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THE EFFICIENCY OF A SUPPLEMENTARY OLD-AGE PENSION SYSTEM – THE CASE OF POLISH VOLUNTARY PENSION FUNDS[1]

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Abstract

The aim of this article is to evaluate the effectiveness of voluntary pension savings plans in Poland, based on the principles of operation and rates of return of voluntary pension funds (pol. Dobrowolne Fundusze Emerytalne, DFE). The selection of those funds from a whole range of solutions available in the 3rd pension pillar is due to the fact that only this type of voluntary pension saving plan provides complete and transparent information about the actual investment policy, the composition of pension investment portfolios, and the achieved rates of return. In order to evaluate the investment policies and the effectiveness of DFEs, the following research methods were used: a literature analysis, an analysis of financial data, and basic methods of investment efficiency assessment. The results of the evaluation lead to the conclusion that despite their adoption of similar investment strategies, the DFEs have achieved very different values of effectiveness. In the years 2013-2018, selected funds achieved higher than average rates of return, while others achieved returns that were no better than the interest rates of standard bank deposits.

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Introduction

Given the limited generosity of public pension systems, voluntary elements of pension systems are playing an ever more important role in providing sources of income in old age. The development of additional savings plans is usually stimulated by a significant involvement of the state and employers in their creation, supervision, and financing. However, with the exception of monitoring of the participation rate and of the value of accumulated assets, the effectiveness of the solutions that are implemented, i.e. whether they really bring economic benefits to the savers, is rarely evaluated. Hence the motivation and aim of this research paper is the assessment of investment efficiency of voluntary, individual pension saving plans in Poland offered in the form of voluntary pension funds.

The supplementary old-age pension system in Poland was established at the time of the profound reform of the entire Polish pension system in 1999. Initially, the part that was intended to supplement the income from the base pension system (1st and 2nd pillar) consisted only of employee pension programs (pol. *Pracownicze Programy Emerytalne,* PPE). However, after a few years of existence of this collective solution, it turned out that it had no chance to cover a large percentage of employees nationwide. Consequently, in 2004 and 2012, a decision was made to broaden the third pension pillar and introduce the two pension savings mechanisms available to individuals: individual retirement accounts (IRA) and individual retirement saving account (IRSA).

Apart from the origins, coverage level and detailed architecture of the Polish supplementary old-age pension system, this area is rarely analysed in research publications. Previous studies focused mainly on presentation and assessment of both architecture and operation principles of voluntary old-age pension plans with a special focus on number of participants, assets under management and predicted level of benefits (Adamska-Mieruszewska & Mosionek-Schweda, 2015; Jedynak 2017). Some publications also deal with the assessment of tax incentives offered to individuals collecting money on individual retirement savings accounts (Rutecka, 2014a; 2015). But the investment efficiency of products offered on the Polish supplementary pension market is seldom evaluated (Rutecka, 2014b; Marcinkiewicz, 2015; Szczepański & Brzęczek, 2016; Dopierała, 2017; Sołdek & Stachnio 2018; Rutecka-Góra, 20181; Dopierała 2018) mainly due to the problems with both the comparability of plans and access to data on portfolio structure and rates of return.

This article fills this research gap by examining the investment efficiency of individual retirement accounts (IKE) and individual retirement savings accounts (IKZE) offered in the form of a voluntary pension fund in the years 2013-2018. To achieve the research goal the following research methods were used: a literature analysis, an analysis of financial data, and basic methods of investment efficiency assessment (nominal and real rates of return, rates of return after fees, yearly and aggregate six-year rates).

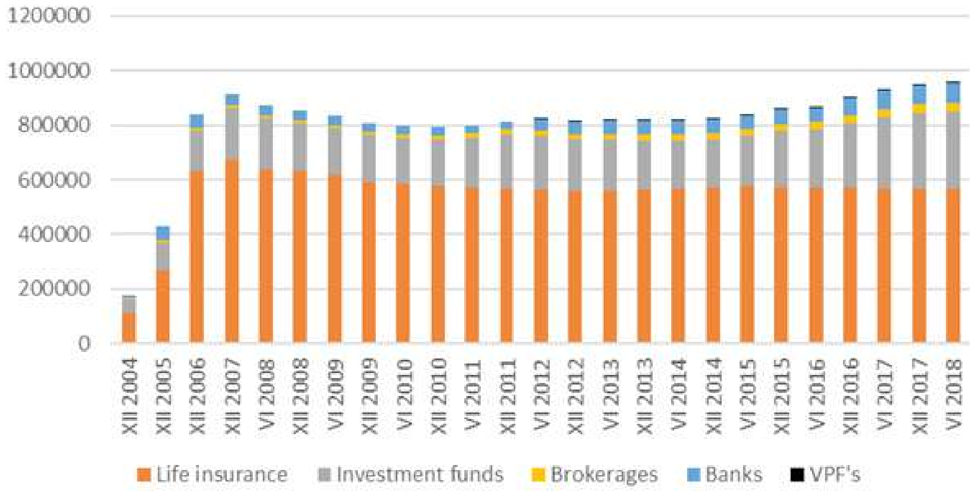
The article begins with a short description of the supplementary old-age pension system, especially individual plans and the role of voluntary pension funds in the Polish third pension pillar. Next there is an analysis of data on contributions made, investment strategies adopted, and fees charged by voluntary pension funds. In the last part are presented empirical results on the investment efficiency of voluntary pension funds and research findings are discussed.

Individual supplementary old-age pension plans in Poland

IRAs were intended to fill the gap in the third pillar of the Polish pension system and the incentive to open them was the exemption of capital income from the capital gains tax (the so-called Belka tax). IRAs were opened mostly in the years 2004-2007 and they numbered over 900,000 at the end of 2007 (Figure 1). In the years that followed, there were no further significant increases in that number, which indicates that this solution was selected by only a relatively small percentage of all potential savers (approx. 5,8% of all employees at the end of 2017) and its potential was exhausted already in the initial period after its creation. The situation did not change even after several important changes were made to the rules of operation of the IRA accounts starting in 2009: the limit on the contributions was increased to 300% of the average monthly salary and partial withdrawals were allowed. The number of IRAs became stable at the level of ca. 950,000 accounts.

Ever since individual retirement accounts were first created, this market segment has been dominated by life insurance companies (Figure 1), which were able to reach potential savers in the most efficient and fastest way thanks to their extensive sales agent networks. The

Figure 1: Deposition of new performance measurement concepts



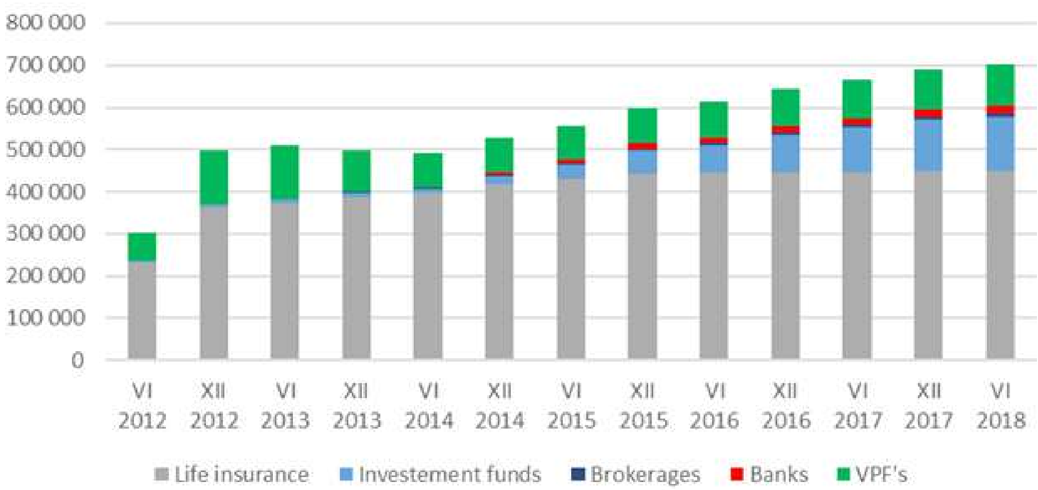
Source: Own collaboration based on Komisja Nadzoru Finansowego (2007, 2011, 2012, 2014, 2016, 2017, 2018)

institutions with the second largest number of opened IRAs were investment fund companies, followed by brokerages and banks, which managed only several/up to twenty thousand accounts. In 2012, voluntary pension funds (pol. *Dobrowolne Fundusze Emerytalne, DFE*) joined the group of institutions that had IRAs in their offer; this was on the occasion of broadening the 3rd pillar by adding a new element: individual retirement security accounts (IRSA).

IRSAs were first established in 2012 in response to the unsatisfactory development of the 3rd pillar and due to the fact that the open retirement funds were no longer mandatory and the value of the contributions made to the capital part of the base pension system (2nd pillar) was reduced. The ineffectiveness of the tax incentives that had applied to the IRAs before required offering much more advantageous solutions, i.e. exempting voluntary pension contributions from personal income tax and, in the years that followed, also offering a reduced, preferential tax rate on the payouts from the IRSAs. Thus, individual pension security accounts were designed as a solution that takes advantage of the much more generous tax regime, referred to as EET (Exempt-Exempt-Tax) or, more accurately, EEpT (Exempt-Exempt-partially Tax).

The advantageous taxation on the voluntary contributions made to the retirement accounts resulted in approx. 700,000 persons deciding to save for retirement using the IRSAs in 6 years after their creation (Figure 2). Initially, it appeared that the number of IRSAs would stabilise at the level of approx. 500,000, but the system

Figure 2: The number of IRSAs in the years 2012-2018 by type of provider



Source: Own collaboration based on Komisja Nadzoru Finansowego (2014, 2016, 2017, 2018)

gained an additional stimulus for growth in early 2014 when preferential taxation of the money paid out of the accounts was adopted and a uniform limit on the contributions was introduced for all savers, equal to 120% of the average monthly wage (previously, savers could deduct from their tax basis contributions that did not exceed 4% of the individual basis for social insurance contributions in the previous calendar year).

Of note is the fact that the only differences between IRAs and IRSAs are different principles of taxation and the limits on the contributions. In the case of both types of accounts, the same types of financial products are available:

1) unit-linked insurance offered by life insurance companies (in this form only saving part of the premium, namely the part that goes to insurance capital funds, is treated as contribution to an IRA or IRSA);

2) investment funds managed by investment fund companies (pol. *Towarzystwa Funduszy Inwestycyjnych, TFI*);

3) bank accounts offered by banks;

4) securities accounts at brokerages; and

5) voluntary pension funds (pol. *Dobrowolne Fundusze Emerytalne, DFE*) managed by universal pension fund management companies (pol. *Powszechne Towarzystwa Emerytalne, PTE*).

With regard to the number of accounts, insurance products have dominated both individual market segments (Figure 1 and Figure 2). However, in the case of the IRSAs, of note is the fact that voluntary pension funds are the second, which may have resulted from the introduction of the IRSAs at the time of changes in the 2nd pillar that were associated with the reduction of the contributions made to the open pension funds (pol. *Otwarte Fundusze Emerytalne, OFE*). PTEs, looking for additional sources of growth of assets and having access to databases of OFE members, could use an effective policy of convincing savers to join the supplementary pension system, especially if OFE members were satisfied with the returns on investment achieved by those institutions.

Voluntary pension funds as an element of the 3rd pillar of the pension system

Even though voluntary pension funds were the last of the institutionalised forms of voluntary pension saving and were introduced only in 2012, their market share is significant, especially in the case of individual retirement security accounts. Moreover, being one of the available forms of IRAs/IRSAs, they are characterised by transparent and complete information concerning not only the number of opened accounts and asset values, but also their investment strategies and their rates of return. This is largely due to the fact that only DFEs are dedicated solely to voluntary pension savings and the funds saved in IRAs/IRSAs are kept in special separate funds. In the case of insurance products and investment funds, pension savings are invested together with other savings of individuals (which are not offered with tax incentives applicable to the 3rd pension pillar). On the other hand, in the case of brokerages, there are no real investment strategies because it is the savers themselves who choose the financial instruments they invest in. Even in the case of banks, despite the simplicity of the product (bank deposits), it is hard to evaluate the long-term effectiveness because banks do not publish historical interest rates applicable to IRAs/IRSAs in the successive calendar years.

The number of DFEs in the IRA market segment is not large because they joined this part of the 3rd pension pillar only in 2012 (8 years after IRAs were first introduced) when life insurance companies and investment fund management companies already had a majority of the market. Consequently, only 5 universal pension fund management companies (PTE) have decided to offer this product: Generali PTE S.A., Metlife PTE S.A., Nationale-Nederlanden PTE S.A., PKO BP Bankowy PTE S.A., and PTE Allianz Polska S.A. At the end of June 2018, those companies operated only approx. 4,900 individual retirement accounts, which corresponded to approx. 0.52% of all existing IRAs and approx. 0.73% of total assets (see Table 1 and Figure 3).

The position of DFEs in the market for individual retirement security accounts was much better (see Table 2 and Figure 4) - at the end of 2017, DFEs operated over 94,000 IRSAs, which corresponded to approx. 14% of the total number of accounts (third place, after life insurance companies and investment fund companies), and managed approx. 14% of total assets.

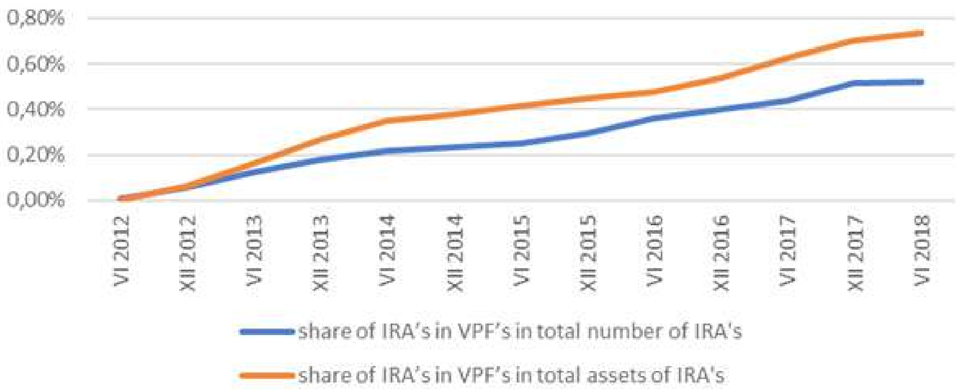
As a result of PTEs being allowed to enter the IRSA market at the time when this institutional form was established, those institutions could compete at an equal level with other entities for voluntary pension

Table 1: The share of DFEs in the IRA market in the years 2012-2017

	2012	2013	2014	2015	2016	2017
Number of IRAs	813,292	817,651	824,485	858,725	902,615	951,576
including in DFEs	*479*	*1,473*	*1,946*	*2,548*	*3,580*	*4,922*
IRA assets (billion PLN)	3,53	4,27	5,03	5,68	6,66	7,96
IRA assets in DFEs (million PLN)	*2,11*	*11,39*	*18,95*	*25,42*	*35,59*	*56,13*

Source: Own collaboration based on Komisja Nadzoru Finansowego (2014, 2016, 2017, 2018)

Figure 3: The share of DFEs in the IRA market in the years 2012-2018



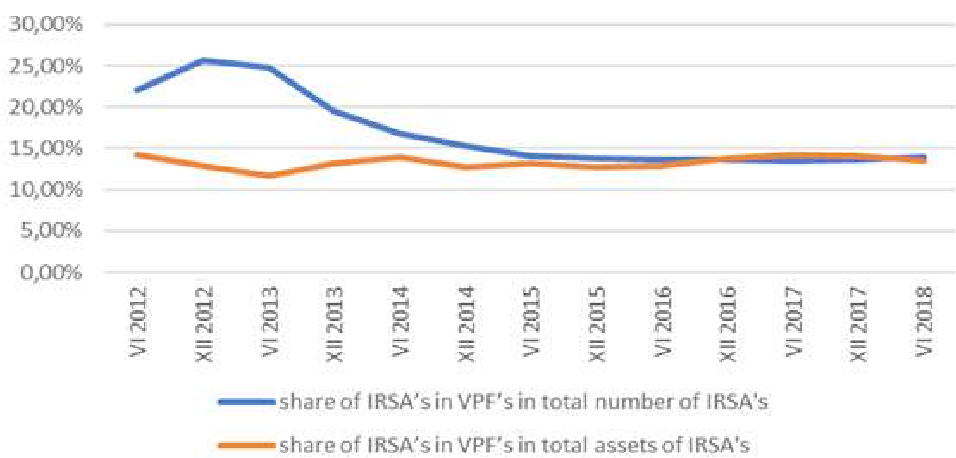
Source: Own collaboration based on Komisja Nadzoru Finansowego (2014, 2016, 2017, 2018)

Table 2: The share of DFEs in the IRSA market in the years 2012-2017

	2012	2013	2014	2015	2016	2017
Number of IRAs	496,821	496,426	528,142	597,560	643,112	690,994
including in DFEs	*127,642*	*97,117*	*80,795*	*82,294*	*87,762*	*94,252*
IRSA assets (million zlotys)	52,88	119,21	295,35	621,97	1078,09	1706,16
IRSA assets in DFEs (million zlotys)	*6,80*	*15,80*	*37,79*	*79,20*	*147,97*	*240,67*

Source: Own collaboration based on Komisja Nadzoru Finansowego (2014,2016,2017, 2018)

Figure 4: The share of DFEs in the IRSA market in the years 2012-2018



Source: Own collaboration based on Komisja Nadzoru Finansowego (2014, 2016, 2017, 2018)

savings. Moreover, the IRSAs were introduced at the time of the introduction of limits on contributions and the elimination of mandatory contributions to open pension funds (OFE) that are managed by universal pension fund management companies (PTE), which created additional pressure to compensate the reduced revenue on account of contributions paid to the OFEs with additional contributions paid to the voluntary funds. Also, the PTEs were able to take advantage of the databases containing data on their several millions of OFE members to attract persons saving in the 3rd pension pillar.

As a result, two times more PTEs decided to offer IRSAs than IRAs. At the end of June 2018, as many as 7 out of the 11 PTEs operated DFEs in this segment of the 3rd pension pillar - 5 institutions offered DFEs as IRA accounts (Generali PTE S.A., Metlife PTE S.A., Nationale-Nederlanden PTE S.A., PKO BP Bankowy PTE S.A., and PTE Allianz Polska S.A.) and 7 PTE offered IRSAs, namely the group given above enlarged by Pocztylion-Arka PTE S.A. and PTE PZU S.A.

The value of contributions paid to DFEs and the limit on the contributions to IRAs and IRSAs

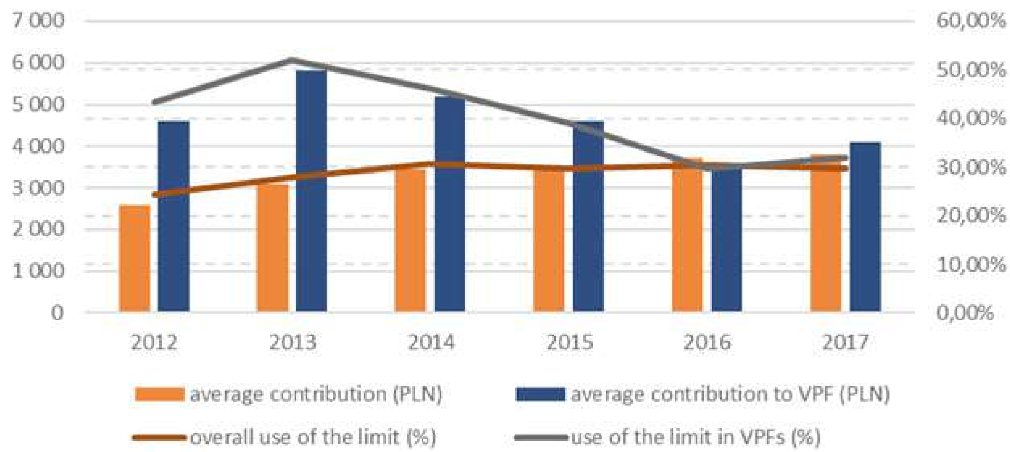
One of the key differences between the two described types of retirement accounts is the limit on the contributions that are subject to preferential taxation. In the case of IRAs, the limit is equal to 2.5 times the contribution that can be deducted from the tax basis in the case of IRSAs. This means that much larger amounts can be paid to the IRA accounts and, consequently, much larger pension savings can be accumulated. Despite the big difference between the limits on the contributions, the problem in the case of both types of accounts is that the statutory limits are not fully taken advantage of. In the case of IRAs, the average contributions made amount to approx. 30% of the limit, while in the case of IRSAs, they amount to approx. 60% (see Figures 5 and 6). Of note is the fact that the average contributions to IRAs in DFEs were usually higher than the overall average contributions to IRAs, which indicates that the pension savings balances for those accounts may be much higher in the future than the overall average balance of IRAs, as long as the investment policies of DFEs are appropriate.

In the case of IRSAs, the advantage of the DFEs in terms of the value of contributions paid and the use of the limit is not so large. The average contribution to DFEs in 2017 was PLN 300 higher than the overall average contribution and was equal to PLN 4,100. However, the use of the limit in IRSAs having the form of DFEs in that year was only approx. 4 p.p. higher than the overall use of the limit (Figure 6).

Investment strategies and structure of the investment portfolio

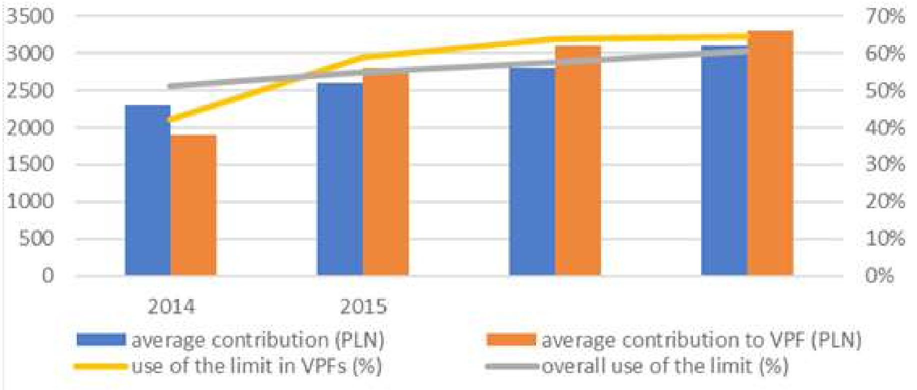
Voluntary pension funds are usually balanced funds. A majority of PTEs created DFE of one type, while several decided to manage a portfolio of several funds: conservative, balanced, and aggressive. In spite of the existence of DFEs of various risk profiles, a large majority of contributions are paid to D (default) type funds whose investment strategies are presented in the table below.

Figure 5: The average contributions and use of the limit on contributions to IRAs in the years 2012-2017



Source: Own collaboration based on Komisja Nadzoru Finansowego (2014, 2016, 2017, 2018)

Figure 6: The average contributions and use of the limit on contributions to IRSAs in the years 2014-2017



Source: Own collaboration based on Komisja Nadzoru Finansowego (2014, 2016, 2017, 2018)

DFEs have a policy of an active allocation of assets, with the composition of the portfolio changing depending on the situation in the financial market. The shares of different asset classes may change in any way, provided that the proportion of stocks should not exceed 60-80% of the portfolio and that debt instruments should largely balance share instruments. The DFE Pocztylion Plus has the most conservative investment policy (max. 40% of stocks) while the NN DFE has the most aggressive one (it allows for 100% stocks in the portfolio). Only a half of the analysed DFEs designated their reference indices, which comprise 40-50% of the stock market indices and 50-60% of the bond market indices.

As a result of their investment strategies, DFEs invest the largest portion of their assets in shares and government bonds (Table 4). However, the proportions of

Table 3: Investment strategies of voluntary pension funds (DFEs)

Fund name	Strategy	Benchmark
Allianz Polska DFE	Financial instruments with high-risk profile - max 65%. Domestic and foreign markets (mostly CEE and developing countries).	-
DFE Pekao	Stocks (25-60%), debt securities and bank deposits, instruments other than stocks and debt securities - max. 20%.	-
DFE Pocztylion Plus	Active Allocation Fund. Debt instruments (max. 60%) and share instruments (max. 40%).	-
DFE PZU	Stocks (max. 80%, declared 50%), debt securities and money market instruments.	50% WIG30 + 50% TBSPI (Treasury Bond Spot Poland Index)
Generali DFE	Stocks, debt securities and money market instruments (active allocation fund), max. 50% abroad	-
NN DFE	Stocks, debt instruments, and foreign markets (active allocation 0-100%)	-
MetLife DFE	Domestic debt instruments (treasury and non-treasury) and share instruments (stocks 10-80%, declared 50%), foreign instruments.	50% WIG20 + 50% TBSPI (Treasury Bond Spot Poland Index)
Nordea DFE	Share and debt instruments (similar proportions in the portfolio are assumed) with dominant role of domestic securities.	40% WIG20 + 50% TBSPI + 10% WIBID O/N
PKO DFE	Share instruments (max. 70%) and debt instruments. Also bank deposits, bank securities (Polish and foreign), up to 20% abroad.	40% WIG + 60% index of Polish treasury bonds

Source: Own collaboration based on DFEs data

Table 4: The assets and the structure of investment portfolios of DFEs at the end of 2017

	Allianz Polska DFE	DFE Pekao	DFE Pocztylion Plus	DFE PZU	Generali DFE	Nationale Nederlanden DFE	MetLife DFE	PKO DFE
Shares	53,62	50,99	35,25	72,84	56,36	56,99	47,63	41,48
Gov. bonds	5,86	43,12	55,08	16,78	35,58	22,13	46,11	48,64
Nongov. bonds	34,17	0,19	1,70	0,42	0,01	12,91	0,00	0,00
Other	6,35	5,70	7,97	9,96	8,05	7,97	6,26	9,88
Assets under management (in PLN mln)	**11,90**	**82,70**	**1,50**	**47,80**	**0,30**	**73,50**	**33,80**	**56,30**
Market share (as % of total DFEs' assets)	**5,86**	**26,87**	**0,49**	**15,53**	**0,10**	**23,88**	**10,98**	**18,29**

Source: Own collaboration based on data from analizy.pl

those asset classes were significantly different among the funds: shares constituted from 35.25% (DFE Pocztylion Plus) to 72.84% of the portfolio (DFE PZU).

As of the end of 2017, the value of assets accumulated in all the DFEs was equal to approx. PLN 308 million, which was only a very small part of the assets of the entire individual pension savings market (IRAs and IRSAs), whose value was equal to approx. PLN 9.7 billion. In the coming years, due to the relatively higher contributions paid to the DFEs, this situation should change.

Costs and fees related to pension savings accounts

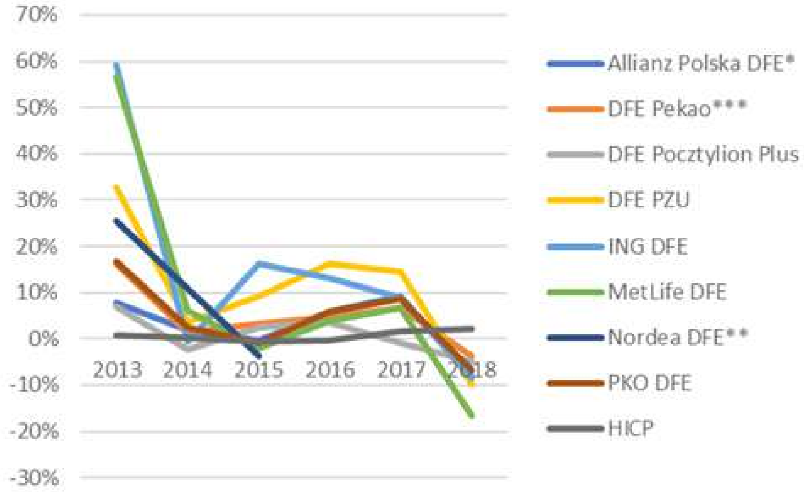
Besides the value of the contributions and the investment strategy, the value of pension savings in DFEs

Table 5: The types and values of fees charged by PTEs regarding the operation of DFEs

Name of institution	Name of fund	Management fee (% of assets)	Up-front fee	Transfer (cancellation fee)
Allianz Polska PTE	Allianz Polska DFE	2,5%	1,5%	PLN 200
Amplico PTE	MetLife Amplico DFE	max 2,5%	50%, max. PLN 500	15% of assets, min. PLN 300
Nordea PTE	Nordea DFE (available from mid-March)	1,95% + a 15% fee if the result is positive and higher than the benchmark	0-4%, depending on the value of the contribution 0-1% of the transferred contribution	20% of assets, min. PLN 500
Pocztylion-Arka PTE	DFE Pocztylion Plus	max 2,5%	3,5%	10% of assets, min. PLN 100
PTE PZU	DFE PZU	up to 2,99% + a 20% fee on the profit above the benchmark	3,4% in the first 5 years, 2,9% - in years 6-10, 2,4% - in years 11-15, 1,0% - after 15 years	10% of assets, min. PLN 50
ING PTE	ING DFE	2% + a 15% fee on profits exceeding 8%	53,4% only on the first contribution (max. PLN 80), further contributions: 0%	50% of assets
PKO BP Bankowy PTE	PKO DFE	max. 3,5%	50%, max. PLN 700	50% of assets
Pekao Pioneer PTE	Pekao DFE	max. 2,6%	2,5% or 0% (if the total contributions exceed PLN 10,000)	10% of assets, min. PLN 50

Source: Own collaboration based on analizy.pl and documents of DFEs

Figure 7: The nominal rates of return of DFEs in the years 2013-2018



*Note: * - D type fund. ** - liquidated in 2016. ***- liquidated in 2018.*
Source: Own collaboration based on analizy.pl and Eurostat

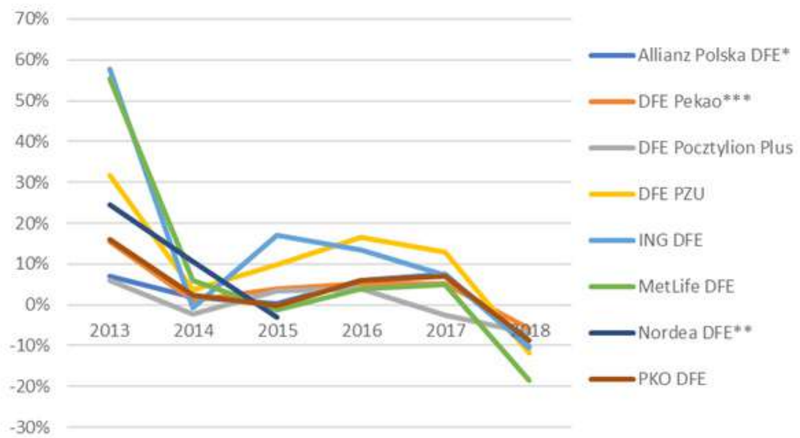
depends on the level of fees charged by PTEs. All funds present in the market charge both up-front fees and management fees. The only voluntary pension fund that does not charge the up-front fee is the PKO DFE, while in the NN DFE it takes the form of a lump-sum fee charged only on the first contribution and is equal to a maximum of PLN 80. In the remaining DFEs, the fee is equal to 0-3.4% of the amount of the contribution paid, whereby one fund (DFE PZU) has a loyalty program related to this fee (Table 5).

The level of the management fees is a reflection of the adopted investment strategy and the risk exposure level. DFEs charge management fees equal to approx. 2-3.5% of assets under management and three of the funds additionally make the fee dependent on exceeding the benchmark (success fee).

Investment efficiency of voluntary pension funds – empirical results and discussion

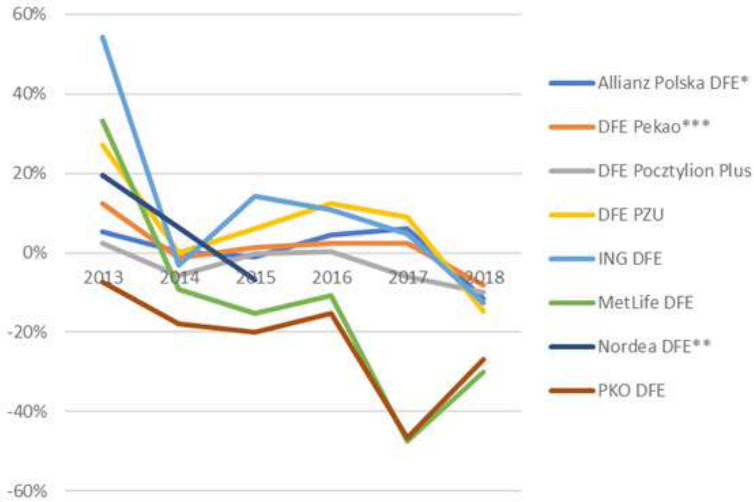
A majority of the DFEs started operation in 2012; consequently, their first full investment period was the year 2013. In 2013, all voluntary pension funds showed excellent or extraordinarily high rates of return ranging from 6.93% (DFE Pocztylion Plus) to 59.13% (ING DFE) in nominal terms. However, those results were not repeated later, i.e. in the years 2014-2018, when a part of the funds had results lower than inflation or even resulted in nominal losses suffered by the savers (Figure 7). Taking inflation into account, only 5 of 8 analysed DFEs achieved a positive real rate of return in 2015, whereby only one fund (ING DFE) achieved a two-digit rate of return in this

Figure 8: The real rates of return of DFEs in the years 2013-2018



*Note: * - D type fund. ** - liquidated in 2016. ***- liquidated in 2018.*
Source: Own collaboration based on analizy.pl and Eurostat

Figure 9: The real rates of return of DFEs in the years 2013-2018, after fees



*Note: * - D type fund. ** - liquidated in 2016. ***- liquidated in 2018.*
Source: Own collaboration based on analizy.pl

year (Figure 8). On the other hand, when the fees charged are included, only 3 DFEs achieved in 2015 a real rate of return that was higher than the interest paid on standard bank deposits (3% in nominal and 3.73% in real terms)..

Yearly rates of return are not the best tool to evaluate the effectiveness of the investments in solutions intended for long-term pension savings. More comprehensive results can be achieved by analysing the aggregate rates of return achieved in the analysed period (Table 6). Although saving for retirement has a much longer horizon than the six-year period presented here, given the relatively recent introduction of DFEs, there is no historical data for a longer horizon.

The investment results achieved by the DFEs in the first six full years of operation (2013-2018) are very diverse. Impressive rates of return were achieved by the NN DFE (99.50% in real terms) and DFE PZU (73.50%). On the other end of the spectrum, there are the DFE Pocztylion with the six-year real result equal to 0.89%, and the Allianz Polska DFE with a 12.01% rate of return. Given the relatively good situation on the financial market in the period in question (Warsaw Stock Exchange Index WIG gained 21,55% in value in nominal terms in the analysed period), one can conclude that the managers of the funds in the second groups did not do their job well and even charged up-front fees and management fees equal to approx. 2-2.5% of the assets. The results they achieved are even less satisfactory when compared with the results of a bank deposit with the interest rate at the level of 3% a year. In the period in question, such a deposit would result in a nominal rate of return of 19.41% and a real rate of return of 15%, without charging any fees whatsoever.

Table 6: The aggregate six-year rates of return achieved by DFEs in the years 2013-2018

	Six-year nominal rate of return	Six-year real rate of return
Allianz Polska DFE*	16,30%	12.01%
DFE Pekao**	31,08%	26,46%
DFE Pocztylion Plus	4,76%	0,89%
DFE PZU	80,14%	73,50%
NN DFE	107,14%	99,50%
MetLife Amplico DFE	50,51%	44,96%
Nordea DFE**	33,78%	33,52%
PKO DFE	27,35%	22,66%

*Note: * - D type fund. ** - liquidated in 2016, a three-year rates of return ***- liquidated in 2018.*
Source: Own collaboration based on analizy.pl and Eurostat

Conclusions

Voluntary Pension Funds are a relatively new form of supplementary pension savings in Poland. Having been introduced in 2012 they attracted ca. 103 thousand individuals who opened 5 thousand IRAs and 98 thousand IRSAs within six years. The market share of DFEs rises slowly every year but the first position of life insurance companies that operate the vast majority of individual pension accounts remains impregnable.

All DFEs are funds of active allocation that tailor their portfolios elastically to the situation on financial market (max. 60-100 is invested in shares). They generally make use of high limits for aggressive investing and allocate a huge part of the portfolio in shares.

The investment efficiency of DFEs was extraordinary in the first year of operation (2013). The best results were achieved by funds managed by ING Nationale Nederlanden and Metlife Amplico PTE that scored more than 50% in nominal terms in the mentioned year. The rates of return for the years 2014-2017 were significantly lower but the majority of DFEs still offered relatively high returns for individual savers. The top two, namely NN DFE and DFE PZU, achieved a six-year real rate of return that amounted to 99.50% and 73.50% respectively. However, the worst fund (Pocztylion Plus DFE) offered the six-year real rate of return of only 0.89% that was significantly lower than a standard bank deposit.

In general, the conducted analysis showed high investment efficiency of the DFE market but with a huge diversification of investment results achieved by separate funds. Although most DFEs were highly beneficial for individual savers their rates of return are rarely communicated to society due to lack of such obligation by law. As a result, savers encounter difficulties with assessment of VPF investment efficiency and choosing the most profitable product. The IRA and IRSA savers are usually provided with the information on account balance and number of investment units bought but have no idea of the nominal, real and after charges rates of return.

This limited information policy may result in failures within the supplementary pension market such as information asymmetry leading to misselling or redistribution towards some IRA and IRSA providers. To limit this possibility, deep changes in information policy requirements are of utmost importance. Otherwise pension savings may be depleted by high fixed management fees charged by financial institutions even in years of recurring negative real profits for the saver.

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