THE IMPACT OF ESG ON ECONOMIC RESILIENCE AND COMPETITIVENESS IN A CANDIDATE ECONOMY FOR EUROPEAN INTEGRATION

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Abstract: *The transition to sustainable finance has placed ESG (Environmental, Social and Governance) criteria at the center of assessing long-term economic performance, going beyond the limits of traditional indicators such as gross domestic product, inflation, unemployment, etc. In the current context, marked by energy shocks, geopolitical instability and climate pressures, the capacity of an economy to generate sustainable resilience and competitiveness is becoming a strategic priority for public policy makers and international financiers. Through a time-series regression model, the study examines to what extent the quality of institutional governance, investments in human capital and energy transition determine the competitiveness and resilience of the economy of the Republic of Moldova as a candidate state for European integration. The results of the study contribute to the literature on the sustainability of finance in small open economies and formulate public policy recommendations aimed at strengthening national resilience in the perspective of European integration.*

Keywords: *ESG factors, economic resilience, competitiveness, human capital, governance, sustainable finance, Republic of Moldova, economies in transition.*
JEL Calssification: *Q56, O43, O15, P27.*

1. Introduction

The global sustainable finance agenda, which includes the set of international initiatives, policies, regulations and practices that aim to redirect capital flows towards sustainable economic, social and environmental projects and activities, has profoundly changed the way they are directed, analyzed and managed, now taking into account not only profit, but also the impact on the environment, society and governance.

Environmental, Social and Governance (ESG) factors and criteria have evolved from marginal ethical exclusion instruments, which entailed the elimination of certain companies or sectors considered unethical, to a central infrastructure of international financial markets, used by institutional investors, banks and regulatory bodies to direct capital flows towards more resilient and competitive economies (Fichtner et al., 2023; OECD, 2022). In 2024, assets managed according to ESG criteria in the European Union exceeded 6.6 trillion euros, representing 38% of total assets under management — an increase that reflects not just a market trend, but a profound structural change in the way investments are made globally (Heflich & Saulnier, 2024).

The literature and research in the field highlight the existence of gaps between the promises of ESG as a tool for real impact and the reality structured by market dynamics and dominant private standards. Economists Jaspert et al. (2024) warn of the risk of "infrastructural lock-in", a process by which private definitions of sustainability, based in particular on the single materiality approach and promoted by the socio-technical infrastructure of ESG ratings, data and indices, become a dominant norm in sustainable investments, without producing real measurable effects in the real economy, such as additional capital allocation to green projects or significant changes in companies' business

practices. And Fichtner et al. (2023) identify an "ESG capital allocation gap" noting that most ESG funds, although promoted as "green", are not directed towards projects that actually help the environment. This distance between rhetoric and reality is all the more acute in small and open economies, where the institutional capacity to absorb and capitalize on sustainable finance remains limited.

This reality is also very relevant for small transition economies that are candidates for European integration, which simultaneously face high energy dependence, institutional fragility and acute demographic pressures, such as the Republic of Moldova. Access to European sustainable financing mechanisms represents for such countries both a strategic opportunity and a structural challenge. In this context, the central objective of the research is to identify and quantify the impact of ESG factors (human capital, institutional governance and energy transition) on long-term economic resilience and competitiveness. To answer this question, the study operationalizes ESG factors at the macroeconomic level through the World Bank's Sovereign ESG Data Portal indicators and empirically tests, based on available data, the relationships between pillars E, S and G and national economic performance, thus providing an empirical perspective anchored in contemporary debates on the real effectiveness of ESG factors in economies vulnerable to external shocks (Fichtner et al., 2023; Gubareva et al., 2023; OECD, 2022).

2. Literature review

The relationship between ESG factors and a country's macroeconomic performance has become one of the most dynamic areas of research in recent years, moving beyond the initial framework of corporate analysis to address the sovereign and national dimension. Recent studies argue that ESG factors operationalized at the country level, through environmental, human capital and institutional quality indicators, constitute structural determinants of long-term resilience, not simple reporting indicators (Keenan et al., 2021; Billio et al., 2024). This perspective is also theoretically grounded in the World Bank's "Changing Wealth of Nations" framework, which argues that sustainable national wealth must incorporate human and natural capital alongside produced capital, thus reconfiguring the traditional metric of economic competitiveness (World Bank, 2021).

Table 1. Summary of the main empirical findings on ESG factors and economic performance

Pillar	Factor	Effect	Context	Sourse
E	CO_2 emissions	↓ long-term competitiveness	Developed economies	Billio et al. (2024); Keenan et al. (2021)
E	Energie regenerabilă	↑ energy resilience	EU, economies in transition	Kwiliński et al. (2024); Akadırı & Özkan (2025)
E	Energy intensity	↓ productivity	Fossil-dependent economies	Solangi et al. (2025)
S	Human capital	↑↑ long-term growth	Universal	Poveda (2023); World Bank (2021)
S	Life expectancy / mortality	↑ productivity	Developing economies	Ghazali et al. (2023); Işık et al. (2024)
S	Education expenditure	↑ innovation, competitiveness	Eastern Europe	Shkolnykova et al. (2024)
G	Rule of law	↑↑ investment, stability	Economies in transition	Ortas et al. (2018); Shkolnykova et al. (2024)
G	Corruption control	↑ capital efficiency	EU candidates	Reyad et al. (2024)
G	Governance effectiveness	↑ FDI attraction	Eastern Europe	Shkolnykova et al. (2024)

Source: elaborated by authors based on reviewed literature.

Recent research on a large sample of European countries confirms a positive relationship between country-level ESG performance and GDP per capita in the long run, although short-term effects remain inconsistent across economies, reflecting institutional and developmental heterogeneity (Iwanicz-Drozdowska et al., 2025). In turn, Wang et al. (2023) demonstrate, on a panel of international data, that country-level ESG performance is positively associated with economic growth, with effects being stronger in economies with more mature institutions and deeper financial markets, a finding particularly relevant for transition economies seeking EU accession.

Although the general direction of ESG effects on economic performance is positive, their intensity and consistency vary significantly by pillar, institutional context and time horizon, as reflected in the asymmetries identified in Table 1 and further detailed for each dimension.

The literature on the **environmental dimension of ESG** at the macroeconomic level reveals an important paradox: while environmental factors are considered crucial for long-term resilience, their short-term effects on competitiveness are often ambiguous or even negative, especially in economies with fossil fuel-based energy structures. Billio et al. (2024) argue that sustainable climate finance can shift capital towards low-emission activities, strengthening macro-financial resilience, but only when credible carbon pricing mechanisms and coherent energy transition policies are in place.

For small economies in transition, energy dependence represents a critical structural vulnerability. Kwiliński et al. (2024) demonstrate that energy poverty and energy import dependence are associated with institutional and economic fragility in Europe, amplifying exposure to geopolitical shocks. This conclusion is directly applicable to Eastern European economies with a high degree of energy dependence. In the same context, Akadırı and Özkan (2025) confirm that environmental ESG factors significantly influence the dynamics of clean energy markets, although the effect depends on the development and maturity of the regulatory framework. Solangi et al. (2025) identify, using data from emerging economies,

that social investments and green finance are mutually reinforcing in achieving sustainable development goals, suggesting the complementarity of the E and S pillars in sustainable growth trajectories.

Human capital is identified by economists as the strongest determinant of sustainable national wealth and long-term competitiveness. This conclusion is supported by the World Bank's theoretical framework (World Bank, 2021), which shows that in most economies in the world, human capital represents the dominant component of total national wealth, significantly exceeding produced and natural capital. Poveda (2023) in turn demonstrates that investment in human capital is perceived by experts as the most critical factor for achieving sustainable development goals, ahead of physical capital or environmental policies. This prioritization is also confirmed by research by Işık et al. (2024), which shows that economic growth in East Asian economies is predominantly aligned with the performance of pillars S and G, not with pillar E. At the European level, Shkolnykova et al. (2024) find that innovation systems and human capital accumulation explain significant differences in transition and competitiveness trajectories between Central and Eastern European countries. Asffel offers an interesting perspective for understanding the gaps between EU member and candidate economies.

At the same time, pillar S has the most robust positive impact on economic growth among the three ESG factors, while the effects of pillar E are less consistent in developing economies (Ghazali et al., 2023).

These studies show that the existing asymmetry between different countries can have direct methodological implications. For small transition economies, empirical models should give greater weight to human capital and public health indicators compared to strictly environmental indicators.

If the literature attributes the role of pillar S as the dominant determinant of wealth, **institutional governance** plays the role of *structural catalyst, the necessary condition without which the impact of other ESG factors cannot materialize*. Ortas et al. (2018) demonstrate, using cross-country data, that national institutions significantly moderate the ability of firms and economies to transform ESG criteria into real performance, while countries with weak institutions obtain limited benefits from ESG integration, regardless of the quality of pillars E and S.

This perspective is also confirmed by the research of economists Shkolnykova et al. (2024) in the context of Central and Eastern Europe, showing that economies with institutions closer to EU standards show faster convergence and greater resilience to external shocks.

Reyad et al. (2024), in an explicit study dedicated to Eastern Europe, demonstrate that ESG performance improves firms' resilience to geopolitical risks and the effect is decisively mediated by the quality of governance at the national level. This suggests that investments in institutional reform, on the one hand, directly improve competitiveness and, on the other, indirectly amplify the benefits of the other ESG pillars.

The complexity of the relationships between ESG factors and economic resilience in small EU candidate economies cannot be captured by a linear analysis of each pillar in isolation, it requires understanding a system of interactions in which environmental factors, human capital and governance condition each other, and their effects are amplified or attenuated by specific contextual moderators. Figure 1 summarizes the transmission mechanisms through which ESG factors influence economic resilience and competitiveness,

highlighting the moderating role of institutional quality and convergence with European standards.

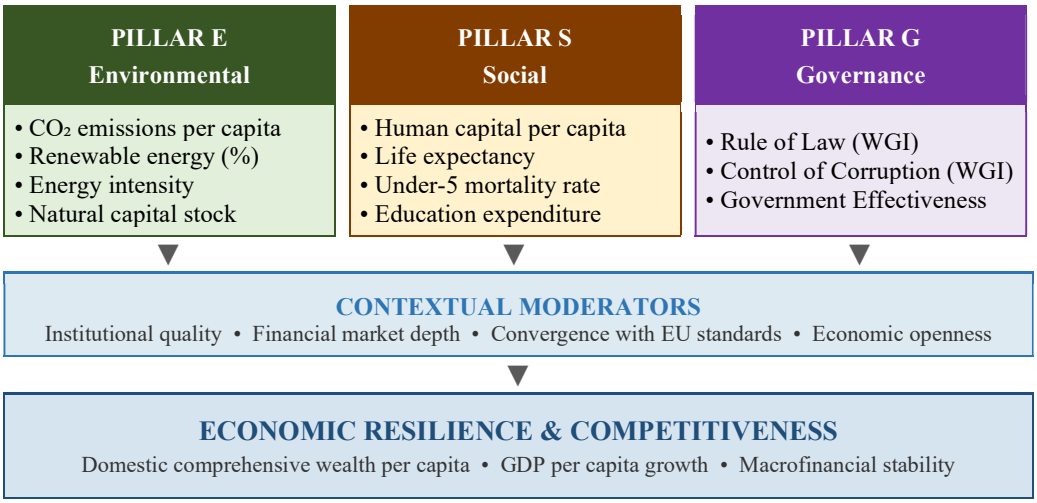

Figure 1. ESG factors and economic resilience in small transition economies

Source: elaborated by authors based on reviewed literature.

Small economies that are candidates for European integration face a specific configuration of constraints and opportunities in relation to the ESG agenda. On the one hand, the EU accession process constitutes a powerful driver of institutional reform and alignment with sustainability standards, generating positive effects on the quality of governance and investment attractiveness (Campos et al., 2014). On the other hand, these economies start from a lower level of development, with limited institutional capacity to absorb green financing instruments and with economic structures that are more vulnerable to external shocks (Bucevska, 2019).

ESG performance and economic growth mutually influence each other in achieving sustainable development goals, with stronger effects in economies with stronger governance. An example in this regard would be Latvia, a small Eastern European economy recently integrated into the EU that demonstrates that ESG investments can improve the financial well-being of the population and that increasing financial literacy amplifies the benefits of integrating ESG criteria, providing a relevant model for candidate economies (Mavļutova et al. (2021). Fichtner et al. (2023) warn that the access of small economies to ESG financing instruments is limited by the "ESG capital allocation gap" which represents the gap between the capital managed according to ESG criteria and the capital actually directed to projects with real impact.

Research shows that ESG factors influence economic resilience and competitiveness, but the effects are strongly conditioned by institutional quality, the maturity of financial markets and the specifics of the development context.

3. Methodology

In order to empirically test the relationship between ESG factors and economic resilience in a small economy in transition candidate for European integration, the research focuses on the Republic of Moldova, considered a sufficiently representative case by combining institutional fragility, high energy dependence and the active process of alignment

with European standards, formally initiated by granting EU candidate status in 2022 (European Council, 2022). For this, data available in the Sovereign ESG Data Portal of the World Bank (World Bank, n.d.) were used, covering the period 1996–2021, operationalizing ESG factors through 18 macroeconomic indicators grouped into the three pillars: Environmental, Social and Governance, along with relevant macroeconomic control variables. The dependent variable is comprehensive household wealth per capita, a composite indicator that goes beyond the limits of traditional GDP by incorporating human, natural and manufactured capital (World Bank, 2021; Arrow et al., 2012). Given the nature of the time series and the specific structure of the available data, the econometric estimation was performed using a fixed-effects model with robust standard errors, which controls for unobservable heterogeneity and ensures the robustness of statistical inference under the specific conditions of a panel with a small number of units (Baltagi, 2008).

4. Results and discussion

The econometric model created based on existing studies and research adapted to the specifics of a small economy in transition, proved to be an adequate analytical framework. The results obtained present an explanatory capacity and provide relevant empirical evidence on the differentiated way in which the three ESG pillars shaped the trajectory of economic resilience and competitiveness over the 26 years analyzed (Table 2).

Table 2. OLS Regression Results: ESG Determinants of Sustainable National Wealth (1996–2021)

Variable	Description	Coefficient	Std. Error	
Pillar S — Social				
ln_NW_HCA	Human capital per capita (log)	**+0.2593**	*(0.0319)*	***
ln_MORT	Mortality rate under-5 (log)	**+0.1855**	*(0.0236)*	***
Pillar E — Environmental				
ln_CO2	CO_2 emissions per capita (log)	**+0.1235**	*(0.0103)*	***
REN_ENERGY	Renewable energy consumption (%)	**−0.0010**	*(0.0005)*	*
ln_NW_NCA	Natural capital per capita (log)	**−0.2728**	*(0.1372)*	*
Pillar G — Governance				
RULE_LAW	Rule of Law (WGI)	**−0.1192**	*(0.0234)*	***
CORR_CTRL	Control of Corruption (WGI)	−0.0142	*(0.0099)*	
GOV_EFF	Government Effectiveness (WGI)	+0.0280	*(0.0197)*	
Control Variables				
ln_GDP	GDP per capita (log)	**+0.1167**	*(0.0138)*	***
UNEMPL	Unemployment rate (%)	**+0.0114**	*(0.0024)*	***
INFLATION	Inflation (%)	**+0.0009**	*(0.0001)*	***
const	Constant	**+8.0507**	*(1.1419)*	***
R^2	0.9801	**Observations**	26	
Adjusted R^2	0.9644	**F-statistic**	1539.075	
Durbin-Watson	2.341	**p-value (F)**	1.36e-19	

Notes: Dependent variable: ln(Domestic comprehensive wealth per capita). HAC standard errors (Bartlett kernel, bandwidth 2) in parentheses.
*Significance: *** p<0.001, ** p<0.01, * p<0.10, n.s. not significant. Period: 1996–2021 (T=26).*
Source: Authors' estimates based on World Bank Sovereign ESG Data Portal.

To understand the significance of these results, it is necessary to place them in the economic context of the analyzed period. The following figures illustrate the trajectory of economic resilience and competitiveness, human capital, institutional governance indicators and renewable energy consumption in the period 1996–2021, which allows us to reconstruct the economic profile of the analyzed period. The profile of a small economy marked by the legacy of the post-Soviet transition and a series of external shocks that have repeatedly tested its capacity for resistance and adaptation.

GDP per capita, the most direct indicator of economic competitiveness, increased from a minimum of 399 USD in 1999 to 5,274 USD in 2021, a recovery visible in Figure 2, but which places the analyzed economy among the most vulnerable in the European space in terms of development level. This upward trajectory has not been linear, disrupted by the 2009 global financial crisis that generated a 6% contraction, the 2014–2015 domestic banking crisis that wiped out the equivalent of about 12% of GDP through systemic fraud, and the 2020 pandemic that produced the most severe contraction in the last two decades, of 8.3%. Each of these episodes highlighted the very structural vulnerabilities that ESG factors are supposed to address, namely fragile human capital eroded by massive emigration, institutions with limited capacity to prevent systemic crises, and an energy dependence of almost 85% on imports, which amplifies any external turbulence and reduces the room for maneuver of economic policy.

Figure 2. GDP per capita Republic of Moldova, 1996–2021

Source: World Bank Sovereign ESG Data Portal. Author's own calculations.

Of the three structural vulnerabilities identified, human capital represents the factor with the strongest impact on long-term economic resilience, both in economic theory and in the results of the empirical model constructed.

Figure 3 illustrates the simultaneous evolution of all S-pillar indicators during the analyzed period, highlighting divergent trends that reflect the structural tensions of an economy in transition: life expectancy gradually increased from 66.2 to 71.5 years, under-5 mortality decreased significantly from 38.4 to 14.8 deaths per 1,000 live births, and education spending fluctuated between 12% and 22% of the government budget, all positive signals of social progress.

Human capital per capita, represented on the secondary axis, followed a more complex trajectory directly reflecting the impact of massive emigration, before partially recovering in 2021. The most important result of the study is the confirmation of the dominant role of human capital in determining long-term economic resilience and competitiveness. The estimated coefficient is positive and statistically significant ($\beta = +0.259$, $p < 0.001$), which means that a 1% increase in human capital per capita is associated with an improvement of approximately 0.26% in the economy's capacity to generate sustainable economic performance.

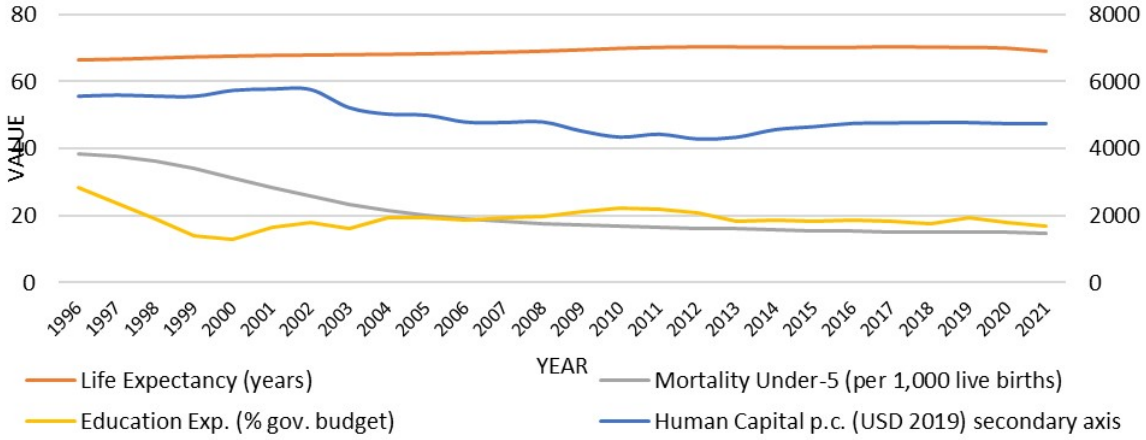

Figure 3. Social Indicators: Human Capital, Life Expectancy, Under-5 Mortality and Education Expenditure, 1996–2021

Note: Human Capital per capita (USD 2019) plotted on secondary axis (right).
Source: World Bank Sovereign ESG Data Portal. Author's own calculations.

This conclusion is not surprising from the perspective of economic theory, but it acquires particular relevance in the specific context analyzed. The analyzed economy lost, according to estimates, between 25% and 30% of its skilled human capital through emigration during this period. Our model suggests that this loss was the most costly factor in the erosion of competitiveness in the long term, superior in impact to any specific political or financial crisis. Poveda (2023) and Wang et al. (2023) confirm this perspective at the international level, identifying human capital as the ESG factor with the most robust positive impact on long-term economic performance, especially in transition economies where the accumulation of knowledge and public health represents the main source of competitive advantage in the absence of abundant natural resources or physical capital.

Another S-pillar indicator, the under-5 mortality rate, also shows a significant positive effect ($\beta = +0.185$, $p < 0.001$). This does not mean that high mortality generates economic growth, but a historical legacy relationship specific to the transition period: in the first years of the analyzed interval, 1996–2005, infant mortality was high, but the economy still benefited from the physical capital and infrastructure accumulated during the Soviet period, generating an apparent positive correlation that gradually reversed as the infrastructure deteriorated and emigration intensified.

The energy transition represents the second structural vulnerability identified in the economic context of the analyzed period. Figure 4 illustrates the evolution of the three indicators of pillar E.

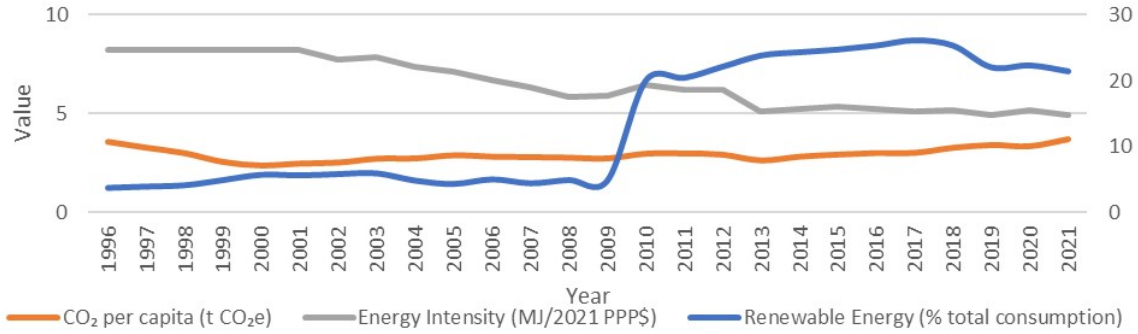

Figure 4. Environmental Indicators: CO_2 Emissions per capita, Energy Intensity and Renewable Energy Consumption, Republic of Moldova, 1996–2021

Note: Renewable Energy (% of total final energy consumption) plotted on secondary axis (right).

Source: World Bank Sovereign ESG Data Portal. Authors' own illustration.

The most visible phenomenon observed is the increase in renewable energy consumption from 3.7% in 1996 to 26.1% in 2021, the most dynamic evolution of all the monitored indicators, accelerated especially after 2010, with the entry into force of the association agreements with the European Union that imposed stricter standards in the field of energy and climate. At the same time, the energy intensity of the economy decreased from 8.2 to 4.9 MJ per unit of GDP, a signal of increasing energy efficiency, while CO_2 emissions per capita remained relatively stable at around 3 tons.

The results of the econometric model for pillar E show effects at the limit of statistical significance. Renewable energy registers a marginal negative effect ($\beta = -0.001$, $p = 0.069$), and natural capital per capita an effect that is also negative and marginally significant ($\beta = -0.273$, $p = 0.067$). These results should not be interpreted as a failure of environmental policy, but as confirmation of the long horizon for the materialization of the economic benefits of the energy transition. Investments in renewable energy imply high capital costs and restructuring of the energy system, whose benefits, energy independence, reduced operational costs, resilience to external shocks, materialize with a delay. Fichtner et al. (2023) estimate that this materialization horizon is 7–15 years, especially in economies with poorly developed financial markets and limited institutional capacity to absorb green financing. a strong argument in favor of continuing and accelerating investments in clean energy, the effects of which will become measurable in the coming decades. Governance indicators remained in negative territory throughout the analyzed period, confirming the persistent institutional fragility of the economy (figure 5). A gradual improvement trend becomes visible after 2016, especially for the rule of law and the control of corruption, reflecting the impact of accelerated institutional reforms in the context of the European association process.

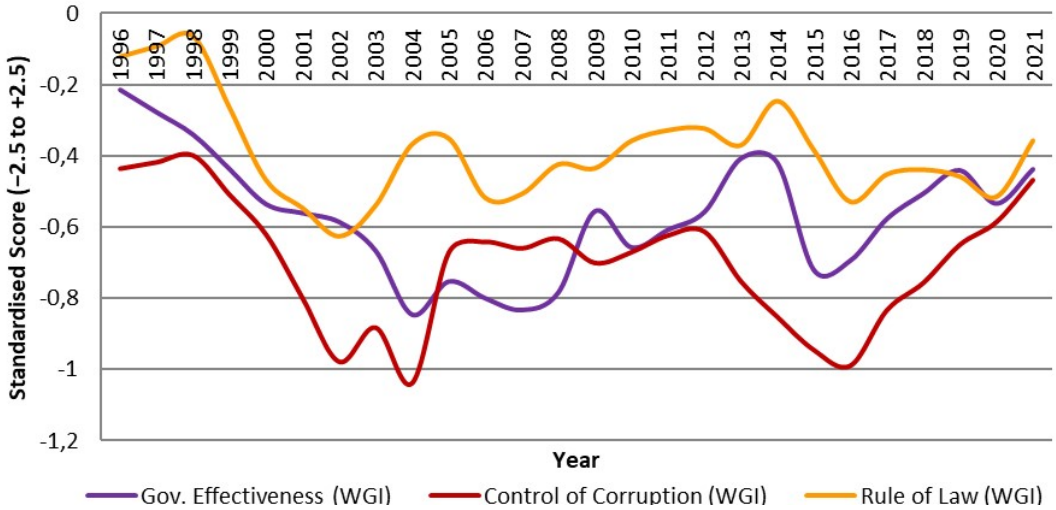

Figure 5. Governance Quality: Government Effectiveness, Control of Corruption and Rule of Law (WGI), Republic of Moldova, 1996–2021

Source: World Bank Worldwide Governance Indicators. Authors' own illustration.

Among the institutional governance indicators included in the model, the rule of law is the only one that presents a statistically significant, negative and strong effect ($\beta = -0.119$, $p < 0.001$). This result is, at first glance, surprising, but the explanation lies in the specific dynamics of institutional reform in post-Soviet economies. The major legal reforms in the analyzed period, the adoption of new civil and criminal codes, the establishment of anti-corruption institutions, the alignment of legislation with the community acquis, coincided chronologically with the most difficult economic periods: the political crisis of 2009–2010, the banking crisis of 2014–2016 and the governmental instability of 2019. In other words, the country chose to reform institutions precisely at the moments of maximum economic vulnerability, generating in the short term a negative correlation that does not reflect the real impact of the reform in the long term. Confirming that in economies with weak institutions, legal reforms generate significant transition costs, uncertainty, compliance costs, administrative restructuring, which temporarily erode competitiveness before producing structural benefits (Ortas et al. (2018). Shkolnykova et al. (2024) confirm the same pattern in Central and Eastern Europe, showing that countries that implemented accelerated institutional reforms in the context of EU accession went through periods of temporary decline in competitiveness, followed by sustained convergence.

5. Conclusions and recommendations

This study aimed to identify and quantify the impact of ESG factors on the resilience and economic competitiveness of the Republic of Moldova in the period 1996–2021. The results of the econometric model confirm that the three ESG pillars exert differentiated and asymmetric effects, with clear implications for the public policies of a small economy candidate for European integration.

Human capital has proven to be the dominant determinant of long-term economic resilience — a robust conclusion, consistent with the international literature and with the specifics of an economy that has lost between 25–30% of its skilled workforce through emigration. Institutional governance, through the rule of law dimension, produces negative

effects in the short term but structurally necessary in the long term, legal reforms coincide with periods of economic vulnerability, generating inevitable transition costs. The energy transition is underway, but the economic benefits are not yet measurable in the analyzed horizon, confirming that the effects of environmental investments materialize in the long term.

These conclusions lead to three priority public policy recommendations for the analyzed economy:

First, investments in human capital must be treated as a national strategic priority, not as a secondary social policy. Second, institutional reform, especially the consolidation of the rule of law, must be accompanied by explicit mechanisms to compensate for the short-term transition costs. The timing of reforms should be linked to the economic cycle, and the international and European financing available through the accession process should be used to cushion institutional shocks, not just for infrastructure investments. Third, continuing the energy transition remains essential despite the absence of immediate economic effects. The 85% dependence on energy imports represents the structural vulnerability with the greatest potential for destabilization in the current geopolitical context. Investments in renewable energy, even if they do not generate immediate competitiveness gains, reduce exposure to external shocks and are a necessary condition for access to European green financing instruments.

The study presents limitations inherent to the time series analysis for a single country, in particular regarding the generalizability of the conclusions. Future research could extend the analysis to a panel of candidate and post-candidate economies, to test the robustness of the identified effects and to quantify more precisely the long-term benefits of institutional reforms and energy transition.

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