

## THE WINE SECTOR IN MOLDOVA UNDER THE LENS OF PERFORMANCE AND RESILIENCE

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**Abstract:** *The wine sector is a cornerstone of Moldova's economy, cultural identity, and international profile, yet it faces ongoing structural and external challenges. This article examines its performance and resilience in the context of European integration. The study combines a review of literature with an analysis of indicators reflecting production, trade orientation, and competitiveness. Emphasis is placed on resilience factors such as adaptation to climate change, compliance with European standards, and innovation in market positioning. The findings indicate that while the sector has improved its performance and competitiveness, long-term resilience depends on sustainable practices, strategic investment, and closer alignment with European market requirements. By viewing the sector through the dual lens of performance and resilience, the paper provides insights for policymakers and industry stakeholders supporting Moldova's European path.*

**Key words:** *performance, resilience, European integration, competitiveness, sustainability, exports, innovation.*

### INTRODUCTION

The wine sector of the Republic of Moldova stands as one of the nation's emblematic and economically strategic industries, uniting cultural heritage with export performance. Rooted in centuries of viticultural tradition, it has evolved into a modern, export-oriented branch grounded in innovation, quality assurance, and sustainability. Yet, it faces ongoing structural and external pressures, from climate change to European market alignment.

This paper applies the dual framework of performance and resilience to trace the sector's evolution, drawing upon academic and institutional evidence, particularly from the National Office of Vine and Wine (ONVV).

Resilience begins with consolidating food safety and quality systems. The implementation of ISO 22000:2018, as emphasized by Țurcan, has strengthened risk-based management and traceability, positioning Moldovan producers within the EU market through transparency and efficiency.

These standards transformed competitiveness from a volume-based to a value-based model, building trust and export credibility [20]. At the same time, cooperation models are crucial. Gheorghita and Crucerescu [10] show that inter-firm collaboration enhances added value and market resilience - principles the ONVV institutionalized via shared logistics, collective branding, and the Wine and Vine Fund. At the macroeconomic level, Gumeniuc [12] links Moldova's GDP growth to capital, labor, and technological progress.

The modernization of viticulture mirrors this pattern: vineyard restructuring and technological renewal have raised productivity, contributing 3% to GDP, 16% to agro-food added value, and 6.5% to the positive trade balance (ONVV, 2019). Complementarily, Crețu and Oberșt [6] note that coordinated external assistance - via EU and donor programs - has funded vineyard renewal, certification, and export promotion, reinforcing resilience through institutional capacity.

Circular economy adoption marks another resilience dimension. Ciloci and Țurcan [7] define circularity as waste minimization, energy efficiency, and by-product valorization, integrating ecology with competitiveness under the European Green Deal. Innovation, highlighted by Ciloci and Țurcan [6], drives this transition by linking technology, academia, and governance. Broader agricultural transformation, outlined by Gheorghiuța, Strătilă, and Gumeniuc [11], also supports viticulture's modernization through FDI, irrigation systems, and resistant varieties, strengthening climate resilience.

Policy alignment with the EU's Common Agricultural Policy, discussed by Litvin [14], further shapes the sector through sustainability, quality, and geographical indications. ONVV programs promoting IGP/DOP wines (up by 25% between 2018–2019) exemplify this convergence.

Circular economy strategies remain central: Ciloci and Țurcan [6] show that efficient input use and low emissions boost both environmental compliance and reputation. Branding and internationalization consolidate performance. Luca and Crucerescu [17] identify "Wine of Moldova. A Legend Alive" as a cornerstone of global recognition, supported by ONVV's integrated campaigns and 842 international distinctions in 2019. Quality management, as argued by Litvin and Bujor [21], ensures compliance, authenticity, and loyalty, while Litvin and Prisăcaru [16] confirm that quality remains the fundamental driver of export competitiveness. ONVV reports [3,4] summarize these gains - export growth, diversification to 71 countries, and resilience during COVID-19 through digitalization and oenotourism initiatives.

Ultimately, Moldova's wine sector exemplifies how performance and resilience coalesce through ISO standards, cooperation, modernization, circular innovation, and institutional governance. Rooted in tradition yet driven by strategy, the industry demonstrates that sustainable competitiveness can thrive even within small-scale and transitional economies.

## MATERIALS AND METHODS

The study was conducted using a mixed quantitative–qualitative methodology designed to assess the performance and resilience of the Moldovan wine sector in the context of European integration.

It combined statistical analysis with interpretive evaluation to capture both measurable economic progress and structural adaptability. The period under analysis, 2015–2024, was selected to include years of major transformation and external shocks, providing a reliable basis for tracing long-term development trends.

The empirical foundation of the research relied on official data from the National Bureau of Statistics of the Republic of Moldova and the National Office of Vine and Wine. These sources ensured consistency and comparability of information.

The analyzed indicators included the evolution of beverage exports by partner country groups according to the Standard International Trade Classification, investments in fixed assets in the wine manufacturing sector, output price indices on domestic and foreign markets, the total value of manufactured wine, and the bankruptcy and solvency rates by enterprise size. Complementary information was taken from institutional reports and scientific publications addressing modernization, innovation, and sustainability in the Moldovan wine industry.

To evaluate performance, time-series and index analysis methods (previous year = 100) were used to monitor the dynamics of key economic indicators and identify structural shifts. The analysis emphasized the relationship between investment, export diversification, and production efficiency as drivers of performance growth. The assessment of resilience focused on financial stability, adaptability, and long-term solvency.

Comparative analysis between enterprises of different size categories was carried out using an adjusted financial stability index to identify patterns of recovery and stabilization across the industry.

The quantitative approach was complemented by qualitative interpretation that contextualized numerical findings within broader institutional and technological developments, particularly those related to European standards and circular economy practices.

The main limitation of the research arises from the limited disaggregation of statistical data, which prevents a detailed microeconomic assessment at the enterprise or vineyard level. Consequently, the analysis focuses on sectoral patterns and macroeconomic trends.

Future studies could complement this approach through econometric modeling or panel data analysis to identify causal links between investment intensity, policy measures, and the sector's resilience.

### RESEARCH RESULTS

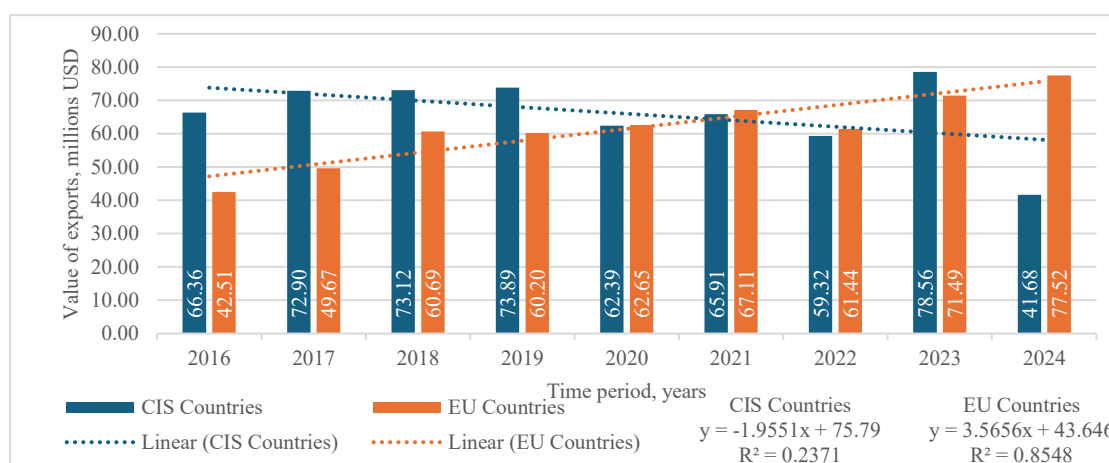
The research results capture the evolving dynamics of Moldova's wine industry through the analytical lens of performance and resilience. Quantitative evidence reveals a structural reorientation of export destinations, sustained investment in fixed assets, and an alignment of price mechanisms with European market standards.

The figures collectively trace a trajectory of modernization, efficiency, and financial stabilization, reflecting both top-down policy reforms and bottom-up entrepreneurial adaptation.

By integrating trade, production, and financial indicators, the results highlight how the sector has transitioned from a volume-driven model to one anchored in quality, innovation, and sustainability. This multidimensional transformation underscores Moldova's progressive integration into European economic and regulatory frameworks.

The first figure reveals the reorientation of Moldova's beverage export markets during the last decade, highlighting the continuous expansion toward the European Union and the relative decline of the Commonwealth of Independent States (CIS) markets.

Between 2016 and 2024, exports to EU destinations registered a sustained upward trajectory, reflecting diversification efforts, quality improvements, and compliance with European standards. Conversely, CIS exports, once dominant, have experienced volatility linked to trade restrictions and currency fluctuations.



**Figure 1. Dynamics of beverage exports value according to SITC from the Republic of Moldova, by the EU and CIS countries, 2016–2024**

Source: authors' processing based on the data presented in [9].

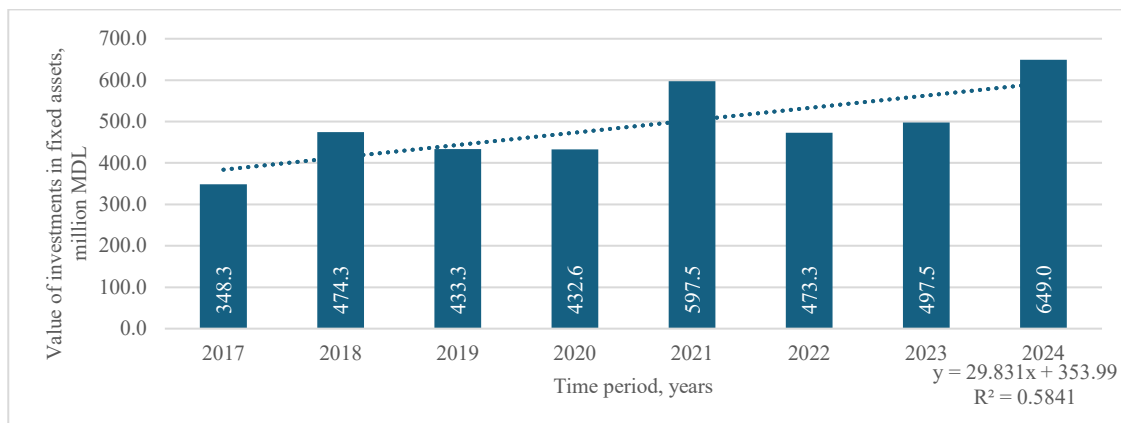
The figure confirms that Moldova’s integration into European trade structures has structurally altered its export composition - an indicator of increasing competitiveness and resilience to geopolitical risks [9].

The gradual convergence of export values between EU and CIS partners marks a critical turning point in the country’s external orientation, illustrating the sector’s capacity to adapt to policy, regulatory, and consumer shifts in the broader European economic area.

The second figure underscores the role of capital formation as a cornerstone of modernization and technological advancement.

The data reflect an overall ascending trend, with visible surges during 2018–2019 and 2022–2024 - periods coinciding with both national support programs and increased foreign direct investment. The temporary stagnation in 2020 corresponds to the pandemic-induced contraction, yet recovery in subsequent years indicates that the industry maintained investor confidence.

Investments have been primarily directed toward production technology, energy efficiency, and quality assurance infrastructure. By modernizing fixed assets, enterprises have enhanced competitiveness and reduced operational vulnerability, reinforcing both performance and resilience dimensions [13].



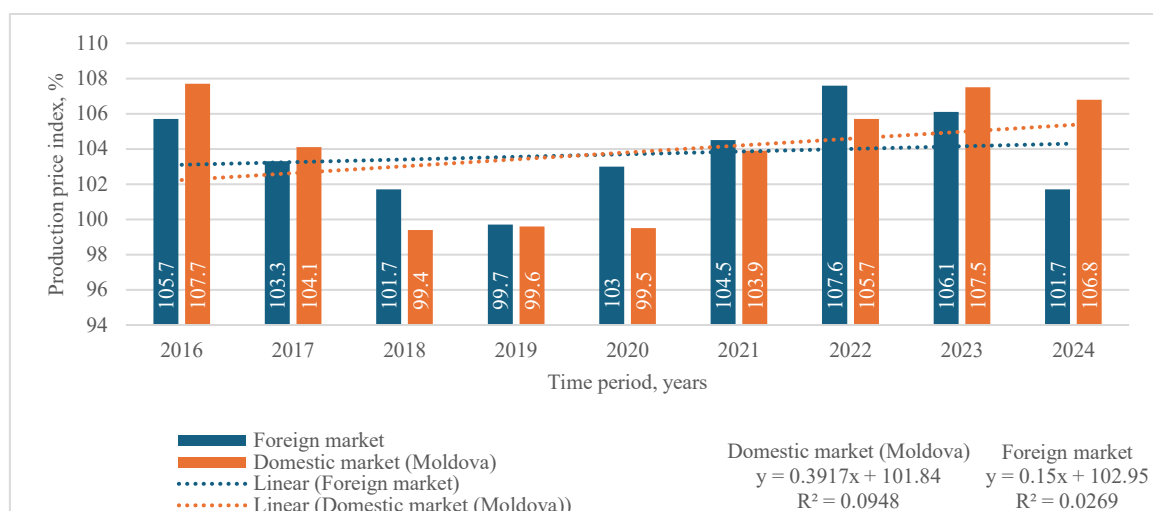
**Figure 2. Dynamics of investment value in fixed assets in the wine manufacturing sector in the Republic of Moldova, 2017–2024**

Source: authors' processing based on the data presented in [13].

The third figure differentiates between domestic and external market price indices, both of which demonstrate sensitivity to external shocks yet maintain upward momentum over the long term.

Price index growth on external markets reflects improved brand positioning and greater perceived value of Moldovan wines abroad, while the domestic price index suggests expanding local demand for higher-quality bottled wines.

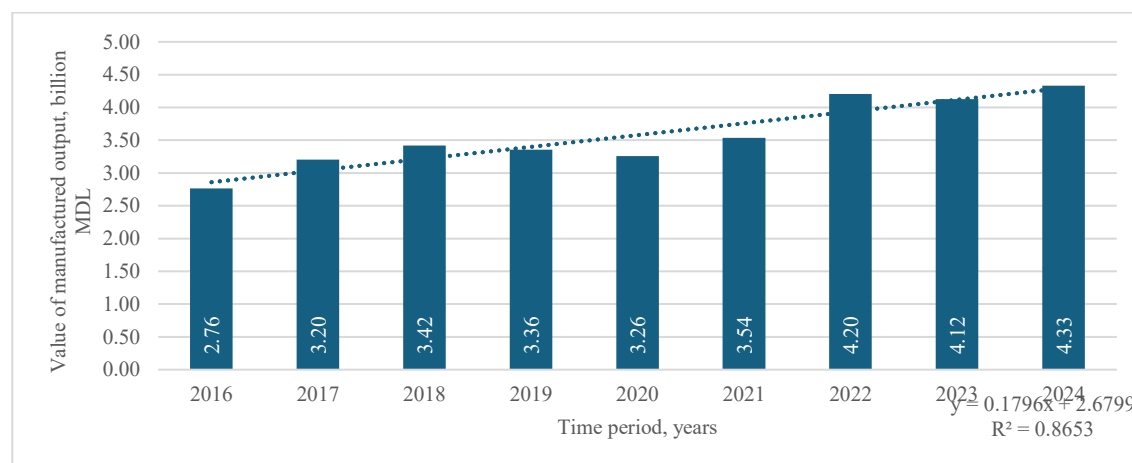
The convergence of these indices after 2021 indicates a maturation of pricing structures and a reduction in volatility. In macroeconomic terms, this figure confirms the integration of Moldova’s wine industry into international price systems, balancing internal affordability with export profitability [19].



**Figure 3. Dynamics of the manufactured grape wine output price index, %, in the Republic of Moldova by type of the market, 2016–2024**

Source: authors' processing based on the data presented in [19].

The fourth figure indicates a strong growth trajectory, particularly after 2018, with temporary contraction during 2020 reflecting pandemic disruptions. By 2024, the output value surpasses pre-crisis levels, confirming recovery and expansion. The continued rise in value suggests improved efficiency, diversification into premium categories, and higher export unit prices. This dynamic aligns with Moldova's transition from bulk to bottled wine exports and the success of the "Wine of Moldova" brand in securing international recognition [22].



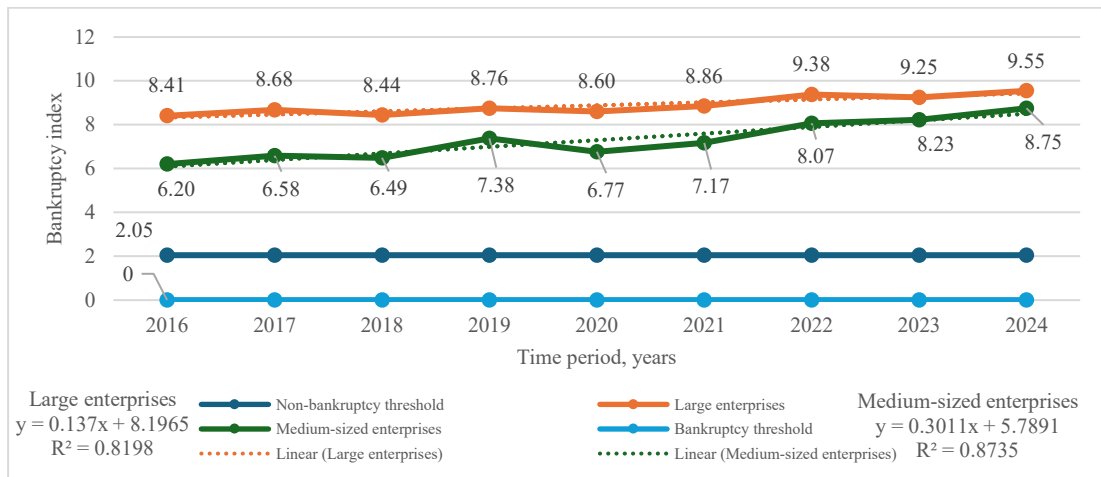
**Figure 4. Dynamics of the indicator of the value of manufactured grape wine output, billion MDL in the Republic of Moldova, 2016–2024**

Source: authors' processing based on the data presented in [22].

The fifth figure captures financial vulnerability and systemic stability. The declining trend from 2016 through 2019, followed by a moderate uptick during 2020–2021, mirrors broader economic cycles.

The subsequent decrease in bankruptcy risk after 2022 suggests that structural reforms, improved profitability, and adaptive financing mechanisms have reinforced solvency across the industry.

The stabilization of the index near its lowest level in 2024 illustrates increased resilience and prudent risk management among major producers [1,2,18].



**Figure 5. Dynamics of the average bankruptcy index of the beverage manufacturing sector in the Republic of Moldova by large and medium-sized enterprises, 2016–2024**  
 Source: authors' processing based on the data presented in [1,2].

Below, SME group exhibits higher initial risk levels, consistent with their greater exposure to liquidity shortages and market shocks. However, the sixth figure indicates a pronounced decline in bankruptcy rates after 2021, coinciding with recovery programs, government support measures, and market diversification.

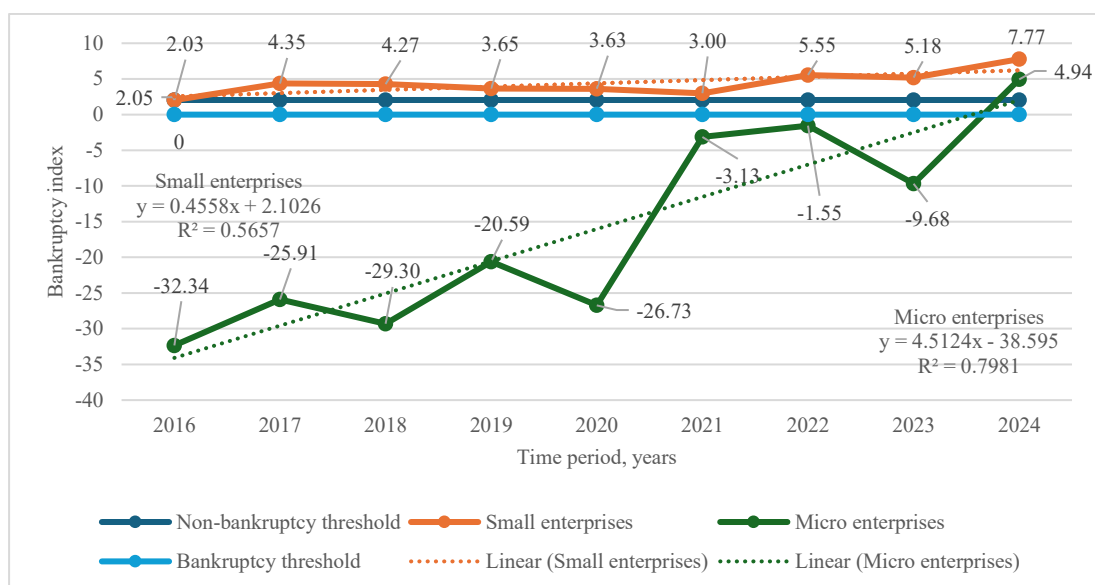
The convergence between small and large enterprise bankruptcy indices by 2024 demonstrates a structural strengthening of the entire sector. Financial sustainability and resilience have been achieved through both top-down policy frameworks and bottom-up entrepreneurial adaptation [1,2,18].

The analysis of the empirical data confirms that Moldova's wine sector has undergone a profound structural transformation over the past decade. The gradual reorientation toward European markets not only diversified export risks but also elevated quality standards and competitiveness.

Continuous investment in fixed assets particularly in technology, energy efficiency, and quality infrastructure has reinforced the industry's productive capacity and long-term resilience. The alignment of domestic and external price indices reflects a consolidation of market maturity, signaling that Moldovan wines are increasingly perceived as value-driven products rather than cost-based commodities.

Financial stability indicators further validate this evolution. The consistent decline in bankruptcy risk, especially among small and medium-sized enterprises, demonstrates the effectiveness of institutional support mechanisms and adaptive strategies.

The convergence of solvency levels across enterprise categories illustrates a more balanced and sustainable industrial ecosystem.



**Figure 6. Dynamics of the average bankruptcy index of the beverage manufacturing sector in the Republic of Moldova by small and micro enterprises, 2016–2024**

Source: authors' processing based on the data presented in [1,2].

Overall, the research results substantiate that the Moldovan wine industry's resilience is rooted in its capacity to merge traditional strengths with modern governance, investment discipline, and European alignment. This trajectory positions the sector as a competitive, innovative, and sustainable contributor to national economic growth and as a key ambassador of Moldova's cultural and export identity.

## CONCLUSIONS

Drawing on empirical and institutional evidence, the article demonstrates that Moldova's wine sector has undergone a substantive transformation over the past decade. Market reorientation toward the European Union, accompanied by certification (ISO 22000) and the promotion of IGP/DOP designations, has shifted the industry from a volume-centric to a value-driven model.

Investment in fixed assets particularly production technology, energy-efficiency measures and quality assurance infrastructure has reinforced productive capacity, elevated unit prices on external markets, and catalyzed the transition from bulk to bottled exports.

The analysis also documents a measurable improvement in financial stability: bankruptcy indices declined broadly after 2022 and convergence of solvency metrics between SMEs and larger firms suggests that policy support and diversification have reduced systemic vulnerability.

Circular-economy and innovation initiatives further buttress resilience by minimizing waste, valorizing by-products and aligning domestic practices with European sustainability norms. Nevertheless, residual risks persist.

Climatic pressures, the compliance burden for micro-producers, and potential value leakage along the value chain require targeted interventions. Policy priorities should therefore include tailored financing and technical assistance for SMEs, spatially differentiated climate-adaptation programs, and strengthened upstream-downstream coordination to secure incremental value capture.

Methodologically, the article's dual lens of performance and resilience proves analytically revealing, yet would benefit from finer spatial disaggregation and farm-level impact evaluation.

Overall, the paper persuasively argues that strategic governance, coordinated investment and market intelligence are necessary to consolidate Moldova's wine sector as a competitive and resilient contributor to European integration. Future research should include longitudinal firm-level studies and cost-benefit analyses of adaptation and evaluation.

## REFERENCES

- [1]. **ACTIVITY AND FINANCIAL POSITION OF ECONOMIC UNITS BY ECONOMIC ACTIVITIES, SIZE OF ENTERPRISE, INDICATORS AND YEARS 2015-2021.** Available online: [https://statbank.statistica.md:443/PxWebPxWeb/pxweb/en/40\\_Statistica\\_economica/40\\_Statistica\\_economica\\_\\_24\\_ANT\\_\\_ANT030/ANT030060.px/](https://statbank.statistica.md:443/PxWebPxWeb/pxweb/en/40_Statistica_economica/40_Statistica_economica__24_ANT__ANT030/ANT030060.px/)
- [2]. **ACTIVITY AND FINANCIAL POSITION OF ECONOMIC UNITS BY ECONOMIC ACTIVITIES, SIZE OF ENTERPRISE, INDICATORS AND YEARS 2021-2024.** Available online: [https://statbank.statistica.md:443/PxWebPxWeb/pxweb/en/40\\_Statistica\\_economica/40\\_Statistica\\_economica\\_\\_24\\_ANT\\_\\_ANT030/ANT030040.px/](https://statbank.statistica.md:443/PxWebPxWeb/pxweb/en/40_Statistica_economica/40_Statistica_economica__24_ANT__ANT030/ANT030040.px/)
- [3]. **ARPENTIN G.** ONVV, 2019, RAPORT ANUAL, Oficiul Național al Viei și Vinului, Chișinău, p. 80.
- [4]. **ARPENTIN G.** ONVV, 2020, RAPORT ANNUAL, Oficiul Național al Viei și Vinului, Chișinău, p. 38.
- [5]. **CILOCI R.**, 2023, The need for the Republic of Moldova to transition to a circular economy. The 5th Economic International Conference „Competitiveness and Sustainable Development, 78–83, doi:10.52326/csd2023.12.
- [6]. **CILOCI R., ȚURCAN I.**, 2024, The Innovation the Driver for Circular Economy. „Tehnica-UTM”, 223–228, doi:10.52326/csd2024.33.
- [7]. **CILOCI R., ȚURCAN I.**, 2024, Towards a Circular Economy through Challenges, Opportunities and Policies, The USV Annals of Economics and Public Administration, 24, 182–189.
- [8]. **CRETU I., OBERȘT A.**, 2017, The Evolution of External Assistance in the Republic of Moldova in 2016 and Recommendations for Improving Their Coordination Mechanism, Journal of Financial and Monetary Economics, 360–362.
- [9]. **EXTERNAL TRADE BY INDICATORS, SECTIONS AND CHAPTERS ACCORDING SITC, GROUPS OF COUNTRIES AND YEARS.** Available online: [https://statbank.statistica.md:443/PxWebPxWeb/pxweb/en/40\\_Statistica\\_economica/40\\_Statistica\\_economica\\_\\_21\\_EXT\\_\\_EXT010\\_serii\\_anuale/EXT010600.px/](https://statbank.statistica.md:443/PxWebPxWeb/pxweb/en/40_Statistica_economica/40_Statistica_economica__21_EXT__EXT010_serii_anuale/EXT010600.px/)
- [10]. **GHEORGHÎȚA M., CRUCERESCU C.**, 2018, The Impact of Cooperation Models of Moldovan Companies on the Growing of Added Value, Journal of Social Science, 1, 128–134.
- [11]. **GHEORGHÎȚA M., STRATILA A., GUMENIUC I.**, 2024, Transformation of Moldova's Agricultural Sector: New Challenges and Investment Opportunities, The 6th Economic International Conference „Competitiveness and Sustainable Development , 229–236, doi:10.52326/csd2024.34.
- [12]. **GUMENIUC I.**, 2018, The correlation analysis of the dependence of the gross internal product on basic factors, Journal of Social Science, 1, 62–67.
- [13]. **INVESTMENTS IN NON-CURRENT ASSETS IN INDUSTRY BY INDUSTRIAL ACTIVITIES AND YEARS.** Available online: [https://statbank.statistica.md:443/PxWebPxWeb/pxweb/en/40\\_Statistica\\_economica/40\\_Statistica\\_economica\\_\\_17\\_ICF\\_\\_IAI010\\_serii\\_anuale/IAI010800.px/](https://statbank.statistica.md:443/PxWebPxWeb/pxweb/en/40_Statistica_economica/40_Statistica_economica__17_ICF__IAI010_serii_anuale/IAI010800.px/)

- [14]. LITVIN A., 2024, Connecting the Agricultural Policies of the Republic of Moldova to the PAC under the Pre-Accession Conditions to the EU, The 6th Economic International Conference „Competitiveness and Sustainable Development”, 17–22, doi:10.52326/csd2024.03.
- [15]. LITVIN A., TURCAN R., STRATILA A., TURCAN I., 2025, Agricultural trade: Impacts on market stability and integration with developing countries, Reference Module in Food Science, Elsevier.
- [16]. LITVIN A., PRISĂCARU V., 2006, Calitatea – factorul de bază în promovarea producției viti-vinicole, Simpozionul Național cu participarea internațională „Perspectivele ale dezvoltării agriculturii în competiția pentru integrarea în Uniunea Europeană”, UASMV, București, 333–336.
- [17]. LUCA D., CRUCERESCU C., 2012, Promoting Moldavian Wines on International Markets and Development of a National Brand, Modern technologies, in the food industry, 2, 385–389.
- [18]. PETCU M., SOBOLEVSCHI-DAVID M.I., ANGHEL I., DINU E., 2023 Analiză economico-financiară, Ed. Economică, ISBN 978-606-093-037-2.
- [19]. **PRICE INDICES FOR INDUSTRIAL PRODUCTION, PREVIOUS YEAR =100 BY ECONOMIC ACTIVITIES, MARKET AND YEARS.** Available online: [https://statbank.statistica.md:443/PxWebPxWeb/pxweb/en/40 Statistica economica/40 Statistica economica\\_\\_05 PRE\\_\\_PRE020\\_\\_serii anuale/PRE020100.px/](https://statbank.statistica.md:443/PxWebPxWeb/pxweb/en/40%20Statistica%20economica/40%20Statistica%20economica__05%20PRE__PRE020__serii%20anuale/PRE020100.px/)
- [20]. TURCAN I., 2020, Ensuring the Safety of the Food Chain by Implementing ISO 22000:2018 in the Enterprises of the Republic of Moldova. The Journal of Educational Theory and Practice, DIDACTICA PRO..., 20, 50–52.
- [21]. TURCAN I., 2020, Indispensabilitatea turismului rural și a turismului vitivinicol pentru Republica Moldova. In Principii de dezvoltare a oenologiei moderne și organizarea pieței vitivinicole, Resp. ed. Sturza, R. Ch.: ”Tehnica-Info”, UTM, pp. 251-267.
- [22]. **VALUE OF MANUFACTURED INDUSTRIAL PRODUCTION BY ECONOMIC ACTIVITIES AND YEARS.** Available online: [https://statbank.statistica.md:443/PxWebPxWeb/pxweb/en/40 Statistica economica/40 Statistica economica\\_\\_14 IND\\_\\_IND020/IND020100.px/](https://statbank.statistica.md:443/PxWebPxWeb/pxweb/en/40%20Statistica%20economica/40%20Statistica%20economica__14%20IND__IND020/IND020100.px/)