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Inclusion of Sustainable Development Investments in EU Funded Projects

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Abstract

The global economic development from the last 3 decades was performed mostly by irrational using and drastically reducing of available resources. Maximizing the economic growth, a promoted tendency subsequent the industrial revolution, can no longer be sustained by our planet, while ignoring the environmental and social issues. In this regard, each State must implement all necessary measures to support sustainable development and any investment effort must contribute to the achievement of sustainable development, taking into consideration all its 3 dimensions: economic, social and ecological. This paper aims to present and analyze the factors that influence and determine the inclusion of sustainable development investments in projects financed by European funds, following an extensive survey conducted among 577 beneficiaries of the most accessed European financing programmes, including through developing specific regression models.

Keywords: Eligibility, European Funds, Financing Rate, Investment, Sustainable Development

Introduction

Protecting the environment and improving its quality are the current concerns of modern society, with an increasing importance, for counteracting and eliminating of the undesired effects of environment degradation. The current development rate cannot be sustained, a clear evidence in this regard being the World Overshoot Day on August 21, 2013: humanity, by this date, has already consumed all the resources that can be provided by the existing capacity of the planet for the year 2013.

The demands of humanity on natural resources have increased by 70% since 1970, whilst the condition of natural ecosystems worldwide has declined by 40% in the same period (WWF-UK 2013). Even if the environmental degradation has not yet reached a critical level for life threatening, it can cause a sharp decline in the quality of our world (Dachin et al. 2003).

Humanity has become gradually more aware of the environmental implications of its activities and is increasingly interested in reducing and correcting the adverse effects.

„The ultimate reference in strong sustainability is absolute in terms of ecological quality and a reasonable basic income for all, both definable from a general societal point of view." (Huppes and Ishikawa, 2009).

Although there are various methods of promoting environmental protection and sustainable development, it is necessary that each new investment include specific sustainable development activities. Scientific work in this field identified various internal and external factors that can influence the project stakeholders to choose alternative ways of developing the project: environment friendly and socio-responsible ways.

According to Adams and Frost (2008), an increasing number of organizations are currently integrating environmental and social indicators into their management practices (strategic planning, performance measurement, risk management and the decision-making process), but their impact varies in accordance with experience, available guides and legislation.

Erlandsson and Tillman (2009) have analyzed the factors influencing the management of environmental information within companies, identifying the impact of government institutions through legislation and fiscal facilities, of NGOs and environmental activists through their awareness campaigns, of modern technologies used by the competition, of standardization and certification organizations (the ISO 14001 type, for example), of sustainable development strategies, and of the financial savings brought on by the use of environment friendly technologies.

Public administration represents a key factor in incentivizing SMEs into improving eco-efficiency, both by using "command and control" tools such as laws and taxes, and via trade policy, public procurement, support for research and development, eco-innovation, environmental education, and by promoting volunteerism and protection for the environment, protected areas and biodiversity (Fernández-Viñé et al. 2012).

Although corporate environmental performance can have a negative impact on short-term financial performance (Horváthová 2010), companies that adopt eco-efficient strategies benefit from an increase in market value and manage to achieve lower operating costs (Sinkin et al. 2008).

Schoenherr (2012) studied the impact of some of the sustainable development measures applied in factories in different areas worldwide, and concluded that certifications such as ISO 14000, pollution prevention and waste management have a significant impact in developing a sustainable business model; on the other hand, recycling materials does not impact the cases analyzed.

In this paper we present the results of a survey conducted among 577 beneficiaries of EU funds, for studying the relationship between the use of grants and supporting sustainable development in such projects.

By applying multiple logistic regression models, we determined the most important factors influencing the beneficiaries of European funds in the making-decision process of including sustainable development investments in connection with eventual future projects.

Sustainable Development And European Funds

In the context of continuing environmental degradation, the European Union promotes switching to sustainable economic growth in the next decade, by employing specific financial instruments. The Europe 2020 Strategy is constructed on three priority areas that mutually support themselves: smart economic growth based on knowledge and innovation, sustainable economic growth through the promotion of low-carbon emissions and efficient

use of resources, inclusive growth, with high labor employment, social and territorial cohesion.

The ultimate goal of the strategy and support offered through financial instruments is proposed to be measured by a number of representative indicators at European level, to be fulfilled by 2020 (EC 2010):

- 75% of the population aged 20 to 64 should be employed;
- Investing 3% of EU GDP in research and development;
- "20/20/20" energy and climate goals (20% reduction of GHG emissions, achieving a 20% share of renewable energy, improving energy efficiency by 20%);
- Reduction of early school leavers under 10% and at least 40% of the younger generation should have an university degree;
- Decreasing by 20 million the number of people at risk of poverty.

Each Member State must assume its own targets for these indicators, so that together will contribute to achieving the European strategic objectives. Romania, after joining the European Union in 2007, has the possibility to access EU funds in order to support the development of the economic, administrative, social, educational, public and private infrastructure, and also protecting and improving the quality of the natural environment.

In these circumstances, our country has the resources needed to switch to a sustainable economy, involving an optimal economic growth and protecting the environment and natural resources. Investments financed by European funds can support both micro and macroeconomic development, and the sustainable development of each project. Obtaining these types of non reimbursable funds involves certain preparatory activities of the project: development of pre-feasibility studies, field surveys, feasibility studies, business plans, financial and economic analysis, assessment studies of the impact on the environment, etc.

Authors Shen et al. (2010) draw attention to the current manner that feasibility studies are compiled: the greatest importance is given to the economic performance, while the environmental and social aspects are treated poorly. They argue that it is necessary to integrate all three dimensions of sustainable development in such studies, and recommend focusing on methods to improve the quality of projects, security performance and environmentally friendly practices. The implementation of these practices depends on the involvement of several types of participants: the government through policies, laws, regulations, administrative reviews and approvals; the project beneficiaries, who lean towards the economic dimension; architects and consultants who can provide different alternatives and advice for the project implementation; suppliers and contractors who influence via the technology they bring to the project.

Sustainable development is a horizontal objective that is necessary to be met by applicants, and it is present in all European funding programmes, along with a second horizontal objective: the principle of equal opportunities and non-discrimination. Given that the generally accepted definitions of sustainable development refer to three dimensions: economic, social and ecological, we consider that it is incorrect to approach the sustainable development exclusively through the ecological dimension in the programmatic documents. This, along with similar other aspects, has significant influence on the decision of grants applicants to include sustainable development investments in projects.

Research Methodology

In order to study the relationship between the use of EU funds and supporting sustainable development through grants projects, a survey was conducted consisting in a

questionnaire having 33 specific questions, designed for applicants and beneficiaries of grants.

The questionnaire development was based on a preliminary identification of factors that can influence the researched issue, which were subsequent included in the questions or provided as options for answering:

- the financing program;
- the total value of the project, the grant value and the financing rate;
- the financed activity and the project stage;
- legal status of organization, the existence of quality management system and measures to improve the quality of environment, sustainable development measures currently applied;
- the existence of a strategy including sustainable development aspects, the environmental effects involved by the developed activity;
- previous experience with grants and involvement of this type investments in previous projects;
- method of project preparation, age and gender distribution of the preparing team;
- level of knowledge, sources of information on sustainable development;
- reasons for including activities that promote sustainable development in the project;
- types of activities that promote sustainable development in the project;
- achievement of the sustainable development objective across the financing program and the project contribution to it;
- limit sources for this type activities inclusion, incentives that promote sustainable development and intention to include or not such activities in future projects.

The factors were identified both by studying the literature and from a previous qualitative research based on focus groups conducted among beneficiaries and applicants for non reimbursable funds, as well as consultants and project developers to obtain such financing.

The structuring technique used for the questionnaire was the funnel one: from general to particular - the questionnaire was divided into 4 main sections: The project: general information; The beneficiary/applicant: general information; Knowledge on sustainable development; The project: specific information.

The addressing procedure of the questionnaire was:

- personally administrated or by telephone, by the inquiry operator;
- self administrated, the subjects filling directly the form and returning to the operator, using e-mail or fax.

There were obtained 577 completed questionnaires, and responses were centralized and processed using SPSS (Statistical Package for the Social Sciences), mainly using nonparametric tests (for ordinal, nominal and dichotomous data), according to the variables specific from the questionnaire. We present below the results of Chi-square correlation test, which is used to analyze the observed frequencies of a categorical variable against the expected frequencies.

Therefore, we analyzed all the categorical variables by applying the Chi-square test and all dichotomous variables by applying the binomial test. The observed frequencies of the variables were analyzed in comparison to the expected frequencies, which were considered equal for each category.

The testing hypotheses are:

Null hypothesis H0: no significant differences registered between the analyzed categories

Research hypothesis H1: significant differences registered between the analyzed categories

The observed frequencies' aberrations from the expected, theoretical ones presented in the Residual column show that the analyzed sample is characterized by:

- frequent total value and grant value projects between 100,000 and 200,000 Euros and 5,000,000 and 1,000,000 Euros (significantly higher frequencies than the theoretical ones);
- prevailing funding rate between 90% and 100%;
- projects for public infrastructure and services;
- completed or under implementation projects by SMEs and LPAs (local public authorities);
- respondents do not generally apply measures to improve the quality of the environment, but do implement quality management systems;
- respondents don't have a current affinity for the use of renewable energy sources, ecologic procurement and environmental technologies, but they mainly apply waste management;
- the analyzed beneficiaries tend to have a medium/long term development strategy which includes specific sustainability issues such as waste management;
- in general, it is considered that the effects of the respondents' activities on the environment are positive;
- respondents have prior experience with non-refundable grants, but not with the sustainable investments financed by these previous projects;
- development teams consisting of women aged between 35 and 50 years old, having a medium level of knowledgeable on sustainable development, who know all the dimensions of sustainable development and 2 or 3 of its principles;
- their main sources of information on sustainable development are the Internet and communications and events organized by institutions;
- the best known principles of sustainable development are prevention, substitution and the polluter pays principle;
- the use of low consumption equipment is the most important investment that supports sustainable development within the analyzed projects;
- average project contribution to the achievement of the medium/long term sustainable development objective;
- main incentive is providing examples and suggestions;
- a majority decision to include sustainable investment in future projects.

The Chi-square test values for the analyzed variables are significant and the probability of wrongly choosing the research hypothesis is smaller than 1% ($p<0.01$), therefore we can reject the null hypothesis without being wrong. The differences between the respondents' preferences for the analyzed variables' categories are significant and are not due to the random sampling variation. The analyzed respondents have formed their preferences for the afore presented categories.

On the other hand, the null hypothesis can be accepted in the following cases: the current use of low consumption equipment, the current limiting pollution aspect, the method of compiling the project under the coordination of a specialized consultant, knowing the good governance principle, the need to align to European standards, the limit of additional costs, the incentive of a higher financing rate, awareness and information campaigns. In these situations, there are no significant differences between the analyzed and the theoretical repartitions.

Regression Models And Results

A variable that is of significant interest with regards to the occurrence probability and the factors that influence said probability is the decision to include sustainable development investments in possible future projects. In order to determine the factors that significantly influence the future inclusion decision, we analyzed several multiple logistic regression models (for nonparametric variables).

Given that the variable has 3 possible answers: „yes," „no," and „depending on future opportunities and constraints", but that only 2 of the 577 respondents said they would not be including such investments in future projects, a new artificial, dichotomous variable was created, which divides the answers into the „yes" and „no" categories, therefore putting together the „no" and „depending on future opportunities and constraints" answers, which basically have a similar meaning and are both opposed to the „yes" answer.

In order to analyze the correlations between nominal variables or between an ordinal variable and a nominal one, χ^2 coefficient and its derivatives were calculated: V Cramer coefficient (specific for nonparametric variables with more than 2 categories) and ϕ coefficient (for dichotomous variables) for assessing the size of the correlation.

Based on the results obtained from the correlation tests, the afore mentioned variable presents significant associations ($p<1\%$ or $p<5\%$) with the following variables:

- $p<1\%$, very weak correlation: total value, non-refundable value, legal status of organization, current measure of using renewable energy sources, the existence of a development strategy, the aspect of limiting/diminishing current pollution, other negative effects entailed by the current activity, prior experience with non-refundable grants and sustainable development investments, the ecologic dimension, prevention principle, substitution principle, reason: a higher financing rate, reason: the institution's need, the social investments, limit source: the lack of immediate necessity, limit source: weak explanation of the objective;
- $p<1\%$, weak correlation: the current measure of applying ecologic acquisitions, the positive effects entailed by the present activity, the level of knowledge with regards to sustainable development, the main information source – scientific books and publications, communications and events organized by institutions, trainings, reason: eligibility criteria, reason: the need to align to European standards, the degree to which the horizontal objective was met, the project's contribution;
- $p<5\%$, very weak correlation: the current measure of waste management, the aspect of the use of recycled products, all dimensions of sustainable development;
- $p<5\%$, weak correlation: the implementation location.

We mention that a very weak association is related to a correlation coefficient between 0.00 and 0.20, and a weak association: 0.20 -0.40.

Given the size of the sample and some authors' opinion about the minimum number of 50 cases for each predictor (including the categories of variables with more than 2 categories), we established that the regression equation cannot have more than 11 predictors.

In the case of the future inclusion criterion, several regression models were gradually analyzed and verified, eliminating the variables that don't have a significant influence on the criterion and adding new variables from the above list:

1) independent variables: the positive effects entailed by the current activity, the current measure of the use of renewable energy sources, the existence of a

development strategy, the aspect of limiting/diminishing current pollution, prior experience with non-refundable grants, substitution;

Table 1:
Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	450	78.0
	Missing Cases	127	22.0
	Total	577	100.0
Unselected Cases		0	.0
Total		577	100.0

a. If weight is in effect, see classification table for the total number of cases.

Source: own work; SPSS processing

Out of a total 577 cases, only 450 valid ones were included in the analysis (the other 127 cases were missing the answers to at least one question each).

Table 2:
Dependent Variable Encoding

Original Value	Internal Value
no	0
yes	1

Source: own work; SPSS processing

Block 0:

Table 3:
Classification Table[a,b]

	Observed		Predicted		
			Inclusion of SD investments in a possible future project		Percentage Correct
			no	yes	
Step 0	Inclusion of SD investments in a possible future project	no	0	164	.0
		yes	0	286	100.0
	Overall Percentage				63.6

a. Constant is included in the model.
b. The cut value is .500

Source: own work; SPSS processing

The results shown in Block 0 refer to the model in the situation prior to introducing the data – the independent variables to the model. In the Classification table (table 3), the model's capacity for prediction without the introduction of predictors is determined: we can state about a grant beneficiary included in the analysis that he will include sustainable development (SD) investments in possible future projects and we will be 63.6% accura

Table 4:
Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.556	.098	32.236	1	.000	1.744

Source: own work; SPSS processing

A p<1% probability was obtained for the Wald parameter test, which allowed us to reject the null hypothesis that assumes that the two categories of respondents regarding future inclusion („yes," „no") do not present significant differences between them. In conclusion, the test is significant and the two categories analyzed are different. The same table showcases the odds ratio: 1.744, of being right when we claim that a beneficiary will include sustainable development investments in future projects. This value is obtained by dividing the affirmative cases observed by the negative ones (268/164).

Table 5:
Variables Not In The Equation

			Score	df	Sig.
Step 0	Variables	Positive effects	35.986	1	.000
		Renewable en. measure	15.904	1	.000
		Development strategy	17.219	1	.000
		Limiting/diminishing current pollution	9.301	1	.002
		Prior experience with grants	19.661	1	.000
		Substitution principle	7.185	1	.007
	Overall Statistics		60.291	6	.000

Source: own work; SPSS processing

The „Variables not in Equation" results table (table 5) analyzes the proposed predictors, not yet included in the analysis, along with the effect of each separate variable. All the predictors are significant (p<1%).

Block 1: Method Enter

Table 6:
Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	61.511	6	.000
	Block	61.511	6	.000
	Model	61.511	6	.000

Source: own work; SPSS processing

The Block 1 results are obtained after the inclusion of the predictors in the analysis via the Enter method (introduction of independent variables in bulk, all together). The Omnibus test certifies that the model is significant, by including the predictors in the equation; we can reject the null hypothesis which maintains that adding the predictors does not increase the model's prediction capacity.

Table 7:
Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	528.829[a]	.128	.175

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Source: own work; SPSS processing

The Model Summary table (table 7) estimated the model's logarithmic verisimilitude. The R^2 indicators proposed by Cox&Snell and Nagelkerke presents what percentage of the dependent variables' variance is explained by predictors (it should be noted here that the Nagelkerke indicator is measured on a unitary scale – up to 1, while the other one has a lower scale). Therefore, we can conclude that 17.5% of the future inclusion decision's variance is explained by the 6 independent variables.

Table 8:
Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	12.530	7	.084

Source: own work; SPSS processing

Tabel 9:
Contingency Table for Hosmer and Lemeshow Test

		Inclusion of SD investments in a possible future project = no		Inclusion of SD investments in a possible future project = yes		Total
		Observed	Expected	Observed	Expected	
Step 1	1	33	32.509	12	12.491	45
	2	25	27.003	21	18.997	46
	3	27	24.831	25	27.169	52
	4	23	19.468	29	32.532	52
	5	9	11.396	26	23.604	35
	6	14	11.182	24	26.818	38
	7	7	14.536	49	41.464	56
	8	17	12.545	42	46.455	59
	9	9	10.529	58	56.471	67

Source: own work; SPSS processing

The Hosmer and Lemeshow test implies testing the null hypothesis of the existence of a linear correlation between the predictors and the odds ratio logarithm for the criterion variable. Obtaining an insignificant result (p>5%) indicates obtaining a suitable regression model.

Table 10:
Classification Table[a]

	Observed		Predicted		
			Inclusion of SD investments in a possible future project		Percentage Correct
			no	yes	
Step 1	Inclusion of SD investments in a possible future project	no	64	100	39.0
		yes	42	244	85.3
	Overall Percentage				68.4

a. The cut value is .500

Source: own work; SPSS processing

The Classification table (table 10) shows the prediction results of the analysed model:

- the model correctly classifies 39% of the beneficiaries that will not include (64/(100+64)): the model claims that 64 of the beneficiaries will not include, but in reality there is a difference of another 100 beneficiaries out of the total number, opting for an unfavourable answer
- the correct classification probability of the ones that will include is 85.3% (244/(42+244))
- the overall prediction capacity is 68.4%, 4.8% higher than the initial one.

Table 11:
Variables In The Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Positive effects	.885	.230	14.860	1	.000	2.423
	Renewable en. measure	.416	.231	3.240	1	.072	1.516
	Development strategy	-.421	.253	2.759	1	.097	.657
	Limiting/diminishing current pollution	.258	.221	1.372	1	.241	1.295
	Prior experience with grants	-.544	.224	5.881	1	.015	.581
	Substitution principle	.500	.214	5.466	1	.019	1.649
	Constant	.675	.488	1.914	1	.167	1.963

a. Variable(s) entered on step 1: Positive effects, Renewable en. Measure, Development strategy, Limiting/diminishing current pollution, Prior experience with grants, Substitution principle, Positive effects

Source: own work; SPSS processing

The last table shown by the SPSS programme includes the regression model's coefficients (B), but also the significance of each separate predictor for the model. It is observed that only the independent variables: positive effects, prior experience with non-refundable grants and the substitution principle have a significant importance to the model ($p<5\%$). Of these, the positive effects have the highest favourable impact, whereas prior experience has a negative impact.

On the other hand, building a regression model that contains only the 3 significant variables as predictors implies lowering the prediction capacity from 68.4% to 65.2%:

Table 12:
Classification Table[a]

	Observed		Predicted		
			Inclusion of SD investments in a possible future project		Percentage Correct
			no	yes	
Step 1	Inclusion of SD investments in a possible future project	no	89	127	41.2
		yes	67	274	80.4
	Overall Percentage				65.2

a. The cut value is .500
Source: own work; SPSS processing

Table 13:
Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Prior experience with grants	-.559	.188	8.819	1	.003	.572
	Positive effects	.988	.189	27.295	1	.000	2.685
	Substitution principle	.549	.185	8.845	1	.003	1.731
	Constant	.366	.337	1.185	1	.276	1.443

a. Variable(s) entered on step 1: Prior experience with grants, Positive effects, Substitution principle.
Source: own work; SPSS processing

In conclusion, the regression model initially resulted is characterised by a good prediction capacity, but it does not synthesize the effect of the most significant influence factors:

$$\ln\left(\frac{\hat{p}}{1+\hat{p}}\right) = 0.885x_1 + 0.416x_2 - 0.421x_3 + 0.258x_4 - 0.544x_5 + 0.500x_6 + 0.675$$

where: $\hat{p}$ is the probability of occurrence of the dependent variable (the decision of future inclusion)

x_1 is the „Positive effects" predictor
x_2 is the „Renewable energy measure" predictor
x_3 is the „Development strategy" predictor
x_4 is the „Limiting/diminishing current pollution" predictor
x_5 is the „Prior experience with grants" predictor
x_6 is the „Substitution principle" predictor

Therefore, we can maintain the significant variables in the analysis and we can add new ones in order to obtain a better model.

2) independent variables: positive effects, prior experience with non-refundable grants, substitution, the level of information and knowledge with regards to sustainable development, the main information source – scientific books and publications, communications and events organized by institutions, training;
The following changes were made to the database:

- upon the „level of information and knowledge with regards to sustainable development" variable, which has 3 possible answers: high/medium/low, 3 new dummy, dichotomous variables were created, in order to directly reflect the level (High_level, Medium_level, Low_level)
- the „training" variable has „yes," „no," and „no, but there is interest to participate in the future" as possible answers. In order to analyze a dichotomous variable, a new dummy variable was created, dividing answers into 2 categories: „yes" and „no" („no" includes the initial „no" answers, as well as the „no, but there is interest to participate in the future" ones)

The resulting model is:

$$\ln\left(\frac{\hat{p}}{1+\hat{p}}\right) = -0.539x_1 + 0.751x_2 + 0.333x_3 + 1.563x_4 - 0.446x_5 + 0.522x_6 + 0.310x_7 - 0.490x_8 - 0.251$$

where: $\hat{p}$ is the probability of occurrence of the dependent variable (the decision of future inclusion)

x_1 is „Prior experience with grants" predictor
x_2 is „Positive effects" predictor
x_3 is „Substitution principle" predictor
x_4 is „Hight level of knowledge" predictor
x_5 is „Medium level of knowledge" predictor
x_6 is „Training" predictor
x_7 is „Information source: scientific books and publications" predictor
x_8 is „Information source: communications and events organized by institutions" predictor

Table 14:
Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Prior experience with grants	-.539	.213	6.398	1	.011	.583
	Positive effects	.751	.214	12.333	1	.000	2.119
	Substitution principle	.333	.206	2.597	1	.107	1.394
	Hight_level	1.563	.380	16.935	1	.000	4.773
	Medium_level	.446	.325	1.884	1	.170	1.563
	Training	.522	.232	5.040	1	.025	1.685
	Source: books	.310	.227	1.860	1	.173	1.364
	Source: events	-.490	.242	4.111	1	.043	.612
	Constant	-.251	.471	.285	1	.594	.778

a. Variable(s) entered on step 1: Prior experience with grants, Positive effects, Substitution principle, Hight_level, Medium_level, Training, Source: books, Source: events

Source: own work; SPSS processing

It is easily noticed that the low level was not included in the model, due to redundancies. The substitution principle, the medium level and the scientific books and

publications source do not have significant importance. On the other hand, the most important predictor is the high level, followed by positive effects.

The model is characterized by: 60.8% initial prediction capacity and a 1.552 chance that the statement „beneficiary x will include sustainable development investments in future projects" is correct; the Wald test is significant and each added predictor improves the model; the 9 predictors show 25.8% of the dependent variable's variance; the final prediction capacity has grown to 69.4%, with 55.2% accuracy for beneficiaries that will not include and 78.5% for beneficiaries that will. The model is valid and can be used.

3) Independent variables: other negative effects entailed by the current activity, prior experience with non-refundable grants and sustainable development investments (SDI), the ecologic dimension, prevention, a higher financing rate, the institution's need, the lack of immediate necessity, the weak objective explanation.

The resulting model is:

$$\ln\left(\frac{\hat{p}}{1+\hat{p}}\right) = -0.227x_1 - 0.496x_2 - 0.579x_3 + 0.398x_4 + 1.813x_5 + 0.515x_6 + 0.312x_7 - 0.413x_8 - 0.363x_9 + 1.083$$

where: $\hat{p}$ is the probability of occurrence of the dependent variable (the decision of future inclusion)

x_1 is „Other negative effects" predictor
x_2 is „Prior experience with grants and SDI" predictor
x_3 is „Ecologic dimension" predictor
x_4 is „Prevention principle" predictor
x_5 is „Higher financing rate" predictor
x_6 is „Institution's need" predictor
x_7 is „Social investment" predictor
x_8 is „Weak explanation" predictor
x_9 is „Lack of immediate necessity" predictor

Table 15:
Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Other negative effects	-.227	.348	.427	1	.513	.797
	Prior experience with grants and SDI	-.496	.188	6.953	1	.008	.609
	Ecologic dimension	-.579	.269	4.646	1	.031	.560
	Prevention principle	.398	.228	3.050	1	.081	1.489
	Higher financing rate	1.813	.750	5.849	1	.016	6.129
	Institution's need	.515	.232	4.920	1	.027	1.673
	Social investment	.312	.231	1.824	1	.177	1.366
	Weak explanation	-.413	.245	2.847	1	.092	.661
	Lack of immediate necessity	-.363	.261	1.931	1	.165	.696
	Constant	1.083	.397	7.440	1	.006	2.953

a. Variable(s) entered on step 1: Other negative effects, Prior experience with grants and SDI, Ecologic dimension, Prevention principle, Higher financing rate, Institution's need, Social investment, Weak explanation, Lack of immediate necessity

Source: own work; SPSS processing

The independent variables that do not have an adequate significance are: other negative effects of the current activity on the environment, the prevention principle, the social investments, weak explanation and the lack of immediate necessity. On the other hand, the most important predictor is a higher rate, followed by the ecologic dimension.

The model is characterized by: 62.6% initial prediction capacity and a 1.677 chance that the statement „beneficiary x will include sustainable development investments in future projects" is true; the Wald test is significant and each added predictor improves the model; the 9 predictors show 22.5% of the dependent variable's variance; the final prediction capacity has grown to 69.1%, with 43.5% accuracy for beneficiaries that will not include and 84.4% for beneficiaries that will. In order to improve the model, we also verified the option of maintaining only significant variables; the prediction capacity was lowered to 67% (60.3% and 71.4%, respectively), but this is acceptable and the model can be used for prediction:

$$\ln\left(\frac{\hat{p}}{1+\hat{p}}\right) = -0.557x_1 - 0.653x_2 + 2.071x_3 + 0.808x_4 + 1.101$$

where: $\hat{p}$ is the probability of occurrence of the dependent variable (the decision of future inclusion)

x_1 is „Prior experience with grants and SDI" predictor
x_2 is „Ecologic dimension" predictor
x_3 is „Higher financing rate" predictor
x_4 is „Institution's need" predictor

The „higher rate" predictor maintains its highest importance, but the second most important is „the institution's need".

4) Independent variables: the current measure of applying ecological acquisitions, eligibility criteria, the need to align to European standards, the degree to which the horizontal objective was met;

The following changes were made to the database:

- upon the „degree to which the horizontal objective was met" variable, which has 5 possible answers: very high/high/medium/low/very low, another 5 new dummy, dichotomous variables were created, in order to directly reflect the degree (very_high_degree, high_degree, medium_degree, low_degree, very_low_degree)

The model's initial prediction capacity is 62%, and the odds ratio: 1.629. All the predictors are significant, with the exception of the very low degree, which, due to redundancies, is eliminated from the analysis in the end. The 8 predictors explain 24.6% of the future inclusion decision's variance, and ensure a final prediction capacity of 71.8% (53.1% and 83.3%), but only 4 predictors are significant: the very high degree, the current measure of applying environmental acquisitions, eligibility criteria and the need to align to EU standards.

Table 16:
Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Very_high_degree	2.310	1.139	4.113	1	.043	10.077
	High_degree	1.137	1.074	1.120	1	.290	3.117
	Medium_degree	.141	1.071	.017	1	.895	1.151
	Low_degree	-.143	1.110	.017	1	.897	.867
	Ecological acquisitions	.739	.259	8.133	1	.004	2.094
	Eligibility criteria	.748	.204	13.485	1	.000	2.113
	European standards	.484	.203	5.685	1	.017	1.622
	Constant	-.850	1.068	.635	1	.426	.427

a. Variable(s) entered on step 1: Very_high_degree, High_degree, Medium_degree, Low_degree, Ecological acquisitions, Eligibility criteria, European standards

Source: own work; SPSS processing

Building a regression model that contains only the significant independent variables leads to a 69.8% (46.9% and 83.9%) prediction capacity and to the following equation:

$$\ln\left(\frac{\hat{p}}{1+\hat{p}}\right) = 1.805x_1 + 0.738x_2 + 0.877x_3 + 0.544x_4 - 0.409$$

where: $\hat{p}$ is the probability of occurrence of the dependent variable (the decision of future inclusion)

x_1 is „Very_high_degree" predictor
x_2 is „Ecological acquisitions" predictor
x_3 is „Eligibility criteria" predictor
x_4 is „European standards" predictor

The very high degree is of highest importance, followed by the eligibility criteria. All predictors have a positive influence on the criterion.

5) By introducing the legal status of organisation into the above model (after creating 6 new dichotomous variables: form_APP, form_SME, form_large_enterpr, form_NGO, form_LPA, form_other), it was observed that only form_SME was a significant predictor. The resulting model is characterized by a 61.7% initial prediction capacity and a 71.2% final prediction capacity:

$$\ln\left(\frac{\hat{p}}{1+\hat{p}}\right) = 1.936x_1 + 0.780x_2 + 0.939x_3 + 0.501x_4 + 0.796x_5 - 0.198$$

where: $\hat{p}$ is the probability of occurrence of the dependent variable (the decision of future inclusion)

x_1 is „Very_high_degree" predictor
x_2 is „Ecological acquisitions" predictor
x_3 is „Eligibility criteria" predictor

x_4 is „European standards" predictor
x_5 is „form_SME" predictor

By adding the non-refundable value variable to the same model, after creating 9 new dummy, dichotomous variables for the 9 grant categories and maintaining only the significant grant variables in the analysis (grant2: non-refundable value between 50.000 and 100.000 euro, grant9: over 10.000.000 Euros), a model with a final prediction capacity of 72.3% (60.3% and 79.8%) was obtained.

Table 17:
Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Very_high_degree	1.923	.455	17.824	1	.000	6.839
	Ecological acquisitions	.763	.272	7.877	1	.005	2.145
	Eligibility criteria	.972	.217	20.064	1	.000	2.644
	European standards	.493	.214	5.276	1	.022	1.636
	form_SME	-.735	.221	11.026	1	.001	.480
	grant2	-.897	.432	4.304	1	.038	.408
	grant9	1.370	.569	5.803	1	.016	3.937
	Constant	-.243	.169	2.058	1	.151	.784

a. Variable(s) entered on step 1: Very_high_degree, Ecological acquisitions, Eligibility criteria, European standards, form_SME, grant2, grant9

Source: own work; SPSS processing

Including 3 extra variables into the model: the current measure of waste management, the aspect of the use of recycled products, all sustainable development dimension (with p<5% on the future inclusion decision correlation tests) increases the prediction capacity to 73.6%, but none of the newly introduced variables is significant.

6) The last regression model analyzed comprises 11 predictors that resulted from the previous models as having the most significant importance.

The model ensures an increase in the prediction capacity from 61.1% to 78.6% (70.2% and 83.9%). The 11 predictors explain 37.7% of the future inclusion decision's variance, but there are 3 variables that lose their significance in the model analyzed:

Table 18:
Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Positive effects	.541	.232	5.461	1	.019	1.718
	Hight_level	1.309	.254	26.537	1	.000	3.703
	Very_high_degree	1.080	.496	4.741	1	.029	2.946
	Higher financing rate	1.615	.661	5.976	1	.015	5.030

Eligibility criteria	.773	.237	10.623	1	.001	2.166
Ecological acquisitions	.643	.295	4.737	1	.030	1.901
Ecological dimension	.048	.287	.028	1	.868	1.049
Institution's need	.434	.236	3.389	1	.066	1.544
grant2	-.581	.481	1.458	1	.227	.560
grant9	1.237	.575	4.624	1	.032	3.444
form_SME	-.548	.250	4.815	1	.028	.578
Constant	-.944	.249	14.389	1	.000	.389

a. Variable(s) entered on step 1: Positive effects, Hight_level, Very_high_degree, Higher financing rate, Eligibility criteria, Ecological acquisitions, Ecological dimension, Institution's need, grant2, grant9, form_SME

Source: own work; SPSS processing

Eliminating the insignificant variables implies a decrease to 75.2% in the prediction capacity (74% and 76%) and to 36.9% in the percentage that explains the criterion's variance through the 8 remaining predictors, and also helps us to obtain the next model in which all the predictors are significant:

$$\ln\left(\frac{\hat{p}}{1+\hat{p}}\right) = 0.574x_1 + 1.364x_2 + 1.179x_3 + 1.829x_4 + 0.719x_5 + 0.737x_6 + 1.240x_7 - 0.672x_8 - 0.803$$

where: $\hat{p}$ is the probability of occurrence of the dependent variable (the decision of future inclusion)

x_1 is „Positive effects" predictor
x_2 is „High level" predictor
x_3 is „Very_high_degree" predictor
x_4 is „Higher financing rate" predictor
x_5 is „Eligibility criteria" predictor
x_6 is „Ecological acquisitions" predictor
x_7 is „grant 9: over 10.000.000 Euros" predictor
x_8 is „form_SME" predictor

In conclusion, based on the last regression model, considered the most viable of all the models analyzed, we can state with 76% accuracy that a certain beneficiary will include sustainable development investments in possible future projects financed by European funds. The model also reveals that the most important factors positively influencing this decision are, in order of importance: a higher financing rate, a high level of information and knowledge with regards to sustainable development, a grant value exceeding 10.000.000 Euros, a high degree to which the sustainable development objective has been met within the funding programme, the current measure of applying ecological acquisitions, eligibility criteria, the SME form and the positive effects of the current activity on the environment.

Conclusion

Investment projects represent the material basis of economic and social development of a country. An investment is defined as an expense that will affect primarily the future, and

is made in the present in order to obtain future gains, which should reward the investor for deferring present consumption, for the rate of inflation, but also for the risk of investing (Caracota Dimitriu and Caracota 2004). Also, given the necessity to support sustainable development, any investment project must address both the economic dimension, and the social and ecological dimensions of sustainability.

This paper presents the results of a research conducted among beneficiaries of EU funds, for analyzing the influencing factors in supporting sustainable development in projects financed by grants. Nonparametric correlation tests were applied on the data, and several multiple regression models have been verified to determine the most important factors. Thus, a higher financing rate for sustainable development investments will most influence applicants to include such investments in projects; ensuring a high level of knowledge and awareness of the concept and principles of sustainable development and its' necessity among applicants of European funds is the second most important factor; a higher value of the grant and the eligibility requirements from the guidelines have a moderate influence on the future inclusion decision. These factors can be directly controlled by the public institutions involved in the management of EU funds, but there are two reasons regarding the current activity of the applicant: application of green procurement and deployment of a positive effect of these activities on the environment. These latter factors can be influenced by public administration through law, taxes or environmental policies, as well as NGOs and environmental activists, but also by business stakeholders.

Any improvement on these aspects leads to an increased probability of future inclusion of sustainable development investments. On the other hand, the SME form of organisation of the applicant negatively influences the future inclusion decision; in other words, there is a tendency that SMEs attach reduced importance to this decision.

The presented research limitations are related to the strength and efficiency of nonparametric tests performed, given the lack of research parametric data. Most data are of categorical type, nominal or dichotomous type, and experts in the field attach a low strength to data-driven nonparametric tests, but there were considered the most appropriate tests for the type of available variables. Also, another weak point of the research is given by the existence of certain correlations between predictors in the regression models, considering that it is recommended to avoid such correlation, but it was not possible to create models that include only independent variables uncorrelated between them. In this regard, several tests were applied: to analyze the significance of each predictor not included yet in the analysis, Hosmer and Lemeshow test; insignificant variables were eliminated from the models, in the search of the best model including only significant parameters. A further step of the research can be achieved by applying regression models for each effect type variable in the questionnaire to determine the most important factors that influence each variable: the reason of including investments that promote sustainable development in the project, the types of investments that promote sustainable development from the project, assessing the achievement of sustainable development horizontal objective in the programme and the project contribution to it; sources of limitation and incentives for inclusion of sustainable development investments. One such full analysis will provide the basis for developing a sustainable development strategy for grant funded projects, including specific recommendations and measures to boost the promotion and support of sustainable development.

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