METHODOLOGY FOR CALCULATING A COMPLEX INDEX FOR ASSESSING THE PRESSURE OF REGIONAL INDICATORS ON PUBLIC ADMINISTRATION

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Abstract

This paper aims to investigate the correlations between regional employment in public administration and several major phenomena, starting from the case of Romania's regions trying to find a territorial statistical solution for measuring the process itself. In this article, especially in its own methodology and methods, the territorial index is estimated as a result of the pressure of other major regional factors, synthesized by specific indicators and indices. The first section describes some conceptual and legal aspects of the regional employment level in public administration and contemporary statistical delimitation of regions in Romania. The second section underlines the originality of the methods and methodology, and the third section defines the three characteristics of the new solutions: the relative temporal, spatial and structural proportionality, the relative trends of an adequate econometric model, and the limits of regional concentration and diversification using the Gini-Struck coefficient in an ABC curve. The analysis of the complexity and impact of the new statistical instruments on regional employment in public administration, its characteristic Romanian limits and the final conclusion show that only an original methodology, some innovative methods and new statistical instruments lead to a better and adequate solution for an optimum level of employment.

Keywords: statistical methodology, method of a pressure index, prognosis, coefficient Gini – Struck in ABC curve, structural or territorial index.

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1. Introduction

Conceptually, three rigorous early distinctions are needed, concerning the region, public administration and index, with special focus on Territorial Index. The acceptation of the term *region* in Europe describes it as harmonized convention or an amalgamation of economic and geographical meanings, methodologically based on the classification of national territorial units for statistics (summarized by the acronym NUTS) a statistical classification that generates, in a faster or slower manner, an own administration structure. Some authors consider the region as a concept without an operational meaning, a real 'piece of land with boundaries more or less defined that often serves as an administrative unit at a level below that of the nation-state' (Eurostat, 2012a). There are other opinions, which give the same concept an outstanding conceptual dynamism, recognizing, for example, for statistics in general and in particular the NUTS classification, 'the potential to contribute towards the gradual creation of a common EU notion of region and regionalization' (Radermacher, 2012, p. 3).

European regions represent the gist of the European Union construction, a project which Romania joined, fully aware, to begin with, of being integrated in a union of regions. Methodologically and optimally, overall, including the present paper, the fundamental component of the EU is defined by the 271 NUTS level 2 regions, placed right in the 'royal' way of spatial partitioning of administrative impact, between the excess of the aggregation of the scores of NUTS level 1 macro-regions and the detail deficiency of the over 1,300 micro-regions (provinces, counties etc.) in NUTS level 3, the 28 Member States of the EU, providing both theoretical boundaries and relevant principles useful for community harmonization. The NUTS regulation does not have its own history; rather, this history is derived from the amplification of the unification process, Regulation (EC) no. 1059/2003 of the European Parliament and of the Council, as amended in 2004 and 2008, as a result of the expansion by ten, and, respectively, two new EU member states. The principles of regional partitioning are of a general nature, but they also have a normative character, where the economic and social reality allows their application, the *demographic principle* of regionalization describes the limiting thresholds for NUTS level 2 by varying ranges:

Table 1: The statistical descriptions of the limits for the NUTS level 1, 2, 3 regions

Level	Minimum population	Maximum population
NUTS level 1	3 million	7 million
NUTS level 2	800,000	3 million
NUTS level 3	150,000	800,000

Source: Official Eurostat website

The *administrative principle* homogenizes the regions, which naturally turn into administrative divisions using the normative criterion, and the *geographic principle* normalizes the mechanism of region delimitation, which thus becomes general geographical units, as well.

The current state of regionalization, according to NUTS level 3, with Romania's eight statistical regions (coded RO11 Northwest, RO12 Center, RO21 Northeast, RO22

Southeast, RO31 South-Muntenia, RO32 Bucharest-Ilfov, RO41 Southwest-Oltenia, RO42 West), although taken over as such by pre- and post-accession EU statistics, remains unregulated definitively in domestic terms, so the purpose of the present article is, among other things, to quantify the pressures of the regional indicators within these areas.

Public administration is defined in a rather diverse, disparate manner, ranging from the unilateral emphasis on 'the management of public programs', in the USA (Denhardt and Denhardt, 2009), to the classical multiplication of meanings as 'the study of government decision making, the analysis of the policies themselves, the various inputs that have produced them, and the inputs necessary to produce alternative policies' (McKinney and Howard, 1998, p. 62). Public administration can be seen as a creator of '*social value*, in a specific public-private collaboration model, within which special institutions build and administer infrastructures' in a modern vision (Fernández Fernández, Fernández-Ardavín and Berenguer Herrero, 2012, p. 778), 'public utility enterprises' (Čudanov, Jaško and Săvoiu, 2012, p. 318), or as an effective process of management of public programs in correlation with the European Union, being characterized by a permanent interaction with community residents, especially regional ones, the key components of a good public governance into the EU countries being based on the principles of *reliable, transparent, accountable* and *efficient* public administration resting on administrative law and pursued in practice (European Principles for Public Administration, 1999). In fact, it is a synthesis of several principles expressed by J. Schwarze in his *European Administrative Law*, as early as 1988 (administration through law, proportionality, legal certainty, protection of legitimate expectations, non-discrimination, the right to hearing in administrative decision-making procedures, interim relief, fair conditions for access of individuals to administrative courts, non-contractual liability of the public administration etc.). Activity in public administration benefits from a multidisciplinary nature, which is grounded on human resources, organizational theory, policy analysis, statistics, policy, budgetary and last but not least, ethics, while it is also under permanent pressure from communities and outcome indicators. The complexity of the multiple meanings of public administration (and local government) is highlighted by some specific issues, which turn into working hypotheses of the methodological construction of a spatial index of regional pressure resulting from regional indicators:

1. The aggregation of multiple activities into the general concept of public administration (84 – public administration and defense; compulsory social security containing: 84.1 – administration of the state and the economic and social policy of the community; 84.11 – general public administration activities; 84.12 – regulation of the activities of providing health care, education, cultural services and other social services, excluding social security; 84.13 – regulation of and contribution to more efficient operation of businesses – in keeping with NACE Rev.2 Eurostat Statistics Explained, (Eurostat, 2012b): the first research hypothesis is limited to the semi-aggregate coded NACE 84.11;

2. The current non-existence of a regional government or administration that should be strictly delimited, with only a type of county administration instead, which brings about both the tendency for the number of employees to decrease (meaning fewer employees in a number of county departments), in the context of reuniting or fusing together several counties (or *județe*) in a regional area, and increasing trends (e.g. as a result of creating, and more active engagement of, some regional departments of community cooperation in inter-regional relations), in relation to the regional core administration, still not regulated, in point of statutory nature, in a definitive manner. The second hypothesis, i.e. a final offset estimate (±) becomes practically equivalent to studying the current volume of administration of the regions, as it is recorded in statistical data;
3. The lack of clear information about the final situation of the regions – and so the third research hypothesis is that the number of the regions, and even regional areas will not change in Romania, rather these details will only be legalized at the current level and form (pre-, and post-accession), becoming the object of criterion optimization, based on a specific statistical indicator (Țapardel and Alex, 2012, p. 720; Ionescu, Lăzăroiu and Iosif, 2012, p. 665);
4. The homogeneity of regional statistics, resulting from their descriptive statistics, which highlight important aspects of regional homogeneity of data series in Romania (Săvoiu, 2012a, p. 57);
5. The steady growth of the importance of regions in the EU will impose new statistical tools of decision-making managerial impact concerning the quantification of the pressure of a number of indicators at regional level due, among other things, to an image on the complexity of the EU administration offering the simple emphasis on the administrative structures (regions).

Under the impact of these assumptions, the main target of the present paper becomes the evaluation of the pressure of regional indicators on local administration/ government, or generating a methodology for a Public Administration Pressure Index in Romania (PAPIR) using a solution similar to that of an *anthropogenic pressure index* (Absalon and Ślesak, 2011). The statistical index is presented in a methodological and three-dimensional manner: 1. $PAPIR_{prognosis}$ based on relative trends of an adequate econometric model (Săvoiu and Popa, 2012); 2. $PAPIR_{spatial}$ based on a relative spatial and structural proportionality approach (Săvoiu, 2007); 3. $PAPIR_{structural}$ based on the natural limits of regional concentration and diversification using Gini – Struck coefficient in an ABC curve (Săvoiu, Crăciuneanu and Țaicu, 2010; Săvoiu, Iorga Simăn and Crăciuneanu, 2012a; Săvoiu, Dinu and Tăchiciu, 2012b), bringing together some of the authors' older concerns, which have now resulted in an original and constructive manner.

2. Statistical data sources and methods

In order to make EU Strategy visible in Romania, the priority macroeconomic reforms for the next two years (2013-2014) are increasing efficiency and effectiveness of public administration, respectively the improvement of the business environment

(Government of Romania, National Reform Programme, 2011). Public administration is recognized as a priority, yet it is difficult to provide or obtain the needed statistical databases for modeling and forecasts. This article proposes three options for creating and maintaining them, by exploiting certified, well-established sources.

The statistical data in the Statistical Yearbook of Romania can be used as a source for such databases, by selecting them based on national legislation and the existence of indicators characterizing the main local public services in accordance with the law of local government and administration (no. 215 of 23 April 2001) and the framework law on decentralization (no. 195 of 25 May 2006) concerning: 1. education; 2. social services (child protection, protection of the disabled, the elderly, family and other people or social groups in need); 3. health care; 4. culture; 5. youth; 6. sports; 7. public order; 8. emergencies; 9. protection and rehabilitation of environment; 10. conservation, restoration and enhancement of historical and architectural monuments, parks, public gardens and nature reserves; 11. urban development; 12. population registry; 13. bridges and public roads; 14. community services and public utilities (water, gas, sewerage, sanitation, heating, public lighting and public transportation), 15. emergency services such as mountain rescue, beach lifeguard and first aid; 16. community and social management activities; 17. social housing and other housing units owned by the administrative unit or managed by it; 18. enhancement of, and turning to account, in the best interest of the local community, the natural resources within the range of the respective administrative-territorial unit; 19. other public services established by law etc.

This first approach does not respect the principle of parsimony, or reducing the number of correlated factors in econometric models (Săvoiu, 2012b, pp. 27-28) and inherently leads to multicollinearity phenomena, which needs to be further meliorated through practical modeling.

A detailed analysis of the first database (see Table 2) concerning Romania, between 1990 and 2010, which has been taken from the World Bank and brought to terms of statistical comparability, is necessary in order to build the time component of Public Administration Pressure Index in Romania ($PAPIR_{prognosis}$).

Selecting the variables for this database had, as the initial criterion, the theoretical aspects of the correlations between the number of employees in public administration (SER01) and the other eight factorial variables (from FDI, Exports and Imports, GFCF, GDP per capita, Household final consumption and industry value added); ultimately, the essential ones are (see Tables 3 and 4) both the normality of the data series according to descriptive statistics (test Jarque - Bera):

Table 2: Data base used for Public Administration Pressure Index in Romania (PAPIR)

An excerpt from available databases of the World Bank about Romania 1990-2010

Year	People employed in PA* (thousands)	Total population as of 1st of July	Net FDI (constant 2000 US$)	Exports of goods and services (constant 2000 US$)	Imports of goods and services (constant 2000 US$)	Gross fixed capital formation (constant 2000 US$)	GDP per capita (constant 2000 US$)	Household final consumption expenditure per capita (constant 2000 US$)	Industry, value added (constant 2000 US US$)
	SER01	SER02	SER03	SER04	SER05	SER06	SER07	SER08	SER09
1990	88	23206720	-24,273,024	6,264,914,885	9,323,555,584	6,504,955,588	1,895.5	1,314	14,886,806,216
1991	94	23185084	47,338,713	5,142,705,677	6,562,791,709	4,448,395,222	1,652.6	1,109	12,865,902,469
1992	97	22788969	89,634,180	5,293,016,368	7,055,966,298	4,937,080,114	1,532.7	1,062	11,212,140,429
1993	101	22755260	103,712,005	5,880,969,245	7,366,813,852	5,347,827,530	1,558.1	1,073	11,621,667,253
1994	109	22730622	394,663,471	7,000,047,905	7,574,168,883	6,454,785,185	1,621.7	1,100	12,388,895,095
1995	120	22680951	470,393,429	8,191,408,653	8,812,062,553	6,900,859,314	1,741.7	1,245	13,102,107,398
1996	113	22607620	288,594,351	8,357,677,494	9,581,535,098	7,292,150,155	1,817.3	1,350	13,868,449,226
1997	121	22545925	1,305,263,279	9,311,411,010	10,298,757,088	7,419,395,363	1,710.5	1,303	12,506,047,602
1998	132	22502803	2,118,238,080	8,883,886,418	11,222,277,373	6,977,091,290	1,632.3	1,313	11,421,243,283
1999	141	22458022	1,047,550,000	9,813,140,665	11,051,734,081	6,639,721,380	1,615.9	1,301	11,232,324,607
2000	148	22435205	1,048,000,000	12,113,000,192	14,042,999,808	7,004,519,154	1,651.0	1,303	11,928,728,416
2001	143	22408393	1,142,023,346	13,459,735,262	16,452,530,410	7,645,227,056	1,769.6	1,467	12,799,525,985
2002	147	21794793	1,079,996,323	15,738,288,254	18,445,172,437	8,280,233,575	1,887.9	1,534	13,554,697,419
2003	152	21733556	1,689,330,993	16,855,705,843	20,953,716,050	9,042,014,755	1,991.6	1,651	14,178,213,512
2004	155	21673328	5,807,791,524	19,535,764,371	24,796,627,139	9,946,216,482	2,164.6	1,840	15,057,263,058
2005	167	21623849	5,739,326,785	20,359,014,919	25,725,082,050	10,204,908,211	2,260.2	1,981	19,887,663,922
2006	183	21584365	9,369,428,020	22,517,070,501	31,487,500,430	11,186,926,393	2,444.0	1,958	16,667,497,273
2007	207	21537563	8,006,519,539	24,273,402,000	40,083,588,047	14,576,565,089	2,595.6	2,164	17,667,547,109
2008	213	21504442	10,878,890,420	28,982,441,988	47,098,215,955	17,389,842,152	2,844.6	2,349	19,045,615,783
2009	217	21469959	3,960,900,588	25,569,901,058	35,521,848,836	15,446,043,133	2,606.9	2,291	20,169,307,115
2010	210	21431298	2,578,209,256	28,256,410,542	39,253,962,761	15,790,362,035	2,636.3	2,660	20,976,079,399

*Note: The source of the data is Onofrei and Lupu (2010)

Source: Data Catalogues, The World Bank

Table 3: Descriptive statistics of factor variables (SER02-SER09) against the endogenous variable SER01

Sample: 1990 2010									
	SER01	SER02	SER03	SER04	SER05	SER06	SER07	SER08	SER09
Mean	145.6190	22221844	2.72E+09	1.44E+10	1.92E+10	9.02E+09	1982.410	1588.952	1.46E+10
Median	143.0000	22435205	1.14E+09	1.21E+10	1.40E+10	7.42E+09	1817.300	1350.000	1.36E+10
Maximum	217.0000	23206720	1.09E+10	2.90E+10	4.71E+10	1.74E+10	2844.600	2660.000	2.10E+10
Minimum	88.00000	21431298	-24273024	5.14E+09	6.56E+09	4.45E+09	1532.700	1062.000	1.12E+10
Std. Dev.	41.08464	595875.3	3.30E+09	8.01E+09	1.27E+10	3.78E+09	416.4888	474.8657	3.18E+09
Skewness	0.428554	0.027533	1.291752	0.513177	0.842963	0.996035	0.774469	0.789748	0.802374
Kurtosis	2.055602	1.587139	3.389053	1.859931	2.383046	2.778642	2.164087	2.431988	2.274235
Jarque-Bera	1.423206	1.749308	5.972623	2.059014	2.820108	3.515171	2.710717	2.465263	2.714205
Probability	0.490857	0.417006	0.050473	0.357183	0.244130	0.172461	0.257855	0.291524	0.257406
Sum	3058.000	4.67E+08	5.71E+10	3.02E+11	4.03E+11	1.89E+11	41630.60	33368.00	3.07E+11
Sum Sq. Dev.	33758.95	7.10E+12	2.18E+20	1.28E+21	3.24E+21	2.85E+20	3469259.	4509949.	2.02E+20

Note: Software used – Eviews and the report of correlation between the exogenous variables and SER01:

Table 4: Correlation matrix for factors' selection

	SER01	SER02	SER03	SER04	SER05	SER06	SER07	SER08	SER09
SER01	1.000000	-0.927379	0.774412	0.970847	0.955436	0.946794	0.899270	0.937910	0.807865
SER02	-0.927379	1.000000	-0.757923	-0.947289	-0.896764	-0.860241	-0.841115	-0.893333	-0.762266
SER03	0.774412	-0.757923	1.000000	0.810907	0.851582	0.778417	0.831602	0.745947	0.669468
SER04	0.970847	-0.947289	0.810907	1.000000	0.982724	0.960221	0.951477	0.976470	0.875067
SER05	0.955436	-0.896764	0.851582	0.982724	1.000000	0.976814	0.972605	0.964817	0.870290
SER06	0.946794	-0.860241	0.778417	0.960221	0.976814	1.000000	0.967987	0.965519	0.887271
SER07	0.899270	-0.841115	0.831602	0.951477	0.972605	0.967987	1.000000	0.964417	0.935662
SER08	0.937910	-0.893333	0.745947	0.976470	0.964817	0.965519	0.964417	1.000000	0.932618
SER09	0.807865	-0.762266	0.669468	0.875067	0.870290	0.887271	0.935662	0.932618	1.000000

Note: Software used – Eviews

A second database, having a spatial, territorial impact this time, can be obtained exploiting the Sustainable Development Indicators at Territorial level for Romania (SDIT), whose number is limited to only 8 of the 46 indicators detailed in classes of information on: 1. the knowledge society, and economic and social development; 2. consumption and sustainable production; 3. transport; 4. conservation and management of natural resources; 5. public health, 6. standard of living; 7. social and territorial cohesion; 8. good governance; 9. tourism; 10. local public utility, according to the data available on the website of the Romanian National Institute of Statistics.

The actual content of such a database, after selection and analysis based on correlation ratio, includes active population, area, number of active enterprises, number of farms, total length of public roads, school population, number of doctors per 1000 inhabitants, and GDP per capita in RON. GDP/capita, in 2010, is systematized in Table 5.

The descriptive statistics in Table 6 show that the selected series, which are coded according to the number of their column, are normally distributed (according to the values of the same Jarque-Bera test), dominantly homogeneous, strongly asymmetric and leptokurtic.

A correlation matrix allowed the selection, out of the 48 SDIT indicators, of the eight indicators in Table 3, in keeping with the correlation ratio, the exception being the active population preferred to the detriment of the total population, which is, in principle, not correlated with the endogenous variable of the number of employees in the regional government.

This variable was accepted and modeled for reasons of phenomenological and methodological normality, the intensity of SER03's relationship with SER01 being modest, but eliminating all demographic variables could generate major problems for the necessary correlation between public administration/government and the people which it should actually serve.

Analogously, variables SER05 (number of farms) and SER07 (school population) do not describe moderate correlations, but weak correlations, yet they were retained for the objective nature of their relationship with public administration (Table 7).

Table 5: Data base used for Public Administration Pressure Index in Romania (PAPIR)

An excerpt from Sustainable Development Indicators at Territorial level for Romania (SDIT) –2010*

Region (code and name)	Average number in PA*	Area km^2	Active population (thou.)	Number of active enterprises	Number of agricultural holdings	Length of public roads (km)	School population (thou.)	Number of doctors per 1000 inhabitants	GDP RON per inhabitant
	SER01	SER10	SER11	SER12	SER13	SER14	SER15	SER16	SER17
RO11 Nord-West	20,991	34,159	1,232	67,871	529,095	12,322	533.2	2.72	21,827.2
RO12 Center	20,735	34,100	1,076	59,253	393,749	10,801	489.4	2.33	23,428.3
RO21 Nord-East	25,364	35,762	1,793	53,165	790,901	13,672	707.4	1.78	15,014.8
RO22 South-East	22,814	36,850	1,252	58,225	459,691	10,763	486.0	1.67	20,076.8
RO31 South-Muntenia	27,463	34,489	1,554	53,686	833,316	12,672	523.4	1.41	20,288.2
RO32 Bucharest-Ilfov	38,509	1,811	1,101	117,679	33,047	890	517.8	5.38	58,137.0
RO41 South-West Oltenia	19,724	29,212	1,100	35,956	576,590	10,838	402.7	2.09	18,735.1
RO42 West	17,042	32,028	857	45,970	272,903	10,428	369.5	3.21	27,640.0
RO - Romania	192,642	238,411	9,965	491,805	3889,292	82,386	4060	2.44	24,435.9

* Note: In Popa's (2012) article the data are taken from INS investigation S3, October 2011, published in 2012. All the rest of the series are obtained from Romanian National Institute of Statistics.

Source: General data, National Institute of Statistics

Table 6: Descriptive statistics of the database selected from SDIT

Sample: 1 8									
	SER01	SER10	SER11	SER12	SER13	SER14	SER15	SER16	SER17
Mean	24080.25	29801.38	1245.625	61475.62	486161.5	10298.25	503.6750	2.573750	25643.42
Median	21902.50	34129.50	1166.500	55955.50	494393.0	10819.50	503.6000	2.210000	21057.70
Maximum	38509.00	36850.00	1793.000	117679.0	833316.0	13672.00	707.4000	5.380000	58137.00
Minimum	17042.00	1811.000	857.0000	35956.00	33047.00	890.0000	369.5000	1.410000	15014.80
Std. Dev.	6677.588	11547.54	296.8564	24601.53	262797.0	3971.407	101.1924	1.275919	13625.85
Skewness	1.305072	-2.091870	0.721797	1.603734	-0.274153	-1.883054	0.742543	1.427687	1.955489
Kurtosis	3.819038	5.681365	2.593056	4.666657	2.311023	5.259236	3.350347	4.012635	5.360806
Jarque-Bera	2.494559	8.231135	0.749856	4.355201	0.258443	6.429240	0.776073	3.059531	6.956385
Probability	0.287285	0.016317	0.687339	0.113313	0.878779	0.040171	0.678387	0.216586	0.030863
Sum	192642.0	238411.0	9965.000	491805.0	3889292.	82386.00	4029.400	20.59000	205147.4
Sum Sq. Dev.	3.12E+08	9.33E+08	616865.9	4.24E+09	4.83E+11	1.10E+08	71679.25	11.39579	1.30E+09

Note: Software used – Eviews

Table 7: Correlation matrix between the variables selected from SDIT (SER02-SER09) and endogenous variable SER01

	SER01	SER10	SER11	SER12	SER13	SER14	SER15	SER16	SER17
SER01	1.000000	-0.797062	0.261615	0.857446	-0.297564	-0.728173	0.400676	0.581355	0.752647
SER10	-0.797062	1.000000	0.301440	-0.846464	0.715625	0.961946	0.075174	-0.909607	-0.957709
SER11	0.261615	0.301440	1.000000	-0.099140	0.776470	0.448402	0.876503	-0.506318	-0.407788
SER12	0.857446	-0.846464	-0.099140	1.000000	-0.643849	-0.849188	0.222792	0.820459	0.895048
SER13	-0.297564	0.715625	0.776470	-0.643849	1.000000	0.843784	0.456983	-0.870903	-0.825173
SER14	-0.728173	0.961946	0.448402	-0.849188	0.843784	1.000000	0.203935	-0.909701	-0.974590
SER15	0.400676	0.075174	0.876503	0.222792	0.456983	0.203935	1.000000	-0.174569	-0.141420
SER16	0.581355	-0.909607	-0.506318	0.820459	-0.870903	-0.909701	-0.174569	1.000000	0.948891
SER17	0.752647	-0.957709	-0.407788	0.895048	-0.825173	-0.974590	-0.141420	0.948891	1.000000

Note: Software used – Eviews

The second database allows building the territorial component of a Public Administration Pressure Index in Romania ($PAPIR_{spatial}$). The statistical methods used for $PAPIR_{spatial}$ exploit these data sets differently; for the temporal investigation the time series of the first database are modeled econometrically, defining the expectations by estimating the aggregate level of the employees in Romania's public administration in a classic form: SER01 = f(SER02-09) + ε, while to address the spatial axis, or the regional breaking down, a model of territorial disaggregation is applied, based on the spatial - structural relation, i.e. v $g_i = \sum_{j=1}^{n} g_j k_j$, $\sum_{i=1}^{n} g_i = 1,0$ şi $\sum_{j=1}^{n} k_j = 1,0$ and where the dependent variable is the number of employees from regional public administration and can be obtained as gi^{NERPA} or $gi^{SER01} = \alpha_0+\alpha_1 SER_{10}+\alpha_2 SER_{11}+\ldots+ \alpha_8 SER_{17} +\varepsilon$. Finally, we turn to a third method for $PAPIR_{structural}$, in which the endogenous variable is first processed structurally to be then analyzed by means of the simplified Hirschmann – Herfindahl and Gini – Struck concentration – diversification coefficients. For its rigorously formulated limits of concentration or regional diversification excess, an original method is preferred for analyzing concentration with the Gini-Struck coefficient in curve ABC (Andrei, Constantin and Mitrut, 2009; Săvoiu, Crăciuneanu and Ţaicu, 2010; Săvoiu and Dinu, 2012).

Table 8: Regional employment evaluations with delimitation character of concentration – diversification within the ABC curve

Structure (regions)	Weight (g_i)		Excessive concentrated regional employment		Excessive diversified regional employment	
	Diversified	Concentrated	g_i (%)	$(g_i)^2$	g_i (%)	$(g_i)^2$
A	0.60	0.333	60.0	0.3600	33.33	0.1111
B	0.25	0.333	25.0	0.0625	33.33	0.1111
C	0.15	0.333	15.0	0.0225	33.33	0.1111
Total	1.00	1.000	100.0	0.4450	100.00	0.3333

Source: Săvoiu, Crăciuneanu and Ţaicu (2010) and Săvoiu and Dinu (2012), was adapted to the regional employment phenomenon

Table 9: Typologies of regional employment, put in perspective and structured according to the ABC curve (following the analysis of the concentration – diversification phenomena)

Index limits	Excessive concentrated regional employment	Excessive diversified regional employment
Hirschman coefficient (n = 3)	0.212	0
Simplified Hirschmann – Herfindahl coefficient	0.667	0.577
Gini - Struck coefficient	0.409	0

Source: Săvoiu, Crăciuneanu and Ţaicu (2010) and Săvoiu and Dinu (2012), was adapted to the regional employment phenomenon

The results of this attempt of methodical improvement represents a statistical element with signaling rile (structural threshold) of the regional employment phenomenon concentrations (specializations) and diversifications.

3. The Characteristics of the new three dimensions of the Public Administration Pressure Index in Romania (PAPIR's Models)

The three models that give the configuration of Public Administration Pressure Index in Romania (PAPIR) manage, only together, to provide the three dimensions of statistical thinking that are also necessary for econometric modeling:

1. the temporal dimension is given by the dynamic model SER01 = f(SER02-09) + ε, (which provides the national forecast level of PA) and thus $PAPIR_{prognosis}$ can be defined;
2. the spatial dimension is given by the territorial model gi^{NERPA} or gi^{SER01} = $\alpha_0+\alpha_1SER_{10}+\alpha_2SER_{11}+\ldots+\alpha_8SER_{17}+\varepsilon$ (which provides the detailed regional level of PA) and thus $PAPIR_{spatial}$ is theoretically delimited;
3. the organizational or structurally limitative dimension for $PAPIR_{structural}$ is given by the analysis model of concentration-diversification, which focuses on the Gini-Struck coefficient in curve ABC (it provides limits and configures programmed tendencies for the regional diversification of PA).

The practical iteration of construction and implementation of PAPIR is shown below. The first model is described below, in the most comprehensive of its forms, possible as number of fundamental factors:

Table 10: $PAPIR_{prognosis}$ model based on eight fundamental factors

Dependent Variable: SER01 Method: Least Squares Sample: 1990 2010				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	166.2796	360.4105	0.461362	0.6528
SER02 = Po	-5.74E-07	1.58E-05	-0.036321	0.9716
SER03 = FDI	1.02E-09	1.83E-09	0.556856	0.5879
SER04 = X	4.53E-09	3.32E-09	1.365553	0.1971
SER05 =M	3.66E-10	1.87E-09	0.195605	0.8482
SER06 = GFCF	7.30E-09	3.35E-09	2.181703	0.0497
SER07 = GDP/capita	-0.076970	0.044285	-1.738075	0.1078
SER08 = HFC	-0.004686	0.037027	-0.126559	0.9014
SER09 = VAI	7.76E-10	3.00E-09	0.258999	0.8000
R-squared	0.968629	Mean dependent var		145.6190
Adjusted R-squared	0.947714	S.D. dependent var		41.08464
S.E. of regression	9.394428	Akaike info criterion		7.615638
Sum squared resid	1059.063	Schwarz criterion		8.063290
Log likelihood	-70.96419	F-statistic		46.31436
Durbin-Watson stat	2.226722	Prob(F-statistic)		0.000000

Note: Software used – Eviews

The model in Table 10 passes the standard tests and evinces the following multifactorial relation as a general form: $PAPIR_{i\ prognosis\ 8}= a + b\times Po_i + c\times FDI_i + d\times X_i + e \times M_i + f\times GFCF_i + g\times GDP/capita_i + h\times HFC_i + i\times VAI_i + \varepsilon_i$.

The synthetic parameterization of the model, without questioning the multicollinearity of factors such as X and M, shows values that virtually tend towards zero

for variables $Po_{i,}$ $FDI_{i,}$ $X_{i,}$ $M_{i,}$ $GCFC_{i}$, VA_{i} and the final model PAPIR prognosis can be estimated in the short term as being reduced to the influences from only two factors, $GDP/capita_{i}$ and HFC_{i}, which, according to the database for 1990-2010, could finally look like this:

$$PAPIR_{i\ prognosis\ reduced} = 166.3 - 0.076970g \times GDP/capita_{i} - 0.004686 \times HFC_{i} + \varepsilon_{i.}$$

The reproach that such a model can attract is that it evinces exclusive tendencies in reducing the level of growth for short-term economic growth prospects, and exclusive growth trends in recession, but that was the specific or characteristic mark of the Romanian economy for the period 1990-2010, which is naturally transferred in the modeling solutions.

In our opinion, the pragmatic multi-factor model is considered optimal for medium-term, and even long-term forecasting capitalizes on imports, internal or external investment through projects, and economic growth ($M_{i,}$ FDI_{i}, $GFCF_{i}$, $GDP/capita_{i}$), and is specified and parameterized in the form resulting from processing the same database primarily extracted from the World Bank 1990-2010 database, through two alternatives with four factor variables ($PAPIR_{prognosis\ 4a}$ and $PAPIR_{prognosis\ 4b}$), and also using the other two alternatives, with only three explanatory factors ($PAPIR_{prognosis\ 3}$ and $PAPIR_{prognosis\ 2}$), as shown in Tables 11 and 12.

The authors' preference for model $PAPIR_{\ prognosis\ 3}$ can be cumulatively justified by the F- statistic tests and the high value of R squared. Thus, the medium-and long-term PAPIR prognosis model is:

$$PAPIR_{i\ prognosis\ 3} = 133.8 + 4.94E\text{-}09 \times Xi + 6.65E\text{-}09 \times GFCF_{i} - 0.060135 \times GDP/capita_{i} + \varepsilon_{i,.}$$

but it is also reducible to a two-factorial model: $PAPIR_{i\ prognosis\ 2} = 21.4 - 0.007433 \times GDP/capita_{i} - 0.060135 \times HFC_{i} + \varepsilon_{i}$.

Table 13: Single factor $PAPIR_{\ prognosis}$ model, typical for the Romanian economy

Dependent Variable: SER01 Method: Least Squares Included observations: 21				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	16.68111	11.39587	1.463786	0.1596
SER08 = HFC	0.081147	0.006885	11.78584	0.0000
R-squared	0.879675	Mean dependent var		145.6190
Adjusted R-squared	0.873342	S.D. dependent var		41.08464
S.E. of regression	14.62161	Akaike info criterion		8.293271
Sum squared resid	4062.038	Schwarz criterion		8.392749
Log likelihood	-85.07935	F-statistic		138.9060
Durbin-Watson stat	0.895430	Prob(F-statistic)		0.000000

Note: Software used – Eviews

Table 13 presents the $PAPIR_{\ prognosis}$ model focused on the critically determinative variable, within the Romanian area, which regards public administration, explained through HFC: $PAPIR_{iprognosis1} = 16.68 + 0.08147 \times HFC_{i} + \varepsilon_{i}$, and in Table 14 are the values estimated:

Table 11: Medium - and long-term PAPIR $_{prognosis}$ models with four explanatory factors

Dependent Variable: SER01 Method: Least Squares PAPIR prognosis 4a				
Sample: 1990 2010 Included observations: 21				
Variable	Coefficient	Std.Error	t-Statistic	Prob.
C	164.8370	35.29769	4.669909	0.0003
SER03 = FDI	-3.29E-10	1.65E-09	-0.198631	0.8451
SER05 = M	3.73E-09	1.27E-09	2.947718	0.0095
SER06 = GFCF	6.01E-09	3.79E-09	1.583117	0.1330
SER07=GDP/capita	-0.072663	0.027877	-2.606510	0.0191
R-squared	0.943447	Mean dependent var		145.6190
Adjusted R-squared	0.929309	S.D. dependent var		41.08464
S.E. of regression	10.92353	Akaike info criterion		7.823971
Sum squared resid	1909.175	Schwarz criterion		8.072667
Log likelihood	-77.15170	F-statistic		66.72994
Durbin-Watson stat	1.862877	Prob(F-statistic)		0.000000

Dependent Variable: SER01 Method: Least Squares PAPIR prognosis 4b				
Sample: 1990 2010 Included observations: 21				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	138.3355	21.98124	6.293345	0.0000
SER04 =X	5.44E-09	1.13E-09	4.813234	0.0002
SER06 = GFCF	6.96E-09	2.32E-09	3.008096	0.0083
SER07 = GDP/capita	-0.055303	0.019948	-2.772331	0.0136
SER08 = HFC	-0.015153	0.021816	-0.694602	0.4973
R-squared	0.967357	Mean dependent var		145.6190
Adjusted R-squared	0.959196	S.D. dependent var		41.08464
S.E. of regression	8.299121	Akaike info criterion		7.274433
Sum squared resid	1102.006	Schwarz criterion		7.523129
Log likelihood	-71.38155	F-statistic		118.5363
Durbin-Watson stat	1.969052	Prob(F-statistic)		0.000000

Note: Software used – Eviews

Table 12: Medium- and long-term PAPIR models with three and two explanatory factors, respectively

Dependent Variable: SER01 Method:Least Squares PAPIR prognosis 3				
Sample: 1990 2010 Included observations: 21				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	133.7869	20.66125	6.475256	0.0000
SER04=X	4.94E-09	8.60E-10	5.743386	0.0000
SER06=GFCF	6.65E-09	2.24E-09	2.974763	0.0085
SER07=GDP/capita	-0.060135	0.018409	-3.266554	0.0045
R-squared	0.966372	Mean dependent var		145.6190
Adjusted R-squared	0.960438	S.D. dependent var		41.08464
S.E. of regression	8.171820	Akaike info criterion		7.208904
Sum squared resid	1135.237	Schwarz criterion		7.407860
Log likelihood	-71.69349	F-statistic		162.8451
Durbin-Watson stat	1.877793	Prob(F-statistic)		0.000000

Dependent Variable: SER01 Method:Least Squares PAPIR prognosis 2				
Sample: 1990 2010 Included observations: 21				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	21.42595	22.68527	0.944488	0.3574
SER07=GDP/capita	-0.007433	0.030455	-0.244051	0.8100
SER08 = HFC	0.087433	0.026711	3.273285	0.0042
R-squared	0.880072	Mean dependent var	145.6190	
Adjusted R-squared	0.866747	S.D. dependent var		41.08464
S.E. of regression	14.99748	Akaike info criterion		8.385206
Sum squared resid	4048.642	Schwarz criterion		8.534423
Log likelihood	-85.04466	F-statistic		66.04506
Durbin-Watson stat	0.931870	Prob(F-statistic)		0.000000

Note: Software used – Eviews

Table 14: Dynamics of the number of employees in Public Administration (PA) in accordance with the correlated prognosis Index HFC

	Year					
	2011	2012	2013	2014	2015	2016
Index HFC (%)	100.0	100.3	102.3	101.7	102.0	101.9
Employees in PA* - (thousands)	192.6	198.4	203.0	206.4	210.6	214.6

*Derivative evaluation of Employees in PA compared with HFC Index

Source: HFC data, Comisia Naţională de Prognoză (2013)

The simplest solution of PAPIR $_{\text{i prognosis 0}}$ is based on household final consumption expenditure per capita, which translates in recognizing a strong determination (Rsquared = 0.866) in the volume of public administration by the final consumption of households (especially their expenditures on taxes and contributions) as a defining feature of that modelling, derived from the model without an interceptor of SER01 depending on SER08 in Table 15.

Table 15: The PAPIR $_{\text{i prognosis 0}}$ model in exclusive relation with HFC

Dependent Variable: SER01 Method: Least Squares Included observations: 21				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
SER08= HFC	0.090822	0.001982	45.82233	0.0000
R-squared	0.866106	Mean dependent var		145.6190
Adjusted R-squared	0.866106	S.D. dependent var		41.08464
S.E. of regression	15.03350	Akaike info criterion		8.304887
Sum squared resid	4520.123	Schwarz criterion		8.354626
Log likelihood	-86.20131	Durbin-Watson stat		0.931324

Note: Software used – Eviews

Once a forecast based on a temporal or prognosis model is accepted, the regional dimension can be ensured by the second model (PAPIR $_{\text{spatial}}$).

The result of analyzing the structural connection is a reduced number of important regional variables (surface: R = 0.80, number of active entrepreneurs: R = 0.86, length of public roads: R = 0.73, and GDP per inhabitant: R = 0.75) which enable adequate structural modeling.

This analysis no longer entirely confirms the legal and administrative regionalization criteria that originally underlay the regionalization of Romania. The legal-administrative pertinence of regional structures based on population and surface have ceased to be an objective criterion of regionalization in Romania, respecting the scientific rigor and set of statistic structural and correlative axioms and methods. Population (including active population) does not represent a variable factor, in practice, nor is there any correlation between it and the number of employees, while the area lost maximum intensity, being surpassed by the number of enterprises (Stare and Jaklič, 2011, p. 581). However, the time evolution of the number of employees in PA was found to be more realistic: this structural variable is dependent on a higher intensity of the number of active enterprises.

Table 16: Values of regional structural correlation intensity expressed by Correlation Ratio (R)

Average number in PA* SER01	Area km^2	Active population (thou.)	Number of active enterprises	Number of agricultural holdings	Length of public roads (km)	School population (thou.)	Number of doctors per 1000 inhabitants	GDP Lei per inhabitant	Population inhabitants
Correlation Ratio – R	SER10	SER11	SER12	SER13	SER14	SER15	SER16	SER17	SER18*
	-0.797062	0.261615	0.857446	-0.297564	-0.728173	0.400676	0.581355	0.752647	0.176303

* Note: SER 18 was not included in the SDIT, but can be found in the Directory of Romania, Population chapter, available at http://www.insse.ro/cms/rw/pages/anuarstatistic2011.ro.do

Table 18: Unifactorial explanatory PAPIR $_{spatial}$ models (with a free term "C")

Dependent Variable: SER01 Method: Least Squares PAPIR spatial 1a				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9772.633	3742.909	2.610973	0.0401
SER12 = NoE	0.232736	0.057020	4.081642	0.0065
R-squared	0.735214	Mean dependent var		24080.25
Adjusted R-squared	0.691083	S.D. dependent var		6677.588
S.E.of regression	3711.424	Akaike info criterion		19.48854
Sum squared resid	82648021	Schwarz criterion		19.50840
Log likelihood	-75.95415	F-statistic		16.65980
Durbin-Watson stat	1.525095	Prob(F-statistic)		0.006490

Dependent Variable: SER01 Method: Least Squares PAPIR spatial 1b				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	37816.19	4519.161	8.367967	0.0002
SER10=AREA	-0.460916	0.142567	-3.232987	0.0178
R-squared	0.635307	Mean dependent var		24080.25
Adjusted R-squared	0.574525	S.D. dependent var		6677.588
S.E. of regression	4355.686	Akaike info criterion		19.80867
Sum squared resid	1.14E+08	Schwarz criterion		19.82853
Log likelihood	-77.23468	F-statistic		10.45221
Durbin-Watson stat	0.896005	Prob(F-statistic)		0.017843

Note: Software used – Eviews

Of all the $PAPIR_{spatial}$ models that can be built, those which can pass the tests and have at least average intensities are those focused primarily on SER12= NoE (Number of Enterprises) and on SER10= AREA, the latter being much lower qualitatively than the former (Table 18, the variant with a free or interceptor term), and invalidated in the variant without a free term (Table 19). There is only one model with two factors (Table 17).

Table 17: $PAPIR_{spatial}$ model with two explanatory factors

Dependent Variable: SER01 Method: Least Squares PAPIR spatial 2				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17655.11	13672.12	1.291322	0.2531
SER04	0.174982	0.113275	1.544754	0.1831
SER02	-0.145362	0.241327	-0.602343	0.5732
R-squared	0.753128	Mean dependent var		24080.25
Adjusted R-squared	0.654379	S.D. dependent var		6677.588
S.E. of regression	3925.724	Akaike info criterion		19.66849
Sum squared resid	77056540	Schwarz criterion		19.69828
Log likelihood	-75.67394	F-statistic		7.626696
Durbin-Watson stat	1.479572	Prob(F-statistic)		0.030282

Note: Software used – Eviews

Table 19: Unifactorial explanatory $PAPIR_{spatial}$ model SER12= NoE (no free term "C")

Dependent Variable: SER01 Method: Least Squares PAPIR spatial 1c				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
SER12 - NoE	0.372166	0.027050	13.75858	0.0000
R-squared	0.434365	Mean dependent var		24080.25
Adjusted R-squared	0.434365	S.D. dependent var		6677.588
S.E. of regression	5022.128	Akaike info criterion		19.99756
Sum squared resid	1.77E+08	Schwarz criterion		20.00749
Log likelihood	-78.99026	Durbin-Watson stat		2.579784

Note: Software used – Eviews

The initial multifactorial model PAPIR spatial = $\alpha_0+\alpha_1SER_{10}+\alpha_2SER_{11}+ \alpha_3SER_{12}+ \alpha_3SER_{13}+ \alpha_3SER_{12}+ \alpha_3SER_{14}\ldots+ \alpha_8SER_{17}+\varepsilon$, is reduced, after careful analysis, to three unifactorial models $PAPIR_{i\ spatial\ 1}= \alpha_0+\alpha_kSER_k+\varepsilon_i$, parameterized with respect to the eight in three regions of Romania, in three different validated variants, in the following order, and only to one model with two factors:

1. $PAPIR_{i\ spatial\ 1a} = 9772.633 + 0.232736\ NoE_i + \varepsilon_i$
2. $PAPIR_{i\ spatial\ 1c} = 0.372166\ NoE_i + \varepsilon_i$
3. $PAPIR_{i\ spatial\ 1b} = 37816.19 – 0.460916\ AREA_i + \varepsilon_i$
4. $PAPIR_{i\ spatial\ 2} = 17655.11+ 0.174982\ NoE_i – 0.145362\ AREA_i + \varepsilon_i$

In the final section, $PAPIR_{structural}$ model is presented, which is focused on the analysis of regional concentration – diversification (obviously, built on trends focusing on diversification policies necessary for sustainable regional development). The preliminary situation of the level of concentration according to the final is presented in the synopsis in Table 20, for the four sets of interest, highly correlated and selected since

the previous analysis: Average Number in PA (abbreviated SER01= AN in PA); area (SER 10); Number of Enterprises (SER12 = NoE).

Table 20: Concentration – diversification of the Romanian major variables of the regions

Regions (code and name)	Average Number in PA SER01= AN in PA		Area SER10 = AREA		Number of Enterprises SER12 = NoE	
	(gi)	$(gi)^2$	(gi)	$(gi)^2$	(gi)	$(gi)^2$
RO11 North-West	0.109	0.011881	0.143	0.020449	0.138	0.019044
RO12 Center	0.108	0.011664	0.143	0.020449	0.121	0.014641
RO21 North-East	0.132	0.017424	0.150	0.022500	0.108	0.011664
RO22 South-East	0.118	0.013924	0.155	0.024025	0.118	0.013924
RO31 South-Muntenia	0.143	0.020449	0.145	0.021025	0.109	0.011881
RO32 Bucharest-Ilfov	0.200	0.040000	0.007	0.000049	0.239	0.057121
RO41 Soth-West Oltenia	0.102	0.010404	0.123	0.015129	0.073	0.005329
RO42 West	0.088	0.007744	0.134	0.017956	0.094	0.008836
TOTAL	1.000	0.133490	1.000	0.141582	1.000	0.142440
Gini – Struck (G – S) concentration - diversification coefficients (n = 8)	$\sqrt{\frac{n\sum_{i=1}^{n} g_i^2 - 1}{n-1}}$	0.0921	$\sqrt{\frac{n\sum_{i=1}^{n} g_i^2 - 1}{n-1}}$	0.1377	$\sqrt{\frac{n\sum_{i=1}^{n} g_i^2 - 1}{n-1}}$	0.1412

The trend of similarity in the level of concentration – diversification, based on either of the two variables quoted as regionally conclusive in PAPIR $_{spatial}$ imposes necessary corrections in terms of increasing employee number. Correct interpretation, already established as a priority in the spatial model that much better worked out the hierarchy of variable SER12 = NoE, identifies some corrections under the pressure of the indicators in the regions with a greater number of enterprises, i.e. RO32 Bucharest - Ilfov Region, against RO41 South-West Oltenia and RO42 West.

The illustration of the practical exploitation, at the national level, and practical orientation of a number of regionalization policies focused on PAPIR and its three constructions, as useful tools in dynamic, spatial and structural evaluations, is summarized in the next section.

4. A brief analysis of the complexity and temporal, spatial and structural impact of the new statistical instruments (PAPIR) on regional employment in public administration (PA)

For the article's purpose an anthropogenic pressure index was used; in fact, this is a statistical specific index used especially in ecology (Absalon and Ślesak, 2011, p. 138), using the formula:

PAPIR FINAL = $[x_1/m_1 + x_2/m_2 + x_3/m_3 + \ldots + x_k/m_k] / \sum [w_1 + w_2 + w_3 + \ldots + w_k]$, where $x_{1,2,3}\ldots$ are values of consecutive factors in the index construction (and must be determined for PAPIR prognosis, PAPIR spatial and PAPIR structural); $m_{1,2,3}\ldots$ are values of mean value of factors in Romania or in all regions of Romania; and $w_{1,2,3}$ represent the coefficient of importance or the weight of the studied factor.

The weight of individual factors was set as 1, assuming that each factor had an equal impact on the regionalization in Romania and the interpretation of each value

represents an area with the lower pressure when value PAPIR < 1.00 and an area with bigger pressure when PAPIR >1.00. One example can be managed within each particular instrumental dimension for PAPIR.

1. With respect to the time factor, at a national level, the following model may be used:

$PAPIR_{i\ prognosis\ 2} = 21.4 - 0.007433 \times GDP/capita_i - 0.060135 \times HFC_i + \varepsilon_i$

PAPIR FINAL= $[x_1/m_1 + x_2/m_2 + x_3/m_3 + \ldots + x_k/m_k] / \sum [w_1 + w_2 + w_3 + \ldots + w_k]$, becomes

PAPIR 2010 = [GDP per $capita_i$ /mean of GDP per $capita_i$ + HFC_i / mean of HFC_i] /2 = 1.502, where Table 3 provides descriptive statistics and the needed value by the mean value (GDP per capita = 1982.41 and HFC=1588.95) and Table 2 provides the time value, e.g. as of 2010 (GDP per capita = 2636.3 and HFC=2660). Comparing the period 1990-2010 with the year 2010 it was found that 2010 had a pressure 50% higher than the period average.

2. Spatially, it can be illustrated by using the following model in the North West Region RO11:

PAPIR spatial 2= [NoE /mean of NoE + AREAi / mean of HFC_i] /2= [67871 /61475.62 + 34159 / 29801.38] /2 = 1.125.

The region analyzed according to spatial PAPIR shows a pressure on the employees in PA by 12.5% higher than the regional average in Romania.

3. The structural exemplifying for the same variables leads naturally, for the Region RO42 West, to different results, by exploiting its structure and structural average, thus showing 5.2% less pressure on the employees in PA.

PAPIR structural = [g^{NoE} /mean of g^{NoE} + g^{AREA} / mean of g^{AREA}] /2 = [0.143 /0.125 + 0.094 / 0.125] /2 = 0.948

All these practical results describe a complex practical model for analyzing the regionalization phenomenon in Romania, in temporal, spatial and structural terms.

5. Conclusions

The theoretical pertinence of this approach on the regions and the pressure of some important indicators generate a special construction of a Public Administration Pressure Index in Romania (PAPIR). The model of this index is actually tridimensional, and takes into account the radical factorial changes that are felt in the logic of the dynamics of the number of employees in public administration (PA). Two variables, essentially different from the legal ones, or those having legal and administrative relevance, namely final consumption of households (especially their expenses on taxes and similar contributions) as a defining feature of temporal modeling, in order to forecast in the quickest and easiest manner, and the number of active enterprises, as an essential feature of spatial modeling (either regional or local), for the relevance and maximum intensity of correlation.

A new legislative and administrative approach is urgently needed in Romania in the regional domain, i.e. fresh emphasis on public spending for taxes in particular,

and the number of enterprises (also including, in future, the number of agricultural holdings), as delimiting the basic criteria of limiting or extending the number of employees in public administration, in which field regional diversification or concentration policies can be initiated (it would be preferable to have a permanent trend of diversification that reduces regional disparities).

It is the very intention of the present article to provide arguments and statistical tools necessary for such new approaches, stressing finally that previously published papers and studies by the same authors identify a greater uniformity of the current statistical regions in Romania compared with the EU – 27 average data series.

References:

1. Absalon, D. and Ślesak, B., 'The Volume of Generated Waste, Population Density and Road Network Density – Anthropogenic Pressure Index', 2011, *Procedia Environmental Sciences*, vol. 3, pp. 136-140.
2. Andrei, T., Constantin, D.L. and Mitrut, C., 'Regional Specialisation and Industrial Concentration in Romania's Transition Period From An Election Cycle Perspective', 2009, *Environment and Planning C: Government and Policy*, vol. 27, no. 4, pp. 713-731.
3. Comisia Națională de Prognoză, 'Proiecția principalilor indicatori macroeconomici pentru perioada 2013-2016', 2012, [Online] available at http://www.cnp.ro/user/repository/prognoza_macroeconomica_2013-2016.pdf, accessed on February 8, 2013.
4. Čudanov, M., Jaško O. and Săvoiu, G., 'Public and Public Utility Enterprises Restructuring: Statistical and Quantitative Aid for Ensuring Human Resource Sustainability', 2012, *Amfiteatru Economic*, vol. XIV, no. 32, pp. 307-322.
5. Denhardt, R. and Denhardt, J., *Public Administration: An Action Orientation*, Belmont: Thomson Wadsworth, 2009.
6. Eurostat, 'Eurostat Statistics Explained', 2012b, [Online] available at http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Category:Nomenclature, accessed on March 16, 2012.
7. Eurostat, 'General Presentation of Regional Statistics', 2012a, [Online] available at http://epp.eurostat.ec.europa at.eu/ portal/page/portal/region_cities/regional_statistics, accessed on March 15, 2013.
8. Fernández Fernández, M.T., Fernández-Ardavín, M.A. and Berenguer Herrero, D., 'Promotion of Social Entrepreneurship through Public Services in the Madrid Region: Successful Aspects', 2012, *Amfiteatru Economic*, vol. XIV, no. 6, pp. 774-785.
9. Government of Romania, 'National Reform Programme (2011 – 2013)', April 2011, Bucharest, [Online] available at http://ec.europa.eu/europe2020/ pdf/nrp/nrp _romania_en.pdf, accessed on March 6, 2013.
10. Ionescu, L., Lăzăroiu, G. and Iosif, G., 'Corruption and Bureaucracy in Public Services', 2012, *Amfiteatru Economic*, vol. XIV, no. 6, pp. 665-679.
11. McKinney, J.B. and Howard, C.L., *Public Administration: Balancing Power and Accountability*, 2nd edition, Westport: Praeger Publishing, 1998.
12. National Institute of Statistics, 'Indicatorii de dezvoltare durabilă teritorială în România', 2012, [Online] available at http://www.insse. ro/cms /files/ IDDT, accessed on March 10, 2013.

13. OECD, 'European Principles for Public Administration', OECD Report, Sigma Papers no. 27, 1999, [Online] available at http://www.oecd.org/site/sigma/publicationsdocuments/36972467.pdf, accessed on March 11, 2012.
14. Onofrei, M. and Lupu, D., 'The Dimension of Public Administration in Central and Eastern European Countries in the Current Financial Crisis', 2010, *Transylvanian Review of Administrative Sciences*, vol. 29E, pp. 109-124.
15. Popa, D., 'Câți salariați sunt la Stat, câți la privat şi în ce sectoare economice lucrează aceştia. Principalele tendințe din piață', HotNews.ro, October 20, 2012, [Online] available at http://economie.hotnews.ro/stiri-finante_banci-13452083-analiza-hotnews.htm, accessed on February 25, 2013.
16. Radermacher, W., 'Foreword', in *Eurostat Regional Yearbook*, 2012, [Online] available at http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-HA-12-001/EN/KS-HA-12-001-EN.PDF, accessed on March 2, 2013.
17. Săvoiu, G. and Dinu, V., 'Solutions for The Statistical Analysis of The Economic Phenomena Described as Opposed, Partially of Entirely Compensated Fluxes: A Case Study on The Exports and Imports of Romania and The Baltic States', 2012, *Transformations in Business & Economics*, vol. 11, no. 1, pp. 54 -71.
18. Săvoiu, G. and Popa, S., 'An Original Econometric Model of FDI in Romania', 2012, *Romanian Statistical Review*, vol. 60, no. 3, pp. 57-63.
19. Săvoiu, G., 'Economic Indicators Used for EU Projects, in Other Criteria of Aggregation than National/Regional', 2007, *Annals of Oradea University Review*, Economics, vol. 2, no. 16, pp. 885-890.
20. Săvoiu, G., 'GDP Indicator for Statistical Comparisons at National/Regional and International', 2012a, *Romanian Statistical Review*, vol. 60, no. 12, pp. 54-62.
21. Săvoiu, G., Crăciuneanu, V. and Țaicu, M., 'A New Method of Statistical Analysis of Markets' Concentration or Diversification', 2010, *Romanian Statistical Review*, vol. 58, no. 2, pp. 15-27.
22. Săvoiu, G., Dinu, V. and Tăchiciu, L., 'Romania Foreign Trade in Global Recession, Revealed by the Extended Method of Exchange Rate Indicators', 2012b, *Amfiteatru Economic*, vol. XIV, no. 3, pp. 173-195.
23. Săvoiu, G., *Econophysics: Background and Applications in Economics, Finance, and Sociophysics*, London: Elsevier Science Publishing, 2012b.
24. Săvoiu, G., Iorga Simăn, I. and Crăciuneanu, V., 'The Phenomenon of Concentration - Diversification in Contemporary Globalization', 2012a, *Romanian Statistical Review*, vol. 60, no. 4, pp. 5-27.
25. Schwarze, J., *Europäisches Verwaltungsrecht*, Baden-Baden: Nomos, 1988.
26. Schwarze, J., *European Administrative Law*, London: Sweet & Maxwell/Nomos, 1992.
27. Stare, M. and Jaklič, A., 'Towards Explaining Growth of Private and Public Services in the Emerging Market Economies', 2011, *Amfiteatru Economic*, vol. XIII, no. 30, pp. 581-598.
28. Țapardel, A.C. and Alex, F.A., 'Strategic Directions for the Bucharest Strategy and City Brand', 2012, *Amfiteatru Economic*, vol. XIV, no. 6, pp. 720-737.