Eco - innovation - a Factor for Increasing the Competitiveness of the Economy in the Context of Sustainable Development

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ABSTRACT

Changes have their sources in external or internal factors and may only produce a slight adjustment from a functional and structural point of view or may lead to a redesign of its essence. Efficiency refers to the ability to identify the most appropriate services, the use of appropriate technologies and the introduction of the best procedure.

The only way to reduce environmental impacts is technological innovation and companies should consider the challenge of sustainable development by investing in the R&D sector.

This paper involves treating two key concepts, innovation as a pillar of the environment for sustainable development and competitiveness. In this context, special attention is given to sustainable innovation.

The beneficial effect of applying eco-innovation cannot be achieved without the existence of technological capacity. Adopting eco- efficient technologies involve substantial costs and requires a strong learning process based on R&D. So we considered it necessary to analyze the impact of the R&D sector on the eco-innovation based on econometric model, using linear regression. The analysis confirms the dependence of eco-innovation on R&D spending and in order to demonstrate the validity of this result we used the Eviews program.

KEYWORDS: *eco-innovation, R&D, competitiveness*

JEL CLASSIFICATION: *O10, O32*

1. INTRODUCTION

The literature of recent years complements the conceptual area of the new economy with elements closely related to sustainable development, especially those related to the structures appropriate to the realization of this type of economic growth, namely: educational structures that form skills for high tech products; strong R&D structures, also supported by public funds; industrial structures based on groups of vital industries in the creation and use of new technologies; adequate funding structures where an important place to hold the venture capital is able to combine the protection afforded by flexible, fair financing with the contribution of competent investors; regulations (incentives, fees) in the telecommunications industry that play a decisive role in the market for these technologies; complementary funds (product design, product development and training) that condition the success of ICT projects (Zaman, 2006).

According to the European Commission (2006), R&D activities are a precondition for innovation and sustainable development, stimulating the use of eco-technologies in order to achieve the desired results.

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One of the priorities of the Europe 2020 Strategy (COM (2010)) proposes sustainable growth by promoting a green and competitive economy by allocating 3% of EU GDP to R&D sector.

Hametner, Martinuzzi, Sedlako, Gjoksi and Endl (2010) highlights the role and potential contribution of the R&D sector to sustainable development. Investment in R&D is considered to be a factor driving a more competitive economy and a knowledge-based society. R&D growth efforts are largely linked to the concept of green upgrading.
According to the OECD (2010), innovation (creating new products/processes and technologies, their diffusion and application) requires economic growth that does not involve the degradation of natural resources.
Schiederig (2011) highlights the need for innovation, an innovation policy with little impact on the environment.

2. OBJECTIVE AND METHODOLOGY OF RESEARCH

The article aims to analyze the extent to which R&D influences eco-innovation. Thus, based on the linear regression, we highlighted the link between the two variables, checking the hypotheses regarding homoscedasticity, normal distribution, stationary of them through the Views program.

Using graphical representation, we have demonstrated that the R&D sector influences eco-innovation. The analysis confirms that countries investing in R&D specialize in technology-intensive activities.

In this sense, the usefulness of this research lies in the need to promote the eco-technologies that are the subject of many debates on sustainable development. However, promoting eco-technologies requires significant R&D funds to achieve qualitative performance. These performances involve the transformation of material resources into goods and services in such a way as to maintain the quality of the environment. Although there is continued promotion of the R&D sector, unfortunately many companies focus on developing products with a prolonged lifetime (repaired, renewed products).

Concerning the research methodology, the present study refers to a series of papers from the literature and the database provided by Eurostat.

2.1 Eco-innovation

Sustainable development is the one able to maintain its level of production without exhausting natural resources or destroying the environment. The strategic importance R&D investment in new technologies was recognized in Barcelona in 2002 at the Council of Europe, which reached an agreement on this investment, which was to reach 3% of P.I.B. By 2010, investing in research being vital to both private and public investors in view of the emergence of new green technologies. Organic technologies (eco-technologies) are those that in the production process or whose products have a negative impact on the environment by using recyclable raw materials, environmental pollution or increased energy efficiency. These technological processes reduce pollution by multiple mechanisms: strict control of air pollution, waste management and management, energy saving throughout the manufacturing process, the use of new recyclable raw material resources. They are very effective for sustainable development and prove their long-term worth, especially for countries with a strong desire to develop and the obvious need to protect their environment both locally and globally. The European

Union's Action Plan for Ecological Technologies (ETAP) aims at achieving the maximum potential for reducing pressure on natural resources, improving the quality of life for European citizens and boosting economic growth. Equally important for the European Union is assistance in transferring and implementing these strategies for developing countries but which have been members of the European community for less time. The EU's strategies are based on the existence of a significant untapped technological potential to improve the environment and contribute to healthy competitiveness and sustainable economic growth. Encouragement in the choice of green technologies in all procurement, investment and business decisions will have to be done, as it will take some time before they are aware of their economic potential to increase the sales market and reduce production costs. The Action Plan (ETAP) foresaw a number of measures to achieve this goal, which require a concerted effort by the European Commission, Member States and major investors to pursue research and implementation of eco-technologies

The negative impact on the environment can be reduced using existing technologies, but new technologies and solutions are always welcome. The energy sector, for example, will benefit from the use of new energy-efficient technologies and increased use of renewable energy resources. In any case, following the current consumer trend - driven largely by costs and availability - means that conventional energy sources such as oil and coal will continue to be an important source. If the climate continues to change, research will be needed, for example, for cleaner coal processing techniques or the discovery of new energy-efficient technologies. At both national and Community level, R&D benefits from the existence of funding programs for the development of green technologies. There is potential to improve the efficiency of existing funding mechanisms (European Investment Bank). Funding programs should especially support small and medium-sized businesses to acquire green technologies. At the same time, it is important to support the exploitation of research results and speed up technology transfer. The European Union encourages Member States to engage in developing their own R&D programs on green technologies. Research effort must lead to commercial applications and new eco-technologies must be supported in their emergence on the market. Potential users of new technologies need convincing proof of their qualities, performance information and their costs.

To this end, in July 2008, the European Commission launched the "Action Plan" which envisages sustainable industrial policy, sustainable production and consumption. It stimulates and promotes demand for high performance products and technologies. Between 2008 and 2013, nearly EUR 200 million was earmarked in Europe to finance projects that directly target eco-innovation.

Supporting innovation and facilitating its application to economic, social and environmental challenges is central to these efforts. Research in various areas such as agriculture, health, energy, etc., highlights the need to respect a set of principles that aim at guiding innovation towards sustainable development in order to successfully complete the implementation process of the national innovation process.

The innovation component that opens new paths towards sustainable development is eco-innovation. This implies significant progress towards achieving the sustainable development goal by reducing the environmental impact of production modes, increasing nature's resilience to environmental pressures, or achieving more efficient and responsible use of natural resources. By supporting new processes, technologies and services that green the economic activities, eco-innovation contributes to optimizing Europe's growth potential, while

responding to common challenges such as climate change or resource and biodiversity mitigation. It is also an opportunity for businesses, reducing costs, generating new growth paths and strengthening the image of the enterprise (European Commission, 2009).
The challenge of innovation for this century will be the more judicious exploitation of our resources, which means doing more with less and reducing the impact of our activities on the environment. Europe must be the first to respond to this challenge if we want to be competitive in a world subject to more and more resource constraints. Worldwide demand for environmentally friendly technologies, products and services is growing rapidly, even in these challenging times, being an area in which Europe has much to offer. This plan targets green jobs and green growth.

Environmental issues can only be solved by involving all parties. They are becoming more and more important internationally and the only solution is the cooperation of countries. The work of scientists leads to an in-depth understanding of environmental issues and must play an increasingly important role in sustainable development through the development of new technologies and the efficient use of natural resources. In order to create clear environmental benefits, new economic and social models are needed. Eco-innovation can be the solution to environmental issues. It encourages businesses to create sustainable solutions, use resources more responsibly and help them to reduce the negative environmental impact of the economy. Eco-innovation supports efforts towards green economic growth and represents the introduction, modification of a product, service or organizational change that reduces the use of resources and reduces the release of toxic substances throughout the life cycle. Therefore, it refers to all forms of innovation (technology, new products and services) and is closely related to the development and implementation of environmental technologies and eco-efficiency and eco-friendly concepts. There are technological solutions that respond to environmental challenges, but their implementation has many barriers. Removing these barriers should aim to promote research and investment. Research is crucial to harnessing the full potential of the dynamic industry sector and to generate innovation and jobs (European Commission, 2009).

The European Union is currently seeking a single European Research Area to help it by accessing it from any Member State, while encouraging cross-border cooperation. The European Parliament and the governments of the EU member states have come to the conclusion that investing in R&D is essential for the future of the continent so it has become one of the main objectives - Europe 2020. U.E. has a global responsibility for the environment, because the way of using resources globally affects the environment, the negative impact being not limited to Europe alone. In some areas, environmental pressure and the negative impact on public health and quality of life are steadily increasing. To make these processes reversible, major investments in the development and use of green technologies will be needed.

The innovative potential of the U.E. can ensure the development of the green technologies that other countries need for the development of their own economy while at the same time preventing the degradation of the environment. The production of goods, services and technologies for the prevention, correction of the environmental impact is extremely competitive on the world market.

Many controversies about environmental policy concern the costs of pollution control. Some specialists are of the opinion that some costs should not be lifted if policies are applied effectively. An important issue is how R&D and the adoption of new pollution control technologies will react to environmental policies and rules.

As far as our country is concerned - although it has considerable potential, a multitude of natural resources, important renewable energy sources, a substantial industrial base and development opportunities - it faces numerous environmental challenges.

In order to determine the measures to be adopted in the long term, it is necessary to establish the strengths and weaknesses as well as the anticipated opportunities and constraints, a SWOT diagnostic analysis being presented in the following table.

Table 1. SWOT analysis of eco-innovation in Romania

Strengths	**Weaknesses**
- The multitude of natural resources that contributes to energy independence; - Renewable energy sources; - High level of qualification and experience of the labor force; - The still low labor cost; - Industrial production.	- Reduced access to information and appropriate training tools; - Poor information on the environmental impact, benefits and associated risks; - Technological deviations from the EU. - Existence of industrial sectors using obsolete, environmentally friendly and energy-intensive technologies; - The high share of polluting industries in the Romanian industry; - The reduced volume of investments for modernization, upgrading; - Insufficient funding for R&D&I; - Reduced utilization of renewable resources.
Opportunities	**Threats**
– Possibility of accessing European funds; – Acquiring licenses for eco-technologies – and eco-products; – Romania's progressive alignment to the – EU target (3% share of R&D spending in GDP); – Developing new patents by research and entrepreneurial units (innovations that can then be disseminated in the economy and sold abroad); – Extension of R&D consultancy; – Promoting R&D&I activities by improving access to technology support services, courses, etc.; – Developing partnerships with companies active in the field of eco-innovation; – Clear, long-term strategy with clearly defined objectives to stimulate investment in eco-innovation; – Introducing advanced technologies or improving existing ones will help increase efficiency and lower costs; – Reducing the legal, bureaucratic obstacles to the efficient operation of the firm.	- Increasing pollution; - Climate change risks; - Socio-economic and political instability; - Increasing costs; - Increasing bureaucracy; - Poor transparency; - Low interest in accessing EU funds; - Relatively unstable legislative framework that does not stimulate sustainable development.

Source: Author's Concept

An analysis of the current situation regarding the environmental pillar of sustainable development allows us to formulate recommendations on the reorganization of production capacities, the forecasting of the necessary expenditures and the technological restructuring, summarized in the following table.

Table 2. Recommendations on eco-innovation

Recommendations	Effects envisaged	Implications
- Improving the communication and information system	- Increase the circulation of ideas by creating a free access network	- Integration into the system of an increasing number of participants (innovators, entrepreneurs, R&D units, consultancy offices, etc.)
- Environmental tax reform that will facilitate the introduction of green technologies	- Encourage eco-innovation	- Creating conditions and incentives; - Reducing low opportunity costs.
- Combining public and private capacities and capital (stimulating public-private partnership)		- Intensify the attraction of foreign direct investment in the development of sound innovation systems (most of the time foreign investments have a "win-win" character, meaning that the inherent risk is exceeded by the many advantages)
- Developing cutting-edge technologies	- Increasing the competitiveness of productive activities by applying these technologies	- Improvement of the national R&D system
- Improve the use of new techniques and technologies.	- Increasing the competitiveness of companies-	- Restructuring of the companies' activity to create the conditions indispensable for the superior capitalization of the new technologies

Source: Author's Concept

Environmental damage is all the more serious, so taking specific measures is more than necessary.

The specific instruments used to implement environmental policy relate to legislative, economic and technical instruments. The technical and legislative ones are implemented through the Environmental Law and the economic instruments are based on market laws and aim at changing the way of production and consumer habits (responsible attitude towards the environment), encouraging competition by implementing the best technologies aimed at improving the environmental performance, so as to reduce pollution.

Improving environmental performance involves a new type of policy based on the business-to-business relationship and on a type of regulation that takes into account mandatory minimum standards and targets within a stimulating innovation regulatory framework.

3. THE CORRELATION BETWEEN ECO-INNOVATION AND TOTAL R&D EXPENDITURE

Using graphical representation, we will demonstrate how R&D spending influences eco-innovation. The analysis targets 28 countries and the correlation between the two variables (using the total R&D expenditure as an independent variable, and as a variable dependent, eco-innovation, 2010-2015).

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0,838150892
R Square	0,702496918
Adjusted R Square	0,691054492
Standard Error	16,05252973
Observations	28

ANOVA

	df	SS	MS	F	Significance F
Regression	1	15820,24733	15820,24733	61,3940527	2,6061E-08
Residual	26	6699,776481	257,6837108		
Total	27	22520,02381			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	45,96275189	6,304000358	7,291045255	9,6286E-08	33,00469358	58,92081021	33,00469358	58,92081021
X Variable 1	27,310898	3,485562133	7,835435708	2,6061E-08	20,14622242	34,47557357	20,14622242	34,47557357

Figure 1. Summary output
Source: author's calculation

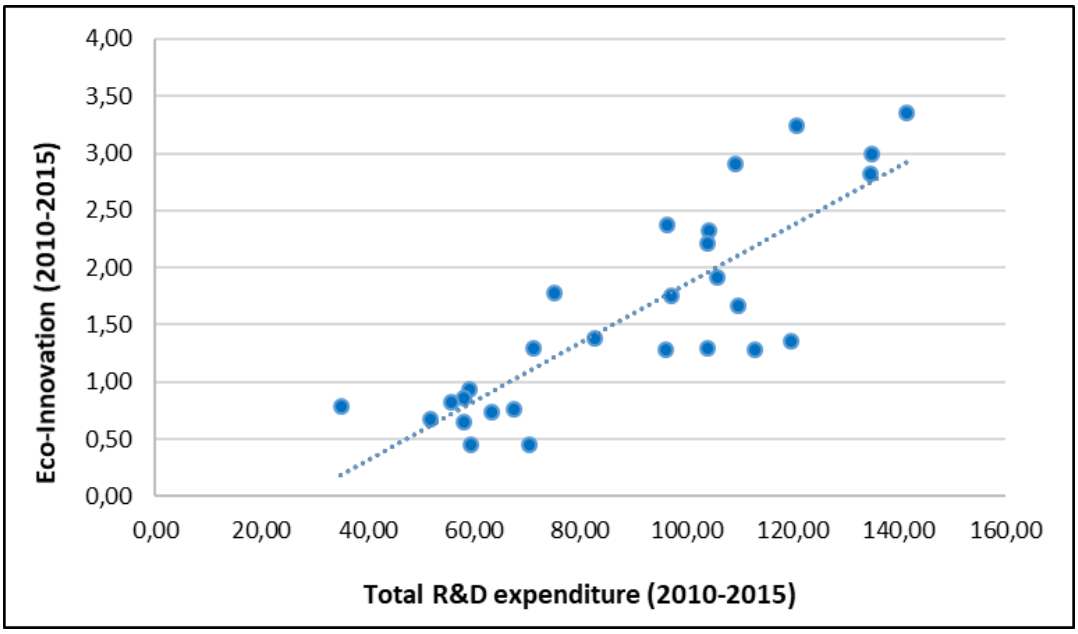

Figure 2. The impact of total R&D expenditure on eco-innovation
Source: Eurostat, Code tsdec320, t2020_rt200 (2010-2015)

The figure 2 confirms the positive correlation between the two variables, noting the high level of parameter R2 (0.70). This means the production of goods with the help of eco-technologies is determined by the performance of R&D activity and by the funds allocated to this sector by 70%. Hence, it is deduced that European countries investing in R&D tend to specialize in the production of eco-intelligent goods.

It is also confirmed that most European countries have the same trend, supporting eco-technologies in order to maintain their global competitiveness and promote sustainability.
In this context, we can define eco-innovation as a preventive approach to environmental policies that can be achieved through innovation that aim to reduce the environmental impact through eco-smart products.

4. RESULTS

The logarithmic form correlation equation corresponds to Y = 0.0257x - 0.7106 demonstrating that eco-innovation depends directly of total R&D expenditure.

A careful examination of Figure 1 confirms the existence of a strong R&D system in terms of the innovative process and its influence on the eco-technologies of production. Rather, countries investing in R&D activities with innovative performance generate significant changes in production.

Eco-innovation implies increased environmental and economic efficiency by reducing waste and polluting emissions. It offers new manufacturing opportunities through the use of "clean" production technologies. As a result, increasing competitiveness is largely the increase in R&D capacity.

Economic competitiveness and sustainable development rely heavily on resource efficiency which involves investing in green technologies or technological upgrades to meet emission standards and increasing eco-efficiency.

Although the correlation between the two variables is positive, it does not reveal the cause-effect relationship but indicates the link between them. Thus, in order to demonstrate the validity of the model we used the Eviews program for econometric analysis, using specific tests to verify hypotheses concerning model errors.

Breusch-Pagan-Godfrey tests the heteroscedasticity of errors (the property of errors of not having constant dispersion) in linear regression.

We analysed the hypothesis that residues are homoscedastic. The test has confirmed it because the coefficients are statistically significant at a significance level of more than 0.05 (Figure 3).

The normality of error distribution is tested with Jarque-Bera (Figure 4).
The test uses the moment μ_0 of the residues (u_t), based on the least squares method, and takes the form of:

$$JB = n\,[1/6(\mu_3^2/\,\mu_2^3) + 1/24\,(\mu_4/\,\mu_2^2 - 3)^2] + n\,(\,3/2 * \mu_1^2/\,\mu_2 - \mu_3\,\mu_1/\,\mu_2) \qquad (1)$$

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.501534	Prob. F(1,26)	0.4851
Obs*R-squared	0.529892	Prob. Chi-Square(1)	0.4667
Scaled explained SS	0.454751	Prob. Chi-Square(1)	0.5001

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 09/13/17 Time: 14:52
Sample: 1 28
Included observations: 28

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	323.8760	136.2735	2.376662	0.0251
TOTAL_R_D_EXPENDITURE	-53.36028	75.34735	-0.708190	0.4851

R-squared	0.018925	Mean dependent var	239.2777
Adjusted R-squared	-0.018809	S.D. dependent var	343.7892
S.E. of regression	347.0073	Akaike info criterion	14.60532
Sum squared resid	3130766.	Schwarz criterion	14.70048
Log likelihood	-202.4745	Hannan-Quinn criter.	14.63441
F-statistic	0.501534	Durbin-Watson stat	2.337996
Prob(F-statistic)	0.485128		

Figure 3. Breusch-Pagan-Godfrey Test

The null hypothesis of the test is H_0 (errors are normally distributed) contrary to the alternative hypothesis H_1 (errors follow another distribution).
The Jarque- Bera test confirms the normal distribution with a probability of more than 0.05.

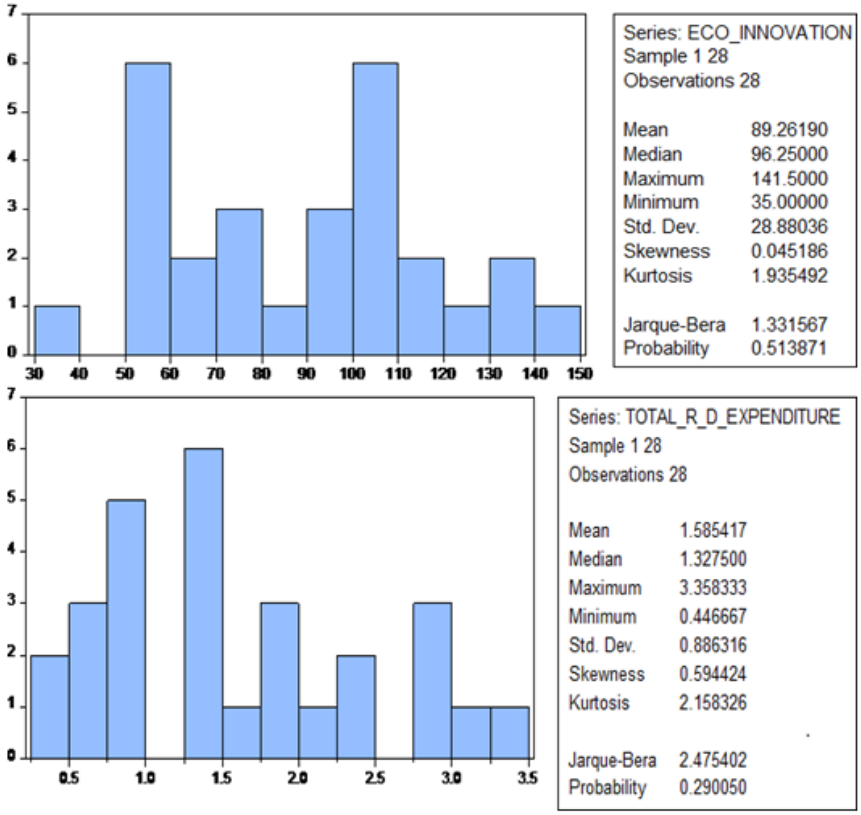

Figure 4. Jarque - Bera Test

Unity root test is the test that evaluates the probability of $\alpha = 1$ in the regression of form $Y_t = \alpha y_{t-1} + XA + e_t$, (X represents the set of other factors that determine the evolution of Y_t, A represents the vector of parameters attached to the variables, et represents the random variable).

The *Augmented Dickey-Fuller Test* (ADF) is one of the root unit tests that starts from the assumption that e_t errors are generated by the stochastic white-noise process. Using this test eliminates a possible self-correction of errors by introducing lags (lagged variables). So the test checks the non-static hypothesis (null hypothesis) vs. stationary.

In our case, assumptions about stationary were confirmed by the *Augmented Dickey-Fuller test (ADF)* by verifying the presence of the root of the Y-series (eco-innovation as dependent variable in our case) in the first difference (it is based on a regression equation including a constant (*intercept*), a trend and a constant (*trend and intercept*), none of the above (*none*). The test confirms the stationary of the variable.

We checked the presence of the root of the unit in the Y series expressed as the 1st order difference (1st Difference – Constant). T-Statistic (- 6.177) is higher than the critical value (-3.724), which shows that in 99% the variable is stationary. Also, the presence of the root of the unit in the Y series is expressed as the (1st Difference – Trend and Constant).T-Statistic (-5.516) is higher than the critical value (- 4.394), which demonstrates 99% probability of stationary. Regarding the presence of the unit root in the Y series expressed as 1st order difference (1st Difference - None), T-Statistic (- 6.278) is higher than the critical value (-2.660), which demonstrates the same hypothesis.

Null Hypothesis: D(ECO_INNOVATION) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.177157	0.0000
Test critical values:	1% level	-3.724070	
	5% level	-2.986225	
	10% level	-2.632604	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ECO_INNOVATION,2)
Method: Least Squares
Date: 09/13/17 Time: 14:04
Sample (adjusted): 4 28
Included observations: 25 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ECO_INNOVATION(-1))	-2.074410	0.335820	-6.177157	0.0000
D(ECO_INNOVATION(-1),2)	0.396932	0.190179	2.087151	0.0487
C	2.969256	6.933271	0.428262	0.6726

R-squared	0.786327	Mean dependent var	-2.253333
Adjusted R-squared	0.766902	S.D. dependent var	71.40542
S.E. of regression	34.47466	Akaike info criterion	10.03049
Sum squared resid	26147.05	Schwarz criterion	10.17676
Log likelihood	-122.3812	Hannan-Quinn criter.	10.07106
F-statistic	40.48060	Durbin-Watson stat	2.241164
Prob(F-statistic)	0.000000		

Null Hypothesis: D(ECO_INNOVATION) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 2 (Automatic - based on SIC, maxlag=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.516553	0.0009
Test critical values:	1% level	-4.394309	
	5% level	-3.612199	
	10% level	-3.243079	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ECO_INNOVATION,2)
Method: Least Squares
Date: 09/13/17 Time: 15:52
Sample (adjusted): 5 28
Included observations: 24 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ECO_INNOVATION(-1))	-2.892628	0.524354	-5.516553	0.0000
D(ECO_INNOVATION(-1),2)	1.021786	0.388853	2.627691	0.0166
D(ECO_INNOVATION(-2),2)	0.393029	0.207342	1.895562	0.0733
C	-16.80423	15.84733	-1.060382	0.3023
@TREND("1")	1.172832	0.937807	1.250611	0.2263

R-squared	0.845084	Mean dependent var	-2.027778
Adjusted R-squared	0.812470	S.D. dependent var	72.93210
S.E. of regression	31.58306	Akaike info criterion	9.926170
Sum squared resid	18952.30	Schwarz criterion	10.17160
Log likelihood	-114.1140	Hannan-Quinn criter.	9.991282
F-statistic	25.91175	Durbin-Watson stat	2.180685
Prob(F-statistic)	0.000000		

Null Hypothesis: D(ECO_INNOVATION) has a unit root
Exogenous: None
Lag Length: 1 (Automatic - based on SIC, maxlag=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.278424	0.0000
Test critical values:	1% level	-2.660720	
	5% level	-1.955020	
	10% level	-1.609070	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ECO_INNOVATION,2)
Method: Least Squares
Date: 09/13/17 Time: 14:07
Sample (adjusted): 4 28
Included observations: 25 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ECO_INNOVATION(-1))	-2.059514	0.328030	-6.278424	0.0000
D(ECO_INNOVATION(-1),2)	0.390327	0.186157	2.096761	0.0472

R-squared	0.784546	Mean dependent var	-2.253333
Adjusted R-squared	0.775178	S.D. dependent var	71.40542
S.E. of regression	33.85714	Akaike info criterion	9.958795
Sum squared resid	26365.03	Schwarz criterion	10.05631
Log likelihood	-122.4849	Hannan-Quinn criter.	9.985840
Durbin-Watson stat	2.236247		
Prob(F-statistic)	0.000000		

Figure 5. Augmented Dickey-Fuller Test

5. CONCLUSIONS

The importance of R&D activities was highlighted by the European Council through the Lisbon Strategy 2010, one of the objectives being to stimulate growth based on rising R&D spending. Encouraging increased R&D investment to boost competitiveness is one of the main objectives of the European Union. One of the seven initiatives of the Europe 2020 Strategy is the Innovation Union Plan which provides for removing barriers to innovation and supports sustainable growth by promoting a more resource-efficient, greener and competitive economy.

In this study we analyzed the importance of R&D activity. Based on statistical data for European countries, we can conclude that the performance of the R&D sector greatly influences the nature of the innovation process, the efforts and technological capacities needed for stable and sustainable economic growth. Sustainable growth/development aims to promote a competitive and resource-efficient economy, the development of new technologies (including green technologies) and the enhancement of competitive advantage.

We consider that, introducing eco-innovation in manufacturing processes requires financial and research resources but it is well known that its application reducing the negative impact on the environment and increasing the level of work safety. It can also lead to increased production capacity and greater flexibility in it, resulting in significant changes in product and market quality.

We consider that the analysis of this study contributes to clarifying an overall picture of the interdependencies between R&D funding and eco-innovation as a factor for increasing the competitiveness of the economy in the context of sustainable development. At the same time, it can be a basis for documenting future studies related to the subject.

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