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REGIONAL DYNAMICS OF PRIVATE PENSION FUNDS IN ROMANIA

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**51th EUROPEAN CONGRESS
OF THE REGIONAL SCIENCE ASSOCIATION INTERNATIONAL
30th AUGUST - 3rd SEPTEMBER 2011, BARCELONA, SPAIN**

REGIONAL DYNAMICS OF PRIVATE PENSION FUNDS IN ROMANIA

Dan CONSTANTINESCU *)

Abstract

The number of participants in the private pension funds, as well as the volume of their contribution, differs significant in each development region.

It goes without saying that the territorial distribution of the indicators related to pension funds are influenced, on the one hand, by the offer of these financial products, which we estimate counting the number of marketing agents authorized by the supervisory committee and, on the other hand, by the solvent demand, which is also determined by a series of economic, social, cultural and institutional factors.

Since the emergence of pension funds in Romania is relatively new, for developing the econometric model we had to use monthly data series, which has induced a number of restrictions related to the information available in this format.

Also, to increase the model's number of degrees of freedom, the data on the indicators will be detailed in the 42 counties, local structures corresponding to NUTS-III level.

Key-words: pension funds, regional distribution, disparities, correlations, concentration, panel model

JEL Classification: G23, R12

Premises

In Romania, the NUTS-II of EU level division correspondent are the Development Regions. They aren't executive-territorial units, neither they have judicial identity, being the result of a free agreement between district and local councils. The development regions don't

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have any executive status, by not having a legislative council or executive body. Their main functions regard the funds distribution received from the EU for regional development, the realisation and interpretation of regional statistics and the coordination of regional infrastructure projects. Their significant growing role was emphasized by gaining the membership of the Regions Committee once Romania adhered to the EU (January, the 1st, 2007).

Romania is divided in eight Development Regions (each including 2 to 7 counties¹), named after their geographical position in the country: North-East, South-East, South-Muntenia, South-West Oltenia, West, North-West, Central, Bucharest-Ilfov (figure 1).

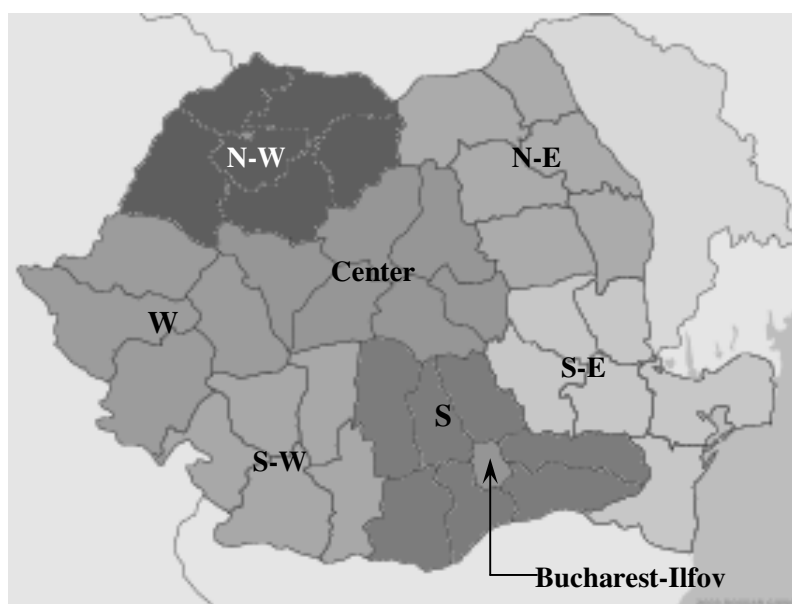


Figure 1. Development Regions in Romania

Regional disparities of the pension funds participants

The participants' regional distribution in the two categories of pension funds (mandatory and optional) at the beginning of the second trimester this year is represented in figure 2.

In both cases, we can outline the Bucharest-Ilfov region, with a share of 26,29%, respectively 39,35% of the total participants. Beyond the economical net superior potential of this region, we can notice that the firms' reports regarding the mandatory pension funds contributions are made based on the participants' residence, while for the optional pension funds is required the employer's registered office.

¹ correspondent to the partitions at NUTS-III in EU

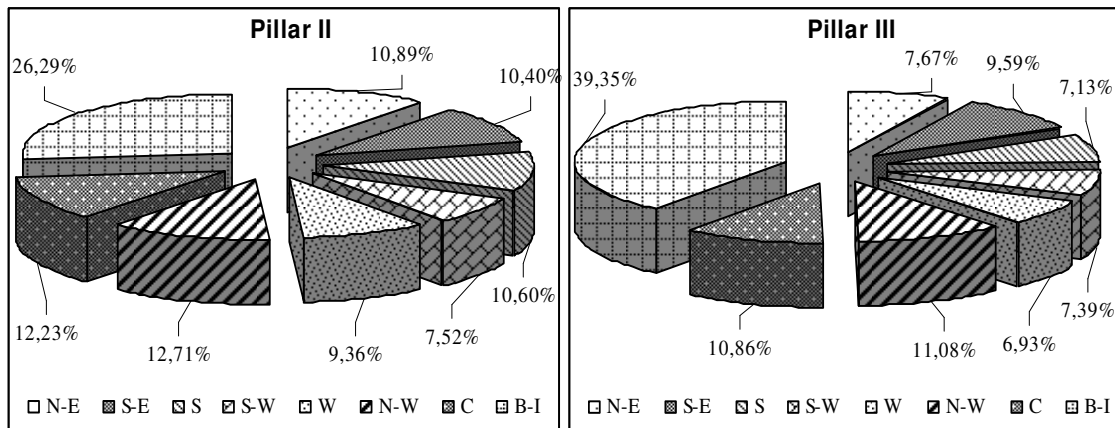


Figure 2. The regional structure of the pension funds participants (1.04.2011).

Corroborated with the high level of concentration of headquarters in the country's capital, the above mentioned phenomenon justifies, in good measure, the significant difference between the two shares.

If we decide to eliminate from the graphic the Bucharest-Ilfov region, we will get a more regular distribution of the pension funds participants over the remaining seven development regions.

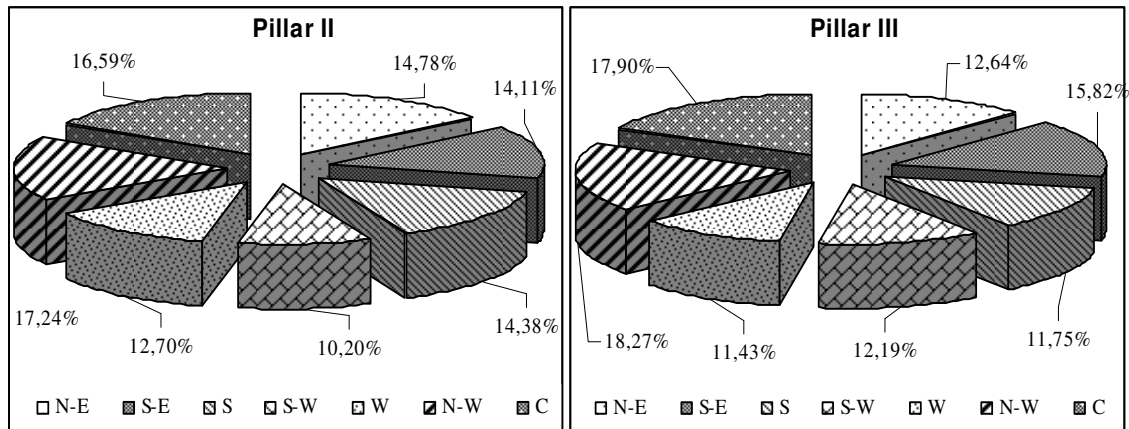


Figure 3. The regional structure of the pension funds participants, without the Bucharest-Ilfov region (1.04.2011)

In addition, for both categories of funds, the North-West and Central regions are situated in the superior part of the classification, while the South-West and West regions are among the last ones.

Similar to the intensive indicators of the insurance area, we can also build for the private pension funds indicators that reflect the profile industry contribution to GDP and the participants' density-population ratio.

Since we don't have territorial data regarding the participants' contributions, we will only use their numeric share in total occupied population, regarding that the recruitment base of the participants to pension funds is made out of the individuals that participate in an economic activity that produces goods or services with the main objective to gain incomes. The calculations have been made for the end of 2010.

Regions	Pension funds participants		Occupied population at the end of the year	Participants' share in total occupied population	
	Pillar II	Pillar III		Pillar II	Pillar III
North - East	536216	16925	1197000	44,7967	1,41393
South - East	513885	20654	1006000	51,082	2,05306
South - Muntenia	521703	15909	1151000	45,3261	1,38221
South - West Oltenia	368428	16711	828000	44,4961	2,0182
West	461476	14666	810000	56,9724	1,8106
North - West	626761	24950	1152000	54,4063	2,16579
Center	602250	24893	999000	60,2853	2,49181
Bucharest - Ilfov	1300230	89484	1268000	102,542	7,05706
TOTAL	4.930.950	224.191	8411000	58,625	2,66545

Table 1. Territorial distribution of the ratio of participation to the pension funds (31.12.2010)

Regarding the Bucharest-Ilfov region we can remark an almost paradoxical situation, in which the number of participants to the pension funds exceeds the occupied population. The explanation is the nature of methodology, since the occupied population is determined starting with the individuals' residence, while the participants' territorial distribution is made after the employer's registered office.

Another remarkable fact is the significant difference between the levels of participation registered for both categories of funds. If for the mandatory funds the share of participation is around 50%, for the optional funds the indicator's level is well reduced, being situated approximately at the level of insurances density.

The level of participation disparity indicators, showed in figure 4, also emphasize the significant difference of the Bucharest-Ilfov region compared to the average and this is the reason that when calculating the regional gaps we have eliminated this region from the chart,

using as reference the North-West region, which registers the highest level of indicators among the remaining regions.

We can remark two groups of regions. The first, which includes the South-East, South-West, North-West and Central regions, is characterised by relatively close indicators of disparity levels afferent to the two categories of funds.

The second one groups the other three regions (North-East, South-Muntenia, West), in which the regional gaps pertaining the optional pension funds are better pronounced.

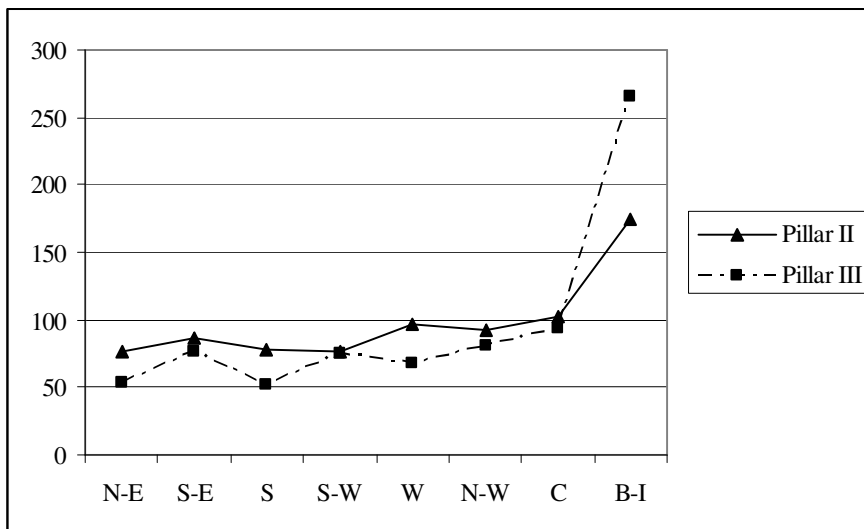


Figure 4. Disparity indexes

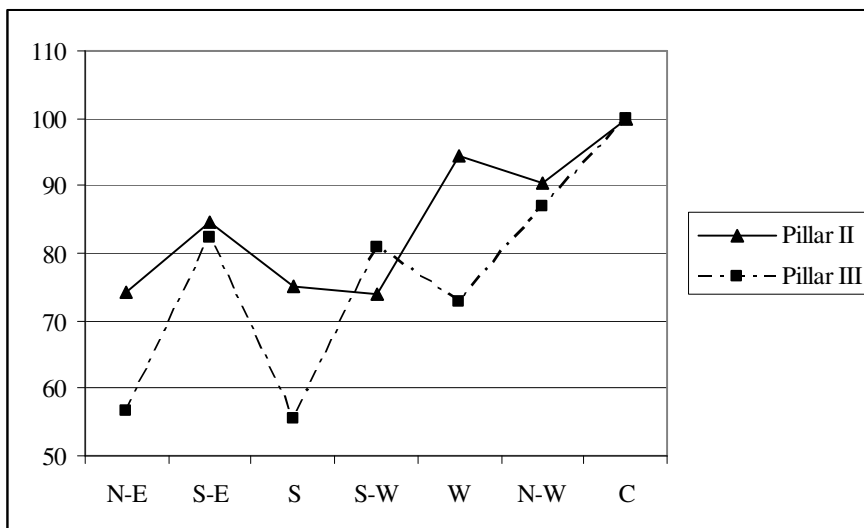


Figure 5. Regional disparities

The utilization of Herfindahl index² and Gini-Struck coefficient³ reveals significant differences between the levels of concentration registered for the two categories of pension funds. Thus, the mandatory⁴ aspect of participating to the second pillar of the pension system gives the participants a more reduced level of concentration than the afferent one for the optional funds which – even from this point of view – are similar to insurances.

Concentration indexes	Pension funds participants	
	Pillar II	Pillar III
Herfindahl	0,1485	0,2093
Gini-Strück	0,1640	0,3105
<i>Herfindahl</i> ¹⁾	<i>0,1462</i>	<i>0,1482</i>
<i>Gini-Strück</i> ¹⁾	<i>0,0625</i>	<i>0,0786</i>

¹⁾without Bucharest-Ilfov Region

Table 2. Concentration levels for pension funds participants (1.04.2011)

As was expected, for both categories of funds the most significant concentration is registered in the Bucharet-Ilfov Region. By taking this region of the calculation, the concentration indicators reveal more uniform participants dispersal over the other 7 regions of development and more, a close in of the levels registered for the two pillars of the private pension system.

Territorial distribution agents of influence of the pension funds participants

Keeping in mind that the participants' recruitment base to pension funds is made out of employees of the public and private sector, a first agent of influence of the participants' regional distribution (P) at the two pension funds categories is the employees' territorial structure (ES).

The regression equations that reflect this connection are (in brackets t-Statistic):⁵

$$P_{II} = 1,2888 ES - 28457,9 \quad R^2 = 0,9908^6$$

$$[65,9629] \quad [-8,8618]$$

² $HHI = \sum_{i=1}^n g_i^2$

³ $GS = \sqrt{\frac{n \sum g_i^2 - 1}{n-1}}$

³ for wage earners under 35 years of age

⁵ to increase the number of degrees of freedom, we further used detailed data on the indicators on the 42 counties, which correspond to territorial structures NUTS-III

⁶ data from the 31.12.2010 have been used

$$P_{III} = 0,0923 \text{ ES} - 4913,76 \quad R^2 = 0,9294$$

$$[22,9496] \quad [-7,4347]$$

The optional aspect of participation to the second pension pillar for employees older than 35 years and the third pillar's optional determination make us think that the demand's territorial structure in the private pension region depends on the financial possibilities of the population, generated by the gross domestic product (GDP) and the average net monthly wage (ANMW).

Looking at the regression parameters, we can remark that for the second pillar participants' regional distribution significant connection is only with the average net income territorial distribution.

$$P_{II} = 405,6026 \text{ ANMW} - 400165 \quad R^2 = 0,4202$$

$$[5,384667] \quad [-4,13904]$$

But, for the third pillar we can emphasize both the connection with the GDP's territorial structure and the Average Net Nominal Monthly Earnings.

$$P_{III} = 0,3201 \text{ GDP} - 1,5075 \quad R^2 = 0,9406$$

$$[25,17385] \quad [-5,62269]$$

$$P_{III} = 27,0389 \text{ ANMW} - 29009,6 \quad R^2 = 0,3416$$

$$[4,5560] \quad [-3,8084]$$

Collinear indicators phenomenon that quantifies the demand for pension funds agents of influence renders impossible the construction of a multi-factorial regression pattern.

Unfortunately, we don't have available data regarding territorial distribution of the private pension funds' sales strength, in order to test an eventual connection with the participants' regional structure.

If we consider that the private pension system and the insurance one practically use the same sales power, we can actually estimate offer's influence over participants' distribution to the pension funds starting with insurance agents' territorial distribution (Ag).

$$P_{II} = 2,5048 \text{ Ag} - 3,5829 \quad R^2 = 0,5752$$

$$[7,3589] \quad [-4,0401]$$

$$P_{III} = 3,7056 \text{ Ag} - 6,4420 \quad R^2 = 0,4750$$

$$[6,0164] \quad [-4,0143]$$

Considerations on the dynamics of regional distribution of pension funds participants

We can talk about a systematic approach of private pension funds participants' regional distribution only after November the 1st, 2009, date when the supervisory authority begun utilizing both information given by the National House of Pensions (the institution responsible with the contributors' national evidence organization to pension system), and by the specialized market based on its own research.

There are also previous data prior to this moment that, with a certain degree of approximation, allows us an analysis of the participants' regional structure dynamic beginning with the end of the second trimester of 2008 (figure 6 and Annex).

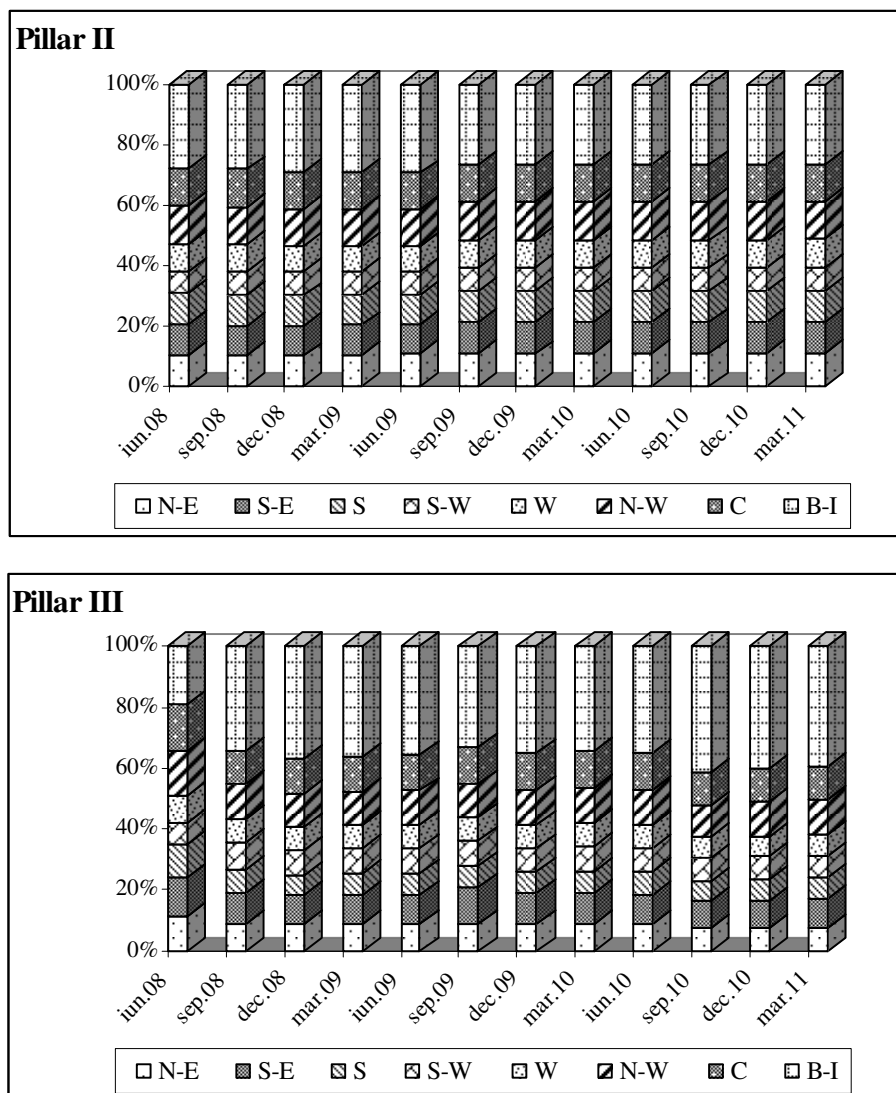


Figure 6. The dynamics of regional distribution of pension funds participants

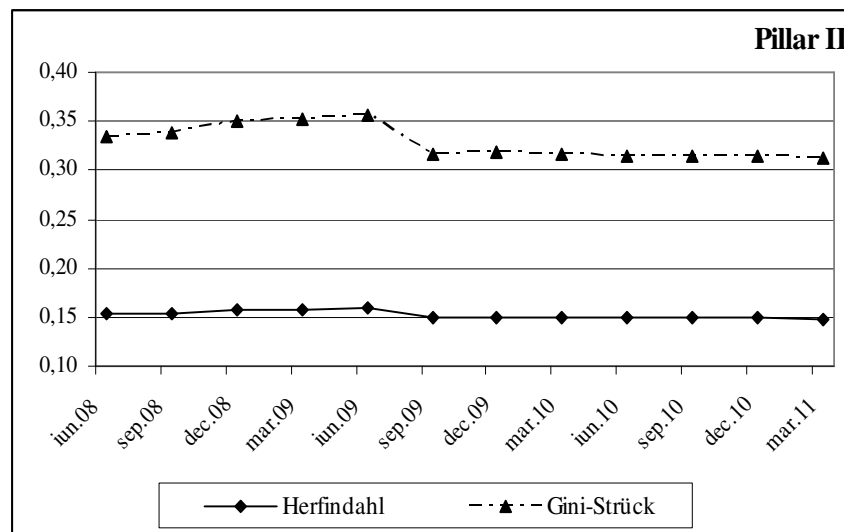
It is easy to observe that, regarding mandatory pensions (Pillar II), we assist to a relative stability of participants' regional structure, the specialized industry's offer operating especially on the distribution of pension funds.

Still, we can remark a slight decreasing tendency in the share of the Bucharest-Ilfov region, but this can also be attributed to the data's questionable quality from June 2008-October 2009 period of time.

Conversely, in the voluntary pensions case (Pillar III), we remark the obvious tendency of consolidation of the leading position for the Bucharest-Ilfov region based on the other regions' share decrease, minus the South and North-West regions which are relatively maintaining the same shares over the entire analyzed period.

Thus, we can say that for this category of funds, the influences of the demand-offer binomial are much more visible, the participants' behavior being relatively similar to the insurances from the voluntary systems.

The same tendencies can be emphasized based on the analysis of concentration indicators dynamic (figure 7).



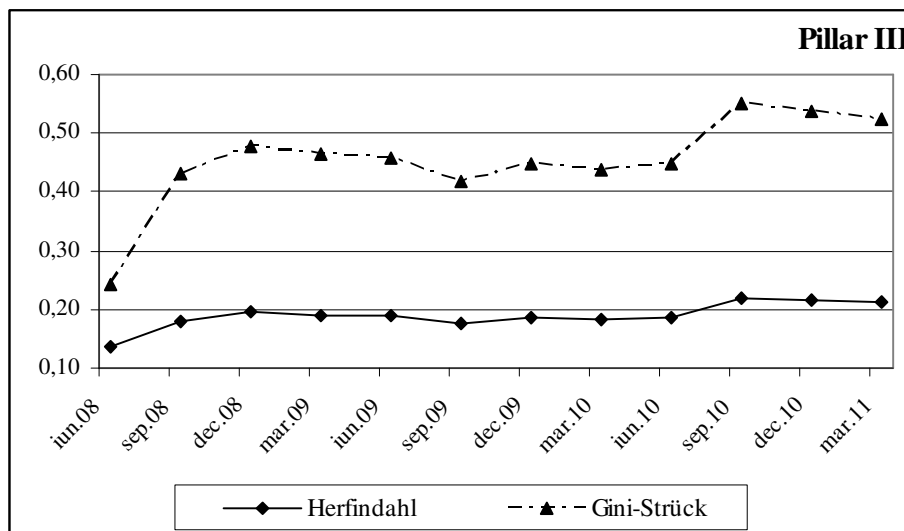


Figure 7. Evolution of concentration level in regional profile for pension funds participants

Further more, we can remark that, for the third pillar, the rising in the level of concentration took place in the third trimester of the year 2010, after which the share of the Bucharest-Ilfov region registers a slight reverse, but without returning to the previous level.

With the intention to emphasize both the analyzed phenomenon's regional distribution dynamic and the influence factors input, we have developed a pattern of the panel type for the monthly data series belonging to the November 2009 – April 2011 period of time, afferent to the 41 administrative territorial structures (counties) that correspond to the level divisions NUTS-III from the EU.

The regression pattern which reflects the correlation between the regional structure of the mandatory pension funds participants – Pillar II (P_{II}) and the number of employees is presented as follows:

Dependent Variable: P_{II} ?
 Method: Pooled EGLS (Period SUR)
 Sample (adjusted): 2009M11 2011M04
 Included observations: 18 after adjustments
 Cross-sections included: 42
 Total pool (balanced) observations: 756
 Linear estimation after one-step weighting matrix
 Period SUR (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-25168.55	1713.543	-14.68801	0.0000
ES?(-1)	1.197413	0.009968	120.1198	0.0000

Weighted Statistics			
R-squared	0.956560	Mean dependent var	0.794245
Adjusted R-squared	0.956503	S.D. dependent var	4.786630
S.E. of regression	0.998298	Sum squared resid	751.4352
F-statistic	16603.47	Durbin-Watson stat	1.993409
Prob(F-statistic)	0.000000		
Unweighted Statistics			
R-squared	0.986374	Mean dependent var	106764.0
Sum squared resid	2.55E+11	Durbin-Watson stat	0.014714

Beyond the obvious logic of using a time lag, we kept in mind that the number of participants is established at the beginning of the month, while the numbers of employees is determined at the end of the month.

Also, a strong and firm correlation can be emphasized in the mandatory pension funds participants' case – Pillar III (P_{III}), specifying that – along with the number of employees' regional structure influence – we deal with an inertial phenomenon ($P_{III,t}$ dependent on $P_{III,t-1}$). This can be due to the fact that, in the first two years since the private pension system became functional, participants' transfers from one fund to another bears penalties.

Dependent Variable: P_{III} ?
Method: Pooled EGLS (Period SUR)
Sample (adjusted): 2009M12 2011M04
Included observations: 17 after adjustments
Cross-sections included: 42
Total pool (balanced) observations: 714
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-558.9176	28.41634	-19.66888	0.0000
$P_{III}(-1)$	0.885254	0.000506	1750.238	0.0000
$ES(-1)$	0.010539	0.000222	47.55326	0.0000

Weighted Statistics			
R-squared	0.999800	Mean dependent var	14.09217
Adjusted R-squared	0.999800	S.D. dependent var	70.72585
S.E. of regression	1.000636	Sum squared resid	711.9042
F-statistic	1780645.	Durbin-Watson stat	2.003880
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.974190	Mean dependent var	4682.657
Sum squared resid	2.13E+09	Durbin-Watson stat	2.924113

The correlation emphasized by the pattern is:

$$P_{III\ it} = \alpha_{it} + \beta \cdot P_{III\ it-1} + \gamma \cdot ES_{it-1} + \varepsilon_{it}, \quad \text{where:}$$

i= 1,40 – counties

t = time.

Based on the conclusion drawn from the statistic analysis of the territorial distribution of the influence factors for the facultative pension funds participants we have analysed its dynamics with the average net monthly wage distribution.

Dependent Variable: P_{III}?
Method: Pooled EGLS (Period SUR)
Sample (adjusted): 2009M11 2011M04
Included observations: 18 after adjustments
Cross-sections included: 42
Total pool (balanced) observations: 756
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-10129.57	1098.479	-9.221450	0.0000
ANMW?(-1)	10.90051	0.948797	11.48876	0.0000

Weighted Statistics			
R-squared	0.464821	Mean dependent var	-0.045949
Adjusted R-squared	0.464111	S.D. dependent var	0.870651
S.E. of regression	0.637355	Sum squared resid	306.2914
F-statistic	654.8737	Durbin-Watson stat	1.514156
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.195148	Mean dependent var	4653.890
Sum squared resid	6.88E+10	Durbin-Watson stat	0.044876

The pattern's results certify a significant and firm correlation as follows:

$$P_{III\ it} = \alpha_{it} + \beta \cdot ANMW_{it-1} + \gamma \cdot ES_{it-1} + \varepsilon_{it}, \quad \text{where:}$$

i= 1,40 – counties

t = time.

All the previous results have been obtained based on uniform panel models (with common effects, $\alpha_{it} = \alpha$, $\beta_{it} = \beta$, $\gamma_{it} = \gamma$), which were used as a method for solving SUR⁷ (periods) to attenuate heteroskedasticity and contemporaneous correlation in the errors across equations.

As we can see, the results are econometrically significant and the models' specification tests are verified.

Conclusions, limits and directions for research's better understanding

The regional structure of the private pension funds participants emphasizes their concentration in the Bucharest-Ilfov region, which is due to both the demand's influence (GDP, ANME and a number of employees above the national average) and the larger offer in the country's capital region.

Mandatory pension funds are less sensitive to the influences of the demand-offer ratio, which took action mainly for the employees over 35 years of age at the time of which took place the implementation of the multi-pillar system (their participation being optional).

The regional gaps are more accentuated in regard to the voluntary pension funds participants, their behavior resembling very well with the insurance products possessors' one.

For the second pillar, the level of concentration tends to stabilize, the tendency of decrease being rather vague, while for the third pillar we assist to a certain increase of the concentration degree, realized with discontinuity followed by slight corrections.

Although the number of employees is decreasing and the pension funds participants' level is rising, their territorial distributions are closely linked.

The main limitations of the analysis and, at the same time, the possibilities of development in the future are due to the novelty of the private pension system, which did not allow the building of multiannual data series.

Further more, for a better emphasize of the territorial distribution phenomenon it would be desirable that, along with the number of participants' indicators, those regarding the contributions' size to the two categories of funds should also be used.

On short term, the persistence of economic crisis and a series of legislative measures with a significant impact (the decrease of budgetary employees' wages, the new Work Code) should

⁷ Seemingly Unrelated Regression

change the tendencies that manifest themselves regarding the regional structure of the private pension system.

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The dynamics of regional distribution of pension funds participants

Pillar II

	N-E	S-E	S	S-W	W	N-W	C	B-I
<i>jun.08</i>	10,34	10,34	10,34	6,90	9,20	12,64	12,64	27,59
<i>sep.08</i>	10,11	10,11	10,11	7,87	8,99	12,36	12,36	28,09
<i>dec.08</i>	10,00	10,00	10,00	7,78	8,89	12,22	12,22	28,89
<i>mar.09</i>	10,43	9,89	9,89	7,69	8,79	12,09	12,09	29,12
<i>jun.09</i>	10,87	9,78	9,78	7,61	8,70	11,96	11,96	29,35
<i>sep.09</i>	10,72	10,36	10,59	7,45	9,37	12,69	12,19	26,63
<i>dec.09</i>	10,67	10,41	10,59	7,42	9,34	12,68	12,21	26,68
<i>mar.10</i>	10,74	10,41	10,63	7,48	9,34	12,69	12,22	26,50
<i>jun.10</i>	10,77	10,40	10,62	7,49	9,34	12,69	12,21	26,48
<i>sep.10</i>	10,80	10,40	10,60	7,48	9,35	12,70	12,20	26,47
<i>dec.10</i>	10,86	10,42	10,58	7,47	9,36	12,71	12,21	26,40
<i>mar.11</i>	10,89	10,41	10,60	7,51	9,36	12,71	12,22	26,28

Pillar III

	N-E	S-E	S	S-W	W	N-W	C	B-I
<i>jun.08^{*)}</i>	11,00	13,00	11,00	7,00	9,00	15,00	15,00	19,00
<i>sep.08</i>	8,96	10,04	7,33	9,18	7,88	11,30	11,04	34,27
<i>dec.08</i>	8,46	9,64	6,82	8,37	7,54	10,59	11,70	36,88
<i>mar.09</i>	8,59	9,78	7,00	8,35	7,61	10,70	11,75	36,22
<i>jun.09</i>	8,62	9,90	7,05	8,30	7,76	10,93	11,82	35,62
<i>sep.09</i>	8,68	12,02	7,20	8,33	7,80	11,02	11,90	33,05
<i>dec.09</i>	8,73	9,88	7,24	7,97	7,64	11,51	11,87	35,16
<i>mar.10</i>	8,66	9,96	7,41	8,11	7,73	11,70	11,97	34,47
<i>jun.10</i>	8,75	9,80	7,33	7,96	7,57	11,68	11,79	35,11
<i>sep.10</i>	7,44	8,99	6,64	7,31	6,89	10,80	10,83	41,10
<i>dec.10</i>	7,55	9,03	6,94	7,34	6,89	10,99	10,88	40,37
<i>mar.11</i>	7,66	9,14	7,12	7,40	6,97	11,13	10,91	39,66

^{*)} undifferentiated numbers (employer/employee)