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# AN INITIAL ASSESSMENT OF EMPLOYEE CAPITAL PLANS

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**Abstract:** The pension system in Poland is an example of the implementation of many reforms and changes, some of which are contradictory. The purpose of the article was the initial assessment of employee capital plans (PPK) as an element supplementing the third pillar of the pension system. The paper is of a theoretical and empirical nature. The study uses comparative analysis and the cluster method to evaluate the investment policy pursued by defined date funds (FZD). The study proves that the investment policy of the funds is similar and that three dominant investment policies can be distinguished. The extended payback period for PPK fund management institutions increases the risk of withdrawing the offer of some financial institutions in the future. The assessment of the PPK scheme allows to state that this program may increase the retirement savings of Poles. The author postulates also the need to increase the knowledge of market participants in terms of both the need to save for retirement and in the forms of saving.

**Keywords:** population ageing, employee capital plans, pension system.

## 1. Introduction

The purpose of a pension system is to secure the livelihood of people in their post-working age. Population ageing has consequences for the economy as well as for public pension schemes (Bielawska, 2019, p. 150). In the last two decades the Polish pension system has undergone several often contradictory reforms, e.g. raising the retirement age, followed by reducing it, as well the establishment of the second pillar of the pension system, and then commencing its liquidation process.

Individual governments pursued different policies regarding the pension system. On the one hand, the government wanted to improve public finance, while on the other, to diversify sources of income for retirement by involving private institutions to increasing savings for retirement (Ząbkowicz, 2016, p. 600).

One of the elements of the retirement system that has not been changed was the third pillar of the retirement system, which includes employee pension schemes (PPEs), individual pension accounts (IKE) and individual retirement accounts (IKZE). In 2019 the so-called employee capital plans (PPK) were created. PPKs are based on an opt-out provision and incentives to participate. PPKs are similar to New Zealand's KiwiSaver scheme (Trainor, 2014, p. 1) and solutions which were implemented in Great Britain, Taiwan and Turkey.

The article has an empirical and analytical character and is based on data from the PPKs market. The purpose of the article is an initial assessment of the implementation of employee capital plans. The study poses three research questions. The first is whether all financial institutions can charge fees on the funds offered, and the second whether the PPK scheme has a chance to contribute to an increase in the retirement savings of Poles compared to alternative forms of saving? The third question is if the FZD funds with the lowest level of investment risk investment policy can protect the savings of fund participants during turbulence on financial markets? The article can be useful from a practical point of view, however, it may also be useful for science, due to the fact that there is no research on PPK in Polish literature yet.

## 2. Reasons for introducing PPK

In 1999 the government stated that the pension system in the future will lose the ability to secure the appropriate level of pension benefits. Therefore, the one-pillar run by Social Insurance Institution (ZUS) which was the 'pay as you go' (PAYG) system was replaced by the three-pillar system. The system consisted of a mandatory 'pay-as-you-go' first pillar (ZUS), a mandatory fully funded pillar of open pension funds (OFE), and a voluntary and funded third pillar (PPE, IKE, IKZE) (Kompa and Witkowska, 2015, p. 965). With changes in the pension system in the literature, attention is drawn to the fact that the transition from the PAYG system to the notional defined contribution (NDC) model is associated with reduced transparency (Williamson, 2004, p. 60).

Over the 20 years that followed many changes and reforms were made to the pension system, which mainly concerned the second pillar and open pension funds (OFEs) (Manor and Ratajczak, 2020, p. 89).

In 2014 the debt part of the OFE portfolios was transferred to ZUS. Another element of the change was the introduction of voluntary contributions to OFE. The option was made for the insured person to make her/his choice (Chrzanowska, 2017, p. 34). In 2020 it was planned to completely liquidate the second pillar of the pension

system and transfer funds accumulated there to the Social Insurance Institution (ZUS) or to the third pillar of the pension system.

In 2016 the retirement age was reduced, meanwhile the working time and life expectancy of retired people have a significant impact on their income (Vörk et al., 2014, p. 31).

Continuous reconstructions of the pension system, as well as the principles of operation and conditions for participation in OFE, was not conducive to building trust in these institutions. Confidence in open pension funds was low. (Marzec, 2018, p. 122). In addition, it was concluded that the transfer of funds from OFE to ZUS only contributed to reducing the budget deficit (Kompa and Witkowska, 2015, p. 982). Confirmation that changes in the pension system are not favourable from the point of view of the participants due to the reduction of risk diversification, is provided, among others, by K. Kompa and D. Witkowska (2014, p. 123).

As far as the financial situation of retirees in 2012, according to statistical data per one household member was relatively good, as evidenced by the results of the analysis carried out by Ciura (2012, p. 98) and Bobrowska (2015, p. 65), predictions about the future are less optimistic. This is mainly due to the deteriorating demographic situation in Poland. According to the data resulting from the ZUS forecast, the system load factor will increase to 2060 (ZUS, 2019, p. 20). In the literature, it was proposed that policymakers identified potentially vulnerable groups of people (i.e. with low expected future pensions) and implement policies that allow individuals to accumulate enough pension capital to have an adequate pension income in the future (Jarocinska and Ruzik-Sierdzińska, 2016, p. 24).

Compared to some Central and Eastern European countries, e.g. in relation to Ukraine, the amount of pensions in Poland is relatively high (Parlińska and Rudyk, 2019, p. 84), however, it is still unsatisfactory, which means that it is necessary to introduce changes and adopt/introduce new solutions. Therefore, in order to improve the income of future pensioners, the government adopted the PPK Act in 2018. This is in line with the suggestion in the literature that real reform should be budget-neutral, this means that it should not generate any new budget deficits (Louzek, 2008, p. 129).

### **3. Forms of saving for retirement and PPK**

Non-state pension funds (NPFs) are the basis of the third level of the pension system in Poland. The third pillar was created to increase savings and additional pension savings as voluntary contributions system from individuals and/or employers. It is possible to save for retirement in several ways within the forms created for this purpose, such as the PPE, IKE, and IKZE. The literature on the subject emphasizes that one of the most important strengths of the NDC model relative to the PAYG model is that it is more resistant to demographic changes and economic trends. Moreover, it provides also more incentive for older workers to remain in the labour

force. The individual accounts associated with the NDC model are likely to generate a greater sense of ownership and entitlement to pension benefits proportional to contributions than with the PAYG DB model, which may make those benefits politically less vulnerable (Williamson, 2004, p. 61). The forms of saving available under the pension system have their advantages and disadvantages (Table 1).

**Table 1.** Features of forms of retirement saving

Form	ZUS	OFE	PPE	IKE	IKZE	PPK
Dutifulness	X	–	–	–	–	–
Lifetime	X	–	–	–	–	–
Minimal benefit guarantee	X	–	–	–	–	–
Surcharge for the state	X	–	–	–	–	X
Sharing contributions with the employer	X	X	X	–	–	X
Automatic participation	X	–	–	–	–	X
Tax benefits for the participants	–	–	X	X	X	X
Life cycle funds available	–	–	–	X	X	X
Inheritance of funds	–	X	X	X	X	X

Source: authors' own elaboration.

The biggest advantage of the first pillar of the pension system is that the ZUS fund pays the pension during lifetime, while the advantage of the other forms is that they are subject to inheritance and involve tax benefits. Employee capital plans are characterized by a different approach to participation, as employees of workplaces become participants in capital plans automatically.

Before launching the PPK program, market surveys indicated that about 70% of employees in workplaces would join the program. In the first period after the program was launched, when large enterprises joined the program, it turned out that the share of people who remained in the PPK program was 39% (Gąsiorowski, 2020), a result which is almost 50% worse than the original market estimates. Women should be particularly interested in additional retirement savings due to the fact that they receive lower monthly annuity payments than a man from the same amount of pension saving because annuity providers take into account the expectation that women live longer than men (Dordea and Popovici, 2008, p. 287).

PPK can be created by an investment fund company (TFI), universal pension societies (PTE), an employee pension society (PTE) or an insurance company. In accordance with the Act, PPK are required to manage investment or pension funds in a number corresponding to at least the number of restrictions regarding the level of investment risk (Ustawa z dnia 4 października 2018 r...).

The funds created under the PPK are so-called funds defined date, which means that the investment policy of the fund should take into account the need to limit the

level of investment risk of a given fund depending on the age of the participant. The essence of such funds is that this is done automatically without the need for fund management by the fund participant.

The biggest advantage of PPK is the fact that, apart from the PPK participant's contribution, the contribution is also paid by the employer and by the state as welcome and annual premiums. Other advantages of saving in PPK are related to (Gumola, 2019, p. 36): auto-enrolment that can be a response to a problem related to lack of activity of workers and postponing the decision in time by the participants of PPK, especially in societies characterized by the smallest knowledge and financial awareness. The solution of automatic allocation system is effective and similar to the KiwiSaver scheme (Townsend, 2018, p. 85). Moreover, funds gathered in employee capital plans are private and inheritable. There is also a possibility to pay out some part of the collected money in some cases of life needs. In addition, the advantage of PPK for participants is the low cost of participation in PPK, the automatic changes of the investment policy of FZD funds which should reduce the investment risk, as well as the possibility of free conversion of funds between funds and the fact that the payment of profit from PPK will be exempt from capital gains tax (Belka tax).

The main disadvantage of PPK is lack of coverage for the self-employed. The disadvantages for PPK participants are the remaining investment risk of FZD funds, reduction of employees' salaries and the need to pay income tax on the contribution paid by the employer. Despite the assurances that the money collected by the funds are the private property of the participants, i.e. understood as the freedom to dispose of these funds up to the age of 60 and even later is strongly limited or involves the return of part of the accumulated funds.

An advantage of PPK for the employer is that contributions paid by the employer are supposed to be tax deductible costs, which is a tax relief for them. For some employers, PPK can be a tool to motivate employees. Contributions from the employer are not included in the remuneration which is the basis for calculating social security contributions.

The disadvantage for the employer is the need to make contributions to PPK, which is a cost to the company. Running PPK is also associated with new obligations for the employer. It should be emphasized, however, that the obligatory contribution for the employer in Poland is 1.5% and is much lower than, e.g. in the KiwiSaver scheme where the contribution is 3%. The same occurs with the 2% contribution of employees in Poland vs. 3% in New Zealand (MacDonald, Bianchi, and Drew, 2012, p. 63). Higher contributions are also paid in the UK, an employer pays 3% and employees 5% (*Workplace pensions*, 2020). In Taiwan employers should pay a minimum contribution of 6% of each employee's monthly wage (Yang, 2020, p. 178). In the literature there appear postulates for increasing contributions to voluntary retirement programs (Townsend, 2018, p. 89).

For PPK managing institutions, the advantage of PPK plans is the ability to offer a product that can generate steady income in the future, while the disadvantage is the relatively low amount of this remuneration.

It is worth emphasizing that the amount of maximum fees for managing FZD funds has been severely limited by the legislator and is similar to the remuneration of ETF funds, which are an example of passive management. In the PPK Act, the main fees were limited to 0.5%, while the average cost of similar funds in New Zealand in the KiwiSaver scheme was 0.96% (Trainor, 2014, p. 2). Hence there is another concern about whether the fund managers of FZD funds will use an active management strategy and desire to outperform the market, or whether the policy will be rather limited to meeting the statutory guidelines for the use of the appropriate structure of the investment portfolio of these funds.

PPKs are similar to PPE where the contributions can be paid entirely by employers and employees. Some similarities of PPK can also be seen in IKE and IKZE because in these saving forms also funds of a defined date can be used.

#### **4. Data and research method**

The study used weekly values of participation units of 97 defined date funds which were active throughout the entire period from 19/01/2020 to 10/05/2020. This was due to the desire to include as many FZD funds as possible in the study. Data were obtained from the money.pl website and the KNF website. The comparative method and the cluster method were used as the research methods. In this regard, the *k*-means method and the Ward grouping method were used. The cluster method allows to group the studied FZDs into clusters using several variables simultaneously (Hartigan, 1975; Hartigan and Wong, 1979, p. 100). The variables used in the study were the simple rate of return and the total risk associated with the rate of return. The total risk associated with the funds was estimated based on the standard deviation of weekly returns. The rate of return for individual FZD funds was calculated from the entire analysed period. The cluster method, unlike ordinary rankings, eliminates the problem of the subjective indication of rates of return and investment risk to separate the group of funds.

#### **5. The results of the study**

The number of managing authorities as of 23 May 2020 was 21, which were created between April and July 2019. The number of funds defined at the end of the period considered was 172 (Table 2). One of the institutions (TUnŻ WARTA S.A.) submitted an application for removal from the PPK register. Based on the data from Table 2, it can be concluded that the largest Polish financial institutions of PKO TFI S.A. and PZU TFI S.A. enjoyed the greatest confidence of participants measured by the size of accumulated assets.

The five largest PPK managing authorities had over a 75% share in the total net asset value. PKO TFI S.A. alone had a 34% share in the total net assets value.

Only the FZD funds of the PKO investment fund company had portfolios of a value above 2 mln PLN.

**Table 2.** Cumulated net asset value of FZDs and the number of FZDs whose net value assets exceeded and did not exceed 2 million PLN

Name of the managing authority	Net assets value (NAV)	Number of funds with NAV below 2 million PLN/ above 2 million PLN	Share of funds with NAV below 2 million PLN/above 2 million PLN
PKO TFI S.A.	207 282 950	0/8	0.0%/100.0%
TFI PZU S.A.	83 950 178	1/7	12.5%/87.5%
Nationale-Nederlanden PTE S.A.	81 083 984	1/7	12.5%/87.5%
NN Investment Partners TFI S.A.	54 583 100	1/7	12.5%/87.5%
Aviva Investors Poland TFI S.A.	34 870 332	1/7	12.5%/87.5%
AXA TFI S.A.	25 072 584	4/5	44.4%/55.6%
Pekao TFI S.A.	19 529 125	5/5	50.0%/50.0%
TFI Allianz Polska S.A.	17 278 737	4/4	50.0%/50.0%
Investors TFI S.A.	16 768 956	4/4	50.0%/50.0%
Santander TFI S.A.	12 378 354	5/3	62.5%/37.5%
Pocztylion-Arka PTE S.A.	10 897 490	6/2	75.0%/25.0%
Generali Investments TFI S.A.	10 860 355	5/3	62.5%/37.5%
BNP Paribas TFI S.A.	10 519 114	6/2	75.0%/25.0%
Esaliens TFI S.A.	8 517 086	8/0	100.0%/0.0%
COMPENSA TUnŻ S.A.	6 459 371	8/0	100.0%/0.0%
MILLENNIUM TFI S.A.	5 223 589	8/0	100.0%/0.0%
PFR TFI S.A.	1 857 179	8/0	100.0%/0.0%
AEGON PTE S.A.	1 406 408	8/0	100.0%/0.0%
SKARBIEC TFI S.A.	948 974	8/0	100.0%/0.0%
BPS TFI S.A.	27 214	8/0	100.0%/0.0%
TUnŻ WARTA S.A.	0	9/0	100.0%/0.0%

Source: own calculations based on (KNF, 2020c).

Based on the data contained in Table 2, it can be stated that in almost half of the managing institutions (7 out of 20), none of the funds they manage has accumulated 2 million of NAV yet, and the total net assets under management of the four entities did not exceed 2 million PLN. PPK are introduced in several stages. Due to the COVID-19 pandemic and the difficult financial situation of employee caused by



this fact, it can be presumed that the participation of many employees interested in joining PPK will be again relatively low. In addition, it is postulated to postpone the implementation of PPK (MojePPK, 2020). This generates a risk of a decrease in the number of managing institutions because if the net asset value of the defined date fund does not exceed 2 million PLN, the costs of such fund are covered by the managing authority (Ustawa z dnia 4 października 2018 r...).

The results of the Szabó's research (2019, p. 48) prove that age and optimism have a significant impact on whether people save for retirement. According to his research, most people between the ages of 29-48 declared retirement savings. These results were similar to what can be observed in terms of savings on IKE, IKZE and especially in PPK (the program has not yet been fully implemented) (see Table 3).

**Table 3.** Value of funds accumulated by IKE, IKZE and PPK participants

Age	Women (IKE)		Men (IKE)	
	Value in PLN	Share	Value in PLN	Share
Up to 30 years	163 519 746	3.0%	223 640 602	4.7%
31-40 years	691 742 743	12.9%	824 988 184	17.2%
41-50 years	1 299 292 761	24.2%	1 292 683 958	27.0%
51-60 years	1 453 401 914	27.1%	1 176 559 380	24.5%
over 60 years	1 764 774 907	32.8%	1 276 760 807	26.6%
Age	Women (IKZE)		Men (IKZE)	
	Value in PLN	Share	Value in PLN	Share
Up to 30 years	73 810 313	4.5%	112 157 763	6.9%
31-40 years	319 341 350	19.3%	419 082 847	25.7%
41-50 years	445 019 047	26.9%	433 395 415	26.6%
51-60 years	493 740 977	29.8%	388 054 723	23.8%
61-65 years	233 721 788	14.1%	189 058 347	11.6%
over 65 years	89 452 300	5.4%	86 994 130	5.3%
Age	Participants (PPK)			
	Value in PLN	Share		
Up to 32 years	120 942 898	19.8%		
33-42 years	234 591 536	38.5%		
43-52 years	196 317 045	32.2%		
53-62 years	57 663 602	9.5%		

Source: own calculations and estimations on the basis of (KNF, 2020b; KNF, 2020c).

Data regarding the value of funds accumulated on IKE and IKZE were calculated in proportion to the share of the IKE and IKZE accounts opened respectively.



Based on the dendrogram (Figure 1), one can identify the three most different FZDs groups. However, due to the fact that the number of available FZD funds was eight, it was decided to divide the studied group into eight clusters.

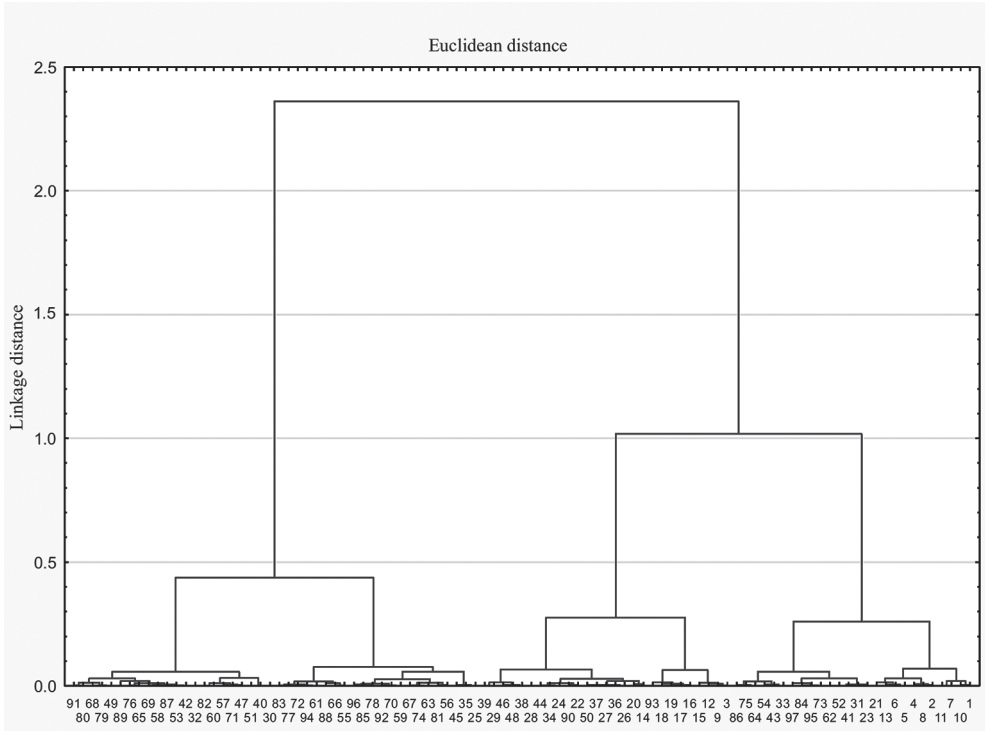


Fig. 1. Dendrogram, the Ward method

Source: own calculations in the Statistica 13 program.

The Act on PPK stipulates that life-cycle funds will strive to achieve security and efficiency of deposits made, and comply with the principles of limiting investment risk (Ustawa z dnia 4 października 2018 r...). The investment policy of defined date funds does not eliminate the risk of not achieving the investment fund’s purpose. In the analysed period the weakness of the Polish stock market was caused by an outflow of funds from OFE to ZUS and by turbulences caused by the pandemic of COVID-19.

Based on the data in Table 4, it can be concluded that a negative average rate of return was identified in all the analysed clusters.

While it is not surprising that the funds whose investment policy is relatively risky have achieved a negative rate of return in the analysed period, those funds that implemented the least risky investment policy also obtained a negative although relatively high rate of return (-1.4%).

**Table 4.** Descriptive statistics of the clusters

Variable	Average rate of return	Standard deviation	Variance
Descriptive statistics of cluster 1 (PPK). The cluster has 12 cases			
Standard deviation	0.036294	0.004210	0.000018
Rate of return	-0.077684	0.004409	0.000019
Descriptive statistics of cluster 2 (PPK). The cluster has 9 cases			
Standard deviation	0.026940	0.007926	0.000063
Rate of return	-0.049741	0.008953	0.000080
Descriptive statistics of cluster 3 (PPK). The cluster has 8 cases			
Standard deviation	0.043316	0.002583	0.000007
Rate of return	-0.090440	0.003766	0.000014
Descriptive statistics of cluster 4 (PPK). The cluster has 20 cases			
Standard deviation	0.048013	0.006147	0.000038
Rate of return	-0.106403	0.004115	0.000017
Descriptive statistics of cluster 5 (PPK). The cluster has 5 cases			
Standard deviation	0.045858	0.005521	0.000030
Rate of return	-0.124625	0.001924	0.000004
Descriptive statistics of cluster 6 (PPK) The cluster has 9 cases			
Standard deviation	0.056103	0.002325	0.000005
Rate of return	-0.133388	0.003637	0.000013
Descriptive statistics of cluster 7 (PPK). The cluster has 8 cases			
Standard deviation	0.046480	0.002631	0.000007
Rate of return	-0.141472	0.004148	0.000017
Descriptive statistics of cluster 8 (PPK). The cluster has 26 cases			
Standard deviation	0.033586	0.014820	0.000220
Rate of return	-0.013928	0.010923	0.000119

Source: own calculations in Statistica 13 program.

Table 5 contains data on funds in individual clusters. Based on the data in Table 5, it can be concluded that none of the clusters included only life-cycle funds with the same defined date.

The analysis of the data presented in Table 5 also shows that the funds operating under PPK tried to minimize the decrease in the value of assets. This is demonstrated by the number of funds in cluster 8 (Table 4).

The lowest average rate of return (-14.1%) was achieved by funds in cluster 7 (Table 4), they were mainly funds whose defined date was from 2045 to 2060, i.e. funds that could realize a more risky investment policy. It should be emphasized

**Table 5.** Number of FZD funds in individual clusters

Cluster number	2025	2030	2035	2040	2045	2050	2055	2060	Total
Cluster 1		3	6	2				1	12
Cluster 2	3	5						1	9
Cluster 3			4	2	1		1		8
Cluster 4			4	4	2	4	3	3	20
Cluster 5			2	1	1		1		5
Cluster 6					2	3	2	2	9
Cluster 7					2	2	2	2	8
Cluster 8	10	2	4	2	2	2	2	2	26
Total	13	10	20	11	10	11	11	11	97

Source: authors' own elaboration.

that the analysed period was relatively short and was associated with exceptional turbulence on the financial market. Moreover, the analysis was preliminary and investing in PPK funds is a long-term process.

## 6. Conclusion

The purpose of the article was the initial assessment of employee capital plans as a program of supplementing the third pillar of the pension system. The analysis of the implementation of PPK shows that there is a risk that some institutions managing PPK funds may withdraw from providing their services due to the extended waiting period for reimbursement. A comparison of the value of assets accumulated by FZD funds and assets accumulated in various forms of saving on IKE and IKZE shows that the new scheme may contribute to an increase in the retirement savings of Poles. In addition, empirical evidence was obtained that the current investment policy pursued by the FZDs was similar and that funds implementing the least risky investment policy can achieve negative returns in short periods. It could be worth implementing into the offered range funds with a minimum level of investment risk, such as money market funds.

It should be emphasized that the period analysed was relatively short and during this period the financial markets were hit by COVID-19. Frequent changes in the pension system and lower than expected participation in PPK allows for concluding that Poles may have limited confidence in the new form of saving. To encourage greater participation in PPK, there is a need to increase knowledge about the necessity of saving and forms of saving for future retirement. This postulate is in line with Bielawska (2019, p. 159).

The article could also be useful for practical purposes, in particular for PPK market participants who can better understand how FZD works.

A similar study should be conducted after the full implementation of the PPK program.

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## WSTĘPNA OCENA PRACOWNICZYCH PLANÓW KAPITAŁOWYCH

**Streszczenie:** System emerytalny w Polsce jest przykładem realizacji wielu reform i zmian, z których część jest sprzeczna i dyskusyjna. Celem artykułu była wstępna ocena pracowniczych planów kapitałowych (PPK) jako elementu stanowiącego uzupełnienie III filara systemu emerytalnego. Artykuł ma charakter teoretyczno-empiryczny. W pracy zastosowano analizę porównawczą oraz metodę skupień do oceny polityki inwestycyjnej prowadzonej przez fundusze zdefiniowanej daty (FZD). Przeprowadzone badanie dowodzi, że polityki inwestycyjne funduszy działających w ramach PPK są do siebie zbliżone i że można wyróżnić spośród nich trzy dominujące, których efektem są podobne wyniki FZD. Wydłużony okres zwrotu instytucji zarządzających funduszami PPK zwiększa ryzyko wycofania oferty niektórych instytucji finansowych w przyszłości. Ocena programu PPK pozwala stwierdzić, że program ten może zwiększyć oszczędności emerytalne Polaków. Autor postuluje także potrzebę zwiększenia wiedzy uczestników rynku w zakresie potrzeby i form oszczędzania na emeryturę.

**Słowa kluczowe:** starzenie się społeczeństwa, pracownicze plany kapitałowe, system emerytalny.