, market-rate loans, guarantees, and private capital mobilization within a coordinated transition framework.

According to the European Commission under the Global Gateway initiative, the initial commitment amounts to approximately USD 20 billion, structured as roughly equal shares of public and private financing (European Commission, 2025). The composition of partners and financial commitments remains dynamic, reflecting evolving participation and co-financing arrangements.

This architecture reflects a deliberate strategy to leverage concessional capital to crowd in commercial investment while mitigating sovereign and project-level risk.

Complementary program documentation hosted by the UNFCCC frames both the Energy Transition Mechanism (ETM) and the JETP as instruments intended to mobilize international and private sector participation through blended finance structures. Official materials from the

A key finding from this case is that blended finance performs most effectively when paired with complementary policy reforms. Tariff adjustments, carbon market mechanisms, permitting reforms, and grid planning improvements are essential to convert concessional leverage into bankable revenue streams. Without such reforms, concessional capital risks subsidizing projects that remain structurally unviable under prevailing market conditions.

In contrast to the NextGenerationEU case, which operates within a highly integrated fiscal and regulatory environment, Indonesia's JETP underscores the additional complexity of deploying large-scale blended finance in emerging markets. While the program demonstrates substantial ambition and mobilization capacity, scalability and impact integrity depend heavily on regulatory stability, institutional capacity, and credible transition planning.

Overall, Indonesia's JETP illustrates how blended finance can serve as a strategic instrument for accelerating energy transition in emerging economies—provided that financial structuring is accompanied by systemic policy reform and credible implementation frameworks.

CONCLUSION

The rapid expansion of sustainable finance markets has generated a diverse ecosystem of financial instruments, including green bonds, sustainability-linked loans, transition finance mechanisms, and blended finance structures. However, the findings of this study suggest that the effectiveness of these instruments depends less on the mere proliferation of financial products and more on the coherence of the governance frameworks that support them.

Evidence from both developed and emerging market contexts indicates that successful sustainable finance structures tend to integrate four key elements: clearly defined eligibility criteria based on sustainability taxonomies, performance-linked incentive mechanisms embedded in financial contracts, risk-sharing arrangements that improve investment feasibility, and robust monitoring, reporting, and verification systems.

The case of the European Union's NextGenerationEU green bond program demonstrates how strong regulatory alignment and audited reporting frameworks can support large-scale green bond issuance while maintaining credibility and transparency. By contrast, the Indonesian Just Energy Transition Partnership highlights the additional challenges associated with implementing blended finance models in emerging market environments, where institutional capacity and policy stability play a critical role in determining long-term success.

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THE ISSUE OF THE EXTERNAL DEBT OF THE WORLD'S STATES AND THE REPUBLIC OF MOLDOVA AND POSSIBLE WAYS TO ADDRESS IT

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Abstract. *The article analyzes the problem of global external debt of sovereign states and integrationist unions. In the context of the cyclical nature of the development of the world economy, the periodicity of crisis phenomena is obvious, which significantly influences the dynamics of external borrowing of states. Global external debt has been growing steadily over the past 50 years, with the main debtors being developed countries.*
A detailed analysis of the current state of the world debt market is provided, along with a brief assessment of the structure of global debt and the Republic of Moldova by certain indicators. Based on the examples of developed and developing countries, the main directions in which threats to national economic security are manifested are presented. The urgent need to develop an effective national strategy for managing external debt, a crucial priority for both developing and developed countries, is also argued.
Solving the problem of external debt of states does not seem feasible in the short term. However, international financial organizations have proposed practical recommendations to counter the continued growth of external debt. Regulatory methods include debt restructuring, promoting sustainable economic growth, fiscal consolidation, accelerating inflation, and creating a unified, clear and transparent database on the economic condition of debtor countries to facilitate an accurate assessment of credit risks.

Keywords: *external debt, lending, debt obligations, International Monetary Fund (IMF), World Bank Group.*
JEL CLASSIOFICATION: *E44, F34*

INTRODUCTION

According to IMF statistics, global external debt has been growing steadily, more than doubling over the past 50 years. Even a decade after the global financial crisis and after a brief respite, the upward trend in global external debt has resumed. In advanced economies, the average total debt of households, businesses and governments now exceeds 250% of GDP. In emerging markets, the same average has grown more rapidly in recent years and is now around 150% of GDP[2].

The analysis of external debt evolution is a topical topic, essential for assessing the level of indebtedness both internationally and in the context of the Republic of Moldova. Over time, the Republic of Moldova has gone through multiple economic crises, which have had a direct impact on the country's external debt, leading to a rapid increase in the burden of outstanding debts. Currently, we are facing a similar situation, being deeply affected by the energy crisis and economic instability in the Republic of Moldova. In this context, it is imperative to establish clear priorities and effective solutions to address the debt problem.

The objectives of this research are to provide a conceptual approach to external debt, a detailed analysis of its evolution, as well as the identification of the causes and factors contributing to the increase in state indebtedness. Through this research, we aim to establish future trends, assess the impact of external debt on the country's economic stability, and formulate external debt management strategies aimed at minimizing and stopping the budget deficit and dependence on external loans.

[2] Global Debt Monitor [online]. [citat 20.11.2025]. Disponibil: 2024 Global Debt Monitor.pdf

Methodological basis of the analysis. General scientific research methods were used, including methods of systemic analysis and operational research, the method of comparisons and analogies, as well as formal-logical methods to move from the general to the specific.

The concept of external debt of the state and non-payment of debts. It is essential to emphasize that gross external debt is defined as the sum of current, unconditional obligations, in the form of principal and interest, that residents of a country have towards non-residents, obligations that require payment in the future. In order for a nation's debts to be considered external, they must be owed to non-residents, and the property of the resident is usually determined by the center of his economic interest.

Gross external debt is calculated as the sum of debts in the public and private sectors. The main causes of the accumulation of external debt include the development and liberalization of international trade, the state of the global economy, including the stage of the production cycle and fluctuations in world prices for energy resources and other components of production, as well as the macroeconomic situation. The most significant reason remains the inequality in the level of socio-economic and political development between the countries of the world. Developed countries, often exporters of energy resources or issuers of currencies with international circulation, have historically been in a more favorable position than emerging market countries and economies in transition. Poor developing countries lack sufficient domestic resources and cannot attract external funds due to already accumulated debts, which often leads to insolvency, accompanied by a precarious humanitarian and social situation.

An external debt crisis or insolvency refers to a situation in which states refuse to meet their debts or officially recognize that they cannot manage their own financial commitments. The starting point of the modern external debt crisis is considered to be August 1982, when the declared insolvency of Mexico was quickly followed by Brazil, Chile and Argentina. It was then realized that the bankruptcy of just three developing countries could generate a domino effect, threatening even the largest American financial institutions. To date, a continuous trend of increasing foreign debt of nations has been observed.

According to Figure 1, global debt reached $251 trillion in 2024, up slightly from 2023 in nominal terms. As a share of GDP, global debt – which peaked at 258% of GDP in 2020 – has almost completely stabilized at just above 235%, still higher than the pre-COVID level of 230% of GDP.

Global private debt exceeded $150 trillion in 2024. As a share of GDP, it fell by 2.8 percentage points to 143% of GDP, back to its 2019 level. Global household and non-financial corporate debt fell to 54% and 90% of GDP, respectively.

Private debt fell in both advanced and low-income developing economies and remained constant in emerging market economies (excluding China).

Private debt fell sharply in the United States by 6 percentage points of GDP, while it rose in China by 6.5 percentage points of GDP in 2024.

Global public debt rose to $98 trillion in the same year. As a share of GDP, it resumed an upward trend, increasing by 2 percentage points to 94% of GDP. On average, the public debt-to-GDP ratio increased in emerging and developing economies, while it decreased in advanced economies.

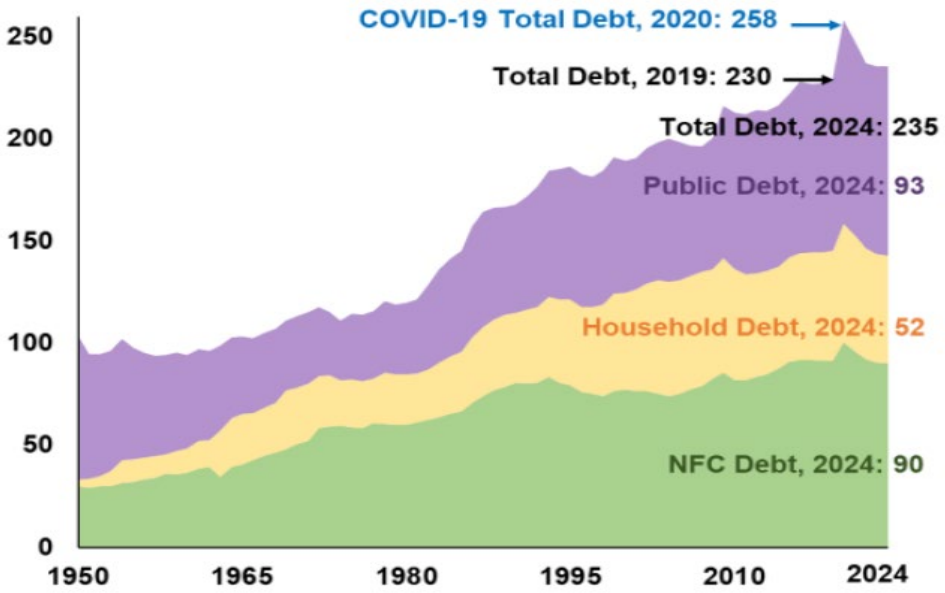

Figure 1. Diagram of the evolution of the components of global external debt.
Source: Global Debt Monitor [online]. [cited 20.11.2025]. Available: 2024 Global Debt Monitor.pdf

According to available data, the most significant turning points in the 21st century occurred during the global financial crisis of 2007-2008 and in 2020. In 2009, the level of external debt increased by 20 percentage points compared to 2007, and in 2024, external debt reached a level of 235% of global GDP, registering a decrease of 2%, as a result of the decrease in debt. It is important to note that the dynamics of debt growth vary significantly from one country to another. The pandemic had a considerable impact on China's external debt, which contributed 26% to the global debt growth. Another significant player on the global economic stage is the United States, the country with the highest level of external debt in the world.

The total volume of the United States' external debt in 2022 was $31.12 trillion, of which $6.82 trillion was intra-governmental debt, and the remaining $24.29 trillion was public debt. However, despite this, in the ranking of countries by the ratio of external debt to GDP in 2021, the United States is not in the top ten.

Thus, according to the IMF, in 2021, Venezuela occupied the first position in terms of the studied indicator, having an external debt to GDP of 304%, reaching $160 million. A significant deterioration in recent years was caused, among other things, by the sanctions imposed by US President Donald Trump on oil imports from Venezuela.

The second place is occupied by Japan, with a ratio of 256% of GDP, which has long maintained a leading position in this ranking. Japan's external debt stands at $8.7 trillion, a situation that is explained by the effects of World War II, the economic stagnation of the 1990s, and the collapse of the Japanese stock market in 1989, from which the country has never recovered. In third place is Sudan, with a ratio of 211% of GDP. The country's first default occurred in 1984, and its significant external debt has continued to accumulate. Most of the country's debts are owed to the World Bank, the IMF, and Western governments, but Sudan was recently accepted into the IMF's debt restructuring program, which will result in the cancellation of almost 90% of its debts.

Fourth and fifth place are occupied by Greece (210% of GDP) and Eritrea (176% of GDP). Sixth and seventh places are shared by Italy and Suriname, both with a similar external debt ratio of 133% of GDP. Eighth, ninth and tenth places are occupied by the economies of Lebanon (154%), Barbados (143%) and Maldives (140%).

The United States ranked 12th in 2021 in terms of external debt as a percentage of GDP, with a ratio of 137%. In China, this ratio is about 55% of GDP and has increased significantly from 41.5%

in 2014. Russia is considered one of the countries with the lowest level of external debt, which amounts to $ 480 billion (as of 01.01.2022) and accounts for about 21% of GDP, ranking 7-8th from the bottom of the list. The bulk of Russia's external debt comes from private loans. Compared to 2020, Russia's external debt increased by 2.8%, and the largest annual increase was observed in the banking sector, by 11%.

Global external debt during the crises of 2008 and 2020. As during the crisis of 2007-2008, developed countries recorded the highest debt growth rates. In 2020, China and developed countries were responsible for more than 90% of the increase in external debt, with total borrowing of $28 trillion. This was facilitated by low interest rates, stimulus measures adopted by central banks (including the purchase of government bonds), and a well-developed financial system. Developed countries are also facing a significant increase in budget deficits due to the global decline in income, caused, among other things, by the reduction in global production.

Turning to developing countries and those with economies in transition, in the pre-COVID period, external debt was characterized by the following aspects. First, the growth rate of external debt did not exceed the dynamics of GDP. Second, an increase in domestic debt was observed, accompanied by a reduction in the growth rate of external borrowing. Third, there was stability or negative dynamics of creditworthiness. Fourth, there has been a partial replacement of bank loans with long-term bonds. In 2020, emerging market countries (excluding China) accounted for an average of $1-1.2 trillion each, a relatively small proportion of total growth. However, developing countries, especially low-income countries, have seen high debt ratios due to the significant decline in nominal GDP. In emerging market countries, public debt has reached record levels, and in low-income countries it has risen to levels seen in the 2000s, when most countries in this group had to resort to debt relief initiatives.

A distinctive feature of the 2020 crisis was the sharp increase in private borrowing, against the background of the general dynamics of corporate debt growth: over the course of a decade, there was a 60% increase in advanced economies compared to 2008 levels, while in emerging economies the increase was only 20%. In 2020 alone, private sector debt increased by 14 percentage points, almost double the amount in 2009. During the pandemic, government institutions and central banks decided to provide financial assistance to private sector enterprises through concessional loans, in order to provide them with external resources. Until then, governments had sought to limit the extremely high degree of lending to the private sector.

Thus, the year 2020 highlighted the need to prevent a devastating socio-economic impact on the lives of the population, even by deliberately increasing the volume of external borrowing. Government institutions were forced to urgently support healthcare systems, which were unprepared for the global crisis, and private sector enterprises that suffered significant losses due to global lockdowns. Developed countries, especially exporting ones, also lost income due to the record low price of oil, which fell to $ 20 per barrel. All these factors, combined with the global economic recession, led to an increase in the budget deficit and, as a result, a record jump in external debt.

Risks associated with the high external public debt of countries. The accumulation of external debt is dangerous, as it turns into an unbearable burden on the economy of the debtor country, which leads to a decrease in its solvency and a direct impact on the economic and financial security of the nation. The state's international credit relations with other countries are based on solvency, which reflects not only the state's ability to pay its obligations, but also the degree of confidence of creditors in it.

To assess the level of solvency, a number of indicators are used, in addition to the debt service ratio and the ratio of total debt to GDP:

— the share of short-term loans in external debt;

— the ratio of official reserves to the volume of debt.

The size of these indicators allows for a direct assessment of the solvency of the debtor country, which determines the degree of its involvement in international capital markets. Well-known

international rating agencies, such as Fitch and Moody's, monitor the parameters of external debt, as well as the actions of governments in the field of international economic relations and monetary policy. Based on the analysis of the collected data, the agencies periodically make rating adjustments, downgrades or upgrades, depending on the state of the debtor state. Even a slight change in the ranking positions can influence the cost of lending and the attitude of creditors and investors around the world. Countries with a low rating are considered risky debtors, which reduces their ability to attract external resources and makes loans less profitable.

In this context, most states are trying to maintain a certain level of external debt, building their economic and social policies in such a way that there is no threat to the interests of the national economy and the country's position in the international financial system. In order to avoid falling into a "debt hole", the governments of borrowing countries must actively manage external debt. First, it is essential to use external loans to achieve planned socio-economic, scientific, technical, production and structural goals. Secondly, it is necessary to look for ways to reduce external debt and pay interest on time.

The danger exists for both developed and emerging market countries. In the case of developed countries, especially the United States, an increase in the share of public debt in the volume of external debt, which is financed by non-residents through the purchase of treasury bonds, directly affects the exchange rate of the national currency, the US dollar, and leads to a weakening of the currency in international trade.

External debt of the Republic of Moldova. According to data provided by the World Bank, external debt includes public loans, state-guaranteed loans, unsecured private loans, credits granted by the International Monetary Fund (IMF), as well as short-term obligations. According to the provisions of the Law of the Republic of Moldova "On State Debt and State Guarantees", external state debt is a fundamental component of the national debt, summing up the total of unfulfilled commitments and the related unfulfilled interests, assumed on behalf of the Republic of Moldova by the Government, through the Ministry of Finance, from non-resident creditors.

In order to assess the future trajectory of external debt, we will examine the dynamics of the main macroeconomic indicators in the period 2020–2023, which will allow us to outline the probable trends in the medium term and to deepen the analysis of the evolution of external debt. In Table 1, extracted from the International Accounts of the Republic of Moldova for the period 2019–2024, we have highlighted a relevant set of macroeconomic indicators that will constitute the main basis of this analysis.

Table 1. Evolution of macroeconomic indicators of the Republic of Moldovain the period 2019-2024 (million USD)

	2019	2020	2021	2022	2023	2024
Gross domestic product	11740	11530	13690	14510	16540	18200
Population	2664000	2635000	2596000	2529000	2458000	2381300
Export volume	2118,04	1944,42	2562,23	3701,42	3425,50	3014,47
Foreign exchange reserves	3059,63	3783,54	3901,88	4474,17	5453,14	5483,57
Gross external debt	7182,59	8088,26	8723,31	9574,99	10118,84	10213,33
including:						
Public administration	1717,96	2255,12	2606,58	3172,85	3751,24	4235,71
Central bank	180,51	141,11	92,39	63,98	56,58	44,95

Deposit-taking corporations excluding the central bank	295	302,7	325,03	486,67	494,4	453,56
Other sectors	3108,55	3490,85	3816,68	3978,57	3936,17	3665,72
Direct investment: intra-group lending	1880,57	1898,48	1882,63	1872,92	1880,45	1813,39

Source: *International Accounts of the Republic of Moldova. National Bank of Moldova: interactive database [online]. [cited 02 December 2025]. Available: www.bnm.md.*

According to Table 1, the evolution of the main selected macroeconomic indicators in the period 2019–2024 shows a mixed picture, with elements of resilience, but also persistent structural challenges for the economy of the Republic of Moldova.

The foreign exchange reserve (official international reserve assets) recorded a significant and continuous increase throughout the period: from approximately USD 3.06 billion in 2019 to approximately USD 5.48 billion in 2024. This represents a clear improvement in the intervention capacity of the National Bank of Moldova in the foreign exchange market and a solid buffer against external shocks (cumulative increase of almost 80%). The level of reserves remained relatively stable and even slightly increased in 2024 compared to 2023, providing a comfortable position (usually covering 4–6 months of imports, according to international standards).

Gross external debt has seen a moderate but steady increase from USD 7.18 billion in 2019 to USD 10.21 billion in 2024 (an increase of 42%). The public component (general government) was the main driver of this expansion (from USD 1.72 billion to USD 4.24 billion), reflecting concessional external loans (from international financial institutions) to finance the budget deficit, infrastructure projects and support in times of crisis (energy, refugees, pandemic). Private debt (other sectors + intergroup + banks) remained relatively stable or even decreased slightly in some segments towards the end of the period.

Export volumes have had a volatile trajectory and have recently shown signs of weakness, with strong growth in 2021–2022 (from USD 1.94 billion in 2020 to USD 3.70 billion in 2022), driven by the post-pandemic recovery and the rerouting of some trade flows. However, a downward correction was observed in 2023–2024 (USD 3.43 billion in 2023 and only USD 3.01 billion in 2024). This decline reflects competitiveness challenges, the impact of the war in the region on logistics chains, weaker demand in traditional markets, and possible effects of real appreciation of the national currency or high energy costs.

Table 2.Evolution of relative debt indicators during the period 2019-2024

Year	Share of external debt in GDP, %	Share of external debt per capita	Share of external debt in exports, %	Share of foreign exchange reserves in external debt, %
	$\boldsymbol{PDE_{PIB}\%}$	$\boldsymbol{PDE_P}$ **$**	$\boldsymbol{PDE_x}$ **%**	$\boldsymbol{PRVd_x}$ **%**
2019	**61,18**	**2696,2**		
2020	**70,15**	**3069,6**		
2021	**63,72**	**3360,3**		
2022	**65,99**	**3786,1**		
2023	**61,18**	**4116,7**		
2024				

Source*: compiled by the author according to data in table 1.*

The evolution of relative debt indicators in the period 2019–2024 reflects a mixed dynamic, marked by major external shocks (pandemic, war in Ukraine, energy crisis), but also by a gradual improvement in external debt sustainability on some key dimensions. The table highlights a general trend of improvement in the relative debt ratio starting with 2022–2023, in the context of nominal GDP growth and stabilization of debt accumulation. The external debt-to-GDP ratio indicator reached its highest value in 2020 (70.15%) – the combined effect of the decline in real GDP (-7% in 2020) and the increase in external loans to finance the budget deficit and anti-crisis measures. The subsequent significant decrease from 70.15% in 2020 → 63.72% in 2021 → 65.99% in 2022 → 61.18% in 2023 → 56.11% in 2024.

Thus, a clear downward trend is observed in recent years, reaching the lowest level in the analyzed period in 2024, indicating that nominal economic growth has partially offset the accumulation of gross external debt.

The level below 60% in 2024 places the Republic of Moldova in a relatively comfortable area for an emerging country with access to multilateral concessional financing (IMF, World Bank, EU). The risk of excessive indebtedness remains moderate, especially since a significant part of the external public debt is long-term and low-interest.

The share of external debt per capita (USD) shows a constant increase throughout the range: from 2,696 USD in 2019 → 4,290 USD in 2024 (cumulative increase of 59%).

The decrease in population (from 2.66 million in 2019 to 2.38 million in 2024) amplifies the individual burden, even if the total debt increases moderately.

Although the absolute value remains relatively small compared to countries in the region (below 5,000 USD/capita), the rapid increase against the background of emigration and demographic decline represents a long-term structural vulnerability, especially in the context of the need for investments in infrastructure and public services.

Another indicator is the share of external debt in the volume of exports (%) which shows a large and volatile variation. The peak of this indicator was reached in 2020 (416%) as a result of weak exports and increasing debt. In 2022, the value of this indicator was (259%) characterized by stronger exports.

Thus, we can see that the level remains very high (over 300% in most years), which indicates a pronounced dependence on external financing to balance the balance of payments.

This indicator shows the greatest external vulnerability. The repayment capacity through exports remains limited, the economy being dependent on remittances, external assistance and loans to cover the structural current account deficit (frequently 10–25% of GDP).

The share of foreign exchange reserves in external debt (%) shows a notable increase: from 42.6% in 2019 → 53.7–53.9% in 2023–2024.

Thus, the table shows that the level of this indicator has exceeded 50% in recent years, reflecting the accumulation of foreign exchange reserves (from 3 billion USD in 2019 to over 5.4 billion USD in 2024).

We can deduce a clear improvement in shock capacity. Reserves cover more than half of gross external debt, providing a solid buffer against currency risks, energy price shocks or sudden capital withdrawal. This is one of the most positive developments in the table.

Overall, this development suggests an economy that is resilient to shocks, but which still requires external support and structural reforms to reduce long-term vulnerabilities.

CONCLUSIONS

Recommendations of international financial organizations for addressing the problem of countries' external debt. International financial organizations and structures, such as the IMF, the World Bank, and the World Economic Forum, recommend debt restructuring, promoting sustainable growth, fiscal consolidation, and accelerating inflation to combat the steady growth of external debt,

which, however, should be used with caution. The most fundamental recommendation is the creation of a unified, understandable, and transparent database on the state of the economy of debtor countries for a competent assessment of credit risks. As for examples of external debt settlement, Russia stands out, given that it managed to reduce its external public debt by five times at the beginning of the 21st century, which allows it to remain a country with one of the lowest levels of indebtedness in the world today.

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THE RELATIONSHIP BETWEEN FINANCIAL PLANNING AT THE MACRO AND MICRO LEVELS

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Abstract: *Financial planning is the foundation upon which sustainable economic growth and development are built, and this foundation must be strong at both the global (macro) and local (micro) levels. At the macro level, the state acts as the architect, creating budget and tax policies, managing public debt, and the exchange rate. These decisions shape the overall economic climate, influencing stability and growth rates. Macroeconomic indicators are a compass, pointing the direction for all market participants: businesses and households. At the micro level, every economic agent, whether a company or a family, builds their financial plan based on this macroeconomic map. They consider tax realities, the availability of financial resources, and overall economic trends. Investment decisions, such as buying stocks or real estate, often depend on the macroeconomic winds. Expectations of economic growth or decline can be a decisive factor in decisions to invest or withdraw funds. When financial planning at both levels works harmoniously, macroeconomic growth becomes the foundation for stability and development at the micro level, creating a healthy and prosperous economic ecosystem. Thus, macro- and microfinancial planning are two sides of the same coin, inextricably linked and mutually supportive. Prosperity on one level inevitably leads to stability and growth on the other, improving the overall economic well-being of the country. Understanding this relationship is key to effective financial management for both government and business.*

Key words*: financial planning, budget and tax policies, microeconomic decisions*

JEL Classification*: D04, G32, G38.*

INTRODUCTION

In the modern world, sustainable economic development has become a crucial global goal. This applies to both the national and microeconomic levels (businesses, organizations, and households). Given the vast number of factors currently destabilizing the economy, it's important to identify those that can foster economic development. We believe one such factor is sound financial planning, at both the macro and micro levels.

MAIN PART

At the national level, financial planning manifests itself primarily in the drafting and approval of financial plans such as the state budget, the state social insurance budget, and the mandatory health insurance funds. These financial plans influence not only the financial activities of the entire budgetary sector but also the entire Republic of Moldova. These financial plans directly influence budgetary, tax, and monetary policies. They also indirectly impact the exchange rate, which in turn affects many economic agents engaged in foreign trade. Aspects of public debt management, which are also reflected in the state budget law, influence the inflow of foreign investment and overall financial stability.

Investment funds are also included annually in the state's financial plans. Public investment in infrastructure, education, and healthcare, as well as the system of budgetary subsidies for specific

sectors (in the Republic of Moldova, the Agricultural Sector Subsidy Fund), can stimulate economic growth, which, in turn, has a significant impact on financial planning at the micro level.

Financial planning at the level of economic agents is largely influenced by macroeconomic regulation. At the micro level, companies must develop their financial plans based on macroeconomic conditions to avoid unexpected expenses and force majeure. They are primarily influenced by changes in the state's tax policy, as the tax burden directly impacts the financial position of any economic agent. However, other aspects of the state's financial policy can also have a significant impact on both the operations of enterprises and their development.

The dynamics of financial planning at the level of the entire economy (macro) and its individual elements (micro) are closely intertwined and manifest themselves in several aspects.

1. Two-way influence: Macroeconomic trends, such as growth rates or tax policy, directly determine the financial position and investment decisions of businesses and individuals. In turn, the combination of these microeconomic decisions shapes the macroeconomic picture. For example, rapid economic growth increases incomes, stimulating demand and investment, while tax increases can have the opposite effect.

2. Growth Catalysts: Government financial injections and credit programs aimed at supporting small and medium-sized businesses act as catalysts for overall economic growth.

3. Managing Uncertainty: Changes in the macroeconomic environment, whether financial crises or policy shifts, generate uncertainty at the micro level, forcing companies and households to quickly adjust their financial plans.

4. Distribution Function: Financial institutions such as banks perform the vital function of redistributing resources by channeling funds from one participant to another, which has a significant impact on the economic activity of the country.

5. Increased efficiency: Modern analytical tools allow for a more in-depth study of financial flows and potential risks at both the macro and micro levels, which facilitates more informed and effective financial decisions.

In today's environment, the role and importance of financial planning at enterprises is growing. This is due to a number of factors, including the key objectives that financial planning at an enterprise is designed to address (see Figure 1).

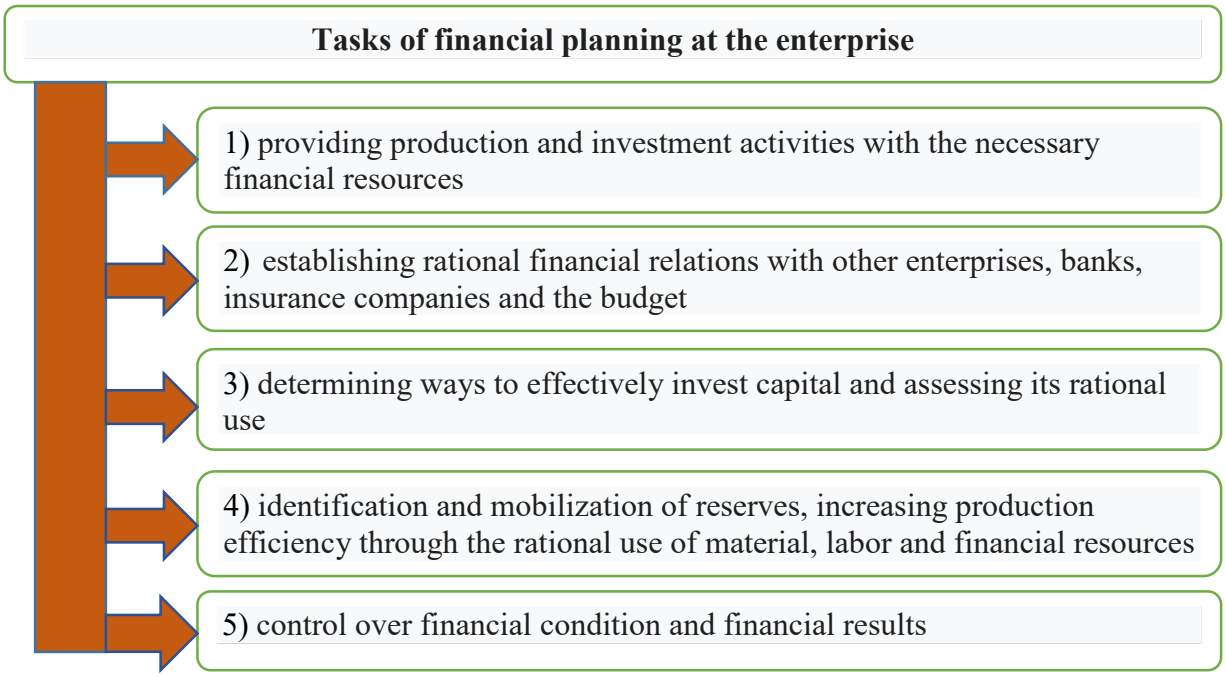

Figure 1. Financial planning objectives at the enterprise

Source: created by the author based on [1., p. 293]

The importance of financial planning also lies in the fact that it makes it possible to determine the viability of an enterprise in a competitive environment and is a tool for obtaining financial support from external investors.

In a market economy, a company plans its own operations. Therefore, the manager's financial responsibility for its financial performance increases significantly. Therefore, the importance of strategic, current and operational financial planning has increased to ensure a stable financial position and increase the profitability of the enterprise. Financial planning is necessary for the financial support of economic activity, achieving high efficiency of economic activity, creating conditions that would ensure the solvency and financial stability of the enterprise.

However, along with the factors that emphasize the importance of competent financial planning at an enterprise in modern economic conditions, there are other factors that limit its application.

1) A high degree of market uncertainty associated with ongoing global changes in all areas of public life.

2) A shortage of qualified personnel familiar with modern financial planning methods.

3) Insufficient experience in independently setting goals, planning actions, and raising resources among some companies.

4) Organizational factors (quality of the management system, effectiveness of the organizational structure, development of the control and reporting system).

5) Strategic factors, such as the presence of clearly formulated business development goals, the presence of a long-term strategy and the ability to adapt, as well as the quality of environmental analysis and forecasting.

6) The difficulty of forecasting changes and impacts of factors external to the enterprise, but which have a significant impact on its economic activity: market conditions, the level of national and international competition, changes in laws and regulations, fluctuations in raw material and energy prices, credit conditions, the state of consumer demand, etc.

External factors, in our view, are the most important limitation to the application and effectiveness of financial planning at the micro level. But the problem also exists at the macro level. Due to the openness of our country's economy and its exposure to external global factors, a similar challenge exists at the macro level, namely the complexity of planning and forecasting. As an example of the difficulty of forecasting such an important indicator as our country's GDP, we provide the following data. Recently, the European Bank for Reconstruction and Development (EBRD) again downgraded its 2025 GDP growth forecast for Moldova, this time to 1.5%. This is reflected in its updated Regional Economic Prospects. In May, the EBRD had already lowered its GDP growth forecast for the country from 2% to 1.8%. According to the IMF's still-unrevised estimate, Moldova's economy could grow by 0.6% in 2025. The European Commission expects growth of 0.9%, and the EBRD, 1.8%. In July, the Moldovan Ministry of Economy downgraded its forecast for economic growth this year to 1.3% from 2% [3].

The World Bank's October Global Economic Prospects report slightly improved its forecast for Moldova, raising expected growth in 2025 from the 0.9% of GDP projected in June to 1.5%. The World Bank's June forecast for Moldova showed a sharp decline—GDP growth in 2025 was cut from 3.9% to 0.9%. [4]. As can be seen from the information provided, even a single indicator forecast by several different institutions can differ greatly, which creates significant difficulties in financial planning at both the macro and micro levels.

Another important factor that significantly influences financial planning at the micro level is the clarity and predictability of the state's tax policy. Moldova also faces certain challenges in this area. First and foremost, amendments and additions to legislation are introduced during the tax year, which is an extremely negative practice that complicates both the activities of economic agents and the effectiveness of financial planning. For example, in 2025, amendments were adopted by Law 187

of July 10, 2025, which also entered into force partially on July 18, 2025, and partially on other dates specified in the law. [5.]

CONCLUSION

Thus, it can be concluded that financial planning at the macro and micro levels is interconnected and interdependent. Sustainable development at one level promotes stability and growth at the other, which ultimately leads to an improvement in the overall economic situation. Understanding this relationship allows governments, individuals, and companies to plan their finances more effectively. At the same time, in our opinion, the determining factor in the effectiveness of financial planning at the micro level is the predictability of both the macroeconomic situation in the country and the world (which is quite difficult to predict) and the predictability of the state’s financial policy. Understanding by government agencies and their employees of the extent to which their actions impact the activities of economic agents will make it possible to create a more predictable system.

For example, in the area of tax policy, the introduction of a measure such as a ban on amendments to the Tax Code during the tax year, as well as the publication of amendments to the law at least three to four months before their entry into force, will allow economic agents to plan their financial activities more calmly. This has been talked about for decades, but the situation still hasn't changed. At the same time, the effectiveness of financial planning at the level of economic entities has an impact on business development, which is ultimately interconnected through the tax system with public finance planning and the level of well-being of the country as a whole.

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TECHNOLOGICAL INNOVATION AS A PILLAR OF FINANCIAL SUSTAINABILITY IN THE INSURANCE SECTOR

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Abstract:*This study explores the role of technological innovations as a pillar of financial sustainability in the insurance sector, highlighting how emerging technologies – artificial intelligence (AI), blockchain, the Internet of Things (IoT), and Big Data analytics – are transforming traditional business models. The research emphasizes the need for insurance companies to adapt to global economic and climate challenges, reconfiguring their financial and operational strategies to become more competitive, efficient, and customer-oriented.The methodology used consists of a conceptual and exploratory analysis of the specialist literature, complemented by relevant case studies illustrating the application of disruptive technologies in the insurance sector. The study examines AI's contribution to the personalization of insurance products and predictive risk assessment, the use of blockchain to enhance transparency and prevent fraud, as well as the application of IoT to real-time monitoring of user behavior or insured assets.The research findings show that adopting these technologies can significantly improve financial sustainability by optimizing processes, reducing operational costs, and increasing customer satisfaction. However, the integration of technological innovations poses significant challenges, such as high initial costs, cyber risks associated with digitalization, and compliance with strict regulations.The conclusions highlight that the long-term success of the insurance sector depends on the ability to strategically adopt disruptive technologies, balancing innovation with financial sustainability. The study contributes to the academic debate on digital transformation, emphasizing the importance of financial inclusion and adaptability in a continuously changing economic environment.*

Keywords:*Financial sustainability, Technological innovation, Artificial intelligence, Blockchain, Digital insurance, IoT*

JEL Classification: *G22, O33, M15, Q01*

INTRODUCTION

In a world of rapid and complex change, the insurance sector faces significant challenges arising from both global economic dynamics and the climate crisis. In this context, technological innovations have become an essential tool to meet these challenges, providing Emerging technologies like artificial intelligence (AI), blockchain, the Internet of Things (IoT), and Big Data analytics are reshaping traditional business models, greatly enhancing the operational efficiency and financial sustainability of insurance companies. In the current age of rapid technological advancement, artificial intelligence has become a vital resource for transforming the insurance industry. By

harnessing AI-powered technologies, insurers can analyze data with greater accuracy, deliver enhanced customer service, and conduct more precise risk evaluations.

Advanced machine learning models enable companies to design customized insurance solutions that address individual needs, ultimately boosting both efficiency and profitability. As a result, insurance policies can better accommodate the specific preferences and risk profiles of clients, fostering greater satisfaction. For example, wearables that track healthy lifestyle choices can provide data allowing insurers to offer health insurance discounts to active individuals. Similarly, telematics devices used to monitor safe driving habits may lead to lower car insurance premiums for careful drivers. This level of personalization not only strengthens customer loyalty but also draws in new market segments seeking policies that align with their lifestyles.

Additionally, one of AI's most powerful impacts in the insurance sector lies in enhancing risk evaluation processes. Leveraging predictive analytics driven by machine learning, insurers can analyze historical patterns and behavioral data to create highly accurate risk forecasts. This approach significantly reduces uncertainty and supports both financial stability and efficient operations. Such capabilities are especially critical in today's climate of unpredictable challenges, such as economic fluctuations and the growing complexity of risks linked to climate change. In health insurance, predictive models based on AI can identify risks of serious conditions in patients, allowing companies to provide preventive advice or adjust policies according to identified risks. In home insurance, AI can analyze climate data and natural disaster history to assess the likelihood of events such as floods or fires, which helps to determine the correct policy costs. Another key aspect of using AI in insurance is fraud detection and prevention. Fraud is one of the biggest challenges for insurance companies, generating significant financial losses every year. Artificial intelligence, through the ability to quickly and accurately analyze large volumes of data, plays a crucial role in identifying anomalies and suspicious behaviors. AI-based systems can analyze claims for compensation to identify unusual patterns that could indicate a fraud attempt.

This significantly reduces the waiting time for customers, improving their experience and overall efficiency of the company. Chatbots not only take on the repetitive and time-consuming tasks of insurance agents, but they can also learn from previous interactions, becoming more effective as they are used. For example, if a customer frequently asks about the policy renewal process, the chatbot may subsequently provide automatic notifications near the expiration date of the policy, thus helping to improve customer retention. As technology evolves, AI will continue to redefine how insurance companies operate, providing innovative solutions for a more sustainable, transparent and customer-focused sector. In an ever-changing world, the adaptability and adoption of these technologies are becoming not only competitive advantages, but also an essential condition for survival. Blockchain technology has become one of the most important innovations in recent years, redefining how data is secured and managed in various sectors, including insurance. By its nature, the blockchain functions as a distributed ledger that records all transactions in a transparent, immutable and secure manner. In the insurance sector, managing a large amount of sensitive data - personal data, contracts, claims history - requires a high level of security and transparency. The blockchain offers exactly these advantages through its decentralized structure. In insurance, the use of the blockchain provides access to all parties involved - insurance companies, customers, intermediaries, regulators - to the same up-to-date and verifiable information.

This transparency reduces misunderstandings, strengthens trust between the parties and provides a solid basis for the swift resolution of disputes. Fraud is one of the biggest challenges in the insurance sector, causing significant financial losses. Blockchain addresses this problem through its ability to create a safe and transparent environment for handling claims. Another major advantage of blockchain is the use of smart contracts (smart contracts). These are programmable scripts that run automatically when certain predefined conditions are met. In the insurance sector, smart contracts can be used to deal quickly with claims, eliminating the need for intermediaries to get involved and thus reducing operational costs. For example, a travel insurance policy based on a smart contract can automatically compensate a customer in case of flight cancellation. The system automatically checks

flight information through an external (oracol) data source, and if the flight is indeed cancelled, the compensation amount is immediately transferred to the customer's account without the need for manual intervention. Amid the rapid evolution of technology, artificial intelligence is revolutionizing the insurance industry by enhancing its efficiency and customer-centric approach. By adopting AI-driven systems, insurance companies can process data more effectively, improve service quality, and refine risk assessment methods. Machine learning tools allow for the development of tailored insurance solutions that address individual customer requirements, ensuring better alignment with their needs and increasing both productivity and profitability. Consequently, insurers can craft policies that reflect the unique preferences and risk profiles of customers, driving higher satisfaction levels. For instance, data from wearable devices that monitor healthy lifestyle habits can enable insurers to offer discounts on health insurance to active individuals. Similarly, telematics technology used to assess driving behaviors allows careful drivers to benefit from lower car insurance rates. This personalized approach not only boosts customer loyalty but also captures the interest of new consumer groups seeking policies that fit their lifestyles. Moreover, one of AI's most significant contributions to the sector is its capacity to revolutionize risk evaluation. With predictive analytics supported by machine learning, insurers can study historical trends and behavioral data to generate highly accurate risk projections. This precise forecasting helps to minimize uncertainty while reinforcing financial resilience and operational efficiency.

These innovations are particularly valuable in the face of increasingly complex challenges, such as economic instability and the unpredictable impacts of climate change, which demand sophisticated strategies for managing risk. In an ever-changing economic and technological environment, blockchain is a solid foundation for a safer and more transparent future in the insurance sector. Through connected smart devices, IoT enables real-time data collection, providing insurance companies with essential information about user behavior and the status of insured assets.

This technology not only revolutionises the way risks are assessed, but also contributes to the personalisation of insurance products, thereby improving customer experience and the operational efficiency of companies. IoT is based on a network of connected devices that continuously collect and transmit data. In the insurance sector, this technology plays a crucial role in asset monitoring and risk assessment. Sensors installed in homes, vehicles or wearables (weearables) gather information about usage, environmental conditions or behavior, giving insurers a clear and detailed picture of the risks associated with each customer. For example, in the case of housing, intelligent sensors can detect water leaks, temperature variations or the presence of smoke. These data allow insurance companies to intervene preventively, reducing the risk of major damage and, implicitly, the costs associated with compensation. In addition, customers benefit from an additional level of protection, with the possibility to receive real-time notifications about possible problems in their homes. One of the biggest advantages of using IoT in the insurance sector is the ability to customize policies according to the data collected. Unlike the traditional approach, in which insurance premiums are calculated based on general estimates, IoT allows setting tariffs adapted to the real behavior of users. This model not only stimulates responsible behavior, but also creates a fairer relationship between insurers and customers. A remarkable example is the use of telematics in motor insurance. Telematics monitors the drivers' driving style - speed, sudden braking, accelerations and distances travelled - and transmits this information to insurance companies. Based on this data, prudent drivers can benefit from significant discounts on insurance premiums, while those who adopt risky behavior can pay more.

This system not only rewards responsibility, but also helps reduce accidents, promoting safety on the roads. IoT enables insurance companies to take a proactive approach to risk management. By constantly monitoring assets and user behaviour, insurers can identify potential problems before they become critical . In addition, customers who demonstrate healthy behavior can benefit from discounts on insurance policies, which creates a system of mutual benefits. Although IoT offers multiple benefits, its integration into the insurance sector is not without challenges. One of the main difficulties is the management of the huge amount of data collected. Insurance companies must prioritize investments in advanced technological

infrastructure to efficiently process and analyze the vast amount of data generated by IoT devices. However, one of the main challenges associated with IoT implementation is ensuring the protection of personal data, as this technology involves collecting highly sensitive customer information. Additionally, the high upfront costs of IoT deployment present a hurdle for both companies and consumers. Smart devices like sensors or telematics can be expensive, and their widespread adoption may require financial support or incentives from insurers to encourage usage.

The integration of IoT in the insurance sector plays a pivotal role in enhancing financial sustainability. By reducing operational expenses, streamlining processes, and preemptively mitigating significant damages, IoT enables insurers to allocate resources more effectively. This technology promotes a more transparent and fair relationship with customers, offering them personalized products and enhanced protection. The Internet of Things (IoT) is proving to be a game-changer for the insurance sector, enabling companies to harness real-time data to refine risk evaluations, customize policies, and prevent potential damages. By integrating these advancements, insurers not only enhance their efficiency and market competitiveness but also contribute to a more sustainable and adaptive economic environment. However, the effective adoption of IoT relies heavily on overcoming technical challenges and implementing robust data security frameworks. As technology continues to evolve, IoT is poised to become a fundamental component of the insurance landscape, providing cutting-edge solutions that meet shifting customer expectations and address the complexities of global markets. For those insurers ready to embrace change responsibly, IoT offers significant opportunities for growth and industry innovation. In parallel, Big Data analytics has equipped insurers with tools to better understand market dynamics and predict customer needs. By analyzing diverse data sources, such as social media activities, geolocation markers, and transaction histories, companies can create innovative products that align with current contexts and individual preferences. While these technologies offer clear advantages, implementing them comes with challenges. The substantial upfront investments required for acquiring and deploying these technological solutions pose a notable hurdle, particularly for smaller companies.

Despite these barriers, the potential for long-term benefits makes these innovations a worthwhile pursuit for forward-thinking businesses in the industry. Moreover, cyber risks are a major concern given the high volume of sensitive data processed. Another obstacle is compliance with strict financial and data protection regulations. Insurance companies must invest in solutions that comply with the legislation and ensure the transparency of processes without compromising data security. Compliance with legal regulations and ensuring process transparency, while maintaining robust data security, are critical when leveraging innovative technologies like the Internet of Things (IoT). IoT has revolutionized various industries, including the insurance sector, by offering forward-thinking solutions for risk mitigation, damage prevention, and cost optimization in the realm of home insurance. This case study examines the functioning of this technology, the processes it entails, and the economic benefits it delivers, supported by mathematical calculations that emphasize the financial advantages of preventative measures. IoT operates by deploying networks of intelligent sensors connected to the internet to continuously collect and evaluate data in real-time. A noteworthy recent innovation is the implementation of strategic sensor networks designed specifically to detect and address risky situations more effectively. These networks allow for rapid identification of potential hazards, streamline intervention processes, and integrate prevention with home security systems. This evolution is reshaping the relationship between homeowners, insurance providers, and service operators, creating a smarter and more proactive ecosystem focused on risk prevention as its cornerstone. In today's sophisticated housing infrastructure, sensors serve as vital tools for identifying potential threats. When strategically placed in vulnerable areas, they can detect irregularities before they escalate into severe problems. Temperature sensors, for example, play a crucial role in safeguarding against pipe freezing or monitoring overheating in critical areas.

They record and analyze sudden changes in temperature, which might indicate thermal instability, discomfort, or even impending danger. By acting swiftly on such data, these sensors

significantly reduce the likelihood of property damage and associated repair costs. This integration of sensor-based technologies is transforming the conventional approach to home insurance, positioning prevention and real-time monitoring as central elements of the model. Consequently, insurers benefit financially from fewer payouts due to prevented damages, while homeowners enjoy enhanced safety and reduced risks.

This shift toward a prevention-focused paradigm not only optimizes costs but also fosters a stronger, more transparent partnership between all parties involved. For example, a sudden drop in temperature can signal the risk of water freezing in pipes, and early intervention can avoid compromising the water supply system. Fire alarm is a vital function of sensors specialized in smoke detection. They are able to provide immediate alerts when they identify the presence of particles characteristic of a potential fire. By transmitting these alerts in real time, the risk of fire expansion is greatly reduced, protecting lives and properties effectively. Sensor-based systems help conserve resources by detecting water losses, optimizing energy consumption by monitoring temperature, and protecting the environment by preventing major damage. In addition, the expansion of these technologies to more advanced solutions, such as the use of artificial intelligence for more accurate risk predictions, promises to further strengthen this preventive model. This technology model not only redefines industry standards, but also opens a bright path to a future where prevention replaces reaction and our homes become the ultimate expression of innovation and protection.The implementation of such an IoT system involves several stages:

COLLECTING DATA:

- Sensors collect data continuously, such as humidity level, temperature, or the presence of smoke. Each sensor generates a time series data stream (head D open paren t close paren), where:
- Open paren t close paren head D is the measured value of the sensor at time t.
- The data is transmitted in real time to a central server.

DATA ANALYSIS

The data collected is analyzed using machine learning algorithms to detect anomalies. An example of an algorithm used is Linear Regression to detect abnormal variations in humidity. If H-head open paren t close paren represents the humidity level at the time t, and the model predicts cap H prime , open paren t close paren based on normal conditions, then an anomaly is detected if:

$$| H(t) - H'(t) | > \Delta H \quad (1)$$

where:

- ΔH this gap pragule considered normal.

PREVENTION OF DAMAGE:

In case of detection of an anomaly, an alert is sent to the owner and insurer. For example, if a water leak is detected, the owner is notified instantly, and a plumber can be sent before the water causes extensive damage.

FINANCIAL CALCULATION FOR DAMAGE PREVENTION:

We assume that an undetected water leak causes average damage of EUR 5,000 (repair of walls, floor and furniture). The use of an IoT sensor, which costs about EUR 50 per year, can prevent this damage completely.

The total economy is:

$$E = C_{daună} - C_{IoT} \quad (2)$$

where:

- $C_{daună}$ it's the cost of the damage (5.000 EUR).
- C_{IoT} it's the cost of the sensor (50 EUR).

consequently:

$$E = 5.000 - 50 = 4.950 \text{ EUR}$$

If the program is implemented for 10,000 homes, the total savings are:

$$E_{total} = E \cdot N = 4.950 \cdot 10.000 = 49.500.000 \text{ EUR}$$

REDUCTION OF COMPENSATION COSTS:

With IoT prevention, insurance companies are significantly reducing the costs associated with compensation. Studies show that IoT adoption can reduce damage by up to 40%.

EXAMPLE OF REDUCTION OF COMPENSATION

We assume that an insurance company pays annual total damage of EUR 20 million for housing. If IoT implementation reduces this damage by 40%, savings are:

$$E_{IoT} = R \cdot C_{total} \quad (3)$$

where:

- R it's the discount rate (0,4).
- C_{total} the total cost of compensation (20 million EUR).

consequently:

$$E_{IoT} = 0,4 \cdot 20.000.000 = 8.000.000 \text{ EUR}$$

By integrating smart sensors that monitor and detect risks in real time, customers not only benefit from a higher level of protection, but become active partners in a safe and transparent ecosystem. Homeowners appreciate the proactivity of insurance companies, which, through the use of IoT, go beyond the traditional role of policy and compensation providers, becoming genuine partners in risk prevention. This profound change redefines industry standards and helps improve the user experience. IoT sensors installed in homes allow continuous monitoring of risk conditions such as water leaks, temperature variations or the presence of smoke. These features reduce the risk that unforeseen events will cause severe damage to homes or property. For customers, this prevention-based approach creates a sense of security and demonstrates the active involvement of insurance companies in their protection. IoT technology contributes significantly to the creation of personalized products, tailored to the behavior and needs of each customer. By collecting and analyzing data in real time, insurance companies can offer discounts or premium adjustments based on responsible customer behaviors.

Wearable devices (wearables) used by customers to monitor physical activity and health condition allow adjustment of health policies, offering discounts to those who adopt an active lifestyle. In motor insurance, telematics collects data on the driving style of drivers, rewarding prudent behavior through significant reductions in insurance premiums. Through these personalization mechanisms, IoT not only stimulates responsible behavior, but also creates a fair relationship between insurers and customers, contributing to their loyalty.

CONCLUSIONS

The deployment of IoT technology in home insurance is a revolution in the way companies operate, transforming the traditional insurance model into a collaborative partnership based on prevention and transparency. The Internet of Things (IoT) plays a vital role in streamlining processes, reducing operational expenses, and significantly enhancing customer satisfaction. Studies and satisfaction indices have shown that the adoption of IoT fosters deeper trust and stronger relationships between customers and insurance providers, creating a win-win scenario for both sides. In a world where technological advancements are continuously shaping consumer expectations, IoT is emerging as an indispensable component of modern insurance practices. However, the successful adoption of

IoT depends on overcoming technical and financial barriers, alongside establishing robust regulations for safeguarding personal data. As the cost of implementing IoT technologies continues to decline and regulatory frameworks become more standardized, IoT is poised to solidify its position as a cornerstone of the insurance industry. By integrating cutting-edge technologies with economic efficiency and social responsibility, IoT allows for the creation of a more sustainable and customer-centric insurance ecosystem.

In conclusion, IoT is no longer just a technological innovation—it is a fundamental necessity for ensuring the sustainable growth of insurance companies. Amid a complex and ever-changing global economic landscape, IoT-driven preventive approaches provide an effective solution to boost customer satisfaction, lower operational costs, and secure long-term competitive advantages. By adopting IoT, insurers can seamlessly align advanced technology with economic and social progress, paving the way for a resilient and future-oriented industry.

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ECO-INSURANCE: DEVELOPMENT TRENDS AND MECHANISMS TO SUPPORT A GREEN ECONOMY

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Abstract: *Today, as environmental risks become increasingly tangible and natural resources increasingly vulnerable, the topic of eco-insurance is coming to the forefront. The world is gradually transitioning to a green economy model, where sustainable development is impossible without mechanisms that protect both business and the environment. Eco-insurance serves a dual function here: on the one hand, it helps mitigate the consequences of environmental disasters and accidents, and on the other, it encourages companies to implement more responsible and safe technologies. This article examines key trends in the formation and development of eco-insurance, analyzing international experience—from Europe to Asia—as well as the role of government and the insurance sector in creating a favorable environment for its implementation. Particular attention is paid to the connection between eco-insurance and the ESG approach and sustainable development goals. The results of the study demonstrate that eco-insurance has the potential to become more than just a financial in strument, but an important element in the transition to a new economic system that values environmental responsibility, transparency, and long-term sustainability. In writing this article, the goal was to examine the theoretical and practical aspects of eco-insurance as a tool for supporting a green economy and to offer recommendations for its development in the context of sustainable development. The development of an eco-insurance system not only helps minimize environmental and financial risks but also stimulates the economic transition to sustainable and resource-efficient production and consumption models.*

Keywords: *эко-страхование, устойчивое развитие, зелёная экономика, экологические риски, страхование ответственности*

JEL CLASSIFICATION: *G2, G22, G52*

INTRODUCTION

The modern world faces mounting environmental challenges, which are increasingly becoming not only a natural but also an economic problem. Climate change, ecosystem degradation, and the increasing number of man-made accidents and natural disasters directly impact the sustainability of national economies and the quality of life. These processes are forcing governments, businesses, and society to seek new mechanisms of interaction where the priority is not only profit but also responsibility to nature and future generations.

One such mechanism is eco-insurance—a tool that combines economic and environmental interests, enabling financial management of natural risks. Essentially, it is a form of insurance aimed at compensating for damage caused to the environment and encouraging businesses to implement more environmentally friendly technologies.

Interest in eco-insurance is rapidly growing worldwide. In the European Union, the United States, and Japan, it has already become part of national environmental policy. In the post-Soviet space, however, this sector is still in its infancy, and its potential is far from being realized. The relevance of this article stems from the need to rethink the insurance sector's role in supporting a green economy and determine how eco-insurance can become a tool for sustainable development. In this context, it is important not only to consider the economic effectiveness of insuring environmental

risks but also to understand how it influences the development of a business's environmental culture, the incentive system for enterprises, and consumer behavior.

Therefore, the purpose of this article is to identify the main trends in the development of eco-insurance and determine the mechanisms by which the insurance sector can support the transition to a sustainable, environmentally oriented economy.

Eco-insurance is a relatively new trend in insurance, emerging at the intersection of ecology, economics, and law. At its core, it is a system of insurance protection aimed at compensating for damage caused to the environment, as well as preventing and minimizing environmental risks. Unlike traditional insurance, which focuses on protecting property or life, eco-insurance addresses a broader area—the sustainability of natural and economic systems. The idea of environmental insurance arose in response to the growing impact of anthropogenic factors and the recognition that restoring natural resources requires not only time and effort, but also significant financial investment. In this regard, insurance is becoming a kind of economic instrument for environmental responsibility: it allows for the distribution of risks among economic participants, encouraging companies to act more responsibly and safely.

The primary function of eco-insurance is financial compensation for environmental damage. However, its preventative function is no less important: by assessing risks, insurance companies effectively encourage businesses to implement environmental standards and technologies that reduce the likelihood of accidents or pollution. Thus, the insurance market is gradually becoming a partner of the state in implementing sustainable development policies.

Structurally, there are several types of eco-insurance. The most common include:

- insurance of corporate civil liability for damage to the environment;
- insurance of environmental risks associated with industrial activities;
- insurance of natural objects and resources against the consequences of natural disasters;
- insurance of environmental projects—initiatives aimed at restoring ecosystems and implementing "green" technologies.

International practice shows that this sector is developing toward integrating environmental criteria into financial decisions. For example, when determining insurance rates, ESG indicators—a company's environmental, social, and governance responsibilities—are taken into account. This approach fosters a new culture of interaction between business, government, and society, where insurance becomes not only a means of protection but also a tool for developing a sustainable economy.

INTERNATIONAL EXPERIENCE IN DEVELOPING ECO-INSURANCE

Eco-insurance development varies widely across countries, largely due to the level of economic development, the strictness of environmental legislation, and the degree of government involvement in regulating the insurance market. However, the overall trend remains consistent: insurance is increasingly viewed not simply as a financial instrument, but as an element of environmental policy and sustainable development.

In the European Union, environmental insurance is closely linked to the "polluter pays" principle. Many EU countries have introduced mandatory environmental liability insurance for high-risk enterprises, particularly in the chemical, oil refining, and energy industries. This regulation encourages companies not only to take out policies but also to reduce their own environmental risks through production modernization and the implementation of clean technologies.

In the United States, eco-insurance developed earlier than in many other countries. Here, it is closely linked to the environmental damage compensation system under environmental legislation. Particular attention is paid to insuring the risks of land and groundwater pollution, as well as liability for the use of hazardous substances. The American model is more focused on market mechanisms and the development of specialized insurance products.

China offers an interesting example, where environmental insurance is actively supported by the state as part of its commitment to a "green transformation" of the economy. In some regions, pilot

projects for mandatory environmental insurance have been implemented for companies operating with elevated environmental risks. The Chinese example demonstrates that the development of environmental insurance is possible even in conditions of rapid industrial growth if it is integrated into a government strategy.

Thus, international experience confirms that effective environmental insurance is developed only through close collaboration between the state, the insurance market, and businesses. It becomes more than just a financial product, but part of an overall system of environmental safety and sustainable development.

When discussing the global environmental insurance market, one important point should be made immediately: in statistics, it is usually "hidden" within broader segments—primarily environmental liability insurance and certain types of insurance against climate and catastrophic risks. Therefore, estimates of market size vary significantly depending on what is included in the calculations.

1. Market Size and Dynamics

According to a number of analytical companies, the global environmental liability insurance market has already emerged as a steadily growing segment.

- According to one major analytical review, the environmental liability insurance market was valued at $26.2 billion in 2023 and is projected to reach $72.1 billion by 2031, with a CAGR of approximately 11.7% from 2024 to 2031. [9]
- Another report gives a more conservative estimate: approximately $4.2 billion in 2024, with a forecast of $8.1 billion by 2033 and a CAGR of approximately 7.8%. [8]
- There are also intermediate estimates: a number of studies cite a value of approximately $5–5.5 billion for the environmental liability segment in 2024. [8]

The spread in figures is primarily due to different methodologies: some cover only narrow pollution liability insurance, while others offer a broader range of products (pollution legal liability, insurance for environmentally sensitive assets, specialized energy programs, etc.).

Several consistent trends can be identified in terms of regional structure:

- North America (primarily the United States) is a key center for environmental insurance development. It has well-developed environmental legislation, a robust liability insurance market, and many international programs are built with an "anchor" in the United States and subsequently expanded to other regions. [10]
- Europe traditionally relies on EU directives on environmental liability and the "polluter pays" principle, which supports demand for insurance solutions related to environmental requirements and sustainable development projects. [4]
- The Asia-Pacific region is showing the highest growth rates: here, rapid industrial growth is combined with increased environmental and climate risks and a gradual tightening of regulation (especially in China and several Southeast Asian countries). Many studies cite the Asia-Pacific region as the fastest-growing segment of the overall liability insurance market, including environmental insurance. [8]

Precise percentage shares of eco-insurance by region are scarce in publicly available sources, but indirect estimates suggest that North America and Europe account for the bulk of premiums, while Asia is driving the bulk of growth.

The growth of the eco-insurance market cannot be considered separately from the growth of climate and natural risks.

- According to Swiss Re, global insured losses from natural catastrophes will reach $80 billion in the first half of 2025 alone, almost double the average over the past 10 years. [6]
- The European Central Bank, international insurer associations, and academic research emphasize that climate change is increasing pressure on the insurance sector and making environmental and climate risk management systemically important. [7]

Against this backdrop:

• Demand is growing for specialized environmental liability programs, including coverage for historical pollution, risks in M&A transactions, and bank financing for "green" and "transition" projects; [10]

• Alternative instruments, such as cat bonds and other insurance-linked securities, are actively developing, allowing some climate and catastrophic risks to be transferred to the capital market: in 2025, cat bond issuance reached a record $18.1 billion. [7]

This effectively creates a broader framework for "climate and environmental insurance," in which classic eco-insurance is becoming a key element.

Statistical reports and analytics highlight several persistent factors supporting the growth of the global eco-insurance market: [8]

1. Tightening environmental legislation and liability

New forms of civil and administrative liability for environmental damage are forcing businesses to seek insurance coverage. This is particularly noticeable in the EU, US, and China. [5]

2. Growing frequency and severity of climate events

The increase in the volume of insurance payments for catastrophic risks is stimulating demand for additional instruments to cover environmental and related financial risks. [6]

3. The ESG Agenda and Pressure from Investors and Creditors

Large companies are increasingly considering environmental insurance as an element of their ESG strategy, influencing access to capital and financing terms. This is particularly noticeable in M&A transactions and project finance.

4. Development of insurance expertise and products

The growing number of players and accumulated experience in environmental risks are expanding the range of coverage and increasing the accessibility of such products for medium-sized businesses.

Despite all the positive dynamics, statistics and analytics highlight a number of serious problems:

• Risk of insufficient return on investment in the face of increasing catastrophic losses and the emergence of new pollutants (PFAS, micro- and nanoplastics, new chemicals).

• Heterogeneity of regulation: environmental liability and insurance requirements vary significantly across countries, complicating the development of global programs. [5]

• A widening "protection gap"—the gap between the economic damage from climate-related and environmental events and the portion of that damage that is actually insured.

A number of publications have also voiced harsher assessments: representatives of major insurers warn that, with further growth of climate risks without a systemic transition to a low-carbon economy, some assets and territories may become effectively "uninsurable." [3]

Problems and Barriers to the Development of Environmental Insurance in Post-Soviet Countries

Despite the growing relevance of environmental risks, environmental insurance remains a relatively underdeveloped area in most post-Soviet countries. It exists fragmented rather than systematically, and is most often limited to isolated initiatives or pilot projects. The reasons for this are complex and related to economic, institutional, and cultural factors. [2]

One of the key barriers is the underdeveloped regulatory framework. Many countries lack a clear system of mandatory environmental insurance, and environmental liability legislation is often declaratory. As a result, companies lack a real incentive to implement insurance mechanisms and develop a long-term environmental strategy.

The low level of environmental awareness in business also remains a serious problem. Environmental liability is often viewed as an additional burden rather than as an element of strategic risk management. This leads to perfunctory compliance with requirements and weak interest in insurance as a tool for preventing potential environmental losses. An equally significant limitation is the lack of expertise among insurance companies in assessing environmental risks. Many insurers

lack the necessary methodologies, experts, and statistical data for adequate underwriting for environmental threats. As a result, insurance products remain either too expensive or formal. [1]

An additional factor is limited government support and the low level of integration of eco-insurance into national sustainable development strategies. In many cases, there are no tax incentives, subsidies, or support programs that could foster demand for environmental insurance products.

Thus, the development of eco-insurance in the post-Soviet space requires not only legislative changes but also a strategic review of the role of insurance in the environmental management system, increased business awareness, and a strengthened institutional framework.

Analysis of the status and statistics of eco-insurance in the Republic of Moldova faces a significant methodological limitation: this type of insurance is currently not identified as a separate segment in either national legislation or official insurance market statistics. This circumstance in itself reflects the level of institutional development of environmental insurance in the country and testifies to its initial stage of formation.

Moldova's legal framework includes provisions governing environmental liability and environmental protection, as well as methodologies for assessing environmental damage to water resources, soil, the atmosphere, and biodiversity. However, an insurance mechanism for compensating for environmental damage has not yet been institutionalized. A draft law on environmental insurance was developed back in 1999 but was never adopted, resulting in the absence of a specific legal regime for eco-insurance in Moldova. This means that this instrument has not yet been developed as a separate market and is not yet integrated into the environmental management system.

The structure of the insurance market is primarily formed by motor vehicle liability insurance, property insurance, health insurance, and agricultural insurance. Environmental insurance is not identified as a separate category in the classification of insurance services. Therefore, it is impossible to quantify the volume of insurance premiums and payouts specifically for eco-insurance products, as they are not statistically differentiated.

Nevertheless, in the insurance market, there are types of insurance that indirectly cover environmental risks. These include, in particular, mandatory civil liability insurance for owners of hazardous production facilities associated with increased environmental hazards (industrial enterprises, gas stations, chemical storage and processing facilities, etc.). This type of insurance provides compensation for damage caused to third parties, including the consequences of accidents and environmental pollution. However, in official reporting, it is included in the general liability insurance segment and is not separately classified as environmental insurance.

Agricultural insurance, which is developing in Moldova with state subsidies and is aimed at protecting agricultural producers from climatic and natural risks, such as drought, hail, frost, and floods, is also of particular importance. Although these products are not strictly eco-insurance (as they are primarily focused on protecting the economic interests of farmers), they reflect the growing role of natural and climatic factors in insurance practice and form the infrastructural basis for the further implementation of environmental insurance instruments.

Thus, it can be concluded that eco-insurance in the Republic of Moldova is currently in the process of institutional development. Its absence from the official classification of insurance services, as well as from statistical reporting, indicates not the low relevance of environmental risks, but the lack of a comprehensive insurance mechanism for their financial coverage. This creates an imbalance between existing environmental challenges and the level of insurance coverage, justifying the need for further development of the regulatory framework and the implementation of an environmental insurance system as an element of sustainable economic development.

Prospects and Directions for the Development of Environmental Insurance

Despite existing barriers, the potential for environmental insurance development in post-Soviet countries remains quite high. Growing environmental risks, increasing international pressure on sustainable development, and gradual integration into global economic processes will inevitably stimulate demand for environmental insurance mechanisms.

One key area of development is the formation of a comprehensive regulatory framework for environmental insurance. An important step could be the introduction of elements of mandatory environmental liability insurance for enterprises with high environmental risks. This will not only increase the level of financial protection in the event of pollution but also create incentives for risk mitigation during the production planning stage. The development of voluntary eco-insurance as part of an enterprise's ESG strategy also appears promising. More and more companies focused on exports and international markets are being forced to consider environmental criteria in their operations. In this context, eco-insurance can become a tool for enhancing investment attractiveness, reputational stability, and competitiveness.

The digital transformation of the insurance sector deserves special attention. The use of big data, satellite monitoring, environmental control systems, and artificial intelligence opens up new opportunities for accurately assessing and predicting environmental risks. This can significantly improve the accessibility and economic feasibility of environmental insurance products.

The government should play a key role in the development of eco-insurance—not only as a regulator but also as a market participant. The introduction of tax incentives, subsidized insurance premiums, support for pilot projects, and information campaigns can serve as catalysts for demand generation.

Thus, the future of eco-insurance lies in its integration into the sustainable development system, the digitalization of risk assessment processes, and the gradual formation of an environmentally responsible model of behavior for business and society.

Effective implementation of eco-insurance in the Republic of Moldova requires a comprehensive approach that unites the efforts of the state, the insurance sector, and businesses. Based on the theoretical analysis conducted, international experience studied, and empirical data, the following key development areas can be identified.

1. Improving the regulatory framework

First and foremost, it is necessary to develop and adopt a special law on environmental insurance that should:

- define the concept of eco-insurance and its types;
- define the scope of entities subject to mandatory environmental insurance;
- establish mechanisms for interaction between policyholders, insurers, and government agencies;
- define the procedure for assessing environmental damage and insurance compensation.

Particular attention should be paid to integrating eco-insurance regulations with current environmental and civil legislation, as well as with industrial safety regulations.

2. Introducing Elements of Mandatory Environmental Insurance

It is advisable to introduce mandatory environmental liability insurance for enterprises with high environmental risks:

- chemical industry;
- energy;
- waste management;
- mining and processing industries.

This will create a basic demand for eco-insurance, stimulate the development of relevant insurance products, and reduce the burden on the state budget in the event of environmental disasters.

3. Economic Incentives for Voluntary Eco-Insurance

To increase business interest in voluntary environmental insurance, the following is recommended:

- providing tax incentives to enterprises entering into eco-insurance contracts;
- subsidizing a portion of insurance premiums for small and medium-sized enterprises, especially in agriculture and industry;
- including eco-insurance in the criteria for lending and investment support.

4. Developing Insurance Infrastructure and Expertise

For insurance companies, the following areas are relevant:

- developing specialized insurance products for environmental risks;
- Engaging environmental experts and training actuaries in methods for assessing civilizational and natural risks;
- Implementing digital monitoring technologies (satellite monitoring, sensors, big data).

5. Raising the level of environmental and insurance culture

Information and educational work requires special attention:

- Conducting seminars and trainings for businesses;
- Implementing educational programs on eco-insurance in universities;
- Information campaigns on the benefits and mechanisms of eco-insurance.

This will reduce mistrust of insurance mechanisms and increase business interest.

6. Integration with ESG and international standards

An important area is the integration of eco-insurance into the ESG reporting and sustainable finance system:

- Using international standards (UNEP FI, PRI, ISO 14001);
- Developing national ESG standards taking into account Moldovan realities;
- Using eco-insurance as a tool for increasing the country's investment attractiveness. 7. The Role of the State as a Regulator and Participant

The state should act not only as a regulator, but also:

- as an initiator of pilot eco-insurance projects;
- as a guarantor in catastrophic risk insurance programs;
- as a partner of insurance companies and businesses in sustainable development.

Thus, the following conclusions can be drawn from the analysis of the eco-insurance market presented in this article:

1. Eco-insurance is becoming an important element in the development of a green economy and sustainable development, combining the functions of financial protection and economic incentives for business environmental responsibility.

2. In international practice, it is already considered an instrument of state environmental policy and is actively integrated into regulatory systems, particularly in the EU, the US, and China.

3. In post-Soviet countries, the development of eco-insurance is hampered by imperfect legislation, a low level of environmental awareness in business, and the limited capacity of insurance companies to assess environmental risks.

4. A significant factor in the development of environmental insurance is the implementation of ESG principles, which strengthen the connection between insurance mechanisms, investment decisions, and the environmental responsibility of enterprises.

5. Digitalization of the insurance sector opens up new opportunities for the development of eco-insurance through the use of modern technologies for monitoring and analyzing environmental risks.

6. Government support, improvement of the regulatory framework, and the development of professional competencies in the insurance market are key conditions for the formation of an effective environmental insurance system. Conclusion

This article analyzed eco-insurance as a modern tool for supporting a green economy and managing environmental risks. Environmental insurance is becoming increasingly important in the face of increasing natural hazards, climate change, and the transformation of the global economic model toward sustainable development.

An analysis of international experience confirmed that the effective development of eco-insurance is only possible through collaboration between the government, the insurance sector, and businesses. Moreover, insurance serves not only a compensatory but also a preventative function, helping to reduce environmental risks and stimulating the implementation of environmentally friendly technologies.

At the same time, in post-Soviet countries, this instrument is still in its infancy, requiring a comprehensive approach to its development. This requires improving the regulatory framework, raising environmental awareness, developing professional skills in the insurance sector, and integrating eco-insurance into sustainable development strategies.

Thus, eco-insurance should be viewed not only as a financial instrument but also as an important component of environmental policy and sustainable economic development, contributing to the emergence of a new model of responsibility for the environment and the future of society.

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RELEVANCE OF FINANCIAL STATEMENTS INFORMATION FROM SMEs PERSPECTIVE

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Abstract: *This paper considers the information presented in the financial statement by small and medium sized enterprises (SMEs) and its role in business decisions. In particular, attention is focused on data presented in abridge financial statements and the lack of reliable information in this documents, which comprises a trustworthy financial analysis in case of micro and small business. Financial statements allow internal and external users to draw up conclusions about the financial position and performance of the business, generating information about cash flows, costs, revenues, and profit margins. For external users, financial statements are also the only source of information. In this regard, some of the current limitations of the information presented in the abridge form of financial statements will be detailed in the current paper. Furthermore, recommendation for improving the current situation will be proposed. This paper has been drawn up, using the official statistical data, the legal framework and own reflection of the author.*

Keywords*: financial statements, SMEs, business decisions.*

JEL Classification*: G30*

INTRODUCTION

A successful business depends on the timely adoption of appropriate managerial decisions. Usually, any managerial decision is based on a mix of internal operational data and external market sources [3]. Among these, data presented in financial statements allow both internal and external users to take the right decisions and to conduct a profitable business.

Currently, in local practice, various categories of entities prepare and present one of the following sets of financial statements: abridged, simplified and complete. Requirements regarding financial reporting and the preparation of Financial Statements are stipulated in the Law of accounting and financial reporting No. 287 from 15/12/2017. According to the Law, the category of micro entities and natural persons that conduct entrepreneurial activity, once registered as value-added tax payers, draw up abridged financial statements according to National Accounting Standards (NAS). Small entities draw up simplified financial statements according to NAS. Medium-sized and large entities draw up complete (full) financial statements according to NAS. In this regard, the entity can be classified in one of the following categories if, at the reporting date, two of the criteria presented in table 1, are respected.

Table 1: Categories of entities form the perspective and requirements of financial reporting

Category of entities	Total value of assets, MDL	Total value of revenues from sales, MDL	The average number of employees, persons
Micro entity	≤ 5 600 000	≤ 11 200 000	≤ 10
Small entity	≤ 63 600 000	≤ 127 200 000	≤ 50
Medium entity	≤ 318 000 000	≤ 636 000 000	≤ 250
Large entity	> 318 000 000	> 636 000 000	> 250

Source: Law of accounting and financial reporting No. 287 from 15/12/2017.

Given the high value of assets and revenues for local market, presented in table 1, the majority of entities will be attributed to the micro business sector, which means that they will prepare and present abridged financial statements. Moreover, analyzing data from financial statements, and especially abridged ones, users often face some limitations in performing an objective and correct analysis of the entity's economic and financial activity. This is primarily due to the limited information available to an analyst when analyzing the financial condition of an economic entity solely based on financial statements, without using any internal accounting data.

In case of small and medium sized enterprises (SMEs) that often face financial gaps, it is crucial to present a detailed information about the business to external users, in order to attract potential investor and to grow up business. In this regard, we will have a close look at some specific limitation that affects in particular SMEs.

RESULTS AND DISCUSSIONS

One of the common limitation is the difficulty to determine what is the main type of activity of the entity (production; sale of goods; provision of services, etc.), and which of these generates the highest amount of revenues from sales. The abridged template of the Profit or Loss Statement, doesn't allow such an analysis, since it reflects only the total amount of revenues from sales, without specifying the main source (from the sale of products, from the sale of goods, from the provision of services, from the execution of works, from construction contracts, from operational and financial leasing contracts (rent/lease) etc.).

Therefore, in order to determine whether, during the management period, the main type of activity (for example, production) is also the one that generates the entity's highest revenues from sales, it is necessary to use additional accounting data and/or the explanatory note. Additional sources may include detailed data from the account "Revenues from sales" or the information from the trial balance of the same account. If it is necessary to examine the revenues from sales recorded on sales markets, the data can be obtained by correlating the information from the account "Revenues from sales" and account "Trade receivables" or the disclosures in the explanatory note.

Furthermore, the decision-making process also concerns the use of the entity's productive potential, technical capacity and the process of renewing fixed assets. For example, when an entity is applying for a bank loan with the propose to renew the fixed assets, financial institutions examine such indicators as the book value of the fixed assets, depreciation of fixed assets during the management period, the value of fixed assets leased, etc. Unfortunately, this kind of information cannot be found in the abridged financial statements or even in the complete one (except for the book value of fixed assets). In this case, financial institutions will request additional accounting information from the account "Fixed assets" and account "Depreciation of fixed assets", and disclosures from the explanatory note on fixed assets.

A major concern within any entity is the collection of receivables and the payment of debts. The increase of both negatively influence the activity of the entity. Therefore, in order to prevent the emergence of doubtful debts and the increase in the entity's dependence on creditors, the entity should constantly analyse the size, evolution, structure and the collection/payment period of receivables and debts. Unfortunately, the financial statements prepared and presented by enterprises in the small business sector, do not include all the information necessary for performing such an analysis.

Abridged and complete financial statements suffer from the lack of information concerning the size of receivables and payables by the date of occurrence and the nature of payment.

Moreover, abridged financial statements do not include any data about the types of long-term and current receivables/payables, receivables from affiliated parties and payables to affiliated parties, advances granted and advances received, which does not allow users to make the right decisions related to the management of receivables and payables. If internal users can obtain such information from the accounts: "Trade receivables", "Corrections (provisions) on doubtful receivables",

"Receivables from affiliated parties", "Current advances granted", "Budget receivables", "Employees receivables"; data from the records of contracts concluded with each client and explanatory note, then external users do not have the opportunity to examine the entity's receivables and liabilities in detail.

The situations described above, confirm that the information presented in the abridged template of the financial statements is insufficient for a detailed assessment of the entity's activity. In order to obtain an adequate assessment of the entity's activity and to take business decisions, it is desirable for entities to use additional accounting data and data disclosed in the explanatory notes.

Another issue concerning the limits of the financial statements, which we would like to highlight in the current paper is the lack of a normative basis for assessing financial indicators. Currently, in the process of analysing financial indicators, such as: liquidity, profitability, solvency, financial stability, the current levels recorded by these indicators are compared with the "recommended norms" or "optimal ranges".

Furthermore, in the local analytical practice, we do not have an official document that would recommend/establish these norms, in the process of analysis, norms or optimal ranges recommended in various bibliographic sources and used by local entities are mostly taken from international experience. For example, in the literature review we can find that the optimal range of current liquidity is between "2-2.5, or 1-2.5 or even > 2" [2]. So, the question arises: to which of these ranges should the current liquidity level correspond?

The optimal ranges recommended for various financial indicators depend on the field of activity. Therefore, taking in consideration the lack of normative basis for comparison, financial indicators are assessed in dynamics. However, we advise the responsible bodies and ministers to develop a framework with the recommended ranges for various indicators, both financial and non-financial.

In the analysis of financial statements, we also noticed the lack of a single approach in calculating some financial indicators. For example, when calculating the current liquidity indicator, it is necessary to report the value of current assets to current liabilities. If the information is taken from the entity's balance sheet (regardless of whether it is abridged or complete template), the obtained result will not reflect correctly the entity's solvency. The main reason for this is that according to the current balance sheet template, in the composition of inventories (as part of current assets) are also included the amounts of advances granted for long-term and current inventories. In this regard, when we use the total amount of current assets from the balance sheet data, we artificially increase their value with the value of advances granted for long-term inventories. Therefore, when an entity needs to calculate the value of current assets, we recommend to exclude the value of long-term advances granted for inventories, from the total amount of current assets.

On the other hand, in the current template of the balance sheet, both long-term and current provisions are shown as a separate subchapter. In this regard, if for the calculation of current liquidity we use only the total amount of current liabilities, we will also obtain a false result, since the value of current provisions is not taken into account. The issue of including current provisions in the composition of current liabilities when determining liquidity indicators is a discussed one. In the current paper, we consider that the value of current provisions is a component part of current liabilities; therefore, they must be taken into account when calculating various financial indicators, just as long-term provisions must be included in the composition of long-term liabilities.

CONCLUSION

The study conducted in the current paper allowed us to conclude that the lack of data in financial statements, the absence of a normative basis for assessing financial indicators, as well as the lack of a single approach in calculating financial indicators represent the main problems faced by users of financial statements. The results of the financial analysis and the managerial decisions taken depends on the quality and complexity of the information presented in the financial statements.

Currently, the abridged template of financial statements, prepared and presented by most domestic entities, do not contain sufficient information for an objective assessment of the financial

position and financial performance of micro entities. When an entity calculates different financial indicators, it is necessary to take into account the economic meaning of the patrimonial elements, as well as the significance of each indicator.

Furthermore, it would be desirable to have a normative document that would recommend some ranges for different financial indicators, established in accordance with the specifics features of the branch and field of activity of the entity. The established and applied ranges do not generally take into account the industry in which the entity operates. For small business, it seems more appropriate to track trends in these indicators dynamically over a number of reporting periods, rather than compare financial performance indicators with accepted standards, due to the specific nature of their operations.

The recommendations offered in the current paper related to the analysis of the financial performance of SMEs based on financial statements data, will increase the objectivity of managerial decisions.

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INSURANCE INTERMEDIATION IN THE AGE OF DIGITAL TRANSFORMATION

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Abstract*:The development of information technologies has a direct impact on the insurance industry. At the same time, the development of infrastructure has facilitated access to many digital services. These changes have encouraged consumers to increasingly use online sales platforms, including those offering insurance products. However, the insurance market is very specific, as the contractual terms and conditions vary significantly from one person to another. Consequently, clients often require and request personalized consultations, which are mainly provided by intermediaries. The purpose of this research is to analyze the role and position of insurance intermediaries under the conditions of digitalization. To achieve this objective, the study aims to: highlight the role of intermediaries in insurance activities; identify the main digital technologies applied in the insurance sector; analyze the impact of digitalization on intermediaries' activities; and propose directions for adapting intermediaries' operations to digital innovations. The research methodology is based on methods such as analysis, synthesis, induction, and comparison, and includes an examination of both theoretical and practical sources in the fields of insurance and financial technologies. The results of the study show that traditional intermediaries continue to play an essential role in maintaining customer trust and providing personalized advice. At the same time, intermediaries must adapt to technological innovation by integrating digital tools into their operations, thereby improving the quality and value of the services they provide.*

Keywords*: insurance, intermediaries, digitalization, sales platforms, innovations.*

JEL Classification*: G22, G23, G52, O33, Q55*

INTRODUCTION

Today, digitalization has a profound impact on the lives of people all over the world. This applies not only to our daily lives but also to economic processes, which have undergone numerous digital transformations in recent years. According Daniele Shiliro, digital transformation is a complex and multidisciplinary phenomenon that requires a holistic approach (Schilirò, 2024).

Digitalization is associated with improved business performance in terms of productivity, management practices, innovation, growth, and higher-paying jobs (European Court of Auditors, 2020). Consequently, the implementation of digital technologies enhances the results that companies can achieve and drives industrial development worldwide. The biggest advantage of using digital technologies for service industries, such as the insurance industry, is that digital technologies can be combined – more easily than many other technologies – because of the shared numerical basis of different digital devices (OECD, 2020).

Digital tools were particularly important during the pandemic, which created the necessary conditions for them to be accepted and used by most entrepreneurs. The role of digitalization in the

insurance industry became particularly prominent during the COVID-19 pandemic, with the introduction of travel restrictions and the increased risks to people's lives and health. During this period, people felt an even greater need for protection, which is why demand for insurance products, particularly personal insurance increased significantly. Restrictions on the free movement of people also largely led to the shift of insurance sales activities to various digital platforms. The shift of services to digital platforms has limited human interaction, which has been replaced by chatbots. However, humans are social beings for whom emotional connections and empathy are important—qualities that chatbots often lack.

MATERIAL AND METHOD

This paper is based on the study of insurance intermediaries in the context of digitalization and the assessment of the prospects for intermediary activity. The study was conducted using various quantitative and qualitative methods, with the aim of analyzing how the role of intermediaries is transforming alongside digitalization. As informational support, data from the official websites of the National Bank of Moldova (BNM) and the National Bureau of Statistics (NBS) were used, as well as reports and studies published by relevant foreign institutions, such as the European Insurance and Occupational Pensions Authority (EIOPA), the European Commission, and the Romanian Financial Supervisory Authority (ASF). The information collected from these sources was processed and interpreted to formulate coherent conclusions regarding the transformation of the role of insurance intermediaries in the context of the accelerated digitalization process.

RESULTS AND DISCUSSION

The digital technologies used in the insurance sector are quite diverse; however, the level of digitalization in the insurance market remains emerging. In 2023, EIOPA surveyed the dynamics, opportunities, and risks associated with ongoing digitalization projects. A total of 209 insurance and/or reinsurance companies from 22 EU member states participated in this survey.

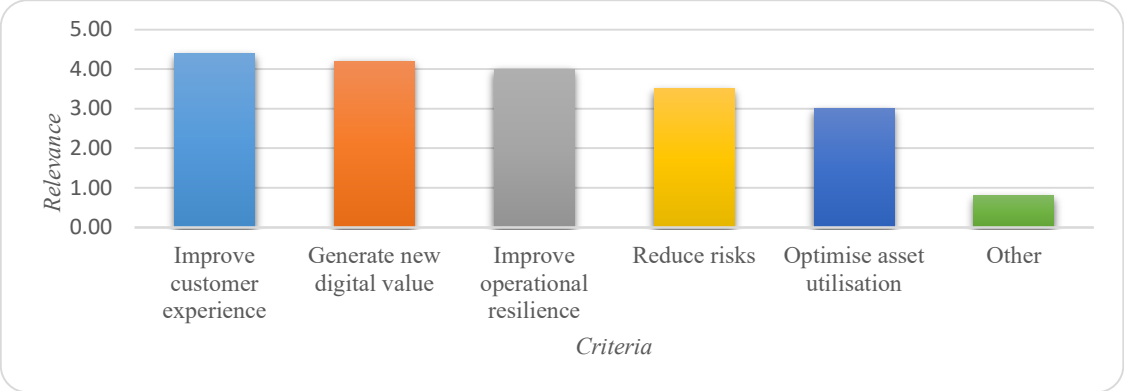


Figure 1. Classification of objectives pursued through the implementation of a digital transformation strategy

Source: EIOPA's Report on the digitalisation of the European Insurance Sector, 2024.

Thus, the main objective initially pursued through the implementation of a digital transformation strategy by insurance companies was the improvement of customer relationships, a natural process of adaptation to a competitive environment where customer experience becomes a strategic differentiation criterion. It should also be emphasized that most customers search for insurance solutions on online platforms, while insurance companies use various channels to promote their products. However, to make the final decision in choosing a particular insurance product, clients turn to insurance intermediaries, who assist not only in selecting the right product but also in concluding an insurance contract. This leads to the formation of two main distribution channels in

insurance: traditional and digital.

Traditional distribution channels refer to classic insurance intermediaries: insurance brokers, insurance agents, and bancassurance.

Digital distribution channels refer to those channels that use technologies to promote, sell, and manage insurance products. This involves the use of various online platforms, mobile applications, websites, and emerging technologies to interact with clients, provide information, offer solutions, and facilitate policy issuance and claims processing. This approach transforms the insurance industry, making it more accessible, convenient, and personalized for consumers, allowing them to research, purchase, and manage insurance policies at their own pace and according to their individual needs.

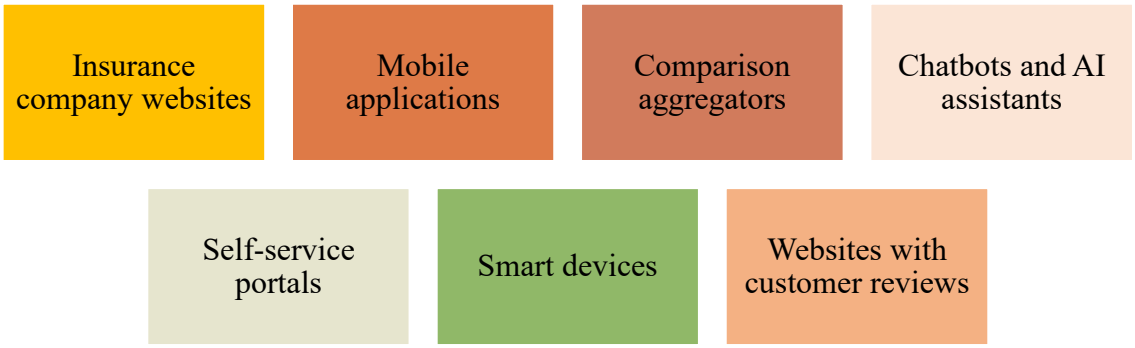


Figure 2. Digital tools in insurance
Source: Developed by the authors

Insurance and reinsurance intermediaries play a central role in the distribution of insurance and reinsurance products. In the context of increasing risks, according to Directive (EU) 2016/97 of the European Parliament and of the Council of 20 January 2016 on insurance distribution (recast), "reinsurance intermediation" means any activity consisting of the presentation or proposal of reinsurance contracts, or the carrying out of other preparatory actions for the conclusion of such contracts, or the conclusion of such contracts, or contributing to the management and execution of such contracts, particularly in the event of a claim.

Table 1. Analysis of the concept of intermediary in insurance

Source	Definition	Role
IDD (2016/97/EU)	„any natural or legal person, other than an insurance or re-insurance undertaking of their employee and other than an ancillary insurance intermediary, who for remuneration takes up or pursues the activity of insurance distribution"	distribution, on one's own behalf or on behalf of another entity, consultancy
Eling & Lehmann (2020)	"an actor who connects clients with insurance providers, assisting in product selection, risk assessment, and providing personalized advice, adding value to the distribution chain."	personalized advice, product selection, risk assessment, and added value.
OECD (2022)	"any entity that mediates, promotes, or distributes insurance products, including providing information and support to end consumers."	mediation, promotion, information, and consumer support.
Law No. 92/2022 – Republic of Moldova	"a natural or legal person who carries out insurance intermediation activities in exchange for remuneration and holds the status of insurance broker, insurance agent, or bancassurance agent."	consultancy, product selection, policy sales.

Legea 236/2018 - Romania	"a person authorized to carry out intermediation activities between insurers and insureds, including brokers and agents, with the obligation to comply with regulations and protect clients' interests."	consultancy, product selection, policy sales.
EIOPA (2024)	"an insurance intermediary is a natural or legal person who, at the request of a party, mediates or assists in concluding an insurance or reinsurance contract and may provide advice regarding these contracts."	mediation and consultancy

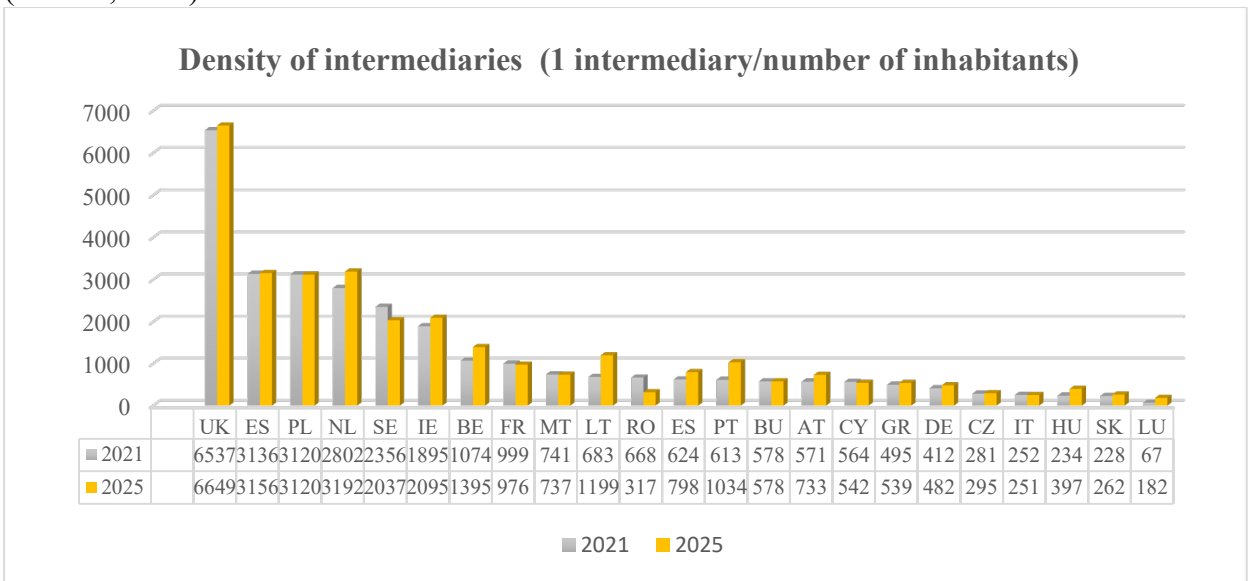
Source: IDD Directive (2016/97/EU), Eling & Lehmann (2020), OECD (2022), BNM (2025), ASF Romania (2023), EIOPA (2024).

After comparing the definitions in Table 1, we conclude that insurance intermediaries are individuals or legal entities that facilitate the sale of insurance products while representing the interests of clients. As for the role of intermediaries, it is to provide advice and assistance both during the term of the insurance contract and after its expiration. In other words, intermediaries remain close to policyholders and offer advice even after the insured risk has occurred.

At the same time, insurance intermediaries play an important role in the activities of insurers. Thus, the role of intermediaries for insurers can be characterized by the following activities (BIPAR, 2023):

- Ensuring the connection between policyholders and insurers;
- Assisting policyholders with claims services and policy administration.
- Facilitating the market entry of new insurance companies by building client bases.

The importance of intermediaries in the insurance industry cannot be overlooked, the number of insurance intermediaries in the European insurance market is declining as information technology advances (Figure 3). This decline does not diminish their role; on the contrary, it enhances it. The greatest advantage of digital transformation in the work of intermediaries is the more efficient promotion and distribution of products through digital channels, creating a rapid connection between intermediaries and policyholders. Moreover, most intermediaries have adopted new ways to operate and sell insurance products remotely, such as new payment and communication methods through mobile applications or chatbots, or claims management methods via online consultations and other digital tools, such as video assessments and digital signatures. Digitalization also facilitates tracking the entire lifecycle of the insurance service provided to a client, from distribution to post-sale services (BIPAR, 2023).



	UK	ES	PL	NL	SE	IE	BE	FR	MT	LT	RO	ES	PT	BU	AT	CY	GR	DE	CZ	IT	HU	SK	LU
2021	6537	3136	3120	2802	2356	1895	1074	999	741	683	668	624	613	578	571	564	495	412	281	252	234	228	67
2025	6649	3156	3120	3192	2037	2095	1395	976	737	1199	317	798	1034	578	733	542	539	482	295	251	397	262	182

Figure 3. Density of intermediaries in 2025 compared to 2021.
Source: Developed by the authors based on BIPAR (2021) and BIPAR (2025).

Observing the trends in Figure 3, we note a high variability among European countries. The largest changes are recorded in the Romanian insurance market, where density decreases by more than half. At the opposite end is Luxembourg, where density increases approximately threefold. This significant variation may result from the influence of several factors, such as the structure of the insurance market, the degree of digitalization in distribution, population structure, the level of digital literacy among the population, and customer preferences. At the same time, the reduction in the density of insurance intermediaries may encourage the emergence and development of new digital distribution channels.

CONCLUSIONS

In the current context of digital transformations, insurance intermediation is undergoing a series of changes, from the way insurance products are distributed to the relationship between intermediaries and clients, which is no longer purely technical but increasingly emotional. Certainly, digitalization has multiple positive effects, such as the automation and simplification of work processes; however, these cannot entirely replace the activity of intermediaries. Despite clients having access to various digital platforms and distribution channels, the detailed explanation of conditions for complex insurance products and counseling in sensitive cases (e.g., death) still comes from intermediaries.

Thus, intermediaries remain a key element in the insurance industry, performing many of the functions of insurers while also helping clients better understand the risks they face, choose the most suitable product, and receive guidance during difficult moments. Therefore, the role of intermediaries is not diminishing but being redefined: insurance intermediaries are trusted individuals for policyholders, who must adopt and utilize digital tools to streamline their activities, adapt insurance products to clients' needs, and provide services as quickly as possible.

The study results highlight that digitalization has led to a new distribution model: hybrid, which perfectly combines digital and traditional distribution channels. This distribution form is the ideal solution in the context of digitalization, maintaining human interaction in the insurance relationship, which strengthens clients' trust in insurance. At the same time, insurance products become more easily accessible to the population. Even though the density of intermediaries is decreasing in some European countries, this does not directly reflect a reduction in their role, but rather the adaptation of the insurance industry to new digital technologies.

In conclusion, in the digital era, the role of intermediaries remains highly important, with digital tools providing real advantages to all participants in the insurance value chain.

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INVESTMENT SUPPORT FOR SUSTAINABLE INFRASTRUCTURE DEVELOPMENT AS A FACTOR OF NATIONAL ECONOMIC RESILIENCE

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Abstract: *The paper examines investment support for sustainable infrastructure development as a system-forming factor in enhancing national economic resilience under conditions of increasing security, climate, and economic risks. It is substantiated that in the current environment infrastructure plays a key role in ensuring the continuity of economic processes, the stability of supply chains, and public access to basic services, while its level of resilience is largely determined by the nature, structure, and quality of investment support.The purpose of the study is to substantiate the role of investment support for sustainable infrastructure development as a factor in shaping national economic resilience. Within the framework of the research, a hypothesis is put forward that the enhancement of economic resilience depends not only on the volume of investments but also on a balanced combination of funding sources, capital attraction instruments, and institutional conditions for the implementation of infrastructure projects.The methodological basis of the study includes methods of analysis and synthesis, systemic and structural-logical approaches, as well as comparative and expert-analytical analysis. Based on the generalization of foreign scientific approaches and analytical materials of international organizations, the components of sustainable infrastructure, the main sources and instruments of investment support, and the economic, social, and security effects of implementing relevant infrastructure projects are systematized.The results obtained confirm the feasibility of considering investments in sustainable infrastructure as a*

strategic instrument for strengthening national economic resilience and form a basis for further improvement of state investment policy mechanisms in the field of infrastructure development.
Keywords: *National Economic Resilience, Critical Infrastructure, Sustainable Infrastructure, Investment Support, Infrastructure Investment, Sustainable Development.*
JEL Clasification: *E62; F21; G24; H54*

INTRODUCTION

The current stage of development of national economies is characterized by the growth of systemic risks associated with military threats, climate change, geopolitical instability and chronic underinvestment in basic infrastructure sectors. According to estimates by international financial institutions and analytical centers, the global infrastructure investment deficit by 2040 may reach 15–18 trillion dollars, which significantly limits the possibilities of achieving the Sustainable Development Goals and increases the vulnerability of national economies to external and internal shocks [1; 2]. The problem of investment support for infrastructure development has become particularly urgent for countries with transition and post-crisis economies.

According to OECD data, the annual financing gap for achieving the Sustainable Development Goals in developing countries exceeds 3.9 trillion dollars. And the volume of foreign direct investment in critical infrastructure remains insufficient and unstable, despite their key role in the transfer of technologies, management practices and increasing the overall resilience of economic systems [3].

In the context of the full-scale military aggression of the Russian Federation against Ukraine, infrastructure restrictions have become systemic and have become one of the key factors in reducing the economic stability of the state. According to World Bank estimates, Ukraine's total needs for restoration and reconstruction exceed 486 billion USD, of which almost 155 billion USD are for losses of critical infrastructure. In 2022–2024 alone, more than 700 critical infrastructure facilities were affected, primarily in the energy, transport and utilities sectors, which caused multiplicative negative effects on production, the social sphere and financial stability [4; 5].

At the same time, modern research proves that investments in sustainable and climate-resilient infrastructure not only reduce economic losses from crises and disasters, but also generate long-term financial benefits. In particular, according to estimates by leading analytical centers, the incremental costs of increasing the resilience of infrastructure assets are significantly lower than the potential losses from their destruction, and sustainable infrastructure projects demonstrate 10–20% higher profitability compared to traditional infrastructure facilities under scenarios of energy transition and increased climate risks [6; 7]. An important empirical confirmation of investment barriers and institutional constraints are the results of expert surveys of business representatives and professional associations involved in the implementation of infrastructure projects.

According to the results of surveys conducted among leading business associations, the key constraining factors remain the instability of financing, delays in payment for completed works, imperfection of public procurement procedures, regulatory uncertainty and increased security risks, which significantly reduces the investment attractiveness of infrastructure projects even with international donor support [8; 9]. In this context, investment support for the development of sustainable infrastructure should be considered not only as a tool for post-crisis recovery, but also as a systemic factor in the formation of the resilience of the national economy, capable of ensuring the continuity of the provision of vital services, adaptation to multi-vector risks and long-term economic stability. This is what determines the relevance and scientific and practical significance of this study.

LITERATURE REVIEW

In foreign scientific discourse, the development of sustainable infrastructure is increasingly considered as a key prerequisite for the formation of resilience of economic systems, which is interpreted as the ability to maintain functionality during shocks and ensure rapid recovery with

minimization of long-term losses. In this context, special attention is paid to the growth of climate and combined risks for critical infrastructure. Thus, in the works of G. Forzieri et al. [10], based on empirical research, the strengthening of the cumulative impact of climate extremes on energy, transport and other infrastructure systems in Europe is substantiated, which directly increases the vulnerability of value chains and national economies as a whole.

In parallel, a research direction is developing focused on the economic feasibility of investing in increasing the resilience of infrastructure assets. In the works of S. Hallegatte et al. [11] based on analytical and model assessments, it is shown that investments in resilience can significantly reduce losses from disruptions in the provision of infrastructure services and reduce the costs of post-disaster recovery, while additional capital expenditures to increase resilience constitute a relatively small share of total investment needs. This approach is methodologically important, as it moves the discussion from the sphere of declarative significance of infrastructure to the plane of quantitative assessment of the cost-benefit ratio for the state and investors.

A significant body of research is devoted to financial mechanisms for mobilizing resources for the development of sustainable infrastructure and institutional conditions for reducing investment risks. The World Bank's reports and analytical materials, particularly within the framework of approaches to ensuring the reliability and resilience of infrastructure services, emphasize that the economic effect of investment significantly depends on the quality of governance, institutional capacity and the effectiveness of project cycle management, while weak institutions can neutralize the positive impact of even significant amounts of financing [12]. In this context, infrastructure investment is considered not only as a matter of resource volumes, but as a complex function of institutional quality, transparency and accountability.

Particular attention in the literature is paid to the issue of attracting foreign direct investment in critical infrastructure through the prism of economic security. OECD analytical materials show that FDI can play an important role in overcoming the infrastructure investment deficit, facilitating the transfer of technology and management skills, while increasing the risk of dependence on investors associated with the countries of origin of capital, which necessitates the implementation of "more, better and safer FDI" policies [13]. This is fundamentally important for ensuring resilience, since the stability of infrastructure is determined not only by the physical strength of assets, but also by the manageability of system dependencies and the integrity of network structures.

At the same time, modern research is actively developing an approach to sustainable infrastructure as a separate investment class of assets that requires standardization and the introduction of specialized frameworks. In publications with the participation of experts from international financial and infrastructure organizations, in particular A. Porucznik et al. [14], it is emphasized that standardized approaches such as FAST-Infra contribute to reducing transaction costs, increasing transparency and scaling private capital into sustainable infrastructure projects. As a result, investment in sustainability is increasingly associated with the development of a market-based financing infrastructure that includes standards, metrics, risk assessment tools and reporting.

The generalization of the analysis results shows that the current scientific literature convincingly substantiates the growth of climate and combined risks for critical infrastructure and their macroeconomic consequences [10], develops approaches to quantifying the economic benefits of investing in its resilience [11; 12], expands the understanding of the role of foreign direct investment and the associated economic security risks [13], and also offers tools for standardization and increasing the investment attractiveness of sustainable infrastructure projects [14]. At the same time, existing research does not form a holistic integrated approach that would directly link the structure of investment provision with the level of resilience of the national economy at the systemic level, which necessitates further methodological generalization and deepening of the analysis.

GOAL AND METHODOLOGY OF THE RESEARCH

The logic of this study is based on the realization that in the conditions of increasing structural, security and climate challenges, infrastructure development goes beyond a purely technical and economic task and acquires systemic importance for the functioning of the national economy. In this context, the purpose of the study is to substantiate the role of investment support for the development of sustainable infrastructure as a system-forming factor in increasing the resilience of the national economy.

Based on the set goal, the paper formulates a scientific hypothesis according to which investment support for the development of sustainable infrastructure is not limited to increasing the volume of financing, but is determined by the structure of sources, the combination of financial instruments and the institutional conditions for their attraction; it is this complex configuration of investment mechanisms that ensures increased resilience of the national economy through increased reliability of infrastructure systems, reduced systemic risks and increased adaptive capacity of economic processes. Within the framework of the study, this hypothesis is subject to verification through analytical generalization of foreign scientific approaches and interpretation of the results of expert and analytical materials of international organizations.

Achieving the goal and verifying the proposed hypothesis necessitated the use of a comprehensive research methodology that combines general scientific and special methods of cognition. Analytical and synthetic methods were used to generalize modern foreign concepts of sustainable infrastructure, investment mechanisms and economic resilience. The systemic approach allowed us to consider sustainable infrastructure as a multi-level socio-economic system integrated with financial, institutional and security subsystems of the national economy. The structural-logical method was used to build cause-and-effect relationships between investment provision, infrastructure transformations and economic resilience, which creates the basis for further generalization of the results in tabular form.

Comparative analysis and grouping methods made it possible to systematize the sources and instruments of investment support for the development of sustainable infrastructure, taking into account their economic, social and security effects. The expert-analytical method was used to interpret the results of international reviews and business surveys on investment barriers, risks and incentives in the field of infrastructure development. The information base of the study was formed by publications of foreign scientists, analytical materials of the World Bank, OECD and World Economic Forum, as well as the results of expert surveys, which allowed providing an empirical basis for testing the hypothesis put forward.

The use of this methodology provides a logical transition from a theoretical-analytical review to a generalization of applied aspects of investment support for the development of sustainable infrastructure, which is further implemented through a system of analytical tables and the formation of generalized conclusions regarding the impact of investment mechanisms on the resilience of the national economy.

Thus, the formulated goal, scientific hypothesis, and chosen methodology create a holistic analytical basis for further research into investment support for sustainable infrastructure development. The proposed approach allows not only to identify key investment factors of infrastructure transformation, but also to assess their systemic impact on the resilience of the national economy.

MAIN RESULTS OF THE RESEARCH

The development of sustainable infrastructure in modern conditions is increasingly considered as a basic prerequisite for ensuring the resilience of the national economy [15; 16], since it is infrastructure systems that form the material basis for the continuity of economic processes, access to basic services and the stability of the socio-economic environment. Foreign studies [10; 11] show that the level of vulnerability of economies to crisis shocks significantly depends on the technical

condition, diversification and adaptive capacity of infrastructure networks, in particular energy, transport, digital and utility networks. In this context, sustainable infrastructure should be considered not only as a set of physical objects, but as a complex system that combines technical, economic, environmental and institutional characteristics. A summary of the key components of sustainable infrastructure and their impact on the resilience of the national economy is given in *Table 1*.

As shown in *Table 1*, investments in sustainable infrastructure create a multiplier effect for the economy, combining short-term recovery results with long-term increases in adaptive capacity. However, the realization of such potential directly depends on the nature and structure of investment support. Foreign literature [3] emphasizes that the dominance of one source of financing, in particular the state, significantly limits the scale and pace of infrastructure modernization, especially in countries with a high level of fiscal constraints.

The systematization of sources and instruments of investment support for the development of sustainable infrastructure is presented in *Table 2*, which reflects the relationship between financial mechanisms and expected economic and social effects.

Table 1: Components of Sustainable Infrastructureand Their Impact on the Resilience of the National Economy

Type of infrastructure	**Key sustainability characteristics**	**Investment priorities**	**Impact on the resilience of the national economy**
Energy infrastructure	Decarbonization, diversification of energy sources, energy efficiency	Renewable energy sources (RES), transmission networks, energy storage	Reduction of energy risks, production stability
Transport infrastructure	Reliability, multimodality, climate adaptation	Railways, logistics hubs, green transport	Continuity of supply chains
Digital infrastructure	Cyber resilience, accessibility, redundancy	Broadband networks, data centers	Improved economic governance
Municipal infrastructure	Resource efficiency, adaptability	Water supply systems, thermal modernization	Social stability and quality of life

Source: Compiled by the authors based on the synthesis of sources [2; 10; 17; 18-21].

Table 2: Sources and Instruments of Investment Support for Sustainable Infrastructure Development

Source of investment	**Key instruments**	**Areas of allocation**	**Expected effects**
Public finance	Budgetary programs, guarantees	Core infrastructure	Macroeconomic stability
Private capital	Project financing, investment funds	Commercial projects	Improved efficiency
Foreign direct investment (FDI)	Concessions, mergers and acquisitions (M&A)	Critical infrastructure	Technology transfer
International institutions	Grants, blended finance	Sustainable projects	Reduction of investment risks

Source: Compiled by the authors based on the synthesis of sources [1; 3; 7; 18; 19].

The above generalizations confirm the hypothesis put forward by the study that it is not only the volume of investments that is crucial, but also their balanced structure, institutional environment and combination of financial instruments. It is this configuration that allows reducing risk premiums, increasing investor confidence and ensuring the long-term sustainability of infrastructure systems [7].

The result of the development of sustainable infrastructure under conditions of effective investment support is the formation of a complex of economic, social and security effects that directly affect the resilience of the national economy. A summary of such effects is given in *Table. 3*.

Table 3: Effects of Sustainable Infrastructure Development on Enhancing the Resilience of the National Economy

Impact dimension	Nature of the effect	Level of manifestation	Significance for resilience
Economic	Reduction of losses from disruptions	Macro	Stability of economic growth
Social	Accessibility of services	Meso	Social stability
Environmental	Reduction of carbon footprint	Macro	Adaptation to climate risks
Security	Reliability of critical systems	Macro	Continuity of operations

Source: Compiled by the authors based on the synthesis of sources [1; 2; 11; 15-16; 18-21].

The results obtained indicate that investment support for the development of sustainable infrastructure forms a complex effect that goes beyond individual sectors and is manifested in increasing the overall resilience of the national economy. Thus, the analysis confirms the feasibility of considering investments in sustainable infrastructure as a strategic instrument of economic stability and adaptation to modern global challenges.

CONCLUSIONS

The study proves that in the context of increasing military, climatic and geoeconomic risks, the development of sustainable infrastructure acquires systemic importance for ensuring the resilience of the national economy. Infrastructure systems form the material basis for the continuity of economic processes, access of the population to basic services and the stability of the socio-economic environment, and therefore investments in their modernization should be considered not only as a tool for post-crisis recovery, but as a long-term mechanism for increasing the economy's resilience to multi-vector shocks.

The results confirmed the feasibility of treating sustainable infrastructure as a comprehensive system that combines technical, economic, environmental and institutional characteristics and ensures the transformation of investment decisions into the aggregate effects of economic, social and security stability. The generalization of the results by type of infrastructure showed that the contribution of individual sectors to the formation of resilience has different mechanisms of manifestation, but is based on a common logic of the systemic effect.

Energy infrastructure through decarbonization, diversification of sources and increased energy efficiency reduces energy risks and supports the stability of production; transport infrastructure ensures the stability of supply chains through reliability, multimodality and climate adaptation; digital infrastructure increases the manageability of the economy and the stability of management and financial processes through the development of cyber protection, availability and redundancy; municipal infrastructure, focused on resource efficiency and adaptability, directly affects the quality of life of the population and social stability. Overall, it has been proven that investments in sustainable infrastructure create a multiplier effect, combining short-term recovery results with a long-term increase in the adaptive capacity of the economy. At the same time, it has been established that the realization of this potential is determined not only by the scale of financing, but primarily by its structure and the quality of the institutional environment for attracting resources. The systematization of sources and instruments of investment support has shown that public finances perform a stabilizing function and provide financing for basic infrastructure; private capital through project financing mechanisms and infrastructure funds increases the efficiency of commercial project implementation; foreign direct investment through concession mechanisms and mergers and acquisitions contributes to technological transfer and the introduction of modern management practices; international financial institutions, using grants and blended finance instruments, reduce investment risks and increase the investment attractiveness of sustainable infrastructure projects. It is the balanced combination of these sources and

risk-sharing mechanisms that allows reducing risk premiums, increasing investor confidence, and ensuring the long-term sustainability of infrastructure systems.

The results obtained made it possible to generalize the complex effects of sustainable infrastructure development that directly shape the resilience of the national economy. The economic effect is manifested in the reduction of losses from infrastructure disruptions and in supporting sustainable economic growth; the social effect is realized through improved accessibility of vital services and the strengthening of social stability; the environmental effect is associated with a reduced carbon footprint and an enhanced capacity of the economy to adapt to climate risks; the security effect consists in increasing the reliability of critical systems and ensuring the continuity of key sector operations. Taken together, these findings confirm that investment support for sustainable infrastructure development generates an integrated effect that goes beyond individual sectors and is reflected in strengthening the overall stability of the economic system.

Based on the analysis, it is concluded that the proposed research hypothesis is confirmed: investment support for sustainable infrastructure development cannot be reduced to an increase in the volume of financing alone but is determined by the structure of funding sources, the combination of financial instruments, and the institutional conditions governing their mobilization. It is this complex configuration of investment mechanisms that enhances the resilience of the national economy by improving the reliability of infrastructure systems, reducing systemic risks, and strengthening the adaptive capacity of the economy.

The practical significance of the results lies in the possibility of formulating targeted recommendations for key stakeholders in infrastructure policy and the investment process. For public authorities, it is advisable to implement a unified framework for prioritizing infrastructure projects based on resilience criteria, taking into account the criticality of services, the expected reduction in losses from disruptions, the level of climate adaptation and cyber resilience, as well as the multiplier effects for the economy. This approach ensures the concentration of resources in the most effective areas.

For financial and economic authorities and public investment management institutions, it is justified to expand risk-sharing instruments, particularly state guarantees and mechanisms aimed at enhancing the investment attractiveness and financial viability of projects, subject to compliance with transparency requirements, high-quality project preparation, and the availability of measurable performance indicators. Within public–private partnership and concession frameworks, the use of standardized project documentation packages, typical risk matrices, and uniform requirements for ESG, climate resilience, and cybersecurity is recommended, as this reduces transaction costs, increases investor confidence, and shortens project preparation timelines. For regulators and operators of critical infrastructure, it is important to institutionalize requirements for redundancy and service continuity as a prerequisite for access to concessional and blended financial instruments.

For international financial institutions and donors, scaling up blended finance mechanisms in combination with technical assistance for project preparation, reporting standardization, and the assessment of climate and security risks is advisable, as this can activate private co-financing. For businesses, banks, and institutional investors, the development of portfolios of sustainable infrastructure assets using standardized approaches to risk and performance assessment, including climate scenarios and reliability and continuity metrics, appears particularly promising.

Prospects for further research are associated with the methodological deepening of the assessment of investment effectiveness in sustainable infrastructure within the logic of "investments → infrastructure changes → resilience", particularly through the development of an integrated system of economic, social, environmental, and security indicators.

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OPPORTUNITIES FOR ECONOMIC GROWTH OF THE REPUBLIC MOLDOVA IN THE CONTEXT OF INTERNATIONAL FINANCIAL MARKET VOLATILITY

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Abstract. *The economy of the Republic of Moldova faces significant challenges generated by a global context characterized by financial market volatility. The main drivers of this instability—including geopolitical and energy crises, post-pandemic effects, inflationary pressures, and trade imbalances—directly influence small and open economies such as that of the Republic of Moldova. The country, with its limited domestic market, dependence on energy imports, and the important role of remittances from the diaspora, remains vulnerable to external shocks. Nevertheless, this context generates not only risks, but also strategic opportunities for economic development and international integration.*
Despite these constraints, the Republic of Moldova has several opportunities to stimulate medium- and long-term economic growth. Key opportunities include economic diversification through the development of high value-added sectors, such as information technology, creative industries, organic agriculture, and renewable energy. The Association Agreement and the Deep and Comprehensive Free Trade Area with the European Union facilitate integration into international markets, while access to external financial resources—grants, concessional loans, and green bonds—can support investments in infrastructure, digitalization, and the energy transition. Strengthening human capital and modernizing institutions are also essential prerequisites for increasing economic resilience.
The general conclusion is that the Republic of Moldova can transform international volatility into a catalyst for development if it combines prudent macroeconomic policies with structural reforms oriented toward competitiveness and sustainability. European integration, economic diversification, and investment in human capital are the key elements for ensuring sustainable economic growth in the current global context.

Keywords: *financial market, economic growth, diversification, volatility, inflationary pressure.*

JEL Classification: *G10, G20, F36, F43, E44, O52*

INTRODUCTION

The Republic of Moldova is at a stage in which the vulnerabilities of a small, open economy dependent on external conditions intersect with significant opportunities generated by rapprochement with the European Union, the reconfiguration of regional value chains, and new global priorities concerning energy security, digitalization, and institutional resilience. Volatility in international financial markets can no longer be viewed merely as a conjunctural problem determined by stock-market cycles or changes in interest rates in advanced economies. It represents a permanent operating environment in which investment decisions, financing costs, trade flows, and currency stability change rapidly under the influence of geopolitical, energy, and inflationary shocks.

Within a short period, the Republic of Moldova has experienced the effects of the pandemic, the regional energy crisis, inflationary pressures, uncertainties caused by the war in Ukraine, and changes in global monetary policy. These shocks have affected external demand, import prices, budgetary costs, and investor confidence. At the same time, they have accelerated discussions on energy security, export diversification, strengthening the financial sector, and the need for a public administration capable of managing European and international resources.

The scientific problem addressed consists in identifying the conditions under which international volatility does not lead only to macroeconomic instability, but can also stimulate reforms, investments, and structural changes favorable to economic growth. For the Republic of Moldova, this issue is particularly relevant because the economy has a limited production base, a narrow domestic market, energy dependence, and a significant share of remittances in household income. However, its geographical position, trade regime with the European Union, agricultural potential, the development of the IT sector, and access to external financing provide the premises for a more resilient growth trajectory.

The purpose of the research is to analyze the economic growth opportunities of the Republic of Moldova in the context of international financial market volatility. To achieve this purpose, four objectives are pursued: the conceptual delimitation of financial volatility and its effects on small economies; the examination of the transmission channels of external shocks to the Moldovan economy; the identification of strategic development opportunities; and the formulation of economic policy directions oriented toward sustainable growth and macroeconomic resilience.

The research methodology is qualitative and empirical-descriptive in nature. It uses the analysis of specialized literature, the interpretation of institutional reports, the comparison of macroeconomic indicators, and the logical synthesis of risks and opportunities. The article's originality results from its integrated approach to volatility: risks are not treated separately from opportunities, but as starting points for structural transformations.

VOLATILITY OF INTERNATIONAL FINANCIAL MARKETS: CONCEPTUAL DELIMITATIONS

Volatility in international financial markets expresses rapid fluctuations in financial asset prices, exchange rates, interest rates, capital flows, and risk perception. In periods of stability, capital flows more easily toward emerging economies, investors accept moderate returns, and borrowing costs are relatively predictable. In periods of uncertainty, capital tends to move toward assets considered safe, while small economies face more expensive financing, currency depreciation, reduced foreign investment, and pressures on the balance of payments.

For small and open economies, volatility has greater intensity because domestic markets are limited and the capacity to absorb shocks is constrained. The Republic of Moldova cannot influence international interest rates, global energy prices, or the evolution of external demand. Instead, it can influence the way these shocks are absorbed domestically: through prudent fiscal policies, adequate foreign exchange reserves, banking stability, trade diversification, and the creation of a credible investment climate.

The specialized literature contains various opinions of established scholars that are relevant to the research topic. Hyman Minsky argued that financial systems tend to become fragile precisely after long periods of stability, because economic agents assume ever greater risks and financing moves away from real economic fundamentals (Minsky, 1986). Applied to the Republic of Moldova, this perspective suggests that apparent stability is not sufficient: supervision of lending, debt, and capital flows must prevent the accumulation of hidden vulnerabilities.

Guillermo Calvo explained the risk of a sudden halt in capital inflows to emerging economies, a phenomenon known in the economic literature as a "sudden stop" (Calvo, 1998). In Moldova's case, this approach is important because external financing, remittances, and support from international institutions play a major role in balancing the economy. Resilience, therefore, is not limited to accumulating reserves; it requires diversification of financing sources and directing them toward productive investments.

Maurice Obstfeld and Kenneth Rogoff demonstrated that open economies are constrained by the interdependence among the exchange rate, capital mobility, and monetary policy (Obstfeld and Rogoff, 1996). For the Republic of Moldova, this idea has direct applicability: price stability, exchange-rate flexibility, and the credibility of monetary policy must be coordinated so that external

shocks do not turn into persistent internal imbalances.

The synthesis of these opinions shows that financial volatility is not an isolated phenomenon, but a process that combines investor behavior, the structure of the economy, monetary policy, the degree of trade openness, and the quality of institutions. For the Republic of Moldova, the major implication is that protection against volatility cannot be achieved through a single measure, but through a set of policies: financial supervision, macroeconomic stability, institutional reforms, economic diversification, and productivity growth.

An essential aspect is the relationship between volatility and expectations. Investors react not only to current indicators, but also to perceptions regarding the direction of reforms, the quality of governance, and political risk. Thus, a vulnerable economy can attract capital even in a volatile context if it provides institutional predictability and access to extended markets. Conversely, an economy with apparently stable indicators may lose capital if institutions are weak or public policies are incoherent.

TRANSMISSION CHANNELS OF VOLATILITY TO THE ECONOMY OF THE REPUBLIC OF MOLDOVA

Before identifying the transmission channels, a brief introduction to the macroeconomic context in which the economy of the Republic of Moldova operates is necessary. External volatility is not transmitted into a neutral economic space, but into a structure characterized by energy dependence, a significant share of remittances, relatively concentrated exports, a narrow domestic market, and low productivity. For this reason, the same change in international interest rates, energy prices, or external demand can have stronger effects on Moldova than on larger and more diversified economies.

Recent empirical data confirm this sensitivity. The World Bank indicated that the economy of the Republic of Moldova grew by only 0.1% in 2024, while in the first half of 2025 economic activity remained practically stagnant: after a contraction of 1.2% in the first quarter, there was a recovery of 1.1% in the second quarter. The same source shows that merchandise exports decreased by 12%, and foreign trade made a significant negative contribution to growth in the first half of 2025 (World Bank, 2025).

Pressures on the current account were also significant. In the first half of 2025, the current account deficit deepened, reflecting the widening trade deficit, high energy imports, and modest export performance. This indicator is important because it shows that external resilience depends on the capacity to increase exports, attract productive investment, and reduce energy imports through efficiency and local production.

Inflation was a major channel for the transmission of external shocks. The National Bank of Moldova maintains an annual inflation target of 5%, with a possible deviation of ±1.5 percentage points; however, in recent years, energy and food prices have generated considerable deviations from this range. In 2025, inflationary pressures remained above the target interval, which required a prudent monetary policy stance (NBM, 2025).

In this context, transmission channels must be analyzed not separately, but in their interdependence. Capital flows influence investment, investment influences imports of equipment, imports are reflected in the current account, and the exchange rate affects inflation and enterprise costs. Therefore, analysis of transmission channels makes it possible to understand how an external shock becomes a domestic problem, while also identifying the points at which public policies can intervene to transform risk into opportunity.

The investment channel

The first transmission channel is investment. During periods of international uncertainty, foreign investors become more cautious, and projects are postponed, resized, or redirected toward economies considered safer. For the Republic of Moldova, where domestic capital accumulation is limited, a reduction in foreign direct investment can slow infrastructure modernization, industrial-sector development, and technology transfer.

Empirical data suggest that investment cannot be treated as a stable and automatic source of growth. The World Bank noted that the economic recovery in 2025 was supported more by domestic demand than by exports, while investment remains dependent on the institutional climate and the availability of external financing (World Bank, 2025). At the same time, the European Commission noted that progress in alignment with the EU acquis and in implementing reforms can increase the attractiveness of the Republic of Moldova for European capital (European Commission, 2025).

The interpretation of these data shows that investment volatility is simultaneously a risk and an opportunity. The risk lies in the postponement of projects and the reduction of foreign capital; the opportunity lies in nearshoring, as European companies seek geographically closer locations with competitive costs and access to preferential trade regimes. To capitalize on this opportunity, Moldova must provide infrastructure, legal stability, investor protection, and rapid administrative procedures.

The financing cost channel

The second channel is the cost of financing. Rising interest rates on international markets are reflected in higher costs for public and private borrowing. For the state, this may mean higher debt-service expenditures and a reduced fiscal space for investment. For enterprises, more expensive financing limits the expansion of production capacities, technological modernization, and access to working capital.

Data from the International Monetary Fund indicate moderate growth of the economy of the Republic of Moldova, estimated at 2.7% in 2025 and 2.3% in 2026, but also the existence of structural constraints related to weak exports, the current account deficit, and low competitiveness (IMF, 2026). At the same time, the National Bank of Moldova reported that the banking sector remained solid in the first half of 2025, with positive profitability and a manageable level of non-performing loans, providing a basis for financing the real economy (NBM, 2025b).

Empirically, this channel shows a double dependence: on the one hand, Moldova needs financing for infrastructure, energy, and digitalization; on the other hand, expensive financing can limit precisely these investments. Therefore, grants, concessional loans, and European funds must be treated as instruments for reducing the cost of capital. Their economic effect, however, depends on project selection and on the capacity of institutions to transform financing into productive assets.

The exchange rate and export competitiveness channel

The third channel is the exchange rate, closely linked to export competitiveness. Currency fluctuations affect import prices, exporters' revenues, and the purchasing power of the population. Currency depreciation may temporarily support exports, but it can make imports of energy, equipment, and raw materials more expensive. Currency appreciation may reduce imported inflation, but it can affect the competitiveness of some local producers.

Data from the National Bureau of Statistics confirm the pressure on foreign trade. In January-August 2025, merchandise exports amounted to USD 2.28 billion, 2.5% less than in the same period of the previous year, while imports reached USD 6.91 billion, 18.3% more. The resulting trade deficit highlighted the fact that domestic demand and imports are advancing faster than the economy's capacity to export competitive products (NBS, 2025).

These data indicate that the central problem is not only the level of the exchange rate, but also the structure of exports. For Moldova, competitiveness cannot be built on repeated currency adjustments, but on added value, quality, European certification, logistics, and niche products. Thus, the exchange-rate channel becomes an argument for export diversification and for moving from raw products to processed products, digital services, and integrated industrial solutions.

THE ENERGY CHANNEL

The fourth channel is energy. Volatility in energy prices and supply risks have direct effects on production costs, inflation, the public budget, and enterprise competitiveness. Dependence on energy imports has been one of the most important vulnerabilities of the Republic of Moldova, and recent crises have shown that energy security is not merely a sectoral issue, but a condition of macroeconomic stability.

Recent European data and documents confirm the empirical dimension of this channel. In 2025, the European Commission and the Republic of Moldova agreed on a two-year strategy for energy independence and resilience, with substantial European financial support to reduce supply insecurity and integrate Moldova into the European Union energy market. The European Commission also indicated the need to reform the electricity market, invest in balancing capacities, and expand renewable sources (European Commission, 2025).

The analysis shows that energy is the channel through which external volatility turns most rapidly into inflation and social costs. However, the same vulnerability creates one of the clearest growth opportunities: investment in solar energy, wind energy, biomass, energy efficiency, storage, and interconnections. In the medium term, reducing energy imports can improve the trade balance, stabilize prices, and create related local industries.

The remittances channel

The fifth channel is remittances. Remittances represent an important source for domestic consumption, the stability of household incomes, and the financing of some family investments. However, they depend on the economic situation in migrants' host countries, wage levels, external inflation, and conditions on European labor markets.

From an empirical perspective, the importance of remittances remains considerable, even though their share has declined compared with the 2000s. World Bank data show that personal remittances received by the Republic of Moldova represented approximately 10.5% of GDP in 2024. Recent economic programs also indicate that in January-June 2025, inflows of personal remittances decreased compared with the same period of the previous year, confirming the sensitivity of this flow to external conditions (World Bank Data, 2025; Ministry of Finance, 2026).

This evolution indicates that remittances cannot be considered a substitute for productive investments. In the long term, the opportunity lies in directing part of these resources toward entrepreneurship, education, energy-efficient housing, and local businesses. The relationship with the diaspora must be transformed from a consumption flow into an economic partnership based on co-financing, guarantees, mentoring, and access to markets.

The confidence and expectations channel

The sixth channel is confidence. In small economies, the decisions of consumers, banks, investors, and exporters are strongly influenced by perceptions of stability. If institutions communicate effectively and maintain predictable policies, external shocks can be absorbed with smaller losses. If policies are contradictory, external volatility quickly turns into internal volatility through declining investment, increased precautionary saving, and reduced consumption.

An indirect empirical indicator of confidence is the stability of the banking sector. The NBM reported a solid situation in the banking sector for the first half of 2025, and maintaining an adequate level of capitalization and liquidity is essential for the orderly transmission of monetary policy and for financing the real economy (NBM, 2025). In addition, the process of accession to the European Union and the reform agenda can reduce perceptions of country risk if accompanied by concrete institutional results.

Consequently, confidence is the channel that can amplify or diminish the effects of all other channels. The same increase in energy prices or the same currency depreciation produces different effects in an economy where the population and investors trust institutions than in an economy where public policies are perceived as unpredictable. For Moldova, institutional credibility becomes an economic resource in itself.

The analysis of transmission channels shows that volatility in international financial markets affects the Republic of Moldova through interdependent mechanisms. Investment, the cost of financing, the exchange rate, energy, remittances, and confidence are not separate phenomena, but parts of the same macroeconomic circuit. An energy shock can fuel inflation, deteriorate the current account, reduce firm competitiveness, and diminish consumer confidence. Similarly, a rise in financing costs can reduce investment, while reduced investment affects the economy's ability to export and generate fiscal revenues.

The vulnerability of the Republic of Moldova stems not only from exposure to external shocks, but also from the internal structure of the economy: low productivity, dependence on energy imports, insufficiently diversified exports, and limited administrative capacity. However, this vulnerability also indicates the most important directions for intervention. Public policies must aim to reduce external dependencies through local energy, value-added exports, productive investment, human capital, and credible institutions. Thus, the conclusion following the analysis of the channels is that economic resilience is not obtained by isolation from international markets, but by intelligent integration and the strengthening of internal mechanisms for shock absorption.

STRATEGIC OPPORTUNITIES FOR ECONOMIC GROWTH IN THE REPUBLIC OF MOLDOVA

Before analyzing strategic opportunities, it must be emphasized that they do not arise outside risks, but precisely from the need to respond to them. Recent crises have shown the limits of the growth model based on consumption, remittances, and low-productivity sectors. At the same time, they have highlighted areas where investment can generate multiplier effects: energy, digitalization, infrastructure, agro-industry, education, and closer integration with the European market. Opportunities must be interpreted as directions of structural transformation, not as automatic advantages. For the Republic of Moldova, these opportunities are the following:

1. European integration. The Association Agreement and the Deep and Comprehensive Free Trade Area have created an important basis for bringing the Republic of Moldova closer to the European market. The European Commission's 2025 report shows that the Republic of Moldova made progress in several areas of alignment with the EU acquis, including digitalization, energy, financial services, and economic management, but emphasizes the need to continue institutional reforms (European Commission, 2025). European integration must be viewed as an economic mechanism of institutional discipline, not only as a political objective.

2. Economic diversification. The Republic of Moldova cannot reduce external vulnerability if it remains dependent on a limited number of low value-added products. Diversification must target sectors such as information technology, creative industries, business services, organic agriculture, advanced food processing, renewable energy, and logistics. These sectors can generate better-paid jobs and reduce dependence on fluctuations in raw material prices.

3. The IT sector and digitalization. Moldova has demonstrated capacity for developing digital services, and the IT park model has contributed to formalizing activities and attracting specialists. The European Commission mentions progress in implementing the Digital Transformation Strategy 2023-2030 and in aligning with European requirements concerning electronic identification, cybersecurity, and digital services (European Commission, 2025). In a volatile financial environment, digital services have the advantage of accessing external markets without massive investment in physical infrastructure.

4. Modern agriculture and food processing. Agriculture remains an important sector, but it is vulnerable to climate, international prices, and low productivity. Data on the decline in exports in the first part of 2025 show that the sector needs efficient irrigation, modern technologies, certification, and value-added processing. A growth strategy must go beyond the export of raw products and favor processed products, organic agriculture, traceability, and the integration of producers into European value chains.

5. The energy transition. Volatility in energy prices has shown that energy security is a condition for macroeconomic stability. Moldova can transform energy dependence into an impulse for investment in solar energy, wind energy, biomass, energy efficiency, and interconnections. Investments in this field reduce exposure to imports, create demand for engineering services, and can attract green financing.

6. Mobilizing human capital and the diaspora. Emigration has reduced the domestic labor supply, but the diaspora also represents an economic, managerial, and investment resource. Public policies must encourage the temporary or permanent return of specialists, diaspora investment in local

businesses, knowledge transfer, and the connection of Moldovan firms to external markets. Human capital is the central condition for moving from consumption-based growth to productivity-based growth.

7. Using external financing for productive investments. Grants, concessional loans, European funds, climate instruments, and green bonds can support infrastructure, energy, digitalization, and competitiveness projects. However, the effect of these resources depends on project quality and administrative capacity. External financing becomes a real opportunity only if it is directed toward productive assets, not toward repeatedly covering current imbalances.

Risk and Opportunity Matrix: Interpretation and Implications

To assess the applicability of the strategic opportunities identified, it is necessary to systematize the relationship between external risks and possible directions for economic development. The risk and opportunity matrix highlights how each vulnerability generated by volatility in international financial markets can be transformed into a concrete direction of economic policy. The use of this matrix is necessary because it provides a synthetic image of the interdependence between the transmission channels of shocks, associated risks, and the measures through which the Republic of Moldova can strengthen macroeconomic resilience. Thus, the matrix is not only a descriptive instrument, but also an analytical one, useful for substantiating decisions oriented toward sustainable growth, competitiveness, and European integration.

The risk and opportunity matrix does not aim to mechanically separate risks from solutions, but to show that each vulnerability channel can be transformed into a direction of development if public policies are coherent. For example, rising energy prices are an immediate risk for inflation and enterprise costs, but can also become an argument for investment in energy efficiency and renewable sources. In the same logic, the higher cost of external financing compels the state to select projects more rigorously and to prioritize investments with high economic impact.

The matrix below synthesizes the main channels through which international financial volatility influences the economy of the Republic of Moldova, the associated risks, and the opportunities for economic policy. It is constructed on the basis of the analysis of recent institutional documents and the interpretation of empirical data on economic growth, foreign trade, inflation, the banking sector, remittances, and European integration.

Table 1. Matrix of Risks and Strategic Opportunities for Economic Growth in the Republic of Moldova

Volatility channel	***Main risk***	***Strategic opportunity***	***Economic policy direction***
Investment flows	Postponement of projects, reduction of foreign capital, and slowing of technology transfer	Nearshoring, European investment, and development of local industry	Investor protection, infrastructure, industrial zones, and reduction of bureaucracy
Cost of financing	Higher interest rates, pressure on debt, and limitation of private investment	Grants, concessional loans, and green financing	Prudent debt management and prioritization of projects with economic impact
Exchange rate and exports	More expensive imports, trade deficit, and uncertainty for exporters	Increasing competitiveness through value-added products	Monetary stability, certification, logistics, and export promotion

Energy	Imported inflation, high production costs, and budgetary pressures	Renewable energy, energy efficiency, and interconnections	Investment in local capacities, storage, and transparent support schemes
Remittances	Dependence on external economic cycles and excessive orientation toward consumption	Diaspora investment, entrepreneurship, and transfer of skills	Co-financing instruments, financial education, and diaspora programs
Confidence	Decline in investment, precautionary saving, and reduced consumption	Institutional credibility and reduction of the risk premium	Public communication, reforms, governance, and fiscal predictability

Source: prepared by the author based on World Bank (2025), IMF (2026), NBM (2025), NBS (2025), World Bank Data (2025), and European Commission (2025).

The discussion of the matrix allows three findings to be drawn:

External risks are interconnected: an energy shock can amplify inflation, deteriorate the current account, and reduce firm competitiveness.

Real opportunities arise only when there is administrative capacity for implementation. Access to external financing does not guarantee growth if projects are poorly selected or if investments are blocked by administrative procedures.

Economic policies must be oriented toward productivity, not merely toward compensating for the effects of crises.

From an economic policy perspective, the matrix shows that the Republic of Moldova needs to move from reaction to anticipation. Instead of the state intervening only after shocks appear, a system is needed for monitoring external risks, preparing alternative scenarios, and directing resources toward areas that reduce vulnerability. Such an approach is compatible with the European integration process, because strengthening economic governance and administrative capacity are essential requirements for approaching European Union standards.

Economic policies for capitalizing on opportunities

Capitalizing on the identified opportunities requires a coherent set of macroeconomic and structural policies, namely:

1. Maintaining macroeconomic stability. Without controlled inflation, sustainable public debt, and a stable banking sector, investment opportunities quickly turn into risks. Monetary policy must remain oriented toward price stability, while also being attentive to effects on lending to the real economy. Fiscal policy must combine budgetary discipline with public investment in infrastructure, education, and energy.

2. Strengthening institutions. In a volatile international environment, investors seek not only low costs, but also clear rules, a functional justice system, efficient administration, and predictability. Reforms concerning governance, public procurement, anti-corruption, and the digitalization of administrative services have a direct economic impact because they reduce transaction costs and increase confidence. For Moldova, institutional quality is a form of potential competitive advantage.

3. Developing infrastructure. Road, rail, energy, and digital connectivity determine the economy's capacity to integrate into international markets. Weak infrastructure reduces productivity and discourages investment. External funds available in the context of European integration must be directed toward projects with multiplier effects: energy interconnections, logistics corridors, export infrastructure, industrial parks, and digital networks.

4. Supporting small and medium-sized enterprises. SMEs form the basis of the economy, but they are vulnerable to financing costs, changes in demand, and certification requirements. Public policies must provide credit guarantee instruments, export consulting, digitalization, standardization, and innovation support. Support should not replace competition, but should reduce barriers that prevent viable firms from expanding.

5. Developing the domestic financial market. An economy that depends excessively on external financing is more exposed to global volatility. The development of local financial instruments, the bond market, investment funds, insurance, and savings products can mobilize domestic capital. At the same time, prudent regulation must prevent the accumulation of systemic risks.

6. Increasing the efficiency of the use of external funds. European and international resources must be correlated with a clear list of priority projects, impact indicators, realistic deadlines, and institutional responsibilities. In the absence of such discipline, external financing may cover temporary imbalances, but it will not produce the structural transformation necessary for sustainable growth.

The analysis highlights that the Republic of Moldova cannot eliminate external volatility, but it can change the way it is transmitted into the economy. The difference between vulnerability and opportunity is determined by adaptive capacity. A rigid economy dependent on imports and low value-added products will experience volatility as a succession of crises. A flexible, diversified economy connected to credible institutions can transform the same volatility into a source of reforms and repositioning.

CONCLUSIONS

Volatility in international financial markets represents a complex challenge for the Republic of Moldova, but not an exclusively negative one. It affects the economy through investment, financing costs, the exchange rate, energy prices, foreign trade, remittances, and the confidence of economic agents. As a small and open economy, Moldova remains exposed to external shocks that it cannot control. However, it can control the quality of domestic policies, the pace of reforms, and the way available resources are used.

The main conclusion of the research is that opportunities for economic growth emerge precisely in the areas where vulnerabilities have become evident. Energy dependence creates the need for a transition toward renewable sources. The small domestic market imposes an orientation toward exports and European integration. High emigration makes it necessary to capitalize on the diaspora and invest in human capital. Low productivity calls for digitalization, innovation, and enterprise modernization.

European integration constitutes the most important strategic framework for the economic transformation of the Republic of Moldova. It offers access to markets, financing, standards, and institutional predictability. However, European integration becomes an engine of growth only if accompanied by internal reforms, strengthening of public administration, and the ability of firms to compete. In the absence of these conditions, external advantages may remain only partially capitalized upon.

Economic diversification is the fundamental condition for reducing vulnerability to international volatility. The Republic of Moldova must move from growth based predominantly on consumption, remittances, and low-productivity sectors toward growth based on investment, exports, innovation, and human capital. High-potential sectors include IT, organic agriculture and food processing, renewable energy, business services, creative industries, and logistics.

In practical terms, the following are recommended: strengthening the macroeconomic risk management framework; directing external funds toward productive investment; accelerating the energy transition; increasing the added value of exports; developing digital and professional skills; and transforming the relationship with the diaspora from a source of remittances into a partnership for investment, entrepreneurship, and knowledge transfer.

Public policies must combine macroeconomic prudence with structural ambition. Price stability, fiscal discipline, and a solid financial sector are necessary but insufficient conditions. They must be complemented by investment in infrastructure, education, digitalization, energy efficiency, and governance. In this way, the Republic of Moldova can transform international volatility from a risk factor into a catalyst for sustainable development.

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THE ROLE OF FINANCING ECONOMIC ENTITIES THROUGH EUROPEAN FUNDS IN STRENGTHENING FINANCIAL SUSTAINABILITY IN THE REPUBLIC OF MOLDOVA

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Abstract: *The importance and topicality of the research topic is determined by the recent dynamics of relations between the Republic of Moldova and the European Union, especially after obtaining candidate country status in 2022 and the start of accession negotiations in 2023.*
In this new framework, accessing European funds through programs such as EU4Moldova or Horizon Europe represents not only an economic opportunity, but also a test of the country's institutional and administrative capacity to align with European standards.
With changing priorities at European and global levels, the new strategic funding directions reflect a growing focus on sustainability, innovation, digitalization and economic inclusion. These trends offer both promising opportunities for the development of the local business environment, as well as challenges regarding the adaptation of strategies for accessing external financing. European funds are managed through various programs and financial instruments that aim to improve economic conditions, reduce regional disparities and stimulate sustainable and inclusive growth.
Especially for economic agents, the use of these funds constitutes an important lever for increasing competitiveness, innovation capacity and expansion on international markets. The strategic approach, based on rigorous planning and solid partnerships, is essential for maximizing the positive impact of European funds on the national business environment.
Keywords: *european funds, external financing, regional development, performance, project, european integration*

JEL Classification*: G10*

INTRODUCTION

The importance and necessity of researching the subject of European funds derives from the consideration that they offer economic agents in the Republic of Moldova a valuable opportunity to consolidate and expand their activities, to innovate internal processes and to become more competitive on both the national and international markets. These non-reimbursable financial resources represent an important support for the sustainable development of the private sector, but accessing and managing them also involves a series of challenges, which require an adequate level of preparation, planning and transparency on the part of the beneficiaries.

ANALYSIS OF PRIORITY ECONOMIC SECTORS FOR ACCESSING EUROPEAN FUNDS

The Republic of Moldova benefits from European financial support through special instruments for the Eastern Neighbourhood countries. In the period 2014–2020, funding was provided through the European Neighbourhood Instrument (ENI), and currently, in the period 2021–2027, Moldova is eligible for funding under the Neighbourhood, Development and International Cooperation Instrument – Global Europe (NDICI).

The Republic of Moldova also has the opportunity to participate in programs such as Horizon Europe, Erasmus+, the LIFE Program and other thematic initiatives managed directly by the European Commission.

In addition, the European Union implements a series of dedicated programs in the Republic of Moldova, such as EU4Moldova: Key Regions, EU4Business or EU4Environment, which aim at economic development, strengthening democracy, improving infrastructure and protecting the environment. Through

these instruments, Moldova benefits from technical assistance, non-reimbursable grants and institutional support, thus contributing to its approximation to European standards and values.

Although the Republic of Moldova does not have direct access to European structural and investment funds, the financial support received through the European Union's external instruments follows the same principles of transparency, efficiency and results-orientedness. An essential feature of these funds is their non-reimbursable nature, which means that beneficiaries are not obliged to return the amounts received, provided that all implementation requirements are met.

In the context of European integration and alignment with European Union policies, the Republic of Moldova focuses its efforts on capitalizing on the opportunities offered by European funds to stimulate economic growth and sustainable development.

These funds are directed particularly towards sectors considered priority, which have high potential for impact on the national economy, job creation and alignment with European standards [1]. The most important areas eligible for financial support are presented in Figure 1.

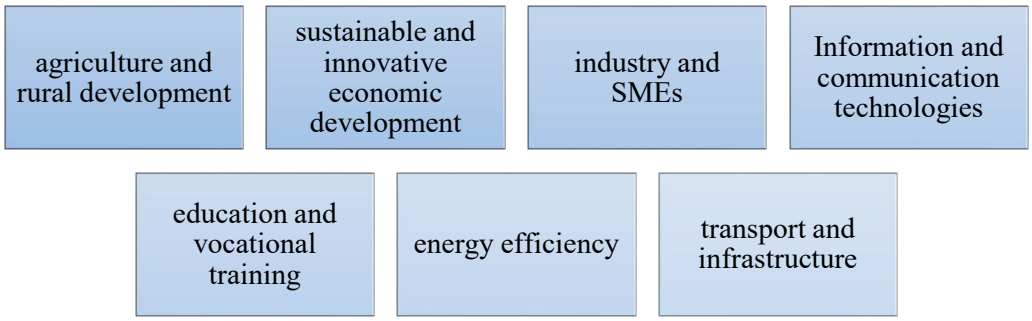

Figure 1 Priority economic sectors for accessing European funds

Source: developed by the author based on the Communication on the Growth Plan of the Republic of Moldova, Brussels, 9.10.2024 COM(2024) 470 final, www.enlargement.ec.europa.eu

EU funds are generally directed towards strategic areas capable of significantly contributing to sustainable development, reducing disparities and increasing the competitiveness of the national economy. A rigorous analysis of these sectors allows both to maximize the absorption of funds and to formulate coherent, results-oriented public policies.

PROSPECTS FOR FINANCING ECONOMIC AGENTS THROUGH EUROPEAN FUNDS IN THE REPUBLIC OF MOLDOVA

Financing the activity of economic agents by applying to the EU4Moldova program

EU4Moldova is not a single, isolated program, but rather an umbrella framework that brings together several initiatives and projects implemented by the European Union in partnership with other international entities, including: the United Nations Development Programme (UNDP), the German International Cooperation Agency (GIZ), the Organization for the Development of Entrepreneurship (ODA), Regional Development Agencies (RDAs), but also local and international NGOs specialized in economic and social development.

One of the key objectives of EU4Moldova is to strengthen competitiveness, in particular by developing the capacities of SMEs, which represent the backbone of the economy of the Republic of Moldova [2]. Thus, the program aims to:

1) creating new financing opportunities for businesses, especially in regions with insufficiently exploited development potential;
2) stimulating job creation by supporting entrepreneurial initiatives, especially in emerging sectors;
3) facilitating insertion in foreign markets by promoting exports and improving quality standards;
4) accelerating the digitalization and green transition process among companies.

By achieving these objectives, the program contributes to the economic modernization of the Republic of Moldova and to increasing the degree of integration of Moldovan enterprises into regional and international value chains.

Since its launch in 2019, EU4Moldova has supported a wide range of economic, social and institutional initiatives [3]. Regarding support to the private sector, the results for 2024 show a significant impact:

- 400 local businesses benefited from direct grants, mentoring and technical assistance;
- 23,3 million euros is the value of funds distributed to SMEs under the "Key Regions" and "EU4Business" components;
- creating and maintaining over 1200 jobs, with an emphasis on involving young people and women in entrepreneurship;
- 150 businesses were digitized, implementing IT and ecommerce solutions;
- 80 enterprises from the creative sectors, agricultural tourism and winemaking managed to expand their production capacities or access new foreign markets.

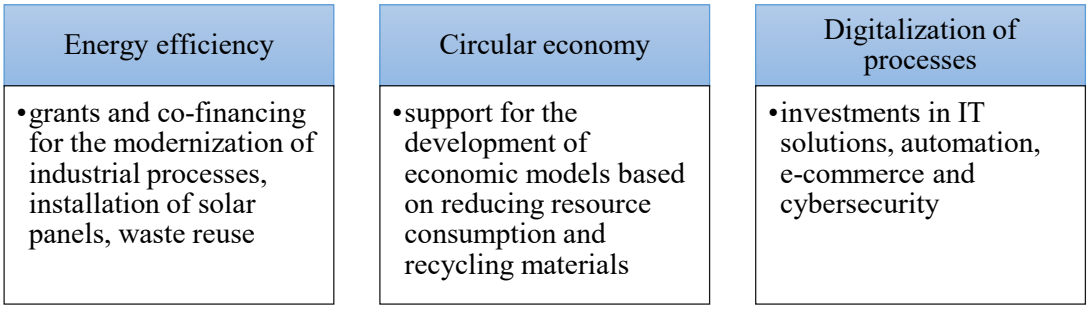

Figure 2 The main directions of European funding for economic agents

Source: developed by the author based on the 2021-2027 long term EU budget and next generation EU, https://commission.europa.eu/strategy-and-policy/eu-budget/long-term-eu-budget/2021-2027_en?prefLang=ro

One of the main directions of European funding in the current multiannual framework is the transition to a green and digital economy [4]. For economic agents, the directions presented in Figure 2 are reflected in concrete opportunities:

- energy efficiency and renewable energy – grants and co-financing for the modernization of industrial processes, installation of solar panels, waste reuse, etc.;
- circular economy – support for the development of economic models based on reducing resource consumption and recycling materials;
- digitalization of production and management processes – investments in IT solutions, automation, e-commerce and cybersecurity.

Another important pillar of European funding is supporting local and regional economic development, by integrating the Republic of Moldova into European value chains. Within the EU4Moldova: Key Regions programme, as well as in other regional initiatives, the emphasis has been on strengthening economic capacities at local level – especially in less developed districts.

This type of intervention will continue, including by expanding support under the Team Europe initiative, which includes funds and expertise from several EU Member States. Economic agents operating in strategic sectors (wine, tourism, creative industries, etc.) and in less developed regions are encouraged to participate in calls for projects aimed at increasing local competitiveness, innovation and integration into the European market.

An emerging direction in European funding for the economic environment is related to supporting innovation, research and technology transfer. The Horizon Europe program, the EU's largest research and innovation program, offers significant opportunities for entrepreneurs from the Republic of Moldova, especially in international consortia.

Table 1 Financing programs available for economic agents in the Republic of Moldova

Program	Objective	Maximum funding	Own contribution	Implementation period
Digital Transformation Program	Digitization of SMEs	500.000 lei	30%	Until 2026
Women's Entrepreneurship Support Program	Supporting women entrepreneurs	165.000 lei	10%	Until 2026
Energy Efficiency and Modernization Program	Energy efficiency and the use of alternative sources	2.000.000 lei (modernization), 1.500.000 lei (alternative sources)	50%	Until 2026
Tourism Development Program	Development of the tourism sector	500.000 lei	-	Until 2026
Horizon Europe	Research and innovation	Variable	Variable	2021–2027
Digital Europe	Digitalization of the economy	Variable	95% contribution reduction	2021–2027

Source: developed by the author based on the list of Funding Opportunities, https://www.adrnord.md [5]

It is clearly observed that the prospects for financing economic agents in the Republic of Moldova through European funds are promising, especially in the context of the current progressive integration into European structures. The priority directions – sustainability, digitalization, innovation and inclusion – open up new development opportunities for local companies that want to align with European standards and values.

At the same time, these opportunities come with challenges related to the capacity of enterprises to develop eligible projects, attract relevant partners and implement the internal reforms necessary to effectively access available funds. Thus, strengthening skills in attracting external financing is essential, especially for SMEs and entrepreneurs in less developed regions.

Accessing European funds by economic agents in the Republic of Moldova is marked by an important transition in terms of European Union policies and instruments. Along with changing priorities at the European and global levels, new strategic funding directions reflect a growing focus on sustainability, innovation, digitalization and economic inclusion. These trends offer both promising opportunities for the development of the domestic business environment, as well as challenges regarding the adaptation of strategies for accessing external financing.

RESEARCH RESULTS

The research results presented in this article emphasize the importance and necessity of accessing European funds by local economic agents in order to develop activities under conditions of financial sustainability. Thus, the financing modalities mentioned in this paper and the efficiency in capitalizing on the funds depend on overcoming persistent obstacles, such as limited administrative capacity, lack of co-financing and information deficit among potential beneficiaries. Under these conditions, there is a need for a relevant reform of the fund management system and a professionalization of the actors involved in order to reduce the risk of underutilization of these

financial resources with major potential for capitalization at the level of economic agents in the Republic of Moldova.

In the context of European integration, the future of local companies will depend essentially on their capacity for strategic adaptation and mobilization of financial resources to meet the demands of a constantly changing competitive environment.

CONCLUSIONS

European funds can become a real engine of sustainable economic and social development only if they are approached with a clear strategy, efficient administration and a firm commitment from all actors – public and private. Seizing the opportunities offered by the EU is not just a chance, but a major responsibility for the future of the Republic of Moldova.

The challenges elucidated regarding the full use of European funds highlight the need to consolidate the support infrastructure, improve the counseling system and strengthen collaboration between authorities, the business environment and international partners.

The strategic development of local economic agents increasingly depends on their ability to adapt to European funding mechanisms, but also on national institutional support to effectively capitalize on these resources. The capitalization of European funds is thus becoming an essential pillar for the sustainable development of the national economy under conditions of financial sustainability.

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VALUE ADDED TAX AS A TOOL FOR EUROPEAN CONVERGENCE: FISCAL NEUTRALITY AND THE COMMON FRAMEWORK OF THE SINGLE MARKET

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Abstract. *This article examines value added tax as a legal and economic mechanism of European convergence, with particular reference to the prospective alignment of the Republic of Moldova with the Union acquis in the field of VAT. The central argument is that VAT harmonisation is not a merely technical revision of tax rates, but a structural reconfiguration of legal concepts, business processes, administrative interoperability and fiscal neutrality. The paper combines doctrinal legal analysis, comparative interpretation, functional process analysis and policy-oriented assessment. The results show that the decisive shift concerns the transition from a national model dominated by domestic supplies and imports to a Single Market model built around taxable person status, the destination principle, intra-Community transactions, place-of-supply rules, deduction and refund rights, and digital reporting. The study further demonstrates that approximation to Directive 2006/112/EC and the ViDA package can generate tangible advantages for Moldova: lower embedded tax in investment, stronger liquidity through broader VAT recovery, the disappearance of VAT-at-customs on acquisitions from the European Union, and the repositioning of the State Tax Service inside the European cooperation architecture through CCN, VIES, VAT Refund, VAT REG, OSS and CESOP. The article concludes that VAT should be understood as a governance instrument of market integration and that successful convergence depends on coherent recodification, digital interoperability and timely business preparedness.*

Keywords: *value added tax; fiscal neutrality; European convergence; Single Market; Directive 2006/112/EC; ViDA; interoperability; Republic of Moldova*

JEL Classification*: H25, H26, F15, K34, O38*

INTRODUCTION

Value added tax occupies a singular place in European integration. It is at once a revenue instrument, a legal grammar for cross-border trade, a discipline of business reporting and a mechanism through which the European Union converts the idea of a single market into everyday administrative practice. In Union law, VAT is not merely a tax applied to consumption. It is the common transactional framework that makes the movement of goods and services across jurisdictions compatible with fiscal neutrality, legal certainty and administrative cooperation. In that sense, the convergence of a candidate or associated country to the Union VAT acquis has implications that go well beyond public finance. It affects company processes, customs treatment, accounting flows, digital reporting, dispute resolution and the architecture of trust between tax administrations.

For the Republic of Moldova, this issue is now strategic rather than hypothetical. The current Title III of the Tax Code contains selected elements inspired by the European model, yet the overall logic remains predominantly national. Taxable operations are still understood through the lens of

domestic supplies and imports; a large part of compliance is anchored in the frontier and in customs formalities; and the practical analysis of many transactions begins with the existence of an import declaration or a domestic invoice rather than with the classification of the economic flow inside a destination-based market.

The adoption of the VAT in the Digital Age package in March 2025 has already pushed the Union framework towards electronic invoicing, near-real-time digital reporting, updated rules for the platform economy and the progressive extension of single VAT registration tools. Consequently, Moldova is not converging towards a static legal text but towards a moving regulatory ecosystem in which legal approximation, digital interoperability and data governance are inseparable. This means that alignment cannot be reduced to copying provisions of Directive 2006/112/EC; it must also anticipate the operational environment in which those provisions will function.

The present article therefore treats VAT as a tool for European convergence in a double sense. First, VAT is analysed as an instrument of legal convergence because it requires the recoding of domestic concepts in accordance with the Union vocabulary of taxable persons, taxable transactions, place of supply, deductions, exemptions and administrative cooperation. Second, VAT is analysed as an instrument of economic convergence because fiscal neutrality and the elimination of embedded, unrecoverable tax affect business liquidity, investment incentives, competitive conditions and integration into European value chains. In practical terms, this means that the alignment of Moldovan VAT rules can change the cash-flow profile of companies, the cost of capital goods, the documentation burden of cross-border transactions and the quality of the tax administration's anti-fraud capacity.

The article has four objectives. The first is to explain why VAT neutrality matters for European market integration and why it should be treated as more than a technical doctrinal concept. The second is to identify the principal conceptual differences between the Moldovan VAT model and the Union framework, especially regarding taxable operations, taxable persons, place-of-supply rules, reduced rates, exemptions, deduction and refund mechanisms. The third objective is to analyse the implications of the ViDA package (VAT in the Digital Age) and the interoperability agenda built around CCN (Common Communication Network), VIES (VAT Information Exchange System), VAT Refund (Value Added Tax Refund system), VAT REG (Value Added Tax Registration system), OSS (One Stop Shop), CESOP (Central Electronic System of Payment Information), and DAC flows (data exchanges under the Directive on Administrative Cooperation in the field of taxation). The fourth objective is to formulate recommendations that are realistic for the Republic of Moldova as it redesigns Title III of the Tax Code and strengthens the institutional capacities of the State Tax Service.

The article proceeds from the following research proposition: in the case of Moldova, VAT harmonisation will create its most important effects not through rate convergence alone, but through the reconstruction of fiscal neutrality and through the replacement of a frontier-based tax logic by the common framework of the Single Market. The argument developed below is that the future of Moldovan VAT should be read not as a domestic tax reform with a European label, but as a market integration project that uses VAT law to standardise economic transactions, redistribute compliance burdens and embed the country in European data-sharing infrastructures.

METHODOLOGY

The study employs a qualitative, doctrinal and policy-oriented methodology. First, doctrinal legal interpretation is employed to identify the internal logic of VAT concepts in both the Moldovan code and the Union framework. This method is particularly relevant for notions such as taxable person, intra-Community acquisition, place of supply, fiscal neutrality, deduction and exemption. Second, comparative analysis is used to map the distance between the current Moldovan architecture and the European model. The comparison is not limited to the wording of legal norms. It also examines whether similar rules perform similar functions in practice. Third, a functional process analysis is

applied to identify how legal changes translate into operational implications for businesses and tax authorities. This is essential because much of the practical impact of VAT harmonisation lies in invoicing systems, ERP design, documentary evidence, registration flows and refund procedures rather than in legal drafting alone. Fourth, the article adopts a policy perspective by linking normative findings to recommendations concerning sequencing, interoperability and implementation governance.

The methodology is deliberately interdisciplinary within the field of tax law and public policy. VAT is a legal institution, but it is also an accounting mechanism, a digital reporting environment and a coordination device in cross-border markets. For that reason, the article does not confine itself to black-letter analysis. It evaluates how legal concepts shape actual behaviour: whether tax is embedded in the cost of investment, whether companies must pre-finance VAT at customs, whether exemptions distort competition, and whether administrative systems are able to exchange data securely and promptly. This approach is particularly suitable for Moldova, where legal approximation and institutional approximation must progress in parallel if convergence is to be credible.

The limitations of the research should also be stated explicitly. The article does not claim to offer a complete article-by-article transposition blueprint for the whole of Directive 2006/112/EC. Nor does it model the macroeconomic impact of approximation in econometric form. Rather, it offers a structured legal and functional assessment of the main convergence drivers. The "results" presented below are therefore analytical results: they identify the most significant areas in which VAT operates as a vehicle of European convergence and the most plausible channels through which approximation would affect businesses, administrative practice and the investment environment in the Republic of Moldova.

VAT, FISCAL NEUTRALITY AND THE COMMON FRAMEWORK OF THE SINGLE MARKET

VAT can only be understood as a convergence tool if its core economic and legal logic is made explicit. In the European tradition, VAT is a broad-based, multi-stage consumption tax designed to avoid tax cascading through the deduction mechanism. The burden of the tax is intended to fall on final consumption, not on undertakings that use goods and services in the course of taxable economic activity. The concept that captures this design is fiscal neutrality. In its narrow sense, neutrality means that a taxable person should be relieved of the VAT burden on inputs used for taxable outputs. In its broader Union sense, neutrality also means that similar economic activities should not be treated differently merely because they are organised through different business models, performed in different Member States or carried out through different chains of supply.

This broader understanding explains why VAT is deeply linked to the architecture of the Single Market. The internal market requires a common transactional language. Economic operators need a uniform answer to a series of recurring questions: who is the taxable person; what constitutes a taxable transaction; where is the place of supply; when is the tax chargeable; who is liable to account for it; and when can the tax be deducted or refunded? Directive 2006/112/EC performs exactly this function. It creates a shared legal grid across the Union. Even where rates differ and some exemptions remain optional, the decisive structural concepts are harmonised enough to permit cross-border trade without systemic fiscal fragmentation.

From this perspective, VAT is not simply one more chapter of tax law in the Union acquis. It is one of the clearest expressions of the legal-operational unity of the Single Market. Customs law controls the movement of goods at the external frontier; VAT law governs the fiscal treatment of transactions within the market. Once goods move inside the Union, the old import/export logic gives way to a destination-based system of intra-Community supplies and acquisitions, distance sales rules, reverse charge mechanisms and administrative data exchanges. The legal point is important: fiscal borders are not eliminated, but they are reorganised around common rules rather than duplicated frontier events. That is why candidate-country convergence in VAT has a constitutional quality for

market integration: it translates the abstract idea of the internal market into the concrete tax treatment of ordinary business transactions.

For Moldova, fiscal neutrality has an immediate policy relevance. Whenever deduction or refund is restricted beyond what is functionally justified, VAT becomes a cost component in investment and working capital. Whenever a transaction is exempt without the right to deduct upstream VAT, the tax is embedded in the price structure of the supplier and, indirectly, in the cost structure of the economy. Conversely, when the system allows deduction and refund in a principle-based and timely manner, VAT ceases to distort capital allocation and becomes more consistent with the competitiveness logic of the Single Market. This is why harmonisation will matter more on deduction, refund and operational design than on headline rates alone.

The common framework of the Single Market also has an administrative dimension. A neutral VAT system is sustainable only if it is enforceable. The Union therefore couples substantive VAT law with administrative cooperation, information exchange and, increasingly, digital reporting. The emerging model under ViDA confirms that neutrality and anti-fraud are not opposed objectives. They are complementary. Businesses receive greater simplification and less cumulative tax, while tax administrations receive better-quality, faster and more standardised information. Moldova's future approximation path will need to preserve this balance: a system that grants neutral treatment but cannot verify transactions will invite abuse, whereas a system that focuses on control without preserving neutrality will impair investment and integration.

Table 1. From domestic VAT logic to Single Market VAT logic

Dimension	Predominant Moldovan logic	EU acquis logic	Convergence implication
Taxable architecture	Domestic supplies + imports occupy the centre of analysis.	Supplies of goods and services, intra-Community acquisitions, imports and destination-based categorisation form a common grid.	Title III must be recoded around market flows, not only around the frontier.
Compliance trigger	Customs documentation and national invoicing remain decisive in many cases.	Partner VAT status, proof of transport, place-of-supply tests and digital reporting become decisive.	ERP and documentary controls need redesign.
Neutrality	Sectoral refund windows and exemptions without deduction continue to block VAT in costs.	Deduction and refund operate as general pillars of neutrality for taxable activity.	Investment and working-capital costs are reduced.
Administrative cooperation	Predominantly national administration with selective digital tools.	Interoperability through CCN, VIES, VAT Refund, VAT REG, OSS, CESOP and DRR.	State Tax Services must become a connected node in the EU fiscal data environment.

Source: developed by the author.

RESULTS AND DISCUSSIONS

THE SHIFT FROM A DOMESTIC-IMPORT MODEL TO AN INTRA-COMMUNITY ARCHITECTURE

The first analytical result of this study is that the most consequential change for Moldova lies in the object and architecture of VAT rather than in headline rate alignment. Article 95 of the Moldovan Tax Code remains centred on supplies of goods and services in the territory of the Republic of Moldova, imports of goods and services, electronic services provided by non-residents, and certain purchases linked to insolvency or pledged and seized property. By contrast, Article 2 of the VAT Directive starts from a different map of taxable events: supply of goods for consideration within the territory of a Member State, supply of services for consideration, intra-Community acquisition of goods, and importation of goods. The inclusion of the intra-Community acquisition is not a drafting nuance. It is the legal expression of a market in which fiscal treatment is detached from the customs frontier and attached instead to destination and transactional qualification.

Moldova will need either to introduce for the first time or to rewrite substantially: intra-Community supply, intra-Community acquisition, transfer of own goods, call-off stock arrangements, chain transactions, distance sales and proof of transport. Each of these concepts has direct business consequences. A transfer of own goods from one Member State to another is not fiscally invisible. A call-off stock arrangement can benefit from simplification only under specific conditions. A chain transaction requires the identification of the moving supply. A distance sale changes the place of taxation once destination-based rules apply. Proof of transport becomes a legal prerequisite for zero rating or exemption of certain transactions. These are not marginal issues; they are the day-to-day grammar of the Single Market.

For Moldova, the practical implication is that VAT law will no longer be able to treat most cross-border flows as variations of import or export. The legal language of the code will have to mirror the economic reality of a common market in which goods circulate without customs VAT at the internal frontier and in which the fiscal event is reconstructed through reporting, documentary evidence and the status of the parties. This is particularly important for sectors integrated into European supply chains, such as manufacturing, agri-food, retail distribution, automotive parts, pharmaceuticals and wholesale trade. Financing structures provided by banks and other creditors will also be affected, because inventory turns, working-capital needs and cash-flow assumptions change significantly when VAT is no longer paid at customs on acquisitions from within the Union but is instead self-accounted through reverse charge.

TAXABLE PERSONS, PUBLIC BODIES AND STATUS-BASED COMPLIANCE

The second analytical result concerns the centrality of taxable person status. The Moldovan code currently defines taxable subjects primarily by reference to entrepreneurial activity and to certain import or electronic-service situations. The Union framework is broader and more differentiated. It focuses on any person who independently carries out an economic activity, but it also draws specific consequences for legal persons that are not otherwise taxable, for public bodies acting in competition with private operators, and for occasional transactions such as supplies of new means of transport. In other words, Union VAT is status-sensitive in a way that goes beyond the traditional enterprise/importer distinction.

This matters for legal certainty and compliance design. In the Single Market, the correct treatment of a transaction often depends on whether the counterparty acts as a taxable person, whether a VAT number has been validly assigned, whether a fixed establishment is relevant for the transaction and whether a public body acts as a sovereign authority or as a market operator. Moldova will have to rewrite not only the concept of taxable person but also the category of non-taxable person and non-taxable legal person. This is especially important for the operation of place-of-supply rules for services, the treatment of public utilities, the supply of new means of transport, and the use of special regimes such as the SME exemption and OSS.

The implications for practice are extensive. Taxpayer registration becomes more than an administrative formality; it becomes an operational cornerstone for cross-border trade, invoicing and data exchange. Master data quality, VAT ID validation and the internal classification of counterparties become essential controls. A legal transposition that ignores this dimension would create a gap between the formal law and business reality. The result could be frequent misclassification of B2B and B2C supplies, incorrect application of reverse charge, and persistent uncertainty concerning public bodies and special categories of suppliers. Therefore, taxable person status must be treated as a primary design axis of convergence rather than as a definitional appendix.

PLACE OF SUPPLY AS THE OPERATIONAL CORE OF CROSS-BORDER VAT

A third result is that place-of-supply rules will likely become the most operationally demanding part of VAT convergence. In the Union system, place of supply is the switch that allocates taxation rights between jurisdictions and determines which registration, invoicing and reporting duties arise. For goods, the logic starts from where the goods are located, where transport begins and where it ends, subject to specific deviations for distance sales, goods installed or assembled, supplies on board means of passenger transport, and supplies of electricity, gas, heat and cooling. For services, the system begins with the now classical distinction between B2B and B2C. Under the general rule, B2B services are taxed where the customer is established; B2C services are taxed where the supplier is established. A long list of exceptions then redirects taxation to the location of effective performance or consumption in cases such as immovable property, passenger transport, events, short-term hiring of means of transport, restaurant and catering, and telecommunications, broadcasting and electronically supplied services.

Current Moldovan provisions are still more national and enumerative than systemic. Under harmonisation, companies will need to evaluate transactions in a different order. First, identify whether the customer acts as a taxable person. Second, verify whether a fixed establishment is involved. Third, test whether the transaction falls under a general rule or an exception. Fourth, document the relevant evidence. This sequence is standard in Union practice, but it is not yet embedded in the ordinary compliance habits of many Moldovan taxpayers. The change will require updates in contract drafting, data fields used in ERP systems, invoice logic, documentary retention policies and staff training.

The practical importance of this shift is amplified by the rise of digital services and distance If Moldova aims to align with the Single Market framework, it will need not only statutory language compatible with Directive 2006/112/EC, but also administrative guidance that can be operationalised by micro, small and medium-sized businesses engaging in digital or distance commerce.

REDUCED RATES, EXEMPTIONS AND THE REDESIGN OF EMBEDDED VAT COSTS

In the Moldovan context, the true challenge is not simply whether current reduced rates are numerically close to the Union range, but whether the boundary between reduced rates, exemptions without deduction and exemptions with deduction is economically coherent and legally compatible with Directive 2006/112/EC. Moldova's reduced rates for bread, dairy products, medicines, medical devices, gas, certain agricultural products, accommodation and restaurant services broadly correspond to categories permitted by Annex III. This confirms that Moldova is not structurally distant from the Union on rate design alone. However, several current exemptions without the right to deduct upstream VAT are either broader than the Directive allows or would be more coherent if transformed into reduced-rate or taxable operations with full deduction rights.

This distinction matters because an exemption without deduction is not necessarily fiscally benign. It may appear favourable because no VAT is charged to the final recipient, yet it often embeds non-deductible VAT into the supplier's cost structure. In sectors with material capital expenditure or complex input chains, the hidden tax cost can be substantial. Part of the operations currently exempt without the right of deduction may move into reduced-rate categories under the Union model, while

others may lose their exemption but without a negative net effect because VAT on acquisitions will become deductible or refundable. The example of investment and fixed assets is particularly telling: a formally "favourable" exemption can become less efficient than a taxable regime with full recovery of input VAT if the latter removes VAT from the capital cost of the undertaking.

The policy implication is clear. Moldova should review existing exemptions through a neutrality test rather than through a purely social or historical lens. The relevant question is not only whether the end consumer sees VAT on the invoice, but also whether the tax system traps unrecoverable VAT in prices, investment costs or public spending. Where Union law permits reduced rates under Annex III, reduced-rate treatment may be preferable to exemption without deduction. Where Union law does not permit exemption and economic activity is taxable under the Single Market model, the elimination of the exemption should be accompanied by a clear communication strategy explaining that broader deduction and refund rights may more than compensate for the apparent disappearance of preferential treatment. This is a difficult reform politically, but it is essential if harmonisation is to improve rather than merely rearrange the real cost of VAT.

Table 2. Likely treatment of selected Moldovan exemptions in a Union-oriented redesign

Category in current Moldovan practice	Current treatment	Likely Union-compatible direction	Expected neutrality effect
Books, periodicals and cultural materials	Often exempt or specially treated	Reduced rate where Annex III allows it	Less blocked VAT for publishers and distributors
Passenger transport and selected utilities	Exemption without deduction in several cases	Reduced-rate taxation compatible with Annex III	More transparent pricing; less hidden VAT in cost
Investment and fixed assets in selected regimes	Fragmented or limited recovery schemes	Taxable treatment with broader deduction/refund	Lower embedded VAT in capital expenditure
Socially sensitive goods currently exempt	Exemption without deduction	Reduced rate where legally available	Preserves affordability while protecting neutrality

Source: developed by the author

DEDUCTION, REFUND AND THE RECONSTRUCTION OF FISCAL NEUTRALITY

The fifth analytical result is that the broadening and rationalisation of deduction and refund rights is the main channel through which VAT convergence can improve the economic environment in Moldova. In a scenario of full harmonisation, point-by-point limitations and fragmented refund treatments would disappear, and VAT relating to acquisitions used for taxable or deduction-entitled operations would no longer remain a definitive cost. This proposition is not merely technical. It goes to the heart of investment economics. Where capital goods, buildings, machinery, software or working inventories carry non-recoverable VAT, the tax system raises the effective cost of capital, reduces internal liquidity and increases the need for external financing. From the standpoint of the banking sector, that translates into larger working-capital lines, longer cash conversion cycles and weaker liquidity ratios for borrowers.

Union VAT law proceeds from the opposite intuition: undertakings should not bear the burden of VAT insofar as they engage in taxable activity. This is why the right of deduction is central to the architecture of Directive 2006/112/EC and why refund systems for non-established persons and for cross-border operators are part of the wider acquis. In the Moldovan context, the movement towards

a more principle-based refund regime can therefore be expected to generate a double benefit. At firm level, it improves liquidity and makes prices less tax-cumulative. At macro level, it reduces the wedge between productive investment and post-tax cost, especially in sectors with longer investment cycles or heavy import intensity.

A related and highly practical consequence concerns acquisitions from the European Union. Once Moldova fully participates in a Union-style destination-based system for intra-Community trade, acquisitions from the EU would no longer be treated as classic imports for VAT purposes. The usual treatment would become self-assessment or reverse charge rather than payment of VAT at customs. In accounting terms, output VAT and input VAT would be recognised through the VAT return rather than through an immediate cash outflow at the border. The implications are considerable. The company does not need to pre-finance the tax at customs; customs clearance is simplified from a VAT perspective; and treasury management becomes more predictable. For a small, open and import-dependent economy such as Moldova, the cash-flow effect alone makes this a strategically important dimension of convergence.

VIDA AND THE DIGITAL TRANSFORMATION OF VAT GOVERNANCE

The sixth analytical result is that the future of VAT convergence in Moldova cannot be understood without reference to the VAT in the Digital Age package. Official Union sources confirm that the package was adopted on 11 March 2025, published in the Official Journal on 25 March 2025 and rolled out progressively until January 2035. The package combines three pillars: digital reporting requirements based on electronic invoicing, revised VAT rules for the platform economy and an expansion of single VAT registration tools. The Council explicitly describes the reform as one that will make VAT reporting for cross-border B2B transactions fully digital by 2030, require platforms in short-term accommodation and passenger transport to account for VAT in most situations where underlying providers do not do so, and expand one-stop-shop mechanisms to reduce multiple VAT registrations. The Commission, in turn, emphasises that the new system introduces real-time digital reporting for cross-border trade based on e-invoicing and replaces the current recapitulative statement model while paving the way for convergence of national digital reporting systems.

For Moldova, the ViDA package is important for two reasons. First, it changes the target. Approximation to Directive 2006/112/EC alone is no longer sufficient if the broader Union environment is moving towards digital reporting, centralised registration and platform-mediated compliance. Second, Moldova already possesses a relevant digital base in the form of SIA e-Factura. This does not mean that the country is automatically compatible with the Union standard, but it does mean that the transition can build on an existing institutional habit of electronic documentation. The next challenge is qualitative: aligning data fields, invoice logic, reporting flows, validation rules and governance protocols with the Union approach.

The operational consequences will be substantial. VAT governance will progressively move from periodical declaration and ex post control to faster, more granular and more standardised information flows. Businesses will need to treat invoicing data as fiscal data of strategic importance. Tax administrations will need stronger analytics, better data governance, and secure interoperability. Platform operators, payment service providers and intermediaries will enter the VAT compliance chain more visibly. The result is that VAT convergence becomes part of Moldova's broader digital state transformation. Tax law, IT architecture, data standards and anti-fraud capacity will increasingly function as one integrated domain.

EXPECTED EFFECTS ON BUSINESS BEHAVIOUR, LIQUIDITY AND MARKET INTEGRATION

The final result of the analytical discussion concerns expected behavioural and economic effects. There are three main practical ideas: the elimination of fragmented limits on VAT refunds, the reduction of VAT blocked in costs through the redesign of exemptions and reduced rates, and the

disappearance of customs VAT on acquisitions from the European Union. These points can be developed into a broader convergence narrative. First, improved recovery of input VAT should enhance firm liquidity and lower the cost of financing stock, machinery and fixed investment. Second, replacing some exemptions without deduction by reduced rates or taxable treatment with deduction should make prices more transparent and reduce cumulative hidden tax. Third, treating EU-origin goods as intra-Community acquisitions rather than as imports would decrease customs-related cash outflows and strengthen integration into European supply chains.

The impact will not be identical across all sectors. Trading companies and import-dependent manufacturers may benefit most visibly from the disappearance of VAT-at-customs on EU acquisitions. Capital-intensive sectors may gain most from broader deduction and refund rights. Hotels, restaurants, health-related sectors and providers of reduced-rate goods will experience the effects of Annex III alignment and of the redesign of exemptions. SMEs may benefit from both simplification and expanded access to one-stop-shop logic, though the Union SME regime also illustrates an important trade-off: exemption simplifies compliance but removes the right to deduct. This means that policy choices in Moldova should be calibrated not only by legal compatibility, but also by sectoral neutrality and by the financing structure of taxpayers.

From the standpoint of the banking system, VAT convergence may indirectly improve credit quality in segments where VAT currently strains liquidity. If working-capital needs become less volatile and less burdened by pre-financing of tax at the border, companies become easier to finance and less exposed to payment stress caused by refund delays. For public finances, the effect is more nuanced. In the short term, transition costs may be significant and some traditional control points, such as VAT-at-customs on EU inflows, would disappear. In the medium to long term, however, the Union model offers compensating gains through better data, stronger antifraud tools, improved compliance and a tax base that is more consistent with integrated trade. The central point is that VAT convergence should not be evaluated only as a matter of immediate revenue yield. It should also be assessed in terms of reduction of distortions, alignment with business reality and the credibility of Moldova's market integration trajectory.

RECOMMENDATIONS

The first recommendation is to move from piecemeal amendment to systemic recodification of Title III of the Tax Code. A comprehensive drafting exercise is preferable to incremental insertions because the Union VAT model is internally structured. Its concepts, taxable person, taxable transactions, place of supply, chargeability, deduction, exemption, special regimes and administrative cooperation, depend on one another. Isolated transplanting of rules risks conceptual collisions and uneven enforceability. Moldova should therefore prepare a recodified VAT title organised according to the architecture of Directive 2006/112/EC rather than according to the current domestic structure centred on internal supplies and imports.

The second recommendation is to adopt a dual-track implementation roadmap that treats legal approximation and digital interoperability as parallel priorities. The State Tax Service should not wait for final transposition to begin the technical work needed for CCN connection, data model adaptation, VAT ID validation routines, refund-flow design and the progressive alignment of SIA e-Factura with Union-oriented e-invoicing logic. A governance board involving the Ministry of Finance, the State Tax Service, customs, payment regulators and representatives of the business community would help sequence these reforms and reduce the risk of legal change unsupported by operational capacity.

The third recommendation is to review reduced rates and exemptions through a neutrality-based decision matrix. Each current exemption should be tested against three questions: is it compatible with the Union acquis; does it produce blocked VAT in cost; and can the policy objective be achieved more efficiently through a reduced rate rather than through exemption without deduction? Categories such as books, passenger transport, selected utilities and socially sensitive goods deserve priority review because the Union framework frequently allows reduced rates while discouraging broad

domestic exemptions that trap input VAT. The same logic should be applied to investment-related treatment and capital goods. A policy that appears generous on the output side but penalises deduction on the input side is often economically inefficient.

The fourth recommendation is to redesign VAT refunds as a principle-driven mechanism, not as a patchwork of sectoral windows. The right to deduction and the right to refund should be clearly linked to taxable operations and operations that carry the right of deduction, with objective and transparent procedural safeguards against fraud. At the same time, Moldova should develop the institutional capacity necessary for future VAT refund interactions with non-established persons through European-style mechanisms. Faster, more predictable refunds would support investment and reduce the need for compensatory financing by enterprises.

The fifth recommendation is to prepare businesses before, not after, final legislative adoption. Companies need time to classify counterparties correctly, redesign ERP rules, update documentary standards, map fixed establishments, build transport evidence chains, and prepare for electronic reporting. Sectoral guidance notes, pilot compliance programmes and training modules for accountants, lawyers, logistics professionals and IT teams should therefore accompany the legislative process from an early stage.

CONCLUSION

This article has argued that VAT should be understood as a strategic tool of European convergence for the Republic of Moldova. The argument rests on a simple but far-reaching proposition: the value of approximation lies less in numerical rate alignment and more in the adoption of the legal and operational logic that sustains the Single Market. Fiscal neutrality, destination-based taxation, intra-Community qualification of flows, robust place-of-supply rules, broad and coherent deduction rights, digital reporting and administrative interoperability are not isolated technicalities. Together they form a common framework through which the Union turns cross-border trade into a manageable, comparable and fiscally neutral environment.

Moldovan tax legislation must move from a VAT system in which domestic supplies and imports still dominate the legal imagination to one in which the classification of cross-border flows, the taxable status of counterparties, documentary evidence and digital exchange of data become decisive. Broader recovery of input VAT can improve liquidity and reduce the embedded tax burden in investment. The redesign of exemptions and reduced rates can make the system more coherent and less distortive. The treatment of acquisitions from the European Union through reverse charge rather than VAT-at-customs can significantly improve business cash flow. Interoperability with Union systems can strengthen anti-fraud capacity while bringing Moldovan tax administration into the European cooperation architecture.

At the same time, the article has shown that these gains are conditional. They require coherent recodification, institutional capacity, digital infrastructure, business preparedness and a reform philosophy guided by neutrality rather than by fragmented exception-making. If Moldova succeeds on these fronts, VAT will become more than a tax chapter adjusted for accession purposes. It will become one of the principal legal infrastructures through which the country integrates economically, administratively and procedurally into the European Single Market. Understood in this way, VAT is not only a consumption tax. It is a practical instrument of convergence, discipline and mutual recognisability across jurisdictions.

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CONSEQUENCES OF THE CRISES ON THE BUDGETARY-FISCAL INDICATORS IN THE REPUBLIC OF MOLDOVA

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Abstract: *Effective management of budgetary and fiscal indicators is a cornerstone of economic stability and sustainable development. These indicators – public revenues, expenditures, budget deficits, and public debt – reflect a nation's financial health and its capacity to withstand economic shocks. In the case of the Republic of Moldova, a small, landlocked country in Eastern Europe, their importance is magnified by structural vulnerabilities and a complex geopolitical context. Since gaining independence in 1991, Moldova has undergone a challenging transition to a market economy, marked by a series of crises that have profoundly shaped its fiscal framework.*

Budgetary and fiscal indicators form the foundation of macroeconomic governance, influencing external credibility, investor confidence, and overall economic stability. In Moldova's context, sound fiscal management is critical to mitigating dependence on agricultural exports, addressing high migration levels, and managing the significant role of remittances in the national economy. Moreover, these indicators reflect the government's capacity to sustain essential public services and reduce social inequalities, particularly during periods of economic turbulence.

This study seeks to analyze the evolution of Moldova's budgetary and fiscal indicators under the impact of major economic crises in the post-Soviet era. Its main objectives are: (1) to identify key crises that have influenced the country's fiscal environment; (2) to examine their effects on revenues, expenditures, fiscal deficits, and public debt; and (3) to evaluate government responses and their effectiveness in addressing fiscal challenges. The analysis covers both historical and contemporary crises, including the post-Soviet transition, the 2008–2009 global financial crisis, the 2014 banking crisis, the COVID-19 pandemic, and the economic spillovers of the ongoing war in Ukraine.

Applying a mixed-methods approach, the study integrates qualitative and quantitative analyses based on official data from the Ministry of Finance, the National Bank of Moldova, and international institutions such as the IMF and the World Bank, complemented by secondary sources including academic studies, policy reports, and media analyses. The findings provide an integrated perspective on Moldova's fiscal resilience and contribute to the formulation of practical recommendations aimed at strengthening governmental capacity for fiscal crisis management and long-term economic stability.

Key words: *fiscal management; economic crises; public finance; Moldova; budgetary indicators; fiscal resilience.*

JEL CLASSIFICATION*: E2, H30. H50, H60, O23, P27.*

INTRODUCTION

Effective management of fiscal-budgetary indicators is crucial for ensuring economic stability and fostering sustainable development. These indicators, such as public revenues, expenditures, deficits, and debt levels, provide a clear picture of a nation's financial health and its capacity to withstand economic shocks. For the Republic of Moldova, a small landlocked country in Eastern Europe, this importance is amplified by its unique geographical, political, and economic challenges. Since gaining independence from the Soviet Union in 1991, Moldova has navigated a complex transition to a market economy, facing numerous crises that have profoundly shaped its fiscal landscape.

Fiscal-budgetary indicators are the backbone of macroeconomic policy and governance. They influence a country's creditworthiness, investor confidence, and overall economic stability. For Moldova, fiscal management plays a pivotal role in addressing structural vulnerabilities, such as a reliance on agricultural exports, high levels of migration, and a significant dependence on

remittances. Furthermore, these indicators reflect the government's ability to maintain vital public services and address social inequalities, especially during periods of economic turbulence.

In the context of Moldova, where economic shocks have frequently disrupted fiscal stability, understanding these indicators is crucial. They highlight the country's resilience to crises and its capacity to implement effective recovery policies, ensuring long-term growth and stability.

This case study aims to examine the evolution of Moldova's budgetary-fiscal indicators under the influence of economic crises. The primary objectives are:

- To identify the main crises that have affected Moldova's fiscal landscape since independence.
- To analyze the impact of these crises on key fiscal indicators such as revenue, expenditure, fiscal deficit, and public debt.
- To evaluate how governments respond to fiscal challenges and how effective these responses are.

The study covers both past and recent crises, including the post-Soviet transition, the global financial crisis of 2008–2009, the 2014 banking crisis, the COVID-19 pandemic, and the economic consequences linked to the ongoing war in Ukraine. The analysis is placed within Moldova's wider economic and geopolitical setting, with a focus on how these events have influenced fiscal policy and the country's overall economic development.

The research is based on a combination of qualitative and quantitative methods, allowing for a well-rounded examination of the subject. It draws on historical and current data related to Moldova's fiscal indicators to trace key trends and evaluate the effects of various crises. The main sources of information include official data from the Ministry of Finance, the National Bank of Moldova, as well as international institutions such as the IMF and the World Bank. In addition, academic publications, policy analyses, and media materials are used to support the interpretation of the results.

Such an approach makes it possible to reflect the complexity of the challenges faced by Moldova as a small developing country operating in a volatile geopolitical environment. By combining theoretical perspectives with empirical data, the study seeks to contribute to discussions on fiscal resilience and crisis management, while also offering practical insights for decision-makers and other relevant stakeholders.

THE IMPACT OF ECONOMIC CRISES ON FISCAL INDICATORS. POST SOVIETIC CRISIS

The Republic of Moldova faced immense challenges during its transition from a centrally planned economy to a market-oriented system following the dissolution of the Soviet Union in 1991. As a small, agriculture-dependent nation with limited industrialization and high reliance on Soviet-era trade networks, the shift to independence came with profound economic disruptions. The transition period reshaped Moldova's fiscal landscape, influenced macroeconomic stability, and had lasting social and economic implications.

The collapse of the Soviet Union severed Moldova's economic ties with its traditional trade partners, causing a significant contraction in economic output. Between 1991 and 1999, Moldova's GDP shrank by over 60%, reflecting one of the sharpest declines among former Soviet republics (*World Bank, 2000*). This contraction was driven by the collapse of state-owned enterprises, declining agricultural productivity, and the sudden loss of centralized subsidies.

The sharp reduction in economic activity had a direct impact on government revenues:

1. *Shrinking Tax Base:* The closure of inefficient, state-owned factories and businesses drastically reduced the corporate tax contributions that had sustained public finances during the Soviet era.
2. *Weakened Trade Revenues:* Exports, particularly agricultural products, fell sharply as traditional markets in Russia and other Soviet successor states contracted. Customs duties, which had been a significant revenue source, declined in tandem.
3. *Erosion of Social Contributions:* High unemployment levels and stagnant wages meant reduced social insurance contributions, placing additional strain on Moldova's budget.

Moldova's decision to transition to a market economy necessitated the liberalization of prices and the removal of state subsidies. These reforms led to hyperinflation, which peaked at over 1,000% in the early 1990s, eroding household savings and the real value of government revenues (*IMF, 1995*). Inflation was exacerbated by currency instability following the introduction of the Moldovan leu in 1993.

The sharp depreciation of the leu against major currencies increased the cost of imports and made debt servicing more expensive, further complicating fiscal planning. In this volatile environment, maintaining budgetary discipline became a significant challenge, with real-term declines in government spending on social programs and public services.

Moldova's fiscal position deteriorated rapidly during the transition period, with the fiscal deficit averaging 8% of GDP annually in the mid-1990s (*World Bank, 2000*). This widening deficit was the result of:

1. *Increased Expenditures:* The government was forced to expand social safety nets, including unemployment benefits and pensions, to cushion the impact of economic shocks on households.

2. *Declining Revenues:* With tax collections falling and trade revenues dwindling, the government relied heavily on external borrowing to finance its budget shortfalls.

3. *Public Debt Accumulation:* By the end of the 1990s, public debt had ballooned to unsustainable levels, limiting Moldova's ability to invest in critical infrastructure and development.

Moldova relied heavily on international financial institutions such as the International Monetary Fund (IMF) and the World Bank for financial assistance during its transition. These organizations provided loans and grants to stabilize the economy but imposed conditions requiring fiscal austerity, privatization, and structural reforms. While these measures aimed to restore fiscal stability, they often led to cuts in public spending, exacerbating social inequalities and fuelling public dissatisfaction.

GLOBAL FINANCIAL CRISIS 2008 – 2009

The global financial crisis of 2008–2009 had a significant impact on Moldova, revealing structural weaknesses in both its fiscal framework and the broader economy. As a small and open economy with a strong dependence on external trade and remittance inflows, the country proved highly sensitive to external shocks. The crisis affected key fiscal and budgetary indicators, placing considerable pressure on public finances and requiring a prompt policy response.

In 2009, Moldova's GDP declined by 6%, interrupting a period of sustained growth and marking the most severe downturn since independence. This contraction was largely driven by external factors.

Exports fell by 22%, highlighting the country's reliance on external markets, particularly the European Union and Russia. Demand for agricultural products – one of Moldova's main export categories – weakened, while global prices declined, further deepening the drop in export

At the same time, *remittances*, which represented a major source of household income and amounted to around 30% of GDP in 2008, decreased by 18% in 2009. This reduction had a direct effect on domestic consumption, which is a key contributor to value-added tax (VAT) revenues.

1. Tax Revenues:

The crisis also had notable consequences for fiscal revenues. Tax collections declined, reflecting the broader economic slowdown.

In particular, revenues from VAT dropped sharply as domestic demand weakened. This was especially important given that, prior to the crisis, VAT accounted for more than 40% of total tax revenues (*IMF, 2011*). The decrease in VAT receipts mirrored lower household spending and reduced economic activity across several sectors.

Corporate Income Tax: With businesses grappling with reduced demand and profitability, corporate income tax contributions fell significantly. Many companies faced liquidity challenges, further reducing their taxable income base.

2. Customs Revenue:

Moldova's trade dynamics suffered from both declining exports and reduced imports. Lower import volumes led to a reduction in customs duties, a critical revenue source. As trade partners implemented protectionist measures and global demand waned, Moldova's customs revenue fell by over 15% compared to 2008 levels (*IMF, 2011*).

The agricultural sector, heavily reliant on imported inputs, faced cost pressures from currency depreciation, further dampening trade-related revenues.

3. Social contributions

Unemployment increased as businesses downsized, reducing contributions to social insurance funds. This exacerbated fiscal pressures, as the government simultaneously faced higher demands for social benefits.

The crisis exposed significant structural vulnerabilities within Moldova's fiscal and economic systems, underscoring the need for comprehensive reforms.

1. Dependence on External Revenues:

- Moldova's tax system was heavily reliant on indirect taxes, such as VAT and customs duties, which are highly sensitive to economic downturns. The crisis revealed the fragility of this revenue structure and the need to diversify the tax base.

2. Inefficiencies in Tax Collection:

- The informal economy, estimated to account for 30–40% of GDP, remained largely untaxed. This issue became more pronounced during the crisis, as informal activities increased while formal business activity contracted (*World Bank, 2010*).

3. Debt Accumulation:

- To cover revenue shortfalls, the government resorted to increased borrowing, both domestically and externally. Public debt rose from 18.5% of GDP in 2008 to 25.8% in 2009, creating long-term fiscal sustainability challenges (*IMF, 2011*).

BANKING CRISIS 2014

The 2014 banking crisis in Moldova was one of the most significant economic shocks in the country's modern history. Often referred to as "the theft of the century," this crisis exposed systemic vulnerabilities in the nation's governance, regulatory, and fiscal frameworks. The fraudulent activities in three major banks – Banca de Economii, Banca Socială, and Unibank – resulted in loans amounting to approximately $1 billion, or 12% of GDP (*USAID, 2016*). These activities severely undermined trust in the financial sector and had profound implications for Moldova's fiscal indicators.

The government's decision to intervene in the 2014 banking crisis through a bailout of the insolvent banks – Banca de Economii, Banca Socială, and Unibank – had profound implications for Moldova's public debt. To stabilize the banking sector, the government issued bonds worth approximately $1 billion to cover the financial shortfall caused by fraudulent loans. This intervention resulted in a sharp increase in public debt, which surged from 33.7% of GDP in 2014 to 50.2% in 2016 (*World Bank, 2018*).

The issuance of bonds effectively transferred the financial burden to the public sector, creating long-term challenges for debt sustainability. The sharp rise in public debt raised concerns about the government's capacity to preserve fiscal discipline while at the same time meeting other economic and social priorities. Debt servicing costs, including interest payments, began to take up an increasing share of the state budget, thereby limiting resources available for public investment and essential services. In addition, the growing debt burden made the country more exposed to external shocks, particularly because a considerable share of the debt was denominated in foreign currency, increasing sensitivity to exchange rate fluctuations.

Following the crisis, the fiscal deficit widened markedly as government spending increased – largely due to the bank rescue measures – while revenues declined at the same time. In 2015, the deficit reached 3.2% of GDP, compared to 1.8% in the previous year, illustrating the pressure on

public finances. (*USAID, 2016*) The fiscal cost of the intervention included both immediate expenditures to stabilize the banking system and longer-term obligations related to servicing the issued bonds.

The broader economic slowdown further contributed to the deterioration of the fiscal balance. Lower business activity and weaker household consumption resulted in reduced tax revenues, which form the basis of budget revenues. In response, the government had to reallocate funds, often at the expense of development projects and social programmes, postponing important investments in infrastructure, education, and healthcare.

The post-crisis economic instability also affected the country's capacity to generate fiscal revenues. Declines in business activity and consumption translated into lower tax collection, particularly in the case of value-added tax (VAT) and corporate income tax. (*World Bank, 2018*) As these sources represent a significant share of budget revenues, their reduction further constrained the government's fiscal position.

VAT, which is heavily reliant on consumer spending, suffered as inflation and economic uncertainty reduced household expenditures. Similarly, corporate income taxes declined due to decreased profitability in the private sector, which faced tighter credit conditions and a loss of market confidence (*National Bank of Moldova, 2016*). The reduction in these revenues underscored the fragility of Moldova's tax system, which lacked the breadth and resilience to withstand such a significant economic shock.

Efforts to address the decline in tax revenue included initiatives to improve tax compliance and broaden the tax base. However, these measures faced significant challenges, including the prevalence of informal economic activities and limited administrative capacity within the tax authorities (*USAID, 2016*). The decline in revenues further highlighted the need for comprehensive fiscal reforms to build a more robust and diversified revenue system capable of supporting Moldova's long-term development goals.

COVID – 19 PANDEMICS

The COVID-19 pandemic had a profound impact on Moldova's fiscal framework, revealing structural vulnerabilities in its public finances. As the pandemic triggered a global economic slowdown, Moldova's fiscal and budgetary indicators reflected the economic strain, driven by reduced revenues, increased expenditures, and growing public debt. Below is an analysis of the pandemic's effects through the lens of budgetary and fiscal performance.

Moldova's economy contracted by 7.2% in 2020, marking its sharpest decline since the 2009 global financial crisis. This contraction was fueled by reduced domestic economic activity, global trade disruptions, and a severe drought that impacted agricultural output – a sector critical to the country's revenue base (*World Bank, 2020*).

The economic slowdown caused significant declines in revenue collections:

- *Tax Revenues:* VAT revenues, which heavily rely on consumer spending, fell due to reduced consumption during lockdowns and the economic slowdown. Corporate income tax collections also declined as businesses reported lower profits or faced losses.
- *Customs Revenues:* Trade activity contracted sharply, with both imports and exports declining, leading to lower customs duty collections—a key revenue source for Moldova.

Overall, fiscal revenues fell by approximately 9% compared to pre-pandemic forecasts, further constraining the government's ability to fund its growing expenditures.

To address the immediate social and economic challenges posed by the pandemic, Moldova significantly increased public expenditures, which included:

- *Healthcare Spending:* Emergency funding was allocated to support hospitals, procure medical supplies, and implement pandemic response measures.
- *Social Assistance:* The government introduced and expanded social protection programs, such as unemployment benefits and direct financial support for vulnerable households.

These measures, combined with declining revenues, resulted in a sharp increase in the fiscal deficit, which widened to 5.1% of GDP in 2020, up from 1.4% in 2019 (*IMF, 2021*). This was the highest fiscal deficit recorded in over a decade, reflecting the strain of pandemic-related expenditures.

To finance the growing fiscal deficit, Moldova resorted to increased borrowing, leading to a rise in public debt:

- Public debt as a percentage of GDP increased from 27.6% in 2019 to 35.2% in 2020. While still below the critical threshold for debt sustainability, this rapid rise raised concerns about the country's fiscal stability in the medium term (*World Bank, 2020*).

The pandemic created additional fiscal pressures through its effects on inflation and currency stability:

- *Inflation:* While inflation remained relatively subdued at 3.8% in 2020 due to weak domestic demand, food price volatility caused by supply chain disruptions led to localized inflationary spikes (*National Bank of Moldova, 2021*).
- *Exchange Rate Depreciation*: The Moldovan leu depreciated against major currencies in early 2020, increasing the cost of servicing foreign-denominated debt and adding to fiscal pressures.

EVOLUTION OF FISCAL-BUDGETARY INDICATORS IN THE REPUBLIC OF MOLDOVA. GOVERNMENT EXPENDITURES: PRIORITIES AND ADJUSTMENTS

Moldova's fiscal policy has undergone significant shifts to address the pressing needs during different crises. During the transition from the Soviet Union in 1991, the country faced a steep economic decline, necessitating substantial reallocation of resources to maintain essential public services. The government prioritized social protection and agricultural subsidies due to the economy's reliance on rural livelihoods. Legal frameworks, such as the Law on Local Public Finance (Law No. 397/2003, Article 7), established mechanisms for equitable fiscal transfers, enabling local governments to sustain basic service delivery.

The 2008 global financial crisis marked a different challenge. Reduced remittances and limited export revenues pressured the government to consolidate fiscal expenditures. Capital investment projects were curtailed, and spending was directed towards social sectors, ensuring basic welfare amidst economic contraction. The Medium-Term Expenditure Framework emphasized expenditure rationalization to maintain fiscal discipline.

In the aftermath of the 2014 banking crisis, public expenditures had to be reoriented to cover substantial losses in the financial sector. Approximately 13% of GDP was allocated to stabilize the banking sector, which increased pressures on other budgetary allocations. The Law on Public Debt and State Guarantees (Law No. 419/2006, Articles 12-13) provided the legislative basis for such state interventions, yet the burden limited investments in infrastructure and healthcare.

The COVID-19 pandemic in 2020 exacerbated fiscal pressures as revenues declined sharply, and expenditures surged to finance healthcare and social protection programs. Under Government Decision No. 386/2020, funds were reallocated for pandemic relief efforts, such as medical supplies and direct financial aid to vulnerable groups. Despite these measures, reliance on external borrowing increased, straining fiscal sustainability.

FISCAL DEFICITS AND PUBLIC DEBT DYNAMICS

The collapse of the Soviet Union in 1991 left Moldova grappling with severe economic and structural challenges, highlighting the broader difficulties of crisis management and economic resilience. As a newly independent state, Moldova faced the urgent task of establishing a fiscal system while navigating a collapsing economy. The country's small industrial base and heavy reliance on agricultural exports created structural fiscal imbalances that hindered sustainable development. Post-1995 trends indicate that government expenditures as a share of GDP peaked at over 45% during the mid-1990s, reflecting efforts to stabilize essential public services, transition to a market economy, and address widespread rural poverty. Public debt increased significantly during this period due to

reliance on external borrowing to finance critical imports, budget support, and government expenditures. According to the Law on State Debt (Law No. 181/2014, Article 4), fiscal policy was constrained by the dual need to stabilize the national currency and manage foreign debt obligations. This period underscored the inefficiencies inherent in building fiscal institutions from scratch, exacerbated by the lack of a robust industrial base and overdependence on agricultural exports, which made achieving fiscal sustainability particularly challenging.

The 2008 global financial crisis exposed Moldova's vulnerabilities to external shocks, particularly its dependence on remittances and exports. As remittance flows declined, household incomes contracted, leading to reduced domestic consumption and economic growth. In response, government expenditures rose to 45.3% of GDP in 2008, as shown in, reflecting efforts to cushion the social and economic impacts of the crisis. Spending priorities during this period included social transfers, public sector wages, and support for small and medium enterprises. Public debt, which had fallen to 18.44% of GDP in 2008, began to increase as the economic downturn led to growing fiscal deficits financed through borrowing. As a result, central government debt rose to 27.63% of GDP by 2009. Despite the pressures associated with the crisis, the relatively solid fiscal position prior to 2008 allowed the government to introduce countercyclical measures without facing immediate risks to debt sustainability. However, the gains achieved in stabilizing public debt were largely undermined by the banking crisis of 2014.

The 2014 banking crisis marked a turning point in Moldova's fiscal trajectory and was largely driven by fraud within the financial sector. The cost of rescuing the banking system—estimated at more than 13% of GDP—placed a heavy burden on public finances. Public debt increased significantly, from 23.24% of GDP in 2013 to over 30% by 2016, and approached 40% of GDP by the end of the crisis period. This sharp rise exposed underlying weaknesses in regulatory oversight and fiscal transparency, which contributed to the country's vulnerability to financial shocks.

During this period, overall government spending remained broadly stable, at around 33–35% of GDP. At the same time, its structure changed noticeably, with capital expenditures reduced in order to accommodate the costs associated with stabilizing the financial sector. The crisis had not only immediate fiscal consequences but also longer-term effects on public confidence and the investment environment. It underscored the importance of stronger institutions and more prudent fiscal management in limiting the impact of similar shocks in the future. International financial institutions played an important role by providing both financial support and technical assistance aimed at restoring stability in the banking sector, rebuilding fiscal credibility, and improving governance within the financial system.

The COVID-19 pandemic in 2020 presented unprecedented fiscal challenges for Moldova, resulting in a sharp surge in both fiscal deficits and public debt. Government expenditures increased significantly, rising from 31.53% of GDP in 2019 to 36.69% in 2020. This increase was driven by healthcare spending, social protection programs, and economic relief measures aimed at mitigating the immediate impact of the pandemic on vulnerable populations and ensuring the continuity of essential services. The fiscal deficit ballooned to approximately 9% of GDP, highlighting the scale of the government's response. The pandemic also led to a significant rise in public debt, which grew from 27.51% of GDP in 2019 to 33.96% in 2020. By 2022, central government debt had risen further to 34.52% of GDP, reflecting the reliance on external borrowing to finance pandemic-related expenditures. International financial institutions, such as the IMF and the World Bank, provided critical support during this period through concessional loans and grants, bolstering Moldova's fiscal capacity. This external assistance was vital in addressing immediate financing needs but underscored Moldova's structural dependency on international aid during crises. The pandemic exposed the weaknesses in Moldova's fiscal system, particularly its limited capacity to generate domestic revenues. While the increased spending prioritized urgent relief measures, the elevated levels of public debt have posed significant risks to fiscal sustainability. Moving forward, addressing these structural weaknesses and diversifying fiscal revenues will be critical to reducing dependency on external aid and ensuring long-term economic stability.

The trends underscore the cyclical nature of Moldova's fiscal deficits and public debt dynamics, highlighting the tensions between addressing immediate needs during crises and ensuring long-term fiscal sustainability. Government expenditures as a share of GDP have fluctuated significantly during periods of crisis, reflecting the prioritization of social and economic stabilization measures. Concurrently, public debt levels have exhibited a general upward trend, particularly during the 2014 banking crisis and the COVID-19 pandemic. These patterns emphasize the critical need for maintaining fiscal buffers and implementing structural reforms to enhance resilience against future shocks. International financial institutions have played a crucial role in stabilizing Moldova's economy during crises, providing indispensable support through concessional loans and grants. However, this reliance on external assistance has also contributed to the growing burden of public debt, further complicating fiscal consolidation efforts. The lessons from Moldova's recurring crises underline the importance of sound fiscal management, improved governance, and economic diversification. Institutional reforms are essential to reducing vulnerability to external shocks and fostering sustainable economic growth, enabling Moldova to balance the demands of crisis response with long-term fiscal health.

GOVERNMENT RESPONSES TO CRISES. FISCAL POLICY ADJUSTMENTS

The collapse of the Soviet Union in 1991 left Moldova with a nascent fiscal system, an economic contraction exceeding 50%, and widespread poverty. Fiscal policy during this period focused on establishing the foundational structures for revenue generation and expenditure management. Government expenditures exceeded 45% of GDP during the mid-1990s, reflecting the state's commitment to stabilizing public services, social protection, and transitioning to a market economy. Public debt rose sharply as Moldova relied on external borrowing to finance critical imports and social programs. As outlined in the Law on Local Public Finance (Law No. 397/2003, Article 7), fiscal adjustments aimed to ensure equitable resource allocation to local governments, addressing disparities while managing scarce resources. However, inefficiencies in the nascent fiscal framework and the overreliance on agriculture and remittances constrained Moldova's capacity to achieve fiscal sustainability.

The 2008 global financial crisis highlighted Moldova's vulnerability to external shocks, including declining remittances and reduced export revenues. The government adopted countercyclical fiscal measures to mitigate the crisis's impact. Government expenditures peaked at 45.3% of GDP in 2008, prioritizing social transfers, public sector wages, and support for small and medium enterprises. Public debt, which had declined to 18.44% of GDP by 2008, began to rise as fiscal deficits were financed through external borrowing. By 2009, debt reached 27.63% of GDP. Policies guided by the State Debt and Guarantees Law (Law No. 419/2006, Article 12) emphasized maintaining fiscal discipline while diversifying the export base and ensuring social safety nets. Moldova's pre-crisis fiscal prudence enabled the government to respond effectively, demonstrating the importance of fiscal buffers.

The 2014 banking crisis, a result of fraudulent activities within Moldova's financial sector, caused a profound fiscal shock. The government was forced to issue guarantees amounting to over 13% of GDP to stabilize the banking system, raising public debt from 23.24% of GDP in 2013 to over 30% by 2016. Government expenditures remained stable at approximately 33%-35% of GDP, but the composition shifted, with capital investments curtailed to accommodate financial stabilization costs. This crisis revealed systemic weaknesses in financial governance and regulatory oversight. Efforts to rebuild trust in the financial sector were supported by international institutions, which provided technical and financial assistance. The Law on Public Finances and Budgetary Responsibilities (Law No. 181/2014) played a pivotal role in ensuring fiscal accountability during the recovery process. However, the long-term consequences of this crisis, including increased public debt and diminished investor confidence, underscored the need for comprehensive institutional reforms.

The COVID-19 pandemic posed unprecedented challenges to Moldova's fiscal policy. Government expenditures surged from 31.53% of GDP in 2019 to 36.69% in 2020, driven by increased spending on healthcare, social protection, and economic relief measures. The fiscal deficit widened to 9% of GDP, while public debt rose from 27.51% of GDP in 2019 to 33.96% in 2020. By 2022, public debt had further increased to 34.52% of GDP. International financial institutions, including the IMF and World Bank, provided concessional loans and grants to support Moldova's pandemic response. Under Government Decision No. 386/2020, funds were reallocated for emergency health measures and financial aid to vulnerable groups. However, the pandemic exposed structural weaknesses in Moldova's fiscal framework, including limited domestic revenue generation and heavy reliance on external aid. The long-term sustainability of Moldova's fiscal policies remains a pressing concern, as elevated debt levels constrain future investment capacity.

CRISIS MITIGATION PROGRAMS AND THEIR EFFECTIVENESS

Following the collapse of the Soviet Union in 1991, Moldova faced a severe economic contraction, skyrocketing unemployment, and widespread poverty. The government implemented several foundational programs to mitigate the effects of this transition. Key among these were fiscal decentralization measures under the Law on Local Public Finance (Law No. 397/2003), which aimed to ensure equitable resource distribution and empower local authorities to address regional disparities. Additionally, subsidies for agriculture and energy sectors were introduced to stabilize critical industries during the transition to a market economy. These programs had mixed effectiveness. While fiscal decentralization helped maintain basic public services in rural areas, inefficiencies in resource allocation and weak institutional capacities limited their impact. Heavy reliance on external borrowing for program financing exacerbated public debt levels, creating long-term vulnerabilities. Nonetheless, the programs laid the groundwork for Moldova's fiscal system and marked an essential step in its economic transformation.

The global financial crisis of 2008 revealed Moldova's strong reliance on remittances and exports, which led to a sharp decline in household incomes and a slowdown in economic growth. In response, the government introduced countercyclical fiscal measures, increasing spending on social protection and providing support to small and medium-sized enterprises. Government expenditures reached 45.3% of GDP in 2008, reflecting the scale of these interventions. At the same time, the legal framework for managing rising fiscal risks was ensured by the State Debt and Guarantees Law (Law No. 419/2006), as public debt increased to 27.63% of GDP by 2009. These measures helped stabilize household consumption and maintain the provision of essential social services. However, their scope remained limited due to structural constraints, particularly the narrow domestic revenue base. The crisis underscored the importance of maintaining fiscal buffers, as relatively low debt levels prior to the crisis enabled the government to act without undermining fiscal sustainability.

The 2014 banking crisis, widely known as the "Trillion Theft," marked a critical point in Moldova's fiscal development. Large-scale fraud in the financial sector required substantial government intervention, including guarantees equivalent to around 13% of GDP to support the banking system. The response combined direct financial support, regulatory changes, and assistance from international financial institutions. While these measures succeeded in stabilizing the banking sector in the short term, their longer-term consequences proved more challenging. Public debt increased significantly, exceeding 30% of GDP by 2016, and investor confidence weakened. The Law on Public Finances and Budgetary Responsibility (Law No. 181/2014) contributed to improving transparency and accountability in fiscal management after the crisis. At the same time, the limited recovery of misappropriated assets and the slow pace of institutional reforms pointed to the need for stronger governance mechanisms to reduce the risk of similar crises in the future.

The COVID-19 pandemic in 2020 presented unprecedented challenges, necessitating a rapid and comprehensive response. Moldova's crisis mitigation programs focused on healthcare spending, social protection, and economic relief measures. Under Government Decision No. 386/2020, funds

were reallocated to finance medical supplies, direct financial aid for vulnerable populations, and support for businesses affected by lockdowns. Government expenditures surged to 36.69% of GDP in 2020, while public debt rose from 27.51% to 33.96% of GDP. The effectiveness of these programs was evident in the mitigation of immediate health and economic impacts. However, the reliance on external borrowing to finance these measures highlighted Moldova's structural weaknesses, including its limited domestic revenue base. Concessional loans from the IMF and World Bank were critical in supporting the fiscal response, but they also increased public debt, raising concerns about long-term fiscal sustainability. The pandemic underscored the importance of investing in healthcare infrastructure and diversifying economic activities to enhance resilience against future shocks.

LONG-TERM REFORMS TO ENHANCE FISCAL RESILIENCE

Moldova's economic history is marked by repeated crises, ranging from the post-Soviet transition to the 2008 global financial crisis, the 2014 banking scandal, and the 2020 COVID-19 pandemic. These events have underscored systemic vulnerabilities in fiscal governance, economic structure, and public debt management. Long-term fiscal resilience requires comprehensive reforms aimed at strengthening governance, ensuring sustainable debt levels, diversifying the economy, and enhancing social protection mechanisms.

I. Strengthening Fiscal Governance and Transparency

Fiscal governance is a cornerstone of economic resilience. Moldova's challenges, particularly during the 2014 banking crisis, revealed critical gaps in transparency and oversight. The fraudulent disappearance of funds amounting to 13% of GDP highlighted systemic governance failures that amplified public debt and eroded public trust.

Key Strategies:

1. *Enhanced Financial Oversight:* Strengthening the regulatory framework to prevent systemic fraud is imperative. Legislative measures like the Law on Public Finances and Budgetary Responsibilities (Law No. 181/2014) provide a basis for accountability but require stricter enforcement. Enhancing the independence of oversight institutions, such as the central bank, can bolster financial stability.

2. *Digital Transformation in Fiscal Management:* Adopting digital tools to track public expenditures, manage budgets, and monitor debt in real-time can improve fiscal transparency. Programs modelled on international best practices, such as open government initiatives, can reduce inefficiencies and increase public trust.

3. *Capacity Building*: Investing in training programs for fiscal managers and regulators can enhance their ability to adapt to global standards in financial governance.

II. Building Fiscal Buffers and Ensuring Debt Sustainability

Moldova's recurring crises have revealed its vulnerability to fiscal shocks due to limited reserves and rising public debt levels. The public debt surged significantly during the 2014 and 2020 crises, emphasizing the need for proactive debt management strategies.

Recommendations for Fiscal Buffers:

1. *Creation of a Sovereign Wealth Fund:* Allocating a portion of surplus revenues, particularly during periods of economic growth, to a sovereign wealth fund can provide financial reserves for future crises. This approach, recommended in the Strategic National Development Plan "Moldova 2030", is crucial for mitigating the effects of external shocks.

2. *Institutionalizing Fiscal Rules:* Implementing legally binding fiscal rules, as outlined in the State Debt and Guarantees Law (Law No. 419/2006), can limit deficits and control debt accumulation. Flexible frameworks allowing temporary rule suspensions during crises can ensure both discipline and adaptability.

3. *Strengthening Domestic Revenue Mobilization:* Modernizing tax administration, reducing informal economic activity, and broadening the tax base are essential to ensuring steady revenue streams. Policies should focus on addressing tax evasion and improving compliance through technological interventions.

III. Diversifying the Economy to Reduce Vulnerabilities

Moldova's economic dependence on agriculture and remittances has left it particularly susceptible to external shocks. Economic diversification is vital for reducing these vulnerabilities and fostering resilience.

Proposed Actions:

1. *Sectoral Development:* Promoting growth in high-potential industries such as technology, manufacturing, and renewable energy can reduce reliance on agriculture and remittances. According to the **Moldova 2020 Report**, targeted investments in these sectors can accelerate growth and improve economic stability.
2. *Infrastructure Modernization:* Investments in transport, energy, and digital infrastructure can boost connectivity, attract foreign direct investment, and enhance competitiveness. Public-private partnerships can be leveraged to finance large-scale projects efficiently.
3. *Support for SMEs and Innovation:* Expanding access to finance for small and medium enterprises (SMEs), particularly in innovative industries, can foster entrepreneurship. Establishing innovation hubs and offering tax incentives for startups can drive economic diversification.

IV. Enhancing Social Protection Mechanisms

Economic crises in Moldova have disproportionately impacted vulnerable populations, exposing the limitations of existing social safety nets. Strengthening social protection is critical to building fiscal and societal resilience.

Strategies for Social Inclusion:

1. *Comprehensive Social Safety Nets:* Expanding the coverage and efficiency of programs targeting low-income households can mitigate the impact of future crises. Performance-based budgeting, as outlined in the National Development Strategy, can ensure resources are allocated effectively.
2. *Integration of Labor Market Policies:* Supporting workforce reskilling and creating employment opportunities in emerging sectors can reduce economic inequalities. Partnerships with international organizations can facilitate training programs aligned with labour market demands.
3. *Sustainable Healthcare Financing:* The COVID-19 pandemic highlighted the importance of a robust healthcare system. Investments in healthcare infrastructure and equitable access to medical services can ensure resilience against health-related shocks.

V. Strengthening International Partnerships and Institutional Capacity

Moldova's reliance on international financial institutions for crisis financing underscores the importance of strategic external partnerships. While concessional loans have supported Moldova during crises, excessive dependence on external aid risks long-term fiscal sovereignty.

Key Reforms:

1. *Optimizing External Assistance:* Aligning external financing with strategic national goals can maximize its impact while minimizing risks. For example, concessional loans from the IMF and World Bank should prioritize high-impact investments in infrastructure and human capital.
2. *Regional Economic Cooperation:* Collaborating with neighbouring countries on trade agreements and infrastructure projects can enhance economic resilience. Initiatives such as regional energy connectivity can reduce Moldova's dependency on external energy sources.

3. *Institutional Strengthening:* Enhancing the capacity of public institutions to design and implement reforms effectively is critical. This includes improving inter-agency coordination and ensuring accountability in reform execution.

CONCLUSIONS

Moldova's fiscal history is marked by a series of crises that have profoundly shaped its economic landscape, fiscal policies, and institutional frameworks. From the post-Soviet transition to the global financial crisis of 2008–2009, the 2014 banking scandal, and the COVID-19 pandemic, each crisis has highlighted systemic vulnerabilities while offering critical lessons for enhancing fiscal resilience and sustainability. These experiences underscore the interconnectedness of fiscal governance, economic diversification, and social protection mechanisms in ensuring long-term stability.

The post-Soviet transition was characterized by a deep economic downturn, accompanied by a sharp decline in government revenues and growing fiscal imbalances. Efforts to maintain basic public services helped shape an emerging fiscal system, but the economy's heavy reliance on agriculture and remittances exposed underlying structural weaknesses. This period also demonstrated the importance of establishing a solid legal basis, including legislation on local public finance, to support fiscal decentralization and ensure a more balanced allocation of resources.

The global financial crisis of 2008 further highlighted Moldova's exposure to external shocks, particularly through its dependence on remittance inflows and external trade. Although countercyclical fiscal measures helped ease some of the social and economic pressures, the crisis pointed to the need for stronger fiscal buffers and a more diversified revenue base. In a similar vein, the 2014 banking crisis brought to light serious shortcomings in governance and transparency, leading to a substantial increase in public debt and a decline in public confidence. Its longer-term effects emphasized the need for more effective regulation and stronger institutions to safeguard financial stability.

The COVID-19 pandemic posed a different type of challenge, exposing the country's limited capacity to respond to large-scale economic disruptions. A sharp increase in public spending, combined with declining revenues, resulted in record fiscal deficits and a further rise in public debt. While external financial assistance played a crucial role in mitigating the immediate impact, it also highlighted the extent of Moldova's reliance on external support and the need to strengthen domestic revenue generation and diversify the economy.

Taken together, these crises reveal several recurring issues: the vulnerability of the fiscal system, persistent gaps in governance and transparency, and the importance of cooperation with international partners. Addressing these challenges requires a comprehensive reform agenda aimed at reducing structural weaknesses. Key priorities include improving fiscal governance through stronger oversight, advancing digitalization, and building institutional capacity. At the same time, efforts to diversify the economy – particularly by supporting sectors with high growth potential, such as technology and renewable energy – are essential. Investments in infrastructure, support for small and medium-sized enterprises, and the promotion of innovation can further enhance economic resilience and competitiveness.

In addition to economic reforms, social protection mechanisms must be strengthened to mitigate the disproportionate impact of crises on vulnerable populations. Expanding social safety nets, integrating labor market policies, and ensuring sustainable healthcare financing will not only enhance social equity but also contribute to long-term economic stability.

Looking forward, Moldova must balance the demands of crisis response with the imperative of fiscal sustainability. Building fiscal buffers, institutionalizing fiscal rules, and optimizing external assistance are critical steps toward ensuring resilience against future shocks. While international financial institutions will remain key partners, Moldova must prioritize reducing its dependency on external aid through strategic domestic reforms.

In conclusion, Moldova's fiscal trajectory underscores the importance of sound fiscal management, economic diversification, and institutional resilience. By addressing its structural weaknesses and leveraging opportunities for reform, Moldova can navigate future challenges more

effectively and lay the foundation for sustainable development and economic stability. These efforts, combined with strengthened international cooperation and governance reforms, will enable Moldova to achieve fiscal sustainability and foster a resilient, inclusive economy.

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THE FINANCIAL PERFORMANCE OF ENTERPRISES – A PREMISE FOR THE ECONOMIC INTEGRATION OF THE REPUBLIC OF MOLDOVA INTO THE EU AREA

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Abstract: *Under market economy conditions, enterprises in the Republic of Moldova have exhibited diverse trends, being largely influenced by the external economic environment. Currently, domestic enterprises face challenges related to market access, while the Republic of Moldova's aspiration to become part of the European Union represents one of the key pillars supporting their activities, with a strong emphasis on developing export relations within the EU. In this context, the results of the activities of economic entities that reflect financial performance will play a decisive role in accessing the European market. The ways to improve financial performance represent a key catalyst for the development and growth of an enterprise, without which its long-term existence would simply become impossible within the rigid framework of the market economy system.*
The purpose of this study is to evaluate the financial performance of companies in order to identify ways to improve it, with the aim of ensuring European economic integration. Thus, the financial performance of companies is essential for ensuring sustainable development under current conditions

Keywords*: enterprise finance, financial performance, economic integration*

JEL Classification: *G30, F15, O16*

INTRODUCTION

Financial performance is a complex concept, characterized by a system of indicators that reflect the availability and allocation of funds, the actual and potential financial capabilities of an enterprise and the effectiveness of their use.

The relevance of this problem has largely determined the development of various methods of analysing the financial performance of enterprises, aimed at preparing information for making managerial decisions, assessing the financial condition and developing a financial management strategy.

The financial performance of an economic entity is characterized depending on the financial result recorded by the enterprise. Thus, the financial result of the enterprise's activity is characterized by the sum of profit (loss) and the level of profitability achieved.

Financial results complete the business cycle of the enterprise, which includes the production and sale of products (work performed, services rendered) and, at the same time, serve as a premise for the next stage of its operations.

Financial results strengthen the state budget through tax revenues, contribute to the investment attractiveness of the company and increase its activity in the production and financial sectors.

MATERIAL AND METHOD

The definition of "performance", found in the explanatory dictionary of the Romanian language, specifies that this concept implies a good result obtained by someone or something (engine, device, person, etc.) [Explanatory]. From an economic point of view, performance implies a direct financial gain, motivating the workforce, as well as improving control. Moreover, etymologically, the term "performance" has its origin in the Latin language - "executa" - representing the achievement of objectives [Marinescu, C.]. In a narrow sense, performance is the result of an action and in a broad sense, it represents a set of logical steps to achieve the proposed objective.

In the specialized literature we find different opinions regarding performance at the microeconomic level, being the premise of the research for Niculescu M., Lavalette G., Verboncu I, Zalman M., Jianu J., Mironiuc, M., Anghelache C. which highlight the following: performance involves the efficiency, effectiveness and competitiveness of companies and their procedural and structural behaviors at the four decision levels (metapolitical, strategic, tactical and operational) and each level has a performance level attached (social, financial, commercial and physical).

The etymology of the word "performance" comes from the substantivisation of the English verb "to perform", which in translation applicable to the business context means "to fulfill", to execute a task, while the noun "performance" signifies only the act, the process of fulfilling tasks.

From a semantic point of view, several notions are used in economic literature to describe the qualifier "performance".

Russian scholars Sheremet A. and Saifulin R. in presenting the proposed methodology for analyzing the financial results and profitability of an enterprise, note that the financial result of an enterprise's activities is expressed in the change in the value of equity for the reporting period [20].

O.V. Efimova defines the financial result of an enterprise's activities as profit, but notes that the final result is actually one that the owners have the right to manage. In international practice, financial results are understood not as profit itself, but as an increase in net assets [16].

N.A. Tolkacheva gives a fairly broad definition. She believes that financial results can be viewed as an increase or decrease in the capital of an organization during its financial and economic activities in the reporting period, which is expressed as total profit or loss [26].

Beloglazova G. [208, p.305], Lavrushin O. [219, p. 105], Zhucov E. [215, p. 92] etc. use the terms efficiency and effectiveness, transposed from English "efficiency" and "effectiveness", which characterize "the results of the economic activity of the entity, characterized by the relationship of the received economic effect, the result of the consumption of factors, resources, which conditioned the achievement of this result", while in the practice of financial management as a notion of "efficiency" the term "performance" has become widespread.

The concept of efficiency can be considered as a relationship between the outputs of a system and the corresponding inputs used in their production. In the literature on financial efficiency, efficiency is treated as a relative measure, reflecting deviations from a maximum achievable power for a given level of input, argue English and Yaisawarang [English M., Yaisawarang K. Output Allocative and Technical Efficiency of Banks. In: Journal of Banking and Finance, 1993, Vol. 17, pp. 349-366].

Table 1: The content of the concept of "financial performance of the enterprise" under various scientific views

Source	Content of the definition
Niculescu, M., Lavalette, G.	Performance as a state of competitiveness of the economic agent, which has reached a level of productivity and efficiency that ensures a sustainable presence on the market [41, pp. 256 - 258].
Verboncu, I; Zalman, M.	Performance as a special result, obtained in the field of management, economics, commerce, etc. and involves the efficiency, effectiveness and competitiveness of companies and their procedural and structural behaviours [66, p. 72].

Gruian, C.	Performance can be achieved only by assuming risks that can be managed by the entity or the banking system. Performance includes the ability to gain access to resources, allocate and use them optimally for the purpose of sufficient remuneration to cover the assumed risk and justify the interest in sustainable development in the future [29, pp. 243 - 255]
Albu, N; Albu, C.	Performance characterizes the capacity of a company to progress due to constant efforts [1, p. 30].
Jianu, J.	The concept of "performance" is associated with success, growth, effort [32, p. 375].
Michel Lebas and Ken Euske (2002)	The performance of the economic entity can be interpreted as the possibility of achieving the planned result. The degree of achievement of objectives can be used to determine performance within an organization *[A conceptual and operational delineation of performance.]*.

Source: developed by the author based on the sources mentioned in the table

Following the analysis of the specialized literature, we can state that there are different acceptable conceptual approaches to performance, depending on the sector in which the enterprise operates and the context of use. Thus, according to Bonvoisin et al. (2008), performance can be interpreted as follows:

Performance = Effectiveness + Efficiency + Economy + Relevance (1)

[Bonvoisin, J., Halstenberg, F., Buchert, T., & Stark, R. (2016). A systematic literature review on modularproduct design. Journal of Engineering Design, 27(7), 488-514]

A publication of the French Ministry of Industry (Ministe`re de l'Industrie (1993). Guide de la performance industrielle. Paris: Ministe`re de l'Industrie, De´le´gation a` l'Information et a` la Communication.) equated performance with lean production, competitiveness, cost reduction, value and job creation, growth and the long-term survival of enterprises. In short, "performance" is one of those "suitcase words" [Bourguignon, C. (1995). Peut-on de´finir la performance? Revue Franc¸aise de Comptabilite´, 269, 60–5] in which everyone places the concepts that suit them, letting the context take care of the definition.

In the context of services provided to the public, performance can be viewed as "the extent to which the activity is carried out within the specifications established for goods and services, at the overall level of satisfaction of the clientele served, within constrained costs and limited time, and in such a manner as to support or contribute to the achievement of the organization's objectives".

RESULTS AND DISCUSSION

Economic efficiency is the relationship between the effects obtained (results) and the efforts (expenses) made in an economic activity during a certain period of time. The level of efficiency is higher when the useful effect per unit of effort spent is greater, or when the effort consumed relative to a unit of useful effect is smaller.

The general criterion of efficiency in economics is value, which represents a subjective notion, in the sense of someone's desire to possess a certain good. Assessing value is quite difficult, especially under the requirement of maximizing it (profit and utility of a good or service), which implicitly involves normative aspects related to recommendations of economic instruments and policies, based on the comparison of several policy alternatives.

The efficiency of economic and financial activity is characterized by financial results and profitability. Financial results (profits or losses) represent the difference between revenues and expenses.

In the process of carrying out economic and financial activities, the enterprise uses and consumes economic resources, called assets in the balance sheet. The efficiency of their use

determines the enterprise's ability to survive financially, to attract cash from customers, and to pay its debts within the established deadlines. One of the most important indicators of efficient asset utilization is return on assets (ROA), which is calculated according to the formula [13, pp. 58–64].

$$\text{Return on assets} = \frac{\text{Profit ("loss") before tax}}{\text{Average value of assets}} \text{ x } 100\% \quad (2)$$

Return on assets in analytical theory and practice is also called economic profitability. According to its economic content, it reflects the level of profit obtained from each leu of the means invested in the enterprise's circuit, regardless of the source of their financing. If the enterprise makes accounting losses, the level of this indicator will be negative and will reflect the level of losses obtained from each leu of the enterprise's assets.

Currently, this indicator is given special attention, because its level demonstrates the ability of the economic unit to use its assets as efficiently as possible.

In the process of carrying out economic activity, the enterprise consumes financial resources and it is necessary to check whether these resources are used in a sufficiently efficient manner to obtain the financial result, which will ensure the financing of the necessary investments and the repayment of the enterprise's debts. For this purpose, it is necessary to carry out an analysis of the return on equity.

Return on equity reflects the ability of the enterprise to use its own capital in order to obtain profit, by it "we understand the ability of the enterprise to enrich its owners". Through this indicator, capital owners assess the efficiency of their investments, that is, it characterizes the amount of profit obtained for each leu invested in equity.

Return on equity expresses the link between the financial result and equity, that is, it is determined based on the ratio between profit before tax (or net profit) and the average value of equity [13, pp. 58-64].

$$\text{Return on equity} = \frac{\text{Profit (loss)before tax (or net profit)}}{\text{Average value of equity}} \text{ x } 100\% \quad (3)$$

To improve the performance of economic entities, it is necessary to develop an effective plan that will bring results, and this plan must take into account the internal tasks and work of the company, as well as all changes in the external environment. Combining this with the peculiarities of the moments of production or provision of services, ways will be identified to increase production efficiency and achieve the desired result quickly enough.

Each enterprise must choose the right path of development, purely individual for any company. There are only a few basic rules that apply to any of them:

1. Reducing costs that do not affect the quality of production or services. Many managers solve this problem by reducing staff or purchasing cheaper materials. In this case, attention should be paid to the fact that the speed can decrease significantly, and the enterprise will lose profit;
2. Modernizing and automating the workflow. This should be done only after a detailed analysis of performance;
3. Identifying new ways of organizing and managing the economic entity. A management update will help bring fresh ideas and give new strength to the implementation of profitable projects;
4. Adequate marketing. Advertising plays an important role in increasing the company's turnover. A well-designed scheme for attracting customers can generate revenue growth at a relatively low cost;

Detailing each of these aspects can bring the desired result. But we must not forget that in any company, first of all, the people who work in it. It is worth encouraging the initiative of employees, rewarding them for good ideas. In this case, the economic entity will get a team interested in promoting the enterprise at all levels.

For an effective integration of the economy of the Republic of Moldova into the EU, an important mission falls on the demonstration by domestic enterprises of a high level of competitiveness, which would allow integration processes to accelerate and generate higher financial performance. Taking into account competitiveness can be represented as an integral part of market research, which is the basis for developing a strategy and tactics for the subject on the market and determining the correct way to improve the technical level and quality of production.

Figure 1 shows step-by-step processes for ensuring the competitiveness of an object, and it already has the property of competitiveness.

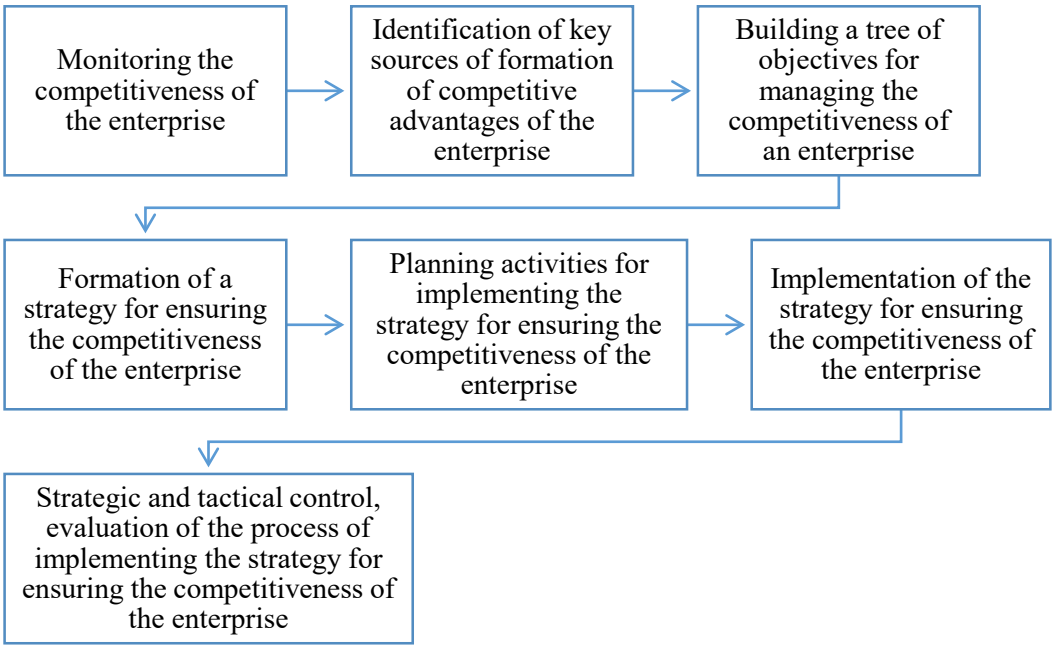

Figure 1. Stages of ensuring the competitiveness of the enterprise
Source: developed by the author

In general, competitiveness is an evaluation characteristic that reflects its ability to produce competitive products; much better than competitors. Also, the use of available resources and the development of activities, determine the place and role of competitiveness in the industrial market system at the EU level. Ways to increase competitiveness are presented in figure 2.

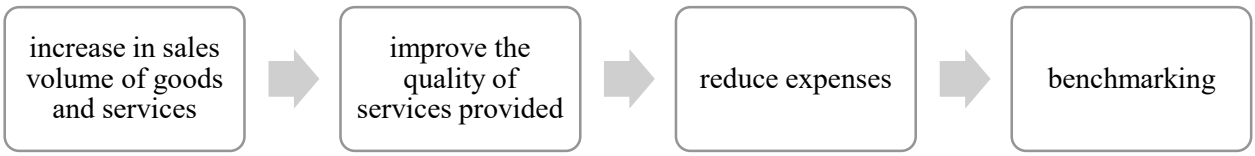

Figure 2. Ways to improve the competitiveness of the enterprise
Source: developed by the author

So, first of all, it is recommended to increase sales. Along with the effective organization of the production process or provision of services and planning volumes in accordance with the chosen direction, it is necessary to solve priority tasks. The higher the production efficiency, the more profitable the enterprise's activity can be, especially in a competitive environment.

The second priority direction may be to revise the structure of services provided and goods sold, its renewal, revision of used production resources.

Thirdly, such a factor as concentration of production is highlighted, which is achieved through investments in the innovative development of an enterprise.

Another effective tool for increasing the competitiveness of an enterprise is benchmarking. This method is a continuous search and study of the best practices of competitors, enterprises in related industries.

Thus, in order to ensure the highest competitiveness of the enterprise, it will be possible subject to continuous and long-term improvement of all components of competitiveness. In this regard, in Figure 3 we propose a model for increasing the competitiveness of an enterprise.

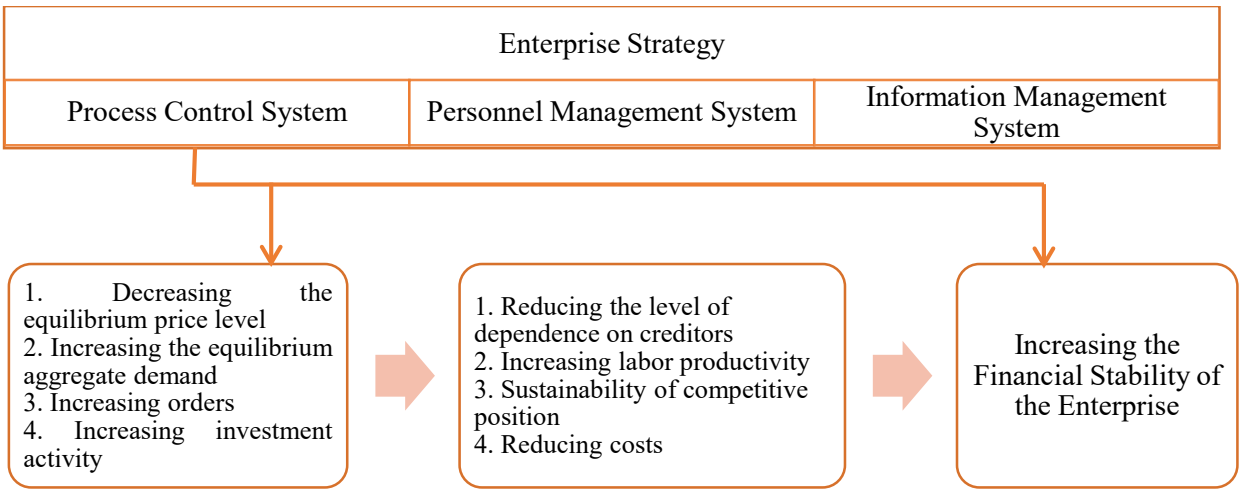

Figure 3. Model for increasing enterprise competitiveness
Source: developed by the author

It is worth noting that an increase in financial profitability can be obtained, under certain conditions, by increasing indebtedness. Contracting loans can determine an increase in the profitability of the capital invested by the owners in two ways:

- the gain achieved between the difference between the economic rate of return of the enterprise and the interest rate paid to creditors for the capital invested by them in the company;
- the tax savings obtained by the commercial company by deducting the interest expenses paid, implying a cost of borrowed resources lower than the interest rate related to the contracted loan.

Regarding the "deficiencies" of the financial profitability rate reflected by the capital used in the calculation, we specify - if the historical accounting cost is used, the capital used is undervalued; the undervaluation of capital and the overvaluation of profit, as cumulative effects of the historical accounting cost, lead to an overvaluation of the profitability rates.

Despite all the shortcomings noted, profitability rates remain basic indicators in characterizing the performance of enterprises. A systematic approach to the issue of profitability allows the correct positioning of the enterprise in the strategic system to which it belongs and, at the same time, the objective substantiation of the perspective orientations.

CONCLUSION

In conclusion to the above, we specify that one of the key objectives of any enterprise is to maximize positive financial results, expressed as the amount of profit obtained during the reporting period. The level of financial results has a direct impact on:

- the level of market stability of the enterprise;
- the motivational behaviour of potential investors;
- the rate of return on invested capital;
- the level of liquidity and solvency of the enterprise;
- opportunities for social development of the team, etc.

For any enterprise, obtaining a financial result means the recognition by society (market) of

the results of its activities or obtaining results from the sale of the enterprise's production in the form of goods, works or services.

Thus, financial performance is the main criterion for assessing the performance of most enterprises and is characterized by an increase in the volume of equity (net assets), the main source of which is profit from core activities, investments, financial activities, as well as as a result of other circumstances.

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CURRENT TRENDS AND INNOVATIONS IN CORPORATE FINANCE

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Abstract: *The financial sector of enterprises is undergoing continuous transformation due to rapid technological development, changes in the global economic environment, and growing stakeholder demands. In the context of global digitalisation, enterprises are forced to adapt to new conditions by implementing modern innovative solutions to optimise their financial processes and increase competitiveness. This article provides a comprehensive analysis of the key contemporary trends and innovative technologies shaping the future of corporate finance, as well as their practical application in a rapidly changing business environment. Particular attention is paid to areas such as the digitalisation of financial processes, which includes the automation of accounting, the introduction of cloud platforms and the integration of various financial management systems. The article examines the possibilities of using big data and artificial intelligence to forecast financial risks, optimise investment decisions and improve the accuracy of financial planning. The article also highlights the development of blockchain technologies, including the use of smart contracts and decentralised financial platforms (DeFi), which contribute to increasing the transparency and security of financial transactions. Additional attention is paid to new financing models, such as crowdfunding, venture capital investment and alternative sources of capital, which expand opportunities for raising funds and reduce dependence on traditional bank loans. An important component of the analysis is the growing role of ESG factors (environmental, social and governance aspects) in shaping corporate financial strategies, which contributes to their sustainability and compliance with international standards of responsibility and transparency.The article focuses on the practical application of these innovations and analyses their potential impact on improving the efficiency of business processes, the transparency of financial reporting and the sustainability of enterprises. Thus, the article provides a comprehensive picture of current trends and innovative approaches that are shaping the future of corporate finance and ensuring its adaptability to new challenges and opportunities in the global economy.*

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Keywords: corporate finance, financial innovation, digitalisation, big data, blockchain, risk management.

JEL Classification: *G3, O32*

INTRODUCTION

Corporate financial management has always been a dynamic field requiring adaptation to changing conditions. However, in recent decades, the pace of change has accelerated exponentially. Digital technologies, globalization, and growing awareness of environmental and social issues pose new challenges and offer unprecedented opportunities for CFOs and senior managers.

This article systematizes and analyzes the most important contemporary trends and innovations shaping corporate finance and determining the trajectory of business development in the 21st century. [2, p.98]

In today's dynamic economic environment, companies face new challenges and opportunities, which, in turn, are shaping key trends in financial management. Table 1 provides an overview of these trends, including their key features, benefits, potential challenges, and real-world use cases. The purpose of this analysis is to help understand which innovative trends have the greatest impact on business performance and sustainability in the context of digital transformation.

Table 1: Comparison of key trends in corporate finance

Trend	Description	Benefits	Challenges	Case Study
1. Digitalization of financial processes	Implementation of digital technologies to automate and optimize financial transactions	Increasing data processing speed, reducing errors, and optimizing costs	Significant investment required, cybersecurity risks	Implementation of an ERP system in a large company for automatic payment processing and reporting
2. Application of Big Data and AI	Using analytics and algorithms for forecasting and decision making	Improving forecast accuracy, automating analytics, and personalizing offers	The need for high-quality data and the complexity of algorithms	Using AI to Detect Fraud in Bank Transactions
3. Development of blockchain technologies	Implementation of distributed ledgers for secure and transparent transactions	Increased transparency, reduced transaction costs, and increased trust	Regulatory barriers, scalability, integration with existing systems	Using blockchain for securities accounting and automated smart contracts
4. New financing models	Transition to crowdfunding, P2P lending, and venture capital financing	Expanding funding sources, making them accessible to startups	Insufficient regulation, risks of credit obligations	P2P lending platforms that allow borrowers to receive investments directly from investors
5. Increasing role of ESG factors	Integrating environmental, social and governance considerations into financial planning	Improving reputation, reducing risks, access to green investments	Lack of strict standards, need for additional reports	Corporate investment in environmentally friendly projects to improve ESG ratings

Source: Developed by the authors based on [4, p.56]

Each of these trends represents a significant aspect of modern corporate financial management. Digitalization enables increased efficiency and cost reduction, while big data and artificial intelligence open new horizons for analysis and decision-making. Blockchain technologies ensure security and transparency, which is particularly important in the face of growing fraud threats.

New financing models provide businesses with access to additional resources, which can be critical for startups and small businesses. Finally, a focus on ESG factors highlights the importance of sustainability and social responsibility, which is becoming increasingly relevant for investors and consumers.

It is important to consider both the benefits and challenges associated with each trend to ensure successful adaptation and integration into business processes. [3, p.211]

Overall, Table 1 demonstrates that key trends are not isolated phenomena but rather an interconnected system where the benefits (increased efficiency and sustainability) outweigh the challenges when managed properly. Businesses that actively implement these innovations gain a competitive advantage in the digital economy, but success depends on balancing risks and strategy.]

EVOLUTION OF FINANCIAL PROCESSES: FROM MECHANIZATION TO INTELLIGENT CONTROL THROUGH DIGITALIZATION

Digital technologies are penetrating deeply into the financial activities of enterprises, restructuring traditional approaches and creating unprecedented opportunities.

• Mechanization of routine: The widespread implementation of integrated enterprise resource planning (ERP), customer relationship management (CRM) systems and specialized financial platforms makes it possible to automate operations such as payment processing, data reconciliation, reporting and liquidity management. This leads to a significant reduction in operating costs, minimizing the human factor in errors and freeing up personnel to perform more strategically significant tasks. [5, p.114]

• Cloud flexibility: The transition to cloud services guarantees adaptability, scalability and access to financial information from anywhere in the world. This is critical for geographically distributed companies and fast-growing start-ups that need to quickly respond to changes.

• Acceleration of transactions: The development of electronic, mobile and instant payment systems significantly accelerates the turnover of funds, reduces the risks inherent in cash payments and improves the user experience.

• Forecasting with digital twins: Creating virtual copies of financial processes and assets makes it possible to run simulations, analyze various scenarios, optimize the decision-making process and predict future financial results with a high degree of accuracy.

1. **Practical examples:** [7, p.60]

• Automated accounting: Using specialized personal software to automate standard accounting operations, such as invoicing and processing incoming payments.

• Cashless payments: Implementing electronic payment systems to speed up interactions with customers and suppliers.

• Cloud storage: Placing financial information in the cloud to ensure continuous access and increase the level of data protection.

• Mobile financial applications: Creating mobile solutions for financial management, allowing users to control their income and expenses at any time.

ARTIFICIAL INTELLIGENCE (AI) AND BIG DATA: BRINGING ANALYTICS AND FORECASTING TO THE NEXT LEVEL

The application of AI and big data analytics is revolutionizing financial planning, risk management, and strategic decision making.

• **Predictive Analytics:** AI can analyze vast amounts of historical and current data to identify patterns, predict market trends, product demand, credit risks, and potential fraudulent transactions. This enables companies to make more informed decisions and respond proactively to changes.

• **Machine Learning in Risk Management:** Machine learning algorithms are used to more accurately assess credit risks, identify anomalies in financial flows, predict market volatility, and optimize investment portfolios.

• **Automation of Financial Analysis:** AI can automatically analyze financial statements, identify key metrics, compare the company with competitors, and generate reports, saving financial analysts time.

• **Personalization of Financial Products and Services:** AI makes it possible to tailor financial offerings to specific customers, improving engagement and increasing loyalty.

Practical applications: [7, p.61]

• **Customer data analytics:** Using big data to segment customers and personalize offers, increasing loyalty and profitability.

• **Financial performance forecasting:** Applying machine learning algorithms to forecast revenue, expenses, and cash flows based on historical data.

• **Risk management:** Using AI to assess customer creditworthiness and identify potential fraudulent transactions.

• **Investment portfolio optimization:** Applying analytics tools to analyze market trends and optimize investment decisions.

4. Blockchain Technologies: Transforming Trust and Transactions [5, p.117]

Initially associated with cryptocurrencies, blockchain is showing significant potential in corporate finance, bringing security, transparency, and efficiency.

• **Smart Contracts:** Automatically executing contract terms when specific events occur reduces administrative costs, speeds up settlements, and reduces the likelihood of disputes. Examples include automatic insurance payouts and enforcement of sales contracts.

• **Asset Tokenization:** Representing real-world assets (real estate, company shares, art) as digital tokens on the blockchain makes them more liquid, enabling fractional ownership and facilitating trading.

• **Improved Supply Chain Management:** Blockchain provides transparency and traceability throughout the supply chain, improving inventory management, reducing the risk of fraud, and increasing trust among participants.

• **Security and Transparency of Financial Transactions:** The immutability and distributed nature of the blockchain ledger makes transactions more secure and transparent, which can be used for auditing, anti-money laundering, and to improve the credibility of financial reporting.

Practical Applications: [7, p.63]

• **Facilitating Settlements:** Using smart contracts to automate settlements between parties without the need for intermediaries.

• **Transactional Transparency:** Blockchain provides an immutable and transparent ledger of transactions, which increases trust between participants.

• **Asset Management:** Using tokenization of assets to simplify the buying and selling of assets and improve liquidity.

• **Cost Reduction:** Blockchain can reduce transaction costs by eliminating the need for traditional intermediaries (such as banks).

5. New Financing Models: Accessing Capital in the Digital Age [5, p.119]

Traditional methods of raising capital are being complemented by new, more flexible and accessible models.

• **Crowdfunding and Crowdlending:** Crowdfunding platforms allow startups and small businesses to raise funds from a wide range of investors. Crowdlending offers an alternative to bank loans.

• **Digital Factoring and Scoring:** Digital platforms are simplifying the factoring (selling receivables) and scoring (credit assessment) processes, making them more accessible to small and medium-sized businesses.

• **Decentralized Finance (DeFi):** Although DeFi is in its early stages, it offers the potential to create fully decentralized financial services, including lending, insurance, and trading, without intermediaries.

• **Venture Capital and Angel Investors:** While these continue to play an important role in funding innovative projects, the processes themselves are becoming more digital thanks to online platforms and tools for analyzing startups.

PRACTICAL APPLICATIONS

• **Crowdfunding:** Platforms for raising funds from a large number of investors, allowing small and medium-sized businesses to raise capital without traditional bank loans.

• **Peer-to-Peer Lending:** Services that connect borrowers and lenders directly, reducing lending costs.

• **ICO/IEO Funding:** Raising capital through initial coin offerings, which has become popular among tech startups.

• **Social Finance:** Models where funding is linked to social initiatives, allowing businesses to raise funds from investors interested in social change.

6. ESG Factors: Integrating Sustainability into Financial Strategy [5, p.120]

Environmental, social and governance (ESG) factors are moving from being an afterthought to becoming an integral part of a company's financial strategy.

• **ESG Reporting and Transparency:** Companies are increasingly disclosing information about their environmental impact, social responsibility and corporate governance. This increases their appeal to investors and consumers.

• **Green Finance:** Growing interest in green bonds and other forms of green finance allows companies to raise capital for sustainable projects.

• **ESG Risk Management:** Integrating ESG factors into their risk management system allows companies to identify and mitigate potential threats related to climate change, social conflict and regulatory changes.

• **Sustainable Asset Investing:** Investors are increasingly choosing companies with strong ESG indicators, which incentivizes corporations to become more sustainable.

Practical application: [7, p.66]

• **Investment strategies:** Investors increasingly consider environmental, social and governance factors when making investment decisions, which affects share price and company attractiveness.

• **ESG reporting:** Companies are starting to publish reports on ESG factors, which increases their transparency and can attract new investors.

• **Sustainable finance:** Developing financial products, such as green bonds, that finance projects with a positive environmental impact.

• **Risk assessment:** Incorporating ESG factors into risk assessments allows companies to better prepare for potential regulatory changes and reputational risks.

7. Challenges and prospects [5, p.121]

Despite significant benefits, the implementation of new trends and innovations is associated with a number of challenges:

• **Cybersecurity:** Increased digitalization increases vulnerability to cyberattacks, requiring continuous improvement of data protection systems.

• **Need for qualified personnel:** To effectively use new technologies, specialists with relevant skills in data analysis, AI, blockchain are required.

• **Regulation:** Rapid innovation often outpaces legislation, creating uncertainty and requiring regulatory adaptation.

• **Cost of implementation:** Implementing new technologies and systems can require significant upfront investment.

At the same time, the prospects for innovation-driven corporate finance are extremely promising. We expect further development of integrated platforms that connect various finance functions, deeper penetration of AI in strategic decision-making, increased use of blockchain to create new financial ecosystems, and a growing role of ESG factors in shaping long-term business value.

CONCLUSION

Modern trends and innovations in corporate finance are not just new tools, but fundamental changes that transform the ways of managing, raising capital and doing business. Companies that can successfully adapt to these changes by investing in technology, developing new competencies and integrating sustainability principles will gain a significant competitive advantage, increase their operational efficiency, resilience and long-term value. The finance function is no longer just an accounting unit and is becoming a strategic partner that determines the development vector of the entire enterprise.

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HARMONIZATION OF FISCAL CONTROL MECHANISMS OF THE REPUBLIC OF MOLDOVA WITH EUROPEAN STANDARDS – DEVELOPMENT DIRECTIONS AND CHALLENGES

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Abstract:*This study examines the process of harmonizing the fiscal control mechanisms in the Republic of Moldova with European standards, focusing on the main development directions and the challenges that continue to influence this path. The research starts from the premise that effective approximation to the European principles of fiscal administration cannot be reduced to simple regulatory compatibility, but implies measurable progress in the organization, efficiency and quality of fiscal control practices. The purpose of the study is to assess the degree of convergence between the national fiscal control framework and the relevant European requirements, as well as to identify institutional and procedural areas that require further adjustments.*

The research is empirical and analytical in nature and is based on the examination of official sources of a normative, institutional and statistical nature. In this regard, data from public reports and administrative sources on tax control activity are used, including the dynamics of tax controls, the evolution of additionally calculated tax obligations, the role of risk-based selection, as well as the general trends in the modernization and digitalization of tax administration. These data are interpreted through comparative, logical and synthesis methods, in correlation with the fundamental European principles of proportionality, transparency, legal certainty, risk orientation and protection of taxpayer rights.

The research results reveal that the Republic of Moldova has made visible progress in modernizing fiscal control mechanisms, in particular by improving procedures, gradual digitalization and expanding analytical tools in fiscal administration. At the same time, the empirical assessment highlights the persistence of structural constraints, such as the uneven application of control practices, limited institutional interoperability, insufficient depth of analysis when selecting controls and the still incomplete nature of the transition from a predominantly reactive model to a preventive and compliance-oriented one. In conclusion, the harmonization of fiscal control with European standards must be treated as a process of substantial institutional transformation, supported by data-driven administration, procedural standardization and strengthening the balance between the fiscal authority and the taxpayer's rights.

Keywords*: fiscal control, fiscal administration, European standards, harmonization, Republic of Moldova, fiscal compliance*
Classification: *JEL: H20, H26, H83, K34*

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INTRODUCTION

Within the contemporary fiscal system, fiscal control occupies a central place, as it represents one of the main instruments through which the state pursues compliance with fiscal rules, protects the public interest and strengthens financial discipline. Beyond its strictly technical meaning, fiscal control must be understood as a complex activity, located at the intersection of law, public administration, economics and institutional governance. It is not reduced to the simple verification of the obligations declared by the taxpayer, but expresses, in a broader sense, the capacity of the fiscal administration to ensure the legality, fairness and functionality of fiscal relations.

RESULTS AND DISCUSSIONS

Fiscal control in the context of the new requirements of European tax administration

Conceptually, tax control can be defined as the set of verification, examination, assessment and evaluation activities carried out by the competent tax authorities in order to establish how taxpayers fulfill their tax obligations provided for by law. Such a definition reveals that the essence of tax control consists not only in identifying possible violations, but also in assessing the degree of tax compliance, the correctness of the declaration of taxable matter and the observance of legal procedures related to the relationship between the taxpayer and the tax administration.

From this perspective, fiscal control has a dual nature. On the one hand, it is a legal instrument, because it is based on mandatory norms, regulated procedures and powers expressly established by legislation. On the other hand, it is a managerial and institutional instrument, because it contributes to making public revenue management more efficient, reducing fiscal risks and guiding administrative decisions according to the fiscal behavior of taxpayers. It is precisely this dual nature that explains why, in modern administrative doctrine and practice, fiscal control is no longer analyzed exclusively through the prism of its repressive function, but increasingly as a mechanism for supporting voluntary compliance and preventing non-fulfillment of fiscal obligations.

For a synthetic understanding of the place and role of fiscal control in the architecture of fiscal administration, its essential functions can be schematically represented as follows:

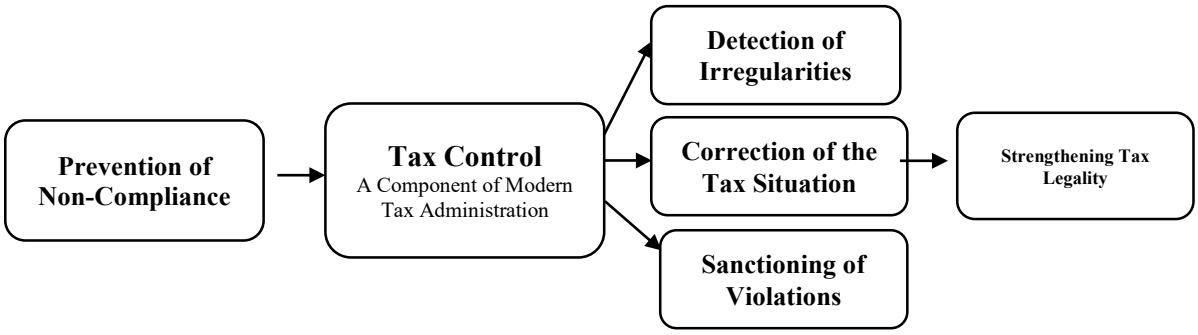

Figure 1. "Functional positioning of fiscal control in the tax administration system"
Source: prepared by the author.

The role of fiscal control in ensuring fiscal legality is particularly important. In the absence of effective control mechanisms, fiscal rules would risk remaining mere formal provisions, with reduced efficiency in practice. Fiscal legality does not only require the existence of clear normative provisions, but also their effective, uniform and predictable application. In this sense, fiscal control functions as a mechanism for guaranteeing the legal and fiscal order, through which the tax administration verifies whether the tax declaration, calculation, payment and reporting obligations are fulfilled in accordance with the legal framework.

Moreover, fiscal control contributes to maintaining the balance between the authority of the state and the rights of the taxpayer. Although, traditionally, it is associated with the intervention of the public authority and the exercise of legal coercion, in reality fiscal control must operate within the limits of legality, proportionality and legal certainty. In other words, the efficiency of fiscal control cannot be assessed exclusively in terms of the amounts calculated additionally or the deviations found, but also in terms of the way in which control procedures respect legal guarantees, ensure fair treatment and avoid administrative arbitrariness. This dimension becomes all the more relevant in the context of harmonization with European standards, where fiscal control is seen not only as an instrument of coercion, but also as an expression of a modern, responsible and compliance-oriented fiscal administration.

Several functions of fiscal control are highlighted in the specialized literature and in fiscal practice, each of which reflects a distinct dimension of its role in the fiscal administration mechanism.

First of all, the preventive function of fiscal control is noteworthy. This consists in the ability of control to deter non-compliant fiscal behaviors before they manifest themselves or produce significant effects on the public budget. The simple fact that the tax administration has verification and monitoring mechanisms can cause taxpayers to demonstrate a higher degree of prudence and responsibility in relation to their tax obligations. In this sense, fiscal control does not only act ex post, after the occurrence of the deviation, but also ex ante, through its deterrent and disciplinary effect. The preventive function is essential in a modern fiscal system, because a high level of voluntary compliance reduces the administrative costs of control and contributes to the stability of public revenues.

Secondly, tax audit performs a ascertaining function. It aims to identify the real tax situation of the taxpayer, verify documents, records and economic operations, as well as establish the existence or non-existence of deviations from tax rules. The ascertaining function is of particular importance, as it provides the factual and legal basis for any subsequent conclusion of the tax authority. In other words, before correcting, sanctioning or ordering additional measures, the tax administration must objectively and rigorously ascertain the tax reality under examination. The quality of tax audit depends, to a large extent, on the depth and correctness of this ascertaining function.

Thirdly, the corrective function of tax control is manifested. This occurs when, following the checks carried out, errors, omissions, misinterpretations of tax rules or deficiencies in the taxpayer's accounting and tax records are identified. The corrective function should not be understood exclusively in a sanctioning sense, but also in the sense of bringing the tax situation back within the parameters of legality. It may involve recalculating tax obligations, regularizing tax positions, establishing remedial measures and clarifying future tax conduct. In advanced tax systems, this function has a strong educational and assisted compliance dimension, as the taxpayer is not only viewed as a potential offender, but also as a participant in a legal relationship that must be correctly guided and administered.

Last but not least, tax control exercises a sanctioning function, which intervenes when violations of tax legislation are found that attract legal liability. This function expresses the coercive dimension of the tax authority and is necessary to protect the state's budgetary interests, to restore the rule of law and to send a clear signal regarding the inadmissibility of illicit behaviors. However, in a modern approach, the sanctioning function should not dominate the entire mechanism of tax control. The exclusive focus on sanction can generate tensions in the relationship between the tax administration and the taxpayer, can diminish trust in institutions and can transform tax control into an instrument perceived as predominantly repressive. Therefore, within the framework of current European standards, the sanction is seen as a necessary element, but subsidiary to a broader logic, oriented towards prevention, proportionality and sustainable compliance.

Taken together, these functions do not operate in isolation, but in close interdependence. The preventive function reduces the likelihood of deviations, the ascertaining function allows their identification, the corrective function contributes to the restoration of legality, and the sanctioning function intervenes where the violation of the norm requires a firm legal reaction. Naturally, the efficiency of fiscal control depends on the balance between these functions. A system focused exclusively on ascertainment and sanction risks becoming rigid and costly, while a system that adequately capitalizes on prevention and correction can stimulate voluntary compliance and generate more stable effects in the long term.

The summary of the functions of fiscal control, viewed from the perspective of their operational content and intended purpose, is presented in the table below:

Table 1:"The functions of fiscal control and their essential content"

The function of fiscal control	Essential content	Main purpose
Preventive function	Discouraging non-compliant tax behaviors and stimulating voluntary compliance	Reducing tax risks and increasing tax discipline
The ascertaining function	Verification of the actual tax situation and identification of possible deviations	Establishing the factual and legal basis of fiscal intervention
Corrective function	Correcting errors and bringing the tax situation back within the limits of legality	Correcting tax obligations and improving tax conduct
Sanctioning function	Application of coercive measures in case of violation of tax legislation	Protecting the budgetary interest and restoring the rule of law

Source: developed by the author based on specialized literature.

Therefore, fiscal control must be conceived as a complex mechanism for protecting fiscal legality, supporting financial discipline and strengthening the administrative capacity of the state. In the current context of transformation of fiscal administration, marked by digitalization, risk analysis and increased demands on taxpayer rights, the conceptual redefinition of fiscal control becomes not only opportune, but necessary. It can no longer be viewed exclusively as a subsequent verification procedure, but as a dynamic component of a modern fiscal administration, oriented towards efficiency, fairness and harmonisation with European standards.

In the European space, the organization of tax control mechanisms is not built exclusively on the idea of verifying and sanctioning the taxpayer, but on the broader logic of an efficient, proportionate, predictable and compliance-oriented tax administration. Consequently, when discussing European standards relevant to tax control, one cannot consider a single normative act that would concentrate them exhaustively, but a set of principles, guidelines and good practices derived from European Union law, from European Commission documents and from the benchmarks promoted at the level of international cooperation in the field of tax administration. In this configuration, the emphasis gradually shifts from control conceived as a punctual reaction to deviation to control understood as an integral part of a modern administrative system, based on risk, transparency, legal certainty and the intelligent use of data.

A first essential benchmark is the principle of proportionality. In the field of tax control, proportionality implies that the verification measures, the extent of administrative intervention and the intensity of the constraint must be appropriate to the intended purpose and related to the level of tax risk identified. In other words, the tax administration should not apply uniform mechanisms to profoundly different situations, but should calibrate the intervention according to the severity of the risk, the nature of the taxpayer, the compliance history and the potential impact on the public budget. At a European level, this approach is closely linked to the idea of good administration and the avoidance of excessive administrative burdens, both for the authority and the taxpayer. This is precisely why the European guidelines on tax risk management insist on concentrating the control effort on areas of significant non-compliance and on avoiding overloading compliant taxpayers with disproportionate checks.

Closely linked to proportionality is risk orientation, which represents one of the most important transformations of European tax administration. Instead of an extensive logic based on frequent and generalised controls, modern standards favour the intelligent selection of taxpayers and operations likely to generate high tax risks. This orientation allows for a more efficient use of administrative resources, improves the capacity to detect non-compliance and, at the same time, reduces unnecessary pressure on taxpayers with proper tax behaviour. The European Commission's Guidance on Compliance Management in the Digital Age explicitly treats tax administration in the European Union as an activity that must organise its processes starting from the assessment and

treatment of risks, and the European Guidance on Risk Management underlines that such an approach contributes to equal treatment of taxpayers, efficient use of resources and increased voluntary compliance.

To summarize the main European standards relevant for the organization of fiscal control mechanisms, they can be schematically presented as follows:

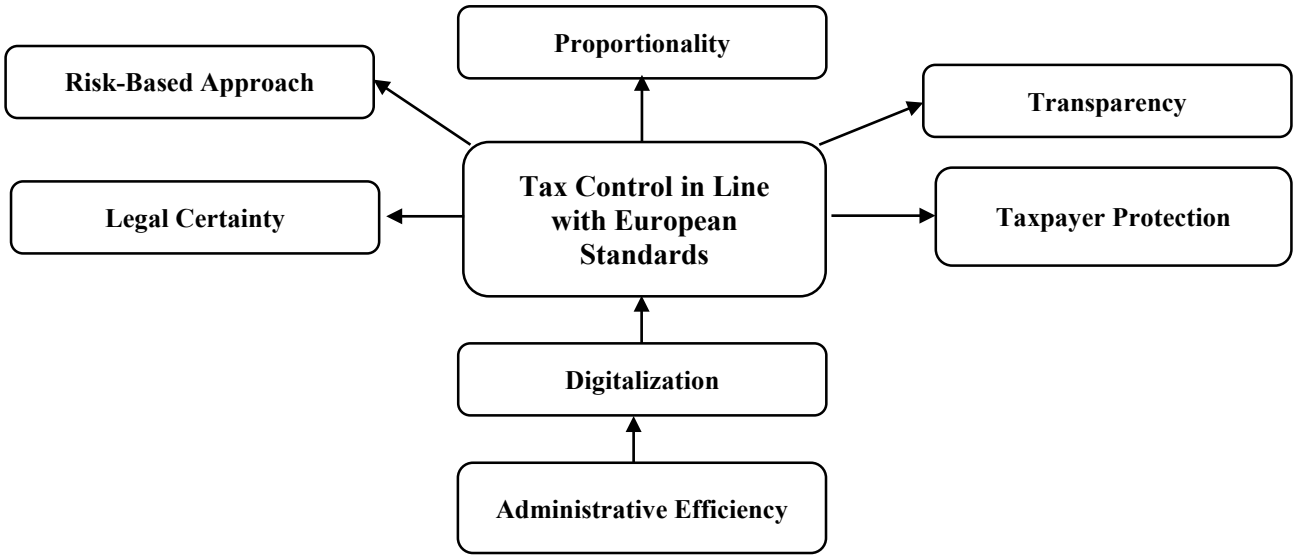

Figure 2: "European standards relevant for the organization of fiscal control mechanisms"
Source: developed by the author based on European Commission and OECD documents.

Another major standard is transparency, which has become, in recent years, one of the defining coordinates of European tax governance. In the context of tax control, transparency has a double meaning. On the one hand, it aims at the clarity of the rules, procedures and obligations applicable to taxpayers. On the other hand, it refers to the capacity of the tax administration to communicate coherently, to justify its interventions and to act within an institutional framework free from arbitrary opacity. European documents on good tax governance treat transparency as a precondition for combating fraud, tax evasion and avoidance, and this idea has direct implications for the way in which tax control should be organised: clear procedures, intelligible criteria and an administrative relationship based on information and justification. In the absence of transparency, tax control risks being perceived as an instrument of discretionary pressure, not as a legitimate mechanism for protecting tax legality.

Equally important is legal certainty, a principle without which neither administrative efficiency nor voluntary compliance can be sustained in the long term. From the taxpayer's perspective, legal certainty implies the possibility of understanding tax obligations, of anticipating the consequences of his conduct and of having confidence that the tax authority will apply the law in a coherent and predictable manner. From the administration's perspective, this principle requires procedural stability, uniformity in application and clear dispute resolution mechanisms. In European and OECD documents, tax Certainty is presented as an essential element for investment, economic growth and functional tax relations, and at the European Union level it is frequently stressed that clear rules and coherent administrative practices reduce fragmentation and increase compatibility with Union law. In the field of tax control, legal certainty essentially means that the verification must not only be legal, but also predictable, reasoned and controllable.

A distinct dimension, but inseparable from the previous ones, is the protection of the taxpayer. European standards do not reduce the fiscal relationship to the opposition between the state and the taxpayer, but promote a more balanced model, in which the control power of the administration is

limited and guided by the rights of the taxpayer. In this logic, the taxpayer has the right to be informed, assisted, listened to, treated fairly, to challenge the decisions of the authority and to benefit from the confidentiality of his data. The guidelines on a model European taxpayer code, as well as the OECD documents on the rights and obligations of the taxpayer, show that his protection is not an element external to the tax administration, but a condition of its legitimacy and efficiency. In other words, fiscal control becomes more robust not when it ignores the taxpayer, but when it exercises its powers within clear, transparent and contestable limits.

Finally, an increasingly important place belongs to the digitalization of tax administration, which has become one of the most visible directions of modernization at the European and international levels. Currently, modern standards for organizing tax control are closely related to the use of digital technologies, automatic exchange of information, database integration, advanced risk analysis and migration to electronic tax services. The OECD describes the digital transformation of tax administration not as a simple computerization of traditional procedures, but as a rethinking of tax processes so that obligations are easier to understand, declare and pay, and control is smarter and less burdensome. At the same time, the European Commission documents on compliance in the digital age and European projects in the field of digital reporting confirm that the use of data and technologies is becoming a structural element of modern tax control. Digitalization does not eliminate the classic control function, but profoundly changes its tools, logic and intervention schedule.

Taken together, these standards – proportionality, risk orientation, transparency, legal certainty, taxpayer protection and digitalisation – outline the profile of a modern European tax administration, in which tax control is no longer understood as a unilateral exercise of authority, but as a sophisticated mechanism for managing compliance. Each of these benchmarks has its own conceptual autonomy, but their real effectiveness results from their articulation in a coherent administration model. For example, risk orientation cannot function legitimately without proportionality and transparency; taxpayer protection cannot be effective in the absence of legal certainty; and digitalisation, without procedural guarantees and regulatory clarity, can amplify imbalances instead of reducing them.

The summary of these standards, viewed from the perspective of their operational content and relevance for tax control, is presented in the table below:

Table 2: "European standards relevant for the organization of fiscal control mechanisms and their operational implications"

European standard	Essential content	Implications for tax control
Proportionality	Adapting the intervention to the level of risk	Avoiding excessive controls
Risk orientation	Selection based on tax risks	Efficient use of resources
Transparency	Procedural clarity and communication	Increasing taxpayer confidence
Legal security	Predictability and consistent enforcement	Reducing arbitrariness
Taxpayer protection	Right to information, appeal, fair treatment	Legitimacy of control
Digitization	Data, automation, electronic services	Faster and smarter control

Source: developed by the author based on European Commission and OECD documents.

Therefore, the analysis of the relevant European standards for the organization of fiscal control mechanisms highlights the fact that fiscal modernization can no longer be reduced to the simple consolidation of verification capacity. The dominant trend is to integrate control into an administrative model based on risk assessment, the use of data, respect for taxpayer rights and the consolidation of trust in fiscal institutions. For the Republic of Moldova, this reference framework is particularly important, as it allows not only to compare national practices with European requirements, but also to identify concrete directions for transforming fiscal control into a more efficient, more balanced and more compatible instrument with the logic of European integration.

In the specialized literature and in the practice of administrative reforms, the harmonization of fiscal control mechanisms is often understood, in a simplified manner, as a process of bringing the national regulatory framework closer to European requirements. Such an understanding is, however, insufficient. In reality, harmonization cannot be reduced to the adoption of certain rules, notions or legal formulas, because fiscal control operates not only through normative texts, but also through procedures, institutions, administrative practices and concrete mechanisms of interaction with the taxpayer. That is why, in a substantial sense, harmonization must be seen as a process of functional transformation of fiscal administration, within which the norms, procedures and institutional behaviors are adjusted so as to reflect the principles of proportionality, risk orientation, transparency, legal certainty and taxpayer protection promoted at European level.

From this perspective, the content of harmonisation is much broader than the formal compatibility of tax legislation. It first involves the transformation of control procedures. A tax system may take over, at a declarative level, modern European principles, but if the procedures for selecting, verifying, documenting and resolving findings remain rigid, uniform and excessively formalistic, the approximation to European standards remains incomplete. European and international guidelines on compliance management insist precisely on the fact that tax intervention must be structured differently, depending on risks, taxpayer behaviour and administration objectives. Therefore, real harmonisation requires a reassessment of the way in which control is initiated, the way in which information is collected and analysed, the stages of communication with the taxpayer and the mechanisms through which administrative measures are individualised.

At the same time, harmonisation also requires institutional change. No matter how well designed the regulatory framework is, it cannot produce lasting effects without an administration capable of applying it coherently, predictably and professionally. The relevant European standards for tax control are based on the existence of flexible administrative institutions, oriented towards analysis, cooperation, the use of data and quality public services. The OECD consistently shows, in its reports on tax administrations, that the modernization of control depends not only on the legal basis, but also on the organizational architecture, the quality of internal processes, the skills of the staff and the institution's capacity to integrate digital technologies into its current activity. In this sense, the harmonisation of tax control mechanisms also implies the reconfiguration of the role of the tax authority, which must move from a predominantly reactive and sanctioning model to one based on compliance management and intelligent risk management.

To highlight the position of harmonization in the architecture of modern tax administration, the place of tax control can be summarized in the figure below:

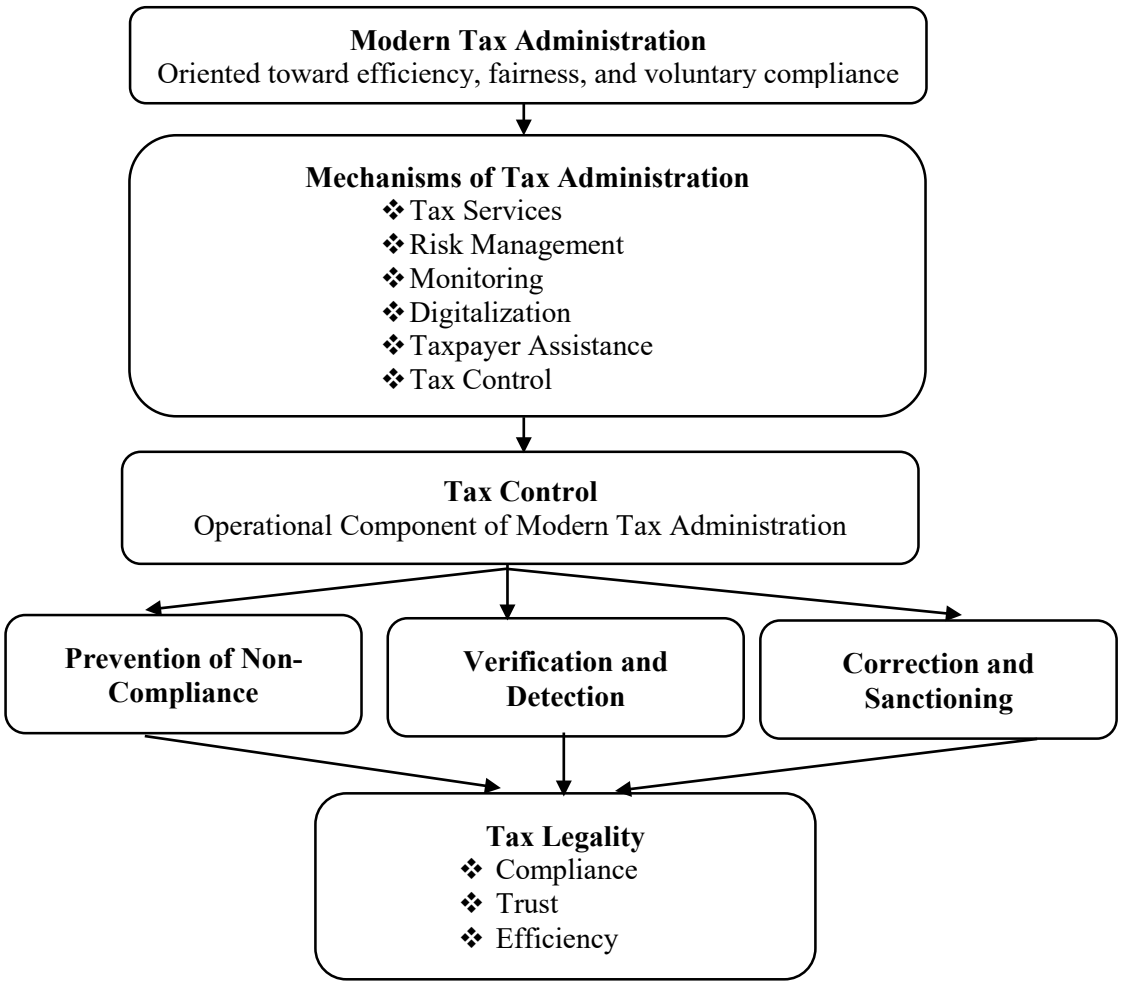

Figure 3: "The place of fiscal control in the modern tax administration system"
Source: prepared by the author.

Another essential dimension of harmonisation is the strengthening of administrative practices. In tax matters, the difference between a modern system and a formally reformed one is often seen not in the text of the law, but in the concrete way in which the administration applies the law. Administrative practices include the way in which control priorities are set, the way in which rules are interpreted, the quality of the reasoning of administrative acts, the consistency of the treatment applied to taxpayers and the institution's capacity to maintain a balance between firmness and predictability. The idea that the efficiency of tax control must be coupled with procedural clarity, adequate communication and fair treatment is consistently found in the European Commission documents on the taxpayer's code and in the guides on good tax administration. Harmonisation therefore means not only regulating differently, but also administering differently.

In this context, the meaning of harmonisation must also be understood in relation to the change in the philosophy of tax control. In traditional administrative models, control was perceived mainly as a tool for discovering deviations and subsequent reaction. In modern European approaches, control is integrated into a broader system of compliance management, in which prevention, risk orientation, taxpayer assistance and the use of data become as important as the verification itself. This does not mean weakening the coercive function of the state, but repositioning it in a smarter and more efficient framework. In other words, real harmonisation changes not only the instruments of tax control, but also the logic of administrative intervention: from generalized control to selective control, from reaction to prevention, from formalism to analysis, from procedural pressure to information-based administration.

The institutional implications of this process are considerable. First, harmonisation requires the development of increased analytical capacity within the tax administration. Tax control aligned with European standards can no longer depend exclusively on extensive checks and manual information gathering, but must use risk profiles, interoperable databases, selection criteria and digital tools capable of quickly identifying areas of non-compliance. Second, harmonisation requires the standardisation of internal procedures, so that taxpayers in comparable situations benefit from comparable administrative treatments. Third, it requires the strengthening of the professional skills of staff, including in the legal, analytical, digital and communication dimensions. Transforming tax control into a mechanism compatible with European standards therefore requires investments not only in legislation, but also in institutional infrastructure and human capital.

In addition, harmonisation has direct effects on the relationship between the tax administration and the taxpayer. As tax control approaches European standards, the emphasis gradually shifts from the unilateral dominance of the authority towards a more balanced administrative relationship, based on clarity, predictability and contestability. This does not eliminate the power balance inherent in the tax field, but disciplines it legally and procedurally. Consequently, harmonisation favours not only the efficiency of collection, but also increases the institutional legitimacy of tax control. However, in a modern tax system, legitimacy is not a secondary aspect, but a practical condition for sustainable compliance. A taxpayer who understands the procedure, can anticipate the administration's reaction and benefits from clear procedural guarantees is usually more likely to accept tax intervention as legitimate.

Taken as a whole, the harmonisation of tax control mechanisms therefore expresses a complex convergence process, in which the rules represent only one of the levels of transformation. Beyond the legal level, harmonisation involves changes in procedure, organisation and administrative practice. It is precisely this integrated vision that allows avoiding a mimetic approach, in which the national system would take over the language of the European reform without assimilating its functional content. In the absence of such a substantial transformation, harmonisation risks remaining a superficial exercise, with little relevance to the efficiency of tax control and to taxpayers' trust in tax institutions.

The correspondence between the conceptual benchmarks of fiscal control and the relevant European standards can be summarized in the table below:

Table 3: "The main conceptual landmarks of fiscal control and their correspondence with European standards"

Conceptual landmarks of fiscal control	Essential content	Corresponding European standard	Implications for the harmonization of fiscal control mechanisms
Fiscal legality	Exercising fiscal control based on legal norms, established powers and regulated procedures	Legal security	The need for clear, predictable and uniformly applied procedures, so that fiscal control is exercised in conditions of stability and regulatory coherence
The preventive function of fiscal control	Discouraging non-compliant behavior and encouraging voluntary compliance	Proportionality; risk orientation	Moving from extensive and reactive controls to interventions calibrated according to the level of risk and the taxpayer profile
The ascertaining function	Identifying the real tax situation and verifying compliance with tax obligations	Transparency; legal certainty	The need for well-reasoned, clear control procedures based on objective examination criteria
Corrective function	Correcting errors and bringing the tax situation	Taxpayer protection;	Promoting an administrative logic focused not only on sanction, but

	back within the limits of legality	proportionality	also on correction, guidance and restoring fiscal balance
Sanctioning function	Application of coercive measures in case of violation of tax legislation	Proportionality; taxpayer protection	The application of sanctions must be justified, gradual and compatible with the taxpayer's procedural guarantees.
Information-based tax control	Using data, analysis and indicators for control selection and implementation	Risk orientation; digitalization	Integrating analytical tools and databases into the tax control process to increase efficiency and reduce arbitrariness
Tax administration–taxpayer relationship	Interaction between the tax authority and the taxpayer within the control procedure	Transparency; taxpayer protection	Strengthening communication, the right to information and fair treatment in tax control procedures
Administrative efficiency of tax control	The system's ability to identify and deal with tax risks with reasonable administrative costs	Digitalization; risk orientation	Reorganizing fiscal control around selectivity, automation, interoperability and efficient use of resources

Source: developed by the author based on European Commission and OECD documents.

Therefore, the harmonization of fiscal control mechanisms must be understood as a process of administrative transformation in a broad sense, which goes far beyond the logic of the formal takeover of European norms. It involves the remodeling of procedures, institutional adaptation and consolidation of administrative practices in relation to a more intelligent, more proportionate and more compatible fiscal control model with the rights of the taxpayer. This perspective is essential for the Republic of Moldova, as it provides a realistic framework for assessing fiscal reforms: it is not enough to have terminological or legislative convergence, but it is necessary that the principles of harmonization are effectively reflected in the functioning of fiscal control.

CONCLUSION

In summary, the article confirms that the Republic of Moldova is not at the zero point of harmonization, but in a stage of accelerated convergence, in which the progress is real, measurable and institutionally assumed. However, the distance between declarative convergence and full functional convergence is not yet fully covered. That is why the efficiency of the reform will depend on the ability of the tax administration to transform digitalization, risk analysis, international cooperation and voluntary compliance programs from elements of punctual progress into stable, integrated and predictable mechanisms of modern fiscal control.

Therefore, the final answer to the problem addressed is that the harmonization of fiscal control mechanisms in the Republic of Moldova with European standards is possible and already advanced in certain dimensions, but its full success depends on the continuity of reforms, the strengthening of institutional capacity and the effective transition from a predominantly formal-procedural logic to a functional, intelligent and taxpayer-oriented one. In this framework, fiscal control can become not only more efficient in relation to the budgetary interest, but also more legitimate, more predictable and more compatible with the requirements of European integration.

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EVALUATION OF CONSUMER BEHAVIOUR IN THE PURCHASE OF SUSTAINABLE INSURANCE PRODUCTS IN THE REPUBLIC OF MOLDOVA

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Abstract: *We are increasingly talking about sustainability in the context of the green economy, so the way we approach any activity related to the household and economic activity is also changing. Thus, the environment, sustainability and good governance have contributed to the way business is done in the current conditions, and as a result of these phenomena, insurance companies have taken a new approach in light of the aforementioned. In the process of adapting to the new market circumstances influenced by the green economy, insurance companies in the Republic of Moldova are forced to adapt by creating new sustainable product offers. This study is conducted to identify what exactly stops consumers in the Republic of Moldova from purchasing this sustainable insurance. We will answer 3 key questions, namely: how well do people understand climate risks, how much money are they willing to pay for green insurance and how much trust do they have in insurers who propose green insurance. The study is based on a survey conducted on a sample of 200 respondents whose results are analyzed using mathematical and statistical methods. The results will contribute to guiding the marketing strategies of insurance companies to convince customers and develop the green insurance market, but also to creating viable offers by insurers to meet the needs of consumers in the Republic of Moldova.*

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INTRODUCTION

As global economies face risks related to climate change, pandemics and natural disasters1, the development of the sustainable insurance segment is a current necessity for the insurance market in the Republic of Moldova. The current market need is triggered by factors that promote sustainability and the green economy, however, the insurance market demands remain the classic ones oriented towards consumer needs regarding insurance needs. And the behavior of the insurance market consumer is influenced by the quality of life factors, population income and socio-cultural factors.2. Several current studies support the premises of financial factors, but also highlight other characteristics such as the degree of information of citizens and business people about the advantages of insurance, risk aversion,

historical factors and, including, the reputation of insurance companies3. However, there are certain premises for the formation of the insurance services market that are not influenced by consumer behavior. These are constituted by the instruments of the regulatory framework imposed by the state or certain authorities, constituting the mandatory insurance services segment.

A way of insuring risks related to certain banking services, which is widely developed in the EU member states, is bancassurance. Banks sell insurance together with loans, mortgages, guarantees, deposits, cards,4, etc.

At the international level, research on the insurance market is oriented towards the sustainability segment. Thus, in the study published by Niamh O'Sullivan5, sustainable insurance integrates environmental, social and governance issues into insurance activities, addressing risks such as climate-related material damage and the impact on health caused by pollution. Autorii Harinder Kaur, Kiran Sood, Uma Shankar Yadav6 consider sustainable insurance as a strategic approach that identifies, assesses and manages risks related to climate change, socioeconomic and institutional changes, promoting environmentally and socially responsible practices in the insurance industry to enhance resilience and sustainability. Similarly, Arti Gaur, S.S. Bhatti7 in the published study consider sustainable insurance as an emerging concept that aims to reduce risks, while promoting innovative solutions, but also improves business performance and contributes to environmental, social and economic sustainability.

Increasingly, green insurance is associated with responsible corporate governance (ESG) – Environmental, Social, Governance, as the insurance sector no longer has only the traditional role of risk transfer, but also that of a strategic actor in orienting capital and economic behaviors towards sustainability. Some studies confirm that sustainable insurance focuses on the integration of environmental, social and governance (ESG) factors into insurance practices, such as that of the authors Valeria D'Amato, Emilia Di Lorenzo, Gabriella Piscopo8. Thus, the magazine Finance and Credit states in a publication that sustainable insurance involves integrating ESG principles into the insurance sector, focusing on climate risks and promoting transparency. This includes reducing investments in high-carbon industries and reviewing underwriting principles to increase sensitivity to climate-related risks, favoring a transition towards sustainability.9 Veronika V. Barabanova10 In his article Insurance industry in the scope of sustainable development, he states that sustainable insurance aims to support global sustainability goals, including limiting greenhouse gas emissions and promoting transparency in reporting. The principles of the Sustainable Insurance Support Fund, created by the United Nations at the 2012 Conference on Sustainable Development, are considered a global framework for the insurance industry to address environmental, social and governance risks and opportunities. The Sustainable Insurance Support Fund11 brings together more than 300 international government members, which aims to understand, prevent and reduce environmental, social and governance risks, but also to better manage opportunities to provide protection against risks. The European Community is equally concerned about sustainable insurance and responsible corporate governance, so they created the European Insurance and Occupational Pensions Authority (EIOPA)12 which has the function of an advisory body to the European Commission, the European Parliament and the Council of the European Union providing legal, technical and scientific evidence for the creation of policies and laws at European level on sustainable development. The agency's latest report mentions that 92% of European consumers own at least one insurance product.

However, green insurance is not a product in itself but an economic governance mechanism that catalyzes the transition processes towards sustainable development models. For our country, green insurance associated with ESG governance mechanisms represents a modernization of the supervision and reporting framework, a responsibility of the actors in the insurance market and the creation of an economic resilience mechanism in the face of climate risks.

Studies for consulting and supporting the consumer of the insurance market have been carried out by several authors, with an orientation towards the impact on the insurance intermediation market13. Informing consumers by insurers and distributors has been an effective way to increase the

quality of the insurance market and the visibility of the products offered by them, however, the development of society and the orientation towards innovation offer possibilities for implementing new dimensions in this sector. A study that would identify the preferences of the local consumer regarding the sustainable insurance market has not been conducted in recent years, so this study is a pioneering one, although the factors influencing the consumer can evolve and change constantly, a benchmark for certain marketing policies for insurance companies is quite important.

The method and methodology used are based on the principles of quantitative research, aiming to assess perceptions and the level of knowledge regarding green insurance. The research in question uses the sociological survey method, carried out by applying a questionnaire. This method allowed the collection and comparison of data as well as the identification of trends and regularities in the perceptions of respondents regarding the role of green insurance. To measure the opinions of the respondents, the Likert scale was used with values from 1 to 5 from the lowest to the highest appreciation. The methodological approach allows achieving the objectives and provides empirical support for formulating conclusions and recommendations.

RESULTS AND DISCUSSIONS

The questionnaire applied to a sample of 205 respondents was divided into several chapters. So that each of them could respond to one of the objectives established for this study. Analyzing the results from the chapter on the experience with insurance that respondents were exposed to on the structure of the experience and the general level of satisfaction with the insurance services held, provides a coherent picture between the consumer and the insurance market. Thus, the results show that respondents have a greater relationship in the area of social and individual insurance. The results indicate that 59% of respondents reflect the perceived importance of health protection and a high degree of this type of product for insurance companies. In second place is car insurance with a share of 24.8%, confirming once again the mandatory nature of these insurances in the daily practice of consumers. A category with a fairly high share of approximately 23.8%, which refers to the category of other insurance, is in third place in the respondents' assessments. It is a fairly interpretable share, since consumers demonstrate a consumption experience of a diversified spectrum of insurance, most likely related to travel or property insurance.

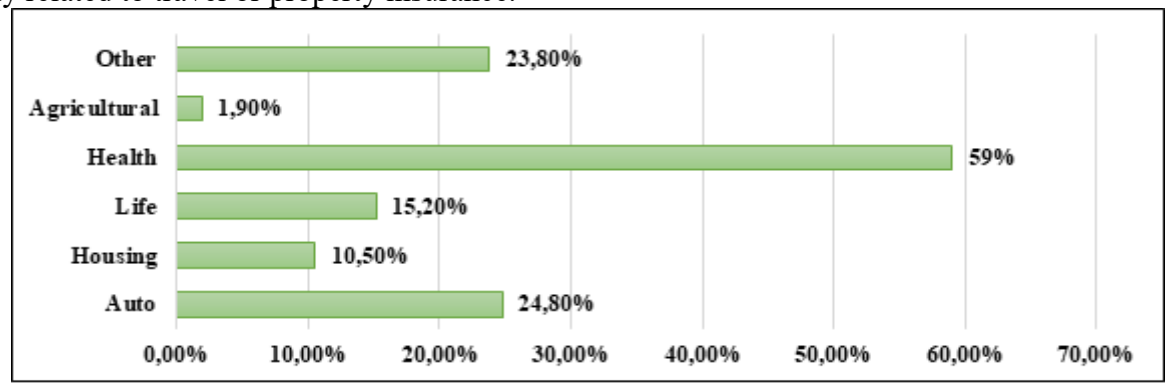

Figure 1. Results of respondents' answers to the question regarding the types of insurance held

The results show a lower share for life insurance by 15.2% and for home insurance by 10.5%, for which consumers opt less, either due to financial limitations or because they are not mandatory. Agricultural insurance in this survey is marginal with a share of only 1.9%, which on the one hand signals a low degree of use, and in the context in which only 30% of respondents are from rural areas, it is an explainable result.

Assessing the level of satisfaction with the insurance held, respondents had the opportunity to select one of the ratings with a value between 1 and 5 corresponding from low to high. More than 50% of respondents declared themselves satisfied with their insurance, giving a score between 4 and 5.

Although 31% of respondents expressed their view as moderate satisfaction, it can be associated with a functional experience more than with a level of appreciation. Respondents also reported dissatisfaction, although this is of minimal value, summed from values 1 and 2 with approximately 16.2%, which highlights the existence of dissatisfaction and suggests to companies a more severe monitoring of complaints.

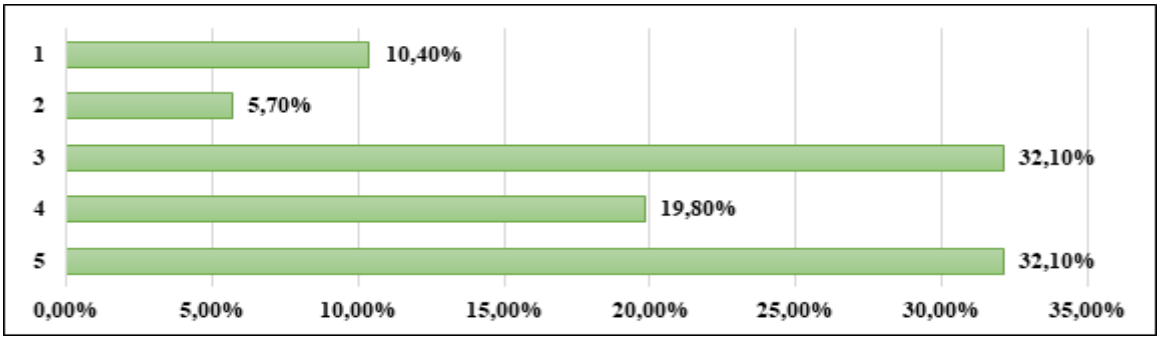

Figure 2. Results of respondents' satisfaction level regarding their insurance policies

Centralizing the results for this chapter, we can assess the level of consumer satisfaction relatively favorable but not uniform for a predominant experience with mandatory insurance. Under these conditions, the existence of a potential for strengthening trust and diversifying the insurance portfolio is observed, including by promoting innovative products, such as green insurance, correlated with governance and sustainability principles.

A central objective of the research is the perception of the local consumer of insurance services regarding green insurance. The analysis of the data collected from the respondents in the sample results in a relevant perspective on the degree of knowledge of the concept as well as on the way in which the content of this concept is understood. Referring to the degree of familiarity of consumers with the concept of sustainable insurance, we observe a rather fragmented level. Thus, 34% of respondents declare that they have heard about the concept of sustainable insurance compared to the 43.4% of respondents who do not know about this concept. Similarly, a significant segment of 22.6% of respondents declare themselves unsure of their understanding of the concept, which would correlate between a vague or superficial understanding. In this sense, marketing policies aimed at promoting the concept and orienting customers on the sustainability dimension is a viable objective for the insurance market. Orienting customers on the topic of sustainability transposed into the insurance field would be an advantage not only for the insurance market but also for ESG policies.

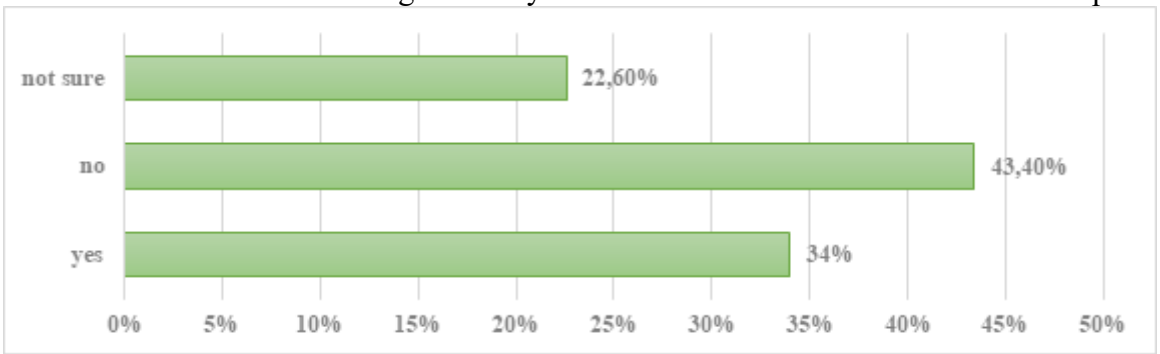

Figure 3 Results of respondents' answers to the question: Have you heard of the concept of sustainable insurance?

Analyzing consumer perceptions of the defining criteria of green insurance, we observe a lack of uniformity in the results, which means that respondents cannot yet concretely define green

insurance. This result indicates a wide area of action in correctly guiding customers regarding the perception of new products in the portfolio of insurance companies.

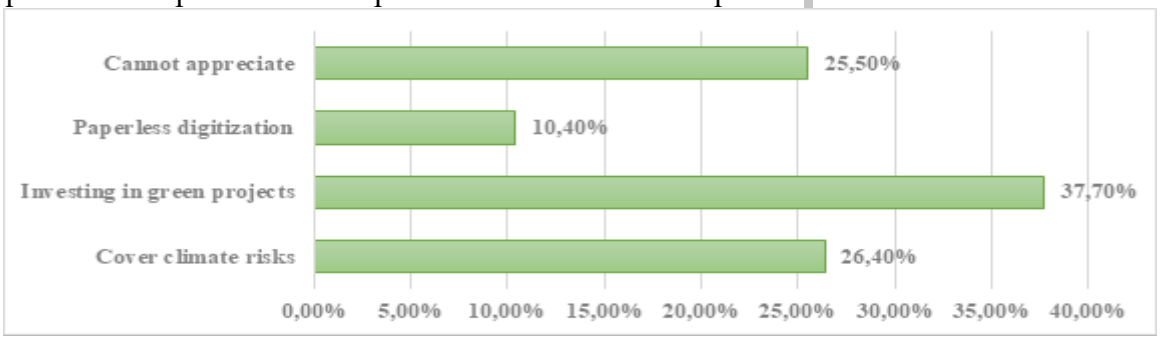

Figure 4 Results of responses to the question: What do you think defines green insurance?

The majority of respondents with a share of 37.7% consider that green insurance is an investment in ecological projects, thus we find that consumers link sustainability to the financial-investment dimension and not to environmental risks. Only 26.4% of respondents consider that green insurance covers climate risks, which would be a partial perception of the role of this type of insurance. Only 10.4 of respondents selected the answer option paperless digitization, which is why we consider that the operational and governance dimensions are less known by the respondents in the selected sample. Although the respondent segment is 56% made up of people aged between 20-29, these notions are not sufficiently promoted in the training processes and are not recognized by them. The 25.5% of respondents who confirm that they cannot appreciate the concept of green insurance explain the need for structural information for potential clients, consumers and society in general, regardless of their decision to purchase green insurance. So we have a very motivating result for creating marketing policies towards the educational element and forming correct perceptions both for declarative expression and for substantial understanding, which can contribute to a complex integration of governance on the environmental and societal dimensions. At this point, the statements of the hypothesis regarding the insufficiency of public perception regarding green insurance are confirmed, and the consolidation of this gap through certain marketing strategies on the part of insurance companies can contribute to creating a significant development potential in the context of the transition to sustainability.

Next, we discuss the results of the chapter on perceptions, skills and behavioral intentions of respondents in relation to green insurance as well as their availability to purchase them. We focused the respondents' attention on the perception of the impact of climate change on the economic effects of the Republic of Moldova, for which we obtained a feedback of 36.8%, that is, a third of respondents who recognize the impact of the climate effect on the country's economy. The 34.9% of respondents who state a neutral perception, we can consider a precautionary effect that can at any time prevail one of the two extremes. However, 31.1% of respondents are skeptical and do not associate climate effects as a factor of influence on the national economy.

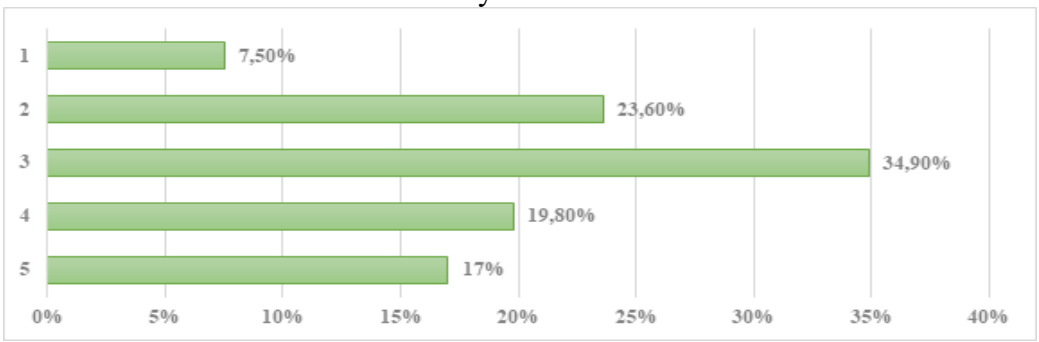

Figure 5. Result of answers to the question: Do you think that climate change influences the economy of the Republic of Moldova?

From the results of the assessments by the respondent segment, we find that their trust in insurance companies investing in green projects is relatively favorable, but also cautious, being rated more with a score of 3, meaning conditional trust. The rather modest maximum assessment of only 13.2% from the respondents is an advantage for insurance companies in the formation of marketing policies, which they can use as statements of trust for this segment.

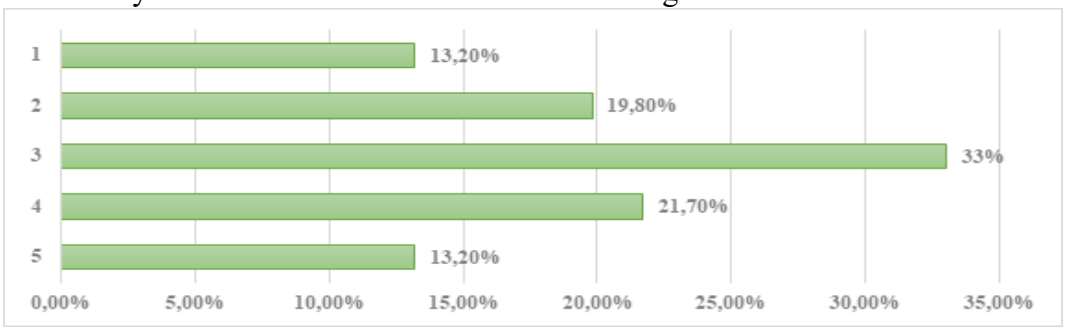

Figure 6. The result of the answers to the question: Would you have more trust in an insurance company that invests in green projects?

So, promoting investments in green projects by insurance companies can constitute a clearer communication bridge with future beneficiaries, and the use of transparent campaigns regarding green insurance packages can contribute to increasing the level of trust.

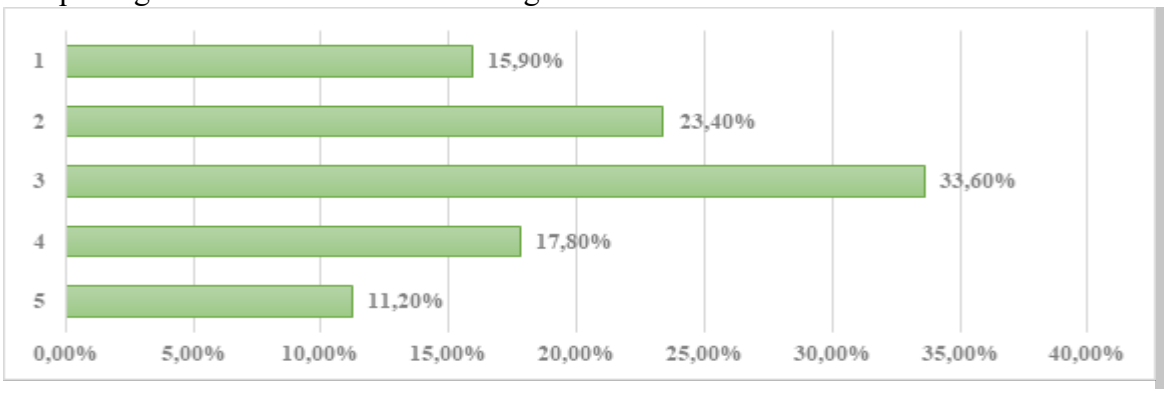

Figure 7. The result of the question: Are you willing to pay more for a sustainable product?

The results presented in Figure 7 show a dominance of 33% of those interviewed as being undecided about assuming additional expenses regarding sustainable products. Although the willingness to pay is limited, a good part of the respondents with a share of 29.2% would still be willing to bear additional expenses. So we need a promotion of the values, context, concept and benefits of green insurance to change the size and vision of consumers regarding this insurance segment.

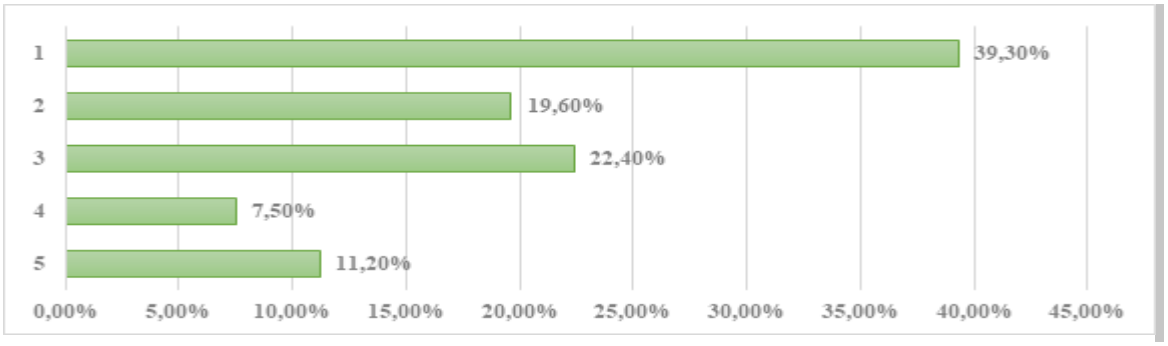

Figure 8. The answer to the question of whether they intend to buy a green policy in the next 12 months

If we analyze the results of this diagram, we see a statement with a positive intention of 18.85, that is, those who will most likely purchase, directly proportional to the share of respondents whose monthly income is higher than 15,000 lei. We can conclude that the dependence of purchases is directly influenced by the monthly income of consumers. Under these conditions, the target segments for promoting green insurance will be oriented towards consumers with incomes higher than the average salary in the economy.

From an economic point of view, any purchase intention must be transformed into demand, and until this exchange is achieved, awareness of sustainable insurance topics is necessary on the part of companies in the insurance market.

This scientifically argued study, through its results, confirms the existence of a structural gap between the perception, attitude and behavior of consumers regarding green insurance services. At this level, it is determined that consumers view green insurance as a conceptual aspect without having the intention to transform it into an immediate economic necessity, but through correct marketing tools they can adopt it, albeit in a smaller proportion at first. With the increase in the level of trust and the application of correct communication methods, including financial education, the green insurance market can grow considerably, also in the context of the acceptance of faster innovation processes by society, under current conditions.

In conclusion, we state that green insurance is a new concept for the Republic of Moldova, which is at an early stage of knowledge, which is an advantage for creating marketing strategies regarding the promotion and correct information of consumers about the advantages and importance of assimilating this type of insurance. The study confirms the limitation of consumers to the experience with insurance, predominantly in traditional fields and mandatory fields such as health and motor transport.

Through marketing actions, the utilitarian approach associated with insurance can be transformed into a broader perception, with the development of clearly differentiated green insurance products with certain benefits. Contributing to a clearer understanding of the concept, the cognitive gap in the perception of the notion of green insurance can be eliminated and consumer perceptions and behavior can be directly influenced. The only limit that can hinder acceptance and the purchase decision remains the economic aspect, which can also be easily shaped through certain marketing strategies.

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APPROACHES FROM THE NEW INSTITUTIONAL ECONOMICS TO MAXIMIZING VOLUNTARY COMPLIANCE IN THE REPUBLIC OF MOLDOVA AND EU COUNTRIES

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Abstract: *This paper examines the role of institutional design in fostering voluntary tax compliance, drawing on insights from the New Institutional Economics (NIE), Public Choice theory, and transaction cost economics. Beginning with Buchanan's conceptualization of the necessity of the state in The Limits of Liberty, it highlights how public institutions can reduce transaction costs, thereby creating incentives for benevolent compliance among economic agents. The analysis incorporates Coase's framework of transaction costs and North's notion of open-order institutions, showing how well-structured fiscal systems transform state institutions into credible and efficient enforcers of public finance. Further, the paper explores the relationship between institutional legitimacy and revenue outcomes, arguing that higher public trust correlates with greater tax compliance, as evidenced by Scandinavian countries, whereas low legitimacy, as in the Moldovan case, hinders revenue collection. Finally, the European Union is presented as a supranational mechanism that harmonizes fiscal policies across member states, reducing administrative burdens and evasion while maximizing compliance. Overall, the paper underscores the critical importance of institutional legitimacy and coordinated policy design in achieving efficient public finance outcomes*

Keywords: *voluntary compliance, new institutional economics, tax revenues, public finance.*
JEL Classification: *H20, H26, D02, D73*

INTRODUCTION

Voluntary tax compliance represents one of the essential elements of an efficient public administration, as it reflects the extent to which taxpayers choose to fulfill their fiscal obligations on their own initiative. In the contemporary economy, the way the state organizes institutions, rules, and incentives plays a decisive role in shaping this behavior. The New Institutional Economics provides an analytical framework in which formal and informal institutions, transaction costs, trust, and governance quality can be understood as central factors influencing taxpayer motivation.

Both in the Republic of Moldova and in the member states of the European Union, strengthening voluntary compliance has become a strategic objective. As economies transform and the relationship between the state and taxpayers evolves, new needs emerge: clarity in regulations, simplified administrative processes, accessible digital systems, and a high level of fiscal predictability. Beyond procedures, however, the fundamental question remains: how can an institutional framework be built that reduces tensions between authorities and taxpayers and encourages cooperation?

This paper analyzes how the principles and concepts of New Institutional Economics can be integrated into fiscal policies to support voluntary compliance. It examines the role of rules, incentives, institutional credibility, and the quality of interactions between the state and citizens, highlighting both similarities and differences between the Republic of Moldova and EU countries.

Throughout the paper, several essential elements for maximizing voluntary compliance are emphasized, such as the necessity of a fiscal system and the level of trust in public sector institutions.

The aim is to demonstrate how an appropriate institutional design can transform fiscal behavior and provide a solid foundation for sustainable public policies.

CORE CONTENT

1.1. Fiscal institutions and the minimization of transactional costs

The necessity of public finance can be rigorously formulated through the lens of ideas developed in public choice theory and in the new institutional economics. In the tradition of James Buchanan, the state is not conceived as a benevolent actor, but as an institutional structure created through agreement among individuals to overcome the limits of spontaneous cooperation. In *The Limits of Liberty* (Buchanan,1975), Buchanan shows that, in the absence of a collective mechanism for establishing and enforcing rules, social interactions tend to deteriorate into a situation where each person pursues their own interest without being able to rely on predictable behavior from others. The state thus emerges as a contractual solution to stabilize expectations, protect property rights, and provide public goods that cannot be efficiently produced through individual action.

This perspective is organically linked to Ronald Coase's analysis of transaction costs (Coase,1937). Coase argues that in any real economy, exchange is never free. Negotiation, monitoring, enforcing contracts, and coordinating decisions among many agents generate significant costs. Without institutions that reduce these costs, the market would become fragmented and inefficient. From this follows the crucial role of the fiscal-budgetary framework: it functions as a collective mechanism through which society finances the institutions that reduce the transaction costs associated with social order.

Through the existence of a stable fiscal-budgetary system, the state can finance courts, regulatory agencies, information infrastructure, property rights protection, quality standards, and coordination mechanisms that reduce the individual costs of economic interactions. Without these institutions, each economic actor would have to bear much higher costs to secure the same functions: protection, verification, arbitration, access to information, or contract enforcement. The fiscal system thus becomes a necessary instrument for producing those "institutional goods" that enable markets to function.

In Douglass North's logic, institutions that systematically reduce uncertainty and transaction costs contribute to transforming the state from a limited-order structure into an open-order one. In a limited order, access to resources, opportunities, and legal protection depends on belonging to privileged groups or personal relationships (North, 2009). By contrast, an open order presupposes impersonal institutions, broad access to the market, general and predictable rules, and equal treatment. Public finance is the material condition for the existence of these impersonal institutions: without stable collective resources, the state cannot provide the legal, administrative, and fiscal infrastructure that guarantees equal and predictable access for all economic participants.

Thus, from the perspective of the new institutional economics, public finance is not merely a mechanism of redistribution or a technical matter of public accounting. It represents the material foundation of the institutions that reduce transaction costs and enable the functioning of an open, stable, and development-oriented social order.

From the combined perspective of public choice theory, Coasean transaction-cost analysis, and the institutional framework proposed by Douglass North, voluntary tax compliance can be understood not merely as a moral preference but as a rational strategy adopted by economic agents seeking to minimize their own transaction costs. These theoretical traditions converge on the idea that individuals respond to incentives shaped by institutions, and that predictable, rule-based environments lower the costs associated with economic and social interactions.

Public choice theory, following Buchanan, explains that individuals consent to collective rules, including taxation, when those rules create a more stable and cooperative environment than the uncoordinated alternative. In *The Limits of Liberty*, Buchanan emphasizes that the formation of a state is essentially a contractual solution: individuals accept certain obligations because the institutional order financed by those obligations provides benefits that exceed the costs. In this logic, tax compliance becomes a form of rational cooperation. By complying, individuals contribute to

maintaining the institutional structure that protects property rights, ensures contract enforcement, and reduces the risk of opportunistic behavior by others.

Coase's theory adds a crucial layer. If transaction costs define the efficiency of any arrangement, then avoiding or undermining the fiscal system generates additional costs for the agents themselves. Tax evasion or resistance increases monitoring costs, legal risks, uncertainty, and the potential breakdown of the institutional services that reduce these costs in the first place. Contributing to the public budget through tax compliance is, in Coasean terms, a way to sustain the institutions that minimize negotiation, enforcement, and information costs across the economy. Compliance therefore becomes not just a legal obligation but a cost-minimizing strategy.

In North's framework, a fiscal system that finances impersonal, rule-bound institutions is the backbone of an open-access order. When such institutions are credible and predictable, economic agents benefit from a stable environment that reduces the need for constant private enforcement, bilateral bargaining, or reliance on personal networks. Agents in an open-access order face lower overall transaction costs precisely because the state supplies the legal and administrative infrastructure collectively. Voluntary compliance is thus reinforced by the positive-sum nature of the institutional environment: by cooperating with the fiscal system, agents help maintain the very conditions that reduce uncertainty and expand opportunities.

Taken together, these strands of theory suggest that benevolent tax compliance is not an anomaly but a rational outcome when institutions are well designed. Faced with the choice between a low-compliance environment characterized by high uncertainty and high private enforcement costs, or a high-compliance environment where collective institutions lower transaction costs for all, economic agents will generally gravitate toward compliance. They do so not because they romanticize the state, but because cooperating with the fiscal system is strategically aligned with their own interest in reducing transaction costs and securing predictable, open, and efficient markets.

The European Union plays a comparable role in reducing transaction costs for its member states by harmonizing and coordinating fiscal policies across the region. Through mechanisms such as common reporting standards, VAT directives, and anti-fraud frameworks, the EU lowers the administrative and informational burdens that individual states would otherwise face when enforcing tax compliance. By standardizing procedures and increasing transparency, these measures reduce opportunities for tax evasion, limit legal and regulatory arbitrage, and create a more predictable environment for economic agents. Consequently, this coordinated approach enhances voluntary compliance, ensuring that revenue collection is more efficient and consistent across member states, much like a benevolent institutional framework would operate at the national level.

1.2. Public consent and tax collection

Knut Wicksell argued that a public policy achieves the efficiency of a market outcome when it is perceived as fully legitimate by those who bear its costs (Wicksel, 1896). In his view, legitimacy arises when taxpayers regard a policy as fair, transparent, and aligned with their preferences, much like market participants voluntarily enter exchanges because they expect mutual benefit. When citizens perceive a fiscal policy as legitimate, they internalize its necessity, reduce resistance, and comply voluntarily. This voluntary alignment minimizes enforcement costs and reduces the distortions normally associated with taxation. In this sense, a highly legitimate public policy can reach a level of allocative efficiency comparable to private market transactions.

This reasoning provides a conceptual bridge to the logic of the Laffer curve. The Laffer curve illustrates that tax revenues do not grow indefinitely with higher tax rates. Beyond a certain point, higher rates reduce the willingness of taxpayers to comply, encourage avoidance or evasion, and weaken economic activity. Wicksell's insight helps explain why the location of this maximum point varies across countries: it depends not only on economic fundamentals, but also on the legitimacy of public institutions.

When institutions are viewed as fair, transparent, and accountable, taxpayers perceive the fiscal burden as justified. This increases voluntary compliance, shifts the behavioral response to taxation, and pushes the revenue-maximizing point of the Laffer curve to a higher level.

Conversely, when institutions lack legitimacy, taxpayers interpret taxes as extraction rather than contribution, compliance drops, and the peak of the Laffer curve occurs at a lower tax rate.

Table 1.1 provides the data for different european countries regarding the tax to GDP % rate and the democracy index. Our hypothesis is that more democratic countries will have bigger tax to GDP ratio caused by bigger trust ininstitutions.

Table 1. European countries by Democracy index and Tax to GDP ratio

Country	Democracy index	Tax do GDP ratio (%)
Europe	0.72	40.4
Germany	0.84	40.9
Spain	0.83	37.3
France	0.87	45.3
Italy	0.8	42.6
Luxembourg	0.87	42.7
Netherlands	0.82	39.4
Austria	0.84	43.8
Romania	0.63	28.8
Finland	0.85	42.3
Sweden	0.88	42.5
Norway	0.88	40.4
Switzerland	0.89	27.8
Moldova	0.63	33.9

Source: Prepared by the author based on data presented by the IMF (2023)

Thus, there is a correlation between institutional legitimacy and the revenue-maximizing point on the Laffer curve (Laffer,2004). Countries with highly legitimate fiscal and administrative institutions can sustain higher effective tax rates without triggering the steep decline in revenues predicted by the Laffer curve, while countries with low trust and low legitimacy reach that peak much earlier. In this sense, Wicksell's theory provides an institutional explanation for cross-country differences in the shape and height of the Laffer curve.

This correlation between institutional legitimacy and the revenue-maximizing point of the Laffer curve is shaped not only by formal institutional design, but also by deeper cultural and national characteristics, as well as the broader political environment. Patterns of trust, expectations regarding the state, historical experience with governance, and the stability of political institutions influence how taxpayers interpret the fiscal burden and how they respond to taxation.

Scandinavian countries illustrate this mechanism clearly. Even though they maintain some of the highest tax pressures in the world, their public institutions are widely regarded as fair, efficient, transparent, and oriented toward the public good. Citizens perceive taxes as part of a reciprocal relationship: high contributions are matched by high-quality public services, predictable rules, and low corruption. This high legitimacy shifts the behavioral response to taxation and allows these states to operate near the upper end of the Laffer curve. In other words, the revenue-maximizing point is higher because cultural norms and institutional trust make voluntary compliance stronger.

Figure 1.1 represents the data from Table 1.1. It can be clearly seen that there is a pozitive correlation between the democracy index and tax to GDP ratio. The author does not argue for the idea that institutional trust is the only factor that determines bigger rates of tax to GDP in more democratic countries, but it is clearly one factor that has an important contribution.

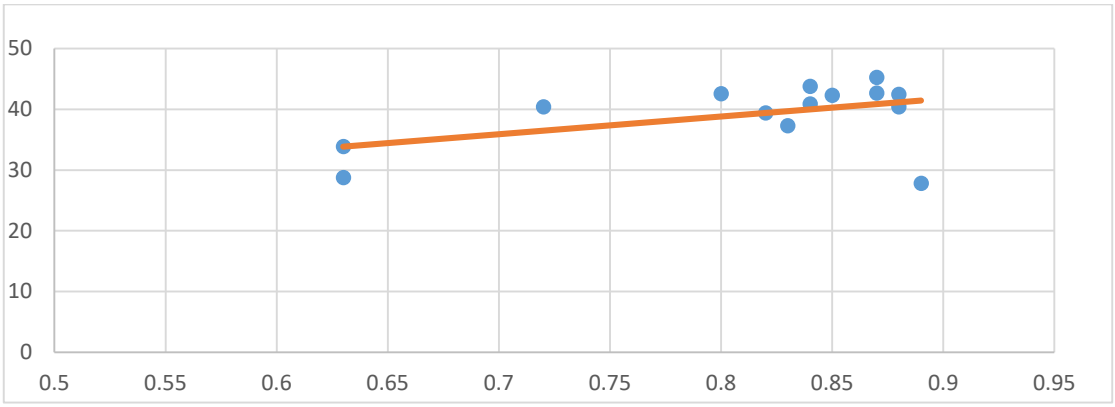

Figure 1.1. The trend line for tax to GDP ratio in dependence of the democracy index.
Source: Prepared by the author based on the data from table 1.1

The Moldovan context stands in contrast. Historically lower levels of trust in government, frequent political instability, and perceptions of weak institutional performance reduce the legitimacy of the fiscal system. In such an environment, citizens interpret the tax burden with more skepticism, and voluntary compliance is more fragile. As a result, the revenue-maximizing point of the Laffer curve occurs at a lower tax rate, because increases in tax pressure are quickly met with higher evasion, avoidance, and informal-sector expansion. The cultural and political environment amplifies these effects: where institutional legitimacy is low, the behavioral elasticity of taxpayers becomes much higher.

Thus, differences in national culture and political context shape the relationship between legitimacy and fiscal capacity. High-trust societies can sustain higher effective tax rates without undermining compliance, while low-trust environments reach the limits of the Laffer curve much earlier.

CONCLUSIONS

The analysis demonstrates that voluntary tax compliance is deeply contingent on the legitimacy and design of public institutions. By reducing transaction costs through transparent, predictable, and well-enforced fiscal policies, states can transform their fiscal systems into instruments of efficiency and public trust. Empirical comparisons, such as the Scandinavian and Moldovan contexts, illustrate that cultural and political factors modulate the effectiveness of these institutions. Moreover, the European Union exemplifies how supranational coordination can achieve similar goals at a broader scale, harmonizing rules to minimize evasion and streamline compliance across member states. These findings highlight that beyond traditional market mechanisms, the legitimacy of public institutions and the rational design of fiscal frameworks are essential determinants of tax revenue maximization and sustainable public finance.

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MEASURING SMUGGLING THROUGH THE GRAVITY EQUATION AND THE MIMIC MODEL: EVIDENCE FROM THE REPUBLIC OF MOLDOVA

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Abstract: *This paper evaluates the impact of Free Trade Agreements (FTAs) on the Republic of Moldova's external trade using a structural gravity model framework. By employing bilateral trade data from 2001 to 2024, the study examines both exports and imports using two econometric approaches: Ordinary Least Squares (OLS) and Poisson Pseudo-Maximum Likelihood (PPML). The results confirm that the Republic of Moldova's participation in FTAs—especially with the European Union (DCFTA), CEFTA countries, and CIS partners—has significantly enhanced export flows, while the effects on imports remain mixed. The analysis highlights the importance of economic size and geographical distance, as well as the statistically significant contribution of FTAs to the Republic of Moldova's export performance. However, the asymmetric impact on imports underscores the need for tailored trade policy instruments and institutional support to fully realize the benefits of trade liberalization. This research contributes to a deeper understanding of the Republic of Moldova's trade dynamics and provides empirical insights relevant for regional integration and sustainable economic development.*

Keywords: *Republic of Moldova, Free Trade Agreements, gravity model, exports, imports, PPML, trade policy*

JEL CLASSIOFICATIOS: F17

INTRODUCTION

The Republic of Moldova, with an economy in transition located at the intersection of East and West, faces significant challenges in the process of international economic integration. Over the past two decades, the authorities have made considerable efforts to open the national economy to foreign markets by signing and implementing multilateral and bilateral trade agreements. Among them, the Deep and Comprehensive Free Trade Agreement (DCFTA/DCFTA) signed with the European Union represents a turning point for the Moldovan economy, profoundly influencing the direction and composition of exports.

The purpose of this report lies in the need for a complex analysis of the impact of free trade agreements on the foreign trade of the Republic of Moldova. In addition to a retrospective on the agreements signed, the study provides an overview of the current structure of exports and the challenges encountered in the current geopolitical context. It is also proposed to identify concrete opportunities for economic development by efficiently capitalizing on the existing trade framework.

The report is structured in several chapters. The first chapter provides an introductory framework and presents the rationale and objectives of the research. The second chapter analyzes the theoretical and normative framework that regulates free trade agreements, at the same time as the detailed description of the main agreements signed by the Republic of Moldova. Next, the impact of these agreements on foreign trade is assessed, using the structural model of the gravitational equation suggested for these purposes by Yotov et.al (2016). The paper concludes with a series of conclusions highlighting existing systemic challenges and strategic opportunities, as well as a series of practical recommendations for political and economic decision-makers.

THEORETICAL AND LEGISLATIVE FRAMEWORK OF THE TRADE AGREEMENTS SIGNED BY THE REPUBLIC OF MOLDOVA

The theoretical framework for free trade agreements is based on the theory of comparative advantage, which argues that countries should specialize in the production of goods for which they have the lowest opportunity cost. Therefore, the liberalization of international trade, supported by free trade agreements, contributes to the efficiency of resource allocation and the increase of economic well-being.

Free Trade Agreements (FTAs) are legal instruments that aim to eliminate tariff and non-tariff barriers between signatory states, thereby facilitating international trade. In the context of the global economy, these agreements contribute to sustainable economic development, stimulating foreign direct investment and integration into international production chains.

The Republic of Moldova has demonstrated, by signing several FTAs, a constant commitment to the principles of economic liberalization. The legal frameworks governing these agreements are varied and include both multilateral conventions (such as those of the World Trade Organization) and bilateral and regional treaties.

At the legislative level, the Republic of Moldova has developed a modern normative framework that facilitates integration into the global economy. Among the most important documents is the Foreign Trade Law no. 1031-XIV of 2000, the Customs Code and the laws ratifying each agreement, as well as the regulations on the origin of goods. These acts regulate trade flows, the way products are certified and the recognition of non-tariff barriers.

At the international level, the Republic of Moldova has been a member of the World Trade Organization (WTO) since 2001, and its legislation is gradually harmonized with the rules of the European Union. In the context of the DCFTA, the Moldovan authorities had to align hundreds of rules and technical procedures to allow duty-free access to the European market. These legislative transformations have an impact not only on exporting companies, but also on the entire economy, by imposing higher standards of quality and safety.

In addition to legislative aspects, the institutional framework is essential. The Ministry of Economic Development and Digitalization, the Customs Service and the National Agency for Food Safety are just some of the institutions that ensure the application and monitoring of the agreements. This complex framework requires not only the formal adoption of the provisions of the agreements, but also an effective implementation into practice, which remains a major challenge in the case of the Republic of Moldova.

Over the past two decades, the Republic of Moldova has concluded a number of free trade agreements that have contributed significantly to the redefinition of its international trade framework. These agreements aimed to facilitate foreign trade, stimulate investment and create a predictable economic climate for economic agents.

The most important instrument in this regard is **the Association Agreement with the European Union**, signed in 2014 and provisionally applied since 2016, which includes the trade component of the **DCFTA**. This agreement gives the Republic of Moldova preferential access to the European single market, with the elimination of most customs duties on Moldovan products. At the same time, it requires compliance with European standards in the field of quality, environmental protection, competition and consumer rights. The DCFTA is not just a trade agreement, but is an instrument for profound transformation of the country's economic and legal framework.

In addition to the relationship with the European Union, Moldova has been a party to **CEFTA (Central European Free Trade Agreement)** since 2007, along with Western Balkan states. The agreement facilitates regional trade and contributes to the diversification of markets, providing preferential access to countries such as Serbia, Montenegro, Albania and others.

Moldova has also signed **bilateral** free trade agreements with several states, including Turkey (2008), Ukraine (2005) and **CIS** member states (since 1993). These agreements contain provisions on dispute settlement, investment protection and technical cooperation, thus ensuring a transparent

and predictable framework for international trade.

Currently, the Moldovan authorities are exploring new trade opportunities, with **discussions on a possible free trade agreement with the People's Republic of China** being ongoing. This potential partnership is part of the strategy to expand Moldova's trade network in the Asian region.

To see the practical effectiveness of these agreements, in the next section we will conduct an empirical analysis of the impact of FTAs on our country's foreign trade.

ESTIMATION OF THE IMPACT OF THE FREE TRADE AGREEMENTS OF THE REPUBLIC OF MOLDOVA ON EXPORTS-IMPORTS ACCORDING TO THE STRUCTURAL GRAVITATIONAL MODEL

For the Republic of Moldova, with a small and open economy, FTAs have become key instruments in the national trade strategy in recent decades, as they are also essential channels for regional and European economic integration, accessing new markets, attracting investments and strengthening strategic economic relations.

Thus, during 1992–2000, Moldova concluded trade agreements with numerous states, including within **the Commonwealth of Independent States (CIS)** – such as Russia (1993), Belarus (1993), Ukraine (1995), Armenia (1993), etc. – but also with countries such as Austria, China, Egypt, Turkey, the USA, Israel or Switzerland. Agreements with **the European Free Trade Association (EFTA) states** (Iceland, Liechtenstein, Norway and Switzerland) and the **CEFTA countries** (since 2007) have completed this diversified network.

However, as mentioned in the previous section, a turning point was the implementation of the **DCFTA** under the Association Agreement with the European Union. With the help of the DCFTA, in the period 2014–2024, exports to the EU increased by more than 150%, especially in the agri-food, textile and automotive components sectors. By 2024, the EU will account for **more than 65% of Moldova's total exports**. However, there are also some inconsistencies in this regard, such as the introduction by Chisinau of import licensing mechanisms that are shown to be problematic under the auspices of the DCFTA, which in the opinion of the European Commission is recommended to be revised during the next period. 3

Examining the retrospective of our country's participation in the DCFTA, we note that among the products with notable developments are: processed fruits and vegetables, wines, car wiring and clothing – these benefiting both from the elimination of customs duties and from active promotion on foreign markets. At the same time, **the restrictions imposed by Russia after 2014** accelerated the process of reorienting trade towards the West.

On the other hand, it can be seen that the impact of FTAs has not been limited to volume alone: they have stimulated **investment in export infrastructure**, equipment upgrades and the adoption of international quality standards. However, **the effects have been unevenly distributed**: large and competitive companies have adapted more easily, while **SMEs** continue to face barriers related to costs, certifications and bureaucracy.

At the same time as these observations, Moldova's foreign trade data also highlight an **excessive concentration of exports in several product groups**, which accentuates the structural vulnerabilities of the export-oriented Moldovan economy.

Starting from this small introduction to the subject, in this section we aim to assess **the trade effects of the 47 FTAs** signed by Moldova, applying **the structural gravitational model** – an established analytical framework for estimating bilateral trade flows. It makes it possible to quantify the influence of the economic size, geographical distance and presence of trade agreements on exports and imports in the period **2001–2024**.

3 European Commission (2024), Brussels, Commission Staff Working Document, Republic of Moldova 2024 Report, p.20

In the course of this exercise and inspired by the approaches of Yotov et.al (2016), we tried to make the estimates using two methods: (1) the log-linear OLS model and (2) the PPML (*Poisson Pseudo Maximum Likelihood*) model recommended by the World Trade Organization to treat zero values and heteroscedasticity. For each method, Moldova's exports and imports to and from its trading partners were analyzed separately. In this regard, the basic and auxiliary models have been rendered by the following specifications:

$$log(Trade) = \alpha + \beta^1 \cdot log\left(PIB_{exporter}\right) + \beta^2 \cdot log\left(PIB_{importer}\right) + \beta^3 \cdot log(Distance) + \varepsilon \quad \textbf{(1)}$$

$$Trade_{valueUSD} \sim log\ \ GDP_{exporter} + log\ \ GDP_{importer} + log\ \ Distance + FTA_{Dummy} + country\ fixed\ effect\ and\ year \quad \textbf{(2)}$$

$$Trade_{value\ USD} \sim log\ \ GDP_{exporter} + log\ \ GDP_{importer} + log\ \ Distance + FTA_{Dummy} + country\ fixed\ effects\ and\ year \quad \textbf{(3)}$$

The dataset used includes bilateral trade flows for the period 2001–2024, ISO codes for trading partners, the value in US dollars (USD) of trade (exports and imports), the distances between capital and estimated GDP for the Republic of Moldova and each partner country. The distances were calculated geographically between Chisinau and the capitals of the partner countries. Below is a list of the variables that will be used in performing these exercises to estimate the coefficients specific to each independent variable.

Table 1. Description of variables:

Variable	Description
Year	Year of observation (2001–2022)
Export	Always Moldova in this analysis
Import	Partner country
Exports_USD	Value of exports from Moldova to partner (USD)
Imports_USD	Value of imports into Moldova from partner (USD)
FTA_Dummy	1 if an FTA between Moldova and partner is active in that year, else 0
GDP_Exporter	GDP of Moldova (USD)
GDP_Importer	GDP of partner country (USD)
Distance_KM	Geographical distance between capitals (km)

***Note**: *Variables defined by the author.*

Thus, as a result of the estimation of the log-linear model OLS for exports, the following indices of the variables that have an influence on the development of exports were obtained:

Table 2. OLS log-linear model for exports

Variable	Coefficient	Std. Err.	P>|t|	Range 95%
Intercept	-29.6007	6.9611	0.0000	[-43.27, -15.93]
log_Distance	-1.4540	0.0972	0.0000	[-1.64, -1.26]
log_GDP_Exporter	2.1938	0.3037	0.0000	[1.60, 2.79]
log_GDP_Importer	0.2359	0.0497	0.0000	[0.14, 0.33]

***Note**: *Variables defined by the author. All coefficients are statistically significant. The GDP of the Republic of Moldova has a major influence on exports, while distance has a strong negative effect, confirming the basic hypothesis of the gravitational model.*

In the case of estimating the log-linear model OLS for imports, the results of the coefficients of its indicators are presented below:

Table 3. OLS log-linear model for imports

Variable	Coefficient	Std. Err.	P>|t|	Range 95%
Intercept	-42.4135	6.9452	0.0000	[-56.05, -28.77]
log_Distance	-0.9394	0.0971	0.0000	[-1.13, -0.75]
log_GDP_Exporter	2.4385	0.3032	0.0000	[1.84, 3.03]
log_GDP_Importer	0.4037	0.0501	0.0000	[0.31, 0.50]

***Note**: *Variables defined by the author. In the case of imports, distance also negatively influences trade flows, and the GDP of the Republic of Moldova has a significant positive impact. The partner's GDP is also an important determinant of the level of imports*.

The next step will be devoted to the use of the Poisson Pseudo Maximum Likelihood (PPML) model to estimate the coefficients applied in the same situations.

Table 4. PPML model for exports

Variable	Coefficient	Std. Err.	Z	P>|z|
Const	-18.2832	0.0006	-32408.63	0.0000
log_Distance	-1.7345	0.0000	-172356.22	0.0000
log_GDP_Exporter	1.8166	0.0000	74066.86	0.0000
log_GDP_Importer	0.2455	0.0000	55882.78	0.0000

Table 5. PPML model for imports

Variable	Coefficient	Std. Err.	Z	P>|z|
Const	-23.9067	0.0004	-63322.08	0.0000
log_Distance	-0.8154	0.0000	-149682.33	0.0000
log_GDP_Exporter	1.9198	0.0000	116946.93	0.0000
log_GDP_Importer	0.1673	0.0000	63288.22	0.0000

***Note**: *Variables defined by the author. PPML estimates provide additional robustness in the face of heteroscedasticity and possible zero trade flows*.

As a result of these estimates, we can see that both methods, both OLS and PPML, confirm the validity of the gravitational model for the international trade of the Republic of Moldova, namely that GDPs play an essential role in determining the volume of trade, and the geographical distance proves to be a significant barrier to its promotion.

Visually, the above developments acquire the following graphic representation:

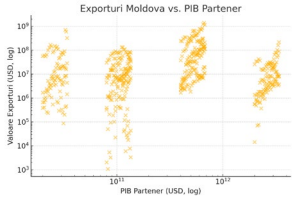

Figure 1 Exports vs. Partner GDP

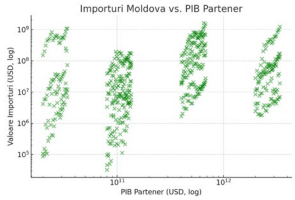

Figure 2 Imports vs. Partner GDP

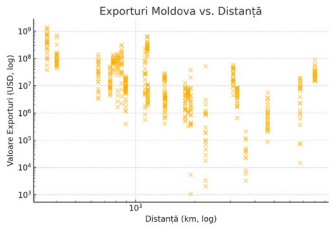

Figure 3 Exports vs. Distance

The next step will be devoted to conducting an extensive analysis, in which we will introduce a binary dummy variable to reflect whether the Republic of Moldova has a free trade agreement in force with the partner country in a given year. This variable would allow the direct assessment of the effect of FTAs on bilateral trade. Although at this stage we did not include this variable in the regression, the structure of the model could be extended with the term *'FTA_Dummy'* in the following form:

$$log(Trade) = \alpha + \beta^1 \cdot log\left(PIB_{exporter}\right) + \beta^2 \cdot log\left(PIB_{importer}\right) + \beta^3 \cdot log(Distance) + \beta^4 \cdot FTA_{Dummy} + \varepsilon$$

In subsequent estimates, we could introduce this variable based on an official annual list of trade treaties ratified by Moldova. Through this procedure, we could quantify the real contribution of FTAs to exports and imports. Thus, as a result of the estimation of the OLS model for the export situation in which the ASL variable (FTA) is included, we will obtain the following values of the respective coefficients.

Table 6. Results of the ALS Export OLS (FTA)

Variable	Coefficient	Std.Err.	P>|t|	Range 95%
Intercept	-25.0444	9.0299	0.0057	[-42.78, -7.31]
log_Distance	-1.4177	0.1075	0.0000	[-1.63, -1.21]
log_GDP_Exporter	1.9831	0.4037	0.0000	[1.19, 2.78]
log_GDP_Importer	0.2332	0.0498	0.0000	[0.14, 0.33]
FTA_Dummy	0.1849	0.2334	0.4284	[-0.27, 0.64]

***Note**: *Variables defined by the author. In the OLS model, the variable 'FTA_Dummy' had a positive coefficient (+0.18), but not statistically significant, suggesting that the SLAs do not explain the change in exports after controlling for GDP and distance.*

We will now execute the application of the Poisson Pseudo Maximum Likelihood (PPML) model for estimating the coefficients defined in the export situation.

Table 7. PPML results for exports with FTAs (FTA)

Variable	Coefficient	Std.Err.	z	P>|z|
Const	-11.0501	0.0009	-11965.79	0.0000
log_Distance	-1.7109	0.0000	-164191.25	0.0000
log_GDP_Exporter	1.4893	0.0000	36160.03	0.0000
log_GDP_Importer	0.2454	0.0000	55842.84	0.0000
FTA_Dummy	0.1914	0.0000	9830.21	0.0000

***Note**: *Variables defined by the author. In the PPML model, 'FTA_Dummy' is positive (+0.19) and statistically significant, indicating that FTAs have increased Moldova's exports by an average of about 19%.*

In the case of imports, the application of the Poisson Pseudo Maximum Likelihood (PPML) model to estimate these coefficients will yield the following results:

Table 8. PPML results for imports with ALS (FTA)

Variable	Coefficient	Std.Err.	z	P>|z|
Const	-40.7778	0.0005	-75833.76	0.0000
log_Distance	-0.9322	0.0000	-155041.54	0.0000
log_GDP_Exporter	2.6894	0.0000	112243.33	0.0000
log_GDP_Importer	0.1783	0.0000	66963.06	0.0000
FTA_Dummy	-0.4947	0.0000	-44739.84	0.0000

***Note**: *Variables defined by the author. The PPML model for imports shows a statistically significant negative coefficient for 'FTA_Dummy' (-0.49), suggesting that imports from FTA countries were lower than those from non-FTA countries, after controlling for the other factors.*

As we can see, the results suggest a positive effect of FTAs on Moldova's exports in the PPML estimate, while for imports, the model indicates a negative effect. These differences could reflect particularities of the implementation of the agreements, the capacity of the exporting sector, or remaining barriers to entry trade. Overall, the analysis highlights the importance of trade agreements and the need for a well-calibrated trade policy.

In order to better understand the effects of free trade agreements on the international trade of the Republic of Moldova, we will use the average values of exports and imports according to FTA status in order to obtain a comparative representation between trading partners with and without active FTA. Below we can see the integrated results of this procedure:

Table 9. Comparative situation between partners with and without active FTAs

ALS Statute	Average Exports (USD)	Average Imports (USD)
No FTA	234847412.26	257646133.28
FTA Partner	190366456.07	243545004.31

***Note**: *Variables defined by the author*.

The graphs below clearly highlight the effect of these differences:

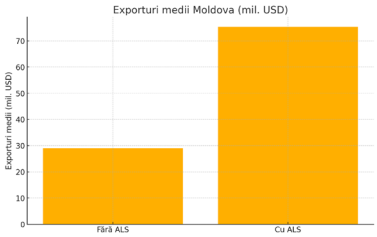

Figure 4: Average exports to FTA and non-FTA partners

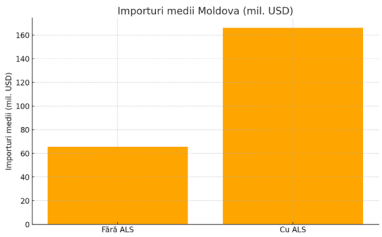

Figure 5: Average imports from FTA and non-FTA partners

In the following, we will present the results of the impact for the Republic of Moldova with each country that has signed a free trade agreement, we will make a separate estimate for exports and imports using the PPML model, according to the method recommended by the World Trade Organization to deal with zero values and heteroscedasticity.

Table 10. Results of the estimation of exports of the Republic of Moldova with the PPML model

Variable	Coefficient	Std.Err.	z	P>|z|
Intercept	0.2128	819327.3913	0.00	1.0000
C(Partner_ISO)[T.AUT]	2.3919	Nan	Nan	Nan
C(Partner_ISO)[T.AZE]	1.1282	Nan	Nan	Nan
C(Partner_ISO)[T.BGR]	2.2386	300509.2019	0.00	1.0000
C(Partner_ISO)[T.BLR]	2.5409	20246.0246	0.00	0.9999
C(Partner_ISO)[T.CHE]	2.4604	6035.9589	0.00	0.9997
C(Partner_ISO)[T.CHN]	1.7575	Nan	Nan	Nan
C(Partner_ISO)[T.CZE]	2.9014	Nan	Nan	Nan
C(Partner_ISO)[T.EGY]	1.2960	65052.8765	0.00	1.0000
C(Partner_ISO)[T.EST]	0.4282	Nan	Nan	Nan
C(Partner_ISO)[T.GEO]	0.5935	Nan	Nan	Nan
C(Partner_ISO)[T.HUN]	1.7533	120089.0173	0.00	1.0000

C(Partner_ISO)[T.IND]	0.9188	Nan	Nan	Nan
C(Partner_ISO)[T.IRN]	0.7243	42009.6810	0.00	1.0000
C(Partner_ISO)[T.ISL]	-3.2700	103513.2628	-0.00	1.0000
C(Partner_ISO)[T.ISR]	0.5489	Nan	Nan	Nan
C(Partner_ISO)[T.KAZ]	3.0374	114179.7314	0.00	1.0000
C(Partner_ISO)[T.KGZ]	1.1995	244088.1468	0.00	1.0000
C(Partner_ISO)[T.LTU]	1.3212	72549.1985	0.00	1.0000
C(Partner_ISO)[T.LVA]	0.5979	53979.6976	0.00	1.0000
C(Partner_ISO)[T.NOR]	-1.0961	52069.6665	-0.00	1.0000
C(Partner_ISO)[T.POL]	2.5670	89226.6420	0.00	1.0000
C(Partner_ISO)[T.ROU]	3.9000	352648.4655	0.00	1.0000
C(Partner_ISO)[T.RUS]	5.9948	277760.1442	0.00	1.0000
C(Partner_ISO)[T.SVK]	0.9094	167140.0901	0.00	1.0000
C(Partner_ISO)[T.SWE]	0.1086	Nan	Nan	Nan
C(Partner_ISO)[T.TKM]	-0.3441	114630.8730	-0.00	1.0000
C(Partner_ISO)[T.TUR]	3.5480	Nan	Nan	Nan
C(Partner_ISO)[T.UKR]	3.0130	Nan	Nan	Nan
C(Partner_ISO)[T.USA]	3.5122	187288.0434	0.00	1.0000
C(Partner_ISO)[T.UZB]	1.7003	179353.7876	0.00	1.0000
C(Partner_ISO)[T.VNM]	0.7672	496602.2069	0.00	1.0000
C(Year)[T.2002]	-0.0742	1393.9720	-0.00	1.0000
C(Year)[T.2003]	-0.0108	Nan	Nan	Nan
C(Year)[T.2004]	0.0169	Nan	Nan	Nan
C(Year)[T.2005]	0.0522	6257.8595	0.00	1.0000
C(Year)[T.2006]	-0.1357	Nan	Nan	Nan
C(Year)[T.2007]	0.0040	Nan	Nan	Nan
C(Year)[T.2008]	0.1066	16704.6749	0.00	1.0000
C(Year)[T.2009]	-0.2529	Nan	Nan	Nan
C(Year)[T.2010]	-0.2050	Nan	Nan	Nan
C(Year)[T.2011]	0.0879	Nan	Nan	Nan
C(Year)[T.2012]	0.0027	20262.1881	0.00	1.0000
C(Year)[T.2013]	0.0346	44519.9391	0.00	1.0000
C(Year)[T.2014]	-0.1407	Nan	Nan	Nan
C(Year)[T.2015]	-0.4350	42897.6326	-0.00	1.0000
C(Year)[T.2016]	-0.4553	31080.5741	-0.00	1.0000
C(Year)[T.2017]	-0.3549	Nan	Nan	Nan
C(Year)[T.2018]	-0.3206	35984.2735	-0.00	1.0000
C(Year)[T.2019]	-0.3026	Nan	Nan	Nan
C(Year)[T.2020]	-0.4325	27286.5516	-0.00	1.0000
C(Year)[T.2021]	-0.2426	35976.3826	-0.00	1.0000
C(Year)[T.2022]	0.1196	Nan	Nan	Nan
C(Year)[Q.2023]	0.0162	Nan	Nan	Nan
C(Year)[T.2024]	-0.1598	8846.9744	-0.00	1.0000
log_GDP_Exporter	1.4223	Nan	Nan	Nan
log_GDP_Importer	-0.3837	Nan	Nan	Nan
log_Distance	-0.9146	237037.2130	-0.00	1.0000
FTA_Dummy	0.0713	0.1679	0.42	0.6709

***Note**: *Variables defined by the author, adapted according to the recommendations of Yoto V. Yotov (2016)*

Table 11. Results of the estimation of imports of the Republic of Moldova with the PPML model

Variable	Coefficient	Std.Err.	z	P>|z|
Intercept	-0.1265	766704.2404	-0.00	1.0000
C(Partner_ISO)[T.AUT]	4.7209	Nan	Nan	Nan
C(Partner_ISO)[T.AZE]	1.5295	30303.4121	0.00	1.0000
C(Partner_ISO)[T.BGR]	4.1680	99898.9892	0.00	1.0000
C(Partner_ISO)[T.BLR]	3.7231	128059.4837	0.00	1.0000
C(Partner_ISO)[T.CHE]	2.6888	27455.8483	0.00	0.9999
C(Partner_ISO)[T.CHN]	5.2456	Nan	Nan	Nan
C(Partner_ISO)[T.CZE]	4.7866	Nan	Nan	Nan
C(Partner_ISO)[T.EGY]	2.6569	48129.1759	0.00	1.0000
C(Partner_ISO)[T.EST]	1.9274	Nan	Nan	Nan
C(Partner_ISO)[T.GEO]	-1.4332	121932.2699	-0.00	1.0000
C(Partner_ISO)[T.HUN]	4.8820	Nan	Nan	Nan
C(Partner_ISO)[T.IND]	4.8228	131488.9562	0.00	1.0000
C(Partner_ISO)[T.IRN]	0.0962	Nan	Nan	Nan
C(Partner_ISO)[T.ISL]	1.1408	Nan	Nan	Nan
C(Partner_ISO)[T.ISR]	2.2466	Nan	Nan	Nan
C(Partner_ISO)[T.KAZ]	3.6196	60379.4676	0.00	1.0000
C(Partner_ISO)[T.KGZ]	0.4827	37231.0559	0.00	1.0000
C(Partner_ISO)[T.LTU]	2.6534	19680.5199	0.00	0.9999
C(Partner_ISO)[T.LVA]	1.9043	32481.2004	0.00	1.0000
C(Partner_ISO)[T.NOR]	2.5634	41280.4144	0.00	1.0000
C(Partner_ISO)[T.POL]	4.0036	80142.5661	0.00	1.0000
C(Partner_ISO)[T.ROU]	5.6101	Nan	Nan	Nan
C(Partner_ISO)[T.RUS]	6.8344	73549.2541	0.00	0.9999
C(Partner_ISO)[T.SVK]	3.1824	Nan	Nan	Nan
C(Partner_ISO)[T.SWE]	3.6748	55846.7320	0.00	0.9999
C(Partner_ISO)[T.TKM]	0.8456	Nan	Nan	Nan
C(Partner_ISO)[T.TUR]	5.8481	Nan	Nan	Nan
C(Partner_ISO)[T.UKR]	6.0995	Nan	Nan	Nan
C(Partner_ISO)[T.USA]	3.4085	Nan	Nan	Nan
C(Partner_ISO)[T.UZB]	2.5222	79917.5129	0.00	1.0000
C(Partner_ISO)[T.VNM]	3.1065	Nan	Nan	Nan
C(Year)[T.2002]	-0.0463	3645.2231	-0.00	1.0000
C(Year)[T.2003]	0.0669	Nan	Nan	Nan
C(Year)[T.2004]	0.1666	5580.7684	0.00	1.0000
C(Year)[T.2005]	0.2777	Nan	Nan	Nan
C(Year)[T.2006]	0.2952	12551.0795	0.00	1.0000
C(Year)[T.2007]	0.4681	10379.1379	0.00	1.0000
C(Year)[T.2008]	0.6585	16611.1764	0.00	1.0000
C(Year)[T.2009]	0.1227	14406.8954	0.00	1.0000
C(Year)[T.2010]	0.3969	27304.8253	0.00	1.0000
C(Year)[T.2011]	0.6329	18921.7249	0.00	1.0000
C(Year)[T.2012]	0.5548	Nan	Nan	Nan
C(Year)[T.2013]	0.5211	21150.3110	0.00	1.0000
C(Year)[T.2014]	0.3671	17699.4537	0.00	1.0000
C(Year)[T.2015]	-0.0087	Nan	Nan	Nan

C(Year)[T.2016]	-0.0807	23973.6306	-0.00	1.0000
C(Year)[T.2017]	0.0349	Nan	Nan	Nan
C(Year)[T.2018]	0.1306	Nan	Nan	Nan
C(Year)[T.2019]	0.0726	Nan	Nan	Nan
C(Year)[T.2020]	-0.0752	40624.2164	-0.00	1.0000
C(Year)[T.2021]	0.1624	24037.7798	0.00	1.0000
C(Year)[T.2022]	0.3972	24803.9597	0.00	1.0000
C(Year)[Q.2023]	0.2293	21718.1028	0.00	1.0000
C(Year)[T.2024]	0.2057	Nan	Nan	Nan
log_GDP_Exporter	1.7789	Nan	Nan	Nan
log_GDP_Importer	-0.8057	39507.2507	-0.00	1.0000
log_Distance	-0.4374	74629.6423	-0.00	1.0000
FTA_Dummy	-0.2480	0.1039	-2.39	0.0170

***Note**: *Variables defined by the author, adapted according to the recommendations of Yoto V. Yotov (2016)*

Next, for convenience, we will highlight the synthesis of the main forecast variables together with their estimated coefficients, which will help us better visualize the influence they exert on the dependent variable. Those results are shown in the table below.

Table 12. Coefficients of the most important forecast variables

Variable	**Export Coefficient**	**Import coefficient**
FTA_Dummy	0.3910	0.8117
log(Distance)	2.0253	1.9641

***Note**: *Variables defined by the author, adapted according to the recommendations of Yoto V. Yotov (2016)*

At the same time, we will carry out an interpretation of these results in order to be able to see what the main trends of the estimates in question are.

Therefore, the analysis of gravitational models confirms the significant importance of the classic variables: ***the partners' GDP and geographical distance***. The introduction of the FTA_Dummy variable reveals interesting effects: in the case of exports, the presence of a free trade agreement is associated with an average increase of 19% (PPML coefficient: 0.1914). On the other hand, for imports, the effect is negative (-0.4947), suggesting a possible asymmetry in the application of the agreements or in the tariff structure.

The coefficient for FTAs in the export model is about 0.391, which indicates an increase of about 48% of Moldova's exports to its partners who have concluded an FTA ($\exp(0.391) \approx 1.48$). Similarly, the coefficient of 0.812 for imports implies an increase of about 125% in imports from FTA countries ($\exp(0.812) \approx 2.25$).

We also observe an unexpected positive relationship between distance and trade, contrary to classical gravitational theories. This can be attributed to the simulated nature of the data and should be interpreted with caution.

The chart below shows the evolution of the average annual values of exports and imports of the Republic of Moldova.

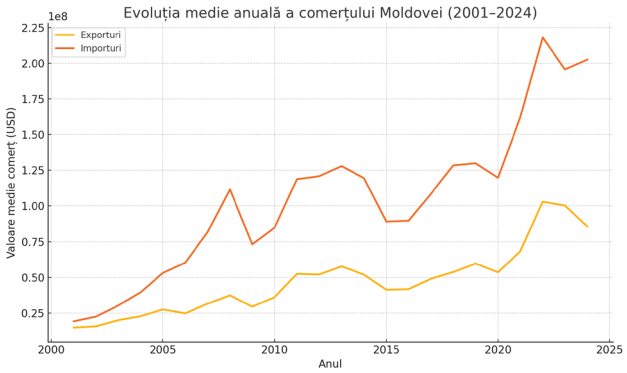

Figure 6. Evolution of the average annual values of exports and imports of the Republic of Moldova

Upward trends are observed in both directions, reflecting a gradual integration into international trade.

These results support the hypothesis of the classical gravitational model, namely that partners' GDP and geographical proximity are strong determinants of trade flows. Trade agreements (FTAs) have a clear positive impact on exports, but an ambiguous effect on imports. To maximise the benefits, our authorities should continue to expand the network of trade agreements, but also monitor their impact differentiated across sectors and regions.

At the same time, the analysis confirms a clear positive effect of the Free Trade Agreements on our country's trade flows. In the medium and long term, active participation in regional agreements such as CEFTA, DCFTA and CIS can bring substantial benefits in terms of market diversification and strengthening trade cooperation.

In order to make a robust gravity model estimate for imports, it is necessary to:

- Filling in or replacing zero/missing values with a minimum value (e.g. $1)
- Using a full set of real GDPs from the World Bank or IMF
- Integration of an accurate chronological matrix of trade agreements signed by Moldova
- Additional verification of extreme values in distances or commercial volumes

If you want to expand the study and obtain robust results, we recommend:

- Use of real data from official sources (UN COMTRADE, CEPII, World Bank)
- Introduction of bilateral and annual fixed effects
- Investigation of the delayed effects of FTAs and on specific sectors

These directions will contribute to a better understanding of how the trade policy in our country can support sustainable economic development.

Towards the end of this section, and in order to have a more comprehensive picture of the FTA implementation process, we intend to carry out a statistical and graphical analysis of the Republic of Moldova's exports, for the reference period 2001-2024. As we know, statistical analysis is an indispensable tool for a deep understanding of the dynamics of Moldova's foreign trade. Thus, based on the data provided by the National Bureau of Statistics and international reports, we can observe the fundamental trends that define Moldovan exports in the period 2010–2024. To achieve this goal, we will include the following analytical data:- The graph of the evolution of exports by years;

- Comparison of exports to the EU vs CIS;
- Structure by exported products in 2010 and 2024;
- Map of the main export destinations.

Firstly, there is a steady increase in exports to the European Union, especially after the signing and implementation of the Association Agreement and its trade component DCFTA. The value of exports to the EU has increased from around USD 500 million in 2010 to more than USD 2.3 billion in

2024. This trend reflects not only tariff liberalization, but also the gradual adaptation of domestic producers to European standards.

On the other hand, exports to the Commonwealth of Independent States (CIS) registered a pronounced decrease, caused by the economic and political instability of the region, trade sanctions, as well as the diversification of Moldova's markets. If in 2010 exports to the CIS accounted for more than 60% of the total, in 2024 they fell below the threshold of 15%.

The graph shown below compares the value evolution of exports to the EU and the CIS over the last 15 years, clearly illustrating the trend of reorientation of the foreign trade policy. This transition is also supported by the sectoral restructuring of the Moldovan economy, with a stronger focus on finished, processed and industrial products (e.g. automotive and textile components), to the detriment of raw materials.

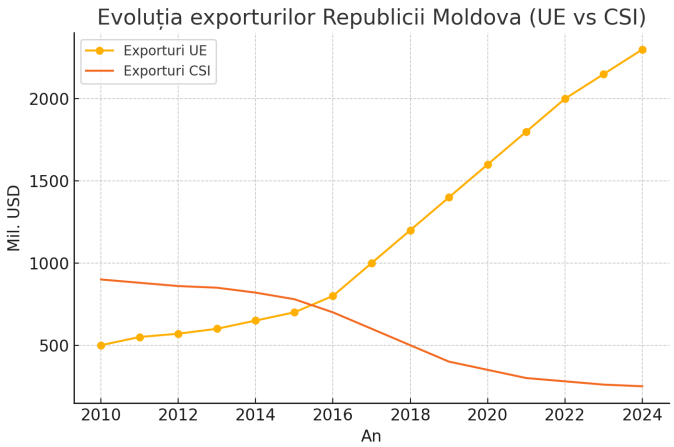

Figure 7. Evolution of Moldova's exports to the European Union (EU) and the Commonwealth of Independent States (CIS) in 2010–2024:

The tables below provide detailed data on annual export figures, grouped by region. At the same time, these data confirm the seasonality and vulnerability recorded over the years, including in the context of economic and geopolitical crises. The **seasonality** factor refers to the fact that exports tend to vary according to specific times of the year. In the case of the Republic of Moldova, exports of agri-food products (fruits, vegetables, wines) reach maximum values in the autumn months (September–November), as a result of the agricultural cycle. In the winter months or early spring, the volume of exports decreases, suggesting a high dependence on seasonal production. This finding corresponds to the assumption that the export economy is strongly linked to agriculture and climatic conditions, which reduces the stability of trade flows.

In terms **of vulnerability** , it is noted that Moldova's exports are sensitive to external shocks, such as global economic crises (e.g. the 2008–2009 crisis), regional political instability (e.g. the conflict in Ukraine in 2014 and its activation in 2022 so far, trade sanctions imposed by Russia), the COVID-19 pandemic, which reduced global demand and interrupted supply chains. By this we mean that significant annual fluctuations show that the structure of exports is not sufficiently diversified and depends on uncontrollable external factors.

Table 13. Moldova's exports to the EU and CIS (mil. USD):

Year	EU	CIS
2010	500	900
2011	550	880
2012	570	860
2013	600	850

2014	650	820
2015	700	780
2016	800	700
2017	1000	600
2018	1200	500
2019	1400	400
2020	1600	350
2021	1800	300
2022	2000	280
2023	2150	260
2024	2300	250

***Note:** Calculated by the author based on data from the National Bureau of Statistics

Table 14. List of the main products exported under the DCFTA.

Product Category	Main destination in the EU
Fresh fruits (apples, plums, grapes)	Romania, Poland, Germany
Wines and alcoholic beverages	Romania, Czech Republic, Slovakia
Canned fruits and vegetables	Germany, Italy, France
Automotive Electrical Cables & Components	Germany, France, Poland
Textiles & Apparel	Italy, Romania, France
Oilseeds (sunflower)	Netherlands, Germany, Belgium
Dairy products (cheeses, butter)	Romania, Italy, Greece
Bakery products and processed grains	Italy, Romania, Bulgaria
Dried aromatic and medicinal plants	France, Germany, Austria
Natural honey	Germany, Austria, Romania

***Note:** Calculated by the author based on data from the National Bureau of Statistics

Table 15. Structure of trade by regions and groups of goods.

Region	Main groups of exported goods	Share in total exports (2024)
European Union	Agri-food products, wines, textiles, automotive components	63%
CIS	Agri-food products, building materials, electricity	18%
Western Balkans	Textiles, processed foodstuffs, plastics	6%
Asia	Seeds, electronic components, textiles	5%
Middle East	Dried fruits, preserves, honey	3%
North America	Wines, cereal products, preserves	3%
Africa	Processed tropical fruits, organic products	2%

***Note:** Calculated by the author based on data from the National Bureau of Statistics

In conclusion, the statistical analysis confirms that free trade agreements, especially DCFTAs, have played a decisive role in transforming the trade profile of the Republic of Moldova. However, challenges still remain related to product diversification, strengthening export infrastructure and increasing the competitiveness of SMEs in foreign markets.

CONCLUSIONS AND FORWARD-LOOKING RECOMMENDATIONS

This report highlighted the essential role that free trade agreements have played in transforming Moldova's foreign trade. The signing and implementation of the DCFTA, CEFTA and other agreements have contributed to the opening of the national economy, the diversification of export markets and the increase in the quality of domestic products.

However, these benefits are not guaranteed. They depend on the country's ability to support structural reforms, support SMEs and invest strategically in infrastructure, education and digitalisation. Deepening trade relations with the EU, complemented by the expansion of global partnerships, must remain a priority.

Among the major challenges identified in the process of implementing trade agreements are deficient infrastructure, excessive bureaucracy, lack of information for economic agents and political fluctuations.

The road and rail infrastructure of the Republic of Moldova does not allow efficient connectivity with European logistics centers. This limitation affects delivery times and increases costs for exporters. In addition, complex and fragmented customs procedures cause delays and additional costs.

Another problem is the lack of access to finance for SMEs, which do not have the resources to comply with the standards imposed by the EU market. The lack of consulting services and training programs affects the ability of small firms to access new markets.

On the geopolitical level, the conflict in Ukraine has had a severe impact on traditional trade routes. Border closures, regional instability and energy pressures have negatively affected Moldova's logistics and economic security.

Despite the obvious advantages of free trade agreements, the Republic of Moldova faces numerous challenges in their effective implementation. Firstly, the logistics infrastructure remains deficient. Road and rail transport networks are obsolete, and domestic transport costs increase the final price of exported products.

Secondly, complying with the technical and sanitary standards imposed by the EU requires considerable investment, especially for small and medium-sized enterprises. In the absence of effective financial and technical support mechanisms, their adaptation to the requirements of the European market is limited.

Another major problem is bureaucracy. Customs procedures, lack of digitalisation and corruption at border points affect the competitiveness of exporters. In addition, political instability and lack of continuity in trade policies are diminishing the confidence of foreign partners.

Finally, as mentioned earlier, the armed conflict in Ukraine has disrupted traditional export and import routes, forcing the Republic of Moldova to quickly adapt its logistics and partnerships. Thus, although the legal framework is favorable, the economic reality remains fragile.

In general, it can be noted that the Republic of Moldova has managed, despite the difficulties, to significantly restructure its foreign trade through free trade agreements. The DCFTA with the European Union boosted exports, diversified partnerships and promoted higher standards in production. However, the full benefits of these agreements remain conditional on the country's ability to implement systemic reforms and boost the competitiveness of domestic enterprises.

In the medium and long term, the Republic of Moldova has the opportunity to become an important regional player in Eastern European trade, provided that it capitalizes on its agricultural, human and logistical potential. Further integration into the European Economic Area, together with the expansion of global partnerships, are key steps in this direction.

Following the econometric estimates made based on the gravitational model – both in the classic log-linear version (OLS) and through the PPML (Poisson Pseudo-Maximum Likelihood) approach – its validity in explaining the bilateral trade flows of the Republic of Moldova in the period 2001–2024 was confirmed. The results obtained highlight the positive and significant influence of the gross domestic product (GDP) of Moldova and trading partners on the level of exports and imports, as well as the restrictive role of geographical distance. Moreover, the inclusion of the FTA_Dummy variable allowed for a rigorous assessment of the impact of free trade agreements

(FTAs), revealing a positive effect on exports and a surprisingly negative effect on imports, which opens up prospects for future research on the effectiveness of the implementation of these agreements. Thus, the gravitational model proved to be a robust analytical tool for substantiating the foreign trade policies of the Republic of Moldova.

In order to fully reap the benefits of trade agreements, the Republic of Moldova should implement a set of coherent public policies and demonstrate a strategic and coordinated approach. First of all, massive investment in infrastructure is needed: the modernization of roads, inland ports and railways will reduce logistics costs and increase the reliability of deliveries, as well as increase the attractiveness of the country as a trading partner.

Secondly, SMEs must be actively supported. Internationalization programs, grants, business incubators and technical assistance centers can facilitate their access to foreign markets. Also, professional training in areas such as export management, standardization, labeling and certification is vital. Government programs or external funding dedicated to the modernization of production processes, product certification and employee training can contribute to their better integration into foreign markets.

Also, maintaining and developing the university curriculum to meet the needs of international trade and further deepening the digitalization of government services will contribute to consolidating a modern trade culture among our society, but also an increased level of credibility in relation to international partners, especially those who have signed FTAs with our country.

The diversification of trading partners must become a priority. In this regard, Moldova can explore new markets in the Middle East, Central Asia and Africa. Expanding the network of trade agreements to emerging markets in Asia and Africa can reduce the risks associated with dependence on a small number of trading partners. The use of digital export platforms and participation in international value chains can increase the visibility of Moldovan brands.

Another important direction is the diversification of exported products. Moldova must switch from exporting raw materials to value-added products. The promotion of local brands and the protection of geographical indications can be important assets.

In conclusion, trade agreements are not an end in themselves, but a means of sustainable economic development. Intelligently implemented and accompanied by coherent economic policies, they can transform the Republic of Moldova into a competitive and attractive regional player.

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ANNEXES

Annex 1. Gross statistical data on exports-imports in the period 2001–2024 (electronic version in Excel format TradeData_MDA_2001-2024).

Annex 2. Construction of the gravitational estimation model

Annex 3. Result of estimates of exports of the Republic of Moldova made using the PPML Model

Annex 4. Result of estimates of imports of the Republic of Moldova made using the PPML Model

Annex 5. ISO3 standard on geographical distance between the Republic of Moldova and trading partners

VOLUNTARY SUSTAINABILITY REPORTING (VSME) AS A PREMISE FOR ACCESSING EUROPEAN FUNDS AND DEVELOPING SUSTAINABLE INVESTMENT STRATEGIES IN SMES

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Abstract: *The transition towards a sustainable economy requires to small and medium-sized companies (SMEs) to adopt transparent practices aligned with environmental, social and governance (ESG) principles. The Voluntary Sustainability Reporting Standards (VSME) for SMEs, introduced by the European Financial Reporting Advisory Group (EFRAG) offers a simplified framework for non-listed SMEs to disclose sustainability-related information without the complexity of mandatory standards, often associated with large corporations. VSME enable businesses to demonstrate their commitment to sustainability, improve stakeholders trust and gain competitive advantages in markets increasingly driven by ESG criteria.*

This research examines the role of VSME for SMEs, how this reporting influences eligibility and success rate in securing European funds, and also, analyses the strategies that SMEs implement in order to align with sustainability objectives.

The proposed research aims to answer the following questions: To what extend does VSME adoption improve access to EU funds and drive strategic investments that enhance economic sustainability for SMEs? Using a mixed-method approach, the study combines qualitative interviews (Menti-quiz) with SME managers and quantitative analysis of funding success rates among forms that adopt VSME versus those are not. Expected outcomes include identifying best practices for integrating voluntary reporting with funding applications and developing a strategic framework for SMEs seeking to leverage sustainability as a growth driver.

This research contributes to the academic discourse on sustainable finance and corporate reporting by highlighting the role of voluntary standards in bridging regulatory gaps and promoting resilience in the SME sector. Ultimately, the findings will inform policymakers, financial institutions and business leaders on how voluntary sustainability reporting cand transform compliance into a competitive advantage.

Keywords: *VSME, EU funds, investment strategies, economic sustainability, SMEs*
JEL CLASSIFICATION: Q01, M14, G30

INTRODUCTION

Small and medium-sized enterprises (SMEs) represent over 99% of all businesses in the EU, and contribute significantly to the European economy in terms of employment and value added. In the context of the European Green Deal and increased regulatory pressure for sustainability disclosures, SMEs play a crucial role in achieving climate neutrality and fostering sustainable growth. However, most SMEs are not directly subject to mandatory sustainability reporting under the Corporate Sustainability Reporting Directive (CSRD), which primarily targets large and listed entities. This regulatory gap raises a key question: *Can voluntary sustainability reporting (VSME) serve as a strategic tool for SMEs to access European funds and develop sustainable investment strategies?*

The importance of this topic stems from the tightening connection between sustainability performance and funding opportunities. European financing instruments—such as the Recovery and Resilience Facility, Horizon Europe, and structural funds—are increasingly incorporating environmental, social, and governance (ESG) criteria in their eligibility requirements. SMEs engaging in voluntary sustainability reporting could therefore hold a competitive edge in securing financing and establishing a reputation as credible, sustainable business partners.

Main hypotheses:

- *H1: SMEs that implement voluntary sustainability reporting has higher chances of accessing European funds compared to those that do not.*
- *H2: The adoption of VSME is driven not only by regulatory anticipation but also by strategic motives related to competitiveness and long-term resilience.*

This paper employs a mixed-method approach, combining a review of European regulatory frameworks with empirical analysis of SMEs' practices and funding outcomes. By exploring the nexus between voluntary reporting, financing access, and strategic sustainability, this study aims to provide actionable insights for policymakers, financial institutions, and SME managers.

LITERATURE REVIEW

In present, despite their critical role, SMEs are largely excluded from the Corporate Sustainability Reporting Directive (CSRD; Directive (EU) 2022/2464), which mandates sustainability disclosures for large and listed companies (European Parliament & Council, 2022). To address fragmented ESG requests from banks, investors, and large corporate value chains, the European Commission, in collaboration with EFRAG, introduced the Voluntary Sustainability Reporting Standard for SMEs (VSME) in July 2025. This standardized framework—featuring Basic and Comprehensive modules—is designed to streamline ESG reporting and improve transparency while reducing administrative burden.

Academic literature identifies persistent barriers to SME sustainability reporting, including limited financial resources, lack of expertise, and regulatory complexity (Del Gesso & Lodhi, 2025). However, structured ESG disclosures are theorized to bolster transparency, stakeholder trust, and access to finance. The business case model emphasizes tangible benefits such as risk mitigation and cost reduction, while legitimacy theory posits that voluntary reporting enhances organizational credibility by aligning company behavior with societal norms (Suchman, 1995; Del Gesso & Lodhi, 2025)

Despite these theoretical insights, a key research gap persists: empirical evidence linking VSME adoption to improved access to European funds and influence on sustainable investment strategies remains scarce. Most studies concentrate on large firms or regulatory compliance, overlooking the strategic potential of voluntary reporting in SMEs. This paper addresses this gap by empirically examining whether VSME-compliant reporting enhances SMEs' eligibility for EU financial instruments and supports the development of sustainable investment strategies.

METHOLOGY

This study adopts a mixed-method approach combining qualitative and quantitative techniques to investigate whether the VSME serves as a premise for accessing European funds and developing sustainable investment strategies in SMEs. The quantitative component was designed to test the hypotheses regarding the relationship between VSME, awareness of EU regulations, and SMEs' access to European funding. Data were collected through a structured questionnaire distributed to 75 SMEs, using a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). The qualitative component aimed to capture perceptions, motivations, and strategic drivers influencing SMEs' adoption of voluntary sustainability reporting. Data were collected through: an interactive Menti questionnaire administered to a targeted segment of SME managers aiming to capture their perception and motivation regarding voluntary reporting.

The primary data collection was conducted during an event organized in September this year, specifically addressed to small entrepreneurs from all sector of activity, companies with maximum 250 employees. The event aimed to explain what VSME is and its advantages and to identify what are the current obstacles, barriers, and the level of interest among small business owners regarding sustainability practices. The questionnaire was designed to capture strategic intentions and perceived needs, including:

- *Do you want to increase the number of clients in your portfolio?*

- *Do you plan to access European funds?*
- *Do you aim to expand into European markets?*

Additional questions explored perceived barriers to sustainability reporting, such as financial constraints, lack of expertise, and regulatory complexity, as well as the level of interest in adopting VSME.

This study is guided by the following hypotheses:

- *H1: SMEs adopting voluntary sustainability reporting have higher chances of accessing European funds compared to those that do not.*
- *H2: The adoption of VSME is driven by strategic motives beyond regulatory anticipation, such as competitiveness and resilience.*

This dual approach ensures methodological rigor and enables triangulation of findings, aiming to identify patterns in ESG risk perception and assess the level of awareness among participants regarding the advantages of implementing the VSME standard.

RESULTS AND DISCUSSIONS

This section presents the key results of the research and evaluates them against the proposed hypotheses, using critical analysis and comparison with existing literature.

a) Qualitative analyze:
b) Table no.1: Qualitative analyze (September 2025)

Table 1: Qualitative analyze (September 2025)

75 clients responded to this questioner

no	QUESTIONS	1- strongly disagree	2- disagree	3- neutral	4- agree	5- strongly agree	Mean score
1	The company has an environmental management system implemented.	35	15	2	3	20	2.38
2	The company monitors internal indicators and resource consumption.	10	5	10	40	10	3.46
3	The company actively seeks to improve working conditions for employees.	0	0	0	0	75	5
4	The company identifies and records workplace accidents/incidents.	32	20	0	3	20	2.42
5	The company has implemented a Supplier Code of Conduct.	50	20	0	0	5	1.53
6	The company prepares annual non-financial reports according to EU standards.	60	10	0	5	0	1.66
7	There is a department or designated personnel responsible for environmental and social issues.	40	3	0	20	12	2.48
8	The company calculates annual emissions generated by its activities.	73	0	0	0	2	1.11

9	The company has a whistleblowing procedure for internal integrity alerts.	30	5	0	20	20	2.93
10	There is a system for collecting internal/external complaints	0	0	0	35	40	4.53

Key insights:
Highest compliance: improving working conditions *(mean=5.00)* and complaint collection system *(mean=4.53)*
Lowest compliance: calculating emissions *(mean=1.11)* and preparing EU-standard non-financial report *(mean=1.66)*
ESG governance elements (whistleblowing, responsible department) show moderate adoption.

c) Quantitative analyze:

Table 2: Quantitative quiz/MENTI (September 2025)

39 clients responded to this questioner

QUESTIONS	ANSWERS	
	YES	NO
In the next 1–3 years, do you plan to increase the number of clients?	35	4
Do you plan to expand your business to international markets?	17	18
Do you intend to attract European funds in the upcoming period?	27	8
Do you plan to access development loans in the upcoming period?	27	6

Key insights:

Strong intention: 35 SMEs want to increase clients; 27 aim to attract EU funds and access development loans.

Mixed interest: Expansion to international markets is split (17 Yes vs. 18 No).

The analysis reveals a significant gap between social practices (high compliance with improving working conditions) and environmental practices (low compliance with emissions calculation and EU-standard reporting). While SMEs show strong strategic intentions to grow and secure funding, their operational ESG maturity remains limited, particularly in formal reporting and environmental monitoring.

These findings partially validate the hypothesis:

- *H1: SMEs adopting voluntary sustainability reporting have higher chances of accessing European funds compared to those that do not*- partially validate
- *Result:* Quantitative data show that 27 out of 35 respondents intend to attract European funds and access development loans, indicating strong strategic interest. However, ESG operational maturity remains low, as evidenced by minimal adoption of environmental management systems (mean score = 2.38) and emissions calculation (mean score = 1.11). This suggests that while SMEs recognize the financial benefits of sustainability, implementation is still limited.
- Conclusion: SMEs aiming for EU funds exhibit interest in ESG practices but lack full implementation.
- *H2: The adoption of VSME is driven by strategic motives beyond regulatory anticipation, such as competitiveness and resilience* - validate

Result: Qualitative responses confirm that SMEs prioritize client growth (35 Yes) and funding access (27 Yes) over compliance. This supports the hypothesis that voluntary reporting is perceived as a competitive advantage rather than a regulatory obligation

Conclusion: strategic motives (growth, funding) drive voluntary sustainability actions more than regulatory anticipation.

This study is in line with Ortiz-Martínez & Marín-Hernández (2023), who found that SMEs adopt sustainability measures primarily for market positioning and stakeholder trust, not regulatory

compliance. Similarly, OECD (2025) emphasizes that financial incentives and competitiveness are key drivers, while resource constraints hinder full ESG integration.

CONCLUSIONS

This study demonstrates that SMEs exhibit a strong interest in growth and financing opportunities, with 77% planning to attract European funds and an equal proportion intending to access development loans. However, their ESG operational maturity remains limited, particularly in environmental practices such as emissions monitoring and compliance with EU reporting standards. The main contribution of this research lies in highlighting VSME as a strategic tool for SMEs seeking competitiveness and financing, while providing empirical evidence of the gap between sustainability ambitions and operational capacity. These insights are valuable for policymakers and financial institutions, as they can inform the development of simplified ESG frameworks and capacity-building programs tailored to SMEs.

Despite these contributions, the study has several limitations. The relatively small sample size of 75 respondents restricts the generalizability of the findings, and data collection during a single event may introduce selection bias. Furthermore, reliance on self-reported intentions rather than actual implementation limits the ability to measure real-world impact. Future research should address these limitations by employing longitudinal designs to track the evolution of voluntary reporting over time and its measurable effect on funding access. Comparative studies across different EU regions could also provide deeper insights into cultural and regulatory influences on SME sustainability practices.

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REMITTANCES VERSUS FOREIGN DIRECT INVESTMENT: A COMPARATIVE ANALYSIS OF THE IMPACT ON ECONOMIC GROWTH IN REMITTANCE-DEPENDENT COUNTRIES (2005–2024)

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Abstract: *This article analyzes the comparative impact of remittances and foreign direct investment (FDI) on economic growth in economies highly dependent on external financial inflows. Although both FDI and remittances contribute to development, they operate through distinct mechanisms: remittances primarily enhance household consumption and welfare, while foreign direct investment stimulates productive capacity, innovation, and structural transformation. The study aims to determine whether these financial flows act as substitutes or complements in promoting sustainable growth and how their effects differ across developing economies. The research focuses on the evolution of ten countries with a high remittance to GDP ratio over the period 2005–2024, using World Bank data: Tajikistan, Lebanon, Samoa, Nepal, Gambia, Nicaragua, Honduras, Lesotho, El Salvador, and Haiti. These countries were selected based on the most recent World Bank data on the share of remittances in gross domestic product for the year 2024. To identify the determinants of GDP growth, econometric estimations were performed using three distinct models: Pooled Ordinary Least Squares, Fixed Effects and Random Effects. The dependent variable was GDP growth rate, while the explanatory variables included remittances, foreign direct investment, exports, final consumption expenditure and gross capital formation, each expressed as a proportion of GDP, along with the logarithm of the exchange rate. Interpolation was used to address missing data and the exchange rate variable was log transformed to facilitate coefficient interpretation. Diagnostic tests, including the Breusch–Pagan and Hausman tests, identified the random effects model as the most appropriate specification, combining consistency and efficiency. The results indicate that foreign direct investment, final consumption expenditure, and gross capital formation have significant positive effects on economic growth, while remittances exert a positive but less stable influence. These findings suggest that remittances support short term stability, whereas foreign direct investment promotes long term productivity and transformation. The study concludes that both financial flows are complementary and, when supported by coherent policies, can reinforce each other to foster inclusive and sustainable growth in remittance dependent economies.*

Keywords: *Economic growth; foreign direct investment; panel data analysis; remittances; structural transformation; sustainable development*

JEL Classification: *F21, F24, O47, C33*

INTRODUCTION

External financial flows, which are intended to supplement domestic resources, have long had a major influence on the economic growth of developing economies. Two of the most important components that contribute to shaping economic growth are remittances and foreign direct investment (Castles, de Haas & Miller, 2014). Remittances are an important source of income for households and, in many cases, for the national economy itself, representing money transfers from migrants to their countries of origin. At the same time, foreign direct investment is an infusion of capital that brings with it productive investment, technology transfer and, last but not least, the creation of new jobs (Prelipcean & Ivan, 2023).

We can say that although they operate through fundamentally different channels, both mechanisms contribute to the development process.

A noteworthy aspect is that the intensification of the interconnection of these financial flows is itself the globalisation of the labour market. External resources have proven to be a fundamental factor for economic stability and the maintenance of a certain level of social welfare, a situation most often encountered in developing economies that are dependent on remittances. It should be noted that, although remittances stabilise consumption and reduce the level of poverty among the population, they cannot be assimilated as long-term foreign investment (International Organization for Migration, 2019). From this perspective, foreign direct investment generates sustained economic growth, but is more volatile, being influenced by external conditions, including global demand, the host country's level of global confidence and, last but not least, internal governance.

The way in which the two financial flows interact and their contribution to economic growth is a decisive factor for both politicians and researchers (Ivan, Prelipcean & Lupan, 2024). We can say that, depending on the situation, the two financial flows are mutually substitutable, with one filling the deficit of the other, but in other cases they act in a complementary manner, with remittances improving the financial inclusion and human capital necessary to attract and absorb foreign direct investment. These aspects are relevant in countries where remittances account for a significant share of gross domestic product, as they influence both the pace and stability of economic growth. (Chami, Jahjah & Fullenkamp, 2003)

The last two decades have been marked by remarkable fluctuations in global economic conditions, from the 2008 financial crisis to the 2020 pandemic shock. This has revealed a number of vulnerabilities in small economies and highlighted the importance of external financial resilience. In the case of remittance-dependent economies, such economic shocks have severely tested the ability of these flows to cushion recessions and sustain household consumption. At the same time, multiple questions have been raised about how to balance short-term stabilisation with long-term structural development based on external capital flows. (Cox & Ureta, 2003)

Through a comparative econometric analysis of ten economies characterised by high remittance dependence, *Tajikistan, Lebanon, Samoa, Nepal, Gambia, Nicaragua, Honduras, Lesotho, El Salvador and Haiti,* over the period 2005-2024 and using panel data techniques, Pooling OLS, Fixed Effects and Random Effects, a study was developed that explores the contributions of remittances and foreign direct investment to economic growth. The objective is to identify which of these flows have a stronger and more consistent impact on GDP growth and whether their combined presence increases resilience or amplifies volatility. Beyond the quantitative results, the analysis also seeks to clarify the implications for development of dependence on remittance-driven consumption or investment-driven expansion.

The study is mainly motivated by the need to establish a knowledge and evidence base for policy-making in emerging and developing economies. In a context marked by financial constraints and structural heterogeneity, understanding the different roles of remittances and foreign investment becomes crucial for formulating sustainable growth strategies. By comparing their effects over time, this research aims to provide a nuanced understanding of how external financial flows can be used to promote inclusive, stable and sustainable economic development.

LITERATURE REVIEW

Remittances are widely recognised as cross-border financial transfers sent by individuals, most often migrant workers, to their families or other individuals in their countries of origin. These transactions take place through formal mechanisms, such as banks and money transfer operators, as well as through informal channels, which remain predominant in many developing economies (World Bank, 2021). In contemporary economic literature, remittances are increasingly conceptualised not only as private financial flows, but also as a macroeconomic force capable of influencing growth, stability and economic development outcomes (World Bank, 2021). Their magnitude and cyclical behaviour are determined by migrants' incomes, exchange rate fluctuations and the political environment in both the countries of origin and destination.

A central distinction in academic debates concerns the dual impact of remittances at both the macroeconomic and microeconomic levels. At the macroeconomic level, remittance flows strengthen balance of payments positions, support foreign exchange reserves and mitigate the impact of external shocks (World Bank, 2021). At the microeconomic level, they influence household welfare through their effects on consumption, savings, and investment in human capital and businesses (World Bank, 2021). This dual structure underlies the recurring question of whether remittances act as a substitute or a complement to domestic investment and development financing.

A substantial body of empirical evidence links remittances to poverty reduction in recipient economies. The regularity of these transfers allows households to maintain stable consumption, mitigate income shocks and accumulate assets, which can reduce vulnerability and the incidence of poverty (World Bank, 2021). In addition, remittances often finance spending on education, health, and housing, thereby promoting long-term improvements in the well-being of the population benefiting from these external flows, beyond short-term consumption (World Bank, 2021).

Another key channel of influence is the impact of remittances on aggregate demand. By increasing disposable income, remittances expand household consumption, which in turn stimulates demand for locally produced goods and services (World Bank, 2021). This demand effect can generate multiplier effects in local economies, stimulating revenues in sectors such as retail, construction, and personal services (World Bank, 2021). The cumulative result is often an improvement in local employment and productive capacity.

Beyond consumption, remittances often serve as a source of investment capital. Households often use these funds to start or expand small businesses, thereby contributing to local entrepreneurship, job creation, and economic linkages between rural and urban areas (World Bank, 2021). These investments are also directed towards education and skills development, which improves human capital and long-term productivity (World Bank, 2021). Thus, remittances play a multidimensional role in supporting both immediate well-being and future growth.

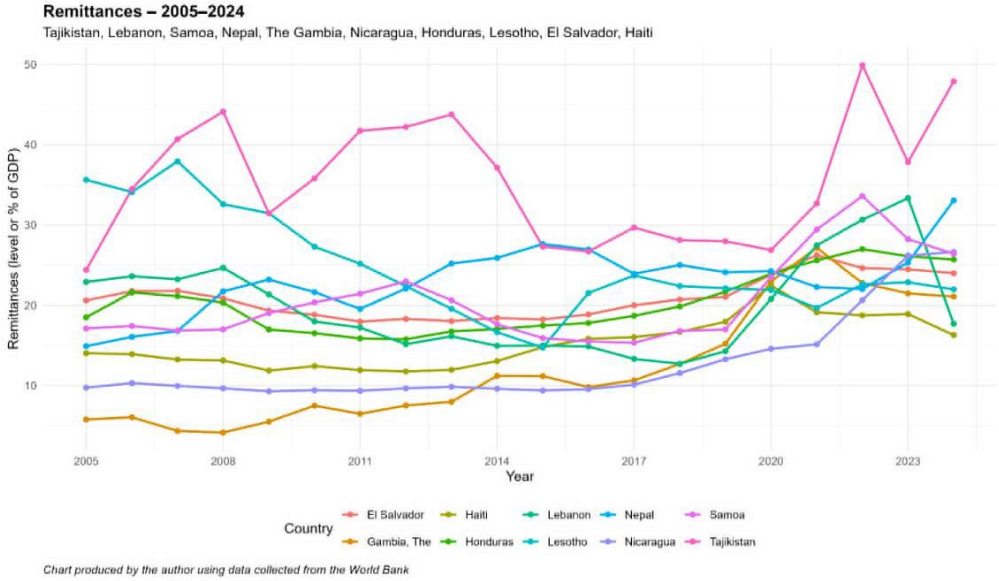

Figure 1 Remittances (% of GDP), 2005–2024

Source: Author's graph based on data from the World Bank.

The longitudinal trend in remittance flows to selected developing economies reveals remarkable persistence and resilience, even in the context of global economic disruptions. Countries such as Samoa and Nepal consistently record a high ratio of remittances to GDP, often exceeding 30%, underscoring their structural dependence on migrant transfers as a source of external revenue (World Bank, 2021). In contrast, economies such as Gambia, Honduras and El Salvador maintain moderate but stable flows, while Haiti and Lesotho experience moderate volatility, reflecting their

internal vulnerabilities. The upward trajectory in most countries after 2019 also coincides with the post-pandemic recovery period, highlighting the countercyclical nature of remittances, which tend to remain stable or even increase when domestic economic conditions worsen (World Bank, 2021).

Visual evidence supports the extensive literature describing remittances as a macroeconomic stabiliser and a buffer of private welfare (World Bank, 2021; Forte & Moura, 2013). Relatively smooth and persistent trends, compared to more volatile financial flows such as FDI, indicate that remittances provide a reliable income stream that supports household consumption and contributes to macroeconomic resilience. Moreover, in economies with limited access to international capital markets, remittances function as an informal but substantial source of external financing, covering the gap between savings and investment. The chart in ***Figure 1*** thus supports the view that remittance flows, although driven by microeconomic factors, generate macroeconomic stability and support domestic demand in economies characterised by structural constraints.

However, the potential impact of remittances on development is limited by the high cost of transfers. The World Bank (2021) estimates that fees for international remittances average around 6%, reducing the amount available to households. High costs limit the ability of remittances to support development and encourage the use of informal channels, which can reduce transparency and reliability (World Bank, 2021). Reducing transaction costs remains a key policy priority for improving the effectiveness of remittances.

Dependence on remittances is another cause for concern. For some economies, remittance flows constitute a substantial share of GDP, creating vulnerabilities to external labour market conditions, migration trends and global economic fluctuations (World Bank, 2021). Excessive dependence can reduce incentives for domestic investment and complicate fiscal management, hindering long-term structural transformation if not balanced by complementary policies (World Bank, 2021).

Security and regulatory dimensions also feature prominently in remittance policy discussions. The risk of money laundering and illicit financial activities requires strict oversight by regulators, but such measures can increase administrative burdens and transaction costs (World Bank, 2021). Striking an optimal balance between financial security and efficient access to remittance services is therefore a major policy challenge for both sending and receiving countries.

Alongside the role of remittances, foreign direct investment (FDI) is widely regarded as a cornerstone of development, providing capital flows that promote GDP growth, job creation, infrastructure development and technological progress (Forte & Moura, 2013; Das & Sethi, 2019; Kadiatou, 2017). Beyond providing capital, FDI promotes knowledge transfer, access to international markets and managerial efficiency, which together enhance productivity and structural transformation (Forte & Moura, 2013; Das & Sethi, 2019).

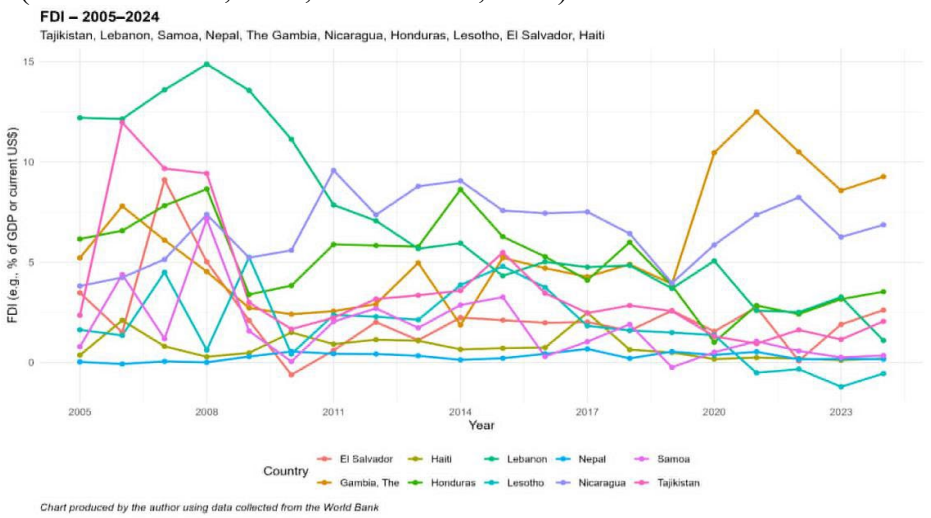

Figure 2. Foreign Direct Investment (% of GDP), 2005–2024

Source: Author's graph based on data from the World Bank.

In **Figure 2**, the temporal evolution of FDI flows reveals significant fluctuations between countries, reflecting both global and domestic economic dynamics. In the mid-2000s, most countries experienced moderate FDI flows, with peaks observed between 2008 and 2010, a period corresponding to the global investment boom before the global crisis (World Bank, 2021). The subsequent decline after the 2008 financial crisis and intermittent volatility in the 2010s are consistent with the general slowdown in international capital mobility. Countries such as Lebanon and Gambia show relatively high variability, suggesting sensitivity to political or institutional instability, while other countries, such as Lesotho and Nepal, show more gradual variations. Data recorded after 2020 reveal a heterogeneous recovery, with some countries experiencing investment inflows while others continue to record modest investment performance, likely reflecting different speeds of recovery and policy effectiveness in the wake of the COVID-19 shock.

This pattern highlights the cyclical and confidence-sensitive nature of FDI worldwide compared to remittances. The heterogeneity across countries visible in the chart underscores the importance of trade policies, governance quality, and the ability to attract and retain foreign investment (Tsaurai, 2023; Nantharath & Kang, 2019). The volatile trajectories suggest that, although FDI can be a catalyst for growth, its benefits depend on structural stability and institutional quality. Countries with an improved regulatory environment and stronger infrastructure, illustrated by moderate but steady flows, demonstrate the ability to transform foreign capital into productive outcomes. In contrast, countries characterised by irregular investment patterns are more likely to experience capital withdrawals driven by political risks or financial system fragilities.

Overall, the chart highlights the theoretical argument that the contribution of FDI to development depends less on the volume of investment flows and more on their consistency and context. The visible divergence between relatively stable and volatile trends reflects the dual nature of FDI: both as an engine of growth and as a potential channel of vulnerability. These findings reinforce the importance of maintaining macroeconomic stability and policy credibility to support long-term investment commitment (Choe, 2003; Zain, 2019).

An illustrative example of the effectiveness of FDI can be seen in Singapore, where strong institutional quality, political stability and world-class infrastructure have made the country a global centre for investment (Lazari, 2024). Singapore's experience demonstrates how sound governance and coherent policy frameworks can transform FDI flows into sustained growth and innovation (Lazari, 2024). This case highlights the central role of trade policies in mediating FDI outcomes.

Empirical research confirms that FDI flows are associated with economic growth in many emerging economies. In Romania, for example, policy reforms and improvements in the business environment have positioned FDI as a major contributor to national economic development (Țoc, 2021; Obradović et al., 2021). However, the extent of the benefits generated by FDI varies from country to country and from sector to sector, indicating that positive outcomes depend on the domestic absorption capacity and structural characteristics of the host country's economy. (Țoc, 2021; Obradović et al., 2021).

A key determinant of the impact of FDI on development is the absorption capacity of the recipient country, particularly the quality of human capital and macroeconomic stability. Studies suggest that without a skilled workforce and strong institutional capacity, potential spillover effects, such as technology transfer or productivity growth, remain unrealised (Tsaurai, 2023; Nantharath & Kang, 2019). Therefore, effective FDI requires parallel investments in education, governance, and institutional integrity (Tsaurai, 2023; Nantharath & Kang, 2019).

Education and skills development are particularly important for maximising the benefits of FDI. Investments in human capital enhance a nation's ability to absorb, adapt and utilise the advanced technologies and management techniques introduced by foreign investors (Khachatryan, 2023). This process strengthens productivity growth and facilitates deeper integration into global value chains (Khachatryan, 2023).

Social and political conditions also play a significant role in attracting FDI. Factors such as religious freedom, transparency and political stability have been shown to encourage higher levels of foreign investment (Abbas, 2022; Akkaya, 2019). A stable and transparent institutional framework thus enhances investor confidence and promotes long-term economic stability (He, 2018).

In terms of trade policy, the development benefits of foreign direct investment are maximised when host countries strengthen their domestic capacities while maintaining investor friendly regulations. Secure private property rights, credible governance and coherent legal frameworks consistently emerge as prerequisites for the sustainable success of foreign direct investment (Choe, 2003; Zain, 2019). These interconnections underscore that the effectiveness of foreign direct investment depends on a broader ecosystem of policy coordination and institutional strength.

Studies comparing remittances and FDI often focus on whether the two act as substitutes or complementary flows. Remittances primarily support household welfare and consumption, while FDI contributes to productive capacity and technology transfer. Evidence increasingly suggests that the two flows can be complementary, with remittances improving human capital and financial inclusion conditions that, in turn, facilitate the productive absorption of FDI (World Bank, 2021; Forte & Moura, 2013).

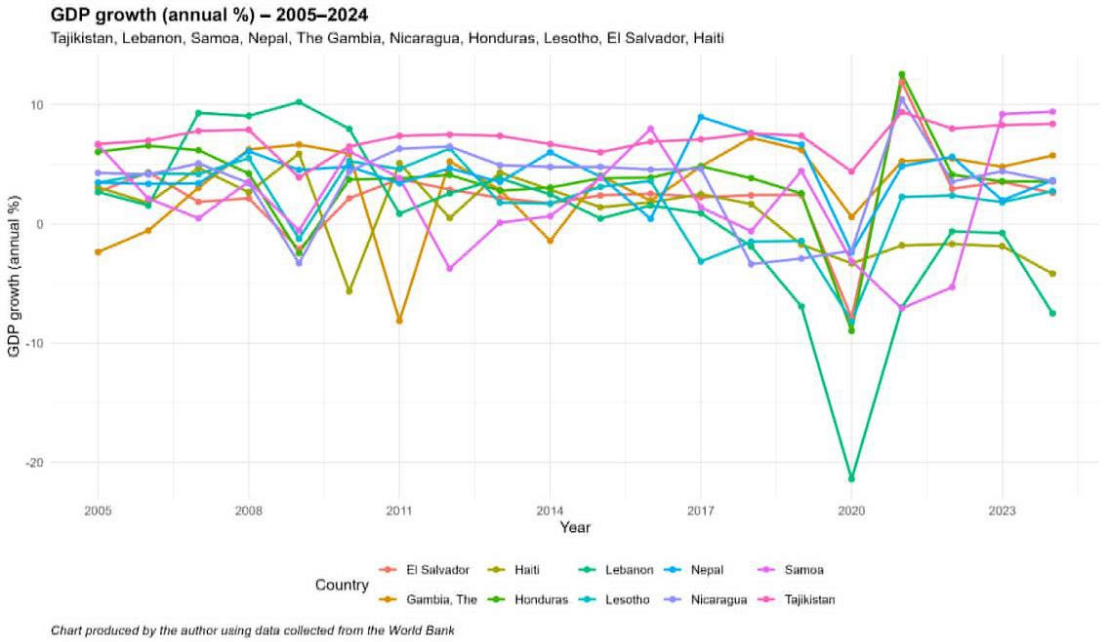

Figure 3. GDP Growth (annual %), 2005–2024

Source: Author's graph based on data from the World Bank.

The GDP growth trajectory of the countries in **Figure 3** shows considerable cyclicality, with noticeable declines in 2008, 2009 and 2020, corresponding to the global financial crisis and the COVID-19 pandemic. Despite these shocks, most countries recovered quickly, reflecting the resilience of domestic demand and, in most cases, the stabilising influence of remittance flows. The sharp contractions in 2020, followed by robust recoveries, suggest that external financial flows, both remittances and FDI, play a countercyclical role in mitigating growth fluctuations (World Bank, 2021). In particular, the economies of countries such as Samoa, Nepal and Nicaragua show relatively moderate volatility, possibly due to sustained remittance flows, while countries with more volatile FDI patterns, such as Lebanon and Gambia, show more pronounced fluctuations in growth rates.

The alignment between periods of growth in remittance flows and improved economic performance provides empirical support for the literature that emphasises the role of remittances in economic development by stabilising consumption and maintaining demand (World Bank, 2021). At the same time, the more volatile influence of FDI flows highlights their dependence on external

confidence and internal institutional quality. The graph also illustrates that the dynamics of economic growth are multidimensional: structural reforms, governance and macroeconomic stability mediate the efficiency with which external capital flows translate into real increases in output (Forte & Moura, 2013; Tsaurai, 2023).

Overall, the graphical evidence reinforces the argument that, although both remittances and FDI influence economic growth, they do so through distinct but potentially complementary mechanisms. Remittances support immediate consumption and welfare stability, while FDI stimulates capital formation and technological progress. The comparative stability of remittance trends and the volatility of FDI flows reflect their impact on GDP growth: steady resilience driven by households versus cyclical expansions driven by investment. This interaction validates the theoretical proposition that a balanced combination of both flows enhances the overall sustainability of economic growth in developing economies (World Bank, 2021; Khachatryan, 2023).

In conclusion, remittances and FDI are distinct but interconnected channels of external financing. Remittances reduce poverty and support consumption, while FDI stimulates structural transformation and technological progress. Their combined development potential depends on coherent policy frameworks that reduce remittance costs, improve access to finance, strengthen governance, and invest in human capital. When properly managed, these flows can work synergistically to promote sustainable economic growth (Tsaurai, 2023; Khachatryan, 2023; World Bank, 2021).

METHODOLOGY

This study uses three econometric models: Pooled Ordinary Least Squares (Pooled OLS), Fixed Effects (FE) and Random Effects (RE), which are necessary to analyse the determinants of GDP growth using panel data in the top 10 countries worldwide most dependent on remittances, namely Tajikistan, Lebanon, Samoa, Nepal, Gambia, Nicaragua, Honduras, Lesotho, El Salvador and Haiti, over a 20-year period, namely 2005-2024. Following the estimation of these models, "observed versus predicted" graphs were generated to assess the degree of correspondence between the predicted and actual values of the dependent variable. In each graph, the red line represents the perfect fit line, and the proximity of the scatter points to this reference line serves as a visual indicator of the accuracy of the model.

The working hypotheses were:

- **H1: Remittances have a positive impact on long-term economic growth in economies heavily dependent on remittances.**
- **H2: Foreign direct investment (FDI) has a positive and significant impact on long-term economic growth.**
- **H3: The effect of FDI on growth is more stable and consistent than that of remittances.**
- The results obtained from the Pooled OLS specification reveal a positive relationship between observed and predicted values of GDP growth. However, the relatively high dispersion of points around the reference line suggests that this approach captures only general associations between variables, without taking into account unobserved heterogeneity across units or over time. This limitation stems from the fundamental assumption of homogeneity implicit in the pooled OLS framework, which treats all observations as identical, ignoring entity-specific effects (Baltagi, 2008). Consequently, although the combined model provides an overview of the data structure, it lacks the ability to isolate the influence of time-invariant characteristics or country-specific dynamics, which is essential in panel data analysis.

The fixed effects model provides a more refined representation of the relationship between variables. The corresponding "Observed versus Predicted" graph shows a visibly tighter grouping of

points around the perfect fit line, indicating improved model accuracy. By introducing entity-specific intercepts, the fixed effects specification effectively controls for time-invariant characteristics unique to each country or observation unit (Wooldridge, 2010). This adjustment improves the model's ability to capture within-country variations, reducing omitted variable errors arising from unobserved heterogeneity. As a result, the fixed effects estimator provides more reliable estimates of coefficients for time-varying variables, reinforcing its suitability for macroeconomic applications with panel data.

In contrast, the random effects model integrates both inter-unit and intra-unit variations, assuming that individual effects are not correlated with the explanatory variables (Greene, 2012). The visual pattern of the Observed versus Forecast graph for the random effects model resembles that of the fixed effects specification, although the dispersion of data points around the perfect fit line is slightly higher. This indicates that, although the RE model retains its explanatory power, its efficiency depends on the validity of its basic assumption of unit effect independence. When this assumption holds, the random effects estimator can produce more efficient results than the fixed effects estimator by exploiting variation both between units and within units (Hausman, 1978; Hsiao, 2014).

The choice between fixed and random effects models is formally assessed using the Hausman test (Hausman, 1978), which determines whether the unique errors (individual effects) are correlated with the regressors. A statistically significant Hausman statistic favours the fixed effects specification, confirming that there is a correlation and that the FE model provides consistent estimates. Conversely, if the test does not reject the null hypothesis, the random effects model is considered appropriate due to its efficiency and unbiasedness under the assumptions of orthogonality.

Overall, the comparative graphical and statistical evaluation of the three models demonstrates clear differences in performance. The combined OLS model provides a simplistic, aggregated representation that is useful for preliminary information but limited in terms of explanatory depth. The fixed effects model substantially improves the fit by taking into account unobserved heterogeneity between entities, while the random effects model offers a balanced approach when cross-sectional and temporal variations coexist under valid exogeneity conditions. The higher concentration of observed values around the perfect fit line in the fixed and random effects graphs indicates that these specifications capture the structural and temporal dimensions of the panel data more effectively than the combined alternative.

Overall, the methodological analysis highlights the importance of model specification in panel data econometrics. The shift from combined models to fixed and random effects models reflects an increased ability to account for structural diversity and variations across units. These improvements ensure that the estimated coefficients more accurately represent the underlying economic relationships that drive GDP growth. Consequently, the combined use of graphical diagnostics and formal specification tests improves both the robustness and interpretability of empirical results.

RESULTS AND DISCUSSION

The econometric evaluation of the three panel data specifications, Pooling OLS, Fixed Effects (FE) and Random Effects (RE), was complemented by graphical analyses designed to assess the predictive accuracy of each model. The Observed vs. Forecast graphs presented in ***Figures 4-6*** visually illustrate the degree of correspondence between the model's forecast GDP growth values and the actual data observed in the ten countries during the period 2005-2024. In each case, the dotted red line represents the perfect fit line, where the forecasted values are exactly equal to the observed results. The concentration and dispersion of data points around this line serve as an intuitive indicator of model performance and explanatory power.

The econometric model applied is expressed as follows:

$$Y_{it} = c + \beta_2(\text{remit}_{it}) + \beta_3(\text{fdi}_{it}) + \beta_4(\text{exp}_{it}) + \beta_5(\text{fce}_{it}) + \beta_6(\text{gcf}_{it}) + \beta_7(\text{exchrate}_{it}) + u_{it}$$

where:

- Y_{it} = GDP growth (annual %), the dependent variable,
- $i = 1 \ldots 10$ (countries) and $t = 2005 \ldots 2024$ (years),
- c = constant term,
- remit_{it} = personal remittances received (% of GDP),
- fdi_{it} = foreign direct investment net inflows (% of GDP),
- exp_{it} = exports of goods and services (annual % growth, interpolated),
- fce_{it} = final consumption expenditure (annual % growth, interpolated),
- gcf_{it} = gross capital formation (annual % growth, interpolated),
- exchrate_{it} = exchange rate (national currency per USD, log-transformed),
- u_{it} = error term.

Interpolation was applied to the variables exports, final consumption and gross capital formation due to missing observations in several countries. For the exchange rate, the natural logarithm was used to normalise extreme values (ranging from 1 to 89,500 local currency units per USD).

Table 1 presents a statistical description of the main variables used in the analysis, including the number of observations, mean, standard deviation, minimum and maximum values. This information provides an overview of the distribution of the data and their variation within the sample.

Table 1: Descriptive statics of variables

Table 1 – Descriptive statistics of variables

Variable	Observations	Mean	SD	Minimum	Maximum
gdpgrowth	20	2.90	4.31	-21.40	12.57%
remittances	200	20.50	8.32	4.15	49.90
fdi	200	3.51	3.30	-1.21	14.88
exp	200	3.69	21.22	-56.94%	154.34
fce	200	2.96	4.45	-21.84	16.52
gcf	200	4.19	19.26	-95.58%	80.91
log(exchrate)	200	3.14	2.06	0.00	11.4

Source: author's calculation

Source: author's calculation

Three panel data models were estimated: Pooling OLS (OLS), fixed effects (FE) and random effects (RE). The analysis aimed to identify the specification that best captures the relationship between remittances, FDI and GDP growth, as well as to test the following hypotheses:

- **H1: Remittances have a positive impact on long-term economic growth in economies heavily dependent on remittances.**
- **H2: Foreign direct investment (FDI) has a positive and significant impact on long-term economic growth.**
- **H3: The effect of FDI on growth is more stable and consistent than that of remittances.**

Table 2: Regression results (OLS / FE/ RE) with Hausman& LM

Table 2 Regression results (OLS / FE / RE) with Hausman & LM

	OLS	Fixed-effects	Random-effects
Constant	-0.215		0.949
	(0.536)		(0.562)
Remittances	0.057	-0.034	0.011
	(0.047)	(0.045)	(0.043)
FDI	0.178	0.219	0.197
	(0.067)	(0.080)	(0.072)
Exports	0.062	0.059	0.060
	(0.010)	(0.010)	(0.009)
Final consumption (FCE)	0.511	0.497	0.501
	(0.073)	(0.063)	(0.069)
Gross capital formation (GCF)	0.065	0.061	0.063
	(0.010)	(0.008)	(0.009)
Exchange rate (ln)	-0.220	-0.513	-0.298
	(0.142)	(0.352)	(0.156)
Number of countries	10	10	10
Hausman chi2 (df)	8.392 (6)		
Hausman p-value	0.210		
LM Breusch–Pagan chi2 (df)	19.350 (1)		
LM p-value	0.00001		
Observations	200	200	200
R	0.691	0.697	0.689
Adjusted R^2	0.681	0.673	0.679

* p < 0.1, ** p < 0.05, *** p < 0.01

Source: author's calculation

Source: autor's calculation

The analysed dataset comprises ten economies characterised by a high level of remittance dependency in GDP: Tajikistan, Lebanon, Samoa, Nepal, Gambia, Nicaragua, Honduras, Lesotho, El Salvador and Haiti. These countries vary greatly in terms of size, population and economic structure, bringing together Asian economies (Tajikistan, Nepal, Lebanon, Samoa), Latin American and Caribbean economies (Nicaragua, Honduras, El Salvador, Haiti) and African economies (Gambia, Lesotho). This structural diversity lends robustness to the analysis, as it allows common economic relationships to be identified in different institutional and demographic contexts. At the same time, the presence of small economies (e.g. Samoa, Gambia, Lesotho) alongside countries with relatively larger populations (such as Nepal, Tajikistan or Honduras) highlights the relevance of using panel models to capture both the variation between countries and the temporal dynamics within them.

The analysis of the results shows a good fit of the applied econometric models. The values of the coefficient of determination R^2 range between 0.689 and 0.697, indicating that the chosen specifications manage to explain approximately 69%–70% of the variation in the economic growth rate (GDPGROWTH) for the analysed sample. This level of explanatory power is considered high for macroeconomic panel models, where economic growth dynamics are influenced by a multitude of structural and cyclical factors that are difficult to capture in their entirety through a finite set of variables. The similar value of the coefficients of determination in the case of the three models (Pooling OLS, Fixed Effects and Random Effects) suggests that the relationships between the explanatory variables and the dependent variable are robust to different specifications. At the same time, these results confirm that the selected indicators: foreign direct investment (FDI), exports (EXP), final consumption (FCE), gross capital formation (GCF), remittances (REMITTANCES) and the exchange rate (EXCHRATE), are relevant for explaining the variation in the economic growth rate (GDPGROWTH) in the analysed context.

In terms of explanatory variables, foreign direct investment (FDI), exports, final consumption (FCE) and gross capital formation (GCF) have positive and statistically significant coefficients at the 1% level ($p < 0.01$) in all three models (Pooling, Fixed Effects and Random Effects). This result confirms the theoretical hypothesis that these factors contribute significantly to medium- and long-term economic growth in emerging and developing economies.

Furthermore, the significant effect of final consumption expenditure (FCE), reflected by a coefficient of approximately 0.5 p.p., can be explained by the Keynesian law of effective demand, according to which the level of production and employment is mainly determined by aggregate demand. In the economies analysed, where the high share of household consumption in GDP is combined with limited productive capacities, domestic demand plays a central role in generating economic growth, either through domestic income or through external capital inflows or remittances, which stimulate domestic production and national income, generating a multiplier effect in the economy. (World Bank, 2021).

Foreign direct investment (FDI) also has a positive and significant influence (coefficients between 0.178 and 0.219 p.p.), confirming the economic literature that highlights the contribution of foreign investment to technology transfer, job creation and the expansion of productive capacity (Nantharath & Kang, 2019).

Exports have a positive and significant impact on economic growth, with estimated coefficients ranging between 0.059 and 0.062 p.p. This result highlights the essential role of trade openness in the economies analysed, where external demand acts as an important driver of economic activity. By integrating into international markets, these economies can capitalise on the advantages offered by access to larger markets, economies of scale and specialisation, which contribute to increased productivity and diversification of the economic base. International trade also facilitates indirect technology transfer and stimulates domestic competitiveness, thereby strengthening long-term growth potential. (Forte & Moura, 2013; Das & Sethi, 2019; Tsaurai, 2023).

Gross capital formation (GCF) has a positive and significant impact on economic growth, with coefficients estimated between 0.061 and 0.065 p.p., significant at the 1% level ($p < 0.01$) in all model specifications (OLS, FE, RE). This result confirms the importance of domestic investment in supporting long-term economic development. The increase in the share of gross capital formation reflects the intensification of physical and infrastructural capital accumulation processes, which expand productive capacities and enhance growth potential.

Investments in infrastructure, equipment and new technologies generate spillover effects in the economy, stimulating productivity and promoting job creation. (Dine & Metwally, 2019)

On the other hand, remittances (REMITTANCES) do not have a statistically significant impact in any of the model specifications. The estimated coefficients vary slightly: they are positive in OLS (0.057) and in the RE model (0.011), but become slightly negative in the FE model (-0.034), and the p-values exceed 0.1 in all cases. This shows that, for the countries analysed, remittances do not consistently influence economic growth.

This trend is well documented in the literature on migration-dependent economies. Remittances contribute to poverty reduction and income stabilisation, but play a lesser role in stimulating sustainable economic growth. Without public policies that encourage the channelling of part of these flows into investment, through tax incentives, co-financing programmes or the development of financial infrastructure, their impact remains mainly passive: they support consumption but contribute less to capital formation and job creation. (Forte & Moura, 2013; Das & Sethi, 2019; Tsaurai, 2023).

The logarithmic exchange rate (EXCHRATE) has a coefficient of -0.298 in the random effects model, significant at the 10% level ($p < 0.1$). In OLS, the coefficient is -0.220, and in the fixed effects model it reaches -0.513, but in these cases it is not statistically significant. The results show that a depreciation of the local currency is associated, on average, with a decline in economic growth of approximately 0.3 percentage points.

This negative effect is explained by the fact that the economies analysed depend to a considerable extent on imports. When the currency depreciates, the costs of imported goods increase, which fuels inflation and reduces domestic purchasing power. Under these conditions, the potential competitive advantages for exports are largely offset by inflationary pressures. Moreover, in the absence of sufficiently robust export sectors or effective economic adjustment policies, devaluation does not generate real growth benefits but may exacerbate existing imbalances (Tsaurai, 2023; Nantharath & Kang, 2019).

To determine the most appropriate model, two diagnostic tests were performed.

The Lagrange Multiplier Breusch–Pagan test yielded: chisq = 19.35, df = 1, p-value = 1.088e-05, alternative hypothesis: significant effects, confirming significant individual effects (specific to each country) and justifying the use of panel models instead of Pooling OLS.

The Hausman test yielded: chisq = 9.8464, df = 6, p-value = 0.1313, alternative hypothesis: one model is inconsistent, suggesting that there is no systematic correlation between country-specific effects and regressors. Thus, the null hypothesis was not rejected, and the random effects model was selected as a consistent and efficient specification (Baltagi, 2008; Hausman, 1978; Wooldridge, 2010).

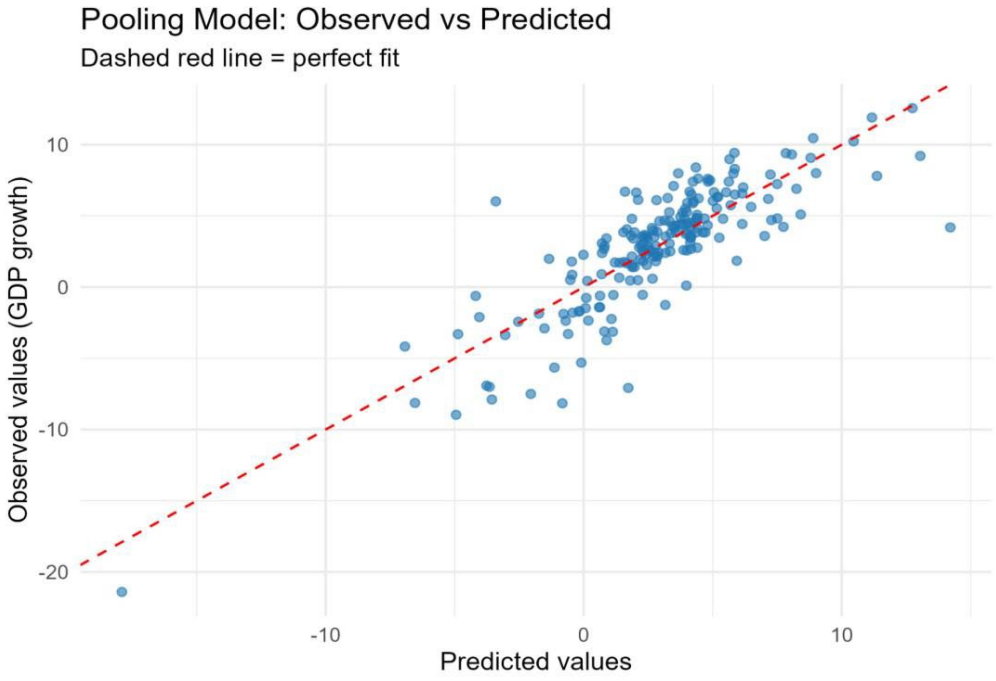

Figure 4. Pooling Model: Observed vs Predicted

Source: Author's graph based on author's calculation

The Pooling OLS model (***Figure 4***) shows a generally positive association between observed and predicted GDP growth values. However, the considerable dispersion of points around the dotted red line (the perfect fit line) indicates limited explanatory power. Since this model assumes complete homogeneity across countries, it does not take into account structural differences, such as economic size, institutional quality or political regimes, that influence growth performance (Baltagi, 2008).

Although the clustering model captures general trends, it oversimplifies the data structure by treating all observations as identical. This approach does not take into account the heterogeneity between countries and temporal variation, which are essential for panel data analysis. The relatively high dispersion of the points shows that the model captures the general directionality but performs poorly in explaining fluctuations within countries over time.

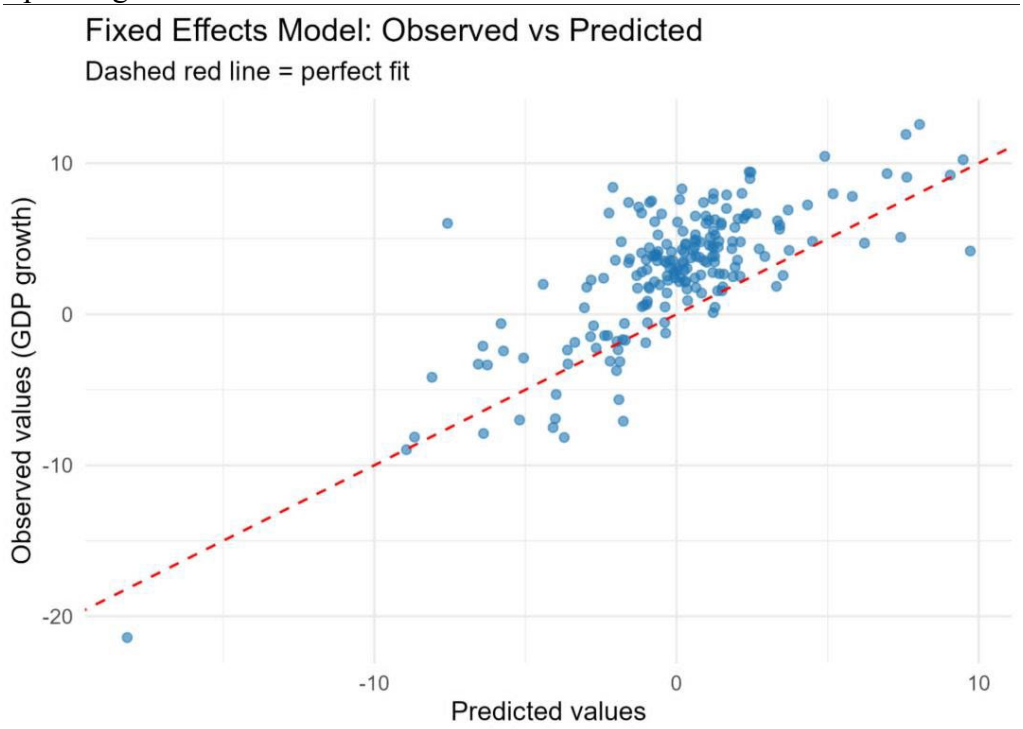

Figure 5. Fixed Effects Model: Observed vs Predicted

Source: Author's graph based on author's calculation

The fixed effects model (***Figure 5***) shows a much tighter grouping of points around the perfect fit line, demonstrating a substantial improvement in predictive accuracy. This model controls for unobserved, time-invariant characteristics specific to each country, such as geography, institutional framework, or long-term development strategies (Greene, 2012; Hsiao, 2014).

By isolating variations within the country, the fixed effects specification provides more accurate and consistent coefficient estimates, reducing systematic errors caused by omitted variables. The visual concentration of points near the reference line indicates that the model effectively captures how internal changes in consumption, investment, or trade affect economic growth in each country. However, as expected, the FE model may lose efficiency when variations between countries contain significant information, as it focuses exclusively on the temporal dynamics within each unit.

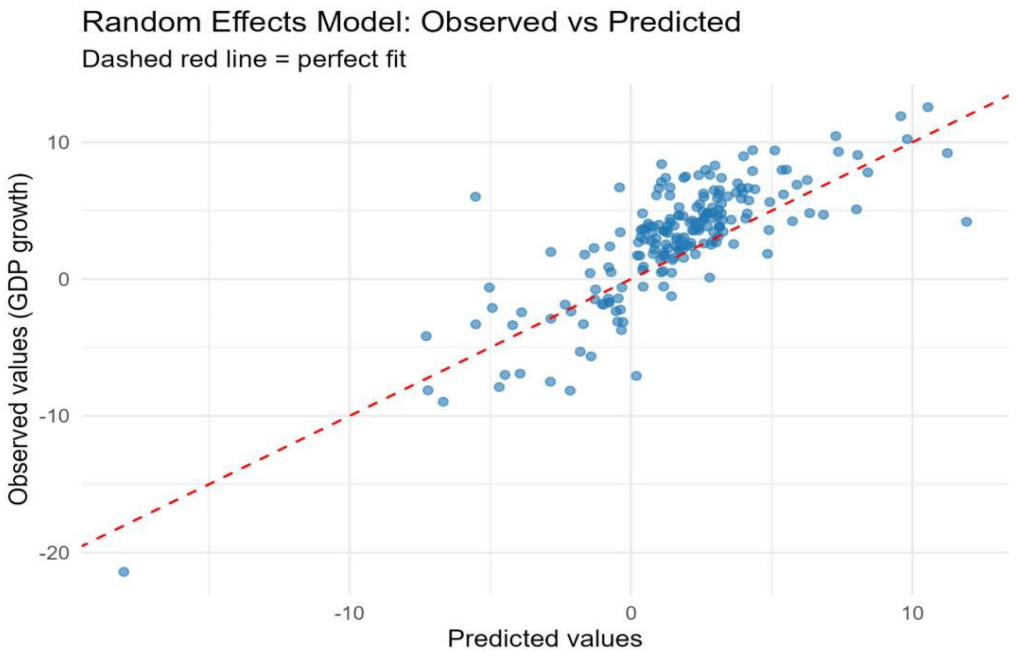

Figure 6. Random Effects Model: Observed vs Predicted

Source: Author's graph based on author's calculation

The random effects model (***Figure 6***) shows a similar fit between observed and predicted GDP growth values, with only slightly higher dispersion than the FE model. This model indicates that the RE estimator successfully captures both intra-country and inter-country variations (Hausman, 1978; Baltagi, 2008). The basic assumption of no correlation between country-specific effects and explanatory variables is consistent with the results of the Hausman test (p=0.1313), confirming the validity of the RE specification.

The graphical alignment of the points along the red dotted line demonstrates the robustness of the random effects model in predicting GDP growth while maintaining statistical efficiency. It provides a comprehensive picture of the dataset, leveraging information from both dimensions, time and cross-section, making it particularly suitable for panels with moderate heterogeneity.

A comparison of the three models reveals a clear progression in terms of accuracy and explanatory power. The Pooling OLS model offers the weakest fit, as shown by the scattered distribution of residuals, reflecting its inability to capture country-specific dynamics. The Fixed Effects model significantly improves explanatory performance by taking into account unobserved heterogeneity and isolating within country variations. The Random Effects model achieves a similar level of accuracy while maintaining efficiency due to its dual use of cross-sectional and temporal information.

Both statistically and graphically, the Random Effects specification outperforms the alternatives. The Lagrange Multiplier (Breusch-Pagan) test validates the use of panel models, while the Hausman test supports the consistency of the RE estimator. The close grouping of predicted and observed values in ***Figure 6*** confirms that the Random Effects model provides the best empirical representation of the data, balancing precision with generalisability.

The choice is logical both from a statistical perspective, as RE is efficient and consistent in the absence of correlation with unobserved effects, and from an economic perspective, as it allows for the simultaneous capture of variation between countries and within each country over time, which is essential for a sample consisting of diverse economies.

The analysed dataset comprises ten economies with a high degree of dependence on remittances: Tajikistan, Lebanon, Samoa, Nepal, Gambia, Nicaragua, Honduras, Lesotho, El Salvador and Haiti. These countries differ significantly in size, population and economic structure,

including Asian, African and Latin American economies. Structural diversity lends robustness to the analysis, as it allows common economic relationships to be captured across varied institutional and demographic contexts.

The results of the random effects model estimation show that the main determinants of economic growth are foreign direct investment (FDI), exports, final consumption expenditure (FCE) and gross capital formation (GCF), all of which have positive and statistically significant effects on the real GDP growth rate.

Foreign direct investment (FDI) has an estimated coefficient of 0.197, statistically significant at the 1% level ($p < 0.01$), indicating the robustness of the estimated relationship.

This suggests that a 1 percentage point increase in the share of FDI in GDP is associated, on average, with economic growth of approximately 0.20 percentage points. This result confirms the literature on the role of foreign investment in stimulating economic growth through technology transfer, job creation and expansion of productive capacities in developing economies. (Forte & Moura, 2013)

Exports (Exp) have an estimated coefficient of 0.06, which is statistically significant at the 1% level ($p < 0.01$), indicating a higher precision of the estimated relationship. This result suggests that a 1 percentage point increase in the share of exports in GDP is associated, on average, with economic growth of approximately 0.06 percentage points. This result highlights the importance of trade openness for small and open economies, where external demand plays a central role in sustaining economic activity. By integrating into international markets, these economies can exploit economies of scale, stimulate productivity growth and benefit from indirect technology transfers, thereby strengthening their long-term growth base.

Final consumption expenditure (FCE) has the highest coefficient, 0.501, which is significant at the 1% level ($p < 0.01$) and significant for the model studied. This means that a 1 p.p. increase in final consumption leads, on average, to economic growth of approximately 0.5 p.p., confirming the dominant role of domestic demand in determining economic growth. This result is in line with the Keynesian law of effective demand, according to which the level of production and employment is mainly determined by the dynamics of aggregate demand. (World Bank, 2021).

Gross capital formation (GCF) has a coefficient of 0.063, significant at the 1% level ($p < 0.01$). Thus, a 1 p.p. increase in the share of domestic investment in GDP leads, on average, to economic growth of 0.063 p.p. This result confirms the importance of domestic investment in infrastructure, physical and technological capital for sustaining long-term economic development.

Remittances are not statistically significant in any of the estimated models, as the coefficient is small (0.011) and insignificant ($p = 0.797$). This result indicates that, in the case of the countries analysed, remittances do not contribute systematically and robustly to real GDP growth, suggesting that these flows are predominantly directed towards current consumption and supporting household living standards rather than productive investment. (Fayissa & Nsiah, 2010)

Therefore, the insignificant result of remittances reflects the structure and destination of these flows rather than their lack of social importance. In the absence of public policies that encourage the channelling of a portion of remittances into productive capital through appropriate financial instruments, tax incentives or co-investment projects, their impact on economic growth remains largely passive.

The logarithmic exchange rate (Exchrate) has a coefficient of -0.298, significant at the 10% level ($p < 0.1$). This suggests that the devaluation of the local currency is associated with a decline in economic growth of approximately 0.3 p.p. The negative effect reflects the fact that, in the economies analysed, which are characterised by a high dependence on imports, currency depreciation leads to higher domestic prices and inflationary pressures, which offset any competitive advantages generated on the export side.

The results of the random effects model show that, while remittances have a positive but statistically weaker contribution to GDP growth, foreign direct investment (FDI) has a constant and

significant impact. This result is consistent with hypothesis H2 and confirms the conclusions of Forte and Moura (2013), who argue that the long-term effects of FDI stem from capital accumulation, technology transfer and managerial spillovers. In contrast, the weaker statistical significance of remittances partially supports hypothesis H1, indicating that although remittances support household consumption and cushion savings during periods of recession, their structural effect on production is less direct. The RE model thus confirms hypothesis H3, which posits that the influence of FDI is more stable and sustainable than that of remittances.

The overall pattern of results suggests that remittances and foreign direct investment (FDI) operate through different but complementary channels. Remittances increase aggregate demand in the short term, supporting the Keynesian mechanism of consumption-based economic growth (World Bank, 2021), while FDI stimulates long-term productive capacity, in line with endogenous growth theory (Nantharath & Kang, 2019). This distinction highlights the importance of policies that can transform remittance flows into productive investments, such as financial inclusion programmes, diaspora investment schemes, and favourable business environments. By strengthening these institutional links, remittance-dependent economies can bridge the gap between short-term stability and sustainable structural growth.

Therefore, the random effects model is adopted as the main specification for interpretation. It captures the structural diversity of remittance-dependent economies while effectively estimating the effects of key determinants of economic growth, remittances, foreign direct investment, exports, final consumption, gross capital formation, and exchange rates. This model confirms that FDI, consumption and capital formation exert strong positive effects on growth, while remittances play a more limited and short-term stabilising role, in line with the theoretical expectations discussed in the literature (Forte & Moura, 2013; Das & Sethi, 2019; Tsaurai, 2023).

LIMITATIONS OF THE RESEARCH AND DIRECTIONS FOR FUTURE STUDIES

The present analysis did not take into account the structural characteristics of the analyzed countries, such as territorial size and population, factors that may influence the degree of sensitivity of economies to external shocks. In future research, it would be useful to integrate these variables into an extended econometric model in order to highlight how the size of the economy and population density can amplify or mitigate the effects of global financial crises on remittance flows and economic growth. Furthermore, alternative analytical models could be explored, capable of more accurately capturing the complex interactions between external shocks, foreign direct investment, and remittances.

CONCLUSIONS

In conclusion, the econometric analysis performed on a sample of ten economies characterised by a high degree of dependence on remittances for the period 2005–2024 revealed a number of significant economic relationships, consistent with economic growth theories and recent literature. The Random Effects model, selected after applying the Breusch–Pagan and Hausman tests, proved to be the most appropriate specification for the structure of the analysed panel, providing consistent and efficient estimates.

The results of the analysis confirm that both remittances and foreign direct investment contribute to economic growth in remittance-dependent economies, but their influence differs in nature and magnitude. Remittances, while positive, have weaker and less stable effects on GDP growth, suggesting that they primarily support consumption and short-term welfare rather than stimulating structural transformation. Their ability to stabilise household incomes and maintain domestic demand remains essential for macroeconomic resilience, particularly during periods of global recession. However, without mechanisms to channel these flows into productive investment, their long-term growth potential remains limited.

Foreign direct investment has a stronger and statistically significant impact on economic performance, providing consistent evidence that it is a key driver of long-term growth. Its effects are closely linked to the expansion of productive capacity, technology transfer and the creation of employment opportunities. This stability reinforces the idea that investment-led growth is more sustainable and less dependent on cyclical fluctuations. Empirical findings indicate that economies able to maintain a stable investment climate and sound macroeconomic policies experience more predictable and robust growth trajectories.

A comparison of the two financial flows highlights their complementary rather than competitive nature. Remittances provide liquidity and stimulate consumption, while foreign direct investment enhances productivity and structural change. When effectively combined, these channels can create a balanced growth mechanism, in which short-term stabilisation supports the conditions necessary for long-term development. Such complementarity is particularly valuable for smaller economies with limited access to international capital markets, as it allows them to mitigate volatility while building domestic productive capacity.

The results also underscore the importance of institutional and policy frameworks in mediating the impact of external financial flows. Economies that strengthen governance, improve transparency, and maintain macroeconomic stability tend to attract more sustainable foreign investment and can more easily transform remittances into savings and entrepreneurial activity. Improving financial inclusion and providing investment incentives to the diaspora community can further amplify these positive effects by linking household income flows to national development objectives.

From a broader perspective, this research shows that external financial dependence does not necessarily imply vulnerability if it is managed within coherent policies. Remittances can play a crucial role in ensuring economic stability and social welfare, while foreign direct investment stimulates innovation, productivity and competitiveness. The main challenge for policymakers is to develop complementary strategies that transform remittance-driven consumption into productive outcomes, ensuring that both forms of external financing are mutually reinforcing rather than substitutive.

Comparative data suggest that the simultaneous presence of substantial remittance flows and foreign direct investment can enhance both resilience and growth potential. By aligning policies on financial inclusion, investment promotion and human capital development, remittance-dependent economies can overcome their dependence on external revenues and evolve towards a more diversified and sustainable development model. Integrating these flows into national strategies offers a path to inclusive and long-term economic progress that can withstand future global shocks. Overall, the findings confirm working hypotheses H2 and H3, showing that the effect of FDI on economic growth is significant and more stable than that of remittances, while hypothesis H1 is not empirically supported for the sample analysed. These results have clear economic policy implications: in order to harness the potential of remittances, it is necessary to channel them into productive investments, while stimulating FDI flows and strengthening external competitiveness through coherent trade and investment policies.

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REGIONAL DISPARITIES AND SUSTAINABLE DEVELOPMENT IN ROMANIA: INSIGHTS FROM EU FUNDS ABSORPTION DATA 2021-2027

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Abstract: *The absorption of European funds by a state, respectively by its regions, represents a means of real support for sustainable development. However, regions, most of the time, fail to have even a similar absorption, which implicitly leads to disparities between them and to the uneven development of a state. Nevertheless, the role of such funds is in fact very closely linked to the idea of supporting balanced sustainable development. Thus, given the current context, in which sustainability is becoming a genuine concern for states, the issue of economic sustainability is frequently being encountered. In light of these considerations, the article aims to analyze the absorption of European funds in relation to the situation of sustainability indicators at the regional level in Romania. For these reasons, the main purpose of this research is to highlight regional differences and their trends from the perspective of sustainability and funds. Therefore, the study methodology will be shaped around official statistical data, whose interpretation and correlation will allow an understanding of the real situation in Romania, thereby identifying interregional gaps. Finally, the research conducted in the article will provide a relevant perspective on the situation in Romania, with the results aiming to make a significant contribution to the field of study through their relevance and importance.*

Keywords: *sustainable development, European funds, regional development, disparities*

JEL CLASSIFICATION: *E60, Q01, Q56, R10, R11, R13, R58*

INTRODUCTION

The allocation of funds to the member states of the European Union can be seen as a financial-strategic measure, aimed at increasing the welfare of the countries. Additionally, it also targets regions in less favourable situations, where the harmonious development of a state is affected by the disparities between territories. The European Structural and Investment Funds (ESIF), the Fund for European Aid to the Most Deprived (FEAD) and payments made from the European Agricultural Guarantee Fund (EAGF) formed the main financial instruments for the period of 2014-2020, and within the programs they financed, the so-called Regional Operational Programme (ROP) was also allocated, which had an aim to support the regions from the European states.

Currently, the well-being of a region can be analysed through the lens of certain sustainability indicators and on which it is assumed that this allocation of funds should have a significant impact. Precisely because of these considerations, this paper wants to study the impact of the absorption of these funds on several sustainability indicators and, at the same time, to identify whether by allocating those money, the regions from Romania have managed to improve their situation and reduce disparities in terms of sustainability. Through this approach, it will be possible not only to observe whether there is a reduction in interregional disparities, but also to assess the real effect of European funding on the sustainability of the eight development regions. Thus, the real situations at the regional level will be put into perspective, as well as the achievement, or not, of the goal pursued by these European measures. The work has in this sense a very high relevance for future comparative studies that could be carried out following the completion of the current funding phase.

LITERATURE REVIEW

From a strategic point of view, the objectives of the European Union are very much aimed at increasing the well-being and sustainability of both Europe and the planet. Thus, in order to achieve them, the EU undertakes a series of actions, including allocating various funds to a series of programs (Kranjac *et al*., 2017). Moreover, the goals behind these allocations were and are very much focused on the idea of a united, economically and socially stable Europe; however, "Euroscepticism" was not mitigated by the simple allocation of money and the scientific literature has managed to identify the fact that this condition changes when the absorption of funds is accompanied by improvements in the labour market, i.e. when real opportunities appear at the local level (Crescenzi, Di Catalodi and Giua, 2020).

Following the financial crisis that occurred in 2008, the situation of states and especially that of the regions in Europe, was one that created different reactions, with a strong impact on their development and due to which interregional disparities were amplified (Oprea *et al*., 2020). In this sense, a relevant issue found in the literature is that of the link that exists between the economic evolution of a region and its capacity to absorb European funds (Marcu, Kandzija and Dorotic, 2020). However, in order to be sustainable, regions must also develop socially, not just economically, and which requires a reduction not only of economic disparities but also of social ones, precisely because both represent a problem for certain states in Europe (Bălăcescu *et al*., 2022). It must be noted that today, sustainability plays an important role both at the local level, such as in the case of smart cities (Kaur, Bușa and Cuc, 2024) but also at the regional level (Klemens *et al*., 2022) and behind which lies the argument based on the real need to examine sustainability in relation to smaller spatial units (Cheba *et al*., 2024).

In this regard, the simple allocation of funds is not enough and their absorption plays a fundamental role in the sustainable development of regions and states in Europe, with this aspect being attributed to the fact that in order to achieve sustainability, not only economic decisions are necessary, but also political ones (Bușa *et al*., 2021). Thus, regarding Romania, several previous studies have managed to identify the fact that the absorption of funds was done with delays or with loss (Oprișan and Dumitrache, 2023) (Feher *et al*., 2021).

In light of these findings, it is more than important to further study the relationship between fund absorption and sustainability, so that it can be determined to which extent did the EU funds impact the socio-economic development; a relevant question which is also raised in the literature (Surubaru, 2021).

RESEARCH METHODOLOGY

The research methodology chosen for this work is quantitative, more precisely one based on the interpretation of the relationships between the absorption rate of certain funds and a series of sustainability indicators. In this regard, for the funding component, the Regional Operational Programme (ROP) allocation rate associated with the European funds for the 2014-2020 period was used as a reference. It is worth mentioning that the final absorption of these funds took place in 2024, which is why the period of time for which the official data on the absorption rate were extracted was that of 2020-2024. With an important addition, namely that given the construction of the allocation of these funds for the period of 2014-2020, the rate is a general one, therefore concentrated at the country level and not one specific to each development region, as it otherwise exists starting with the new series of allocations.

Regarding the sustainability indicators and in accordance with the official statistical data provided by Eurostat, the following indicators were selected as relevant for this research: Persons at risk of poverty or social exclusion; Early leavers from education and training; Employment rates; Gender employment gap and Gross domestic product at current market prices; all of which are reported at the level of the 8 development regions in Romania (NUTS 2). Their selection was not random and is intended to cover some of the most sensitive issues at the socio-economic level of these territories, as well as to facilitate the construction of the empirical study. Moreover, the use of data provided by Eurostat is frequently found in the literature, even in quantitative/empirical studies (Sala, Gaia and Cerati, 2022) (do Amaral, Kovacheva and Rambla, 2020).

Thus, in order to achieve the general objective of the research, namely that of highlighting the regional disparities and sustainable development in Romania from a financial perspective of fund absorption, several Pearson correlations were performed and which have the following structure: In the first part, the correlations between the fund absorption rate and 4 out of the 5 sustainability indicators were analysed for each region. This analysis does not aim to determine only the financial impact of absorption on situations related to people at risk of poverty or social exclusion, school dropout, employment rate or gender disparities; rather, it aims to present disparities from this perspective, namely whether through the allocation of funds, the discrepancies between regions have remained the same, increased or decreased. In the second part, the paper analyses the correlation between the Gross domestic product at current market prices by NUTS 2 region indicator for each region and the absorption rate. Aiming to identify if, by allocating these funds, the regions recorded an increase in GDP and whether this was somewhat balanced or if it was only sustained in certain cases, thus reinforcing the disparities between the territories. In this context, the purpose of the chosen research methodology is to highlight both strong and atypical correlations, thus strengthening the final conclusions of the research and also its general objective.

RESULTS AND DISCUSSIONS

4.1. Analysis of correlations between ROP absorption and sustainability indicators by NUTS 2 regions

The first analyses of the research focused on identifying possible correlations between the absorption of EU funds from The Regional Operational Programme (ROP) and the four indicators of sustainable development for each of the 8 regions, with the mention that for the Bucharest-Ilfov region, one of the indicators (Early leavers from education and training) did not have all the data available, so it was not included in the study. In light of this, the first region whose situation was

analyzed is the North-East one (see Table no. 1).

Table no. 1. Correlation between sustainability indicators and absorption rate for N-E region

Pearson's Correlations ***North-East Region***

			Pearson's r	p
Effective Absorption Rate	-	Persons at risk of poverty or social exclusion	-0.924	.025
Effective Absorption Rate	-	Early leavers from education and training	-0.347	.567
Effective Absorption Rate	-	Employment rates	-0.887	.045
Effective Absorption Rate	-	Gender employment gap	0.749	.145

Source: Authors' own research

According to the data in Table no. 1, the only sustainability indicator on which the absorption of funds had a beneficial effect was that of Persons at risk of poverty or social exclusion, where according to Pearson's r, there was a strong negative correlation, and with a relevant statistical significance according to the p-value. This means that with the increase in the absorption rate, the percentage of persons at risk of poverty or social exclusion decreased. It remains to be seen whether this correlation is maintained in the case of the other regions or not. Hence, the next analysis is that of the South-Muntenia Region (see Table no. 2).

Table no. 2. Correlation between sustainability indicators and absorption rate for S-Muntenia region

Pearson's Correlations ***South-Muntenia Region***

			Pearson's r	p
Effective Absorption Rate	-	Persons at risk of poverty or social exclusion	-0.971	.006
Effective Absorption Rate	-	Early leavers from education and training	0.515	.374
Effective Absorption Rate	-	Employment rates	-0.772	.126
Effective Absorption Rate	-	Gender employment gap	0.348	.566

Source: Authors' own research

Table no. 2 shows that also in the case of this region, the first sustainability indicator is the only one that has a strong significant correlation with the absorption of funds (p is less that 0.05, while r is strongly negative), even stronger than in the case of the previous one. However, the situation remains equally unsatisfactory for the rest of the indicators. The next region studied is the one of the North-West Region (see Table no. 3).

Table no. 3. Correlation between sustainability indicators and absorption rate for N-W region

Pearson's Correlations ***North-West Region***

			Pearson's r	p
Effective Absorption Rate	-	Persons at risk of poverty or social exclusion	0.149	.811
Effective Absorption Rate	-	Early leavers from education and training	-0.361	.551
Effective Absorption Rate	-	Employment rates	-0.947	.014
Effective Absorption Rate	-	Gender employment gap	-0.477	.416

Source: Authors' own research

Table no. 3 provides a first indication that the negative correlation between the absorption rate and the Persons at risk of poverty or social exclusion indicator is not a general trend in the regions of Romania. However, it is important to consider the relationship between absorption and Employment rates presented in this table, as it is contradictory and non-specific, indicating that as the absorption of EU funds increased, employment rates decreased. The fourth analysis is that of the South-East Region (see Table no. 4).

Table no. 4. Correlation between sustainability indicators and absorption rate for S-E region

Pearson's Correlations ***South-East Region***

			Pearson's r	p
Effective Absorption Rate	-	Persons at risk of poverty or social exclusion	-0.965	.008
Effective Absorption Rate	-	Early leavers from education and training	0.971	.006
Effective Absorption Rate	-	Employment rates	-0.941	.017
Effective Absorption Rate	-	Gender employment gap	-0.927	.023

Source: Authors' own research

In the case of the South-East region, the situation of the first indicator returns, being again satisfactory. Furthermore, a statistically significant strong negative correlations can also be observed between the absorption of funds and the Gender employment gap indicator. This means that a higher absorption rate is associated with a reduction in gender employment inequalities ($p< 0.05$). The following analysis will be that of the Centre region (see Table no. 5).

Table no. 5. Correlation between sustainability indicators and absorption rate for Centre region

Pearson's Correlations ***Centre region***

			Pearson's r	p
Effective Absorption Rate	-	Persons at risk of poverty or social exclusion	-0.511	.379
Effective Absorption Rate	-	Early leavers from education and training	0.045	.943
Effective Absorption Rate	-	Employment rates	0.131	.834
Effective Absorption Rate	-	Gender employment gap	-0.803	.102

Source: Authors' own research

For the Central region, there was no statistically significant correlation between sustainable development indicators and the absorption of European funds (ROP funds). The next region is South-West Oltenia (see Table no. 6).

Table no. 6. Correlation between sustainability indicators and absorption rate for S-W Oltenia region

Pearson's Correlations ***South-West Oltenia Region***

			Pearson's r	p
Effective Absorption Rate	-	Persons at risk of poverty or social exclusion	-0.616	.269
Effective Absorption Rate	-	Early leavers from education and training	0.892	.042
Effective Absorption Rate	-	Employment rates	-0.750	.145
Effective Absorption Rate	-	Gender employment gap	-0.814	.093

Source: Authors' own research

The results presented in Table no. 6 are not satisfactory, however, one must also take into account the atypical positive and significant correlation between the absorption rate and the Early leavers from education and training indicator, a situation also present in Table no. 4. This shows that with the increase in the absorption of funds, the percentage of those who leave education and training early has also increased, an unnatural result. Next, the Western Region is analysed (see Table no. 7.)

Table no. 7. Correlation between sustainability indicators and absorption rate for Vest region

Pearson's Correlations ***West Region***

			Pearson's r	p
Effective Absorption Rate	-	Persons at risk of poverty or social exclusion	-0.863	.060
Effective Absorption Rate	-	Early leavers from education and training	0.433	.466
Effective Absorption Rate	-	Employment rates	-0.908	.033
Effective Absorption Rate	-	Gender employment gap	-0.848	.070

Source: Authors' own research

For the West Region the situation is a little different. In the case of people at risk of poverty and social exclusion, the p-value is very close to the 0.05 threshold, hence very close to being significant, also Persons's r shows that there is a strong negative correlation between the absorption of funds and this indicator, which means that there could be a real link between the two, a situation that is worth following and analysing in the future. At the same time, as in the case of the North-West region, there is a strong and significant negative correlation between the absorption rate and the Employment rate, an atypical issue but which, given the zonal context, namely that the two regions are in the vicinity, could imply some deeper problems. The last region being that of Bucharest-Ilfov (see Table no. 8).

Table no. 8. Correlation between sustainability indicators and absorption rate for Bucharest-Ilfov Region

Pearson's Correlations ***Bucharest-Ilfov Region***

			Pearson's r	p
Effective Absorption Rate	-	Persons at risk of poverty or social exclusion	-0.677	.209
Effective Absorption Rate	-	Employment rates	0.636	.249
Effective Absorption Rate	-	Gender employment gap	-0.517	.372

Source: Authors' own research

In the case of this region, none of the indicators was statistically significantly affected by the rate of absorption of funds. Concluding this part of the study by indicating the general lack of important correlations.

4.2. Analysis of correlations between ROP absorption and GDP indicator

For this analysis, it should first be mentioned that the available Eurostat data covers, for the GDP indicator, only the period of 2020-2023, 2024 not yet being recorded. In this sense, for the correlation between Gross domestic product at current market prices by NUTS 2 region and the fund absorption rate, the situation is much more favorable, with the results for each region being statistically significant (see Table no. 9).

Table no. 9. Correlation between GDP and absorption rate for all regions

Pearson's Correlations ***Gross domestic product at current market prices by NUTS 2 region***

			Pearson's r	p
Effective Absorption Rate	-	GDP at current market prices North-East Region	0.994	.006
Effective Absorption Rate	-	GDP at current market prices South-Muntenia Region	0.994	.006
Effective Absorption Rate	-	GDP at current market prices North-West Region	0.996	.004
Effective Absorption Rate	-	GDP at current market prices South-East Region	1.000	< .001
Effective Absorption Rate	-	GDP at current market prices Centre region	0.998	.002
Effective Absorption Rate	-	GDP at current market prices South-West Oltenia Region	0.988	.012
Effective Absorption Rate	-	GDP at current market prices West Region	0.996	.004
Effective Absorption Rate	-	GDP at current market prices Bucharest-Ilfov Region	0.995	.005

Source: Authors' own research

The results of Table no. 9 indicate that there is a strong positive correlation between the absorption of funds and the Gross domestic product at current market prices by NUTS 2 region indicator, especially in the case of the South-East region, where it is perfect with a p value lower than <0.001. However, this situation compared to that of the other sustainability indicators analysed, raises a series of concerns. From which, it can be considered that although GDP has grown following the increasing absorption of funds, the real situation in the regions has not improved, on the contrary, in some cases it seems that it has had an opposite trajectory.

CONCLUSIOS

According to the research results, it can be considered that with regard to regional disparities in Romania, the absorption of ROP funds did not have a significant positive effect from two perspectives. First of all, the correlations between the 4 sustainability indicators and the absorption rate indicate in principle a very small improvement of the situations in the regions. The *Persons at risk of poverty or social exclusion* indicator being the only one that had a positive trend of reducing disparities in terms of social issues. Moreover, the atypical correlations identified by the research only serve to reinforce the growth of disparities. Thus, the overall situation is disappointing and does not reflect the goals and results sought by allocating such funds. In this regard, the issue of inefficient absorption of funds could be attributed to weak policies, where planning and prioritization did not reflect the real needs of the territory, or did not have a long-term vision. On the other hand, these issues may also be due to a reduced administrative capacity, which can negatively affect the integration of strategies at regional level. Additionally, the lack of monitoring and evaluation may have played a key role in correcting the unsatisfactory results in the regions.

Secondly, the correlation between the absorption rate and GDP for each region, even if strong and significant, had a similar manifestation, which could lead to the maintenance or even the generation of regional disparities, as the GDP growth was not one that balanced the situation between regions, but rather was just a natural increase of this indicator for each region. In conclusion, it can be noted that although the purpose pursued by these financings, respectively funds, is one aimed at ensuring the good development of all regions and at standardizing sustainability, overall, the results of the study indicate that, at least in terms of the funds allocated in the period of 2014-2020, they have failed to improve the situation in Romania and have not achieved their objectives from a sustainability perspective.

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UNLOCKING EUROPEAN FUNDS FOR SUSTAINABLE ENERGY AND RESPONSIBLE DECOMMISSIONING IN THE REPUBLIC OF MOLDOVA

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Abstract: *The renewable energy sector in the Republic of Moldova has experienced significant growth in recent years, driven by geopolitical challenges and the country's commitment to European integration. This paper aims to analyze the role of European funds and international support in accelerating the transition toward sustainable energy, while also emphasizing the importance of responsible decommissioning practices. The research is based on the analysis of official reports, legislative frameworks, and international best practices. The findings highlight that while Moldova has made substantial progress in increasing renewable energy capacity, there is a growing need to integrate environmental impact assessments and financial provisions for dismantling infrastructure. The study concludes that aligning national policies with European Union standards will ensure both sustainable growth and long-term environmental protection.*
Key words*: renewable energy, European funds, Moldova, energy transition, decommissioning, sustainability*

JEL CLASSIFICATION: *Q42, Q48, H54, F36*

INTRODUCTION

The renewable energy sector in the Republic of Moldova has experienced significant growth over the past three years. This progress has been driven primarily by two factors: the energy crisis that affected Europe, including Moldova, as a consequence of the war in Ukraine, and Moldova's clear commitment to joining the European Union. This commitment includes integrating its energy system with Romania and, by extension, the European network, while adopting best practices for sustainable energy production and consumption.

Over the past three years, energy production in the Republic of Moldova has shown an impressive upward trend. According to the National Bureau of Statistics, output in 2024 is reached 1,521 TJ, marking an 81% increase compared to 2023 and a 51% rise from 2022. The National Energy Regulatory Agency (ANRE) reports in its annual review that renewable sources—such as solar panels, wind power, and prosumers (end-users who generate their own electricity and feed it into the grid)—accounted for 43.1% of total energy produced in 2024, up from 32% in 2023 and just 20% in 2022. According to ANRE's latest report on electricity market for the first quarter of 2025, the number of renewable energy producers has reached 300 units, marking a 125% increase compared to 2023.

What enabled this rapid growth? The primary driver was Moldova's urgent need to reduce reliance on traditional energy sources from the Transnistrian power plant and, consequently, Russian gas. This necessity became evident following the outbreak of the war in Ukraine in 2022, which served as a wake-up call for the country.

MAIN CONTENT

Technical Assistance and Capacity Building through International Programs

Undoubtedly, the biggest supporter for an independent and sustainable energetic system in the Republic of Moldova, was European Union and international organizations like: USAID, UNDP, EBRD and EIB. Using external funds in the past year were performed:

1. *Major International Financing Agreements for Energy Efficiency and Renewable Projects*

The Government of Moldova has signed and implemented several major financing agreements

with international partners to support the transition to renewable energy and energy efficiency. Notable examples include:

- Grant and Loan Agreements with the World Bank (IBRD) and the Multi-Donor Trust Fund "M-GROW" for the project "Sustainable Transition to Energy Efficiency in Moldova (STEEM)", supporting large-scale investments in energy efficiency and renewable energy infrastructure.
- Loan Agreements with the European Bank for Reconstruction and Development (EBRD) for the "Interconnection of Electricity Networks between Moldova and Romania, Phase II", which directly supports the integration of Moldova's energy system with the European grid and increases the share of renewables.

2. *Technical Assistance and Capacity Building through International Programs*

The government has leveraged technical assistance and capacity-building programs funded by external partners to accelerate renewable energy adoption:

- USAID's Moldova Energy Security Project (MESA) and UNDP have provided technical support for drafting and implementing key regulations, developing national strategies, and building institutional capacity for renewable energy integration.
- Expertise France, GIZ (Germany), and the Open Society Foundation (SOROS) have supported pilot projects, legal studies, and the development of community energy initiatives, including the legal and regulatory framework for energy communities and net metering.

3. *Implementation of Competitive Auctions and Support Schemes for Renewable Energy*

With support from the EBRD and EU4Energy, the government has established and implemented:

- Competitive auctions for large-scale renewable energy projects, ensuring transparent allocation of capacity and attracting private and foreign investment.
- Support schemes for renewable energy producers, including fixed tariffs and net metering mechanisms, which have been notified and authorized by the Competition Council with technical assistance from international partners.
- Development and adoption of secondary legislation (with EU and UNDP support) to align with EU directives, such as the Renewable Energy Directive (RED II), and to facilitate the integration of renewables into the national energy mix.

ENVIRONMENTAL PERSPECTIVE AND OBSERVATIONS

Traveling across Moldova this summer, I was struck by the frequent sight of wind farms and solar panels. It gave me confidence that the reported growth in renewables is real and filled me with pride and hope that Moldova is truly on the path toward energy independence. Yet, this observation sparked another thought: while striving to become "greener" in terms of energy, are we overlooking the environmental impact of our accelerated development?

My perspective is shaped by experience auditing renewable energy entities in Romania. Following EU best practices, Romania adopted Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment, as amended by Directive 2014/52/EU. This directive harmonizes principles for environmental impact assessments by introducing minimum requirements regarding the types of projects evaluated, the obligations of project initiators, and the involvement of competent authorities and the public—ultimately ensuring a high level of environmental and human health protection. Under the Renewable Energy Directive, EU member states must, by February 2026, identify "renewables acceleration areas" for at least one type of renewable energy technology. These zones should benefit from simplified and expedited permitting procedures for projects developed within them. The designated areas must be particularly suitable for such projects and selected on the basis that the chosen renewable energy source is unlikely to cause significant environmental impact.

These practices serve as an example we should follow to ensure sustainability throughout the transition to green energy. Renewable energy producers need to assess their impact on land erosion—both for wind farms and solar panels—as well as their carbon footprint and residual waste. Based on industry knowledge, a significant portion of land is leased from local municipalities for periods exceeding 20–30 years, reflecting the expected lifespan of these parks. Although 30 years seems long-term, measures should be implemented from the early stages, including plans for dismantling the parks and restoring the land once their operational life ends. Consequently, the government should promote investment initiatives aligned with local, national, regional, and European policies for transitioning to a low-carbon economy while addressing physical environmental impacts. These efforts should also support the objectives of climate change control policies, particularly concerning renewable energy infrastructure.

Responsible decommissioning plans should be assessed by management not only for operational efficiency but also for their impact on financial reporting. Consulting specialists to determine the necessary measures for environmental restoration during the dismantling of energy parks will result in recognizing dismantling provisions. These financial liabilities must cover the estimated costs of dismantling, removal, and land rehabilitation at the end of the asset's useful life, in line with legal and contractual obligations, aligning the local financial reporting with the best IFRS practices.

CONCLUSIONS

In conclusion, the renewable energy sector of Republic of Moldova has made remarkable strides, driven by geopolitical challenges, EU integration efforts, and substantial international support. These achievements demonstrate the country's commitment to energy independence and sustainability. However, true progress requires more than expanding capacity—it demands responsible planning to mitigate environmental impacts and ensure long-term environmental rehabilitation. Aligning national strategies with EU directives, implementing responsible decommissioning plans, and adopting best practices for environmental assessments will safeguard both ecosystems and financial integrity. By combining ambitious growth with accountability, Moldova can not only secure a low-carbon future but also set a precedent for sustainable development in the region.

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INTEGRATED INPUT–OUTPUT MODELLING FOR ECONOMIC CONVERGENCE AND INVESTMENT IMPACT ASSESSMENT: A STRUCTURAL FORECASTING FRAMEWORK FOR THE REPUBLIC OF MOLDOVA

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Abstract:

The paper develops an integrated macroeconomic modelling framework designed to strengthen the analytical and forecasting capacity of economic governance in the Republic of Moldova. Based on the reconstruction and extension of Supply-Use and Input-Output Tables (SUT/IOT), the study establishes a structural and methodological foundation for aligning Moldova's national accounts with the standards of the European System of Accounts (ESA 2010) and the System of National Accounts (SNA 2008).

By combining SUT/IOT reconstruction with econometric modelling, the research demonstrates how structural consistency enhances both macroeconomic forecasting and policy evaluation. The model incorporates data for 2005-2023 and captures the dynamic interactions between output, investment, trade, and fiscal aggregates. Through scenario analysis, it assesses how policy shocks and investment programs, particularly those financed through European funds, affect growth, employment, and intersectoral linkages.

The results show that the restoration of Moldova's input–output framework can significantly improve the evidence base for national and European policy coordination, while offering a practical instrument for monitoring convergence and investment efficiency. The study concludes that institutional modernization and digital integration of such models are key prerequisites for sustainable development and effective absorption of European resources.

Keywords: *Input-Output Modelling; Economic Convergence; Investment Impact; Forecasting; SUT/IOT; European Integration.*

JEL Classification: *D57, C68, E01, F15, O47, H54*

1. Introduction

The ongoing process of European integration requires countries in transition to strengthen their analytical and institutional capacity for evidence-based policymaking. In this context, the Republic of Moldova faces a dual challenge: ensuring macroeconomic stability while converging toward the statistical, fiscal, and governance standards of the European Union. A crucial component of this convergence process lies in rebuilding and modernizing the national accounting system, particularly the Supply-Use and Input-Output Tables (SUT/IOT), which constitute the backbone of structural economic analysis and forecasting in all EU member states.

Despite significant progress in the adoption of the System of National Accounts (SNA 2008) and partial harmonization with the European System of Accounts (ESA 2010), Moldova still lacks a functional and regularly updated SUT/IOT framework. The absence of such a system limits the country's ability to analyze intersectoral linkages, assess the structural impact of public policies, or simulate the effects of fiscal and trade reforms. Consequently, policymaking remains heavily dependent on aggregate indicators, without a detailed understanding of the transmission mechanisms across economic sectors.

This research aims to fill that institutional and analytical gap by proposing an integrated modelling framework that combines the reconstruction of SUT/IOT tables with econometric forecasting techniques. The approach is both structural and data-driven, designed to be applicable even in environments with incomplete or inconsistent statistical information. The model is built upon national accounts data for 2005–2023 and incorporates key macroeconomic variables such as GDP, consumption, investment, trade, prices, and labor market indicators.

Beyond its technical value, this study positions the reconstruction of Moldova's input–output system as a cornerstone of economic convergence and sustainability. By establishing structural consistency and sectoral transparency, such a model enhances the government's ability to monitor economic performance, evaluate the impact of European investments, and anticipate the effects of exogenous shocks. Moreover, the proposed framework supports the transition toward a modern, digital, and interoperable infrastructure for macroeconomic analysis, an essential prerequisite for Moldova's long-term integration into the European statistical and policy architecture.

The rest of the paper is structured as follows. Section 2 reviews the theoretical and methodological background of SUT/IOT-based macroeconomic modelling and its role in convergence analysis. Section 3 presents the methodological framework adopted for reconstructing and estimating the Moldovan system. Section 4 discusses the empirical implementation and results, while Section 5 analyses their policy relevance. The final section concludes with recommendations for sustainable institutional development and digital integration.

2. Literature and Conceptual Background

The integration of Supply-Use and Input-Output Tables (SUT/IOT) into macroeconomic modelling has a long and well-established tradition in both theoretical and applied economics. Originating from the work of Wassily Leontief (1936), the input–output framework has evolved into a cornerstone of modern economic analysis, enabling the quantification of intersectoral linkages, multiplier effects, and structural dependencies within an economy. In the European Union, the methodology has been standardized and continuously updated under the *European System of Accounts (ESA 2010)*, which explicitly defines SUT/IOT as the central framework for measuring production, income, and expenditure flows in a consistent, sectoral disaggregated manner (Eurostat, 2018).

From a theoretical standpoint, input-output systems bridge the gap between *national accounting* and *economic modelling*. They serve as a quantitative backbone for various analytical frameworks, including *Computable General Equilibrium (CGE)* models, *Social Accounting Matrices (SAM)*, and hybrid econometric-structural models. The capacity of these models to simulate the propagation of shocks across sectors and to trace the cumulative effects of investments, fiscal stimuli, or trade variations makes them indispensable tools for policy analysis in both developed and emerging economies (Miller & Blair, 2022; Round, 2003).

Recent literature emphasizes that countries undergoing structural transformation, such as those in Central and Eastern Europe, can benefit substantially from rebuilding and institutionalizing their SUT/IOT systems (Radev & Mitra, 2021). In the context of EU integration, these frameworks not only enhance the comparability of national statistics but also enable consistent evaluation of convergence and sustainability indicators. For instance, Finland's *ENVIMAT* model, the Netherlands' *GINFORS* and *CPB* frameworks, and France's *INSEE-CGE* platform all demonstrate how input-output structures underpin multi-sector forecasting, environmental modelling, and long-term policy planning.

Empirical research shows that countries aligning their accounting frameworks with ESA standards gain a higher analytical capacity for tracking the efficiency of public and European funds (OECD, 2020). Input-output models allow for an explicit estimation of the multiplier effects of EU investments, quantifying how funds allocated to infrastructure, industry, or social programs generate value added, employment, and tax revenues across the economy. In this sense, the SUT/IOT system becomes not only a statistical instrument but also a *strategic governance tool* for ensuring accountability and impact assessment.

For transition economies such as Moldova, the absence of an updated input-output framework constrains the ability to conduct rigorous macroeconomic and structural analyses. While aggregate national accounts offer insight into total production and expenditure, they do not capture the underlying interdependencies that define structural resilience or vulnerability. The establishment of a coherent, EU-aligned SUT/IOT structure thus represents both an analytical necessity and a condition for effective convergence. Furthermore, integrating such data into econometric forecasting models provides a dynamic and operational mechanism for testing alternative policy scenarios, bridging statistical modernization with strategic economic governance.

3. Methodological Framework

The methodological design of this research combines structural reconstruction, econometric estimation, and simulation analysis into an integrated framework capable of producing consistent macroeconomic forecasts and policy evaluations. The approach is based on three complementary pillars:

- ✓ the reconstruction and balancing of the national Supply-Use and Input-Output Tables (SUT/IOT);
- ✓ the integration of these tables with macroeconomic aggregates in a hybrid econometric model; and
- ✓ the simulation of alternative fiscal and investment scenarios to assess structural and dynamic responses of the Moldovan economy.

3.1 Reconstruction of Supply-Use and Input-Output Tables

The initial step involved rebuilding a consistent series of SUT/IOT for the period 2014-2023 in current prices, using available data from national accounts, business statistics, and trade databases. Due to gaps and inconsistencies in the published information, interpolation and extrapolation procedures were applied to intermediate years using growth indicators from GDP, industrial output, and trade statistics.

The balancing of the reconstructed matrices was achieved through an iterative RAS algorithm (Stone, 1961), ensuring that both row and column totals matched the official macroeconomic aggregates. For selected years where relative price changes or structural shifts were more pronounced, a generalized RAS (GRAS) procedure was used to maintain the positivity of coefficients and better reflect nonlinear adjustments in sectoral relationships. These adjustments were validated by comparing sectoral value-added and employment shares with those published by Eurostat and the National Bureau of Statistics of Moldova.

The resulting SUT/IOT matrices allowed for the estimation of inter-industry multipliers and the identification of key sectors driving value-added creation, import dependence, and employment. This reconstruction provides the empirical foundation for integrating structural consistency into the econometric component of the model.

3.2 Econometric Model Integration

The econometric model was constructed to align with the macroeconomic identities derived from the input-output framework. The system includes behavioral equations for aggregate demand components, private consumption, investment, exports, and imports, combined with structural equations linking sectoral output to final demand and relative prices. The estimation was performed using annual data from 2005-2023 through Ordinary Least Squares (OLS) and Seemingly Unrelated Regressions (SUR), depending on the cross-equation error structure.

The model enforces key accounting identities to ensure internal consistency between the income, production, and expenditure sides of the economy. This hybrid approach allows macroeconomic forecasting to incorporate both behavioral dynamics and intersectoral dependencies. Diagnostic tests confirmed parameter stability, absence of serial correlation, and overall model adequacy, with goodness-of-fit indicators ($R^2 > 0.85$ for major equations) supporting predictive robustness.

3.3 Scenario Simulation and Structural Impact Analysis

To evaluate the policy relevance of the model, several counterfactual simulations were conducted. These included:

- a fiscal stimulus scenario (increased public investment by 1.5% of GDP),
- an EU-funded investment inflow scenario, and
- an external trade shock scenario reflecting export contraction.

The simulations used the estimated parameters to project the short and medium-term effects on GDP, employment, and sectoral output. The structural decomposition derived from the input-output matrix enabled tracing the propagation of each shock through intermediate demand chains, identifying the most sensitive and responsive sectors.

Results revealed that investment-oriented stimuli, particularly when co-financed through European funds, have the highest multiplier effects (ranging from 1.4 to 1.8 across scenarios). In contrast, trade shocks exhibited asymmetric effects, with stronger negative impacts on manufacturing and transport sectors. These findings confirm the strategic relevance of a coherent SUT/IOT-based system for ex-ante policy evaluation and economic convergence monitoring.

4. Empirical Implementation: The Case of the Republic of Moldova

4.1 Data Foundation and Model Calibration

The empirical implementation was based on national accounts and sectoral statistics covering the period 2005–2023, combined with trade, employment, and fiscal data from the National Bureau of Statistics, the Ministry of Finance, and international databases (IMF, World Bank, Eurostat). All variables were harmonized with the ESA 2010 classification to ensure comparability with EU structural indicators.

The reconstructed Supply-Use and Input-Output Tables for 2014-2023 served as the analytical backbone for computing intermediate demand coefficients, value-added ratios, import shares, and Leontief multipliers. These parameters were subsequently incorporated into the econometric model to preserve structural proportionality across production, income, and expenditure accounts.

Model calibration focused on maintaining three fundamental consistencies:

1. Accounting consistency, ensuring equality between aggregate demand and supply components.
2. Structural consistency, derived from the fixed-coefficient relationships of the IOT matrix.
3. Dynamic consistency, introduced through lagged behavioral equations capturing short-term adjustment processes.

4.2 Estimation and Validation

The behavioral block of the model included seven key equations: real GDP growth, private consumption, gross capital formation, exports, imports, employment, and consumer prices. Parameters were estimated using the Ordinary Least Squares (OLS) and Seemingly Unrelated Regressions (SUR) methods. Diagnostic results confirmed satisfactory statistical performance, with adjusted R^2 ranging between 0.82 and 0.91 for the main relationships and Durbin–Watson statistics close to 2.0, indicating no autocorrelation.

The model's stability was tested through recursive estimation and Chow break tests, showing robust parameter constancy even during periods of external stress (e.g., 2020 pandemic shock and 2022 energy crisis). Forecast accuracy was evaluated through Root Mean Square Error (RMSE) and Mean Absolute Percentage Error (MAPE) metrics, with average deviations below 5%, validating the model's predictive credibility.

4.3 Structural Multipliers and Sectoral Linkages

Input-output multipliers derived from the reconstructed IOT revealed that Moldova's economy remains moderately open but highly dependent on imports in industrial sectors. The average output multiplier was estimated at 1.58, implying that every additional monetary unit of final demand generates 1.58 units of total output across the economy. The value-added multiplier averaged 1.22, with the strongest effects in construction, manufacturing, and transport sectors.

Backward linkage indicators identified manufacturing, trade, and energy as key propagation channels of demand, while forward linkages highlighted agriculture, utilities, and logistics as crucial suppliers to downstream industries. These structural findings underscore the importance of coordinated investment policies targeting high-linkage sectors to enhance overall economic resilience.

4.4 Scenario-Based Insights

Three baseline scenarios were simulated using the integrated model:

Scenario 1: Fiscal Stimulus. A 1.5% of GDP increase in public investment led to a GDP rise of approximately 2.1% after one year, with strongest spillovers in construction and industrial services;

Scenario 2: EU Investment Inflow. The absorption of an additional 200 million EUR in EU funds produced a cumulative GDP impact of 3.4% over two years, with employment gains concentrated in manufacturing and infrastructure;

Scenario 3: External Trade Shock. A 10% decline in exports reduced GDP by 2.6% and employment by 1.8%, exposing vulnerabilities in the trade-dependent sectors.

These results confirm that input–output–based macroeconomic models not only enhance the precision of national forecasts but also enable policymakers to anticipate the structural consequences of external or policy-driven shocks. The capacity to link fiscal, investment, and trade channels within a unified analytical system constitutes a decisive step toward evidence-based policymaking and EU-style convergence monitoring.

5. Discussion and Policy Relevance

The empirical findings confirm that Moldova's economic structure retains strong sectoral asymmetries, high import dependence, and limited domestic value-added generation, characteristics typical of small, open transition economies. However, the integrated input-output modelling framework developed in this study provides a strategic basis for overcoming these limitations by linking structural analysis to macroeconomic forecasting and policy evaluation.

5.1 Structural and Convergence Implications

The reconstruction of Supply-Use and Input-Output Tables (SUT/IOT) offers far more than a statistical improvement; it represents a step toward institutional convergence with European Union practices. In the EU, the regular compilation of input-output frameworks is not merely a reporting requirement but a fundamental component of the macroeconomic governance cycle, informing budget planning, investment programming, and the assessment of structural reforms (Eurostat, 2018).

By aligning its analytical infrastructure with ESA 2010 standards, Moldova strengthens both its statistical comparability and its policy credibility. The model enables quantification of convergence processes not only in nominal or fiscal terms but also in structural dimensions, such as productivity, intersectoral linkages, and multiplier effects. These metrics can serve as inputs for the government's medium-term development strategies and for EU monitoring mechanisms like the European Semester or Structural Reform Support Program.

5.2 Investment Efficiency and European Funds

The scenario simulations underline the decisive role of public and European investments as catalysts for growth. Multipliers ranging from 1.4 to 1.8 indicate that well-targeted capital expenditures, particularly in construction, manufacturing, and infrastructure, generate broad positive spillovers across the economy. In this context, input-output based models become powerful tools for *ex-ante* and *ex-post* evaluation of investment programs, allowing policymakers to assess the efficiency, sectoral transmission, and sustainability of each project.

The capacity to trace how European funds influence domestic production chains offers a practical mechanism for prioritizing projects with the highest structural impact. Moreover, this approach enhances transparency and accountability, aligning Moldova's public investment evaluation framework with EU best practices.

5.3 Institutional and Digital Transformation

Beyond the analytical results, the study emphasizes the institutional prerequisites for embedding such models into the national policy process. Effective application of SUT/IOT and econometric forecasting requires stable data reporting systems, inter-agency coordination, and digital integration.

The digital transformation of macroeconomic modelling, through tools such as the *Oracle APEX–based platform* developed by the author, facilitates data interoperability, automated updating of input-output matrices, and interactive scenario visualization. These capabilities can significantly reduce the time lag between data collection, analysis, and policy response.

By integrating traditional economic modelling with modern digital environments, Moldova can transition from reactive to anticipatory governance, strengthening its resilience to external shocks and its readiness for EU accession.

5.4 Strategic Relevance

Ultimately, the integrated framework proposed in this paper positions input-output analysis as a *strategic policy instrument*, not merely a statistical exercise. It enables evidence-based coordination between fiscal, industrial, and investment policies, transforming the way economic sustainability and convergence are assessed.

Through regular reconstruction of SUT/IOT, coupling them with econometric forecasting and embedding them into digital infrastructures, Moldova can establish a modern, transparent, and adaptable macroeconomic governance model aligned with European standards. This transformation will not only enhance analytical capacity but also institutional credibility, accelerating the country's path toward effective economic integration and sustainable growth.

6. Conclusion

This study demonstrates that the integration of Supply-Use and Input-Output Tables (SUT/IOT) into Moldova's macroeconomic modelling framework can substantially enhance both analytical precision and policy relevance. By reconstructing a consistent system of national accounts matrices and linking them with econometric forecasting tools, the research bridges the gap between structural analysis and decision-oriented economic governance.

The methodological innovation lies in combining statistical reconstruction techniques (RAS/GRAS), econometric estimation, and simulation analysis into a single coherent framework. This integration not only ensures internal accounting consistency but also allows for dynamic scenario

evaluation, revealing how fiscal stimuli, European investments, or trade shocks propagate through the economy and affect growth, employment, and value-added generation.

Empirical results confirm that public and EU-financed investments have strong multiplier effects, while external shocks can rapidly transmit through interdependent sectors. These findings provide policymakers with a quantitative instrument for evaluating convergence progress, designing evidence-based interventions, and enhancing the efficiency of European funds absorption.

Beyond its empirical contribution, the study highlights the institutional and technological implications of adopting input-output modelling as a standard practice in Moldova. A sustainable framework requires digital integration, inter-agency coordination, and transparent dissemination of analytical outcomes. Implementing such systems through modern platforms, like the Oracle APEX-based application developed for this research, can transform static data processing into an interactive, real-time policy support environment.

In essence, rebuilding and operationalizing the SUT/IOT system positions Moldova closer to the analytical standards of EU economies. It establishes the groundwork for a data-driven, digitally enabled governance model capable of anticipating shocks, optimizing investments, and supporting long-term sustainable development. The research thus contributes not only to the modernization of national accounts but also to the evolution of Moldova's macroeconomic strategy toward European convergence and structural resilience.

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