

COMPARATIVE STUDY REGARDING THE EVOLUTIN OF PRIVATE PENSION FUNDS IN ROMANIA (SECOND PILLOR)

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Abstract: The goal of this paper is to present the basic characteristics of the Romanian private pension system as well as its evolution during a period of 43 weeks from 20th June 2008 to 10th March 2009. The paper begins by describing the legal work frame of the system and carries on by using basic descriptive statistics operations to emphasize the differences between the existing pension funds. The paper also tries to foresee, using Mathematica, the future values of the yields of four pension funds.

Keywords: Private pension, pension funds, yield, future value.

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1. The premise of the introduction of private pensions in Romania

At present the public pension system in Romania, a system that is operating on the principle of redistribution between generations, ensures pensioners a replacement income of approximately 40% of the average gross wage in the economy. In these circumstances it is indispensable to supplement the public pension with a private pension schemes where the contributions raised from the policyholders are accounted for in individual accounts and are fructified over the entire period of accumulation, so that in the decumulation phase the money obtained should increase. The pension obtained from the public system, supplemented with that obtained by the policyholders after participating in a private pension fund, is able to give pensioners a decent replacement income.

Besides the above motivation, in recent decades, two complementary phenomena has led to the need for an alternative to the public system and namely: an aging population and a declining birth rate. Both had the effect of modifying the normal report value of the active population / inactive population, creating strong pressures on the active population and on the entire public pension system. Forecasts for the coming decades indicate further deterioration of this report. According to a study conducted in 2006 by the Department for Economic and Social Affairs of the UN, in 2020 the population aged over 65 will represent 17.5% of the total population, and by 2050, the share of this population will be 30% of the population.

To cope with these pressures from the public system, many countries have decided to implement multi-pillar pension schemes. This way, through the reform undertaken in the field, in Romania were implemented two new components of the pension system: Pillar II (mandatory privately managed pensions) and Pillar III (voluntary privately managed pensions).

Shareholding members in pension funds (the insured) are persons aged up to 35 years, which are contributing to the public pension system. They are required to participate in a pension fund that is privately managed. There is a second class of participants, which are the taxpayers aged between 35 and 45 years that are now contributing to the public pension. For them, participation in privately managed funds covered by pillar II remains their option. For each of the participants to the private pension fund, an individual account is created in which monthly contributions and the investment resulting from the contributions to the fund will accumulate. In the first year collecting the contributions (2008), the amount was 2% of the base (the same basis of calculation used to determine the public contribution to public pensions). Within the following 8 years, the

rate of contribution shall be increased with 0.5 percent per year, starting from January 1st of each year, which will add up to 6%. After just one year, the Executive has decided ceasing growth contribution by 0.5 percent for 2009, arguing the decision through the excessive deficit of the social security budget, from which the contributions would be redirected.

Each participant adhering to a fund under the contract of membership, will benefit from an opened account in which the afferent individual account units are retained, and the participant complies with the restriction not to participate simultaneously to several pension funds. Note that the asset held by any participant may not be pledged or sold, and also it can not be subject to enforcement.

For a management in accordance with the law, currently in our country there are 14 pension funds managers, namely: AIG Pension Fund, ALLIANZ-TIRIAC Private Pensions, The Pension Fund Bancpost, BCR Pension Fund Administration, BRD Pension Fund, BT AEGON, AVIVA Management Society of a Private Pension Fund, GENERALI Pension Fund, ING Pension Fund, INTERAMERICAN Management Society of a Private Pension Fund, KD Pension Fund, OmniaSIG Pensions, OTP Pension Fund, PRIMA PENSIE Pension Fund. The fund administrator operates as a joint stock company formed solely for the purpose of managing pension funds and, optionally, providing private pensions.

Depending on the investments they made, each pension fund assumes a certain risk level and expects to obtain a satisfactory yield rate. Although the level of risk undertaken depends on the investment strategy and risk affinity for each fund, the law imposes certain limits to ensure safety, quality, liquidity and profitability of investment. Thus, in accordance with the law, a pension fund can invest in: money market instruments (with a maximum of 20% of fund assets value), government bonds (with a maximum of 70% of the total fund assets), bonds or other securities issued by local authorities (with a maximum 30% of the total fund assets), securities traded on regulated and supervised markets (up to 50% of the total fund assets), government bonds and other securities issued by third countries (to a maximum of 15% of the total fund assets), bonds and other securities issued by local authorities of third countries (to a maximum 10% of the total fund assets) or by foreign non-governmental organizations, if the instruments are listed on the stock market and they meet the criteria for rating (in proportion than 5% of the total fund assets), other instruments provided by the Supervisory Commission of Private Pension System.

The assets of each privately managed pension fund are kept by the Depository institution. According to the law number 23 of 2007, the depository is a credit institution in Romania, approved by the National Bank of Romania, in accordance with the banking laws or a branch in Romania of a credit institution authorized in one EU State or that is part of the European Economic Area, approved by the Supervisory Commission of Private Pensions System, for the activity of storing, according to the law, which they are assigned to storage safely, all assets of each privately managed pension fund. Currently in Romania the operating depositories are : Romanian Commercial Bank SA, BRD - Groupe Societe Generale SA, Bancpost SA, and ING Bank NV Amsterdam Bucharest Branch.

The institution responsible for regulation and supervision of privately managed pensions is the Supervisory Commission of Private Pensions System, established by GEO 50/2005. Its main mission is to regulate, coordinate, monitor and control the activities of private pensions system and protect the interests of the participants and beneficiaries by ensuring the efficient functioning of the pension system and provide information on it.

2. Distinctive features of the pension funds administered by Pillar II managers

To characterize the effectiveness of the activities conducted by the existing pension funds and to make a comparison between them we started from the annualized yield rates of pension funds, which are published weekly [3]. These yields are used because they allow comparison with other

investment yields made on other levels and financial markets. The first processing of these data relate to determining the variation in absolute terms between the initial and the final yields, the average, the variance, the standard deviation of each pension fund based on well known formulas. Thus, we obtain:

Table 1 Basic Statistics

Operators

Pension Fund	$\Delta_{38/1}$	Average	σ^2	σ
ING	-23.68	20.6863	42.1715	6.49396
Vital	1.35	11.0837	0.4045	0.636003
AIG	11.68	5.00442	8.11513	2.84871
OTP	-1.12	5.08047	26.6571	5.16306
Prima Pensie	-0.77	-5.80349	7.7785	2.789
Interamerican	14.1	4.52628	30.3161	5.50601
Aripi	14.97	5.23326	27.8414	5.27649
Omniforte	14.78	1.16233	40.7095	6.3804
Pensia Viva	14.7	0.0362791	65.8041	8.11197
Bancpost	13.34	-4.42651	14.8325	3.8513
AZT Viitorul Tau	24.13	4.84535	38.5666	6.2102
BRD	19.09	-1.91651	20.8363	4.56468
KD	21.23	0.0567442	35.206	5.93346
BCR	29.89	-0.372558	172.973	13.1519

Results and interpretations

Analysis of the submitted data shows that ING had the least favorable evolution in absolute terms, which registered a decrease in annualized yield of 24.57% from 41.07% in the first week to 17.39% in the last one. Also OTP and PRIMA PENSIE recorded a negative evolution. In absolute terms the best development was at BCR which increased from -19% declared yield after the first month to 10.89% declared yield at the end of the 41st week. If we relate the evolution of yields over the entire period, ING is the leader, getting an average yield of 20.6863% and the yield corresponding to the PRIMA PENSIE fund confirms the negative trends established earlier. Another issue arising from this table is the degree of homogeneity of the batch yields of each fund. This degree is obtained by comparing the mean with the variance and the standard deviation. So it can be concluded that the series of yields of funds such as PRIMA PENSIE, BRD and BCR are heterogeneous, and the AIG series is a series with a high degree of homogeneity. In a further deepening of the comparison, we chose the series of yields from ING pension fund, BCR and KD. For each of these series of yields we found a function that highlights the most faithful evolution and we forecasted 3 future values using that specific function. This way, we adjusted the 2 series using the graphics method, and once we determined each graph, we applied the analytical method to determine the coefficients of the function on which the adjustment and extrapolation will take place. All these methods have been put into practice through Mathematica using the least squares method. For all tree functions a statistical proof was carried on.

In the case of the ING pension fund the function that best approximates the evolution is given by

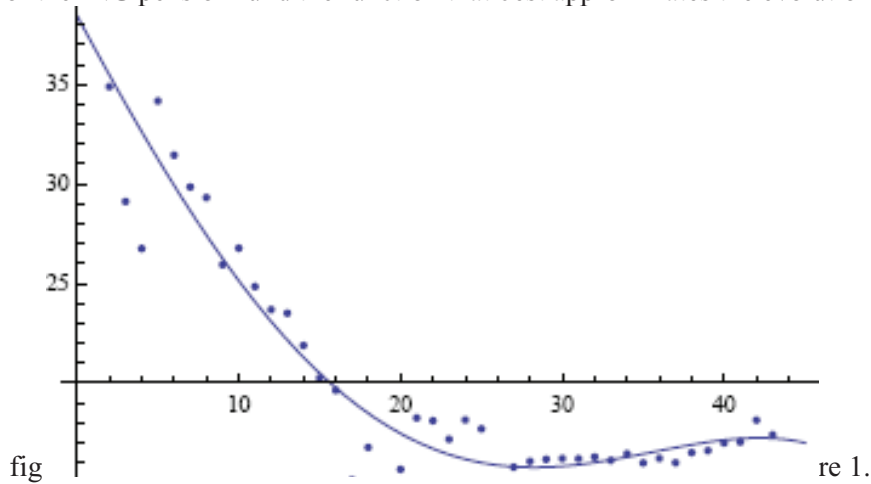


Figure1. ING yield rate

A first conclusion that can be disengaged from the graph is that during the 43-week yield the fund has recorded a significant decrease. As can be seen the graph of this function refers to a third degree polynomial. Thus the function we were seeking is $Y: [1, \infty) \rightarrow \mathbb{R}$.

$Y_t = 38,4483 - 1,51373 \cdot t + 0,0103426 \cdot t^2 + 0,000932249 \cdot t^3 - 0,0000144455 \cdot t^4$. To prove the validity of the function we determine the correlation report, a value that should be as close to 1 as possible. In our case the correlation report is 0,938044654, which demonstrates that the function is valid. Further more, two statistical test were taken: the Fisher test and the Student test. The first test increases the function's significance due to the fact that the calculated value of 95,26816714 is higher than the critical one of 1,67097051. According to the Student test all 4 coefficients of the function have an influence on the yield value, the critical value of 2,018082 being lower than every of the calculated values. As for the future values we calculated $Y_{44}=17,1368$, $Y_{45}=16,9896$, $Y_{46}=16,7637$.

The next studied pension fund is BCR. In this case the graph is given by Figure 2:

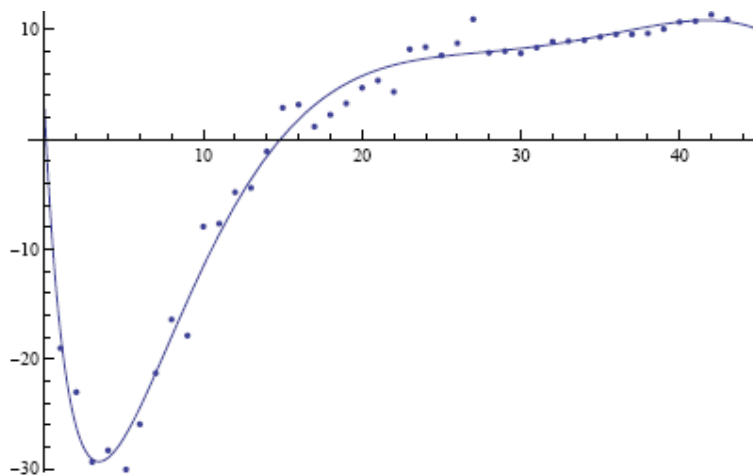


Figure2. BCR yield rate evolution

We can state that despite the decrease in the first few weeks, this fund had a good evolution maintaining an upward evolution. The function that best suits us is a linear combination of a four degree polynomial and a logarithm. After calculating the function's coefficients we obtain:

$$Y: [1, \infty) \rightarrow \mathbb{R},$$

$$Y_t = 82,8226 + 27,5405 \cdot t - 1,00397 \cdot t^2 + 0,0192257 \cdot t^3 - 0,000142942 \cdot t^4 - 115,568 \text{Log}[2 + t]$$

The validity of the model is certified by the correlation report value which is 0,993446 and by the two statistical tests, Fisher and Student. The calculated value of the Fisher's test is 559,0331 which is significantly higher than the critical value of 1,670971. Analysing the Student's test results we can conclude that every coefficient has an influence on the yield value, the most important influence being the one of the logarithm²³⁵. The future values calculated for this pension fund are: $Y_{44}=10,425$, $Y_{45}=9,95601$, $Y_{46}=9,24863$.

The last pension fund analyzed is KD. The graph that best represents its evolution can be seen in figure 3:

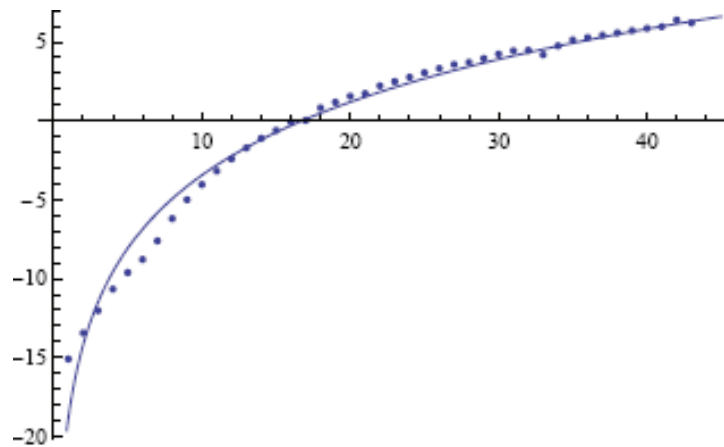


Figure3. KD yield rate evolution

A direct computation leads us to the function on which the graph is based upon: $Y: [1, \infty) \rightarrow \mathbb{R}$, $Y_t = -17,7364 + 0,0738881 \cdot t + 5,72032 \cdot \text{Log}[t]$. The statistic validation shows us that the coefficients meet all the requirements. The correlation report value of 0,991824 states that the model itself is statistically valid. As for the Fisher's test, the critical value of 1,670971 is notably lower than the calculated value of 1208,088. A further proof of the validity of the model is given by the Student's test that shows that each coefficient is meaningful and influences the yield, due to the fact that all the calculated values are higher than the critical value of 2,018082. Based on this function the future values that can be foreseen are $Y_{44}=7,1614$, $Y_{45}=7,3638$, $Y_{46}=7,5634$.

It can be noted that these tree funds have a unique evolution that depends on the investment decisions taken by the managers, on the economical, political and social development and not less on the way people perceive the efficiency of each pension fund. Despite all those factors, ING has managed to keep its leading place among privately managed pension funds. Even though BCR's start was not exactly perfect, its evolution has proven that inspired decisions and good management can lead to a spectacular growth. KD has had a constant evolution from the start, with minor setbacks and there is nothing to predict a turn in the near future.

235 The calculated value in absolute terms of the logarithm is 9,93831, which compared to the critical value of 2,018082 demonstrates its influence.

It is important to note that in order to receive a satisfactory pension, a contribution composed of 10% -15% of the income is required, this means a contribution that is larger than the one currently practiced in our country, and also a long time horizon must be considered in order to make this contribution fruitful.

We conclude that although our country is at the beginning of the road regarding the system of privately managed pensions, the premises of an effective activity of this system exist. Clearly there are some gaps, of which we mention the too small values of contributions to these funds which doesn't allow the accumulation of a sufficient amount at the end of the period, or discrepancies between an existing contribution and the life expectancy between the sexes. But we must not forget that even now, on the basis of the world crisis, the private pension funds in Romania have registered over the past 9 months an annualized average yield of 11,9% when the private pension fund in other countries member of the EU, have registered a negative annualized average yield (Hungary -22,6%, Bulgaria -20,8%) .All things considered, we are confident that with time and experience all shortcomings will be overcome.

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