

THE EVOLUTION OF ROMANIA'S SOCIAL INSURANCE REDISTRIBUTION SYSTEM

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Abstract

The social insurance systems have emerged and developed as redistribution systems. The demographic phenomena's trend and the free circulation of citizens towards free labor force markets have imposed the redistribution systems' resetting and the initiation of reforms in all the countries dependent on the only existing system of social insurances, the redistribution one. The social insurance systems cover a transition period in which there is a coexistence between redistribution and accumulative systems, based on investments. Basing oneself on fundamental universal principles, the redistribution systems remodel themselves on scientific basis. The balance between contributors and beneficiaries bends permanently by reducing the population's employment rate, imposing therefore the necessity of reshaping the system also in the situation of economic growth.

In this article, we present the results of the evolutionary analysis of the redistribution system in Romania's legislative and economic outlines. Within the initiated reform, Romania has introduced the principle of contribution. This principle is analyzed in a distinct chapter and considered a fundamental principle of the reform by Romania. In our study, we illustrate the functionality and the distortions of functionality to the Romanian principle, in the way it is implemented and applied in Romania.

The authors suggest that only the actuarial reshaping, on its components of accumulation and redistribution of resources, offers solutions to the integral functionality of the contribution principle into a redistribution system. The study results are presented in the article.

The authors conclude that the sustainability of a redistribution system is determined by the system's stimulating and anticipating character, coexisting with the principles of contribution and social cohesion.

Key words: social insurances; contribution principle; redistribution system; actuarial reshaping; social cohesion

1. Introduction

In the context of citizens' free movement, a community labor force market has developed.

On the path of its active lives, Europe's citizens offer their abilities and professional performances, their work capacity, to the countries of origin or the ones in which they carry out their activity.

Between the citizen and the society, a contract cuts in for the exchange of the remuneration. In the act of labor force selling, **it offers** to the society also the social insurances' contributions, staking on the guarantee of a **further interest of allocation**.

The European Union's regulations imposed to the member states the implementation of reforms for establishing an adequate level of the national pension and for ensuring the conversion of the contributions paid in other states as a community pension.

Ensuring the sustainability of the social insurances' systems is today the responsibility of each national state, but also of the European Union, which has forwarded the phenomenon of flexicurity on the global labor force market.

At the basis of the social insurances there are universally underlain principles, on which foundation the reallocation systems have emerged and developed.

There are **two vital problems** to the beneficiaries:

- To have the guarantee that the pension interests' allocation is equitable

- The remuneration's replacement in the moment of assigning the pension interest is in direct correspondence to the social insurances' system's own share.

We define the principle of contribution as a permanent obligation of each insured person to pay contributions for ensuring the interest to the resources' allocation that will accumulate in the future from the working people.

The principle of contribution in the reallocating systems works as a principle along the other fundamental principles. The efficiency of the principle of cohesion and social solidarity is necessary among generations.

The authors consider that the dependency measured by the dependency rate, as statistical indicator, produces to the beneficiary **the need of demarcating his contributions**.

The allocation principle utilized in the social insurances' systems is based upon the remunerations realized in a period of work assigned by specific law and also upon the working seniority, with particularities from one country to another.

The capital allocation criteria are:

- The contributions, as an expression of the realized remuneration earnings
- Quotization stage, equivalent to the working seniority
- Working conditions

The reallocating systems base themselves on the principle of allocation of the active population's accumulated incomes, by the social insurances' contributions owed on the individual remuneration earnings, to the population that have entirely or partially lost their working capacity or that are forced to go into retirement by effect of law.

Between accumulation (A) and allocation (D) there is a fundamental equation specific to the social insurances' domain:

$$A = \alpha * W * C \quad (1)$$

Where α is the average amount of the contributions, W is the nominal average wages, C is the total number of contributors (the employed population).

$$D = \beta * W * B \quad (2)$$

Where β is the rate of wages' replacement by pension, $\beta = P/W$, P = average amount of pension, B = number of beneficiaries.

In the social conception, $\beta = (P/W) * 100$ is the pensions' adequation rate in the definition proposed by the authors.

In balance, A = D, that is:

$$\alpha * W * C = \beta * W * B \quad (3)$$

In relation (3), we replace $\beta = P/W$ and it results:

$$\alpha * W * C = P * B \quad (4)$$

The reallocating systems have as objective the adequation rate's maximization and we utilize the relation (3), like this:

$$MAX(\beta) = MAX\{\alpha * (C/B)\} \quad (5)$$

MAX(β) is realized when C is maximum, α is maximum and B is minimum.

Factorial analysis:

a) C is the number of contributors. The magnitude of this indicator can increase by 4 methods:

- Maintaining in activity the population that reached the standard age of going into retirement; we define this contribution period using the phrase "after-age contribution"
- Encouraging youth hiring; the attraction of the pre-active population
- Voluntary contributions of the beneficiaries
- Voluntary contributions of the contributors

The proposed methods do not always lead to a value increase of the indicator C, but lead to the value increase of the contributions. In Romania there is the situation $B_K = C_K$, that is a person finds oneself in double situation.

b) α is the average amount of contributions. Because economic agents are rational agents, α 's amount can be increased up to a maximum level that can permit to the economic agent, as employer and actual payer of contributions, to realize profit and to find itself in an economic growth trend. It results that α is a variable depending to C.

c) B is the number of beneficiaries.

The maximization problem narrows down to the optimal realization by the influence of the demographic and economic factors.

Among the demographic factors of influence we specify the economic migration of the labor force and population aging. Statistical data show that the general balance of the social insurances is strongly influenced by the two factors.

The level of the indicator α , the average amount of contributions, bears:

- The economic analysis of the profitability rate of engaged capital
- The social analysis of appreciating the degree of solidarity and social cohesion

The fundamental equation of the social insurances implies a relation of balance between the economic and social components of the system.

The calculation of the indicator C/B, as indicator of statistical analysis that characterizes a reallocating system, generates different perceptions and interpretations:

- The rate of dependency beneficiary-contributor (as ratio $100 \cdot B/C$)
- The number of contributors that "backs up" a beneficiary by the level of paid contributions (C/B)

The indicator C/B has depreciated in time, therefore the system finds itself in a relative balance.

The second evolution phase of the reallocation system is the phase of transition from the Defined – benefit plan system to the Defined – contribution plan system.

In this phase, the actuary's part steps in.

Actuarial science appeared starting with XVIIth century, even by the combination of mortality tables with the rate of interest. First studies belong to De Witt (1671) and Haller (1693). Abraham de Moivre published "Annuities treaty" in 1725. The profession of actuary appeared with the creation of mutual societies of life insurances ("The Equitable").

In Romania, actuarial analysis is approached in association to general insurances and life insurances (C.Anghelache) and in health insurances' analysis (Dan Anghel Constantinescu).

In private systems of insurances, actuarial methods offer analyses for risk evaluation, risk management, the capitalization of insurance funds. Actuarial analysis is based on demographic tables (mortality and shifting) realized using the statistic data and the theory of probability as basis, capitalization and actualization tables obtained from financial tables of actualization.

As we move to systems based on accumulation, the principle of contribution becomes prevalent against the principle of cohesion and social solidarity.

2. The evolution of Romania's Social Insurance System

Romania's Social Insurance System comprised a series of phases during its evolution. According to the applied insurance pattern, the phases covered by the social insurances in Romania are:

1. **The formation of the social insurances** funds by contributions paid by the employees and the employers. The period is marked out by the law of unification of the social insurances from all provinces of our country – 1933. The paid contributions are of 6% applied to the wages, and of 8% starting with 1938.

2. **The foundation of the Pensions General House** and the determination of the mode of calculation and also of the public employment pensions' system of administration (Law no. 446 / 10.07.1943). It introduces the first formula of calculation of the pension. The elements on which basis the pension quantum was determined are: the calculable time, the rate, the last wage. The variation of the pension amount is between 22.5% (for 10 calculable years) and 90% (for 35 years and more). The contributions are established as a rate of 10% to the earnings.

3. **The creation of additional pensions'** fund and the determination of the pension quantum based on the wages average of 5 consecutive years worked in the last 10 years (Law no. 27 / 28.12.1996). The appearance of special laws for lawyers and farmers.

4. **The differentiation of contributions'** rates on the criteria of labor conditions (The Decree 389/1972; Law no. 49/1992) and the pension quantum differentiated on groups and labor conditions (Law no. 3/1977).

5. **The diversification of insurance systems** (farmers, lawyers, handicraft cooperatives) and the differentiated determination of the pension interest by specific law for military staff.

6. **Phase predecessor to the reform initiation** (1990-2000)

Starting with 1990, there can be remarked remuneration increases owed to the inflation effect. The criterion of determining the pension quantum based on the wages average of 5 consecutive years worked in the last 10 years becomes inefficient and incorrect, since for this period there were situations in which the assigned pension, as replacing revenue to the salary, was in fact higher than the last salary recorded on the Work Card.

On the background of the contributor – beneficiary ratio's depreciation and the situations generated by the remunerations increases owed to the inflation effect, the legislator turned to the emission and application of the Government Decision 565/1996. According to this, the pension interest was determined on the basis of an average of revenues to which it was applied the effective "decorrelation" procedure starting with 01.04.1991, the application date of the first measure of employees' social protection. By the "decorrelation" procedure, the wages average was set to the equivalent wages from 01.10.1990.

To the equivalent wage, called deducted average wage, social protection measures were applied, which were also applied to the pensions. After the chronological application of the social protection measures, it was determined the pension quantum which should have been given to a person that went into retirement until 2001.

This procedure was complicated. Disfunctionalities of application have emerged in the situations in which an employee traversed an activity period in the interspaces submitted to the "decorrelation", if the activity period was registered to a private employer that wasn't bound to apply the wages' indexations in the amounts assigned by the Government, but who gave remunerations increases. Since 1998, a process of recorrelation was initiated, which had as an effect the equalization of the pension amounts, ignoring the contribution principle in favor of the social solidarity principle.

7. **The reform initiation** in the Social Insurance System of Romania (Law no. 19/2000)

Starting with 01.04.2001, the law based on the contribution principle was applied and consists in assigning the pension amounts based on an average annual synopsis. This indicator is conceived as being the employee's share to the social insurance system in Romania regarding system contributions. Therefore it is the main criterion of redistributing the resources accumulated by the employees in each period.

The redistribution does not imply the distribution of every person's accumulated contributions, but it does imply the allocation of present accumulated contributions, therefore it is a redistribution process.

8. **Recalculating the pensions assigned** on the basis of the previous legislation by the new procedure of calculation.

The application of the principle contribution and the pensions' assignment based on the average annual synopsis, lead to the appearance of new situations. These refer to the comparability between persons with the same path of obtained earnings and the same quotization duration, who went into retirement previous to the current legislation with the pensions that retired based on the new law.

It was initiated and is to be finalized the procedure of recalculation, which consists in the assignation of the average annual synopsis also to the persons that went into retirement based on the previous legislation.

This procedure is derogatory to the persons that retired until 2001, who concentrated their contributions to the career ending, because that period was taken into account. These persons found themselves in the situation of not being able to adjust the pension amount reassigned on the basis of the average annual synopsis. A great amount of the retired persons have thereby recommenced their activity.

Distortions are registered in the manner of applying the recalculation procedure, owing to the work conditions. The persons that evolved their activity in different and special conditions found themselves in the situation of losing the advantages obtained by bigger pension amounts. The legislator is preoccupied at present to find solutions referring to these categories, triggering a new recalculation procedure.

9. **In the current phase**, there are shaping:

- The diversification of the social insurance systems, by the appearance of special laws for different categories (seagoing staff, diplomats, magistrates, artists) and by applying specific laws (for policemen, militaries). The social insurance systems' diversification is to the detriment of applying the contribution and resources' administration principles.
- The relocation of a part of the individual contribution made by the persons up to 35 years of age to the pensions' private funds for their development.

3. The principle of contribution. Algorithm of calculation

The authors present in this article their own conclusions on the mode of implementation and application of the contribution principle. That is about the formulation of opinions on the resources distribution's equitability considering the contribution of each insured person.

We specify that the algorithm is created and developed by the authors on the basis of the legislation text applied to Romania. For exemplifying the contribution principle, we define the following notations, terms and indicators:

$(P_{ij})_k$ = synopsis realized by a person in the month j of the year i , where i belongs to $(15, S_k)$

S_k = quotization stage, period in which the person has contributed to the social insurance system

$$(P_{ij})_k = \frac{(W_{ij})_k}{W_{ij}} \quad (6)$$

S_t = standard stage of quotization

P_i = synopsis realized by a person in the year i

$(W_{ij})_k$ = gross earnings realized by the person k in the month j of the year i

W_{ij} = gross average remunerations (gross earnings) on the economy in the month j year i

P_k = average annual synopsis realized by the person k

P_k is the indicator which stands at the basis of allocating by the person k of the assigned resources to the social insurance system in Romania, likeness the pension interest.

Statistically, P_k shows how many times the average annual earnings of a person are situated over the level of the average earnings realized in Romania upon all period of quotization to the social insurance system.

In the application of the contribution principle, in Romania the following algorithm of calculation is utilized:

Step 1

Calculating $(P_{ij})_k$ and $P_i = \frac{\sum (P_{ij})_k}{12}$, $j = \overline{1,12}$

Step 2

For i between 1967 and 01.04.2001, $(P_{ij})_k$ increases with a rate between 13% and 22%, considering the contribution to the additional pensions' fund.

$P_s = \sum (P_{ij} * \lambda_{ij})$, where λ_{ij} = rate of increasing the P_{ij}

Step 3

Calculating $P_k = (\sum P_i + P_s) / S_t$, where $i = \overline{1, S_k}$, $S_t = 25$ years for women, 30 years for men

Comment

S_t is variable and increases monthly up to 2014. S_t is different for the persons who performed activities in remarkable and special work conditions.

Remark 1

$$P_k = (\sum (\sum P_{ij}) + P_s) / (12 * S_t), i = \overline{1, S_k}, j = \overline{1, 12}$$

Because P_{ij} does not depend on the contribution rate, it results that P_k does not depend on the contribution rate. There is at least one person y so that $P_k = P_y$ and $(C_{ij})_k * (W_{ij})_k / W_{ij}$ different from $(C_{ij})_y * (W_{ij})_y / W_{ij}$.

Remark 2

Saying α is the average dimension of $(C_{ij})_k$ and the average dimension of $(C_{ij})_y$ and the conditions: $S_k = 30$, $S_t = 30$, $S_y = 30$, identical as periods

There is at least one person y , so that $\alpha \sum \sum (W_{ij})_k / W_{ij} = \alpha \sum \sum (W_{ij})_y / W_{ij}$ and a term $(W_{ij})_k = (W_{ij})_y$, both of different degrees.

It results that in the case of allocating the terms W_{ij} on the range $i * j$, $j = \overline{1,12}$, $i = \overline{1,30}$, $P_k = P_y$ does not show the contribution because the formula does not comprise the actualization element. It results that the current P_k is different to the current P_y .

Remark 3

Saying $\sum (\sum P_{ij})_k = \sum (\sum P_{ij})_y$, with all the identical terms allocated in the period $S_k = S_y$.

Because S_t is differentiated after the sex criterion and S_t is different for k and y , it results that P_k is different from P_y , the contributions being ignored from the calculation formula.

Remark 4

Saying $\sum (\sum P_{ij})_k = \sum (\sum P_{ij})_y$, with all the identical terms allocated in the period $S_k = S_y$.

Because S_t is differentiated after the work conditions criterion and S_t is different for k and y , it results that P_k is different from P_y , the contributions being ignored from the calculation formula.

The contribution principle does not comprise the contribution rate and the actualization element of the contributions. At equal annual synopsis does not always correspond equal contributions.

4. Conclusions and recommendations

The authors conclude that the contribution principle does not correspond to the level of contributions paid by employees and employers, but to an average level resulted from the entire period of activity and contribution.

From the case of study, taking into account the influence element – the rate level of the social insurances' contributions and its evolution, at contributions considered equal at present – it differs the total value of contributions between people with the same contribution indicator level, also utilized in reallocation.

The authors recommend taking into account the coefficients – sum of contributions and the element of actualization and capitalization and the determination of the contribution indicator.

In the social insurance systems' analysis, the authors propose this model of calculation of the accumulations and the closing in to the idea of a virtual accumulation fund, as contribution indicator, like in Australia and Sweden.

The actuary has the role of actualizing the contributions considering the virtually individually accumulated fund and offering solutions for alternative allocation, so that the principle of contribution should comprise not only the obligation, but also the option of choosing the reallocation strategy.

Because more than 20 generations are interested in the equitability of benefits' allocation and in the sustainability of current system of social insurances, we authors propose for Romania:

- The creation of an anticipative system based on the models of Sweden and Australia
- The harmonization of insurance systems on the model of Austria
- Political consensus in reforms' application (Luxembourg model)
- Guaranteeing the interest of equitable allocation and the level of the living standard
- Transparency in the application of EU regulations
- Real manner application of the contribution principle

In conclusion, the authors recommend taking into account the real sum of contributions and the factor of actualization and capitalization and the determination of the real contribution indicator.

5. Practical example of applying the contribution principle

a) Current version applied in Romania

Saying K and Y are two women that go into retirement in 2009. For the exemplification, we use the quotization effective stage equal to 25 years. Both persons have graduated 5 years at the university, before 1984 and accomplished in the same period. For exemplifying, we utilize the average remuneration on all

economy as reporting basis for the period after 1990, with the addition that starting with 01.01.1991 the monthly gross average remunerations are utilized for the determination of P_{ij} .

In the current version the person k achieves a number of 40,50000 points from the work activity. Also, the person y achieves a number of 40,50000 points.

The remunerations achieved by the person k are presented in column $(\sum W_{ij})_k$, while the remunerations of the person y are shown in column $(\sum W_{ij})_y$.

For the years in which the social insurances contributions' rate has changed, the remunerations realized in the two periods are separated.

The contribution indicator and the repartitions in the current version Table 1

Year	Average wage	$\sum (W_{ij})_k$	$\sum (W_{ij})_y$	P_i for K	P_i for Y	$\sum P_K$	$\sum P_y$
1	3,224	47,586	42,557	1.23000	1.10000	1.23000	1.10000
2	3,285	48,526	47,304	1.23100	1.20000	2.46100	2.30000
3	3,317	49,039	67,667	1.23200	1.70000	3.69300	4.00000
4	3,337	39,243	52,057	0.98000	1.30000	4.67300	5.30000
5	3,422	40,284	34,904	0.98100	0.85000	5.65400	6.15000
6	3,538	41,692	36,937	0.98200	0.87000	6.63600	7.02000
...							
11	181,694	6,759,017	2,834,426	3.10000	1.30000	17.60900	15.45100
17	2,876,645	93,203,298	62,135,532	2.70000	1.80000	26.88900	24.96100
18	4,282,622	7,066,326	8,351,113	0.55000	0.65000	27.43900	25.61100
18	4,282,622	50,106,677	46,252,318	1.30000	1.20000	28.73900	26.81100
19	5,452,987	91,610,182	104,697,350	1.40000	1.60000	30.13900	28.41100
20	6,741,152	121,340,736	137,519,501	1.50000	1.70000	31.63900	30.11100
21	8,261,491	168,534,416	178,448,206	1.70000	1.80000	33.33900	31.91100
22	9,668,279	208,834,826	220,436,761	1.80000	1.90000	35.13900	33.81100
23	11,500,000	262,200,000	276,000,000	1.90000	2.00000	37.03900	35.81100
24	14,100,000	380,700,000	355,320,000	2.25000	2.10000	39.28900	37.91100
25	17,421,700	253,172,144	541,257,376	1.21100	2.58900	40.50000	40.50000
Total		1,705,009,682	2,015,857,561	40.50000	40.50000		

Contribution calculated to the effective wage (St=25 years)	40.50000
$P_k = P_i$ for K/ St	1.62000
$P_y = P_i$ for Y/St	1.62000

In the current version, the average annual synopsis of the person y is equal to the average annual synopsis of the person k.

b) Proposed version. Calculating the contributions and determining the indicators P_y and P_k

Let's say C_{ij} is the contributions rate paid over by the two persons K and Y.

We calculate the contributions of persons K and Y, like this:

$$K's \text{ contribution} = C_{ij} * (\sum W_{ij})_k$$

$$Y's \text{ contribution} = C_{ij} * (\sum W_{ij})_y$$

Year = 1984,..., 2008

The value of nonactualized contributions and the average contribution Table 2

Year	C _{ij}	Average wage	$\sum (W_{ij})_k$	$\sum (W_{ij})_y$	K's contr.	Y's contr.	Average contribution
1	15%	3,224	47,586	42,557	7,138	6,384	5,803
2	15%	3,285	48,526	47,304	7,279	7,096	5,913
3	15%	3,317	49,039	67,667	7,356	10,150	5,971
4	15%	3,337	39,243	52,057	5,886	7,809	6,007
5	15%	3,422	40,284	34,904	6,043	5,236	6,160
6	15%	3,538	41,692	36,937	6,254	5,541	6,368
7	15%	4,010	39,418	60,150	4,908	7,489	5,991
...							
18	35%	4,282,622	50,106,677	46,252,318	13,153,003	12,141,233	13,490,259
19	35%	5,452,987	91,610,182	104,697,350	32,063,564	36,644,073	22,902,545
20	34%	6,741,152	121,340,736	137,519,501	41,255,850	46,756,630	27,503,900
21	31.5%	8,261,491	168,534,416	178,448,206	53,088,341	56,211,185	31,228,436
22	31.5%	9,668,279	208,834,826	220,436,761	65,782,970	69,437,580	36,546,095
23	31.5%	11,500,000	262,200,000	276,000,000	82,593,000	86,940,000	43,470,000
24	31.5%	14,100,000	380,700,000	355,320,000	119,920,500	111,925,800	53,298,000
25	29%	17,421,700	253,172,144	541,257,376	73,419,922	156,964,639	60,627,516
Total					525,993,471	616,613,836	319,075,820

Contribution calculated for the average wage	319,075,820
P _k = K's contribution/ Average wage	1.64849
P _y = Y's contribution/ Average wage	1.93250

K's contribution = 616.613.836

Y's contribution = 525.993.471

It results that the contributions level is different for the 2 persons.

As the calculation shows, P_k = 1.64849 and P_y = 1.93250.

In the case of study, we did not take into account the actualization element, as the tables of capitalization of the actuarial analysis show. The contributions' values are determined as historical nonactualized values.

In the phase of resources' reallocation, the ratio μ would correspond to a relative actualization element.

P_{average} represents the average value assigned by the **social insurances budget law**.

The parameter λ is annually established and is comprised between 37,5 % and 45%.

c) The redistribution principle

P_{std} (standard) = value of standard point

Wa = Average current wage

P _{std}	P _{k_old}	P _{y_old}	P _{k_new}	P _{y_new}
697	1.62000	1.62000	1.64849	1.93250

Where: $P_{std} = \lambda * Wa$ (7)

$Val_k = P_k * P_{std} = P_k * \lambda * Wa$ (8)

For S_t = 25 years and λ = 45%:

$$Val_k = (45\% / St) * Wa * \sum_i \sum_j [(Wij(k) / Wij) / 12] \quad (9)$$

- d) **Analysing the formulas** used in the reallocation phase (model elaborated by the authors according to the current legislation), we notice that the reallocated annual value depends on the total earnings **and not on the contributions**.

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