Impact Assessment of Allocated European Funds on Economic Growth in Romania

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Abstract. *During the period 2007-2013, the European Union provided to Romania through cohesion policy approximately 19.7 billion euros[1]. Taking into account the dimensions for the allocation of payments for the development of the regional country, I evaluate that the impact of the European funds from an economic and social point of view, represent a natural concern and at the same time a challenge that is quite difficult to achieve for Romania, but also for any other state. This evaluation cannot be accomplished only based on established indicators on each funding program, because these reflect the outcome of financial interventions and not the real impact on European funds on the economy. For this reason, the General Directorate of Economic and Financial Affairs within the European Commission has developed several econometric models, of which the most relevant are HERMIN and QUEST, which are used in analysing the impact of the European funds allocated through cohesion policy on Member States' economies. Thus, through this approach we aimed to highlight the impact of the European funds allocated through cohesion policy between 2007-2013, on the economic growth in Romania by using an econometric model based on the theoretical model Quest.*

Keywords: Quest model, econometric model, macroeconomic simulation, European funds, the impact of European funds, economic growth.

JEL classification: F15, F36, G00, G10, G20, G21, H00.

1. Introduction

Assessing the impact of European funds on the Romanian economy is a priority for both the Romanian state and the European Commission. This evaluation is very important because based on this, the strategic documents related to the regional development process are elaborated, respectively the regional development plans, the regional development strategies, etc. It is known that in the case of Romania, the funds allocated by the European Union are distributed to the final beneficiaries through several financing programs specially created at the level of each financial year. It should be mentioned that if evaluation were carried out on the basis of the monitoring data related to these funding programs, its conclusions would highlight the direct results obtained from the implementation of projects funded from European funds. Basically, this type of evaluation would highlight the percentage of achievement of the program and / or project indicators, respectively: the number of projects financed from a certain sector, the value of European funds allocated to a certain sector, the number of new jobs created in a certain sector, the number of kilometres of road rehabilitated, etc. In other words, such an evaluation reflects only the immediate effects due to the absorption of European funds and does not help to identify the medium and long term effects, which generally appear after the completion of the project implementation and which leads to economic growth. So, if it is desired to get an assessment on a macroeconomic indicator such as Gross Domestic Product, which measures the

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[1] https://cohesiondata.ec.europa.eu/countries/RO#, website accessed on 07.10.2019

economic growth of a state, it must take into account both the short-term and long-term effects caused by the impact of European funds. Therefore, it should be specified that, when it is desired to highlight the impact of European funds on the growth of the economy, a distinction must be made between the immediate and long-term effects. For this reason, econometric models are used at the level of the European Commission, respectively within the General Directorate for Economic and Financial Affairs, which can also evaluate the long-term effects that the European funds have on the economy of the European Union and the economies of the Member States.

Compared to the above, we will carry out an analysis of the impact of European funds on the economic growth in Romania from the perspective of an econometric model of macroeconomic simulation that we will develop based on the theoretical model Quest. From an architectural point of view, the research is structured in three sections. Thus, in the first section, we proposed to make a presentation of the Quest model focusing on its role and importance in analysing the impact of European funds on the Romanian economy. The second section will be presented the actual simulation of the impact of the European funds accessed by Romania in the period 2007-2013 on the economic growth with the help of an econometric model built according to the theoretical model Quest. In the last section will be presented the conclusions regarding the results obtained after analysing the impact of European funds using the econometric model.

2. The Quest model: role and importance

The Quest model represents an econometric model that is used to assess the impact of investments made through cohesion and structural funds aimed at developing infrastructure, human capital, and the private sector. Regarding the Quest model, it is specified that it is used to analyse the economic effect of European funds first and does not address the other issues relevant to the regional development process, such as social inclusion, the environment, etc. According to Jan in't Veld[2], the Quest model is used for "evaluating the potential impact of Cohesion Policy funding programs on the convergence objectives in the 2007-2013 programming period". According to the Economic and Financial Affairs - Economic Research section of the European Commission's website[3]: "There are different versions of the QUEST model, estimated and calibrated, each used for specific purposes." These variants of the model are used differently in the process of evaluating structural reforms of the member states of the European Union, depending first on how the assessment will be carried out: at the regional or sectoral level. The Quest model is described by Jan in't Veld as a model with Keynesian and neoclassical influences that are based on behavioural equations with influences from economic optimization models of economic agents. Jan in't Veld assumes that economic agents "maximize their utility and profit in correlation with intertemporal budgetary constraints"[4]. At the same time, it is assumed that the Quest Model focuses on impact analysis and evaluation of the impact of the financial allocations granted to the Member States through the cohesion policy of the European Union taking into account three directions:
> ➢ **Financial allocations targeting the infrastructure**

According to the Quest model, the financial allocation for infrastructure development is assimilated to the increase in government spending. Thus, the

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[2] Jan in't Veld, The Potential Impact of the Fiscal Transfers under the EU Cohesion Policy Programme, European Economy, june 2007, no. 283, page 2

[3] According to the website: http://ec.europa.eu/economy_finance/research /macroeconomic_models_en.htm, accessed 10.10.2016

[4] Jan in't Veld, The Potential Impact of the Fiscal Transfers under the EU Cohesion Policy Programme, European Economy, june 2007, no. 283, page 5

increase in government spending has a direct effect on the Gross Domestic Product, the public capital will directly contribute to productivity, and the infrastructure will be focused on the proper functioning of the economy. It should be noted that determining the efficiency of financial allocations for government expenditure (public investment) is particularly difficult to evaluate, this being highlighted by the fact that within a certain time frame a public investment does not have the same yield. Moreover, there are cases in which some public investments that have been profitable after a certain period (which is very difficult to measure) have not been useful (for example: due to technological progress), generating only expenses. It should be noted that there are econometric difficulties in evaluating the productivity of government spending (public investment), considering that productivity may have the same rising or falling trend depending on fluctuations in government spending. Also, another difficulty in the process of evaluating the productivity of government spending that needs to be mentioned is "reverse causation", respectively: the realization of the infrastructure leads to economic growth or vice versa;

> ➢ **Financial allocations targeting human resources**

The allocation of financial resources for the development of human capital implies the distribution of financial resources to the following areas: education, labor market programs, social inclusion, professional reconversion, qualification, retraining, entrepreneurship, activities for women, unemployed, disadvantaged persons, etc. It should be mentioned that the financial allocations that are oriented to the development of human capital, respectively to the development of the human resource, contribute to the sustainable development of an economy, to its competitiveness and indirectly to economic growth, but their effect is visible in the medium and long term, a few years, not immediately visible. For this reason, it is very difficult to evaluate the efficiency of financial allocations for human resource development. The efficiency of the financial allocations for the development of human resources is evaluated using the Quest model from consumption and investments. In order to evaluate the efficiency of financial allocations for human resource development, the Quest model uses two scenarios[5]: an optimistic scenario in which is considered that "the impact of human resources expenditures is the same as that of education expenses" and a pessimistic scenario in which is considered that „the impact of expenditures distributed for the development of the human resource is half as compared to the effects of the expenses in education." This scenario measures the sensitivity to the results obtained;

> ➢ **Financial allocations aimed at the private environment**

Assessing the allocation of financial resources to support the SME sector, respectively the private sector, to increase their competitiveness and maximize profit is the third direction analyzed using the Quest model. The Quest model focuses on the allocation of financial resources to increase the competitiveness of SMEs, starting from the premise that they can generate productive effects.

The cohesion policy of the European Union allocated to Romania between 2007 and 2013 European funds of approximately 19.7 billion euros[6]. Most of these European structural and investment funds have been distributed through financing programs set up for this purpose at the national level to the following sectors: infrastructure, human resources and the private sector, according to **Chart no. 1**, as follows:

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[5] Jan in't Veld, The Potential Impact of the Fiscal Transfers under the EU Cohesion Policy Programme, European Economy, june 2007, no. 283, pages 12-13
[6] https://ec.europa.eu/regional_policy/sources/docgener/informat/country2009/ro_en.pdf , website accesed on 02.10.2019

**Chart no. 1. The distribution of European funds by intervention areas
between 2007 and 2013
% of total allocation**
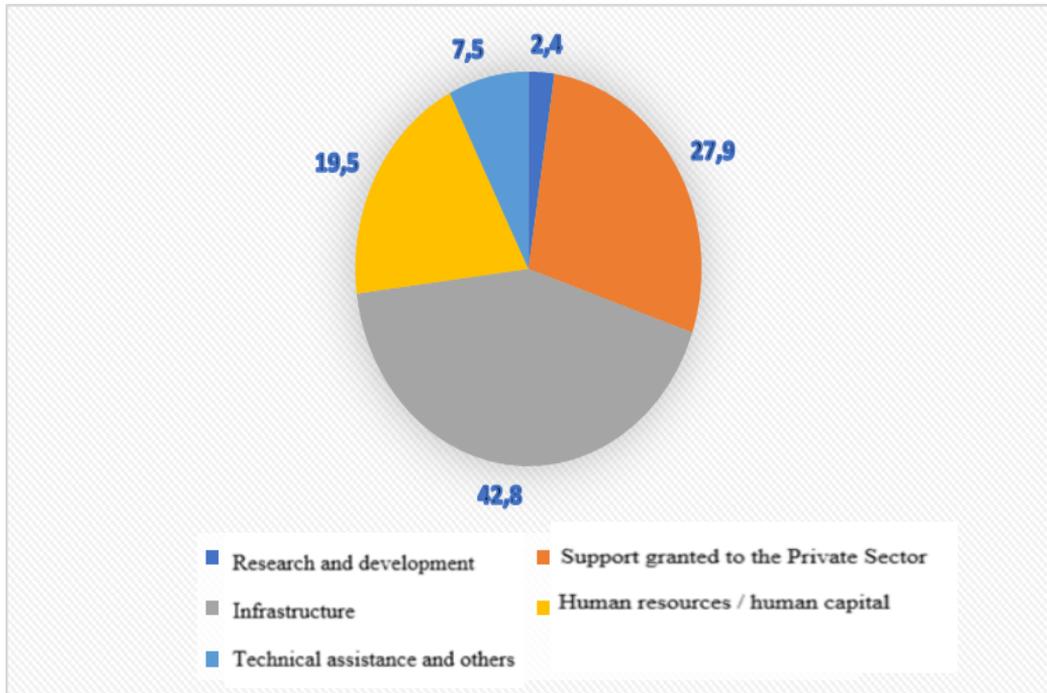
*Source: own processing based on data presented on https://ec.europa.eu, website
accessed on 02.10.2019.*

Using the data presented in **Chart number 1** and performing a simple
mathematical calculation, one can conclude that the three analysed sectors,
respectively: infrastructure, human resources and the private sector have benefited
from an allocation of over 90% of the total European funds allocated to Romania by the
European Union in the previous financial year. This highlights the fact that the three
directions addressed in the analysis of the impact of European funds on economic
growth using the Quest model are absolutely consolidated.

**3. Simulation of the impact of European funds on the Romanian economy
using the built econometric model**

Methodology:

As the Quest model implies, the analysis of the impact of the European funds
allocated in the period 2007-2013 on the Romanian economy will concern three clear
directions. Thus the research implies that at each level of the three directions different
equations are constructed, each of them providing essential information regarding how
the European funds have influenced the economic growth of Romania, getting to
develop *an econometric model of Quest type based on 5 equations.*
Each of these directions will be analysed on the basis of unifactorial regression
equations, which will try to capture the tendency regarding the relationship between
different macroeconomic variables at the level of Romania, so that after all these
relations will be applied in the context of the usefulness of European funds and the
added value they have brought to our country's economy. The regression equations

will be estimated **based on the method of ordinary least squares (Eng. Ordinary Least Squares - OLS)**, which involves estimating a linear relationship between the variables considered, a relation by which the square of the errors of trend deviation is minimized for each point in the data series considered. Eviews 7.0 software will be used to implement this technique to optimize the relationship between variables.

The command in Eviews 7.0 software to estimate the linear relationship between the considered variables is as follows:

$$LS^7 \quad dependent\ variable \quad independent\ variable_1 \quad independent\ variable_2 \quad C,$$

The dependent variable and the independent variables presented in the above command will be used according to the equation that is intended to be used within the model, and C represents a constant, necessary in estimating the one-factor or multifactorial linear regression model.

• Description of the data used:

The period for which the data were extracted is represented by the interval 2007-2017. The data were extracted annually. This period was chosen to capture Romania's first European Union budgetary year as a member of the European Union and the next three years, given that the absorption of European funds allocated in 2007-2013 continued after 2013.

Thus, the present analysis proposes to capture the impact that the European funds had on the economy during the first budget year following Romania's accession to the European Union. Data were chosen with annual frequency, this being the highest frequency for which we had data available. Although this is a short period, it relied on a larger number of data series for a common period, maintaining the reservation that the model's results have gaps, not surprising the economy over several business cycles. On the other hand, the specialists[8] in the field regarding the Quest model present the same type of approach for shorter intervals. Thus, the chosen database is in line with the practice in the field undertaken so far. The data series that will be used in the present research are the following:

In **Table number 1**, it can be seen that the financing programs for which the absorption rates were presented were those programs that directly influence in our opinion the three directions that are addressed by the Quest model, namely: infrastructure, human resources and the private sector. For this reason, to underline the financial impact of these financing programs, we proceeded to present the total financial allocations on each of the four financing programs, respectively:

Table no. 1. The absorption rate of the main financing programs between 2007 and 2013
- % of total allocation -

The analyzed directions	Human Resurse	Private Sector	Infrastructure	
Financing programs (years)	The rate of absorption related to Operational	The rate of absorption related to Operational	The rate of absorption related to Transport	The rate of absorption related to the

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[7] LS – Least Squares
[8] The specialists of the General Directorate of Economic and Financial Affairs within the European Commission

	Program Human Resources Development (OPHRD)	**Program Increasing Economic Competitiveness (OPIEC)**	**Sector Operational Program (TSOP)**	**Regional Operational Program (ROP)**
2007	0	0	0	0
2008	0	0	0	0
2009	0	0	0	0
2010	0	0	0	0
2011	6,34	6,77	6,22	17,61
2012	11,81	14,45	10,24	25,6
2013	28,75	36,4	31,23	44,87
2014	46,53	56,94	56,65	57,14
2015	46,55	58,16	58,79	62,99
2016	67,87	84,81	76,88	81,95
2017	87,49	95	86,88	93,5

Source: own processing, based on the data presented on the following websites accessed on 02.10.2019: www.fonduri-ue.ro, http://www.ince.ro

Table no. 2. The total financial allocation related to the principal funding programs for 2007-2013

Financing programs	**Allocating years 2007-2013 (lei)**
Sectorial Operational Program Increasing Economic Competitiveness (SOPIEC)	2536646054,00
Regional Operational Program (ROP)	3966021762,00
Sectorial Operational Program Human Resources Development (SOPHRD)	3200038455,00
Transport Sector Operational Program (TSOP)	4288134778,00

Source: own processing, based on the data presented on www.fonduri-ue.ro, website accessed on 02.10.2019

Table no. 3. Other series of data used in the analysis

YEAR	**Gross Value Added Industry sector (millions of lei)**	**The value of Commercial Services (millions of lei)**	**Export Value (FOB) (millions of lei)**	**Real Gross Domestic Product (millions of lei, constant prices 2010)**	**Unemployment rate (%)**
2007	64783	57089,10	98579	532252.3	3.68
2008	85690	162289,40	123812	581,791.6	4.11
2009	75052	154458,20	123344	549691.7	7.41
2010	83907	162542,80	157436	528247	6.69

2011	88239	178467,20	191986	538849.8	5.02
2012	95396	195969,10	200790	550042.6	5.35
2013	102282	201505,90	219120	569374	5.57
2014	107446	220479,00	233247	588794.3	5.18
2015	118528	239515,40	242747	611589.5	4.76
2016	102979	247661,90	257701	640950.8	4.66
2017	115400	274306,20	286123	685762.2	3.85

Source: own processing, based on data presented on the websites of INS and EUROSTAT, accessed on 03.10.2019

- **Empirical testing:**

As a methodology used to interpret the model used it can be stated that, the first step in this purpose is to present each equation used within the econometric model. The starting point in this approach was the classic **CES** (Constant Elasticity Substitution) function. Starting from the theory that underlies it, we went on to construct a series of regressions that highlight precisely the elasticity of the different macroeconomic variables when modifying absorption rates. Thus, the obtained results will be represented by elasticities, for which it will be assumed that they will present constancy over time. Below, we presented the classic form of the CES function, the one from which one started in constructing the equations on which the built Quest model is based, respectively:

$$Y_t = C(1) * \log(X_t) + C(2) * \log(Z_t) + C(3) * \log(+ C(4) + \varepsilon,$$

where:
Y_t - Dependent variable;
X_t - Independent variable;
Z_t - Independent variable;
P_t - Independent variable;
C (1), C (2), C (3) - the coefficients of the independent variables. These coefficients will show how much percent the dependent variable changes if the independent variable changes by 1 percent;
C (4) = constant (the free term of the equation);
ε = model error.

Thus, following the presentation of the equations within the econometric model, each regression equation will be estimated and tested using the EVIEWS software, the procedure used in this regard is the least-squares method. Following the estimation of the equations, it is necessary that the model is statistically validated or its weaknesses are highlighted. For this purpose, two tests established in the specialized literature will be used: the Fischer test (F-Statistic) and the Student test (T-Student). The first of these tests is used to validate the model as a whole, and the second to validate each estimated coefficient, to check whether it is different from zero, that is, whether it is statistically significant. Next, the way the Student test is applied will be presented to validate whether each parameter is significantly different from zero.

The hypotheses underlying the T-Student test are:
- H0: C (1) = 0, meaning the value of the coefficient is not significantly different from zero;
- H1: C (1) ≠ 0, meaning the value of the coefficient is significantly different from zero.

It can be mentioned that each estimated coefficient is associated with a probability that represents the error you commit when you wrongly reject H0 (null hypothesis). Thus, this probability must be very low for the estimated parameters to be considered statistically significant. Usually, a tolerance threshold of 5% are accepted for this test (for a coefficient to be significant is necessary that the probability to be less than 5%). The same procedure regarding the 5% tolerance threshold can be applied also for the F test, but now the probability of F will be needed. After we have presented the methodological aspects of caring for the basis of the use model for measuring the impact of cohesion funds on the Romanian economy, then the 5 equations on which the model is based can be tested. Regarding these equations, we make it clear that these will be presented, estimated and analysed taking into account the three directions mentioned, as follows:

▪ **Impact of European funds targeting infrastructure**

Two equations will be built to highlight the positive impact that the increase in the level of absorption of the structural funds on the SOPT financing program has had on different sectors. Thus, I considered that this financing program contributed to the growth of the economy as a whole (which will be surprised by the analysis of the impact on GDP), but also to the development of the industry, in particular, the Romanian car industry, which benefited from the improvement of the infrastructure in especially from western Romania and Transylvania.

The first equation to be estimated using Eviews 7.0 software is the one that reflects the impact of the evolution of the absorption rate of European funds on the level of GDP:

$$\text{REAL GDP} = C(1) * \text{SOPT} + C(2) + \varepsilon,$$

where:
REAL GDP = Real Gross Domestic Product;
SOPT = Absorption rate for the Sectorial Operational Program of Transport (%);
C (1) = the coefficient of the independent variable;
C (2) = constant (the free term of the equation);
ε = model error.

Following the estimation of the model, it is important to follow which was the meaning of the relations between the variables according to the estimated linear regression. Thus, in **Figure no. 1**, it is noted that there was a positive relationship between the degree of absorption of European funds for the SOPT financing program and the real GDP in Romania. Therefore, an increase in the degree of absorption leads to an increase in the Romanian economy.

Figure no. 1. Test on model estimation using Eviews regarding Real Gross Domestic Product influenced indicator by the European funds allocated through SOPT

Dependent Variable: Real Gross Domestic Product
Method: Least Squares
Date: 10/05/19   Time: 00:09
Sample: 2007 2017
Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SOPT	1441.322	319.8200	4.506667	0.0015

C		147557.3	14054.56	10.49889	0.0000

R-squared	0.692938	Mean dependent var	190389.5
Adjusted R-squared	0.658820	S.D. dependent var	58790.16
S.E. of regression	34339.69	Akaike info criterion	23.88896
Sum squared resid	1.06E+10	Schwarz criterion	23.96130
Log likelihood	-129.3893	Hannan-Quinn criter.	23.84335
F-statistic	20.31004	Durbin-Watson stat	1.227532
Prob(F-statistic)	0.001475		

Source: Data processing by the author in Eviews

The following estimated equation is the one that reflects the influence of the absorption rate of the funds allocated through the SOPT financing program on the gross added value of the industry, respectively:

GAV IND = C (1) * SOPT+ C (2) + ε,

where:
GAV IND = Gross Added Value of the industry;
SOPT = Absorption rate for the Sectorial Operational Program of Transport (%);
C (1) = the coefficient of the independent variable;
C (2) = constant (the free term of the equation);
ε = model error.

It is known that the transport sector is a vital sector for the economy of any state. The more a state has this more developed sector, the more investors are attracted to this state. At the level of the European Union, developed transport infrastructure is the main condition for achieving a single market. Referring to Romania, it can be observed that in the counties where the transport infrastructure is more developed, respectively: Timișoara, Cluj, Sibiu, Constanța, Iași there have been numerous investments. This aspect confirms the fact that good transport infrastructure in Romania will lead to investments that will contribute to the creation of new jobs and not least to the growth of the Romanian economy. Thus, analysing the obtained result, which can be viewed in **Figure no. 2**, it can be appreciated that in this case there was also a positive value of the coefficient for the SOPT variable. This aspect indicates that this is a relation of the same meaning between the gross added value of the industry in Romania and the absorption rate of the European funds allocated through SOPT. In other words, a higher absorption rate of European funds allocated through this program has contributed to the increased value-added from the industry, contributing to Romania's economic growth.

Figure no. 2. Test on model estimation using Eviews on the Gross Added Value of the Industry, an indicator influenced by the European funds allocated through SOPT

Dependent Variable: GAV IND
Method: Least Squares
Date: 10/05/19   Time: 00:10
Sample: 2007 2017
Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SOPT	418.1651	87.22519	4.794087	0.0010
C	82091.64	3833.131	21.41634	0.0000

R-squared	0.718603	Mean dependent var	94518.36
Adjusted R-squared	0.687337	S.D. dependent var	16749.20
S.E. of regression	9365.538	Akaike info criterion	21.29043
Sum squared resid	7.89E+08	Schwarz criterion	21.36277
Log likelihood	-115.0973	Hannan-Quinn criter.	21.24482
F-statistic	22.98327	Durbin-Watson stat	1.774744
Prob(F-statistic)	0.000982		

Source: Data processing by the author in Eviews

▪ **Impact of European funds targeting human resources**

The second direction approached in the Quest-type model is the one regarding the financial allocations from European funds targeting human resources, and here we refer to the financing program SOPHRD. To present the impact of the structural funds on human resources, the unemployment rate will be considered as a dependent variable and the financial resources allocated and attracted through SOPHRD will be considered as an independent variable. The general form of the equation is as follows:

Unemployment rate = C (1) * SOPHRD + C (2) + ε,

where:
Unemployment rate = Unemployment rate;
SOPHRD = Absorption rate related to the Sectoral Operational Program Human Resources Development;
C (1) = the coefficient of the independent variable;
C (2) = constant (the free term of the equation);
ε - model error.

In **Figure no. 3** it can be observed that the SOPHRD variable from the regression equation that was considered for the estimation has the negative coefficient, which shows an inverse relationship between the two variables: dependent (Unemployment rate) and independent (Absorption rate of European funds allocated through SOPHRD). Therefore, an increase in the absorption level on this program reflects a decrease in the unemployment rate. Thus, it can be appreciated that the projects that aimed at the integration of the labour force, the professional reconversion or the qualification/retraining of the personnel, implemented with the help of the European funds allocated through SOPHRD, have had beneficial effects by reducing the unemployment rate. However, I believe that the effects of the programs implemented with SOPHRD funding will be seen even in the years following the last year considered (2017), and the implications will be greater and more difficult to quantify in figures.

Figure no. 3. Model estimation test using Eviews on the Unemployment Rate, an indicator influenced by European funds allocated through SOPHRD

Dependent Variable: Unemployment rate
Method: Least Squares
Date: 10/05/19   Time: 00:12
Sample: 2007 2017
Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.

SOPHRD	-0.014532	0.011228	-1.294295	0.2278
C	5.506423	0.449094	12.26118	0.0000

R-squared	0.156924	Mean dependent var	5.116255
Adjusted R-squared	0.063249	S.D. dependent var	1.140716
S.E. of regression	1.104052	Akaike info criterion	3.198817
Sum squared resid	10.97037	Schwarz criterion	3.271161
Log likelihood	-15.59349	Hannan-Quinn criter.	3.153213
F-statistic	1.675199	Durbin-Watson stat	1.362586
Prob(F-statistic)	0.227786		

Source: Data processing by the author in Eviews

▪ **Impact of European funds targeting the private environment**

The last segment to be analysed, according to the Quest model, is the one concerning the private environment and the way in which the financing programs that were addressed especially to the SMEs in the private sector have influenced the country's economy. To address this direction we will refer to the impact of the funds raised to increase the competitiveness of the Romanian economy, the private environment through SOPIEC and we will follow their impact and the way in which they influenced the commercial services and the industry. Considering that an increase of the private sector, an increase of the competitiveness leads to the development of the services sector, which will be implicitly reflected in the gross domestic product of the respective country, the first of the equations for which the parameters will be estimated is the one related to the commercial services, respectively:

$$VCS = C(1) * SOPIEC + C(2) + \varepsilon,$$

where:
VCS = Value of Commercial Services;
SOPIEC = Absorption rate for the Sectoral Operational Program Increasing Economic Competitiveness;
C (1) = the coefficient of the independent variable;
C (2) = constant (the free term of the equation);
ε = model error.

Figure no. 4. Model estimation test using Eviews on the Value of Commercial Services, an influential indicator by the European funds allocated through SOPIEC

Dependent Variable: VCS
Method: Least Squares
Date: 10/05/19   Time: 00:13
Sample: 2007 2017
Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SOPIEC	1356.613	296.8600	4.569876	0.0013
C	146912.5	13987.71	10.50297	0.0000

R-squared	0.698833	Mean dependent var	190389.5
Adjusted R-squared	0.665370	S.D. dependent var	58790.16
S.E. of regression	34008.46	Akaike info criterion	23.86957

Sum squared resid	1.04E+10	Schwarz criterion	23.94192
Log likelihood	-129.2826	Hannan-Quinn criter.	23.82397
F-statistic	20.88377	Durbin-Watson stat	1.268779
Prob(F-statistic)	0.001347		

Source: Data processing by the author in Eviews

The connection between the value of commercial services and the degree of absorption of European funds through SOPIEC has been positive. Thus, an increase in the absorption rate of European funds related to this financing program leads to an increase in the value of commercial services, meaning an increase and development of the private environment, productivity in this area of the economy and improvement of their contribution to the evolution of the economy of Romania.

The last equation that has been estimated in this research is that of studying the impact that the evolution of the degree of absorption through the ROP program had on the gross added value of the industry that is on the product of that segment of the private environment that operates in the industry. Again, we paid close attention to the meaning of the connection indicated by the model for the two variables.

$$GAV\_IND = C (1) * ROP + C (2) + \varepsilon,$$

where:
GAV_IND = Gross Added Value of the industry;
ROP = Regional Operational Program
C (1) = the coefficient of the independent variable;
C (2) = constant (the free term of the equation);
ε = model error.

According to the data in **Figure no. 5**, in the latter equation, the relationship obtained is again positive, showing that an increase in the absorption rate of European funds leads to an increase in the gross added value of the industry. Thus, an increase in the investments made through the ROP can lead to an increase in production capacities, but also to an increase in productivity, all of which are reflected in an increase in the gross value added of the industry, an aspect that will automatically contribute to the economic growth in Romania.

Figure no. 5. Model estimation test using Eviews on the Gross Added Value of the Industry, an indicator influenced by the European funds allocated through the ROP

Dependent Variable: GAV_IND
Method: Least Squares
Date: 10/05/19   Time: 00:14
Sample: 2007 2017
Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROP	419.6772	76.13440	5.512320	0.0004
C	79880.79	3677.848	21.71943	0.0000
R-squared	0.771491	Mean dependent var		94518.36
Adjusted R-squared	0.746101	S.D. dependent var		16749.20
S.E. of regression	8439.661	Akaike info criterion		21.08224
Sum squared resid	6.41E+08	Schwarz criterion		21.15458

Log likelihood	-113.9523	Hannan-Quinn criter.	21.03663
F-statistic	30.38568	Durbin-Watson stat	2.087615
Prob(F-statistic)	0.000374		

Source: Data processing by the author in Eviews

4. Conclusions

The conclusions obtained following the application of the Quest-type model built were in line with the expectations initially set, while reinforcing the conviction that a high absorption rate of European funds will only add to the Romanian economy, leading to the development of the main sectors of the economy and also to contribute to the economic growth of Romania. Thus, in all the cases analysed using the econometric model, relations were obtained according to which the European funds allocated to Romania in the period 2007-2013 to the three sectors analysed: the private environment, human resources, and infrastructure, brought an added value to the Romanian economy. Those series of data and variables that we found available and that we considered the most relevant were chosen so that they could best reflect from our point of view the ideas that should be surprised, and the results were according to economic expectations and intuition. For each of the three economic sectors analysed, direct relationships were obtained between the absorption degrees of the European funds and the dependent variables considered. Thus, an increase in the absorption of European funds has certainly brought added value to each of the sectors chosen for analysis. For all the estimated equations, positive relations were obtained between the level of absorption of the European funds and the level of development of the sectors of the Romanian economy that we have surprised through the dependent variables considered.

Regarding the three sectors analysed, it can be specified that the European funds had a beneficial impact for the entire Romanian economy, despite the deficiencies and the numerous bottlenecks that existed in the period 2007 - 2013 regarding their absorption, due to both the institutional system and the especially the legislative system in the field. It should be noted that if the financial allocations in the field of agriculture have immediate effects, the financial allocations aimed at financing the regional development, respectively of the infrastructure, human capital, and the private sector have long-term effects, this aspect being argued also by the statistical data that were the basis of the present analysis based on which the econometric model of Quest type was developed.

Thus, regarding the human resources sector, the indicator considered representative for this sector and studied in the present research, the unemployment rate decreased from 5.57% level registered in 2013, to 3.85% in 2017. This aspect confirming that the European funds allocated to the sector the human resources and absorbed by the beneficiaries from this sector had positive effects, respectively in Romania new jobs were created, the professional reconversion programs reached their objectives, many people belonging to the disadvantaged categories were integrated with the field of work, and so on.

Regarding the private sector, it can be appreciated that in this sector the European funds absorbed have produced beneficial effects. Economic indicators based on which this research was carried out and which reflects the position of the Romanian private sector, confirm the beneficial effects of the European funds on the private sector. Respectively, it can be observed that: The **Real Gross Domestic Product** in 2017 increased by approximately 116,388.20 million lei in 2017 compared to 2013, the **Export Value** increased in 2017 by approximately 67.003.00 million lei in 2017 compared to 2013, the **Value of Commercial Services** increased in 2017 with

approximately 72,800.30 million lei in 2017 compared to 2013 and the **Gross Added Value for the Industry sector** increased in 2017 with approximately 13,118.00 million lei in 2017 compared to 2013.

Regarding the infrastructure, it should be noted that this sector directly influences the evolution of the other sectors of the Romanian economy, especially the evolution of the private sector. Thus, taking into account this aspect and the evolution of the private sector during the period analysed in the present scientific approach, it can be concluded that the European funds absorbed by Romania during the period 2007-2013 to develop the infrastructure had a positive impact, contributing with the two sectors, analysed at the economic growth of Romania.

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