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INDIVIDUAL PENSION PRODUCTS OFFERED BY BANKS IN POLAND – A MULTIDIMENSIONAL COMPARATIVE ANALYSIS[1]

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Abstract The supplementary old-age pension system in Poland consists of group and individual plans. This research covers the latter, namely the individual retirement accounts and individual retirement security accounts that were introduced in 2004 and 2012 respectively. The main aim of the paper is to conduct a multidimensional comparative analysis of bank retirement products including the linguistic complexity of documents creating the retirement contracts offered to individuals by banks, and the costliness and profitability of such products in the period 2012-2019. Moreover, it identifies the dependencies between the linguistic and economic traits of retirement contracts offered by banks. The correlation analysis conducted using the Spearman's rank correlation coefficient showed that the more readable a document of a bank contract is, the higher the interest rate is and the higher the cancellation fees. The results of the study are relevant for both financial institutions and public bodies as they show the key characteristics that may influence the demand for individual retirement products in Poland and may serve as either a stimulator or a barrier in the development of supplementary old-age pension provision.

JEL classification: G21, G23, G51, J26

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Introduction

Individual pension products are an important element of the old-age pension system in Poland as they enable people to supplement the public pension benefits to an adequate level to allow individuals to adjust the old-age provision to their needs. They are offered in the form of individual retirement accounts (IKE), which were introduced to the voluntary part of the pension system in 2004, and individual retirement security accounts (IKZE) introduced in 2012. Both types of retirement accounts are available in the form of life insurance with an insurance capital fund (UFK) offered by life insurance companies, and investment funds offered by investment fund companies (TFI), bank accounts offered by banks, securities accounts offered by brokerage houses and voluntary pension funds (DFE) offered by pension societies.

According to data from the Financial Supervision Authority, at the end of 2020, 742 thousand IKEs and 408 thousand IKZEs operated on the market (KNF 2021a, 2021b). The largest share of the market for individual pension plans was represented by investment fund companies (52.99% and 47.03%, respectively), and the following places were taken by products offered by life insurers (26.96% and 23.66%), banks (11.55 % and 6.91%), brokerage houses (7.53% and 7.74%) pension societies (0.97% and 14.67%), (Mączyńska et al., 2021).

This article analyses individual retirement accounts and individual retirement security accounts offered by banks. The main aim of the paper is to conduct a multidimensional comparative analysis of bank retirement products including the linguistic complexity of documents creating the retirement contracts offered to individuals by banks, and the costliness and profitability of such products in the period 2012-2019. Moreover, it identifies the correlations between the linguistic and economic traits of retirement contracts offered by banks and gives an answer to the question of whether banks use less readable contracts when they offer more costly and less efficient savings accounts. These are the original aspects of this paper.

The research hypothesis is that the less readable and the less transparent a bank contract document is, the higher the cancellation fee and the lower the interest rate offered.

The evaluation covered documents affecting the content of pension agreements, tables of fees and commissions, and interest rate data published on the websites of institutions or obtained by e-mail contact.

This study uses the results of linguistic analysis published by Rutecka-Góra et al., (2020). In order to realize the research objectives, I calculated the nominal and real interest rates of retirement accounts. To check dependencies between linguistic and economic traits of the contracts I calculated the Spearman's rank coefficient and then verified its significance with a non-parametric test.

Research background

The adequacy of old-age pension benefits is determined by various factors. It does not depend solely on the level of participation and the amount of contributions made, or the length of the capital accumulation period. The adequacy of the retirement security could be assessed taking into account the appropriateness of retirement products for individuals that want to protect themselves from having insufficient income in old-age. One of the elements of such adequacy is investment profitability with investment efficiency being the key factor (Broadbent, Palumbo & Woodman, 2006; Tapia, 2008; Rutecka-Góra, 2019b; Brzęczek & Szczepankiewicz, 2016). The other factor is costliness that significantly impacts the final results of long-term saving. The next element is the comprehensibility of the retirement contract for an individual saver in terms of both economic mechanisms and language used (Rutecka-Góra et al., 2020).

Supplementary pension products addressed to individuals should be given special attention to make them better fit the needs and competences of individuals as in the case of these plans savers conclude contracts directly with financial providers. The risk of misselling and risk of bad retirement planning decisions is in individual retirement plans much higher than in collective agreements, mainly due to information asymmetry.

The individual retirement products should be more strictly regulated, and even certified (see more: Rutecka-Góra, 2021) when tax incentives to join the schemes are offered. In such situations the individual has the right to expect that the proposed products are effective tools for raising capital for old age and that they do not contain abusive clauses (Rutecka-Góra & Rutkowska-Tomaszewska, 2021). So the key question is their profitability that includes investment efficiency and costliness. But the regular and readable information about these characteristics of retirement plans is rarely provided either by public bodies or financial providers. Due to the limited access to data, individual

pension vehicles are assessed relatively rarely, and only limited studies are devoted to their profitability and readability (Rutecka-Góra et al., 2020; Pieńkowska-Kamieniecka et al., 2021).

The Polish old-age pension system has a multi-pillar structure. The first and second pillars constitute a basic pension system and use nonfinancial and a funded defined contribution formula respectively (NDC+FDC). The third pillar comprises all forms of supplementary retirement savings, and encompasses both group-based solutions and individual plans of savings for old age. The former involves employee pension schemes (PPEs) introduced in 1999 and employee capital plans (PPKs) which have been implemented since mid-2019. The latter group includes individual retirement accounts (IKEs) and individual retirement security accounts (IKZEs), which were introduced in 2004 and 2012 respectively. The supplementary pension system in Poland is very complex. The studies conducted focus mainly on old-age pension system architecture, coverage and assets under management. Only a few publications refer to investment efficiency (Chorkowy, 2014; Dopierała & Wojciechowski, 2015; Marcinkiewicz, 2015; Dopierała, 2017; Szczepański & Brzęczek 2016; Dopierała, 2018; Rutecka-Góra, 2019a; Rutecka-Góra et al., 2020; Pieńkowska-Kamieniecka et al., 2021) or effects of tax incentives offered in supplementary pension plans (Rutecka 2015; Rutecka-Góra 2019a; Rutecka -Góra et al., 2020). No study focuses solely on the analysis of individual retirement products offered by banks. This article aims to fill this research gap.

Data and methodology

The analysis covered both individual retirement accounts and individual retirement security accounts offered by banks at the beginning of 2017. Agreements were compared in terms of intelligibility of language and clarity of the main documents affecting the content of agreements (typically the rules for operating IKE/IKZE accounts), the level of complexity of the economic mechanism, as well as efficiency and cost. The documents affecting the content of agreements and tables of fees were obtained in the first half of 2017, hence the analysis of the clarity, transparency and the level of costs of agreements refers to the status in 2017, and the evaluation of efficiency covers the years 2012-2019.

According to data from the Financial Supervision Authority (KNF) IKE accounts were offered by twelve banks, while IKZE were offered by three banking institutions, including two cooperative banks, at the end of 2016 (KNF, 2017). Due to a problem with access to data, the final analysis excludes cooperative banks and banks affiliating cooperative banks (with the exception of Bank Polskiej Spółdzielczości S.A.) and Alior Bank S.A. which refused access to information about the agreement, as at the time of data collection it did not offer IKE for new customers[3]. As a result, the study covered products offered by ten banking institutions, including nine IKE and one IKZE (Table 1).

[3] It took over the portfolio of IKE accounts in connection with the acquisition of BPH S.A. on 04.11.2016.

Table 1: Banks offering individual retirement accounts (IKE) and individual retirement security accounts (IKZE) at the end of 2016 whose products were included in the analysis

Item No.	Bank Name	IKE	IKZE
1	BGŻ BNP Paribas S.A.	+	
2	Bank Millennium S.A.	+	
3	Bank Polskiej Spółdzielczości S.A.	+	
4	Getin Noble Bank S.A.	+	
5	Idea Bank S.A.	+	
6	ING Bank Śląski S.A.		+
7	mBank S.A. with a foreign branch	+	
8	PKO Bank Polski S.A.	+	
9	Krakowski Bank Spółdzielczy	+	
10	SGB-BANK S.A.	+	

Source: Own study based on KNF data.

Most of the individual pension accounts functioning on the banking market were individual retirement accounts. It is worth noting that only three banks, including two cooperative banks, decided to offer IKZE. This demonstrates the unattractiveness of the latter solution for banking institutions, which may arise both from past experience related to offering IKE, and a significantly lower annual contribution limit for IKZE. All of these institutions introduced products to the market relatively early.

The study uses the results of the research on the clarity and transparency of agreements by Rutecka-Góra et al., (2020) that covers all key documents affecting the content of the agreements available in the electronic form in the first half of 2017. The analysis excluded the products of Alior Bank S.A. (product withdrawn from sale, no possibility of obtaining documents), PKO Bank Polski S.A. (refusal to provide an electronic version of the agreement), cooperative banks affiliated to BPS S.A. and cooperative banks affiliated to SGB Bank S.A. (unavailability of electronic versions of documents affecting the content of the agreement). For the analysis of costs, the official tables of fees and commissions were used. The efficiency of products was calculated based on interest rates applied by the banks and published on their websites. Taking into account the changes in interest rates within a year, the annual effective interest rates were calculated. The analysis of cost and efficiency excluded products from the following institutions: Alior Bank S.A. (denial of access to data), SGB Bank S.A., the cooperative banks affiliated to BPS S.A., the cooperative banks affiliated to SGB Bank S.A. and Krakowski Bank Spółdzielczy (unavailability of the history of account interest rates). As a result, the cost and efficiency were evaluated for eight banking products. A complete list of products covered by the comparative analysis is shown in the table below.

Table 2: IKE and IKZE offered by banks covered by comparative analysis

Bank Name	Product name	Analysis of clarity and transparency	Analysis of costliness	Analysis of efficiency
BGŻ BNP Paribas S.A.	IKE savings account	+	+	+
Bank Millennium S.A.	IKE	+	+	+
Bank Polskiej Spółdzielczości S.A.	POL-IKE account	+	+	+
Getin Noble Bank S.A.	IKE	+	+	+
Idea Bank S.A.	IKE savings account	+	+	+
ING Bank Śląski S.A.	IKZE	+	+	+
mBank S.A.	IKE savings account for natural persons	+	+	+
PKO Bank Polski S.A.	IKE	-	-	+
Krakowski Bank Spółdzielczy	IKE	+	+	-
SGB-BANK S.A.	IKE with variable interest rate	+	-	-

Source: Own study

Clarity and transparency of contracts

The comprehensibility of the content of agreements for IKE or IKZE accounts offered by banks is based on the measures calculated by JASNOPIS, which is a linguistic computer application (available at www.jasnopis.pl). The analysis uses the results of the readability and transparency research by Rutecka-Góra et al., (2020). Transparency of the documents was assessed directly by a linguist specializing in the evaluation of the level of complexity and transparency of utility texts. The analysis covered the following documents affecting the content of IKE/IKZE agreements: the content of the framework agreement (BG, BNP Paribas S.A., SGB-BANK S.A.), the general provisions of the agreement (Bank Millennium S.A.), and the terms and conditions of operating IKE/IKZE accounts (other banking institutions). Selected detailed results are presented in Table 3.

Table 3: Clarity of agreements on IKE/IKZE accounts offered by banks

Bank Name	Difficulty*	FOG**	Pisarek***	% nouns	% verbs	Nouns/verbs
BGŻ BNP Paribas S.A.	6	9.60	8.85	44	6	7.50
Bank Millennium S.A.	6	8.46	7.87	47	7	6.82
Bank Polskiej Spółdzielczości S.A.	6	9.00	8.32	45	7	6.45
Getin Noble Bank S.A.	6	10.80	9.22	47	7	6.58
Idea Bank S.A.	6	10.47	8.95	47	7	7.11
ING Bank Śląski S.A.	6	9.90	8.60	44	5	8.00
mBank S.A.	7	10.34	9.14	50	6	8.49
SGB-BANK S.A.	6	9.87	9.08	45	7	6.44
Krakowski Bank Spółdzielczy	6	10.66	9.26	44	7	6.65

* Text difficulty class on a 1-7 scale: 1 – childishly simple text (primary school grades 1-3), 2 – very easy (primary school grades 3-6), 3 – easy to understand for the average Pole (secondary school level), 4 – a little more difficult text, understandable for people with secondary education or having extensive life experience (high school), 5 – more difficult text, understood by educated people (bachelor/engineer), 6 – difficult for the average Pole (MA degree), 7 – very complicated, professional text, whose understanding may require expertise (PhD or specialization in the area of the text).
** FOG index. Text vagueness index (FOG Index) – indicates the number of years of education necessary to understand a text.
*** Linear Pisarek index – indicates the number of years of education that is needed to understand the text.

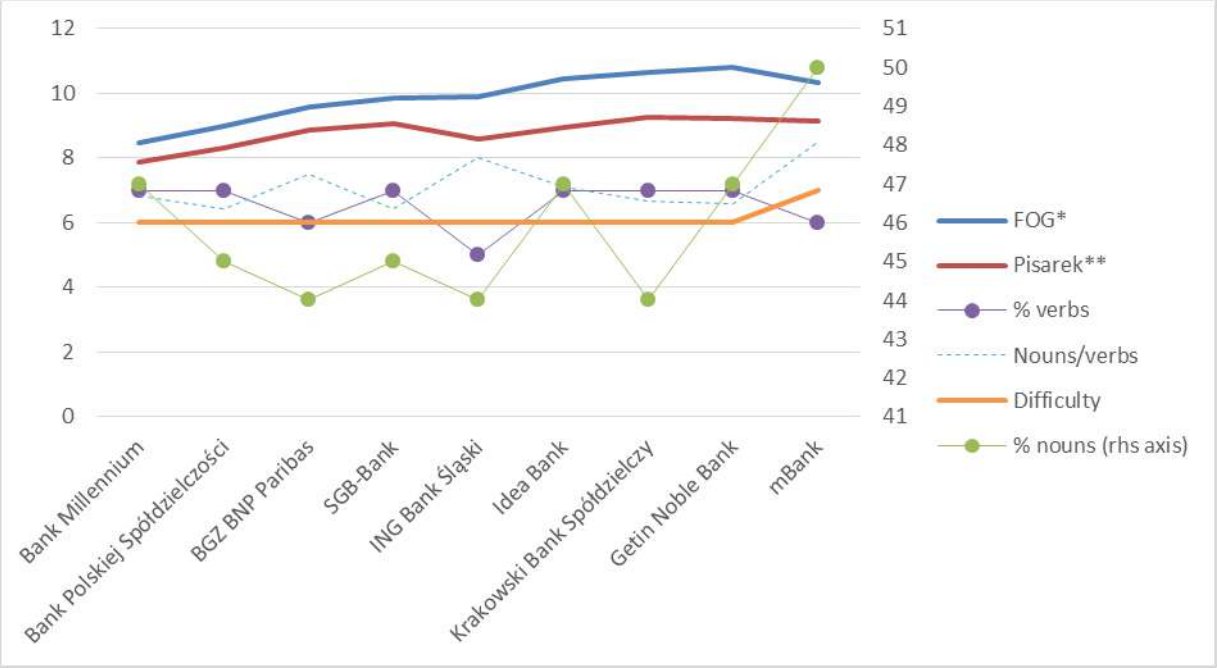
Source: (Rutecka-Góra et al. 2020).

The measurement of the intelligibility of the text using the JASNOPIS application makes it possible to obtain dozens of statistical values. For the purposes of this analysis, the following were used: the text difficulty class, the FOG index, the linear Pisarek index, the percentage of nouns, the percentage of verbs, and the ratio of nouns to verbs in the analysed texts.

The general text difficulty level measures (class of difficulty, FOG index and linear Pisarek index) indicate that agreements for IKE/IKZE accounts offered by banks are written in very difficult language and their content is understandable for people with at least a master's degree, and in the case of the Rules of mBank S.A.– people with a PhD title or specialisation in a particular field. Understanding these agreements requires a long period of education – from approximately eight years (Bank Millennium S.A.) to almost eleven years (Getin Noble Bank S.A., Krakowski Bank Spółdzielczy).

The most unintelligible texts of agreements were further characterised by a high percentage of nouns (mBank S.A., 50%) and a low percentage of verbs (ING Bank S.A. 5%; mBank S.A., 6%). These agreements were also characterised by a high noun to verb ratio. All documents were characterised by a difficult word ratio at a similar level, i.e. 3%.

Chart 1: Indices of the intelligibility of the content of agreements on IKE and IKZE accounts offered by banks



Source: Own study based on (Rutecka-Góra et al. 2020).

The synthetic transparency index used in the analysis is the sum of points assigned by a linguist for the following elements: font, structure, graphics, metatext and direct forms (more: Rutecka-Góra et al. 2020). None of the agreements approached the upper limit of the scoring (five points), and the best of the documents (mBank Rules) received only two points. Most of the agreements did not receive even one point in the indicated sub-categories. A positive result was achieved only by the documents prepared by Idea Bank S.A., SGB -Bank S.A., Krakowski Bank Spółdzielczy S.A. and mBank S.A.

Table 4: Clarity* of agreements on IKE/IKZE accounts offered by banks

Name of institution	Overall rating of transparency (total)	Font	Structure	Graphics	Metatext	Direct forms
BGŻ BNP Paribas S.A.	0	0	0	0	0	0
Bank Millenium S.A.	0	0	0	0	0	0
Bank Polskiej Spółdzielczości S.A.	0	0	0	0	0	0
Getin Noble Bank S.A.	0	0	0	0	0	0
Idea Bank S.A.	1	0	0	0	1	0
ING Bank Śląski S.A.	0	0	0	0	0	0
mBank S.A.	2	0	0	1	1	0
SGB-BANK S.A.	1	0	0	0	1	0
Krakowski Bank Spółdzielczy	1	1	0	0	0	0

* Scale for clarity level: 0 - totally unclear text, 1- very unclear text, 2 – rather unclear text, 3- text of medium clarity, 4 - rather transparent text, 5 - very transparent text.

Source: (Rutecka-Góra et al. 2020).

None of the banking institutions offers an IKE/IKZE account agreement the content of which would be at the same time very understandable and transparent to the customer. The best product in terms of comprehensibility (Bank Millennium S.A.) is the worst in terms of transparency, while the best agreements in terms of transparency are characterised by very poor (mBank S.A.) or average intelligibility (Idea Bank S.A., SGB-Bank S.A., Krakowski Bank Spółdzielczy).

Costs of individual pension products offered by banks

Retirement savings accumulated in IKE or IKZE accounts in banks are generally not subject to any charge, which stems from a very conservative and low-cost nature of these products. They are savings accounts with variable interest rates. A fee in the form of withholding of a specific amount or part of the interest may

Table 5: Liquidation fees for IKE/IKZE offered by banks

Bank Name	Fee amount	Notes
BGŻ BNP Paribas S.A.	PLN 600	PLN 0 for transfer disbursement to an account in TFI BG BNP Paribas S.A.
Bank Millennium S.A.	100% of accrued interest (termination of the agreement before the expiry of 6 months) 50% of accrued interest (after 6 months)	-
Bank Polskiej Spółdzielczości S.A.	100% accrued interest for full months of saving	The fee is not higher than the interest rate for 6 months accrued according to the initial interest rate
Getin Noble Bank S.A.	PLN 0	-

Idea Bank S.A.	100% of accrued interest due on the disbursement date	-
ING Bank Śląski S.A.	1% of funds, up to PLN 300	At least PLN 100 upon reimbursement or transfer disbursement
mBank S.A.	PLN 200	PLN 50 in case of transfer disbursement to institutions with which the bank has signed a cooperation agreement (Generali Życie S.A. and TFI Skarbiec S.A.)
Krakowski Bank Spółdzielczy	PLN 150	-

Source: Own study based on the banks' rules and tables of fees taken from the websites of financial institutions in 2017.

be charged only in the event of termination of the agreement with the bank within twelve months of its conclusion and reimbursement, withdrawal or transfer disbursement from IKE/IKZE. The amounts of liquidation fees are shown in Table 5.

The level of liquidation fees ranges widely – from no fee (Getin Noble Bank S.A.) to PLN 600 (BG BNP Paribas S.A.) and to 100% of accrued interest (Idea Bank S.A., Bank Polskiej Spółdzielczości S.A., Bank Millennium S.A.). Given the nature of the product and the risks associated with it, charging fees in the form of total accrued interest or a high flat-rate fee does not seem to be economically justified, even in the case of incurring the high costs of acquiring customers. They may be recognized as abusive clauses due to the fact they are similar to clauses included in the register of the prohibited contract clauses or considered as such by the President of the Office of Competition and Consumer Protection (more: Rutecka-Góra & Rutkowska-Tomaszewska, 2021).

Interest rates

All IKE/IKZE accounts offered by banks bear variable interest rates that may be changed by decision of the board of the bank (after the earlier change of the indices specified in the agreement) or automatically when the interest rate is determined directly by the amount of a particular external reference rate. Offers of banking institutions also differ in their method of capitalisation – from daily to annual capitalisation – and the time interest is accrued to an IKE or IKZE. Table 6 provides information about the level of complexity of the rules for changes in interest rates described in the documents of the banks.

Table 6: The method of determining the interest rate for IKE/IKZE offered by banks

Name of institution	Type of interest rate	Interest factors (underlying factors/reasons for change)	Capitalisation	Complexity of the rules changes in interest rates*
BGŻ BNP Paribas S.A.	variable (WIBOR 3M or NBP reference rate)	WIBOR 3M (for accounts opened before 02.01.2014) or NBP reference rate (from 02.01.2014)	daily, interest accrued at the end of each day	0

Bank Millennium S.A.	variable (the decision of the board)	Changes to WIBOR, EURIBOR, WIBID by at least 0.001 pp, mandatory reserve rate on deposits by at least 0.001 pp, any of the base NBP rates by 0.001, any inflation rate by at least 0.001 pp, the Bank's obligation to create reserves or write-offs, payment of fees and taxes not provided for in the legislation at the date of conclusion of the agreement	annual	2
Bank Polskiej Spółdzielczości S.A.	variable (the decision of the board)	Changes in the rediscount rate	daily, interest credited at the end of the calendar year	1
Getin Noble Bank S.A.	variable (NBP reference rate or WIBOR 3M)	NBP reference rate or WIBOR 3M (for accounts opened before 02.01.2014)	daily, interest accrued at the end of each day	0
Idea Bank S.A.	2% (first year), WIBOR 3M (subsequent years)	Changes to WIBOR3M by at least 0.01 pp (change from the 22nd day of the month); changes to WIBOR 3M, 6M and 1Y, reserve requirement on deposits, base NBP interest rates – by at least 0.01 pp, annual, semi-annual, quarterly inflation – by at least 0.2 pp, interest rates on the three best IKE accounts (except for cooperative banks) – up to the amount of their average interest rate	daily, interest accrued at the end of the month	1
ING Bank Śląski S.A.	variable (the decision of the board)	No information on what determines the interest rate in the IKE rules. The general rules indicate that a change may occur in the case of changes to the following: NBP reference rate, WIBOR 1M, CSO inflation rate (monthly); adjustment of interest rates up by at least 0.1 pp with the ref. index change by at least 0.1 pp, downward adjustment by up to one-time ref. index change by at least 0.1 pp (single or gradual increase)	monthly	4
mBank S.A.	variable (the decision of the board)	When the following change: 1) the base rate of the National Bank of Poland or the deposit rate, 2) annual, quarterly, monthly CSO inflation rate by at least 0.3 pp, 3) WIBOR, LIBOR, EURIBOR 1M by at least 0.002 pp against any day in the last six months. 4) changes in mandatory reserves, interest rates on Treasury bonds (no indication of which and how much), additional fees, taxes, provisions, etc. Note! in the case of point 1) the interest rate may change to 4-times the baseline change, in other cases by up to 1 pp	monthly capitalisation (the last business day of the calendar month)	3

Krakowski Bank Spółdzielczy	variable (the decision of the board)	It can be decreased (only the direction of change is described in detail) by the reduction rate of: interest rates set by the MPC, CSO inflation rates (annual, quarterly monthly), changes in yield on annual treasury bills, changes in (all) WIBOR and WIBID rates, new reserves, fees, taxes – such a change results in amendment to the agreement. In the case of increases (not necessarily justified), the bank is only obliged to inform about the change.	daily, interest credited at the end of the calendar year	4
SGB-BANK S.A.	variable (changed every 6 months)	The interest rate equal to WIBID 6M – the arithmetic mean of 3 months (Mar-May and Sept-Nov) multiplied by 0.835 (1 year), 0.86 (two years), 0.885 (3-5 years), 0.91 (from 6 years)	no data	2

* the level of complexity of the rules for interest rate change: 0 – the rules are very clear, the customer can calculate the amount of interest, 1 – clearly defined conditions but the change is based on a decision of the board or complicated defined conditions, but the interest rate depends directly on these indexes, 2 – conditions described in a complicated way, and the change depends on the board's decision or is made with a substantial delay, 3 – complex information about conditions, and change made by the decision of the board, in accordance with the direction of change in interest rates being a point of reference, 4 – very complex information about conditions, possible (but optional) change made under a decision of the board.

Source: Own study based on documents affecting IKE/IKZE offered by banking institutions.

The nominal interest rates in the period 2012-2019 are presented in Table 6. With regard to changes in interest rates on banking products during the year, the effective interest rate is calculated taking into account daily capitalisation assuming that the year consists of 365 days.

Table 6: Nominal interest rate on IKE/IKZE in the form of bank accounts in the period 2012-2019

Bank Name	2012	2013	2014	2015	2016	2017	2018	2019
BGŻ BNP Paribas S.A.	4.00%	3.61%	2.20%	1.70%	1.72%	1.72%	1.72%	1.71%
Bank Millennium S.A.	5.00%	4.00%	4.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Bank Polskiej Spółdzielczości S.A.	4.00%	3.96%	3.65%	2.63%	2.40%	2.40%	2.40%	2.40%
Getin Noble Bank S.A.	5.27%	3.73%	2.50%	1.50%	1.50%	1.50%	1.50%	1.50%
Idea Bank S.A.	5.53%	3.59%	3.59%	2.89%	2.00%	1.72%	1.72%	1.71%
ING Bank Śląski S.A.*			1.38%	1.16%	1.00%	0.70%	0.70%	0.70%
mBank S.A.	4.50%	3.10%	2.62%	1.86%	1.75%	1.75%	1.75%	1.75%
PKO Bank Polski S.A.	3.00%	3.00%	3.00%	1.50%	1.50%	1.50%	1.50%	1.50%

* It was assumed that the IKE/IKZE account balance is less than PLN 100,000 (the bank uses increased interest rates if the account balance exceeds PLN 100,000). Product introduced to the offer on 10.03.2014.

Source: Own study based on data obtained from financial institutions and published on their websites.

The interest rate differed significantly among the banking institutions. The highest interest rates in 2012 were offered by Idea Bank S.A. and Getin Noble Bank S.A., while the lowest – by PKO BP S.A., BGZ BNP Paribas S.A. and Bank Polskiej Spółdzielczości S.A. In 2016, the best conditions in terms of interest rates were offered by Millennium Bank S.A. and the worst by ING Bank Śląski S.A., which is the worst in this category in the entire analysed period. The highest 8-year nominal interest rate was observed for the product of Bank Millennium S.A. (31.66%), followed by the offer of Bank Polskiej Spółdzielczości S.A. (25.13%) and Idea Bank S.A. (25.07%). The least profitable product was IKE offered by PKO Bank Polski S.A. (17.72%) and BGŻ BNP Paribas S.A. (18.27%). The lowest cumulative nominal interest rate calculated in this case for a period of almost six years was achieved by IKZE offered by ING Bank Śląski S.A. (5.42%).

For the sake of comparison of the profitability of bank products, real interest rates were also calculated. For this purpose, the harmonised index of consumer prices (HICP) published by Eurostat was employed. Real annual interest rates on IKE/IKZE offered by banks fluctuated in the range of -2.24% to 4.73%, with the highest values observed in 2014 and the lowest in 2019. Eight-year real interest rates indicate that the highest interest rate was offered by the IKE at Bank Millennium S.A. (21.49%), followed by Bank Polskiej Spółdzielczości S.A. (15.46%) and Idea Bank S.A. (15.41%). The lowest real efficiency was achieved by IKZE offered by ING Bank Śląski S.A. (real interest rate of -0.05% for a period of six years) and IKE from PKO Bank Polski S.A. (8.63% for the full period of the analysis, i.e. eight years). In 2019, all eight analysed products offered interest rates below the inflation rate.

Multidimensional comparative analysis

The comparative analysis of individual pension products offered by banks was developed taking into account the following indices attributed to the various components of evaluation: FOG index (level of intelligibility), a synthetic transparency index (level of transparency), the cancellation fee (cost), and real average annual interest rate (efficiency). Among the many indices calculated in the text intelligibility analysis, the FOG index was selected, because it differentiates the most the products analysed. When comparing effectiveness, the real average annual interest rate was selected to eliminate distortions arising from the short history of offering certain products (IKZE was introduced by ING Bank Śląski S.A. only in 2014). The values of the variables analysed for the compared banking products are shown in Table 7 and Chart 2.

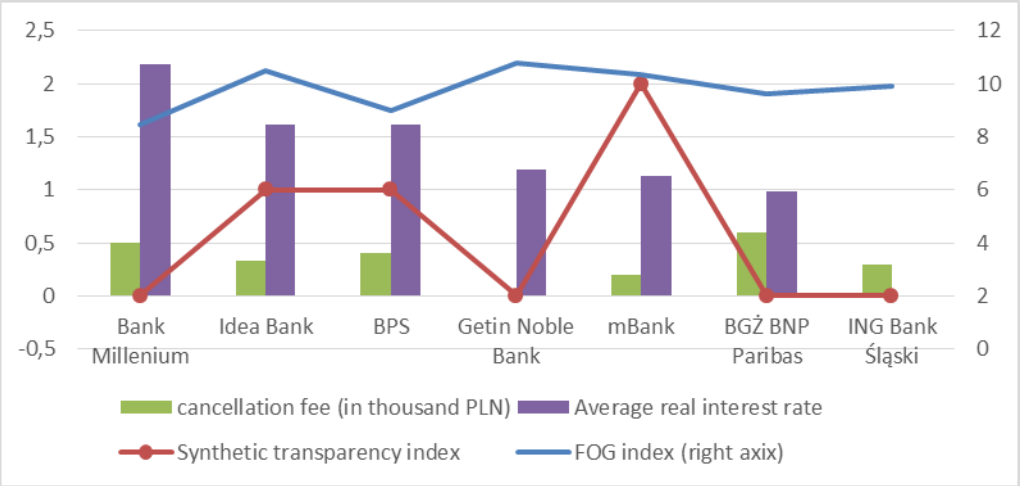
Table 7: Clarity, transparency, cost and average real interest rates for the period 2012-2019 on IKE/IKZE offered by banks

	Agreement intelligibility index (FOG index)	Synthetic agreement transparency index	Cost (cancellation fee, PLN '000)*	Average real interest rate 2012-2019 (%)
BGŻ S.A.	9.60	0	0.600	0.98
Bank Millenium S.A.	8.46	0	0.500	2.19
BPS S.A.	9.00	1	0.400	1.61
Getin Noble Bank S.A.	10.80	0	0.000	1.19
Idea Bank S.A.	10.47	1	0.333	1.61
ING Bank Śląski S.A.**	9.90	0	0.300	-0.01
mBank S.A.	10.34	2	0.200	1.13
PKO BP S.A.	no data***	no data***	no data***	0.92
Krakowski Bank Spółdzielczy	10.66	1	0.150	no data

* the comparative analysis was based on standard liquidation fees and interest rates prevailing at the end of 2016. It was assumed that the agreement is terminated after four months and the account balance is PLN 50,000.
** IKZE interest rate for a period of almost six years – since the introduction of the product (10/03/2014) until the end of 2019.
*** the bank has not released electronic versions of documents for analysis. The product has been withdrawn from the products offered.

Source: Own study.

Chart 2: Clarity, transparency, cost and average nominal annual interest rates for the period of eight years (2012-2019) on IKE/IKZE offered by banks.



Source: Own study.

The best product in terms of efficiency and clarity was IKE offered by Bank Millennium S.A. The product is characterised, however, by relatively low transparency and high liquidation fees (100% interest in the case of termination during the first six months). The second product in terms of efficiency – IKE offered by Idea Bank S.A.– is characterised by a relatively low level of clarity (more than ten years of education necessary to understand the agreement), average transparency and average cost. The worst product in terms of efficiency (IKZE from ING Bank Śląski S.A.) was marked by low levels of clarity and transparency, and an average level of cost. A product with the lowest cost (IKE from Getin Noble Bank S.A.) was characterised by average efficiency, and the content of the agreement was very confusing and not very transparent.

The analysis of the relationship between clarity, transparency, cost and efficiency of investment of the analysed products showed the statistically significant negative correlation between readability (FOG index) and the costliness (cancellation fee). Moreover, there is a statistically significant positive correlation between the intelligibility of the rules and the level of interest rates. This means that the more understandable the rules, the higher the interest rate on the account, but at the same time, the higher liquidation fees for termination of the agreement.

Table 8: Correlation analysis for individual retirement product offered by banks (Spearman's Rank correlation coefficients)

Variable	FOG index	Synthetic transparency index	Cancellation fee	Average real interest rate 2012-2019
FOG index	1.00	–0.45	**–0.79**	**0.29**
Synthetic transparency index	–0.45	1.00	0.36	0.21
Cancellation fee	**–0.79**	0.36	1.00	-0.22
Average real interest rate 2012-2019	**0.29**	0.21	-0.22	1.00

Note: Statistically significant correlations ($p < 0.05$) are bolded.

Source: Author's work.

The results support findings of Pieńkowska-Kamieniecka et al., (2021) who also examined the characteristics of individual retirement contracts in Poland but used other linguistic measures and a shorter period for efficiency assessment. But they are contrary to outcomes of the studies by Carlin (2009), Turner (2013) and Cash and Tsai (2018) who found that less readable documents are used in more costly financial services.

Conclusions

The comparative analysis did not allow for a selection of products that would be the best in all categories evaluated. The most understandable products are characterised by average or low transparency and a very differentiated level of efficiency and cost. The most efficient products are relatively clearer than the others (which does not mean absolute intelligibility), but not very transparent.

From a linguistic point of view, all IKE/IKZE agreements are written in a relatively difficult language (the class of difficulty of the text is 6 or 7 in a 7-point scale), and are not very transparent (the best products received less than 50% of points, more: Rutecka-Góra et al., 2020). This situation may result from the complexity of financial language in general and failure to adapt the content of the documents addressed to individual customers to their ability to understand texts. It is difficult to speak of a specific strategy of financial institutions in this area, particularly because the low level of clarity and transparency does not translate into low efficiency and relatively high cost of the products in any of the analysed cases.

The study proved that the efficiency of IKE/IKZE offered by banks is related to the level of readability of the contract and the level of costs charged in the case of liquidation of individual pension accounts. The research hypothesis was only partly supported as the positive correlation was found solely between readability of a contract and the level of interest rate a bank offers. Moreover, the correlation analysis did not prove any significant correlation between the transparency of a contract or the interest rate or the cancellation fee.

The main finding is that more effective products are at the same time more understandable. But it does not mean that bank contracts properly fit individuals' skills and competences. All the analysed products were characterized by highly unreadable contracts that are understandable for people with at least a master's degree. Moreover, they offer poor protection against inflation as none of the bank retirement accounts offered positive real interest rate in 2019.

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