Possibilities to Quantify the Impact of Accessing Structural Funds and Cohesion Using Econometric Models

Dumitru BELDIMAN[1], Alia Gabriela DUȚĂ[2]
[1,2] University of Craiova
beldimancatalin@gmail.com, alia_gabriela@yahoo.com

Abstract. *The research in this study was aimed at identifying those pros and cons regarding the fact that European funds are an important source of funding for regional development. In this sense, through the architecture of this study I conducted a detailed investigation through which I tried to highlight those aspects that reflect the impact of the absorption of European funds on the Romanian economy. At the same time, through this investigation, we aimed to obtain an overview of one of the most controversial topics related to European funds, namely assessing the impact of accessing European funds using econometric models. We approached this complex issue by developing a HEROM type macroeconometric model. This was done on the grounds that the new trend in the methodology for analyzing, assessing and interpreting the impact of European Union cohesion and regional development policy on Member States' economies is the use of macroeconomic quantification models. In addition, I appreciate that it should be noted that the HEROM model is the Romanian version of the HERMIN model which is one of the most popular simulation models used in this regard.*

Keywords: HEROM model, econometric model, HERMIN model, macroeconomic simulation model, European funds impact assessment

JEL Classification: F15, F36, G00, G10, G20, G21, H00

1. Introduction

The objective of the case study is to assess the impact of access to structural and cohesion funds on economic growth in Romania. Our goal was to quantify the effects induced by accessing the funds mentioned in the financial year 2007-2013. We mention that, at present, only for this programming period, there is complete information, absolutely necessary information without which the proposed analysis could not be performed using the Herom-type econometric simulation model developed in this regard. Regarding the current year 2014-2020, unfortunately, the absorption rate of European funds recorded by Romania at the moment is quite low, which is why it is not possible to perform an analysis on the impact of European funds accessed during the current programming period, as in the absence of data this analysis would not be conclusive.

The developed econometric model was used in order to assess the impact of investments made through structural and cohesion funds aimed at developing the main sectors of the economy. Practically, through this case study, I set out to quantify the impact of European funds absorbed by Romania in the financial year 2007-2013 on the main macroeconomic indicators related to the most relevant sectors of activity of the Romanian economy. I considered it useful to carry out this case study, because, only after such an assessment, I appreciate that a detailed radiograph can be obtained on the weak and strong points and also on those threats and opportunities that Romania must take into account. in the process of adapting the policy of absorption of European funds in the future.

2. Development of the HEROM type model

2.1 Description of data used

The period for which the data necessary for the analysis were collected is represented by the period 2007-2017. Data were extracted annually. This period was chosen to capture Romania's first budget year as a member of the European Union as well as the following years in which I appreciate that the effects of European funds allocated in this first financial year were felt much more clearly on the economy. It should be noted that the absorption of European funds allocated in the period 2007-2013 continued after 2013 until 31.12.2015, and the latest reports on the absorption of these funds were made until 2017.

Thus, this analysis proposes to capture the impact that European funds had on the economy in the first budget year following Romania's accession to the European Union. Data were chosen on an annual basis, this being the highest frequency for which we had data available. Although it is a short time frame, it relied on a larger number of data series for a common period, maintaining the reservation that the results of the models are deficient, not being surprised by the economy over several economic cycles. On the other hand, specialists in the field regarding the Herom model present the same type of approach for shorter time 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 this research are the following:

Table no. 1 Absorption rate for the main funding programs in the period 2007-2013

The directions analyzed	HR	Private sector	Infrastructure		Rural development
Funding programs (years)	The corresponding absorption rate Operational Program Human Resources Development (OP HRD -%)	The corresponding absorption rate Operational Program Increasing Economic Competitiveness (OP IEC-%)	Absorption rate related to the Transport Sector Operational Program (TSOP-%)	Absorption rate related to the Regional Operational Program (ROP-%)	The corresponding absorption rate National Rural Development Program (NRDP-%)
2007	0	0	0	0	0
2008	0	0	0	0	1,36
2009	0	0	0	0	6,77
2010	0	0	0	0	17,1
2011	6,34	6,77	6,22	17,61	40
2012	11,81	14,45	10,24	25,6	50,42
2013	28,75	36,4	31,23	44,87	66,74
2014	46,53	56,94	56,65	57,14	82,5
2015	46,55	58,16	58,79	62,99	91,3
2016	67,87	84,81	76,88	81,95	95
2017	87,49	95	86,88	93,5	95

Source: own processing based on data presented on the following websites accessed on 24.07.2020: www.fonduri-ue.ro, http://www.ince.ro, http://agrointel.ro, https://www.bursa.ro, http://old.madr.ro, https://www.stiriagricole.ro

Table no. 2 Data series used in the econometric analysis performed with the developed Herom model

YEAR	Gross value added agriculture (EUR million)	Gross value added of public services (EUR million)	Gross value added industry (million euros)	Gross value added market services (EUR million)	Gross value added construction (million euros)	Average monthly net nominal nominal earnings Industry (RON)	Exports (million euros)	Average total monthly income per household (RON)	Gross Domestic Product (million euros)	Average household taxes (RON)
2007	6244,01	11.232,8	31530,2	25018,6	12224,8	971	29549	1686,74	127632	1541,96
2008	8.361,8	13638,1	37263,3	26420,7	16644,2	1189	33725	2131,67	146590,6	1915,19
2009	6391,98	11144,1	32229,1	22992,6	13379,9	1300	29084	2315,99	125213,9	2047,33
2010	6591,49	15457,9	37496,2	14757,7	9942,7	1388	37360	2304,28	125408,8	2062,33
2011	8109,08	13895,2	42517,6	11627,8	8294,6	1470	45292	2417,26	131925,4	2183,76
2012	6209,14	14485,8	33409,4	21708,1	9869	1541	45069	2475,04	133147,1	2244,47
2013	7621,29	15196	36277,6	20248,7	9977,2	1604	49562	2559,05	143801,6	2317,4
2014	7110,08	17309,6	38165	22590,8	9415	1720	52466	2500,72	150458	2269,25
2015	6501,24	15690,4	38589,1	27275	10299,9	1827	54610	2686,77	160297,8	2351,53
2016	6537,95	19209,2	40926,9	30282,9	9670,5	1987	57392	2944,6	170393,6	2523,99
2017	7714,07	23136,3	44581,2	34586,8	11227,9	2202	62644	3391,67	187772,7	2874,14

Source: own processing based on data presented on the INS and EUROSTAT websites, accessed on 24.07.2020

2.2 Methodology

As for the developed model, as mentioned, it will be represented by a Herom-type simulation model. This model will address three areas of research, entitled: supply aspects, demand (absorption) aspects and revenue distribution aspects. The simulation model will be built on 7 equations. For the first analyzed direction, 5 equations will be constructed, practically one equation for each sector targeted by it, respectively: industry, market services, agriculture, constructions and public services. In addition to these five equations, another 2 equations will be built, one for the other 2 directions covered by the model. Thus, through the 7 equations based on which we developed the Herom type model, we will aim to capture as much essential information on how access to structural and cohesion funds has influenced the main sectors of the Romanian economy.

As a main feature of the developed model it can be stated that each of the directions covered by it is analyzed based on regression equations, which will try to capture the trend in terms of the relationship between different macroeconomic variables in Romania, because later all these relations should 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 Ordinary Least Squares (OLS) method, which involves estimating a linear relationship between the variables considered, a relationship that minimizes the square of the deviation errors for

each point in the series of data considered. Eviews software will be used to implement this technique for optimizing the relationship between variables.

The command in the Eviews software to be able to estimate the linear relationship between the considered variables is the following:

***LS*[1] *dependent variable - independent variable*$_1$ *- independent variable*$_2$ ***C*,**

The dependent variable and the independent variables presented in the above command will be used depending on the equation to be used in the model, and C is a constant, necessary in estimating the unifactorial or multifactorial linear regression model.

2.3 Empirical testing

From the point of view of the methodology used for the interpretation of the constructed model, it can be stated that the first step for this purpose was the presentation of each equation used in the econometric model. The starting point in this approach was the classic CES (Constant Elasticity Substitution) function. Starting from the theory underlying it, we went further to build a series of regressions that highlight the elasticity of different macroeconomic variables to change absorption rates. Thus, the results obtained will be represented by elasticities, for which it will be assumed that they will be constant over time.

Thus, after the presentation of the equations within the econometric model, we will proceed to the estimation and testing of each regression equation with the help of Eviews software, the procedure used for this purpose being the least squares method. Following the estimation of the equations, it is necessary for the models to be statistically validated or for their weaknesses to be highlighted. In this sense, two tests established in the 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 verify that it is non-zero, ie whether it is statistically significant. Next, the manner in which the Student test is applied will be presented to validate whether each parameter is significantly different from zero.

The assumptions underlying the t-Student test are:

• H0: C (1) = 0, ie the value of the coefficient is not significantly different from zero;

• H1: C (1) ≠ 0, ie the value of the coefficient is significantly different from zero.

It can be mentioned that each estimated coefficient is associated with a probability which represents the error you commit when you erroneously reject H0 (null hypothesis). Thus, this probability must be very low in order for the estimated parameters to be considered statistically significant. Usually, a tolerance threshold of 5% is accepted for this test (for a coefficient to be significant it is necessary that the probability is less than 5%). The same procedure regarding the tolerance threshold of 5% can be applied for the F test, but now the probability of F will be needed.

2.4 Simulation of the developed Herom type model

After presenting the methodological aspects underlying the interpretation of the model used to measure the impact of cohesion funds on the Romanian economy, we will continue to test the equations on which the model is based. Regarding these equations, we specify that they will be presented, estimated and analyzed taking into account the directions of the developed model, respectively:

[1] LS – Least Squere (Metoda celor mai mici pătrate)

☐ **Aspects of the offer**

The first direction that was analyzed is the one called: Aspects of the offer. In this regard, it was assessed how the absorption of European funds influenced the supply in the following sectors covered by the HETOM type econometric simulation model developed, respectively:

• industrial sector:

The first sector to be analyzed is that of industry. In this regard, we have constructed a regression equation to identify the effect of cohesion funds on this sector. Within this equation, the Gross Value Added from Industry (GVA IND) is the dependent variable, and the independent variable is represented by the absorption rate of European funds for the financial year 2007-2013 allocated by the Operational Program Increasing Economic Competitiveness (OPIEC).

GVA IND = C(1) * OPIEC + C(2) + ε_t, unde:

GVA IND = Gross Value Added from Industry (millions euro);

OPIEC = Absorption rate related to the Operational Program Increasing Economic Competitiveness (% of total allocation);

C(1) = the coefficient of the independent variable;

C(2) = constant (the free term of the equation);

ε = model error.

Figure no. 1 Test on estimating the model using Eviews on Gross Value Added in Industry, an indicator influenced by European funds allocated through OPIEC

Dependent Variable: GVAIND

Method: Least Squares

Date: 08/04/20 Time: 10:48

Sample: 2007 2017

Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OPIEC	74.62271	28.70002	2.600093	0.0287
C	35152.62	1352.313	25.99445	0.0000

R-squared	0.428952	Mean dependent var	37544.15
Adjusted R-squared	0.365502	S.D. dependent var	4127.644
S.E. of regression	3287.892	Akaike info criterion	19.19685
Sum squared resid	97292091	Schwarz criterion	19.26919
Log likelihood	-103.5827	Hannan-Quinn criter.	19.15124
F-statistic	6.760483	Durbin-Watson stat	2.161783
Prob(F-statistic)	0.028734		

Source**:** Data processing by the author in Eviews

The results obtained by this model show that there is a direct relationship between the degree of absorption of funds allocated by OPIEC and the level of added value generated in industry during the analyzed period. Therefore, an increase in the degree of absorption can lead to an increase in value added in the industry, according to the

model presented. To quantify the relationship, we can use the OPIEC variable coefficient which is 74,622, which shows that an increase in the degree of absorption on the OPIEC axis by 1 p.p. it can be stated that an increase in gross value added in industry of EUR 74.6 million is possible.

• **market services sector:**

The second part of the offer that will be analyzed is related to the market services sector, respectively: trade activities, accommodation, food services, transport, etc .. And in this case we used a regression equation, aiming to highlight the direct and indirect externalities generated by the European funds during the analyzed period. Within this equation, the Gross Value Added of Market Services (GVA MS) was considered as a dependent variable, and the European funds absorbed by Romania through the Operational Program for Human Resources Development (OP HRD) were considered as an independent variable.

GVA MS = C(1) * OP HRD + C(2) + ε_t, unde:

GVA MS = Gross Value Added of Market Services (millions euro);

OP HRD = Absorption rate related to the Operational Program for Human Resources Development (% of the total allocation);

C(1) = the coefficient of the independent variable;

C(2) = constant (the free term of the equation);

ε = model error.

Figure no. 2 Test on estimating the model using Eviews on the Gross Added Value of Market Services, an indicator influenced by the European funds allocated by OP HRD

Dependent Variable: GVA MS

Method: Least Squares

Date: 08/04/20 Time: 10:47

Sample: 2007 2017

Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OPHRD	144.8323	50.65925	2.858951	0.0188
C	19521.36	2026.313	9.633928	0.0000

R-squared	0.475940	Mean dependent var	23409.97
Adjusted R-squared	0.417711	S.D. dependent var	6528.138
S.E. of regression	4981.483	Akaike info criterion	20.02781
Sum squared resid	2.23E+08	Schwarz criterion	20.10015
Log likelihood	-108.1529	Hannan-Quinn criter.	19.98221
F-statistic	8.173604	Durbin-Watson stat	1.001229
Prob(F-statistic)	0.018813		

Source: Data processing by the author in Eviews

For the private services sector, the results of estimating the regression model again indicated a statistically and econometrically valid model, the estimated coefficients being significantly different from zero, this being highlighted by the probabilities related

to the t-Student test which are less than zero . Also, the direct relation obtained is observed, ie an increase in the degree of absorption on OPHRD by 1 p.p. leads to an increase in the value added in private services of 144.8 million euros, being highlighted at the same time the importance of this axis, but also the positive effects of the money attracted, both in the short term and in the medium and long term.

• **agriculture sector:**

It should be noted that the European funds allocated to agriculture in the period 2007-2013 were not allocated through the instruments of the cohesion policy of the European Union. During this period, the National Rural Development Program, the European Agricultural Guidance and Guarantee Fund and the European Fisheries Fund were the instruments used by the Common Agricultural Policy, representing complementary instruments that contributed to regional development. For this reason, these funds were not analyzed in detail in this case study. The reason why the agricultural sector was analyzed is that this sector, according to the Herom theoretical model, represents the third part of the supply to be analyzed. In this regard, we analyzed an equation using the regression model developed, in order to highlight the externalities generated by the European funds absorbed in this sector. The analyzed equation has as dependent variable the Gross Added Value of the Agricultural Sector (GAV AS), and the independent variable is, this time, the degree of absorption of European funds allocated in the period 2007-2013 through the National Rural Development Program (NRDP).

GAV AS = C(1) * NRDP + C(2) + ε_t, unde:

GAV AS = Gross Added Value of the Agricultural Sector (millions euro);

NRDP = Absorption rate related to the National Rural Development Program (% of the total allocation);

C(1) = the coefficient of the independent variable;

C(2) = constant (the free term of the equation);

ε = model error.

Figure no. 3 Test on estimating the model using Eviews on the Gross Added Value of the Agricultural Sector, an indicator influenced by the European funds allocated by NDRP

Dependent Variable: GAV AS

Method: Least Squares

Date: 08/04/20 Time: 11:03

Sample: 2007 2017

Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NDRP	3.144431	6.760217	0.465141	0.6545
C	7020.035	418.3618	16.77982	0.0000

Source: Data processing by the author in Eviews

The results obtained for the model that tried to explain the variation of the Gross Value Added in the Agricultural Sector according to the absorption rate of funds allocated by NDRP indicate that the model is not statistically valid and that there is not a strong

enough relationship between these variables. Therefore, it can be concluded that the absorption rate of funds allocated by NDRP did not significantly influence the Added Value of the Romanian Agricultural Sector, and the factors that led to this situation are numerous, the impact on the agricultural sector being cumulative and difficult to quantify. However, the coefficient for the NDRP variable is positive, and this shows that there is still a direct relationship between these variables, but it is not strong enough to have a significant influence. The result obtained is in line with reality, as it is known that the European funds allocated by the NDRP not only financed the agricultural sector but also aimed at financing rural development as a whole. Practically, the funds allocated through NDRP led more to investments in rural infrastructure, fixed capital, state-of-the-art technologies to increase productivity in both the agricultural and non-agricultural sectors, investments that contributed to the increase in value. Added Gross Agricultural Sector and also to increase the standard of living in rural areas. For this reason, I believe that the European funds allocated through the European Agricultural Guarantee Fund, which were directly injected into agriculture in the form of subsidies granted to Romanian farmers, as well as the funds allocated through agriculture, had a significant impact on agriculture. through the European Fisheries Fund.

- **construction sector:**

The fourth part of the offer that will be analyzed is the one related to the construction sector. In this case, using the simulation model developed, we analyzed a simple regression equation that has as dependent variable the Gross Value Added in the Construction Sector (GVA CS), and as an independent variable the absorption rate of funds allocated through the Transport Sector Operational Program (TSOP). The purpose of the analysis was to highlight the effects of European funds allocated throughTSOP 2007-2013 on the construction sector in Romania.

GVA CS = C(1) * TSOP+ C(2) + ε_t, unde:

GVA CS **=** Gross Value Added in the Construction Sector (millions euro);

TSOP = Absorption rate related to the Transport Sector Operational Program (% of the total allocation);

C(1) = the coefficient of the independent variable;

C(2) = constant (the free term of the equation);

ε = model error.

Figure no. 4 Test on estimating the model using Eviews on Gross Value Added in the Construction Sector, an indicator influenced by European funds allocated through TSOP

Dependent Variable: GVA CS

Method: Least Squares

Date: 08/04/20 Time: 22:09

Sample: 2007 2017

Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TSOP	69.68670	26.82660	2.597671	0.0288
C	35219.71	1335.749	26.36702	0.0000

R-squared	0.428495	Mean dependent var	37544.15
Adjusted R-squared	0.364995	S.D. dependent var	4127.644
S.E. of regression	3289.205	Akaike info criterion	19.19765
Sum squared resid	97369855	Schwarz criterion	19.26999
Log likelihood	-103.5870	Hannan-Quinn criter.	19.15204
F-statistic	6.747896	Durbin-Watson stat	2.268493
Prob(F-statistic)	0.028848		

Source: Data processing by the author in Eviews

The results also indicate a direct relationship between the absorption rate (TSOP) and the gross value added in the sector for which European funds are granted in that axis, in this case the construction sector. Thus, according to the results obtained, an increase in the absorption rate by 1 percentage point leads to an increase in gross value added in the construction sector by 69.7 million euros.

• **public services sector (non-market):**

The last sector within the offer to be analyzed is the one represented by public services (non-market), respectively: public administration, defense, education, health, etc. The equation analyzed is the one in which the dependent variable considered is the Gross Value Added of Public Services (GVA PS), and the independent variable is represented by the degree of absorption of European funds allocated by the Operational Program Development of Administrative Capacity (OPDAC).

GVA PS = C(1) * OPDAC + C(2) + ε_t, unde:

GVA PS = Gross Value Added of Public Services (millions euro);

OPDAC = Absorption rate related to the Administrative Capacity Development Operational Program (% of the total allocation);

C (1) = the coefficient of the independent variable;

C (2) = constant (the free term of the equation);

ε = model error.

Figure no. 5 Test on estimating the model using Eviews on the Gross Value Added of Public Services, an indicator influenced by the European funds allocated through OPDAC

Dependent Variable: GVA PS

Method: Least Squares

Date: 08/05/20 Time: 09:34

Sample: 2007 2017

Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OPDAC	71.94294	15.70430	4.581097	0.0013
C	12659.47	863.0621	14.66809	0.0000

R-squared	0.699864	Mean dependent var	15490.49
Adjusted R-squared	0.666516	S.D. dependent var	3460.186
S.E. of regression	1998.190	Akaike info criterion	18.20084
Sum squared resid	35934883	Schwarz criterion	18.27318
Log likelihood	-98.10460	Hannan-Quinn criter.	18.15523
F-statistic	20.98645	Durbin-Watson stat	1.827192
Prob(F-statistic)	0.001326		

Source: Data processing by the author in Eviews

Following the estimates, we obtained a positive value for the OPDAC coefficient, ie a direct relationship between the absorption rate related to the Administrative Capacity Development Operational Program and the gross value added in the non-market public services sector. In other words, an increase in the absorption rate by 1 p.p. leads to an increase in the value of non-market public services by 71.9 million euros.

☐ **Aspects of demand (absorption)**

Following the analysis of the Aspects of supply, it is necessary to move towards the analysis of the Aspects of demand (absorption), and here the focus will be on an important element in the evolution of which there are strong implications generated by the externalities of using European funds, namely: exports (EXP). Thus, an equation will be estimated, whose dependent variable is represented by Exports and the independent variables will be represented by: Gross Value Added from Industry (GVA IND) and Average Monthly Net Nominal Earnings from Industry (AMNNE IND). This equation has the following form:

EXP = C(1)* GVA IND +C(2)* AMNNE IND +C(3), unde:

EXP = Valoarea Exporturilor din România;

GVA IND = Valoarea Adăugată Brută din Industrie (milioane euro);

AMNNE IND = Câștigul Salarial Nominal Mediu Net Lunar din Industrie (lei);

C(1), C(2) = the coefficients of the independent variable;

C (3) = constant (the free term of the equation).

The results obtained from estimating the equation, using the Eviews software, are presented in the following figure:

Figure no. 6 Test on estimating the model using Eviews on the Value of Romanian Exports, an indicator influenced by the Gross Added Value in Industry and the Nominal Average Monthly Net Earnings in Industry

Dependent Variable: EXP

Method: Least Squares

Date: 08/05/20 Time: 09:37

Sample: 2007 2017

Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GVA IND	2.855961	0.408183	6.996761	0.0000

AMNNE IND	28.17088	4.703041	5.989929	0.0003
C	-9609.559	11097.60	-0.865913	0.4118

R-squared	0.921815	Mean dependent var	45159.36
Adjusted R-squared	0.902269	S.D. dependent var	11450.48
S.E. of regression	3579.647	Akaike info criterion	19.43092
Sum squared resid	1.03E+08	Schwarz criterion	19.53943
Log likelihood	-103.8700	Hannan-Quinn criter.	19.36251
F-statistic	47.16079	Durbin-Watson stat	1.011665
Prob(F-statistic)	0.000037		

Source: Data processing by the author in Eviews

From the previous figure, it can be seen that all estimated parameters are significantly different from zero, which suggests that the model is statistically valid and economic interpretations can be made with confidence. There was a direct relationship between the independent variables used and the dependent variable, ie an increase in the cause variables led to an increase in exports. Thus, it is assumed that European funds to increase productivity in industry and increase production capacity have led to higher and, most likely, higher quality exports. The same relationship is observed in the case of the average monthly net nominal earnings from industry and exports from Romania, it being obvious that a higher gain due to labor specialization through various training programs, with or without the support of cohesion funds, led to increasing productivity and achieving higher exports, even in conditions of rising wages.

☐ **Aspects of income distribution**

The last direction analyzed is represented by aspects of income distribution. This direction aims to assess the way in which revenues from the economy are used, both at the macroeconomic level (at the level of the central state administration) and at the microeconomic level (at the level of each individual). All these aspects will be summarized and described by means of a regression equation that has as dependent variable the Total Average Monthly Income per Household (TAMIH) and independent variables Gross Domestic Product (GDP) and Average Household Taxes (AHT), respectively:

TAMIH = C(1)*GDP+C(2)* AHT+C(3), unde:

TAMIH = Total Average Monthly Income per Household (RON);

GDP = Gross Domestic Product (millions euro);

AHT = Average Household Taxes (RON);

C(1), C(2) = the coefficients of the independent variable;

C (3) = constant (the free term of the equation).

Figure no. 7 Test on estimating the model using Eviews regarding the level of Average Monthly Total Income per household, an indicator influenced by the evolution of the level of Gross Domestic Product and Average Household Taxes

Dependent Variable: TAMIH

Method: Least Squares

Date: 08/05/20 Time: 09:42

Sample: 2007 2017
Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP	0.002368	0.001178	2.010506	0.0792
AHT	-1.160942	-0.070297	16.51474	0.0000
C	420.7784	103.1522	4.079199	0.0035

R-squared	0.791700	Mean dependent var	2492.163
Adjusted R-squared	0.789625	S.D. dependent var	436.7073
S.E. of regression	44.48272	Akaike info criterion	10.65508
Sum squared resid	15829.70	Schwarz criterion	10.76360
Log likelihood	-55.60294	Hannan-Quinn criter.	10.58667
F-statistic	477.9126	Durbin-Watson stat	1.100171
Prob(F-statistic)	0.000000		

Source: Data processing by the author in Eviews

And for this last test we obtained statistically and econometrically significant relationships, if we use a significance threshold of 10%. Thus, according to the figure above, it can be seen that an increase in GDP leads to an increase in average household income, while an increase in average taxes leads to a decrease in disposable household income.

3. Conclusions

Following the analysis, I appreciate that the model developed by Herom type, led to obtaining valid results from a statistical and econometric point of view. Most of the estimated coefficients were significantly different from zero according to the t-Student test, validated by using the two-tailed Student distribution. It can also be seen that the probability of the Fisher test (Prob (F-Statistic)) is less than any significance threshold of 5%, and this shows that the model as a whole is a valid one, for almost all estimates. the two types of approaches. The coefficients were interpreted for each case from an economic point of view, showing the meaning of the relationships and their intensity depending on the values we obtained for each. In most cases, the relationships obtained within the developed model and based on mathematical relationships are according to expectations and economic theory, but also according to economic intuition. Thus, it can be stated that the estimated Herom type model led us to obtain valid and economically confirmed relationships, which confirm the economic relationships that currently exist between the dependent variables considered and the independent variables, which were represented in for the most part, the absorption rates for the main funding programs for the financial year 2007-2013.

The conclusions obtained from the simulation of the HEROM model built were in line with the expectations initially established, while strengthening the belief that a high rate of absorption of European funds will only bring a boost to the Romanian economy, lead to the development of major sectors of the economy. and, at the same time, to

contribute to economic growth. Thus, in all the cases analyzed through the simulation model, relations were obtained according to which the European funds allocated to Romania in the period 2007-2013 brought an added value to the main economic sectors. This aspect is also confirmed by the most relevant indicators that reflect the evolution of the analyzed sectors using the developed econometric model. Therefore, it was concluded that an increase in the absorption of European funds certainly led to an added value for each of the sectors covered by the developed econometric model, as confirmed by the positive evolution of GDP in the period under review.

Compared to those mentioned, I consider that the developed econometric model highlighted the fact that the European funds allocated to Romania in the period 2007-2013 had a beneficial impact for the entire Romanian economy, despite the deficiencies and countless blockages that existed regarding their absorption, due both the institutional system and, especially, the legislative system in the field, contributing to economic growth.

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