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THE IMPACT OF GREEN ECONOMY DEVELOPMENT ON ECONOMIC GROWTH AND ENVIRONMENTAL PROTECTION: AN ECONOMETRIC ANALYSIS FOR EU COUNTRIES

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Abstract. This research aims to analyze the role of the green economy in economic growth and environmental protection in EU countries. So, let's see how much the green economy influences these two essential elements of an economy. To realize this paper, we used secondary data from the World Bank, OECD, IMF and Eurostat. As for the literature review, we primarily focused on different books, scientific works, different international conferences, reports and online resources. The years analyzed in this research are 2005-2023. The results show that the green economy is vital to boost economic growth and protect the environment. Still, its success depends on strong policies, strategic investments and sustained support from governments and the private sector. The results obtained from this study will serve as good scientific and empirical evidence for future studies that will be carried out in green economics. The results of this study will serve as practical evidence for the governments of European countries regarding the green economy, environmental protection and economic growth to create adequate policies regarding these factors.

Keywords: *Economic growth, green economy, environmental sustainability, environmental protection.*

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1. Introduction

Many countries have created green economic growth infrastructure for various resources and environmental protection, especially in energy transformation, due to increasing green awareness in many countries (Acemoglu *et al*., 2016). Therefore, to achieve the path of green growth, using renewable and non-renewable energy and green technological innovation would be essential. These campaigns or initiatives toward green growth are based on the idea that, at the regional level, environmentally friendly technologies continuously promote economic and green growth (Gali *et al*., 2020).

Efforts by countries worldwide to advance green growth strategies vary in several aspects, such as their breadth, context and degree of involvement in advancing low-carbon outcomes and climate resilience. In recent years, three main themes of much discussion regarding green growth have been technology transfer, North-South investment flows and climate change adaptation and mitigation. These areas tend to focus less on the social aspects of sustainable development and more on discussing the links between the environment and the economy. When discussing green growth policies, they lack the necessary instruments and analytical foundations to guarantee more inclusive growth and development, especially when discussing resolving conflicts between

development goals, such as ensuring environmental sustainability and eradicating extreme poverty and hunger (Burkolter & Perch, 2014).

Aside from the apparent benefits for jobs, the green economy debate has concentrated chiefly on addressing environmental problems, ignoring a more significant chance to reduce poverty and build an inclusive, egalitarian society. Although rarely discussed, tying social policies and green employment efforts together could be crucial, especially when destroying the power dynamics and societal structures that support enduring forms of vulnerability and inequality (Technical Support Team, 2013).

Two main issues in recent public debate have emerged: the relationship between environmental protection and economic growth. The concept of "green growth" emphasizes that good ecological quality can be achieved at lower costs (OECD, 2013) or that good environmental actions can also promote economic growth by increasing productivity and promoting technological advances (UNEP, 2011). On the other hand, proponents of "no growth" emphasize the importance of stopping economic growth to protect environmental integrity (Victor, 2008).

2. Literature review

Given the recent virtue in environmental concerns and worldwide advances since the 1970s, the green economy has emerged as one of the most important global developments and has gained much momentum recently. Within the sustainability framework, the polluter pays principle and the absorption of environmental externalities have been offered to solve environmental issues, resulting in a greener and more ecologically sensitive view of capitalism (Purkis, 2020).

Environmentally sustainable development has been defined in various ways throughout history. The 1987 World Commission on Environment and Development report entitled "Our Common Future" has the most commonly used definition. Based on this report, which has been crucial for the growth of the international discourse on sustainable development, it is "meeting the needs of the present without compromising the ability of future generations to meet their own needs". This definition highlights two essential ideas. The first idea emphasizes the importance of ensuring the basic needs of low-income people. In contrast, the second emphasizes preserving the environment's capacity to meet future needs by utilizing social activity and technology (Brundtland & Khalid, 1987). Green growth and the green economy are frequently cited as essential components of sustainable development. An economic system that considers social welfare and environmental sustainability is known as the "green economy" and economic growth that is both socially inclusive and environmentally sustainable is known as "green growth". The green economy and growth are often cited as essential components of sustainable development. A highly relevant economic system that takes into account social well-being and environmental sustainability is known as a "green economy" and economic growth that is socially inclusive and environmentally sustainable is known as "green growth" (UNEP, 2011).

Green growth is a strategy that addresses all three dimensions of sustainable development to advance towards a green economy and change the growth paradigm. Its goal has been sustainable growth. Green growth was first used at Seoul's Fifth Conference on Environment and Development in March 2005. The need for a green growth policy beyond sustainable development arose during discussions at this conference, which

brought together 52 governments and stakeholders from Asia and the Pacific (Kanianska, 2017).

Green growth has attracted much attention as environmental degradation and climate change have emerged. Institutions such as the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), the World Bank and the Organization for Economic Co-operation and Development (OECD) are seriously considering the green economy. The World Commission on Climate Change has made it a top priority, which is the cause of the continued increase in global temperature and its corresponding impact on the globe (IPCC, 2014; Kasecker *et al*., 2018). To address climate change issues and their impact, the Paris Agreement and the 2030 Agenda for Sustainable Development have renewed action towards a better environment (OECD, 2020). According to the OECD, all developed or developing countries must adhere to the 2030 Agenda for Sustainable Development. Countries that prioritize economic development vary greatly from one another.

While green growth promotes financial and economic development, it ensures the continued availability of natural resources and environmental services for human well-being. Sustainable economic growth is key to achieving the Sustainable Development Goals (SDGs). Increasing environmental sustainability can lead to economic growth and the SDGs see improving environmental quality as a key strategy (OECD, 2021).

The green economy has recently spread widely in Europe and emerged as a tangible solution to many environmental issues in recent years. The many political commitments to the green economy, the creation of guidelines for the efficient use of resources, the financing of innovation and research in the creation of new technologies and the promotion of information campaigns are some of the difficulties associated with the green economy (Dogaru, 2020).

One of the main objectives of sustainable development has been to promote economic growth while preserving environmental quality, which aligns with the aspirations of a green economy. The ecological implications of economic growth, especially in developing countries, have been the subject of much study in recent decades. Economic growth has become increasingly important for countries to build their infrastructure in recent years. Therefore, there is a conundrum for both environmentalists and economists regarding the relationship between economic progress and environmental effects. The main goal of many studies has been to determine the relationship between environmental degradation and economic growth, with varying degrees of success. Numerous studies show that environmental protection is negatively affected by economic growth. Consequently, the strength of economic growth is perceived as a catalyst for environmental degradation, especially during the initial stages of growth when economies are mainly dependent on oil and gas, as observed in the context of N11 nations (Esily *et al*., 2022), for Bangladesh (Voumik *et al*., 2022), for MENA region (Muhammad, 2019), for top African suppliers of natural gas (Esily *et al*., 2023).

Contrary to various claims, the main goal of the Green Growth Strategy is to support and strengthen economic expansion by recognizing the importance of natural capital in national aspects and planning procedures. Strategies to achieve this goal include exerting pressure on innovation, promoting competitiveness and adequately valuing natural capital in its function as a factor of production (Endl & Sedlacko, 2012).

According to Allen and Clouth (2012), although the terms “green economy” and “green growth” have particular significance, they are concepts of the efforts of different organizations and target audiences. Their differences have become blurred and they are

often used interchangeably. However, in today's world, it is challenging to support such a strategy categorically.

A sustainable economy and society with zero carbon emissions, where all energy comes from naturally replenishing renewable resources, is known as a "green economy". Since today, a low-carbon economy still produces carbon emissions; it is, by definition, different from a green economy (Mkik & Mkik, 2020).

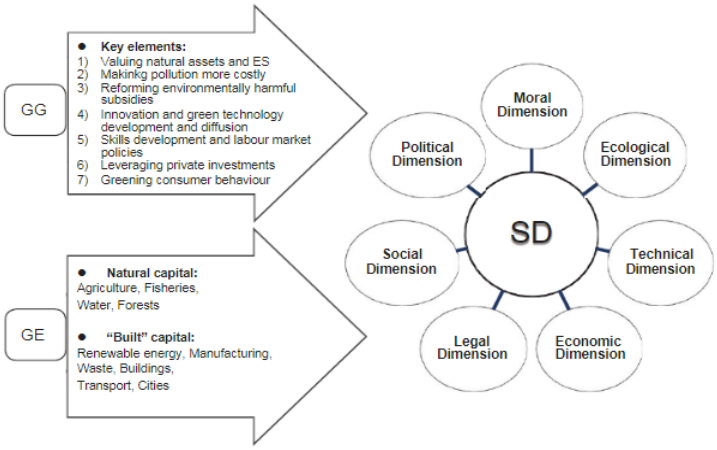

Figure 1. Green growth - green economy - sustainable development model
Source: Kasztelan (2017)

Nowadays, from the perspective of mutual feedback, it is necessary to examine the relationships between the three most important concepts, namely, sustainable development, green growth and green economy. Previous methods largely ignored the mutual functioning of the ideas under analysis in favor of focusing on competitive interactions (Kasztelan, 2017).

2.1. Meta-analysis of research

In this part, many scientific works analyzed by the following authors will be examined, presented in tabular form and dealt with works with the same theme as ours.

Table 1. Meta-analysis of research

Authors	Title	Methodology	Findings
(Soundarrajan & Vivek, 2016)	Green finance for sustainable green economic growth in India	Panel data	Based on the results obtained from this research, we can say that green finance is an essential element of green growth. The study also shows that India today has the opportunity to grow in a way that reduces the costs of environmental degradation, which, in turn, presents a wide range of opportunities for the Indian financial sector.
(Janicke, 2012)	Green growth: From a growing eco-industry to economy	Panel data	This research analyzes green growth as an essential component. Many elements have been discussed within the framework of this research, which also deals with radical "de-growth" in products and processes that harm the long-term conditions of living and production. This research describes some cases of best practices of "green growth".

(Abid *et al*., 2022)	Green growth and sustainable development: dynamic linkage between technological innovation, ISO 14001 and environmental challenges	Panel data	This research shows that technological innovation is significantly associated with green growth. However, among the many environmental challenges, energy consumption poses a barrier to developing green growth, as fossil fuels rather than renewable sources dominate the energy mix. The research findings recommend a much-needed policy suggestion to address environmental challenges while promoting the development of green growth in Pakistan.
(Kurniawan & Managi, 2018)	Economic growth and sustainable development in Indonesia: An assessment.	Linear regression	This research analyzes Indonesia and concludes that GDP per capita growth does not necessarily indicate sustainability. Despite these challenges, sustainability has improved slightly due to increasing production levels and human capital. Indonesia needs to increase its investment at a wealth growth rate to return to sustainable growth. It must also reduce its resource extraction to levels that its productive base can sustain.
(Bartelmus, 2013)	The future we want: Green growth or sustainable development?	Meta-analysis	This study discusses green growth and environmental sustainability. Sustainability is the focus of economic sustainability, based on the total wealth utilized in creating consumer goods and services. Therefore, the reality test of measurability suggests emphasizing green growth over idealistic concepts of holistic development and human well-being.
(Fernandes *et al*., 2021)	Green growth versus economic growth: Do sustainable technology transfer and innovations lead to an imperfect choice?	Country-level aggregated data	This study's findings show that sustainable innovation and technology transfer are two components that drive green growth, which in turn drives economic growth. The results offer new perspectives on the trade-off between financial and green growth and have several managerial and policy implications.
(Sohag *et al*., 2019)	Green economic growth, cleaner energy and militarization: Evidence from Turkey	Autoregressive Distributed Lags (ARDL)	The research results show that technological innovation and clean energy are two of the leading indicators of the long-term promotion of GGE. In the long term, militarization is determined to be detrimental to GGE and the Turkish economy. The study also finds that, over time, there has been an unbalanced adjustment in the effects of population density, militarization, technical advancement and cleaner energy on GGE.

Source: Data analyzed by authors (2025)

3. Scientific research methodology and econometric model specification

The purpose of this paper is to analyze the impact of green economy development on economic growth and environmental protection. For the realization of this paper we will use secondary data from the World Bank, International Monetary Fund, Eurostat, OECD and others to conduct the research. Also, in the literature review part, we will focus on works by different authors and relevant books by experts in the field of economics. Also, we will focus on various international conferences, numerous reports and safe resources from the Internet. The study will use panel data covering 19 years (2005-2023). For data processing, we will use the STATA software program. The importance of the

research lies in its aim to provide accurate and sustainable results that can shed light on the green economy and environmental sustainability. The variables included in this research are the dependent variable (GDP) and the independent variables (Gross Fixed Capital Formation, Green Growth Economy, Environmental tax, Population, Employment).

The data will be processed in the STATA program and to prove the validity of the hypotheses of this study, we will apply the following statistical tests: descriptive statistics, correlation analysis, linear regression, random effect, fixed effect, Hausman - Taylor regression and GMM. Arellano Bond Valuation Model, Generalized Valuation Equations (GEE Model), Heteroscedasticity test, VIF test and Tests of normality

The hypothesis of the study is:

H0*: The development of the green economy does not significantly influence economic growth or environmental protection in EU countries.*

H1*: Developing green economy significantly influences EU countries' economic growth and environmental protection.*

The research questions of the research are:

1. How does the green economy impact EU countries' economic growth and environmental protection?

2. How does implementing green economy policies influence environmental protection outcomes in EU countries?

3. Is developing the green economy key to achieving the EU's climate and energy objectives?

Table 2. Description of the variables included in the econometric models

Variables	Description of variables	Data source
Dependent variable (Y)	Gross Domestic Product (% GDP)	Annual Reports of the Bank World (2005-2023)
Independent variable (X1)	Gross Fixed Capital Formation (% of GDP)	Annual Reports of the Bank World (2005-2023)
Independent variable (X2)	Green Growth Economy (annual %)	Annual Reports of the OECD (2005-2023)
Independent variable (X3)	Environmental tax (%)	Annual Reports of the OECD (2005-2023)
Independent variable (X4)	Population (%)	Annual Reports of the Bank World (2005-2023)
Independent variable (X5)	Employment (%)	Annual Reports of the Bank World (2005-2023)

Source: Data analyzed by the authors (2025)

The econometric model that will be used in this study is specified as follows:

$$GDP = \beta 0 + \beta 1GFCF + \beta 2GGE+ + \beta 3ENVT + \beta 4POP + \beta 5EMP + \gamma it \quad (1)$$

Where:

GDP *- Gross Domestic Product*
GFCF *- Gross Fixed Capital Formation*
GGE *- Green Growth Economy*
ENVT *- Environmental tax*
POP *– Population*
EMP *–Employment*

4. Results

The results will be presented in this chapter through econometric analysis. In this part, the hypotheses presented in the research will be tested and we will try to get answers to the research questions presented earlier. This part will analyze descriptive statistics, correlation, linear regression, fixed effect model, random effect model, Hausman Taylor Estimation, GEE Model and GMM Model, Heteroscedasticity test, VIF test and normality tests. All these results will be extracted through the STATA program.

The following table presents descriptive statistics for the variables included in the research, analyzing the number of observations, the average, the standard deviation, the minimum and the maximum of the variables.

Table 3. Descriptive statistics for the variables included in the econometric model

Variables	Obs.	Mean	Std.Deviation	Minimum	Maximum
GDP	512	2.13203	4.055562	-14.8	24.5
GFCF	513	22.03938	4.351303	10.7	54.3
GGE	513	3.125002	2.117334	2.252756	12.07926
ENVT	513	3.656415	2.958081	2.126923	12.36333
POP	513	15.81791	1.351482	12.90878	18.25205
EMP	513	53.47096	5.335439	37.4	63.7

Source: Authors' calculations in the Stata program (2025)

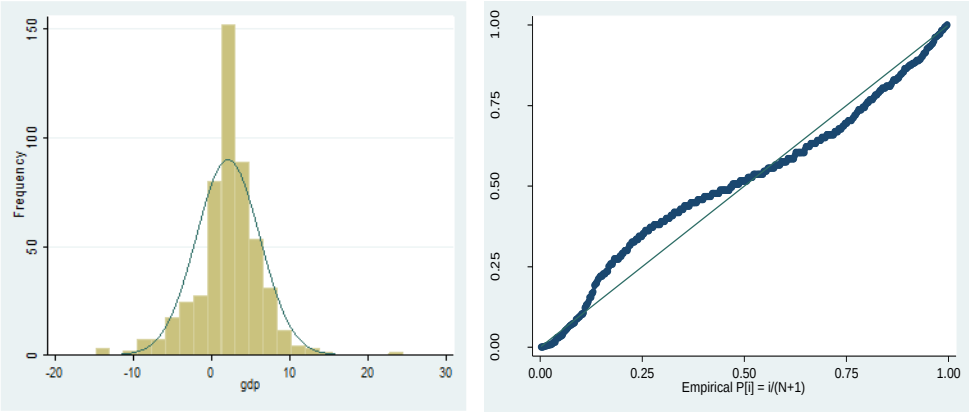

Figure 2. Graphic representation of the histogram
Source: Authors' calculations in the Stata program (2025)

The table presents descriptive statistics for six variables in an economic model, including GDP, GFCF, GGE, ENVT, POP and EMP. Most variables have 513 observations, except for GDP (512) and show varying levels of dispersion, with EMP having the highest mean (53.47) and GDP having the highest standard deviation (4.05). The minimum and maximum values indicate significant differences, such as a negative value for GDP (-14.8) and a high maximum for GFCF (54.3). Overall, the table provides an overview of the distribution and variation in the data.

The histogram illustrates the distribution of GDP, showing a concentration of values around zero, indicating a mean close to zero. The distribution appears relatively symmetric, with a few extreme values ranging from approximately -15 to 25. The overlaid curve suggests that the GDP data roughly follows a normal distribution, though slight

deviations are observed in the tails. The graph highlights a central clustering of GDP values with some notable outliers.

Table 4. Correlation analysis for the variables included in the econometric model

Variables	GDP	GFCF	GGE	ENVT	POP	EMP
GDP	1.0000					
GFCF	0.2464	1.0000				
GGE	0.1199	0.3158	1.0000			
ENVT	-0.1359	-0.0319	-0.2362	1.0000		
POP	0.0761	-0.0499	0.0462	0.0000	1.0000	
EMP	0.0618	0.0196	-0.1070	0.0019	-0.0534	1.0000

Source: Authors' calculations in the Stata program (2025)

The correlation between GDP and GFCF is positive (0.2464), indicating a moderate relationship between investments and economic growth. This suggests that an increase in investments has a positive impact on GDP. The correlation between GDP and GGE is positive but weak (0.1199). This indicates that a green growth economy has a small and insignificant impact on GDP. The correlation between GDP and ENVT is negative (-0.1359), suggesting an inverse relationship between GDP and environmental variables. This may imply that economic growth is associated with a deterioration in environmental conditions. The correlation between GDP and POP is positive but very low (0.0761). This indicates that population growth does not strongly impact economic growth. The correlation between GDP and EMP is positive but very low (0.0618). This suggests that the relationship between employment and economic growth is minimal in this model.

Table 5. Econometric results and empirical findings of the study

Variables	Linear Regression	Random Effects - GLS Regression	Fixed - Effects Regression	Hausman - Taylor Regression	GEE Model	GMM Model
GDP	-	-	-	-	-	-
GFCF	0.2239214 (0.000)***	0.2351424 (0.000)***	0.2628115 (0.000)***	0.2706492 (0.000)***	0.2299889 (0.000)***	0.202183 (0.003)**
GGE	0.1736623 (0.034)**	0.1747778 (0.030)**	.1763482 (0.030)**	0.1796227 (0.024)**	0.1737984 (0.031)**	0.1445552 (0.077)**
ENVT	0.1736623 (0.135)	0.087237 (0.133)	.0873593 (0.140)	0.0842827 (0.143)	0.0881978 (0.127)	0.0502629 (0.536)
POP	-.3726226 (0.005)**	-.3660918 (0.023)**	.4478486 (0.689)	-6.170489 (0.055)**	-.3642229 (0.015)**	-.2054595 (0.904)
EMP	0.013212 (0.708)	0.0123078 (0.762)	1.116479 (0.056)**	0.0005416 (0.991)	0.8885157 (0.660)	6.226915 (0.201)
_cons	1.518689 (0.622)	1.215206 (0.738)	-16.05453 (0.483)	11.47616 (0.232)	-1.574121 (0.855)	-24.54672 (0.459)

Source: Authors' calculations in the Stata program (2025)
Explanation: P-values are shown in brackets: *** indicates statistical significance at the 1% level; ** indicates statistical significance at the 5% level and * indicates 10% statistical significance
Note: GDP - Gross Domestic Product, GFCF - Gross Fixed Capital Formation,
GGE - Green Growth Economy, ENVT - Environmental tax, POP - Population, EMP – Employment

The following is the analysis of statistical tests performed through the STATA program, such as linear regression, random effect, fixed effect, Hausman-Taylor regression, GMM Model-Arellano Link Estimation and Generalized Estimation Equations (GEE Model).

$$GDP = \beta 0.2706492 + \beta 1.1796227 + \beta 2.0842827 + \beta 3.0005416 + \beta 4\text{-}6.170489$$

$$+\beta 50.0005416 + \gamma it \quad (2)$$

This research's results will be interpreted through Hausman-Taylor regression because this model combines the advantages of regression with fixed and random effects, including internal and external variables. The coefficients for most variables are statistically significant at 1%, 5% and 10%, providing valid interpretation results.

β0 - If all other factors are constant, GDP will be 11.47616 units.

β1 - If GFCF increases by one unit, holding other variables constant, GDP will grow by 0.2706 units. This statement is correct since the p-value is 0.000, within the 5% statistical significance level. An increase in gross fixed capital formation, as an indicator of investment, improves the economy's productive capabilities and stimulates the development of key sectors. This leads to economic growth through job creation, increased efficiency and greater economic output.

β2 - If GGE increases by one unit, holding other variables constant, GDP will grow by 0.1796 units. This statement is correct because the p-value is 0.024, within the 5% range. The green growth economy contributes positively to GDP by promoting policies and initiatives that improve economic efficiency and environmental sustainability. This increase suggests that focusing on renewable resources and clean technologies can significantly impact financial performance.

β3 - If ENVT increases by one unit, holding other variables constant, GDP is expected to grow by 0.0848 units. The statement is not statistically significant, as the p-value is 0.143, above the 10% threshold. Although environmental factors can contribute positively to economic growth through sustainable development, the impact in this model is not significant. This may indicate a lack of adequateecological policies directly contributing to GDP.

β4 - If the population increases by one unit, holding other variables constant, GDP will decrease by -6.1705 units. This statement is correct since the p-value is 0.055, within the 5% confidence interval. This result suggests that population growth can pressure existing resources and infrastructure, negatively affecting GDP. A rapid increase in population without an equal rise in investment and services can result in a decline in productivity.

β5 - If employment increases by one unit, holding other variables constant, GDP will grow by only 0.0055 units. The statement is not statistically significant, as the p-value is 0.991, well above the 10% threshold. The relationship between employment and GDP is not essential in this model. This may imply that the impact of employment depends on the quality of jobs and the efficiency of the workforce, not just on the overall level of employment.

The results of the VIF test show that all independent variables in the model have very low VIF values (ranging from 1.01 to 1.21), with an average of 1.09. These values indicate a lack of significant multicollinearity between the variables, suggesting that the independent variables are not highly correlated. This implies that the model is stable and

does not have substantial multicollinearity issues, providing more excellent reliability to the regression results.

Table 6. VIF test

Variable	VIF	1/VIF
GFCF	1.13	0.881764
GGE	1.01	0.990934
ENVT	1.02	0.983299
POP	1.06	0.942082
EMP	1.21	0.826177
Mean VIF	1.09	

Source: Authors' calculations in the Stata program (2025)

Table 7. Heteroscedasticity test

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity H0: Constant variance Variables: fitted values of GDP
Chi2 (1) = 0.14
Prob > chi2 = 0.5205

Source: Authors' calculations in the Stata program (2025)

The results of the Breusch-Pagan test for heteroskedasticity show a p-value of 0.5205, which is greater than 0.05, suggesting that there is no firm evidence of heteroskedasticity. This means that the hypothesis (H_0), which assumes a constant variance of the errors, cannot be rejected. Therefore, the variance of the errors appears to be steady and the model does not have issues with heteroskedasticity, making it more reliable for interpretation.

Table 8. Tests of normality

Skewness/Kurtosis tests for Normality				
Variable	ObsPr (Skewness)	Pr (Kurtosis)	adj chi2 (2)	Prob>chi2
resid	512 0.0001	0.0000	55.03	0.0000

Source: Authors' calculations in the Stata program (2025)

The Skewness/Kurtosis test results indicate that the residuals do not follow a normal distribution. The very small p-values for skewness (0.0001), kurtosis (0.0000) and the joint test (0.0000) provide strong evidence against the null hypothesis of normality. This suggests the need for data transformation or statistical methods that do not assume normality.

5. Discussion

Based on the results of our study, we can observe many essential elements related to the green economy, economic growth and environmental protection. Initially, based on the analyses carried out, we see that the green economy has a positive impact on economic growth, so with the growth of the green economy, we automatically have economic

growth for EU countries. Regarding environmental protection and economic growth, we see that ecological protection affects economic growth, but in our case, not at a very high level due to the non-inclusion of some other indicators by the analyzed countries.

Based on many other types of Research, we see that the green economy has an impact on environmental protection; we have also seen this in the study by the author Kasztelan (2018) who analyzed Green Growth, Green Economy and Environmental Sustainability, where he concluded that these three concepts are interconnected and have a positive impact. In addition to this study, we also have the study by the author Janick, 2012, who analyzed "Green Growth: From a Growing eco-industry to Economic Sustainability". This also concluded that the green economy positively impacted environmental protection. Also, many other authors analyzed these elements and had different conclusions in this context.

Another research related to our research and analyzing the relationship between a green economy and economic growth was analyzed in Turkey by the author (Merdan, 2024) who used as independent variables in the research: renewable energy production, consumption, solid waste and wastewater while as a dependent variable of economic growth, analyzing the period between 1980 and 2022. This research aimed to discover the causal relationship between the green economy and economic development. Before the causality analysis, the stationarity levels of the data set were assessed with ADF. From the data analysis, it was seen that there was no variance change problem in the model, no autocorrelation problem and multiple normal distributions were ensured. Then, the Johansen cointegration test was applied to determine whether the time series had a long-term relationship. After that, homogeneity/heterogeneity tests of autocorrelation and variance were performed to determine whether the VAR model contained a structural problem. The VAR Granger causality model test, error correction (VECM) and Wald block homogeneity test were used for short-run and long-run relationships.

The study results show that while the green economy positively impacts economic growth in the long run, specific hypotheses should be formulated with financial policies that should be followed in both global and local markets. The strategies presented for the transition to a green economy and the efforts towards it have a positive and significant impact on economic growth in the long term. Still, the same cannot be claimed for a short-term period. Still, in the future, advances in scientific and technological progress and overspecialization will inevitably have positive consequences on global and domestic sustainable development in the short term.

The concept of a green economy, the primary strategy of sustainable development, is essential in eliminating conflicts between environmental concerns and economic goals. The authors (Babacan *et al*., 2023) in his study analyzed the purpose of measuring and evaluating the performance of the green economy of the 20 founding countries of the OECD. In the research, a green economy index was calculated for 2014-2018 based on numerical data of 23 variables, used in the framework of 3 main headings: economic, social and environmental, which are thought to represent three dimensions of the green economy. The method used to evaluate these variables is SWARA. According to the results obtained, it can be said that the performance of the green economy of the 20 analyzed countries has increased in the period under review. Positive economic and social development developments play a significant role in this increase in performance.

Countries can increase their Green Economy Index score by improving environmental criteria and developing economic and social criteria. Based on this result,

improvements should be made in energy criteria, which increase environmental scores and indirectly or directly affect economic and social scores.

The authors Nacu and Jercan (2023) conducted another study. This paper aimed to analyze the evolution of the environmental economy for the EU member states. Nowadays, governments and corporations are committed to protecting the environment and promoting sustainable economic development through various programs or regulations. This research aims to observe the impact of the environmental economy on exports across the EU and to understand the process of a green transition.

A path towards green transition and environmental sustainability should not only be a goal for governments or researchers but should be more than that; it should become a way of life and security for future generations. Research shows that the future of economies is passing through environmental and green paths.

The analysis shows that EGSS exports are not only contributed by the major European economies. Romania, for example, contributed more than 6% in 2018 and its results are comparable to those of Austria and Denmark. Countries such as Italy and Germany have -2 % of Romania's result, which means sustainable economic models can be successfully implemented in developing economic systems.

However, there are challenges associated with trade in environmental goods and services, such as the risk of environmental dumping, which occurs when products that do not meet the environmental standards of the importing country are exported. Furthermore, some countries may use environmental regulations as non-tariff barriers to protect their domestic industries, which can limit the development of the ecological goods and services sector. Investing in environmentally sustainable practices, innovative technologies, a green economy, renewable resources and clean energy is essential to foster regional economies' recovery. Involvement in the EGSS and implementing sustainability practices help in economic diversification and prepare governments for competition with more powerful European and global markets.

In addition to these, our results showed that gross fixed capital and population also had a positive impact on economic growth. In contrast, employment did not have a significant effect on our case. Based on these analyses, hypothesis H0 was rejected and hypothesis H1 was accepted.

Also, in this research, we encountered some limitations that have more or less affected our results, such as the lack of data on variables in some countries, which has affected the lack of complete information in this case and the lack of literature because the green economy is something new and has not yet been widely studied by researchers.

6. Conclusions

This research applied econometric analyses to analyze the impact of green economy development on economic growth and environmental protection in EU countries. The results show that green economy development positively impacts both aspects, but the impact intensity varies based on the financial and environmental factors specific to each country.

Based on the results obtained, we see a positive relationship between the green economy and economic growth. Investments in sustainable technologies and renewable energy have helped to improve productivity and create new jobs. Also, policies that support green enterprises contribute to energy efficiency and reduce business operating costs. However, this positive impact depends on the level of infrastructural preparation

and the effectiveness of the policies implemented in the member countries. In some countries with limited financial or technological resources, the impact of a green economy on economic growth may be lower.

The green economy has also positively impacted improving environmental conditions through reduced greenhouse gas emissions and increased use of renewable energy. Policies that promote energy efficiency have produced significant environmental benefits. Furthermore, the impact of these policies varies depending on the level of investment in energy infrastructure and renewable sources. Some EU countries face challenges in achieving emission reduction targets due to their dependence on traditional energy sources and the lack of a sustainable energy network.

As a recommendation from our side, it would be that, given the impact of the green economy on economic growth and environmental protection, all countries should focus on a green economy towards an awareness of the importance of applying this economy and its benefits. Although, in our case, environmental protection and economic growth were not significantly related, we could still see their impact on different studies. Therefore, the main recommendation is the involvement of all countries in the green economy.

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