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Does the Number of Inhabitants Influence the Investments Financing in Territorial Administrative Units?

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Abstract

This study includes financing sources and presents the structure of financing sources for ten territorial administrative units. The structure of the external financing of ten territorial administrative units was analysed, as well as the influence of the number of inhabitants on the volume of internal and external financing sources, using the econometric model. This study shows that the external sources represent the majority share of the financing sources for all the territorial administrative units (UATs) studied. The UATs were selected from all areas of Alba County. Geographically, some UATs are located in the mountain area, where the villages are scattered, and others are located in the hill area, where the distance between villages is small. The paper analyses the correlation between the population number of the ten territorial administrative units (UATs) and the value of the financing from external sources, and if the same correlation is found between the population number and the value of the internal sources of financing.

Keywords

Financing sources, public investment projects, external sources, econometric model

JEL Codes: H20, H27

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1. Introduction

The financing of the institutions is regulated by the Law 500/2002 on the public finances – “The financing of the current expenses and capital expenses of the public institutions are assured as follows:

- a) Integrally from the state budget, the budget of state social insurance, and the budget of the special funds, as necessary;
- b) from own incomes and from subventions from the state budget, the budget of state social insurance, and the budget of the special funds, as necessary;
- c) Integrally from own incomes”.

The financing sources in the Romanian public sector, according to the Order of the Minister of Public Finance, no. 720/2014, for the approval of the Methodological norms for the execution of the budgets of incomes and expenses, are as follows: A. Integrally from the budget; B. External credits; C. Internal credits; D. External non-reimbursable funds; E. Activities integrally financed from own incomes; F. Integrally own incomes; G. Own incomes and subventions; H. The budget of activities related to privatisation; I. The Budget of the Fund for the Environment; J. The Budget of the National Treasury; K. Re-classified; L. The Risk Fund.

The budgets of all UATs (Territorial Administrative Units) were restructured on two sections: the functioning section (current expenses and loans repayment) and the development section (capital expenditure and the implementation of the post-accession European projects). The functioning section represent the base, compulsory, part in an UAT budget, excepting the budget of the external non-reimbursable funds and the budget of the external and internal loans, containing the incomes necessary for the financing of the current expenses, with the aim of achieving the legal competencies, together with the respective expenditure¹. The development section represents the complementary part of the budget of an UAT, excepting the budget of the non-reimbursable external funds, containing the incomes and expenses for the implementation of the development policies to national, regional, county, area or local level.

¹ Art. 2, alin. 50, Law 273/29.06.2006 on The local public finances.

The financing sources of the projects for public investments present two large groups: internal sources and external sources.

The internal financing sources of the public projects. The internal financing sources for the investment expenses of the local administration are the local budget and/or the budget of the subordinated public institutions, with incomes from: taxes and duties, approved by the Local councils in the legal limits, transfer/sale of assets from the public or private property of the local public authorities; concession of assets from the public or private property of the local public authorities; economic activities of the public service units of local interest, and also the extra-budgetary incomes from sponsorship, donations, special/local temporary taxes, imposed by the authorities with the aim of serving as financing source for the projects.

The external financing sources of the public projects include: a) The County Budget; b) The State Budget; c) Governmental programs; d) National priority programs; d) Structural and Investments European Funds (through the operational programs ERDF, ESF, NRDP); e) Territorial cooperation programs; f) Grants; g) Internal and international financial institutions – The European Investment Bank (EIB); h) Other financing sources.

Usually, in the case of the local administration, the planning of the investments starts with the creation of a multi-annual local development strategy, which establishes the directions for the social and economic development, later approved by the Local Councils.

The main objective of the article is the analysis of the existence of a correlation between the population number and the financing sources from the *development section* of the local budget of a UAT. Among the specific objective of the paper, we enumerate: (1) The identification of the national legislation that regulates the *development section* from the local budget of a UAT (2) The comparative analysis of the structure of the financing sources for the projects of 10 UATs; (3) The calculation of the intensity of the relation between the number of the population and the financing sources from the *development section* of the local budget; (4) The construction of two simple regression models, the first one using the volume of the internal sources (SI) as dependent variable, and the second using the volume of the external sources (SE) for 2016-2019 as dependent variable and the population number of the UAT as independent variable.

2. Literature review

Dragoescu and Avram (2008) affirmed that the appearance of the local communities and their investments in the local authority, economically and financially, lead to what is presently known as “local finances”. The efficacy of the local administration increases with the development level of the country and it is positively connected with the national integrity of the juridical system. The opposite operates in case of (Aiello and Bonanno, 2019). Dorosh *et al.* (2019) observed that a rapid decrease of the population leads to the decrease of the incomes in the local budget, making impossible the maintenance of the infrastructure to a proper level. Kobińska and Kubik (2018) evaluated the efficacy of the investment activity in certain communes in Poland. The studies conducted show that the amount of expenditure incurred on the studied spheres of investment activity of the analysed communes does not translate into their efficiency. This is connected with the possibility of obtaining additional funds from EU.

Porcelli and Vidoli (2019) paper addresses the problem of the simultaneous evaluation of local governments' standard expenditure needs together with the related level of standard public services proposing a new approach to fiscal equalisation based on quantitative methods. Roesel (2017) uses the method of the synthetic control in order to identify the effect on the public expenditure caused by the fusions of the German districts. Popilkova *et al.* (2019) determined the factors that influence the decrease of the investment subventions coming from the small municipalities in the South Bohemia area, between 2013 and 2017; the municipalities were classified by the authors in the category of the municipalities with 500 - 4999 de inhabitants. Several indicators were taken in consideration. The size of the population was among these indicators. No significant correlation between the population number and the volume of the investment subventions was registered. Papcunová *et al.* (2019) write that, despite the fiscal decentralisation the Slovakian municipalities depend on the state budget, as fiscal incomes and also subventions. Although territorial self-government has a relatively big decision-making power, its budget is still significant dependent on the state budget.

The Romanian rural environment passes through a prolonged period of transformations, more or less visible in the statistical data (Stănică, 2015; Mihalache, 2013). Although the percentage of the rural population in the total of the Romanian population suffered no significant changes in the last period, ample structural modifications still take place. Pavel and Moldovan, (2016) analysed if the communes financed through SAPARD or through the OG 7/2006 registered a slight decrease of the population, compared to the municipalities that did not benefit of such financing. The study does not indicate the existence of a powerful relation. Despite many stages of research on the efficacy of the communes, there are

no studies to analyse the correlation between the population number and the financing sources from *the development section* from the budgets of the UATs from the Romanian rural area.

3. Methodology of research

The aim of the paper is to analyse if there is a correlation between the population number and the financing sources from the *development section* from the local budget of the UATs. The present paper uses the elements of the comparative analysis as research method: the observance, the comparison, the causal analysis and an econometric model. We compared ten territorial administrative units. There were compared two territorial administrative units. For the analysis of the internal and external financing of the public institutions, we considered the financing sources from the *development section* of the Local Budgets of 10 municipalities (rural environment) from Alba County: Albac; Avram Iancu, Blandiana, Ceru Băcăinți, Cîlnic, Ciuruleasa, Galda de Sus, Horea, Ighiu, Pianu. For the comparative analysis, we used data from the *development section* of the Local Budget: Internal financing sources and External financing sources. The *internal sources* included instalments from the functioning section; incomes from the sale of private assets of the state or of the territorial administrative units; sums from the surplus of the local budget, used to finance the expenses from the development section. The *external sources* included the financing from the National Program for Local Development; sums allocated from the ANCP budget for the financing of the systematic registration works in the National Cadastral and Land registration Program; Non-reimbursable financing programs; credits. We analysed statistical data on: the evolution of the financing sources of the *development section* of the local budgets of the 10 UATs for 4 years (2016-2019). We also analysed the intensity of the relation between the internal incomes and the population number and the intensity of the relation between the external incomes and the population number. In order to justify the results related to the intensity of the relation, we built two simple regression models. The first one uses the volume of the internal sources (SI) as dependent variable, while the second uses the volume of the external sources (SE) for 2016-2019 as dependent variable and population number from the respective UAT as independent variable.

4. The comparative analysis of the structure of the financing sources of the projects

In order to analyse the internal and external financing for the investment projects from the public institutions, we took in consideration the financing sources in the development section of the Local Budget for 10 municipalities in Alba County: Albac; Avram Iancu, Blandiana, Ceru Băcăinți, Cîlnic, Ciuruleasa, Galda de Sus, Horea, Ighiu, Pianu.

The analysed data (Table no. 1 and Figure no.1) show that the territorial administrative units finance from internal sources only a low percentage from the public investments; in our case, only Commune Ighiu (53.92%) and Albac Commune (52.72%) financed from internal sources over 50% from the investments. The causes are related to the fact that the internal sources are limited and usually used to finance the current expenses, because the collecting degree of the budgetary incomes from taxes and duties presents a factor of uncertainty for the financing of the projects, due to their random nature and gradual cashing. Usually, the internal sources are destined to finance small investments projects, feasibility studies, technical projects, taxes and expenses that are ineligible in the larger investment projects, which have external financing sources.

Table 1. The structure of the financing sources of the projects (lei) - consolidated data 2016-2019

NAME	Financing sources		TOTAL	Percentage (%)		Population number
	Internal sources	External sources		Internal sources	External sources	
Albac Commune	2,473,644.84	2,218,152.18	4,691,797.02	52.72	47.28	2098
Avram Iancu Commune	2,205,334.18	6,823,012.90	9,028,347.08	24.43	75.57	1545
Blandiana Commune	583,927.55	6,775,105.12	7,359,032.67	7.93	92.07	924
Ceru Băcăinți Commune	170,634.48	214,671.22	385,305.70	44.29	55.71	253
Cîlnic Commune	674,712.38	2,450,437.38	3,125,149.76	21.59	78.41	1898
Ciuruleasa Commune	816,217.00	4,094,433.60	4,910,650.60	16.62	83.38	1180
Galda de Sus Commune	178,700.00	469,807.53	648,507.53	27.56	72.44	1670
Horea Commune	153,815.36	12,561,547.54	12,715,362.90	1.21	98.79	2080
Ighiu Commune	3,151,083.88	2,693,038.98	5,844,122.86	53.92	46.08	6913
Pianu Commune	309,769.71	8,219,074.33	8,528,844.04	3.63	96.37	3610

Source: data processing from the 10 municipalities http://www.dpfb.mdrap.ro/populatie_uat-uri.html

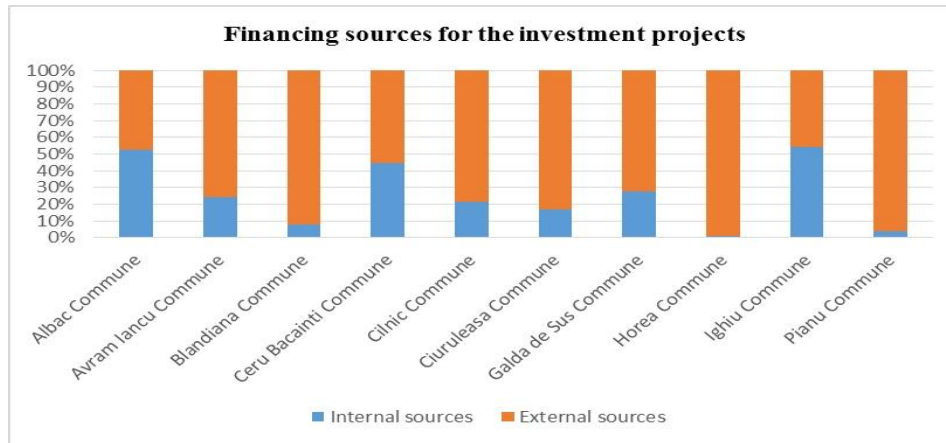


Figure 2. Financing sources for the investment projects – consolidated data 2016-2019

The major investments for the infrastructure are financed from external sources, the State Budget, the County Budget and the non-reimbursable financing projects. The structure of the external financing is presented in Table 2.

Table 2. The structure of the external financing 2016-2019 (lei)

Name	State Budget/ County Budget	Non-reimbursable financing projects	Internal credits	Budget surplus	Total
Albac Commune	1,414,143.47	110,008.71	694,000.00	-	2,218,152.18
Avram Iancu Commune	3,234,501.01	3,588,511.89	-	-	6,823,012.90
Blandiana Commune	5,786,105.69	988,999.43	-	-	6,775,105.12
Ceru Bacainti Commune	28,331.22	186,340.00	-	-	214,671.22
Cilnic Commune	43,500.00	2,406,937.38	-	-	2,450,437.38
Ciuruleasa Commune	3,673,447.91	420,985.69	-	-	4,094,433.60
Galda de Sus Commune	68,120.00	401,687.53	-	-	469,807.53
Horea Commune	11,935,686.21	625,861.33	-	-	12,561,547.54
Ighiu Commune	1,567,248.75	1,125,790.23	-	-	2,693,038.98
Pianu Commune	1,536,341.13	6,554,194.69	-	128,538.51	8,219,074.33
Total	29,287,425.39	16,409,316.88	694,000.00	128,538.51	46,519,280.78

The data (Table 2 and Figure 2) show that the State Budget is the main financing external source for the investments in the UATs, in the detriment of the non-reimbursable financing projects, which are an alternative for the UATs with limited own sources. The budget surplus for Pianu Commune comes from the unconsumed non-reimbursable financing in the current year, which is registered as budget surplus at the end of the year and used with the same destination in the following year. The internal credit in Albac Commune represents the financing of the VAT expenses from external non-reimbursable funds; the VAT will be recovered from the financer, while the credit covers the period between the date of the VAT recovery request and the VAT cashing.

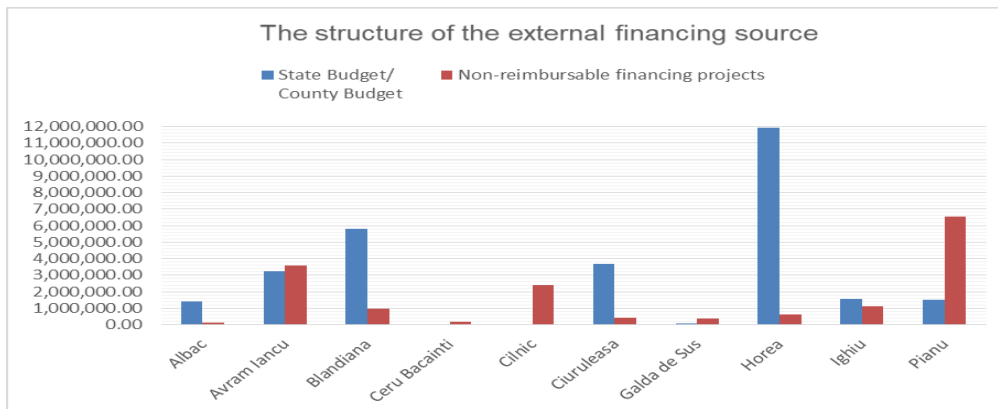


Figure 2. The structure of the external financing 2016-2019 (lei)

Figure 3 shows that the main percentage of the external financing comes from the State Budget.

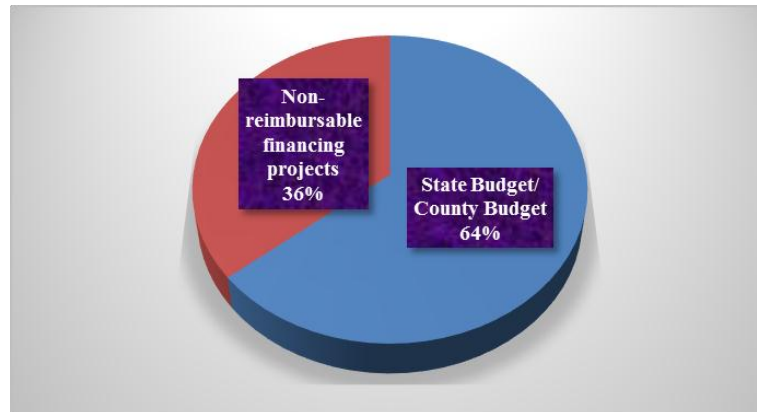


Figure 3. The structure of the external financing 2016-2019 (lei) (cumulated data for the 10 UATs)

5. Results and discussions

We will calculate the intensity of the relation between the population number and the financing sources of the development section in the local budget of the UATs and we will build two simple regression models. The first model has as dependent variable the volume of the internal sources (SURSE_INTERNE). The second model uses the volume of the external sources (SURSE_EXTERNE) for the period 2016-2019 as dependent variable, and the population number in the UAT as independent variable. The correlation coefficient (Pearson) is a quantitative value that describes the intensity of the relation between 2 or more variables. It varies between -1 and 1, where the extreme values show a perfect relation between variables and 0 means a total absence of a linear relation. For the variables X and Y, the calculation formula for the correlation coefficient is:

$$r = \frac{\sum_{i=1}^N (x_i - M_X)(y_i - M_Y)}{N \cdot S_X \cdot S_Y} \quad (1)$$

Where N is the number of values for each variable (40 in this case), x_i and y_i are the values of the variables, M_X and M_Y are their averages, and S_X and S_Y are the standard deviations of the two variables.

By calculating this coefficient related to the intensity of the relation between the internal sources and the population number, we obtained the value of 0.6121, corresponding to a good level of association between these two characteristics. Therefore, a regression model with the volume of the internal sources (SURSE_INTERNE) as variable dependent is meaningful. Related to the correlation coefficient for the intensity of the relation between the external sources (SURSE_EXTERNE) and the population number, we obtained the value of 0,034, corresponding to a very weak level of association between the two characteristics. Therefore, a regression equation for the relation between these two variables is not relevant.

Model 1: we build as follows the first model of simple regression, with the volume of the internal sources (SURSE_INTERNE) as dependent variable, for the period 2016-2019. The number of population (NR_POP) represents the independent variable. C represents the residual variable. Its value will represent the impact of the other variables that influence the evolution of SI and which were not taken in consideration for the present model. The estimation of the parameters of the regression model was made with the help of the EViews 10 software, using the method of the Least Squares. The results of the tests and the values of the variables of the linear regression model, are represented in Figure 4 for the first model.

The column named *Variable* shows the name of the variable to which the parameter in the second column corresponds. Each parameter estimated in this manner measures the contribution of the respective independent variable to the dependent variable. Therefore, the regression equation will be:

$$SI = 88.786 \cdot NrPop + 71098.32 \cdot C$$

The probability tests (Prob = 0.14% < 10%) show that the variable NrPop is not enough significant for the explanation of the dependent variable SI. The **R-squared** statistic measures “the success” of the regression equation in explaining the value of the dependent variable in the sample. Normally, this statistic can be interpreted as the fraction of the dependent variable, explained by the independent variable. The model created with the help of the software EViews 10, presented in Figure 4, has a reliability of 23.81%, meaning that this percentage of the internal sources is influenced by the population number. By

mathematically interpreting the equation of the regression model, we can say that each inhabitant influenced the internal financing sources of the commune with 88.78 lei in each of the last four years.

Dependent Variable: SURSE_INTERNE
Method: Least Squares
Date: 11/16/19 Time: 21:27
Sample: 1 40
Included observations: 40

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NR_POP	88.78610	25.75947	3.446737	0.0014
C	71098.32	73148.80	0.971968	0.3372
R-squared	0.238172	Mean dependent var		267946.0
Adjusted R-squared	0.218123	S.D. dependent var		326915.0
S.E. of regression	289070.6	Akaike info criterion		28.03544
Sum squared resid	3.18E+12	Schwarz criterion		28.11988
Log likelihood	-558.7087	Hannan-Quinn criter.		28.06597
F-statistic	11.88000	Durbin-Watson stat		1.771835
Prob(F-statistic)	0.001400			

Figure 4. The results of the linear regression model (imported from EViews)

Model 2: Related to the correlation coefficient for the intensity of the relation between the external sources and the population number would not be too relevant for the creation of a regression equation for these two variables. This aspect is also confirmed by the results of the tests performed with the help of the software EViews, presented in Figure 5. Still, for a supplementary verification, we built the simple regression model with the volume of the external sources (SURSE_EXTERNE) as dependent variable, for the period 2016-2019. The independent variable consists in the population number (NrPop).

Dependent Variable: SURSE_EXTERNE
Method: Least Squares
Date: 11/18/19 Time: 17:46
Sample: 1 40
Included observations: 40

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NR_POP	24.25642	113.4168	0.213870	0.8318
C	1109203.	322068.0	3.444003	0.0014
R-squared	0.001202	Mean dependent var		1162982.
Adjusted R-squared	-0.025082	S.D. dependent var		1257086.
S.E. of regression	1272754.	Akaike info criterion		30.99997
Sum squared resid	6.16E+13	Schwarz criterion		31.08441
Log likelihood	-617.9994	Hannan-Quinn criter.		31.03050
F-statistic	0.045740	Durbin-Watson stat		2.527613
Prob(F-statistic)	0.831792			

Figure 5. The results of the model of linear regression (imported from EViews)

Therefore, we observed that the *R-squared* statistic, measuring the “success” of the estimated regression equation for the explanation of the dependent variable in the sample, is very low, only 0.12%.

6. Conclusions

For achieving the objectives related to investments, the territorial administrative units use internal and external financing resources. Based on the macroeconomic context, the territorial administrative units use the tax related inventory to establish the maximum level of own revenues estimated to be cashed. The integral financing of the functioning expenses are assured by the estimated income; the remained sums are registered in the development section of the budget, together with the surplus from the precedent year. The financing of the investments from non-reimbursable external funds is achieved through financing contracts and in the conditions established in these contracts. The financing strategy is updated whenever a new financing source or legal provisions appear.

Due to the fact that the local taxes are limited as value and level of collection, the internal resources of the UATs are limited and used mostly for the current expenses of the institutions. With small exceptions, the UATs finance small investments

and the ineligible expenses from the projects of investments with external financing sources. In these conditions, the main financing sources of the investment's projects are the external sources, especially the State Budget and the Non-reimbursable Financing Programs. The small and middle size communes (from the point of view of the population number) have few chances to use bank loans, because the indebtedness is calculated in relation with the own incomes, not permitting large sums to be credited.

We remark that the State Budget is the main source of external financing for the investments of the institutions in our sample. The UATs with a low own income use the non-reimbursable financing programs as source for the investment financing. The 2 models show that the population number influences in a percentage of 35.87 the volume of the financing internal sources in the *development section* of the local budget for the analysed 10 UAT's. therefore, there are other factors that influence the volume of the internal financing sources, as: the management of the UAT, the opening toward the accession of the European programs, the professional level of the employees of the municipality, the degree of attracting the investors in the area, the number of companies in the area, etc. These indicators will be the base of our future research.

The State Budget remains the main financing source of the Local Budgets for the current expenses and also for the investment projects. Also, the reorganisation of the system of the public financing is necessary, together with a redistribution of the public funds, in order to financially increase the local autonomy and to decrease the dependence to the State Budget.

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OMFP 845/2014 pentru modificarea și completarea Normelor metodologice privind organizarea și conducerea contabilității instituțiilor publice, Planul de conturi pentru instituțiile publice și instrucțiunile de aplicare a acestuia, aprobate prin Ordinul ministrului finanțelor publice nr. 1917/2005, cu modificările și completările ulterioare

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