MINISTERUL EDUCAȚIEI NAȚIONALE
ROMÂNIA
UNIVERSITATEA DE MEDICINĂ, FARMACIE, ȘTIINȚE ȘI TEHNOLOGIE „GEORGE EMIL PALADE" DIN TÂRGU MUREȘ

ACTA MARISIENSIS, SERIA OECONOMICA
Online:ISSN 2668-3989, ISSN L 2668-3148
Print:ISSN 2668-3148, ISSN L 2668-3148

THE IMPACT OF ESG PERFORMANCE ON ECONOMIC GROWTH: GLOBAL AND REGIONAL CASES

Călin-Adrian Comes[1,2*], Petru Oneț[2]

[1] Faculty of Economics and Law, Department ED1 – Economic Sciences, George Emil Palade University of Medicine, Pharmacy, Science, and Technology of Târgu Mureș, 38 Gheorghe Marinescu Street, 540139 Târgu Mureș, Romania

Rezumat: *Dezvoltarea durabilă a devenit o preocupare esențială în economia modernă, pe măsură ce țările se confruntă cu provocări precum schimbările climatice, inegalitatea socială și deficiențele de guvernanță. În acest context, cadrul ESG (Environmental, Social, and Governance) oferă o abordare integrată pentru evaluarea modului în care factorii de durabilitate influențează performanța economică. Studiul analizează relația dintre performanța ESG și creșterea economică, utilizând date din 180 de țări pentru perioada 2015–2023. Rezultatele arată că dimensiunile de mediu și sociale au un impact pozitiv asupra PIB-ului pe cap de locuitor, în timp ce indicatorul de guvernanță are un rol mai moderat. Totuși, rezultatele variază semnificativ între regiuni, evidențiind faptul că factorii ESG interacționează diferit în funcție de structura economică și capacitatea instituțională. În Europa, creșterea emisiilor de CO_2 are un impact negativ asupra creșterii economice, reflectând tranziția în curs către modele economice durabile.*

Cuvinte cheie: *ESG, creștere economică, durabilitate, emisii de CO_2, dezvoltare durabilă*

Abstract: *Sustainable development has become a key concern in modern economics as countries face challenges such as climate change, social inequality, and governance deficiencies. Within this context, the Environmental, Social, and Governance (ESG) framework provides an integrated approach to evaluating how sustainability factors influence economic performance. This study examines the relationship between ESG performance and economic growth using data from 180 countries over the period 2015-2023. The analysis shows that environmental and social dimensions have a positive impact on GDP per capita, while the governance indicator has a more moderate role. However, the results vary significantly across regions, highlighting that ESG factors interact differently depending on economic structure and institutional capacity. In Europe, increases in CO_2 emissions have a negative impact on economic growth, reflecting the ongoing transition toward sustainable economic models.*

Keywords: *ESG, economic growth, sustainability, CO_2 emissions, sustainable development*

JEL Classification: O44, Q01, Q56

[*] *Corresponding author: Călin-Adrian Comes*
e-mail: calin.comes@umfst.ro

INTRODUCTION

Sustainable development has become a central theme in modern economics as we increasingly confront global challenges such as climate change, social inequality, and governance crises. The ESG approach was initially promoted through responsible investment principles and voluntary reporting initiatives, first introduced by the United Nations "*Who Cares Wins"* report in 2004. Over time, it has evolved into a global benchmark that guides corporate strategy, governance, and public policy.

The Environmental, Social, and Governance (ESG) framework provides an integrated perspective for evaluating how non-financial dimensions impact long-term economic performance. The environmental component measures the effects of an organization's activities on the natural environment, including aspects such as natural resource management, reduction of pollutant emissions, and biodiversity protection. The social dimension focuses on relationships with employees, local communities, and other stakeholders, evaluating factors such as human rights, working conditions, and social engagement. The governance factor examines leadership structures and decision-making processes, emphasizing transparency, integrity, and ethical management practices, which are essential for ensuring responsible and sustainable governance.

ESG practices have become increasingly important for all stakeholders (Garcia et al., 2017; Zhou et al., 2022) as companies that implement more effective ESG risk management measures create long-term value for investors through sustainable and resilient business models (Henisz et al., 2019). ESG reporting serves as a key communication tool between companies and the financial market, providing information on environmental, social, and governance aspects that are not captured in traditional financial statements. What distinguishes ESG from other sustainability reporting frameworks is that ESG criteria are measurable, auditable, and integrated into financial decision-making. Investors use them to assess a company's risk exposure, long-term sustainability, and performance potential. As such, ESG provides a structured, comparable, and stakeholder-oriented basis for evaluating corporate responsibility. ESG indicators have gained importance not only at the corporate level but also as instruments for assessing national sustainability and development policies.

A growing body of empirical research has examined the relationship between ESG performance and economic outcomes. Khan, Serafeim, and Yoon (2016) demonstrated that firms excelling in managing material aspects of sustainability achieve superior financial performance compared to those focusing primarily on non-material or undifferentiated factors. This finding suggests that investments in sustainability can generate economic benefits when they are aligned with the material priorities of the company's specific industry. Similarly, Diaye, Ho, and Oueghlissi (2022) found that countries that implement coherent environmental protection, social inclusion, and governance transparency policies are more likely to create stable economic environments that attract long-term investment and support sustainable economic growth. In their analysis of 29 OECD countries for the period 1996–2014, they found a long-term positive relationship between ESG performance and GDP per capita. Using panel cointegration techniques, the authors demonstrated that while ESG factors may not significantly impact growth, they tend to contribute positively to economic development over the long run.

However, the ESG–growth relationship remains complex, as its effects vary significantly across countries. In developed economies, ESG performance tends to correlate positively with economic progress, whereas in emerging or transition economies, the impact is often moderated by corruption, political instability, or weak regulatory frameworks (Ortas et al., 2015; Daugaard & Ding, 2022; Mazzioni et al., 2024).

At the same time, there is an ongoing debate about the real effects of implementing ESG criteria. On one hand, some argue that integrating ESG principles stimulates innovation, improves resource efficiency, and strengthens investor confidence, thereby supporting economic development.

ACTA MARISIENSIS, SERIA OECONOMICA
Online:ISSN 2668-3989, ISSN L 2668-3148
Print:ISSN 2668-3148, ISSN L 2668-3148

On the other hand, critics point out that strict ESG regulations may impose additional costs on companies and governments, potentially reducing competitiveness and slowing economic growth.

This research contributes to the growing literature by examining the global relationship between ESG performance and economic growth using data from 180 countries during 2015–2023. By comparing results across continents, the study seeks to identify regional differences in the impact of environmental, social, and governance dimensions on GDP per capita. The findings provide insights into how sustainable policies and responsible governance can promote long-term, inclusive, and environmentally sustainable economic development.

1. DEFINING THE RESEARCH PROBLEM

By examining the relationship between ESG performance and economic growth, we aim to better understand how sustainability-oriented policies can either support or constrain economic development. This study gains particular importance in the global context, where international organizations such as the United Nations, the World Bank, and the European Commission actively promote integrating ESG principles into economic development strategies.

Based on the theoretical arguments and previous findings, the following hypotheses are proposed:

H1: *Higher CO_2 emissions are expected to negatively affect economic growth, as environmental degradation slows down sustainable development.*

H2: *Improved social conditions, reflected by higher life expectancy, are expected to support economic growth through a healthier and more productive population.*

H3: *Stronger governance quality, reflected by lower levels of corruption, is expected to enhance economic performance by promoting institutional trust and investment stability.*

Assessing a country's ESG performance remains a challenging task in economic research for several reasons. First, there is no universally accepted methodology for evaluating ESG performance at the national level. Second, ESG covers a wide range of practices, which can lead to interpretative inconsistencies and reduce comparability across countries.

In this context, the study identifies one representative indicator for each ESG dimension, which we consider to reflect its specific characteristics best. For the environmental dimension (E), we used CO_2 emissions per capita as an indicator of air quality and environmental responsibility. We selected CO_2 emissions per capita instead of total CO_2 emissions in order to highlight the average individual contribution to pollution and the environmental impact adjusted for population size. A country with a large population may appear more polluting in absolute terms simply because of its demographic size, not necessarily due to less sustainable behavior. Carbon dioxide (CO_2) emissions per capita represent the total amount of CO_2 released annually within a country, divided by the total population. This indicator is expressed in metric tons per person and provides a more balanced view of a country's environmental intensity.

The social dimension (S) is represented by life expectancy at birth, which captures the overall quality of life and social well-being. The life expectancy at birth measures the average number of years a newborn is expected to live under current health and living conditions in a country. This indicator, expressed in years, reflects public health standards, access to healthcare, socio-economic conditions, and living quality. A higher life expectancy generally indicates an efficient healthcare system, better education, higher income levels, and adequate social protection.

Therefore, life expectancy is one of the key indicators used to evaluate the level of human development and the overall quality of life, providing valuable insight into the long-term sustainability of socio-economic progress.

For the governance dimension (G), we chose the control of corruption index to measure institutional quality, transparency, and governance integrity. The control of corruption index serves as an indicator of governance quality. It reflects the extent to which public authorities can prevent, detect, and sanction acts of corruption, abuse of power, or the use of public office for private gain. The indicator is measured internationally through perception-based assessments, which combine expert evaluations, public opinion surveys, and data provided by independent institutions. A higher score, closer to 100, indicates a lower perceived level of corruption, signaling a strong institutional framework based on transparency, accountability, and the rule of law, factors that support a stable investment climate and sustainable socio-economic development. A lower score, closer to 0, reflects serious governance challenges, such as weak institutions and limited enforcement of anti-corruption policies. The selected variables reflect the three dimensions of the ESG concept, chosen based on data availability, economic relevance, and the frequency of use in the existing literature.

The dependent variable is GDP per capita (curent USD), which is a key indicator of a country's standard of living and economic performance. GDP per capita was chosen instead of total GDP to ensure comparability across countries with different population sizes, as total values may overestimate economic performance in highly populated nations.

In Table 1 below are the variables used in the model:

Table no. 1 – Review of variables used in the model

Variables	
Dependent variable	
GDP per capita	
Independent variables	
CO_2 emissions per capita	E
Life expectancy at birth	S
Control of corruption	G

Source: Authors' projection

For this research, we used a quantitative method based on a multiple linear regression model applied to panel data for 180 countries between 2015 and 2023. The data were obtained from the World Bank, and the model was estimated using a fixed-effects panel regression, selected according to the Hausman test. To ensure the reliability of the estimates, robust standard errors (Arellano correction) were employed to address potential heteroscedasticity and autocorrelation within the panels. GDP and CO_2 variables were logarithmised using the natural logarithm (ln), as the initial distribution exhibited high skewness and extreme values (outliers).

The logarithmic transformation stabilizes the variance, reduces the influence of outliers, and facilitates the interpretation of coefficients in percentage terms. All computations were performed using the R statistical software.

The model used is given by the following equation:

$$log(GDP_{it}) = \alpha + \beta_1 \cdot log(E_{it}) + \beta_2 \cdot S_{it} + \beta_3 \cdot G_{it} + \varepsilon_{it}$$

where:
α - constant
E_{it} – environmental indicator
S_{it} – social indicator
G_{it} – governance indicator

ACTA MARISIENSIS, SERIA OECONOMICA
Online:ISSN 2668-3989, ISSN L 2668-3148
Print:ISSN 2668-3148, ISSN L 2668-3148

$\beta 1$, $\beta 2$, $\beta 3$ – coefficients of independent variables
ε_{it} – residual

The analysis is conducted in two main stages. In the first stage, a global approach is applied by estimating the econometric model for the entire sample of countries to capture worldwide trends and provide an overall picture of the ESG-economic growth. In the second stage, the sample is divided into geographic regions to identify potential local influences and contextual characteristics that may alter or amplify the effect of ESG performance on economic growth.

2. PRESENTING THE RESEARCH FINDINGS

2.1. Global sample

Table 2 presents the descriptive statistics for the variables included in the model. The data show balanced distributions, with skewness and kurtosis values within acceptable ranges. GDP per capita has a mean of 8.77, ranging from 5.26 to 11.80, reflecting wide income disparities between countries. CO_2 emissions per capita average 0.73, with values between –3.44 and 4.40, indicating significant variation in environmental performance. Life expectancy at birth averages 72.16 years (min 18.82, max 85.53), showing that most countries have high longevity, though a few outliers, likely from conflict-affected or low-income regions. The control of corruption index ranges from 0 to 100, with a mean of 48.49 and moderate dispersion, suggesting that most countries fall near the middle of the governance scale.

Table no. 2 – Descriptive statistics for the global sample

Var.	Mean	Median	Min	Max	Sd	Skewness	Kurtosis
GDP	8.77	8.73	5.26	11.80	1.47	-0.01	-0.92
CO2	0.73	0.97	-3.44	4.40	1.46	-0.45	-0.23
LE	72.16	72.96	18.82	85.53	7.85	-0.67	4.12
CC	48.49	46.92	0.00	100.00	28.44	0.14	1.87

Source: Authors' calculations in R based on World Bank data

Table 3 presents the correlation matrix for the main variables. Correlations above 0.8 are generally considered strong, while those between 0.5 and 0.7 indicate moderate associations. The correlation analysis highlights several important relationships across the global sample.

GDP per capita strongly correlates with CO_2 emissions (0.85) and life expectancy (0.85). Although higher emissions are inconsistent with sustainability goals, they have historically been associated with improved economic development. GDP per capita and the control of corruption index also show a moderate to strong correlation (0.78).

The correlation between CO_2 emissions and life expectancy (0.77) is also positive, reflecting that more industrialized countries often achieve higher social welfare despite higher environmental pressure. Meanwhile, the association between CO_2 emissions and the control of corruption (0.58) is moderate, suggesting that countries with more effective institutions may manage environmental impacts more efficiently. Similarly, the correlation between life expectancy and governance quality (0.68) supports the idea that transparent and accountable institutions contribute to better public health and quality of life.

Table no. 3 – Correlation matrix of variables in the model

Variables	GDP	CO2	LE	CC
GDP	1.0000000	0.8516489	0.8524706	0.7826168
CO2	0.8516489	1.0000000	0.7758263	0.5756414
LE	0.8524706	0.7758263	1.0000000	0.6794907
CC	0.7826168	0.5756414	0.6794907	1.0000000

Source: Authors' calculations in R based on World Bank data

The Hausman test was used to identify the best estimation method for the panel regression model. The results showed that the fixed effects model is more appropriate than the random effects model.

Table no. 4 – Hausman test

Chisq	Degrees of Freedom	*p*-value
259.89	3	2.2e-16

Source: Authors' calculations in R

Regression results in Table 5 indicate that CO_2 emissions positively impact economic growth, with a 1% rise in emissions linked to a 0.17% GDP increase. This suggests that countries with higher emissions, typically more industrialized, tend to have higher economic output. However, this result does not signify sustainable growth, but it highlights the ongoing reliance of the global economy on carbon-intensive activities that harm the environment.

The social component, represented by life expectancy, indicates that an additional year in the average life expectancy of the population is associated with approximately a 1.81% increase in GDP per capita. This relationship underscores the importance of investments in health, well-being, and living conditions as key drivers of economic development. This result is consistent with the conclusions of Leogrande and Costantiello (2023), who also identified a positive relationship between GDP growth and social factors integrated within the ESG framework.

Table no. 5 – Regression results for the global sample

Ind.	CO2	LE	CC
Estimated Coefficients	0.1748335	0.0180696	0.0032178
Std. Error	0.0750350	0.0090938	0.0017692
t-value	2.3300	1.9870	1.8188
Pr(>|t|)	0.01994	0.04711	0.06915
Pr Sign	*	*	.

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Source: Authors' calculations in R based on World Bank data

The governance component, measured by the control of corruption index, does not show a statistically significant impact, being at a marginal significance level of 10%, which suggests that its influence may depend more on regional or institutional contexts.

Overall, the results indicate a global trend in which ESG factors significantly influence economic growth. Among these, the positive impact of CO_2 emissions on GDP per capita reflects the current, unsustainable economic model, where economic activity remains closely tied to carbon-intensive processes.

ACTA MARISIENSIS, SERIA OECONOMICA
Online:ISSN 2668-3989, ISSN L 2668-3148
Print:ISSN 2668-3148, ISSN L 2668-3148

2.2. Regional sample

2.2.1. Europe

The descriptive statistics for the European sample show relatively balanced distributions across all variables, with skewness and kurtosis values within acceptable ranges, indicating normal statistical behavior. GDP per capita has a mean value of 10.09 (log-transformed), reflecting the generally high level of economic development in European countries.

CO_2 emissions per capita average 1.78, with a relatively small dispersion (SD = 0.43), suggesting moderate variation in environmental intensity across the region. Life expectancy is high, with an average of 79.05 years, highlighting the advanced living standards and strong healthcare systems typical of European economies. The control of corruption index also records a high mean (70.67), confirming the region's relatively strong institutional quality and effective governance structures.

Table no. 6 – Descriptive statistics for European sample

Var.	Mean	Median	Min	Max	Sd	Skewness	Kurtosis
GDP	10.09	10.14	7.65	11.80	0.92	-0.41	-0.54
CO2	1.78	1.78	0.45	2.83	0.43	-0.22	0.64
LE	79.05	80.85	68.89	84.06	3.72	-0.67	-0.72
CC	70.67	74.76	13.81	100.00	24.24	-0.59	-0.74

Source: Source: Authors' calculations in R based on World Bank data

Table 7 below presents the correlation matrix for the European sample. GDP per capita shows a strong positive correlation with both life expectancy (0.82) and the control of corruption index (0.90), indicating that higher income levels in Europe are associated with better living conditions and stronger governance systems.

Table no. 7 – Correlation analysis of variables for European sample

Variables	GDP	CO2	LE	CC
GDP	1.000000	0.3823250	0.8187640	0.9043380
CO2	0.382325	1.0000000	0.1334111	0.3160544
LE	0.818764	0.1334111	1.0000000	0.7737449
CC	0.904338	0.3160544	0.7737449	1.0000000

Source: Authors' calculations in R based on World Bank data

The correlation between GDP and CO_2 emissions (0.38) is moderate, suggesting that economic growth in Europe is less dependent on polluting industrial activities compared to the global trend. Life expectancy also correlates positively with the control of corruption index (0.77), reflecting the connection between institutional quality, social well-being, and overall development.

Additionally, CO_2 emissions show a weak correlation with life expectancy (0.13) and control of corruption (0.32), suggesting that higher emissions are not directly associated with better living conditions in Europe as in other areas. This can be explained by Europe's environmental policies and technological advances, which have helped reduce the negative health effects typically associated with industrial pollution. Also, the weak correlation between CO_2 emissions

and control of corruption (0.32) can be attributed to the fact that, in many European countries, strong institutions and regulations already ensure environmental protection.

The Hausman test was used to identify the best estimation method for the panel regression model. The results showed that the fixed effects model is more appropriate than the random effects model.

Table no. 8 – Hausman test

Chisq	Degrees of Freedom	*p*-value
93.22	3	2.2e-16

Source: Authors' calculations in R

The regression analysis for the European sample shows that the environmental component, represented by CO_2 emissions per capita, has a negative and statistically significant impact on economic growth. Specifically, a 1% increase in CO_2 emissions per capita leads to an estimated 0.47% decrease in GDP per capita.

These results suggest that higher emissions are associated with slower economic performance, reflecting Europe's ongoing efforts to reduce its reliance on carbon-intensive industries. The negative relationship indicates a decoupling between economic growth and environmental degradation, likely driven by stricter climate policies and the transition toward renewable energy.

Table no. 9 – Regression analysis for European sample

Ind.	CO2	LE	CC
Estimated Coefficients	-0.4723315	0.0160702	0.0073858
Std. Error	0.1200831	0.0129882	0.0074851
t-value	-3.9334	1.2373	0.9867
Pr(>|t|)	0.0001046	0.2169717	0.3245863
Pr Sign	***		

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Source: Authors' calculations in R based on World Bank data

In contrast, the social dimension, measured by life expectancy, and the governance dimension, represented by the control of corruption index, do not show a statistically significant impact. These findings imply that in Europe, where social and institutional indicators are already at high levels, marginal improvements may not translate directly into short-term economic growth.

2.2.2. Asia

The descriptive statistics for the Asian sample indicate higher variability across all variables compared to Europe. GDP per capita shows a mean of 8.82 (log-transformed) and a wide range between 5.88 and 11.39, reflecting substantial economic diversity within the region, from highly industrialized economies to developing nations. CO_2 emissions per capita average 1.30, with considerable dispersion (SD = 1.28), suggesting uneven levels of industrialization and energy intensity. Life expectancy has a mean of 74.74 years, showing relatively good social conditions but also highlighting disparities in public health and living standards. The control of corruption index records a moderate mean value of 43.95, indicating persistent governance challenges across several regional countries

ACTA MARISIENSIS, SERIA OECONOMICA
Online:ISSN 2668-3989, ISSN L 2668-3148
Print:ISSN 2668-3148, ISSN L 2668-3148

Table no. 10 – Descriptive statistics for the Asian sample

Var.	Mean	Median	Min	Max	Sd	Skewness	Kurtosis
GDP	8.82	8.61	5.88	11.39	1.37	0.08	-1.03
CO2	1.30	1.39	-1.71	3.88	1.28	-0.26	-0.67
LE	74.74	74.59	60.42	85.53	5.75	0.03	-0.98
CC	43.95	41.90	0.48	99.05	26.85	0.23	-1.04

Source: Authors' calculations in R based on World Bank data

Table 11 presents the correlation matrix for the Asian sample. GDP per capita shows a strong positive correlation with life expectancy (0.90) and CO_2 emissions (0.85). CO_2 emissions are also moderately to strongly correlated with life expectancy (0.72). In this region, countries tend to have better living conditions but also higher emissions due to industrial activity. However, these relationships may not imply sustainability, as rapid industrialization often comes with environmental trade-offs. The correlation between GDP and the control of corruption index (0.83) indicates that stronger institutional quality is generally associated with higher levels of economic development in the region. There is also a strong correlation between the control of corruption index and life expectancy (0.79).

Table no. 11 – Correlation analysis of variables for the Asian sample

Variables	GDP	CO2	LE	CC
GDP	1.0000000	0.8539954	0.9000599	0.8314345
CO2	0.8539954	1.0000000	0.7217021	0.6015193
LE	0.9000599	0.7217021	1.0000000	0.7977492
CC	0.8314345	0.6015193	0.7977492	1.0000000

Source: Authors' calculations in R based on World Bank data

The Hausman test indicated that the fixed effects model was appropriate.

Table no. 12 – Hausman test

Chisq	Degrees of Freedom	*p*-value
50.269	3	7.001e-11

Source: Authors' calculations in R

In the Asian sample, the regression results reveal that CO_2 emissions have a positive and statistically significant impact on GDP per capita. A 1% increase in CO_2 emissions per capita is associated with an approximate 0.42% increase in GDP per capita. This result suggests that in many Asian economies, economic expansion remains heavily dependent on energy-intensive and emission-generating industrial activities. Unlike Europe, where emissions were negatively related to growth, Asia continues to experience a growth pattern closely tied to carbon-based production and industrialization.

The social component, represented by life expectancy, also shows a positive and significant impact on economic growth as better quality of life and social development contribute to sustainable economic progress in the region. The governance component, measured through the control of corruption index, does not show a statistically significant impact on GDP per capita. This could be explained by institutional differences across Asian countries, where governance reforms may not yet fully translate into measurable economic effects within the analyzed period.

Table no. 13 – Regression analysis for the Asian sample

Ind.	CO2	LE	CC
Estimated Coefficients	0.4183011	0.0405075	0.0030183
Std. Error	0.1254793	0.0105051	0.0029098
t-value	3.3336	3.8560	1.0373
Pr(>|t|)	0.0009470	0.0001367	0.3002921
Pr Sign	***	***	

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Source: Authors' calculations in R based on World Bank data

2.2.3. Africa

In the African sample, the descriptive statistics reveal considerable variation across countries, reflecting the continent's economic and social diversity. GDP per capita shows an average value of 7.38, with a relatively wide range between 5.26 and 9.86, suggesting substantial differences in income levels between nations.

CO_2 emissions per capita have a low mean value (-0.66) and a wide dispersion (SD = 1.34), indicating that many African economies remain low emitters, largely due to limited industrialization. However, the presence of a few higher values (up to 2.47) points to emerging industrial activity within the region. Life expectancy displays an average of 63.65 years, significantly lower than in other regions, with a wide range from 18.82 to 77.24 years and high kurtosis (6.17), suggesting strong disparities in public health and living conditions.

The control of corruption index averages 31.09, showing relatively weak governance performance across the continent. The high standard deviation (22.02) reflects substantial institutional differences among African countries, ranging from states with almost no governance capacity to those showing moderate institutional strength.

Table no. 14 – Descriptive statistics for African sample

Var.	Mean	Median	Min	Max	Sd	Skewness	Kurtosis
GDP	7.38	7.28	5.26	9.86	0.95	0.41	-0.53
CO2	-0.66	-0.85	-3.44	2.47	1.34	0.27	-0.47
LE	63.65	63.46	18.82	77.24	6.34	-0.91	6.17
CC	31.09	27.01	0	94.34	22.02	0.63	-0.40

Source: Authors' calculations in R based on World Bank data

The correlation matrix for the African sample shows several notable relationships. GDP per capita has a strong positive correlation with CO_2 emissions (0.93), indicating that economic growth in African countries is still heavily dependent on carbon-intensive activities and resource use. This pattern reflects the industrialization stage of many economies in the region, where growth often comes at the cost of higher emissions.

The correlation between GDP and life expectancy (0.57) is moderate, suggesting that while higher income levels are generally associated with better living standards and access to healthcare, progress remains uneven across the continent. A moderate correlation between CO_2 emissions and life expectancy (0.62) further supports the idea that more industrialized African economies tend to provide improved social outcomes, even though this development is not environmentally sustainable.

The control of corruption index shows relatively weak correlations with the other variables (around 0.40), indicating that governance performance varies significantly across African

ACTA MARISIENSIS, SERIA OECONOMICA
Online:ISSN 2668-3989, ISSN L 2668-3148
Print:ISSN 2668-3148, ISSN L 2668-3148

countries and that institutional quality does not yet have a strong, consistent link with economic or environmental indicators.

Table no. 15 – Correlation analysis of variables for African sample

Variables	GDP	CO2	LE	CC
GDP	1.0000000	0.9295261	0.5650903	0.4266860
CO2	0.9295261	1.0000000	0.6219769	0.4075059
LE	0.5650903	0.6219769	1.0000000	0.4270525
CC	0.4266860	0.4075059	0.4270525	1.0000000

Source: Authors' calculations in R based on World Bank data

The Hausman test showed that the fixed effects model is more appropriate than the random effects model.

Table no. 16 – Hausman test

Chisq	Degrees of Freedom	*p*-value
31.544	3	6528e-07

Source: Authors' calculations in R

The regression results for the African sample show that CO_2 emissions per capita have a positive and statistically significant impact on GDP per capita at the 5% significance level. A 1% increase in CO_2 emissions is associated with approximately a 0.25% rise in economic growth, suggesting that many African economies still rely on carbon-intensive production and energy use to sustain economic growth.

The life expectancy variable, representing the social dimension, shows a statistically insignificant impact. This indicates that, although improvements in public health and living conditions contribute to human development, their short-term influence on economic performance is limited, possibly due to persistent inequality and gaps in healthcare access.

Interestingly, the governance variable, measured by the control of corruption index, also shows a positive and statistically significant impact on with GDP per capita, even though the correlation between the two was only moderate. This suggests that governance improvements, though uneven across countries, play a meaningful role in fostering economic growth.

Table no. 17 – Regression analysis for African sample

Ind.	CO2	LE	CC
Estimated Coefficients	0.2517586	0.0103580	0.0043972
Std. Error	0.1188792	0.0080175	0.0021828
t-value	2.1178	1.2919	2.0144
Pr(>|t|)	0.03479	0.19710	0.04461
Pr Sign	*		*

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Source: Source: Authors' calculations in R based on World Bank data

2.2.4. Americas

The descriptive statistics for the Americas indicate moderate variation across all variables. The average GDP per capita (log-transformed) is 9.33, with values ranging between 7.16 and 11.74. This shows a substantial development gap between high-income economies such as the United States and Canada and lower-income countries in Latin America. CO_2 emissions per capita average 0.88, with relatively wide dispersion (Sd = 0.86), suggesting significant differences in industrialization and energy use patterns across the region.

The mean life expectancy is 74.29 years, reflecting moderate social development, though the range between 61.43- and 82.31-years points to notable inequalities in health conditions and living standards. The control of corruption index presents an average of 52.11, with high variability (Sd = 25.44), indicating that governance quality varies considerably, from countries with strong institutions to others where corruption remains a major challenge. The descriptive indicators highlight the region's economic and institutional diversity, combining advanced economies with emerging and developing ones.

Table no. 18 – Descriptive statistics for the Americas

Var.	Mean	Median	Min	Max	Sd	Skewness	Kurtosis
GDP	9.33	9.21	7.16	11.74	0.98	0.35	-0.07
CO2	0.88	0.87	-1.22	3.30	0.86	0.42	0.64
LE	74.29	74.04	61.43	82.31	4.17	-0.29	0.00
CC	52.11	48.57	5.19	96.19	25.44	0.01	-1.25

Source: Authors' calculations in R based on World Bank data

Table 19 presents the correlation matrix. The results show a strong positive correlation between GDP per capita and CO_2 emissions (0.72), suggesting that higher-income countries in the region tend to have greater energy consumption and industrial activity, which contributes to increased emissions. Similarly, GDP and life expectancy (0.71) are positively correlated. The relationship between GDP and the control of corruption index (0.76) is also strong, implying that countries with better governance and lower corruption levels generally achieve higher levels of economic development.

CO_2 emissions are moderately correlated with both life expectancy (0.53) and governance (0.45), suggesting that although industrialization tends to increase environmental pressure, stronger institutions and better social conditions can help reduce its adverse effects.

Table no. 19 – Correlation analysis of variables for the Americas

Variables	GDP	CO2	LE	CC
GDP	1.0000000	0.7198205	0.7083532	0.7552265
CO2	0.7198205	1.0000000	0.5290373	0.4466003
LE	0.7083532	0.5290373	1.0000000	0.5347751
CC	0.7552265	0.4466003	0.5347751	1.0000000

Source: Authors' calculations in R based on World Bank data

The Hausman test showed that the fixed effects model is more appropriate than the random effects model.

ACTA MARISIENSIS, SERIA OECONOMICA
Online:ISSN 2668-3989, ISSN L 2668-3148
Print:ISSN 2668-3148, ISSN L 2668-3148

Table no. 19 – Hausman test

Chisq	Degrees of Freedom	*p*-value
85.427	3	2.2e-16

Source: Authors' calculations in R

In the context of the Americas, the regression analysis shows that CO_2 emissions per capita have a positive and statistically significant impact on economic growth. A 1% increase in CO_2 emissions is associated with an approximate 0.46% rise in GDP per capita, indicating that economic growth in the region remains closely tied to industrial activity and energy consumption, which continue to generate substantial emissions. This pattern indicates that the region's growth continues to rely on environmentally costly industrial activity, especially in developing economies within Latin America.

The social dimension, captured by life expectancy at birth, has a positive and significant impact on GDP per capita. A one-year increase in life expectancy corresponds to about a 2.4% increase in GDP, revealing the importance of human capital, healthcare, and social stability in fostering economic progress across the region.

The governance component, measured by the control of corruption index, shows a negative and marginally significant coefficient at the 10% level. This suggests that while governance and anti-corruption efforts are important, their immediate impact on growth may be mixed or context-dependent in the Americas. One possible explanation is that stronger enforcement and institutional reforms can impose short-term adjustment costs, even though they are beneficial in the long run.

Table no. 20 – Regression analysis for the Americas

Ind.	CO2	LE	CC
Estimated Coefficients	0.4597645	0.0240588	-0.0055727
Std. Error	0.1575064	0.0051420	0.0031696
t-value	2.9190	4.6789	-1.7582
Pr(>|t|)	0.00378	4.412e-06	0.079764
Pr Sign	**	***	.

Signif. codes : 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Source: Authors' calculations in R based on World Bank data

2.2.5. Oceania

The descriptive statistics for Oceania show a moderate variation across variables. The average GDP per capita (log-transformed) is 8.81, with values ranging from 7.40 to 11.08, indicating differences in economic development between advanced economies such as Australia and New Zealand and smaller Pacific island nations.

CO_2 emissions per capita average 0.95, but with a high standard deviation (1.62) and positive skewness (0.83), reflecting strong disparities in industrial activity and energy consumption across countries, particularly between highly industrialized states and low-emission island economies. The mean life expectancy is 71.41 years, with relatively wide variation (from 64.15 to 83.30), suggesting unequal health and living standards across the region. Similarly, the control of corruption index has an average value of 65.70, but a considerable dispersion (Sd = 22.42), showing institutional diversity, from strong governance in developed countries to weaker frameworks in smaller island states.

Table no. 21 – Descriptive statistics for Oceania

Var.	Mean	Median	Min	Max	Sd	Skewness	Kurtosis
GDP	8.81	8.83	7.40	11.08	1.23	0.70	-1.09
CO2	0.95	0.56	-0.72	4.40	1.62	0.83	-0.60
LE	71.41	69.65	64.15	83.30	6.28	0.95	-0.60
CC	65.70	65.71	15.71	100	22.42	-0.35	-0.26

Source: Authors' calculations in R based on World Bank data

The correlation results show that GDP per capita is strongly correlated with CO_2 emissions (0.82) and life expectancy (0.86). The relationship between GDP and the control of corruption index (0.80) is also strong, indicating that governance quality plays a meaningful role in supporting economic development across the region. This may reflect the stability and institutional strength of countries like Australia and New Zealand compared to smaller island states with more limited administrative capacity. CO_2 emissions are moderately correlated with life expectancy (0.50) and governance (0.62), implying that while industrialization contributes to economic growth, it also coincides with institutional and social improvements in better-performing economies.

Table no. 22 – Correlation analysis of variables for Oceania

Variables	GDP	CO2	LE	CC
GDP	1.0000000	0.8186628	0.8631074	0.7984231
CO2	0.8186628	1.0000000	0.4952747	0.6169211
LE	0.8631074	0.4952747	1.0000000	0.7893606
CC	0.7984231	0.6169211	0.7893606	1.0000000

Source: Authors' calculations in R based on World Bank data

The Hausman test was used to identify the best estimation method for the panel regression model. The results showed that the fixed effects model is more appropriate than the random effects model.

Table no. 23 – Hausman test

Chisq	Degrees of Freedom	*p*-value
18.448	3	0.0003

Source: Authors' calculations in R

The regression analysis for Oceania reveals distinct dynamics compared to other regions. The environmental component, measured by CO_2 emissions per capita, shows a negative but statistically insignificant coefficient. This suggests that emissions have no measurable impact on economic growth in the region, likely reflecting the strong emphasis on renewable energy and environmental policies in developed economies such as Australia and New Zealand, which offset the traditional link between emissions and economic output.

The social dimension, represented by life expectancy at birth, displays a positive and statistically significant relationship with GDP per capita, highlighting the importance of health, education, and overall quality of life in supporting sustainable economic performance.

The governance component, measured through the control of corruption index, also exhibits a positive and statistically significant coefficient. This indicates that stronger institutions and greater transparency contribute meaningfully to economic growth in Oceania. Well-governed states tend to create stable environments that foster investment, innovation, and long-term development.

ACTA MARISIENSIS, SERIA OECONOMICA
Online:ISSN 2668-3989, ISSN L 2668-3148
Print:ISSN 2668-3148, ISSN L 2668-3148

Table no. 24 – Regression results for Oceania

Ind.	CO2	LE	CC
Estimated Coefficients	-0.0059896	0.0566103	0.0035828
Std. Error	0.1661074	0.0260010	0.0013808
t-value	-0.0361	2.1772	2.5948
Pr(>|t|)	0.97134	0.03289	0.01155
Pr Sign		*	*

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Source: Authors' calculations in R based on World Bank data

3. CONCLUSIONS

This study examined the impact of Environmental, Social, and Governance (ESG) performance on economic growth using panel data for 180 countries over the 2015–2023 period. The findings highlight that ESG dimensions can influence economic performance, but their impact differs across countries and regions. These differences depend on factors such as the level of economic development, institutional quality, and the extent to which sustainability policies are integrated into national strategies. In developed economies, ESG implementation tends to strengthen long-term stability and innovation, while in developing or emerging economies, limited resources and weaker institutions can reduce the effectiveness of ESG measures.

At the global level, CO_2 emissions showed a positive and statistically significant impact on GDP per capita, suggesting that global economic growth continues to rely on activities that generate greenhouse gas emissions, particularly those related to industrial production and energy consumption. However, this relationship reflects a growth model that remains environmentally unsustainable, as it intensifies environmental degradation and contributes to climate change. The social dimension, represented by life expectancy, had a statistically significant impact on GDP per capita, emphasizing the crucial role of health, education, and living conditions in supporting economic development. The governance component, measured by the control of corruption index, does not show a statistically significant impact, being marginally significant. Although the results do not provide conclusive evidence of this impact, the observed trend suggests that improvements in governance, particularly through reducing corruption, could contribute to enhancing economic growth.

The regional analysis revealed that ESG impacts are not uniform. In Europe, the environmental component, represented by CO_2 emissions per capita, had a statistically significant negative impact on economic growth. A decoupling trend between economic performance and carbon emissions can be observed, possibly driven by the implementation of stricter environmental regulations and climate policies that are aligned with sustainable development goals. The negative impact may also reflect the short-term costs of reducing dependence on fossil fuels and transitioning toward renewable energy sources.

In contrast, regions such as Asia, Africa, and the Americas still display a positive link between emissions and economic growth, reflecting different stages of industrial development and policy implementation. In Oceania, the impact of CO_2 emissions is statistically insignificant. The social component measured by life expectancy at birth did not show a statistically significant impact in Europe and Africa. In Europe, this can be explained by the already high levels of this indicator, which makes it difficult to capture short-term effects on economic growth. In Africa, the generally low life expectancy in many countries may limit the positive influence of improvements in living conditions. The governance component, represented by the control of corruption index, showed no significant impact in Europe and Asia. Similar to life expectancy, the control of

corruption already records relatively high scores in most European countries, reflecting stronger institutional frameworks and good governance practices. As a result, the short-term effects of further improvements are less visible in the analyzed period. The results showed that while ESG factors can foster sustainable economic performance, their effectiveness depends on structural, institutional, and regional contexts.

This study has certain limitations. The analysis relies on data from the World Bank, which, although consistent and internationally comparable, provides only a limited number of ESG-related indicators that are available at the country level. As a result, the three selected variables may not fully capture the multidimensional nature of the ESG framework.

Future research could expand the analysis by incorporating additional indicators to better reflect the complexity of ESG performance. Moreover, applying advanced econometric techniques could help identify the direction between sustainability factors and economic growth.

Bibliography:

United Nations Global Compact. (2004). *Who cares wins: Connecting financial markets to a changing world.* United Nations, https://documents.worldbank.org/curated/en/280911488968799581.

Garcia, A. S., Mendes-Da-Silva, W., & Orsato, R. J. (2017). Sensitive industries produce better ESG performance: Evidence from emerging markets. *Journal of Cleaner Production, 150*, 135–147, https://doi.org/10.1016/j.jclepro.2017.02.180.

Zhou, G., Liu, L., & Luo, S. (2022). Sustainable development, ESG performance and company market value: Mediating effect of financial performance. *Business Strategy and the Environment, 31*(7), 3371–3387, https://doi.org/10.1002/bse.3089.

Henisz, W. J., Koller, T., & Nuttall, R. (2019). Five ways that ESG creates value. *McKinsey Quarterly, 3*, 1–12, Five ways that ESG creates value.

Mazzioni, S., Soschinski, C. K., Leite, M., Dal Magro, C. B., & Sanches, S. L. R. (2024). ESG performance in emerging economies. *Macro Management & Public Policies, 6*(1), 32–45, https://doi.org/10.30564/mmpp.v6i1.6202.

Ortas, E., Álvarez, I., & Garayar, A. (2015). The environmental, social, governance, and financial performance effects on companies that adopt the United Nations Global Compact. *Sustainability, 7*, 1932–1956, https://doi.org/10.3390/su7021932.

Daugaard, D., & Ding, A. (2022). Global drivers for ESG performance: The body of knowledge. *Sustainability, 14*, 2322–2336, https://doi.org/10.3390/su14042322.

Leogrande, A., & Costantiello, A. (2023). *The Role of GDP Growth in the ESG Approach at World Level, Academy of Accounting and Financial Studies Journal. 28. 1-16. The Role of GDP Growth in the ESG Approach at World Level Munich Personal RePEc Archive.*