

# DEMOGRAPHIC AND SOCIO-ECONOMIC DETERMINANTS OF LOCAL FINANCIAL AUTONOMY IN ROMANIA\*

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## Abstract

Local autonomy is a rarely explored concept in the literature, still holding an increasing importance in the current context of Romania's development in the European Union. In this paper we attempt to provide an overall survey on the financial dimension of local autonomy, assuming that local autonomy cannot be implemented, unless local authorities have adequate financial resources. In this study we also analyze the possibility to measure the local revenue autonomy and to identify the variables which represent the determinants of the local revenue autonomy.

Using empirical evidence from Romanian counties, we analyze the regional distributions for own revenues and for the significant determinants of local revenue autonomy. By means of econometric modeling we will highlight the variables which are statistically significant and explain the variation of the local revenues of Romanian counties, as well as the order of importance of the determinants of local financial autonomy. The empirical results show us that, although, theoretically, the counties have a great administrative and financial autonomy, practically this autonomy is very reduced (an average of under 40% for local revenue). The modeling results show that the degree of local financial autonomy can be increased by increasing economic development, urbanization, the average living area per person and fertility. Unemployment and a high level of demographic dependency contribute to the decrease of local financial autonomy.

**Keywords:** local autonomy, financial autonomy, demographic and socio-economic determinants, econometric model.



## 1. Introduction

Local autonomy is a research topic that is not very commonly debated in the literature. As Clark observed (1984, p. 196) 'most academic theorists place their work in the context of an existing, albeit unacknowledged, institutional framework that assumes some kind of local autonomy'. The need for further research in this area is claimed by some researchers (Clark, 1984, Sauviat, 2004, Cigu, 2011, etc.), at least in the current orientation towards local development and decentralization.

At the European Union and national level (Romania), the importance of research on local autonomy is supported by the growing importance of the concept of local development and decentralization, from the legal political and economic perspectives. The current and future Europe is the one which places the emphasis on the promotion of local and community development potentials. Such horizons require the development of theoretical and empirical research that highlights issues raised by the concept of local autonomy, its possibilities of measuring and identifying factors that increase the level of local autonomy.

The goal of this paper is twofold, theoretical and empirical. At theoretical level, the authors attempt to highlight the possibilities of defining the concept of local autonomy and its main dimensions. When highlighting the financial aspect of local autonomy, the study emphasizes the problem of measuring local financial autonomy through revenues. The working hypothesis underlying this analysis is that local autonomy cannot be implemented unless local authorities have adequate financial resources. The measurement of financial autonomy is achieved through the local budget revenues, following a hypothesis which argues that local revenues depend on a number of demographic, social and economic development determinants.

After reviewing the concepts of local autonomy and the financial side of local autonomy, we consider that the identification and description of the exogenous constraints of local autonomy are key conditions for a correct measurement of local financial autonomy. The study will highlight some of these determinants, based on the literature as well as a concrete analysis of Romania after the EU integration. Based on a better understanding of how the legal, demographic, political, socio-economic and other framework conditions intersect to influence local own revenues for a greater local financial autonomy, we undertake a statistical analysis of the main determinants of local financial autonomy of the Romanian counties. An important objective of the empirical part of this study is to build an econometric model in order to explain the variation of local revenues of the Romanian counties and to identify which are its significant determinants and their impact on local financial autonomy.

The paper is structured as follows: Section 2 provides a theoretical analysis of the concept of local financial autonomy, Section 3 describes the method and the statistical data; Section 4 presents the results of the empirical study conducted in the counties of Romania during 2008-2010. The paper ends in conclusions, references and annexes.

## 2. Theoretical aspects regarding the local financial autonomy

In Europe, there are various ways of perceiving local autonomy, since, in history, local autonomy was an internal matter of states, an area at the discretion of state sovereignty, on the condition that it does not violate other generally recognized principles of public international law. At constitutional level, the simple principle of local autonomy is generally included with reference to specific laws that regulate its forms, conditions and limitations. Practically, every country has adopted a particular form of regulation of local autonomy, related to the historical conditions of state formation, structure, forms of government, mixed ethnicities of the population, traditions and aspirations, which generated the organizational form and management type of local government. Thus, countries such as Denmark, Belgium, and the United Kingdom of Great Britain and Northern Ireland do not explicitly use the term local autonomy; however countries such as Romania, Greece, Luxembourg, Spain, and Portugal have regulations enshrined in their fundamental terminology. Nevertheless, all forms of local autonomy are based on the idea that the local autonomy is 'not only a barometer of democracy, but also the most effective way of combining coherent development strategies and national resources with real possibilities' (Dascălu, 2006, p. 148). In this respect, Henri Oberdorff (1992, p. 14) made the following observation: 'These different European constitutions by their decentralized approach, authorizing flourishing of a Europe twinned, complementary, of a Europe of community of states'. This last statement points to the local autonomy, based on decentralization, complementarity and the community of states.

Local autonomy has been mainly defined from a legal perspective, in the field of administrative law. The theme was taken up by the administration science which added the social, political and financial components, but globally, its definition was not unitary until the adoption of the European Charter of Local Self-Government (Council of Europe, 1985).

One of the attempts to define the local autonomy, from a legal perspective, belongs to Maurice Hauriou (1927, pp. 345-346), who uses the term autonomy to describe 'the discretion of the administration left by law sometimes'. Jacob Robinson (1934, pp. 254-256) also examines the nature of local autonomy from a legal perspective by comparing it with the concept of sovereignty. He believes that autonomy exists only by means of respect for those powers that were given to a particular unit while sovereignty is the supreme and unconditional authority of the state. A brief definition of autonomy found in the literature is that given by the political scientist Heinrich Oberreuter (1985, pp. 490-491), namely 'the possibility of free self-determination within existing regulations'.

Gurr and King, (1987, p. 62) stated that 'the local state is autonomous to the extent that it can pursue its interests without substantial interference by the national state'. Ruth Lapidoth (1997, p. 3) defines local autonomy as a way of dissemination of powers to preserve state unity while respecting the diversity of its population: it was a success in some cases and failure in others. For Pratchett (2004, pp. 358-375) 'local self-government in both unitary and federal systems occurs only because a higher-level authority delegates some of its sovereign powers and responsibilities'.

The theorization of local autonomy by Clark (1984) resulted in the achievement of synonymies between local autonomy and actual local discretion. The definition of local discretion given by Clark (1984, p. 199) was 'the ability of local governments to carry out in their own manner their own particular objectives in accordance with their own standards of implementation'. Thus, this definition could lead the reader to the assumption that Clark defined local autonomy taking into account two aspects (Beer-Tóth, 2009, p. 40): (i) the freedom of local government to decide about the range of local public services to be provided; and (ii) the freedom of local authorities to manage the production function, in the common sense of an effective capacity to produce those services.

Regardless of the views on the definition of local autonomy, the majority of authors agree that local autonomy refers to the freedom of administrative units to manage their own affairs in a way that is not entirely controlled by central government authorities, including the ability of local authorities to have a positive impact on citizens.

The most complete and most useful common reference document for local autonomy is nowadays the European Charter of Local Self-Government, adopted by the European Council in 1985 and ratified by Romania in 1997 (Law no. 199/1997). According to the Charter, 'local self-government denotes the right and the ability of local authorities within the limits of the law to regulate and manage a substantial share of public affairs under their own responsibility and in the interests of the local population' (Council of Europe, 1985, art. 3). The definition offered by the Charter, by combining the concept of 'the right' to the 'ability of local authorities', had a more profound impact on European territorial reforms than those which passed only as part of 'the right of local authorities'.

This is because the 'right of local authorities' as a component part of the definition is met in the public law system as competence, namely a set of duties which belong, by law, to local government authorities. In addition to the definition of the notion 'ability', meaning that the legal right to regulate and manage certain public affairs must be accompanied by the means of their effective execution, its application also implies the existence of appropriate financial resources.

By integrating the concept of 'ability of local authorities' in the definition of local autonomy, the Council of Europe asked the countries that ratified the Charter whether local governments have administrative, financial, technical and professional capacity. We should note that in the definition offered by the Charter, local autonomy has several dimensions: administrative, financial, technical, etc. These dimensions have been studied and presented in the literature in various forms, and in relation to the manner in which the Charter was assumed and applied in the European countries. The legal framework in Romania explicitly sets out the content and nature of local autonomy and 'local autonomy can only be administrative and financial' (Law no. 215/2001, art. 4 (1)).

It is important to note that a real local autonomy cannot exist unless financial autonomy is ensured; a transfer of powers from central to local level, meaning administrative autonomy, with no competences in mobilizing resources to local budgets, leads to a negative level of satisfaction of local interests (Onofrei, 2007, p. 75). In other words,

local autonomy can not be implemented unless local authorities have adequate financial resources. The obvious dependence of administrative autonomy on financial autonomy is reflected in most studies. Moşteanu and Lăcătuş (2008, p. 52) believe that local administrative autonomy is conditioned by financial autonomy and offers the possibility to submit the local and national public services to the local specific demands and needs, in terms of efficiency and efficacy. Under these conditions, it can be considered that the 'financial side is an important component of local autonomy, which has influence on the ability of decision of local authorities' (Voinea, 2008, p. 47). Agnes Sauviat (2004, p. 174) states that local autonomy in financial terms is one of the basic conditions of a real freedom of management to the extent where it does not state independence from the state, though requiring the state to guarantee stable and sufficient resources that allow the local authority to fully exercise its relevant decentralized competences. As regards the definition of financial autonomy, the same author (Sauviat, 2004, p. 172) considers that it is very difficult to provide a rigorous and precise definition of financial autonomy. A general definition of local autonomy from a financial perspective offered by the literature is the following: 'local autonomy implies the right of local authorities to have financial resources, to manage and to use them for carrying out the duties prescribed by law, to develop budget, to monitor implementation of the budget which is called financial autonomy' (Voinea, 2008, p. 45).

The financial dimension of local autonomy theoretically requires that local revenues should cover expenditures made during a budget year. The characterization of local financial autonomy in practice is conducted by reference to the registered local budgets indicators, namely by calculating the ratio of own revenues in total revenues of local budgets, the ratio of subsidies and transfers from state budget and other budgets to local budgets in the total local revenues, the ratio of own revenues in the total expenditures of local budgets. Most frequently, the measurement of financial autonomy recognized in the literature is the ratio of own revenues in total revenues, based on the rationale that if the ratio of own revenues in total local revenue sources is higher, the territorial-administrative unit is free to spend as it considers necessary in order to cover the public needs, which translates into a large financial autonomy.

Weingast (1995) and McKinnon (1997) place emphasis on the reliance on local government's own sources of revenues for the finance of decentralized budgets. Therefore, the amount of revenues determines the possibility of carrying out local public expenditures and the increasing of territorial-administrative units' financial autonomy is made by augmenting and ensuring the stability of their own financial resources. In this way, literature uses the notion 'local revenue autonomy', defined as 'the right and the ability to determine the origin and the amount of financial resources, the rate at which the various groups of beneficiaries shall contribute to the common pool, as well as the way the pool (or specific types or units of resources) is used, respectively the right to choose the funding source and, in case of debt financing, the right to define an amortization policy for each investment programme' (Beer-Tóth, 2009, pp. 70, 80).

Local revenue autonomy was measured through quantitative indicators in the literature as follows:

(i) *Decentralization Variable* (Ebel and Ylmaz, 2002), as the ratio of own revenues of local budgets ( $OR_{SNG}$ ) and total revenues of local budgets ( $TR_{SNG}$ ).

$$SRA = \frac{OR_{SNG}}{TR_{SNG}} = \frac{[T_{discr} + NT_{discr} + GG_{obj} + SG_{uncond}]_{SNG}}{[T + NT + GG + SG]_{SNG}}$$

where,  $OR_{SNG}$  is the amount of tax revenues for which local governments have significant or full discretion over rates and/or relief ( $T_{discr}$ ), the non-tax revenues for which local governments have significant or full discretion over rates and/or relief ( $NT_{discr}$ ), the general-purpose grants allocated according to objective criteria ( $GG_{obj}$ ) and unconditional specific grants ( $SG_{uncond}$ ).

(ii) *Own Revenue Ratio* (Meloche et al., 2004),

$$ORR = \frac{OR_{SNG}}{TR_{SNG} + TR_{CG}} = \frac{[T_{discr} + NT_{discr} + GG_{obj} + SG_{uncond}]_{SNG}}{[T + NT + GG + SG]_{SNG} + TR_{CG}},$$

where,  $OR_{SNG}$  = own revenues of local budgets,  $TR_{SNG}$  = total revenues of local budgets and  $TR_{CG}$  = total revenues of the central/state budget. They develop an opposite indicator as „Dependent Revenue Ratio“ ( $DRR$ ) measuring the dependence of local government to the central government.

$$DRR = \frac{DR_{SNG}}{TR_{SNG} + TR_{CG}} = \frac{[(T - T_{discr}) + (NT - NT_{discr}) + (GG - GG_{obj}) + (SG - SG_{uncond})]_{SNG}}{[T + NT + GG + SG]_{SNG} + TR_{CG}}.$$

(iii) *Composite Indicator Of Fiscal Autonomy* (Blöchliger and King, 2006, p. 179),

$$CI_{SRA} = \frac{AT_{SCG}}{T_{SCG} + T_{CG}} = \frac{[T_{discr}]_{SCG}}{T_{SCG} + T_{CG}},$$

where,  $AT_{SCG}$  - the autonomous tax revenues of local governments and  $[T_{discr}]_{SCG}$  - the tax revenues for which local governments have significant or total discretion over rates and relief.

(iv) *Revenue Autonomy of a Local Government* (Ermini, 2009, pp. 10-11),

$$REV\_AUT = \frac{(taxes_i) + (non\_tax\_revenue_i)}{(total\_current\_revenue_i)},$$

where taxes collect revenue from: a) local taxes on households and business property, savings and other locally served functions and b) shared taxes with higher level of governments. The non-tax revenue component of  $REV\_AUT$  refers mainly to fees and

charges paid in exchange for non-capital goods and delivered services. Finally,  $i = 1, \dots, n$  is the index of any local government.

The analysis of local revenue autonomy involves the study of relationships between own local revenues and a number of demographic, economic, social and political determinants that explain the size and dynamics of local revenue autonomy. Thus, as Beer-Tóth observed (2009, p 86), the socio-economic and demographic factors may have direct impact on the revenue autonomy of decentralized authorities. For example, the administrative-territorial units with a high rate of ageing population will collect less tax revenues per capita than an administrative-territorial unit with a more favorable age group structure. The differences in the size of own revenues of local budgets also occur in relation to the urban-rural classification. Urbanization leads to a continuous local concentration of revenues since a high urbanization means the ability to create resources, especially own revenues. Under conditions of economic crisis, the local governments usually face rising unemployment, which requires additional resources for health and social benefits and the need to maintain local taxes low.

These socio-economic and demographic factors are classified as non-legal direct constraints (Beer-Tóth, 2009, p. 86). There should be noted that the theorization of these determinants is conducted in terms of 'exogenous constraints', defined as limits imposed by factors or agents from outside the local government unit (Beer-Tóth, 2009, p. 71). It is considered that the identification and quantification of these constraints which are imposed to local governments in a decentralized system is the greatest challenge when measuring the local financial autonomy. Thorough knowledge of these constraints would contribute to the improvement of techniques for measuring revenue autonomy by building a simple formula that takes into account significant variables (constraints). In this context of measurement, literature (Beer-Tóth, 2009, p 71) proposes two dimensions of exogenous constraints: according to their nature and according to their effects. According to the first dimension, such constraints can be of *legal nature* (if they are generated by written legislation, respectively the totality of legal restrictions determines the first part of the definition, namely, the '*right of local authorities*') and *non-legal constraints* (they determine the second constitutive element of local autonomy, namely the '*ability of local authorities*'). According to the second dimension, exogenous constraints can be *direct* (if they apply to the local government unit itself) and *indirect* (if they apply directly to another government unit but have an impact on the autonomy of the local government itself; or if they apply to one field of intergovernmental fiscal relations but have an indirect impact on the local government policy in another field).

In the literature, these determinants were analyzed separately or in groups of variables (factors of influence) and often in contexts associated to the local revenue autonomy, namely 'fiscal decentralization' and 'revenue decentralization'. Thus, studies stop at a number of determinants that appear to be positively related to revenue decentralization or fiscal decentralization such as: country size (Panizza, 1999), urbanization (Kee, 1977, Wasylenko, 1987, Letelier, 2005, Bahl and Nath, 1986), populati-

on density (Litvack and Oates, 1971, Pommerehne, 1977, Letelier, 2005), population diversity (Panizza, 1999, Letelier, 2005), ethnic fractionalization (Panizza, 1999), level of democracy (Panizza, 1999), political factors (Patsouratis, 1990), income per capita (Oates, 1972, Kee, 1977, Pommerehne, 1977, Bahl and Nath, 1986, Panizza, 1999).

Local autonomy is identical for all local governments, as the local government law stipulates in Romania (e.g. Law no. 215/2001), but its actual contents (*de facto* autonomy) is a function of the existing legal, demographic, political, socio-economic and other framework conditions. As it is shown by the literature (Letelier, 2005; Oates, 1972; Kee, 1977; Wasylenko, 1987; Ermini, 2009 etc.), the study of local autonomy in terms of revenues requires to identify factors that may explain the variation of own revenues collected in the local budgets in the context of a European region or country.

### 3. Data and method

The empirical study in this paper is based on the econometric modeling method using official statistical data series in the counties of Romania during a period of three years corresponding to the period of economic crisis, respectively 2008-2010. For modeling purposes, we identified a number of variables representing the demographic and socio-economic determinants of local financial autonomy. Several variables were identified from the aforementioned literature review and others are proposed by the authors themselves, taking into account the available statistical data. For the variables used in the empirical study we present the following summary table that also included the assumptions on the type of relationship between each explanatory factor and the dependent variable. As dependent variable, we are using the ratio of own revenues in total local revenues, which was calculated by the authors using data from the Court of Auditors and the National Institute of Statistics.

Table 1: Demographic and socio-economic determinants of local revenue autonomy

Variable	Unit of measure	Influence over own revenues
Demographic dependency ratio (ratio of young people 0-14 years plus the elderly over 65 years and adult population aged between 15-64 years)	%	negative
General rate of fertility (per 1,000 women of 15-45 year reproductive age group)	Number of children	positive
Degree of urbanization (proportion of urban population)	%	positive
Unemployment rate	%	negative
Average net wage	Romanian Leu	positive
The average agricultural area per person	sqm	positive
Employment rate	%	positive
Average living area per person	sqm	positive
Crime rate (convictions per 1,000 people)	individuals	negative
The political factor (the majority of County Council belonging to the governing party or parties which are in the opposition)	Binary variable (1 – power, 0 – oppositions)	negative

Source: Developed by the authors

The research presents several limits, among which we mention in particular those related to the availability of statistical data. Since the study is conducted for the counties of Romania, we want to mention the wide gap existing between the time of data collection and the moment of data publication for the variable gross domestic product (GDP). These data will appear two years later, so that in 2010 this indicator was not developed by the National Institute of Statistics (INS). Although it is a very important indicator to assess the economic impact on local revenues, the lack of data for 2010 gave us the option to use other economic variables and to disregard the GDP. The idea to make our own estimations for 2010 for the GDP is not very viable, because the past data series is relatively small, and the period itself is one with important cyclical fluctuations. The data on local revenues which allow the calculation of the ratio of own revenues in total revenues are also publicly available since 2008. This limit on the available data led to the decision to conduct an empirical study for 2008-2010 in the counties of Romania.

Bucharest was excluded from the research, being a special administrative unit in Romania, and differing significantly from most of the counties from the point of view of socio-economic indicators. Therefore, the statistical population consists of 41 counties of Romania.

In this paper, for the statistical data we used several official sources: the Romanian Court of Accounts (reports on local public finances by counties, 2008-2010), the Ministry of Finance (local public budgets, 2008-2010), the National Institute of Statistics (degree of urbanization, employment rate, unemployment rate, average net wage, the average agricultural area per person, average living area per person, crime rate, 2008-2010) and Local Official Statistical Institutes of the Romanian counties (demographic dependency ratio, general rate of fertility, political factor 2008-2010, using the webpage and online databases for each county). The lack of data for a longer period of time and the low volume of data led to the decision to undertake an empirical analysis combining the temporal variation of the local revenues with the cross-section one (between counties).

#### **4. Empirical evidence for local revenue autonomy and its determinants in Romania**

The empirical study is made as follows:

a) a descriptive analysis by means of official statistical data of Romanian counties. In this research we used a set of variables that have been identified in the previous theoretical analysis, namely the local revenue autonomy and its determinants. At this level, the empirical study involves descriptive statistics analysis of counties distributions by dependent and independent variables;

b) an econometric model which explains the variation of local revenues at the county level. The chosen method is the pool panel econometric model which is built for the 41 counties for the period of time 2008-2010.

### a. The statistical analysis of the own local revenues and its determinants

In Figure 1 we can notice the distribution of own local revenue ratio for the 41 counties and its variation in time for the three years under study. The first observation is linked to an asymmetry of revenues, more pronounced in 2008 and 2010, and to their low average level, represented by the median, with values between 33% and 37%. The quartile three is also small, indicating that three quarters of Romania's counties have a ratio of their own revenues in total revenues between 42-45% for the three years studied. Figure 1 also shows that only 25% of the counties have between 42-57% of total own revenues, while 10% are above that level. Each year witnessed several very high-revenues counties and Ilfov County is in such a position throughout the entire period. The counties' average ratio of their own revenues does not exceed 40% in each of the years analyzed and the average value is representative (the variation coefficient is smaller than 30%).

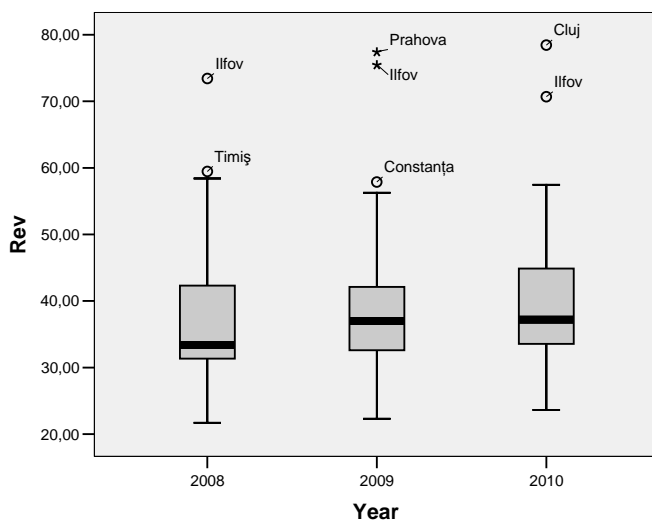


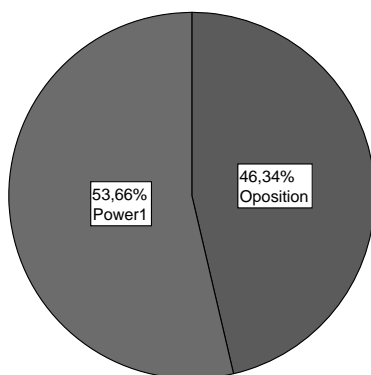
Figure 1: The distribution of the own revenue ratio by county, Romania, in 2008-2010

Source: Developed by authors, based on Statistical Yearbooks of Romania 2008-2010, and Public Reports of Romanian Court of Accounts, 2008-2010

Notwithstanding the economic crisis in Romania, the average proportion of own revenues increased from 2008 to 2010, growth observed by means of the median (Figure 1) and with the mean changing from 37% to 40%. This increase is mainly due to the approximate 20% increase in local taxes imposed by a government decision (G.D. no. 956/2009). The government took such a measure so that the levels of local taxes should be updated with the inflation over the past three years, because they had not been indexed (by inflation) since 2006, when they were set for 2007; the cumulative inflation for the overall period reaches 20%. Another cause of increasing the own revenues which is less relevant is the relative reduction in tax evasion. However, the effectiveness of local taxes and fees collected by the local authorities remains low.

In the period 2008-2010, in 53.66% of the Romanian counties, the management of the County Council was conducted by representatives of the central political power while the remaining percentage belonged to the opposition (Figure 2). The importance of political factors on the local development and on the local financial autonomy is an important topic of analysis for all that represented Romania's transition over the past 20 years.

The influence of the political factor is more evident for transfers from the state budget to local budgets than for own revenues, being obvious in practice (in terms of budgetary adjustments) when additional amounts are allocated to local governments led by members/representatives of the political parties in government. Under these circumstances, we believe that the political factor has no significant influence on the own revenues of local budgets, hypothesis which will be evaluated through the econometric modeling of the next chapter.



**Figure 2:** The structure of Romanian counties taking into account the political factor, in 2008-2010

**Source:** Developed by authors, based on the Political Map of Romania, 2008-2010

Particular attention should be paid to the variation in time of the significant determinants of own revenues. The distribution of counties by unemployment, fertility and average living area per person is presented in the Appendix in Figure 1A. Against the background of continuous economic incertitude, unemployment presents significant dynamics. The rising unemployment was due mainly to the measures to reduce the public sector employees, where more than 50% of these reductions were made at local level (about 76,000, according to official statistical data, 2008-2010), followed by cuts in business segments where the private sector registered negative developments, such as in agriculture, hunting and forestry (-0.8%), construction (-10.7%), transports and telecommunications (4%), trade, repairs of motor vehicles and household goods, hotels and restaurants and other services (-2.8%). During the three years under analysis, a very high unemployment rate is observed in 2008 in Vaslui County, while the lowest rate, significantly smaller than in other counties, is registered in Ilfov County in 2009. The year 2010, albeit the most significant asymmetry, preserves a median value close to 2009 with a slight rate reduction.

In the case of fertility it can be observed that there are differences between counties and relative asymmetry during the three years of economic crisis. The median indicates a decrease in fertility in 2008-2010, a phenomenon that is recorded in Romania on the long term, since the communist period. The impact of fertility on the local financial autonomy can only be negative, because this reduction results in an ageing society and few people employed who contribute financially to the local revenues. The average living area per person is slightly higher in the three years analyzed and the county level distributions are symmetric. From Figure 1A, we can observe a positive situation of Ilfov County and a negative one for Iași County. We expect this variable to have a positive impact on the local revenue autonomy at county level.

Table 2: The bivariate correlation between the percentage of own revenue and its determinants

		Urb	Fert	Wage	Unempl	Ocup	S_loc/p	S_agr/p	Dep_dem	Crim	Rev
Urb	Pearson Correlation	1	-.220*	.235**	-.121	.189*	.141	-.124	-.659**	.261**	.525**
	Sig. (2-tailed)		.014	.009	.181	.036	.119	.171	.000	.004	.000
	N	123	123	123	123	123	123	123	123	123	123
Fert	Pearson Correlation	-.220*	1	-.162	-.209*	.040	-.021	-.003	.224*	-.114	.024
	Sig. (2-tailed)	.014		.074	.020	.661	.816	.974	.013	.211	.791
	N	123	123	123	123	123	123	123	123	123	123
Wage	Pearson Correlation	.235**	-.162	1	-.077	.124	.466**	-.422**	-.384**	-.282**	.692**
	Sig. (2-tailed)	.009	.074		.395	.172	.000	.000	.000	.002	.000
	N	123	123	123	123	123	123	123	123	123	123
Unempl	Pearson Correlation	-.121	-.209*	-.077	1	-.469**	-.316**	.198*	.311**	.126	-.366**
	Sig. (2-tailed)	.181	.020	.395		.000	.000	.028	.000	.165	.000
	N	123	123	123	123	123	123	123	123	123	123
Ocup	Pearson Correlation	.189*	.040	.124	-.469**	1	.619**	-.030	-.289**	-.281**	.391**
	Sig. (2-tailed)	.036	.661	.172	.000		.000	.738	.001	.002	.000
	N	123	123	123	123	123	123	123	123	123	123
S_loc/p	Pearson Correlation	.141	-.021	.466**	-.316**	.619**	1	-.069	-.430**	-.247**	.569**
	Sig. (2-tailed)	.119	.816	.000	.000	.000		.447	.000	.006	.000
	N	123	123	123	123	123	123	123	123	123	123
S_agr/p	Pearson Correlation	-.124	-.003	-.422**	.198*	-.030	-.069	1	.255**	.090	.338**
	Sig. (2-tailed)	.171	.974	.000	.028	.738	.447		.004	.322	.000
	N	123	123	123	123	123	123	123	123	123	123
Dep_dem	Pearson Correlation	-.659**	.224*	-.384**	.311**	-.289**	-.430**	.255**	1	-.032	-.616**
	Sig. (2-tailed)	.000	.013	.000	.000	.001	.000	.004		.723	.000
	N	123	123	123	123	123	123	123	123	123	123
Crim	Pearson Correlation	.261**	-.114	-.282**	.126	-.281**	-.247**	.090	-.032	1	-.200*
	Sig. (2-tailed)	.004	.211	.002	.165	.002	.006	.322	.723		.027
	N	123	123	123	123	123	123	123	123	123	123
Rev	Pearson Correlation	.525**	.024	.692**	-.366**	.391**	.569**	-.338**	-.616**	-.200*	1
	Sig. (2-tailed)	.000	.791	.000	.000	.000	.000	.000	.000	.027	
	N	123	123	123	123	123	123	123	123	123	123

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\*. Correlation is significant at the 0.01 level (2-tailed).

Source: Developed by authors using SPSS for the variables presented in Table 1

For the other factors used in the empirical analysis, the bivariate correlation statistical analysis shows that the percentage of own revenues is positively influenced by the degree of urbanization, employment, net wage, average living area per person and average agricultural area per person and admits a negative impact from unemployment, demographic dependence and crime (see Table 2).

### b. Econometric modeling of revenue autonomy

The econometric model was obtained by means of the backward method, which involves the successive elimination of insignificant independent variables from the model. The result of this procedure is presented in Table 1A of the Annex. The White

cross-section standard errors procedure was applied for the six significant variables to obtain estimates with corrected standard deviations, which removes the problem of heteroscedasticity, specific for cross-section analysis. The econometric model results, after the elimination of insignificant variables, are presented in Table 3.

**Table 3:** Results of econometric modeling

Dependent Variable: REV				
Method: Panel Least Squares				
Sample: 2008 2010				
Periods included: 3				
Cross-sections included: 41				
Total panel (balanced) observations: 123				
White cross-section standard errors & covariance (d.f. corrected)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
URB	0.330687	0.015436	21.42313	0.0000
UNEMPL	-0.671421	0.087545	-7.669430	0.0000
WAGE	0.041251	0.001104	37.36308	0.0000
S_LOC_P	1.387893	0.259430	5.349787	0.0000
FERT	0.438699	0.029588	14.82711	0.0000
DEP_DEM	-0.319225	0.104155	-3.064918	0.0027
C	-46.59735	4.569431	-10.19763	0.0000
R-squared	0.757388	Mean dependent var	39.12217	
Adjusted R-squared	0.744839	S.D. dependent var	11.58481	
S.E. of regression	5.851884	Akaike info criterion	6.426631	
Sum squared resid	3972.368	Schwarz criterion	6.586674	
Log likelihood	-388.2378	Hannan-Quinn criter.	6.491641	
F-statistic	60.35506	Durbin-Watson stat	1.510373	
Prob(F-statistic)	0.000000			

**Source:** Developed by authors using SPSS

As it can be seen in Table 3 above (for the 41 counties of Romania for the period 2008-2010) six factors were identified, explaining the variation of own revenues percentage of 75% (R-squared = 0.757). The sign of estimated regression coefficients using the econometric model supports the assumptions set out in this paper. The importance of unemployment and its negative impact on local revenues is the component which assesses the impact of economic crisis on local autonomy. On the other hand, the net wage shows positive economic impact on local autonomy, according to the assumptions stated in the literature. The demographic dependency has a significant negative impact, which is an important signal for the economic and social situation in the Romanian counties. The opposite position concerns fertility, which has a positive impact on local revenues. The increasing in fertility means a favorable population age structure for economy and also for local development, which involves a positive impact for local autonomy. As expected, the degree of urbanization supports the positive degree of financial autonomy of the counties in Romania, as well as housing, which provides important local tax base. In

the EU context, Romania has a weak position concerning the level of urbanization (with 50%, only Slovenia is under the Romanian level of urbanization, which is of 55%, according to World Bank). Using the EU opportunities, especially the funds for infrastructure, Romania can increase the level of urbanization, and thus the level of local revenues.

It is important to note that the political factor has no significant influence on the own local revenues; respectively there are no significant differences between counties led by the power and counties led by opposition. It also shows that employment rates, crime and average agricultural area per individual have no significant impact on local revenue autonomy.

The quality of the estimated econometric model is supported by the evaluation of assumptions about the residual component. The White method provides homoscedasticity errors and the results below support the hypothesis that the errors are zero (Figure 3) and are normally distributed (Table 4).

Table 4: Kolmogorov test for normality of modeling errors

One-Sample Kolmogorov-Smirnov Test			Unstandardized Residual
N			123
Normal Parameters <sup>a,b</sup>	Mean		,0000000
	Std. Deviation		5,70617127
Most Extreme Differences	Absolute		,097
	Positive		,097
	Negative		-,069
Kolmogorov-Smirnov Z			1,073
Asymp. Sig. (2-tailed)			,200

a. Test distribution is Normal.

b. Calculated from data.

Source: Developed by authors using SPSS

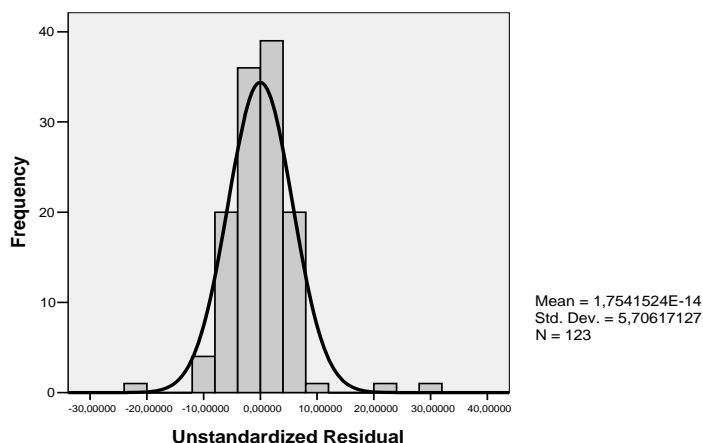


Figure 3: Distribution modeling errors

Source: Developed by authors using SPSS

## 5. Concluding remarks

The overall survey of literature on local revenue autonomy demonstrates the necessity to study the concept of local autonomy and its measurement. We approached local autonomy from the financial perspective, and for its measuring we used the concept of local revenue autonomy. The most important challenge in measuring the local revenue autonomy is the correct identification of significant determinants of the own revenues of local budgets.

Based on the theoretical analysis and the authors' proposals, the empirical study was focused on using data of a set of ten demographic and socio-economic variables for about 41 Romanian counties over the period 2008-2010. The statistical analysis of counties' distributions by percentage of own revenues shows that practically the financial autonomy of the Romanian counties is very low. The bivariate correlations between the percentages of own revenues and its determinants confirmed the proposed hypotheses on the type of relationship between each explanatory factor and the dependent variable. The econometric model also showed two important results: (1) the variables are correlated from a statistically significant point of view with the local revenue autonomy and (2) the order of importance of the significant variables.

Thus, the most important factors are those that have a positive sign of the regression coefficients, therefore helping to increase local autonomy: average net wage, urbanization, average locative living area for a person, fertility. Next, in order of their importance are the factors with negative impact on local autonomy: unemployment and demographic dependency ratio. The political factors, the employment rate, crime and average agricultural area per person have no significant impact on local revenue autonomy for the counties of Romania. The results obtained in this study may contribute to the better knowledge of the local financial autonomy in Romania and the development of measures able to raise the degree of local autonomy, knowing that its level is, on average, relatively low.

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## Annexes

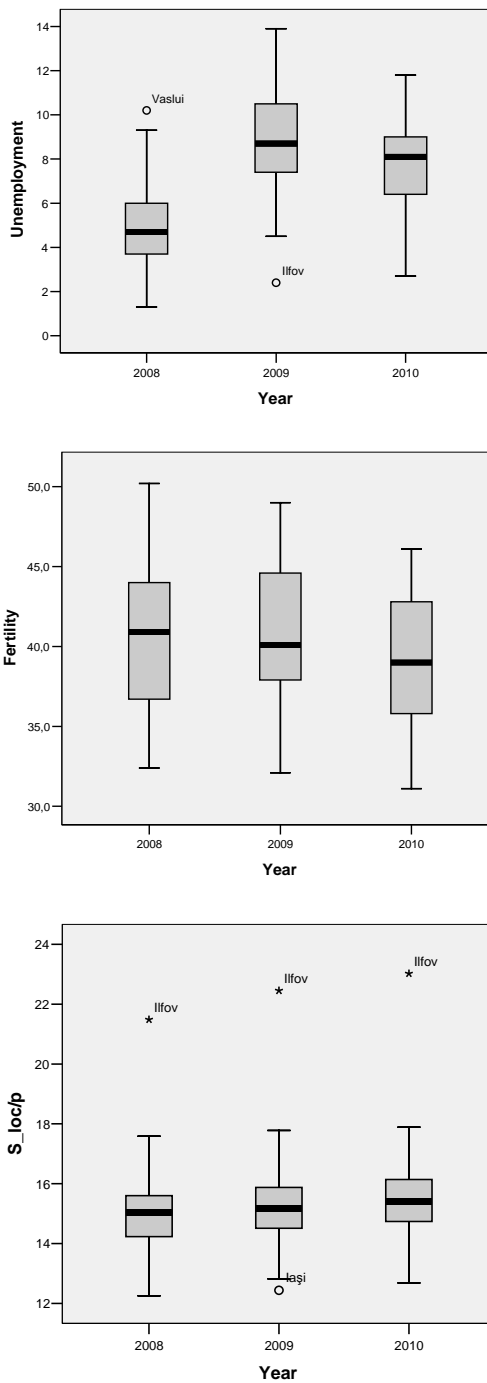


Figure 1A: The distribution of counties by unemployment, fertility and average living area per person

Source: Developed by authors using SPSS

Table 1A: Backward procedure of choice for significant independent variables

**Coefficients <sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-43,823	15,796		-2,774	,006
	Urb	,348	,071	,336	4,880	,000
	Fert	,422	,126	,168	3,338	,001
	Wage	,040	,006	,481	7,070	,000
	Unempl	-,590	,252	-,134	-2,341	,021
	Ocup	,066	,110	,042	,604	,547
	S_loc/p	1,130	,535	,159	2,114	,037
	S_agr/p	-7,0E-005	,000	-,017	-,320	,749
	Dep_dem	-,305	,195	-,117	-1,566	,120
	Crim	-,014	,012	-,064	-1,149	,253
Pol	,540	1,169	,023	,462	,645	
2	(Constant)	-44,317	15,658		-2,830	,006
	Urb	,345	,071	,334	4,893	,000
	Fert	,425	,126	,169	3,382	,001
	Wage	,041	,005	,491	8,035	,000
	Unempl	-,604	,247	-,137	-2,442	,016
	Ocup	,068	,109	,043	,621	,536
	S_loc/p	1,087	,516	,153	2,109	,037
	Dep_dem	-,314	,192	-,121	-1,638	,104
	Crim	-,014	,012	-,063	-1,136	,258
	Pol	,569	1,160	,025	,491	,625
3	(Constant)	-43,475	15,512		-2,803	,006
	Urb	,347	,070	,335	4,931	,000
	Fert	,430	,125	,171	3,442	,001
	Wage	,040	,005	,483	8,186	,000
	Unempl	-,587	,244	-,133	-2,404	,018
	Ocup	,070	,109	,044	,643	,521
	S_loc/p	1,128	,507	,159	2,225	,028
	Dep_dem	-,331	,188	-,128	-1,767	,080
	Crim	-,015	,012	-,067	-1,225	,223
	Pol					
4	(Constant)	-41,463	15,154		-2,736	,007
	Urb	,360	,067	,348	5,354	,000
	Fert	,424	,124	,169	3,414	,001
	Wage	,039	,005	,471	8,436	,000
	Unempl	-,642	,227	-,146	-2,825	,006
	S_loc/p	1,323	,406	,186	3,257	,001
	Dep_dem	-,314	,185	-,121	-1,695	,093
	Crim	-,017	,011	-,078	-1,499	,137
5	(Constant)	-46,597	14,841		-3,140	,002
	Urb	,331	,065	,320	5,113	,000
	Fert	,439	,125	,174	3,522	,001
	Wage	,041	,004	,495	9,195	,000
	Unempl	-,671	,228	-,153	-2,947	,004
	S_loc/p	1,388	,406	,195	3,419	,001
	Dep_dem	-,319	,186	-,123	-1,716	,089

a. Dependent Variable: Rev

Source: Developed by authors using SPSS

**Table 2A:** R Square for regression models in which insignificant variables were removed

**Model Summary <sup>f</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,874 <sup>a</sup>	,764	,743	5,878521980217830	
2	,874 <sup>b</sup>	,763	,745	5,855135115424550	
3	,873 <sup>c</sup>	,763	,746	5,835606476936570	
4	,873 <sup>d</sup>	,762	,748	5,820710088650810	
5	,870 <sup>e</sup>	,757	,745	5,851884202896950	1,519

- a. Predictors: (Constant), Pol, S\_agr/p, Fert, Crim, Unempl, Urb, S\_loc/p, Wage, Ocup, Dep\_dem
- b. Predictors: (Constant), Pol, Fert, Crim, Unempl, Urb, S\_loc/p, Wage, Ocup, Dep\_dem
- c. Predictors: (Constant), Fert, Crim, Unempl, Urb, S\_loc/p, Wage, Ocup, Dep\_dem
- d. Predictors: (Constant), Fert, Crim, Unempl, Urb, S\_loc/p, Wage, Dep\_dem
- e. Predictors: (Constant), Fert, Unempl, Urb, S\_loc/p, Wage, Dep\_dem
- f. Dependent Variable: Rev

**Source:** Developed by authors using SPSS