

Assessing the performance of Pillar II in Romania – time weighted versus money weighted rate of return

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Abstract. *Adequate and complete reporting of the return rates for pension funds is of utmost importance for the success of the second pension pillar. This paper points to the limitations of the current way of reporting the returns by the Romanian pension funds administrators, given by the exclusive use of the time weighted rate of return and argues for the merits of jointly using an alternative indicator, namely the money weighted rate of return. Both return indicators are calculated in nominal and real terms over the 2008-2018 periods and also for various sub-samples, the results pointing to relevant differences.*

Keywords: pension funds' performance, money weighted rate of return, time weighted rate of return, Pillar II, Romania.

JEL Classification: G23, J11, J26, J32.

1. Introduction

Revenues from pensions are the main source of income for the elderly throughout the world. In many countries, the public pension system is complemented by the privately managed pension system. The main objective of the public pension systems is to protect the elderly against poverty, while private pension funds aim to ensure a better replacement rate between the salary earned during the active life and pension income.

The public system operates on the basis of the mandatory contributions paid by the population, according to which the amount of the pension is also set. The sources of financing of pension funds are represented by the savings of individuals. In practice, it is known that the transfer of economic welfare from the present to the future is done through saving. As many people do not have the necessary knowledge to adequately manage their savings for retirement, private pension funds can prove to be a very good option. Also, the rapid pace of population aging that negatively affects public finances, increased longevity, and the development of capital markets encourages the operation of private pension systems.

The main purpose of private pension funds is to invest the money from the contributions through financial markets by using the best investment strategies while complying with portfolio management regulations. Therefore, the amount received by the contributors will depend on the return on assets and the financial performance of the funds. In the literature there are many studies regarding the most appropriate way to calculate the rate of return on investments. Two of the most popular methods are represented by the money weighted rate of return (MWRR) and the time weighted rate of return (TWRR). While the latter measures the performance of the funds' managers, the former is a measure that determines the performance of pension funds' contributors, also taking into account the impact of inputs and outputs of flows.

In the report entitled "Averting the Old Age Crisis" (1994), the World Bank recommends a three pillars system pension, where the first component is the public pension sector, the second pillar is the mandatory, privately managed pensions and the third pillar represents the voluntary, privately managed pension.

This paper points to the limitations of the current way of reporting the returns by the Romanian pension funds administrators, given by the exclusive use of the time weighted rate of return and argues for the merits of jointly using an alternative indicator, namely the money weighted rate of return. While the first indicator is the best measure for assessing the performance of pension fund administrators, we provide arguments that the latter is a better measure for evaluating the actual return on the participants' contributions. Also, we calculate both indicators for the entire period of existence of Pillar II in Romania in nominal and real terms and in addition, we show the differences on various sub-samples of the analyzed period. The results clearly show the need of a change in reporting rules for pension funds administrators by imposing the calculation and presentation of the money weighted rate of return as a relevant measure for assessing the returns on investments generated by the pension funds administrators. We expect that our arguments and conclusions to be of great interest for Romanian public authorities and the Romanian citizens in a broad sense.

The remaining of this paper is organized as follows: the next section contains an overview of the relevant literature in the field of the topic researched, section 3 defines the aims and the novelty of our research, section 4 presents the data and methodology used, section 5 exposes the results in a structured manner while the final section concludes.

2. Problem statement

Private pension funds play an essential role in national pension systems. In the literature it is appreciated that the objectives of investment managers should be to determine the optimal structure of portfolios on behalf of clients so as to maximize profits, mitigate risks by diversifying portfolios, bookkeeping and optimizing the taxes paid. In addition, pension fund administrators are also pursuing long-term objectives for retirees such as ensuring a higher purchasing power than the one of the transferred contributions.

Gruber (1996) showed that mutual funds investing in shares had an annual return less than an investment directly in the stock market index as a result of periodically charged administration fees. Impavido (2009) produced a report for the International Monetary Fund outlining the challenges faced by pension funds managing mandatory contributions to developing measures that would reduce administrative fees and increase the performance of long-term asset management. The report shows that the expected returns can be improved if behavioral inclinations in investment decisions are recognized. The process of reducing administration costs is often hampered by the existence of barriers to entering the market, high market shares of existing pension funds and the indifference of the contributors. The author also highlights the concerns that fund managers have exclusive freedom when it comes to asset allocation. At the same time, long-term returns are also affected by low demand elasticity as a result of the fact that people are not properly informed and can not track investment performance.

The mandatory private pensions (Pillar II) were introduced in Romania in 2007 and are governed by Law no. 411/2004 on privately managed pension funds while the first contributions were transferred in May 2008. The contribution to the second pension pillar is mandatory for all employees under 35 and optional for those aged 35 to 45. Initially, the contribution to the second pension Pillar was set to 2% of the gross salary, with the percentage set to increase to the target of 6% with 0.5 pp per year until 2016. After several delays in increasing the contributions due to budgetary reasons, currently the contribution rate is 3.75% of the gross salary, but considering also the change in structure of labor taxation which became operational in January 2018 this corresponds to a level of 4.5% considering the previous system. In terms of administration fees, during May 2008-December 2018 they were limited by law to 2.5% of the contributions transferred each month and 0.05% monthly on the value of the assets. All 7 pension funds present on Romania's market charged an initial administration fee of 2.5% of the amount of the contributions and a monthly fee of 0.05% of the value of the assets, with one of the funds reducing the commission from contributions to 1.7% starting with April 2018.

Methods of quantifying the performance of pension funds

The performance analysis of pension funds is very important in order to track the evolution of contributions paid, to assess the effectiveness of the fund manager as well as to guide future decisions on the placement of savings.

The most commonly used measure of performance quantification of funds managing private pensions is the time weighted rate of return, but specialists also recommend the calculation of the money weighted rate of return - which is in fact an internal rate of return. Feibel (2003) explains that TWRR is the return obtained by fund managers as a result of the decision to select assets that belong exclusively to it. On the other hand, the MWRR is the return attributed to investors - contributors in the case of pension funds- as it takes into account both the moment of investment and the asset selection process.

In line with what has been exposed above, the Global Investment Performance Standards (GIPS) recommends using the MWRR to analyze the extent to which additional contributions as well as withdrawals affect the overall performance of the fund. The Governmental Accounting Standards Board in the US and the RBC PH & N Investment Counsel in Canada also recognized the importance of money weighted rates of return and decided to include them in the annual performance reports of pension funds in 2014 and 2017 respectively.

TWRR was defined by Fabozzi (1995) as a measure of the growth rate of a fund over a certain period of time. This method does not take account of cash inflows and outflows, taking into account only market developments and fund manager decisions. According to the CFA Institute, the TWRR "allows the evaluation of investment management skill between any two periods". Because fund managers can not control cash flows, the TWRR has the advantage of being a good way to compare the different pension funds operating on the market. A disadvantage of this method is that it does not distinguish between the initial investment and a series of investments.

The MWRR, also known as the Monetary Unit Weighted Rate of Return, is a measure of performance quantification that takes into account both the amounts and the moment when the investor decides to place his money, and the efficiency of the decisions the fund manager adopts. This method reflects the impact on the final value of the initial investment as well as additional cash flows. Feibel (2003) points out that the disadvantage of this measure is that it can not be used to compare the results obtained by investors because decisions are taken in different moments and also the amounts transferred are not the same.

MWRR is determined using the internal rate of return (IRR) method, being the interest rate that equates the invested individual cash flows with the final value accumulated over a period. The CFA Institute recommends using IRR to determine investment return in private instruments such as buyout, venture and real estate. Peterson (2017) also showed that IRR is a much more appropriate method than the TWRR for calculating the return on alternative investments that are less liquid. It has shown that TWRR is appropriate for the valuation of highly liquid assets that do not require additional investments.

Concluding, the literature shows that MWRR, compared to the TWRR, is a more appropriate method to measure the return on an investment portfolio, given that inflows or withdrawals as well as the moment of investment are different for each individual investor. The TWRR is appropriate to assess the performance of private pension managers compared to a benchmark, while MWRR shows the return obtained in relation to each contributor financial plans.

3. Research questions/Aims of the research

In this paper we fill the gap in the existing literature and pension funds reporting in Romania through calculating the returns generated by the administrators of the pension funds active on the second pension pillar by using two alternative indicators, namely TWRR and MWRR. Currently, only TWRR is provided by the pension funds and only from the start of the system. We emphasize the merits of the MWRR as a more accurate way for presenting the returns generated for the contributors by the pension funds administrators and we also calculate both return indicators on sub-samples in order to highlight the evolution of the returns for participants who entered the system at a later date. In order to provide an accurate assessment of the return in terms of purchasing power all indicators are calculated both in nominal terms and in real terms.

4. Data and methodology

The data used in this paper are taken from the Association for Privately Administered Pensions in Romania (APAPR), the Financial Supervisory Authority (FSA) and the National Institute for Statistics (NIS), covering the period from May 2008 (the start of the second pension pillar in Romania) and December 2018. The data consists of the overall contributions transferred to Pillar II (net of the commission applied to the amounts transferred), the average of the net asset value per share and the consumer price index with a fixed base set for December 2018.

In order to calculate the two return indicators a number of additional variables were defined and calculated, namely the compounding factor both in nominal and real terms, the average annualized return of each contribution both in nominal and real terms. The formula of the above indicators and of the TWRR and MWRR are described below:

$$\text{Compounding factor}_t = \frac{\text{Average NAVPS}_{\text{December 2018}}}{\text{Average NAVPS}_t} \quad (1)$$

$$\text{Real Compounding factor}_t = \frac{\text{Compounding factor}_t}{\text{Price index}_t} \quad (2)$$

$$R_{\text{annualized}_t} = \sqrt[n_t]{\text{Compounding factor}_t} - 1 \quad (3)$$

$$\text{Final amount}_t = \text{Compounding factor}_t \times \text{Net contributions}_t \quad (4)$$

$$\begin{aligned}
 \text{Total final amount} &= \sum_{t=1}^N \text{Final amount}_t \\
 &= \sum_{t=1}^N \text{Net contributions}_t \times (1 + \text{MWRR})^{n_t}
 \end{aligned} \tag{5}$$

$$\text{TWRR}_t = R_{\text{annualized}_t} \tag{6}$$

Where NAVPS represents net asset value per share, N is the total number of months until December 2018, t represents the months, with $t = \overline{1, N}$, n_t is the investment period from month t until December 2018 in years, $R_{\text{annualized}_t}$ is the average annualized return rate of month t .

Basically, the compounding factor t represents the multiplication of the month t contribution until the end of the analyzed period allowing the determination of both the end-period value of a specific contribution and also its average annualized return considering the compounding effect. The TWRR is simply this average annualized return at a certain moment in time while the determination of the MWRR is more complex being based on an internal rate of return type calculation. Thus, MWRR is the interest rate which ensures the equality between the total accumulated amount at the end of the period and the sum of all contributions invested at this interest rate.

5. Results

The data and the intermediate indicators used in this analysis are synthetized in the table below:

Table 1. Data and indicators used in the analysis

Month	Net contribution transferred to PII (mil. RON)	Investment period until Dec. 2018 (years)	Compounding factor Dec. 2018/month t	Nominal average annualized return - contribution month t	Price index Dec. 2018/month t	Real compounding factor Dec. 2018/month t	Real average annualized return - contribution month t	Real final amount (2018 prices) in Dec. 2018 - contribution from month t	Real final amount considering the real average annualized return
May 08	85.99	10.58	2.27	8.06%	1.3632	1.67	4.94%	143.24	113.66
June 08	100.66	10.50	2.25	8.04%	1.3566	1.66	4.95%	167.10	132.76
July 08	95.17	10.42	2.22	7.97%	1.3528	1.64	4.88%	156.34	125.25
Aug.08	106.06	10.33	2.20	7.95%	1.3435	1.64	4.90%	173.95	139.27
Sept.08	102.76	10.25	2.19	7.97%	1.3447	1.63	4.89%	167.66	134.65
Oct.08	101.26	10.17	2.20	8.06%	1.3394	1.64	5.00%	166.23	132.39
Nov.08	101.66	10.08	2.15	7.86%	1.3253	1.62	4.89%	164.57	132.62
Dec.08	107.88	10.00	2.12	7.82%	1.3211	1.61	4.86%	173.36	140.43
...
Jan.18	638.37	0.92	0.99	-0.67%	1.0326	0.96	-4.09%	614.42	653.99
Feb.18	695.71	0.83	0.99	-0.66%	1.0246	0.97	-3.52%	675.25	711.16
Mar.18	575.27	0.75	0.99	-1.51%	1.0216	0.97	-4.27%	556.75	586.76
Apr.18	572.42	0.67	0.99	-1.52%	1.0186	0.97	-4.21%	556.24	582.57
May 18	635.44	0.58	1.01	0.90%	1.0131	0.99	-1.33%	630.50	645.29

Month	Net contribution transferred to PII (mil. RON)	Investment period until Dec. 2018 (years)	Compounding factor Dec. 2018/month t	Nominal average annualized return - contribution month t	Price index Dec. 2018/month t	Real compounding factor Dec. 2018/month t	Real average annualized return - contribution month t	Real final amount (2018 prices) in Dec. 2018 - contribution from month t	Real final amount considering the real average annualized return
June 18	621.05	0.50	1.00	0.57%	1.0084	0.99	-1.09%	617.65	629.29
July 18	630.85	0.42	1.00	-0.86%	1.0082	0.99	-2.79%	623.46	637.82
Aug.18	636.34	0.33	0.98	-4.56%	1.0131	0.97	-8.20%	618.45	641.95
Sept.18	631.70	0.25	0.98	-7.37%	1.0102	0.97	-11.06%	613.46	635.88
Oct.18	621.43	0.17	0.98	-9.11%	1.0055	0.98	-12.06%	608.27	624.17
Nov.18	637.79	0.08	0.97	-26.52%	1.0003	0.97	-26.78%	621.43	639.19
Dec.18	641.14	0.00	1.00	0.00%	1.0016	1.00	0.00%	640.12	641.14
Total	39,864.50							47,628.30	47,628.30

Source: APAPR, FSA, NIS, own calculations.

Thus, the contributions transferred to Pillar II in May 2008 amounted 85.99 million RON, they were multiplied in nominal terms 2.27 times until December 2018, corresponding to a nominal average annualized return of 8.06%. Considering the increase in prices during December 2018 and May 2008 of 36.32%, the real compounding factor will be 1.67 corresponding to a real average annualized return of 4.94%. For each monthly contribution, these calculations are performed, the cumulative value of amounts transferred being around 39.86 billion RON while the total accumulated assets amount to approximately 47.62 billion RON. In order to present the computation of the MWRR, the last two columns, based on the determination of the real MWRR for the entire period, show the intermediate calculations, respectively finding the internal rate of rate that equalizes the total value of accumulated assets with the sum of the monthly contributions invested at this rate.

In the table below, are presented the results for the TWRR, both in nominal and real terms for the entire period of existence of the second pension pillar in Romania but also for other sub-samples respectively for a period starting each January of the subsequent years until December 2018 in order to highlight the performance relevant for contributors which entered the system at a later date:

Table 2. Annualized time weighted rates of return in the period May 2008 – December 2018

Month	Nominal average annualized return (%)	Real average annualized return (%)
May 08	8.06	4.94
Jan. 09	7.75	4.79
Jan. 10	6.59	3.87
Jan. 11	5.72	3.69
Jan. 12	5.94	4.08
Jan. 13	5.29	3.99
Jan. 14	4.37	3.15
Jan. 15	2.75	1.45
Jan. 16	3.57	1.48
Jan. 17	2.43	-0.97
Jan. 18	-0.6%	-4.09

Source: APAPR, FSA, NIS, own calculations.

It has to be mentioned that the only information which is publicly available and is promoted as the return of the second pension pillar is the TWRR for the period May 2008 – December

2018 which is 8.06% in nominal terms and 4.94% in real terms. It can be seen the indicator decreased in a significant manner during the subsequent years, being even negative in real terms in the last two years of the analyzed period. Thus, the performance in the first six years was strong, with real average returns around or above 4% but in recent years it has slowdown dramatically. These results are already a strong argument for increased transparency, respectively by presenting to the public the TWRR also on sub-samples in order to better inform the participants about the performance of the pension funds administrators in managing their assets. This information is even more important for the participants which joined the system more recently.

Another important point about the TWRR is that, although it does a good job in assessing the performance of the pension funds administrators, from the point of view of the participant it reflects the actual return of a contribution from a specific point in time. The 8.06% value for the nominal TWRR reflects the return of only the contributions transferred in May 2008, the 7.75% value reflects the return of only the contributions transferred in January 2009 and so one, irrespective of the return for the other flows of contributions. From the perspective of the participant, more relevant is a measure for the return of all contributions which is given by the calculation of the MWRR.

In the table below, are presented the results for the MWRR, both in nominal and real terms for the same periods as TWRR:

Table 3. Annualized money weighted rates of return in the period May 2008 – December 2018

	May 2008- Dec. 2018	Jan. 2009- Dec. 2018	Jan. 2010- Dec. 2018	Jan. 2011- Dec. 2018	Jan. 2012- Dec. 2018	Jan. 2013- Dec. 2018	Jan. 2014- Dec. 2018	Jan. 2015- Dec. 2018	Jan. 2016- Dec. 2018	Jan. 2017- Dec. 2018	Jan. 2018- Dec. 2018
Nominal average annualized return (%)	4.90	4.63	4.25	3.99	3.64	3.14	2.61	2.15	1.69	0.18	-1.88
Real average annualized return (%)	2.67	2.5	2.24	2.06	1.71	1.17	0.41	-0.49	-1.6	-3.5	-4.64

Source: APAPR, FSA, NIS, own calculations.

The MWRR for the period May 2008 – December 2018 is approximately 4.9% in nominal terms and 2.67% in real terms. Although the result can be appreciated as good in absolute terms it can be noticed the relevant gap of about 3.16 percentage points in nominal terms and 2.27 in real terms compared to the TWRR for the same period. This is mostly explained by the fact that the returns of the pension funds were much higher at the beginning of the period when the level of contributions was low, the percentage of the salary transferred to the second pension pillar being increased progressively. Also, salaries were lower at that point. Thus, weighting the returns with the inflows of contributions does influence a lot the returns, with this MWRR indicator being much more relevant for the participants as it reflects the true return of their investment. In the period 2008-2012 the returns generated to the participants which entered the system during this time were positive with yearly real rates of returns around or above 2%. However, for participants who joined the system after

2013 the real returns dropped to 1% or below or even turned negative starting with 2015. These results are even a much stronger argument for increased transparency and more detailed reporting by the pension funds administrators. Basically, in this moment the participants have no information regarding this measure of return which is the relevant one for assessing the increase of their assets with the situation being more unfavorable for more recent contributors to the system. The negative real rates of returns are not necessarily a sign of a lack of viability of the system as the economic environment is characterized by exceptional low levels of interest rates and also asset accumulation for pension being a process which has to be assessed over a longer period of time.

6. Conclusions

Assessing accurately and completely the performance of the pension funds is of utmost importance for all stakeholders to this system - participants, pension funds administrators, the Financial Supervisory Authority, the Government. Currently, there is a lack of transparency and an information gap regarding this subject, with the pension funds only reporting the increase in the value of the net asset value per share or the time weighted rate of return. Also, this is reported exclusively for the whole period of existence of Pillar II with no sub-samples used. Albeit this measure of performance is adequate for assessing the performance of pension fund managers it should not be considered as being the same with the rate of return generated for the participants. For the later, this paper showed the merits of the money weighted rate of return which takes into consideration also the flow of contributions. The results show that the nominal rate of return pointed by this indicator is more than 3 percentage points lower than the TWRR while the real rate is about 2 percentage points lower than its TWRR counterpart. Also, by considering sub-samples we showed a pronounced slowdown of the pension funds' rate of return which is not entirely captured by the current reporting. Similar to other countries, Romania could opt for the use of MWRR alongside TWRR for better understanding of the pension funds rates of return, especially considering the increasing share of their total assets in GDP. In addition, determining the indicators by using sub-samples could early signal any change in the performance of the pension funds and could support participants who entered the system more recently to better understand the return on their contributions.

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