THE ROLE OF PRIVATE INVESTMENT IN THE TRANSITION TO A CIRCULAR AND SUSTAINABLE ECONOMY IN THE EUROPEAN UNION

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Abstract: *Based on the international pressure to achieve climate neutrality and the need to adhere to a sustainable economic framework, the EU faces dilemmas related to the efficient mobilization of capital for the circular economy. This article aims to examine the evolution of private investment at EU level in sectors related to the circular economy. By including economic aspects of sustainability-related investments, the research can provide new public policy models to accelerate the transition to a greener economy and in line with international standards.*
A comprehensive analysis of the interconnections between private investment on the economic performance of circular sectors and climate obligations is a key element of this article. In the first part of the research, we conducted a literature review that captures a unique combination of gross value added, international investment position, direct investment income and climate allocations by sector. In the second part of the article, we presented the investment situation at the European Union level, highlighting both the connections and discrepancies between direct, private and climate investments in relation to the performance of circular economy indicators. Last but not least, this paper contains an econometric analysis on investment dynamics in the European context, using a coherent range of economic and financial indicators, including EU direct investment income, by country and economic activity, Private investment and gross added value related to circular economy sectors, Investments in climate change mitigation, Investment by institutional sectors, Net international investment position and Environmental protection investments of total economy.
Our findings indicate a modest, but growing gap between private capital engagement and circular performance, alongside a notable disparity between the potential for international financing and its actual absorption in green sectors. The findings argue for fiscal stimulus measures and a cohesive policy framework to transform investment into a genuine catalyst for a sustainable transition.

Keywords: *private investment, circular economy, sustainable finance*

JEL Classification: *Q56, O44, E22*

1. Introduction

The most pressing problem facing society is the preservation and protection of the natural environment. This has a serious negative impact on ecosystems and, as a result, reduces both the individual economic potential of countries and the entire world community.

Investors' attention to projects for a transition to a circular and sustainable economy in the European Union is growing. This trend is due to several factors, including awareness of the financial risks associated with climate change, increased environmental regulation, and growing consumer and societal demand for more sustainable products and services.

Sustainable investments open new profit opportunities while contributing to addressing global environmental issues. Investments in renewable energy, waste management, sustainable transport and other green sectors are seeing increasingly higher returns and increased risk tolerance. However, the development of industrial production, transport and the agrarian revolution in agriculture, caused by the rapid scientific and technological progress of mankind, have had a negative effect on nature and led to significant changes in the natural cycle of ecosystems.

In general, the development trends of environmental investments are strongly influenced by climate and environmental risks that are intensifying as regulations tighten. Awareness of investors and consumers about this topic is becoming increasingly vehement as this area will play an increasingly important role in transforming the economy. Further expansion of private investment will be key to achieving sustainable development goals and shaping a low-carbon future.

Taking these aspects into account, we believe that private investment has an essential role in the transition to a circular and sustainable economy in the European Union. The study of specialized literature has opened new research horizons that target the impact of environmental protection investments of total economy, the dynamics of direct investment income at EU level, net international investment position and the evolution of investment for the total economy, government, business as well as household sectors at EU member states level. The research is complemented by the econometric analysis of the way in which private investment and gross added value related to circular economy sectors and Investments in climate change mitigation influence GDPcap. In other words, we have formulated three research hypotheses:

H1. Gross investment in tangible goods positively and significantly influences GDPcap.

H2. The value added to factor costs significantly and positively influences GDPcap.

H3. Private investment in climate change mitigation significantly and positively influences GDPcap.

2. Literature review

The literature review that we conducted starts with a bibliometric analysis of the field of circular economy investments. Thus, a sample was collected, the source of which was the Web of Science database, which was analyzed using the VOS viewer program, which allows grouping and network analysis of bibliometric information.
The first step was to analyze keywords such as “circular economy investment”, “environmental protection investments”, “EU investments” and “investments in climate change mitigation”. These keywords form the “identity” of this interdisciplinary field.

As the main method of data analysis using the VOS viewer program, the “co-occurrence” method was chosen, which groups keywords according to the degree to which they appear together in a single paper. Thus, the keywords form thematic groups. In the "scientific maps" below, clusters are marked in different colors, the size of each keyword is determined by the "total link strength" indicator, i.e. the strength of the connection of a given keyword with all others, and the lines reflect the connections between two separate keywords. The publication period was limited to 2000–2024, and it is worth noting that the number of journal articles and conference proceedings varies significantly.

First, we treated the subject of our study from a global point of view, focusing on "EU investment". To build a scient metric map, we took only those keywords that appeared in the sample at least 5 times, so 1688 terms were selected, from which 33 meet the threshold. A visualization of the research domain is presented in Figure. 1.

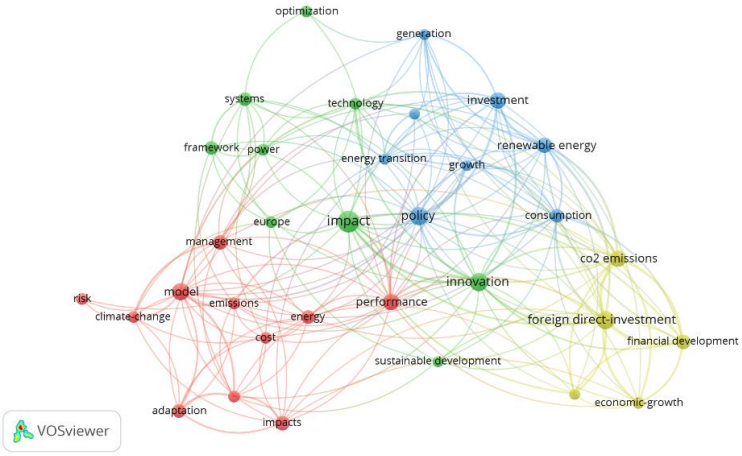

Figure 1: Bibliometric map of keyword “EU investment”
Source: Authors’ projection using VOSviewer version 1.6.17 in processing data extracted from the WoS database

The bibliometric map identifies four significant clusters, which can be designated as ‘’impact’’ and “innovation’’ (green), ‘’performance’’ and ‘’management’’ (red), “foreign

direct investment" and "CO2 emissions" (yellow), "policy", "renewable" "energy and investment" (blue).

The green cluster covers a wide range of concepts related to "sustainable development'', "system", "technology" and "power". The blue cluster, although it contains topics such as "growth" and "consumption", is primarily focused on issues such as renewable energy. The yellow cluster is quite compact and deals with "financial development'' and "economic growth''. Last but not least, the red cluster focuses on topics such as "climate change'', emission and adaptation. The next analysis includes "circular economy investment", and the final selection of keywords consists of 324 keywords.

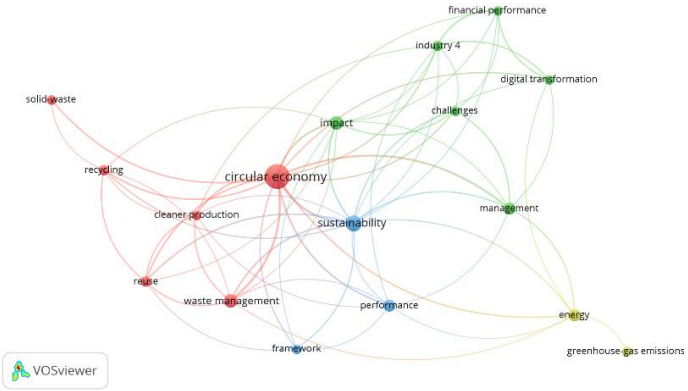

Figure 2: Bibliometric map of keyword "circular economy investment''
Source: Authors' projection using VOSviewer version 1.6.17 in processing data extracted from the WoS database

The visualization of the results is presented in Figure 2, where the size of the object reflects the total strength of the link, and the width of the lines reflects the strength of the link between two terms.

The analysis allows us to identify several clusters, which can be roughly designated as "circular economy" (red), "sustainability" (blue), "financial performance" (green), and "energy" (yellow). The interpretation of the clusters is based on the keywords found in them, however, it should be noted that this division is quite arbitrary, since both the clusters and the terms are interrelated. In the second stage, an analysis was carried out to understand the place of "environmental protection investments" in sustainable economy research. In this way, our search was limited to 894 keywords of which 38 met the threshold. The results of the clustering are presented in Figure. 3.

The results demonstrate that "environmental protection investments" are indeed a broad and diverse field of research. These areas include, first of all, "investments" (red cluster) and their impact on climate change, but also on the management policies that a company has. The second cluster, blue, includes "economic growth", "financial development" and "green finance". "Green financing" is the basis of sustainable economic growth, because it brings together "financial institutions", "environmental measures" and "economic development". Under green financing is

understood the financial services offered by companies for the purpose of improving the environment, mitigating global climate change and using resources more efficiently.

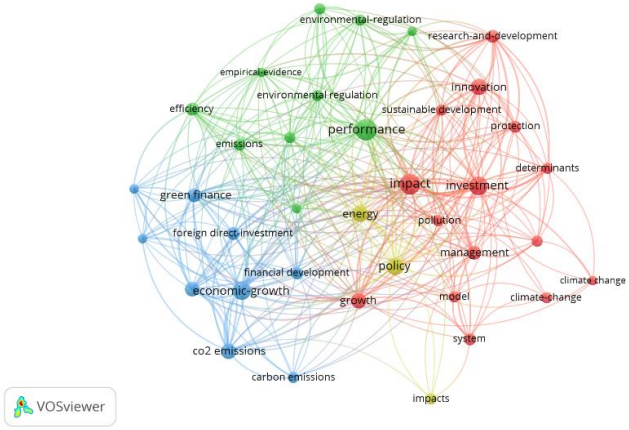

Figure 3: Bibliometric map of keyword "environmental protection investments''
Source: Authors' projection using VOSviewer version 1.6.17 in processing data extracted from the WoS database.

Thirdly, the research field also includes "performance" (green cluster), "efficiency", "environmental regulation" and "empirical evidence". The development of various environmental programs and the protection of the natural environment implies, in addition to respecting the principles of sustainable development, the application of legislative norms. Finally, the yellow cluster represents issues related to policy, energy and impacts. Finally, the last map analyzed has as its research keyword "investments in climate change mitigation''. Thus, we have 581 keywords, 17 meet the threshold. The results obtained are illustrated in Figure 4.

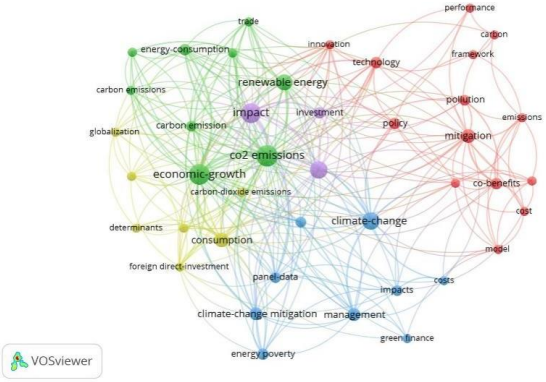

Figure 4: Bibliometric map of keyword "investments in climate change mitigation''
Source: Authors' projection using VOSviewer version 1.6.17 in processing data extracted from the WoS database

The most widespread cluster is the blue one, which focuses on “climate change” and “management”. The main nodes that we can notice are “climate change”, “climate change mitigation” and “green finance”. These are strongly connected to “economic growth” and “policy”. The red cluster focuses on “technology”, “policy” and “co-benefits”. The central nodes include “mitigation” and “pollution”. At the same time, we can notice a strong connection with “performance”, “innovation” and “cost”. The green cluster has “renewable energy”, “energy consumption” and “carbon emission” as main nodes. These are closely related to "impact”, “investment” and "technology". The yellow cluster targets “economic growth”, “consumption”, “foreign investment” and “globalization”. These are related to “carbon emissions”. Finally, the purple cluster has the words “impact”, “investment” and “C02 emission” at its center and presents itself as a central point of intersection with the other clusters.

The concept of a “circular economy” involves building economic activity on the principles of resource renewal and preserving the health of the social environment. ecological-economic system, which allows for efficiency at all scales: from households and small businesses to the global economy (Geissdoerfer, Savaget, Bocken, & Hultink, 2017).

According to experts from the (Ellen MacArthur Foundation, 2019) circular economy has a restorative and closed character, it involves creating a continuous cycle of development that preserves natural capital and increases its value, increasing the efficiency of resources due to the optimization of their use.

The development of a circular economy is associated with a special type of environmental investment - circular investment, appropriate to the criteria of the new sustainable (responsible) investment models. Circular investments usually aim not to obtain profit, but to return negative externalities from economic activity subjects. Such investments are socially responsible because they comply with the laws of development of society and the environment and ensure control over the global environmental problem (Santiago, Scavarda, Caiado, Santos, & Mattos Nascimento, 2025).

Circular investment is an investment in non-financial assets, which involves the transformation of production and consumption waste into a new resource of raw materials (European Investment Bank, 2020).

It is important to note that the formation of circular investments contributes to changing the very paradigm of investment in favor of the so-called transformative investments, or impact investments, which correspond not only to a certain level of economic expectations but also have the potential for social and environmental impact (Penna, Schot, & Steinmueller, 2021).

Circular investment is socially responsible because it complies with the laws of development of society and the environment and ensures control over the ecological debt and ecological footprint, from the reimbursement of negative effects from the economic activity of economic entities (Baratta, Cimino, Longo, Solina, & Verteramo, 2023).

The ultimate goal of the development of circular economy investment is the creation of a sustainable business, the activities of which help to cover not only the operating costs associated with the current execution of works, the provision of services, but also the implementation of investment projects that are consistent with

the ongoing policy of resource and energy conservation (Diaz, Reyes, & Baumgartner, 2022).

(European Commision, 2020) recently adopted a new action plan for the development of a circular economy. The plan was adopted in the framework of two other EU sustainability initiatives: the Green Deal and the New Industrial Strategy, which aim to achieve climate neutrality by 2050 and the sustainable use of natural resources.

3. Research methodology and tools

In our research, we used the most practical approaches to make the connection between the purpose and objectives of the research as easy as possible. Thus, we created a mix of methods for a general framework, classified according to certain specific criteria.

First, we performed a bibliometric analysis, based on which we developed specialized literature. The bibliometric relationships between the key concepts were illustrated in VOSviewer. Subsequently, we selected a Eurostat database that corresponded to the purpose of our work based on the selected dependent and independent variables. We limited the search to the countries of the European Union and to a period starting from 2010 and until 2023. For some of the selected variables, we performed a comparative analysis, due to the incomplete data provided and a small sample to analyze. However, we considered these aspects important for the present research and wanted to capture their evolution during the analyzed period through graphs made using Tableau software.

Finally, we also conducted an econometric analysis using STATA 13 software, applying a fixed-effects panel regression model to study the relationship between private investment and gross added value related to circular economy sectors, Investments in climate change mitigation and GDPcap.

4. Data analysis

Following the review of the specialized literature dedicated to the analysis of private investment in the transition to a circular and sustainable economy in the European Union, no works were found that examined the comparative evolution at EU level of EU direct investment income, Environmental protection investments of total economy and Investment by institutional sectors divided into Business investment, Government investment and Households investment. At the same time, we studied the intensity of the link between Net international investment position, Investments in climate change mitigation by NACE Rev. 2 activity, Investment and Gross value added as an integral part of Private investment and gross added value related to circular economy sectors with GDP per capita. In the first stage, it was necessary to decide on the database, the countries and the time interval. Thus, for the comparative analysis the selected time interval is between 2014-2023, the unit of measurement is Million euro, and the countries for which we found complete data are Belgium, Bulgaria, Czechia, Denmark, Germany, Estonia, Ireland, Greece,

Spain, France, Croatia, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden and Norway. Regarding the econometric analysis the selected time period 2005-2023, the unit of measurement is Million euro, and the countries selected according to the complete availability of data are Belgium, Bulgaria, Czechia, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Croatia, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland and Sweden. The data was collected entirely from Eurostat. The table below contains a brief description of the variables analyzed.

Table 1. Description of analyzed variables

Variables	Abbreviation	Description of variables
Private investment and gross added value related to circular economy sectors	PP1	„includes "Private investments", and "Gross value added" in three sectors: the recycling sector, repair and reuse sector and rental and leasing sector'" (Eurostat, 2025).
Net international investment position - annual data	PIGVA	„shows at a point in time the value and composition of: financial assets of residents of an economy that are claims on non-residents and gold bullion held as reserve assets, and liabilities of residents of an economy to non-residents'" (Eurostat, 2025).
Investments in climate change mitigation by NACE Rev. 2 activity	ICCM	„describes the statistical population is the national economy and includes corporations undertaking activities mitigating climate change" (Eurostat, 2025).
Investment by institutional sectors	IIS	„measures the share of GDP that is used for investment activities in the government, business and household sectors" (Eurostat, 2025).
EU direct investment income, by country and economic activity	DI	„encompasses all kind of cross-border investment made by an entity resident in one economy (direct investor) to acquire a lasting interest in an enterprise operating in another economy (direct investment enterprise)" (Eurostat, 2025).
Environmental protection investments of total economy	EPITE	Includes the following variables: „investment for the production of environmental protection services, consumption of environmental protection services, imports and exports of environmental protection services, transfers of funds for environmental protection'" (Eurostat, 2025)

Source: own elaboration based on data collected from Eurostat

First, we will address the issue related to the Net international investment position. The net investment position is an indicator that shows the result of many years of capital movement. The size of this indicator is the result of the globalization of the financial sector. At the same time, it indicates the connection between the accumulated trade deficit of the EU and the compensating factors in the financial balance. It should be noted that an analysis of the development and analysis of investments in the transition to a circular economy without considering the international investment position of the country would be incomplete. The graph below shows the average of Net EU international investment position from 2010 to 2023. The most worrying values are found in Ireland with -151,535 million euros, Greece with -137,121 million euros and Cyprus with -129.2 million euros. In contrast, the situation is relatively favorable for Malta with an average of 60.34 million euros, Belgium with 50.1 million euros and Luxembourg with 48.72 million euros.

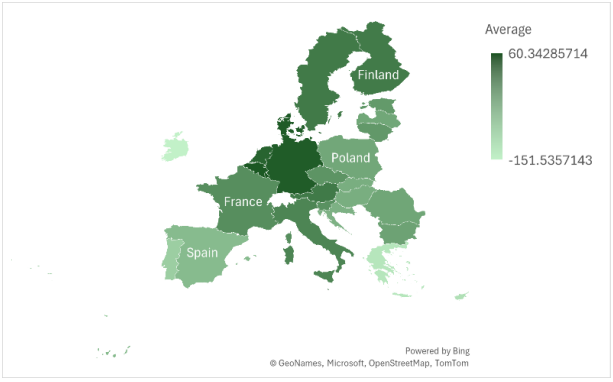

Figure 5: Average of Net EU international investment position from 2010 to 2023
Source: own elaboration in Microsoft Office Excel

The next indicator analyzed is Environmental protection investments of total economy.

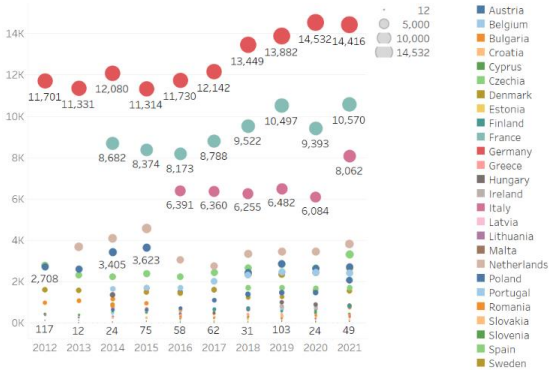

Figure 6: Environmental protection investments of total economy from 2012-2021
Source: own elaboration in Tableau 2025.1

This indicator is essential to study because it shows us the priority areas of use of foreign investments in financing environmental protection programs in basic industries, for the purpose of structural restructuring, their modernization and the prevention of possible environmental disasters. As can be seen in the graph below, Greece is in the best position with 14,416 million euros, with a considerable increase in EU funds for green investments, followed by Poland and Hungary. The lowest values are in Romania, Bulgaria and Slovakia, which have deficiencies in environmental investments.

Regarding Total investment, in the following graphic, it can be noted that we have grouped into Business Investment and Household Investment. The largest average in total investments is Business Investment compared to Household Investment. However, if until the outbreak of the COVID 19 pandemic we can observe an increasing trend, starting with 2020 we can notice a constant fall because of the increase in reluctance regarding investments.

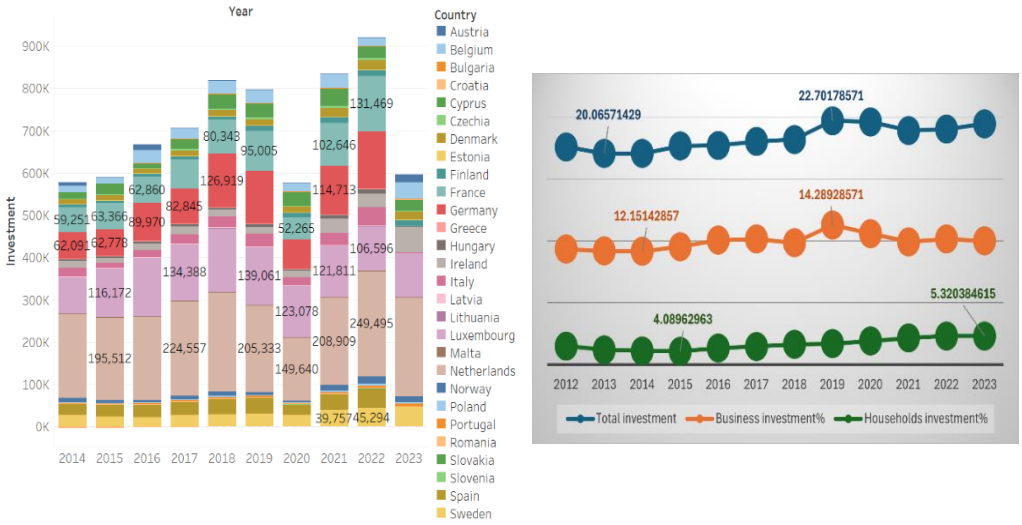

Figure 7: Total investment and EU direct investment income
Source: own elaboration based in Microsoft Office Excel and Tableau 2025.1

Last but not least, we analyzed EU direct investment income, by country and economic activity. A quick look at the graph below shows constant fluctuations, with a significant decrease in 2020 and a partial recovery by 2023. Inflation and new tax reforms made 2023 a year of uncertainty with a strong impact on the investment sphere. However, it can be noted that the highest values are found in Germany, France and Italy, while the lowest values are found in Croatia, Malta and Romania. For the econometric analysis, we selected independent variables Private investment and gross added value related to circular economy sectors, which we divided into two categories Investment (PP1) and Gross value added (PIGVA), respectively

Investments in climate change mitigation (ICCM), and the dependent variable GDP per capita (GDPcap).

First, we performed descriptive statistics of our variables. The basic descriptive statistics contain number of observations (obs), mean (mean), standard deviation (Std. Dev.), maximum (max) and minimum (min) of the specified variables for each year. Adding the detail option also allows you to output characteristic quantiles, several largest and smallest values, skewness and kurtosis coefficients. PP1 variable has the lowest mean values, and GDP cap has the highest mean values. Due to the fact that the distributions, although positively skewed, have very large non-normal extreme values and are affected by positive outliers, we logarithmized the data. The transition to the logarithm allows to reduce the asymmetry. Moreover, the transition to the logarithm in a few cases allows to bring the distribution of regression residuals closer to normal. Next, we will work with the logarithms of the variables PP1, PIGVA ICCM and GDPcap. We will note them in our research "ln_PP1", "ln_PIGVA","ln_ICCM" and "ln_GDPcap".

The histograms indicate positive asymmetries, ICCM and GDPcap have a long tail towards the right that is accentuated. ICCM also has leptokurtic distribution, and GDPcap has moderate kurtosis. PP1 and PIGVA are also similar.

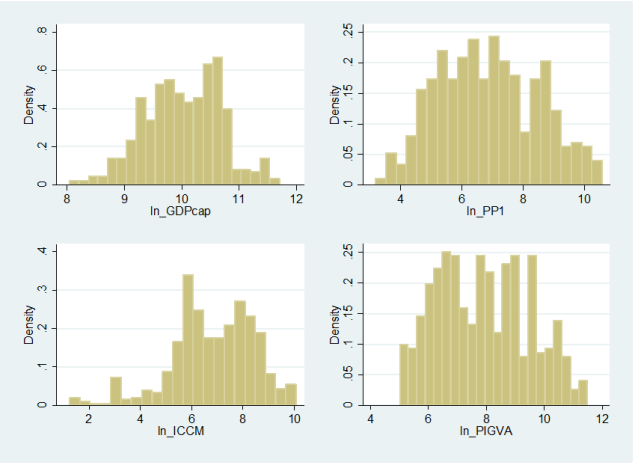

Figure 8: Histogram of ln_GDPcap, ln_PP1, ln_ICCM and ln_PIGVA
Source: own elaboration in SPSS 17.0

The boxplot presented shows that the most compact and stable indicator is GDPcap. ICCM and PP1 show the most fluctuations, with notable differences between observations, while PIGVA is the most balanced variable.

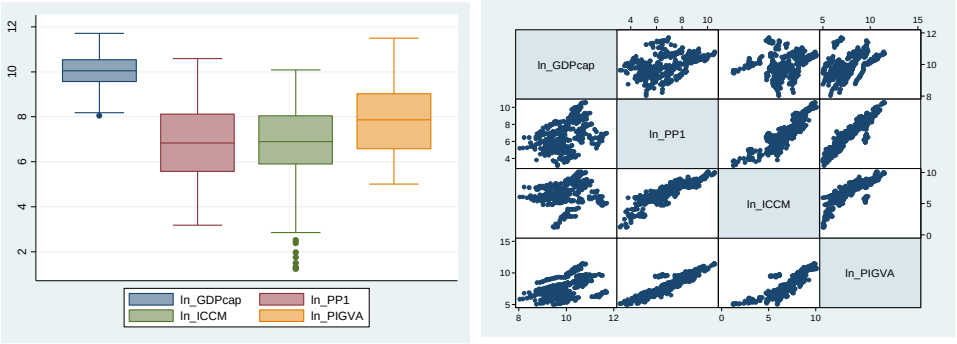

Figure 9: Boxplot and Scatterplot matrix of of ln_GDPcap, ln_PP1, ln_ICCM and ln_PIGVA
Source: own elaboration in SPSS 17.0

The scatterplot matrix shows us some strong correlations between the selected variables after logarithmization. From this we can deduce that our research hypotheses are graphically confirmed in the sense that public and climate investments, as well as value added, have a common evolution. Moreover, we can observe that as one of the variables increases, the other tends to decrease. In other words, there is an interdependence between investments and the indicators that support the transition to a circular economy.

Special tests of stationarity and cointegration for time-series panels prove to be more effective than their conventional time series counterparts. Using panel data allows us to work with smaller samples in the time dimension by increasing the amount of available data in the individual dimension, which reduces the likelihood of structural breaks and solves the problem of low-test power. Initially, panel data stationarity tests assumed of independence of subjects. Andrew Levin and Chien-Fu Lin proposed the first unit root test in panel data based on a simple first-order autocorrelation model of the form. Andrew Levin and Chien-Fu Lin formulated the null hypothesis as the presence of a unit root of the time series. In 2002, Levin, Lin, and Chu extended the work of Andrew Levin and Chien-Fu Lin and suggested that the alternative hypothesis is not only the stationarity hypothesis but also the homogeneity of the autoregressive root hypothesis. In other words, the hypothesis of the Levine–Lin–Chu (LLC) test is based on the homogeneity of the conclusion about the presence of a unit root in the dynamics of the variable: either the hypothesis of stationarity for all objects is rejected, or not (Levin, Lin, & Chu, 2002). The main limitation of the test is the fact that it assumes homogeneity of the autoregressive root, especially in the framework of macroeconomic panels (Westerlund, 2008).

STATA commands for panel data analysis have the prefix ‘’xt’’, which denotes the presence of both a structural ‘’x’’ component and a time ‘’t’’ component. Thus, to test stationarity, we applied the command ‘’Xtunitroot’’ and the results are presented in the tables below.

Table 2. Levin-Lin-Chu unit-root test

Command	Statistic	p-value
. xtunitroot llc ln_PP1-Levin-Lin-Chu unit-root test for ln_PP1		
Unadjusted t	-6.244	
Adjusted t*	-3.537	0.0002
. xtunitroot llc ln_PIGVA - Levin-Lin-Chu unit-root test for ln_PIGVA		
Unadjusted t	-7.702	
Adjusted t*	-6.003	0.0000
. xtunitroot llc ln_ICCM - Levin-Lin-Chu unit-root test for ln_ICCM		
Unadjusted t	-6.793	
Adjusted t*	-3.630	0.0001
. xtunitroot llc d_ln_GDPcap - Levin-Lin-Chu unit-root test for d_ln_GDPcap		
Unadjusted t	-20.059	
Adjusted t*	-12.314	0.0000

Source: authors' calculation in Stata 13

Autocorrelation was evaluated using Wooldridge's autocorrelation test for panel data. The results show that there is no autocorrelation in the panel, so we applied the ''xtserial'' command.

Table 3. Wooldridge test for autocorrelation in panel data

Command	F(1, 26)	Prob > F
. xtserial ln_GDPcap ln_PP1	372.971	0.000
. xtserial ln_GDPcap ln_PIGVA	323.482	0.000
. xtserial ln_GDPcap ln_ICCM	896.253	0.000

Source: authors' calculation in Stata 13

Next, because there is no autocorrelation, we applied the simple panel in the robust form to treat possible heteroscedasticity a priori. Thus, the tests for effects show that fixed effects are optimal, and the command used "xtreg, fe vce(cluster id_Country)". The results presented below contain: estimates of coefficients obtained by the least squares method (Coef.); standard deviations of estimates (Std.Err.), t-statistics (t-statistics tests the hypothesis that the corresponding coefficient in the regression is zero; t=Coef./Std.Err, the p-level of significance of the t-test is equal to the probability of erroneously accepting the hypothesis about the difference between the sample means when it is not true. In many studies, the p-level of 0.05 is considered an "acceptable limit" of the error level and confidence intervals for regression coefficients.

Table 4. Regression results – fixed effects models

Variable	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
. xtreg ln_GDPcap ln_PP1, fe vce(cluster id_Country)						
ln_PP1	0.3842	0.0669	5.7400	0.000	0.2467	0.5217
_cons	7.3825	0.4595	16.0700	0.000	6.4379	8.3271
sigma_u	0.6740					
sigma_e	0.1879					
rho	0.9279					
. xtreg ln_GDPcap ln_PIGVA, fe vce(cluster id_Country)						
ln_PIGVA	0.704	0.053	13.300	0.000	0.595	0.813
_cons	4.464	0.418	10.690	0.000	3.605	5.323
sigma_u	0.997					
sigma_e	0.128					
rho	0.984					
. xtreg ln_GDPcap ln_ICCM, fe vce(cluster id_Country)						
ln_ICCM	0.206	0.077	2.660	0.013	0.047	0.365
_cons	8.615	0.529	16.300	0.000	7.528	9.701
sigma_u	0.640					
sigma_e	0.224					
rho	0.891					

Source: authors' calculation in Stata 13

5. Results and discussions

The stationarity of the variables was tested in the panel analysis, by applying the LLC test. Thus, we tested the hypotheses according to which we rejected the null hypothesis H0 indicating that the panels contain a unit root, and the series is not stationary. The independent variables are stationary, with significant and positive values of the adjusted statistics, a fact confirmed unanimously by $p < 0.001$. However, the independent variable was not stationary, becoming so after applying the first log differentiation.

Autocorrelation was tested by using the Wooldridge test for panel data. According to the results, we can say that a first-order autocorrelation is present ($F > 300$; $p < 0.0000$). To remedy these problems related to standard errors, later in our analysis we used the methods of autocorrelation roughness. Autocorrelation and heteroscedasticity were estimated by regression models with fixed effects and robust standard errors. The coefficient for rho, in our case is ≥ 0.89 and justifies the

use of fixed effects models due to the fluctuations specific to each country analyzed. Thus, from the results of the analysis we can say that between PP1 and GDPcap there is a significant and positive association, with a coefficient of 0.385 ($p < 0.001$), and a 1% increase in PP1 leads to a 0.36% increase in GDPcap. ICCM has a positive effect and a moderate but significant relationship with GDPcap, the coefficient is 0.206, and p=0.013). The most intense relationship is between PIGVA and GDPcap, with a coefficient of 0.704, explaining over 70% of the variation in GDPcap within the analyzed countries.

In other words, all three research hypotheses are confirmed: H1. Gross investment in tangible goods positively and significantly influences GDPcap, H2. Value added at factors cost significantly and positively influences GDPcap.and H3. Private investment in climate change mitigation significantly and positively influences GDPcap.

6. Conclusion

In conclusion, the role of private investment in the transition to a circular and sustainable economy in the European Union can be explained by the link and influence of the impact of environmental protection investments of total economy, the dynamics of direct investment income at EU level, net international investment position and the evolution of investment for the total economy, government, business as well as household sectors at EU member states level. The econometric analysis validates how private investment and gross added value related to circular economy sectors and Investments in climate change mitigation influence GDPcap. The European Union has budgetary and private financing for environmental protection. Currently, traditional sources of financing have declined sharply. The COVID-19 pandemic has had a significant impact, leading to a reluctance to private investment and a reassessment of financing decisions. Moreover, the tightening of conditions for the implementation of targeted programs to eliminate the consequences of environmental accidents and disasters has led to strict reforms. Thus, there is a constant trend of decentralization of the investment process among investment sources. The share of investments in environmental protection financed from the state budgets of EU countries is decreasing. Most investments are financed from the own funds of enterprises and organizations, which today represent the main source of financing for investments in environmental protection.

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