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Investment by Pension Funds in Poland

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**Barriers to increased effectiveness of investment
by pension funds in Poland**

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Abstract

The last ten years of the 20th century was the decade of pension reforms in Central and Eastern European countries. A three-pillar pension system has been adopted in most of that countries, including Poland, where the second pillar is created by open pension funds (OFEs), managed by pension fund companies (PTEs).

The aim of this article is to identify and analyze barriers to the increased effectiveness of investment by pension funds in Poland. The most significant of these barriers include the system of remuneration for pension fund companies, the minimum required rate of return mechanism, the excessively restrictive investment limits, and the lack of rational choice of pension funds by Poles. The conclusion is reached that the system of remuneration for pension fund companies should be linked to a greater extent to the funds' results, which has been achieved in some countries of Central and Eastern Europe, but not in Poland. The current financial crisis has also brought to light the need to make other changes in the second pillar of the pensions system, including liberalization of investment limits for pension funds, particularly in relation to foreign investments, and the introduction of subfunds. It is also necessary to educate society in matters relating to capital-based pensions, since otherwise there is a lack of understanding of the rules according to which pension funds function and of the types of risks associated with this. Moreover, people are insufficiently aware of their shared responsibility for their future pension benefits. The actions listed above would on one hand stimulate competition between the open pension funds in their investment activity, and on the other hand provide protection for the accumulated capital, particularly in a period of financial crisis.

1. Introduction

A widespread social and economic problem today in the economies of many countries in Europe and worldwide is that of the ageing society. Present and projected demographic trends will in the longer term lead to very unfavorable ratios between the populations of people of working age and people over retirement age. The growing number of people over retirement age necessitates increase in the aggregate sum of pension benefits. The main reason for this is the projected more than twofold growth in the ratio of the number of people aged 65 and over to the number aged 20 to 64 – from 23.8% in 2000 to 49.9% w 2050 (according to OECD figures). The distributive type of pension system (PAYG, or “pay as you go”), popular until recently, based on the principle of solidarity between generations, is not able to withstand the unfavorable demographic changes now taking place. A capital-based system is resistant to these changes to a large extent. This makes it necessary to reform pensions systems which are based too much on inter-generation solidarity. Reforms usually move in the direction of a mixed distributive and capital system. A compromise solution is usually a three-pillar system. Such a system has been in place in Poland since 1999, as well as in other countries of Central and Eastern Europe which have recently become members of the European Union. The universal and obligatory nature of participation in a three-pillar pensions system usually applies to the first two pillars: the first of a distributive nature, and the second capital-based. It should be noted that obligatory membership of a pension fund is the most important new feature in the reformed pensions provision system in most Central and Eastern European countries.

The purpose of this paper is to identify and analyze barriers to increased effectiveness of investment by pension funds from the point of view of their members, based on the Polish example. First the pension funds of Central and Eastern Europe will be described, with indication of the differences in the legal and organizational measures according to which funds operate in Poland and in other selected countries. Reference is also made to the pensions systems of Chile and Argentina, since these are the model on which the pension reforms in the post-communist countries were based. Next, an analysis is made of the legal regulations and other factors which may restrict the effectiveness of investment by open pension funds in Poland. Hypotheses that particular factors are barriers to increased effectiveness of investment are verified using analysis of statistical data by quantitative methods: correlation analysis, city-block distance matrix and hierarchical agglomeration methods in order to assess the similarity of funds' investment portfolio structures, and again correlation analysis to investigate the rationality of Poles' choice of pension funds. By

comparing selected Polish legal arrangements with those adopted in other countries of this part of Europe, an attempt is made to determine directions of change aimed at increasing the effectiveness of funds' investment and increasing the level of security for the assets accumulated in the funds.

2. Pension funds in the countries of Central and Eastern Europe

During the last decade of the 20th century, pension funds were created in the countries of Central and Eastern Europe. Although these countries used different legal measures in relation to the organization and functioning of pension funds, by creating a second pensions pillar they followed to a large extent the experience of Latin American countries, particularly the Chilean and Argentine models. In particular the first of these models is often put forward by the OECD and World Bank as a pattern for countries reforming their pensions systems, and has in this context been widely discussed in the literature (Mueller, 1999, Williamson, 2001, Queisser, 1999, Cerda, 2008). It should be noted, however, that while Argentina has retained a distributive pillar, in Chile the whole public pensions system is based on private pension funds, thus the Chilean system is a model for the post-communist countries only in respect of the second pillar – none of these countries has decided to abolish the distributive pillar. The first European country to introduce universal pension fund membership was Hungary (1998), followed by Poland in 1999. Similar steps were taken by Latvia in 2001, Estonia in 2002, Lithuania in 2004, and Slovakia in 2005. Table 1 presents general characteristics of pension funds in selected countries of Central and Eastern Europe.

The largest market for second-pillar pension funds operates in Poland, and the smallest in the Baltic States. The highest percentage of inhabitants participating in the second pillar is in Estonia (38.5%), and the lowest in Lithuania (17.6%). The highest ratio of fund assets to gross domestic product is in Poland (10.9%), and the lowest in Latvia (1.2%). The countries with the most second-pillar pension funds registered at the end of 2006 were Hungary (18) and Poland (15); those with the fewest were Croatia (4) and Estonia (5). The greatest percentage pension contribution paid to the funds is found in Slovakia (9%), and the lowest in Latvia (4%). Differences in the computed indicators for different countries result to a large extent apart from different demographic and economic conditions, from the different times at which pension funds were introduced, as time affects the number of fund members and value of funds' assets, particularly in the early stages.

Table 1. Features of the second-pillar pension funds markets in selected Central and Eastern European countries (2006 figures)

Country	Total fund members (millions)	Total fund members as a percentage of national population (%)	Aggregate value of fund assets (€bn)	Aggregate value of fund assets as a percentage of GDP (%)	Number of pension funds	Pension contribution paid to the second pillar (%)
Bulgaria	2.4	31.2	0.5	2.1	8	5.0
Croatia	1.3	29.5	2.2	7.1	4	5.0
Estonia	0.5	38.5	0.5	3.8	5	6.0
Hungary	2.6	25.7	5.9	6.3	18	8.0
Latvia	0.9	39.1	0.2	1.2	8	4.0
Lithuania	0.6	17.6	0.3	1.3	6	5.5
Poland	12.4	32.5	30.0	10.9	15	7.3
Slovakia	1.1	20.4	0.7	1.5	6	9.0

Source: own calculations based on data from Allianz Global Investors

Because pension funds, in investing their assets on financial markets, incur associated risk, which directly translates into a risk to fund members of loss of their assets, the state may impose an obligation on fund managing entities to make up asset shortfalls resulting from a fund's failure to achieve a guaranteed rate of return (also called the minimum required rate of return). Three solutions are possible in this regard:

- no guaranteed rate of return;
- guaranteed rate of return computed in relation to some reference rate relating to the pension funds market, e.g. the weighted average rate of return for all funds;
- absolute fixed-value guaranteed rate of return.

Among the countries discussed, the first solution applies in Estonia, Lithuania, Latvia and Hungary, the second in Bulgaria, Croatia, Poland, Romania, Slovenia and Slovakia, and the third in the Czech Republic, in relation to non-compulsory pension funds (Borsch, 2007).

Different countries, aiming on one hand to increase the safety of pension fund investments, and on the other to regulate demand for domestic securities, including state debt instruments, impose less or more liberal investment limits. These are presented in Table 2.

Table 2. Investment limits for compulsory pension funds in selected countries of Central and Eastern Europe and in Chile and Argentina

Country	Treasury papers	Bank deposits	Company bonds	Shares	Investment fund units	Foreign investments
Bulgaria	min. 50	No limits	No limits	20	15	15
Croatia	min. 50	5	30	30	30	15
Estonia	35	35	No limits	50	No limits	No limits for EFTA/CEFTA countries
Hungary	No limits	No limits	30	50	50	30
Latvia	No limits	No limits	20	30	No limits	No limits for EFTA/CEFTA countries
Poland	No limits	20	40 publicly traded 10 other	40	15 open 10 closed	5
Romania	70	No limits	No limits	50	No limits	Data not available
Slovakia	min. 30	No limits	No limits	80	No limits	70
Slovenia	No limits	30	No limits	30	30	No limits for OECD countries

Source: based on Erdos M., *For good investment regulations. The CEE experience*, Nagy, Fater, 2006; Dybał M., *Indywidualne, kapitałowe fundusze emerytalne na świecie* in: "Rynek kapitałowy. Skuteczne inwestowanie. Część 1", Tarczyński W. (ed.), Wydawnictwo Naukowe Uniwersytetu Szczecińskiego, Szczecin 2007, pp. 433–443; Allianz Global Investors, *Central and Eastern European Pensions 2007*.

Poland is the country with the greatest degree of restriction on the possible investment of fund assets abroad. This must be regarded as a significant restriction on the ability to take advantage of geographical diversification in the investment portfolio. This limit may thus be a significant barrier to increased effectiveness of investment by open pension funds, especially at a time of downturn on the Warsaw Stock Exchange, and in a situation where stock market capitalization is low in comparison with the value of pension funds' assets. Bulgaria, Croatia and Slovakia have set lower limits on pension funds' investments in treasury papers, which should be seen as having the aim of obliging funds, and consequently their members, to finance the public budget deficit. Comparing Poland with Chile and Argentina, which are also classed as emerging markets, we note that the Latin American countries also apply more liberal regulations on the investment activity of pension funds, with is undoubtedly associated with the fact that funds have been operating for much longer there (since 1981 in Chile and 1994 in Argentina). Both countries have introduced, for example, upper limits on investment in treasury papers (50% of assets), while the post-communist countries do not have limits for those financial instruments (as in Poland) or apply lower limits (e.g. Croatia, Estonia). Limits on investments in shares are at a similar level in those countries and in Poland. However

limits on foreign investments, set at 30% of assets in Chile and 10% in Argentina (Iglesias, 2004), are higher than in Poland (5%).

Different countries of Central and Eastern Europe also have different systems of remuneration for pension fund companies, these being based chiefly on two types of payments: a levy on contributions, and a levy for asset management. The second may have two components: the first calculated on the value of the assets of the managed fund, and the second depending on the investment results attained. The highest levy on contributions applies in Lithuania (10%), where the levy on managed assets is 1% annually. The lowest is in Croatia (0.8%), where the levy on managed assets is 0.95% annually and may be increased by a “success fee” of not more than 25% of the profits made by the fund. In Bulgaria the levy on contributions is a maximum of 5%, and that for management 1% of the value of assets annually (according to data from *Central and Eastern European Pensions 2007*, Allianz Global Investors). In Poland the fee charged on contributions is 7%, and the payment for managed assets is as follows: the first (basic) component may not exceed 0.045% of the value of assets, whereas the second (variable) component, dependent on results, is limited to 0.005% of the value of net assets in a month, and this sum for the variable component may be charged only by a fund which achieved the highest rate of return in a given period. The variable component of the management fee is not charged by the fund which had the lowest rate of return in a given period. Of these examples, the solution giving funds the greatest motivation to manage their assets most effectively would seem to be that applied in Croatia.

3. Barriers to increased investment effectiveness

An objective measure of the effectiveness of investment by a pension fund is the real rate of return, which can be defined as the relative increment of assets on a fund member’s account caused by the investment results achieved, adjusted by the fees charged by the pension fund company. A fundamental question to be asked when analyzing the investment effectiveness of pension funds relates to barriers, which firstly have a negative effect on funds’ rate of return, and secondly deter lowering of the fees charged by the fund companies. These barriers may be of different types: legal, social, economic. By studying legal and organizational regulations relating to the functioning of open pension funds, and analyzing funds’ investment activity and Poles’ decisions on their choice of fund, the following barriers to increased effectiveness of investment by open pension funds have been identified:

1. The system of remuneration for pension fund companies
2. The minimum required rate of return mechanism

3. The structure of investment limits, and absence of subfunds
4. Irrational selection of funds by Poles

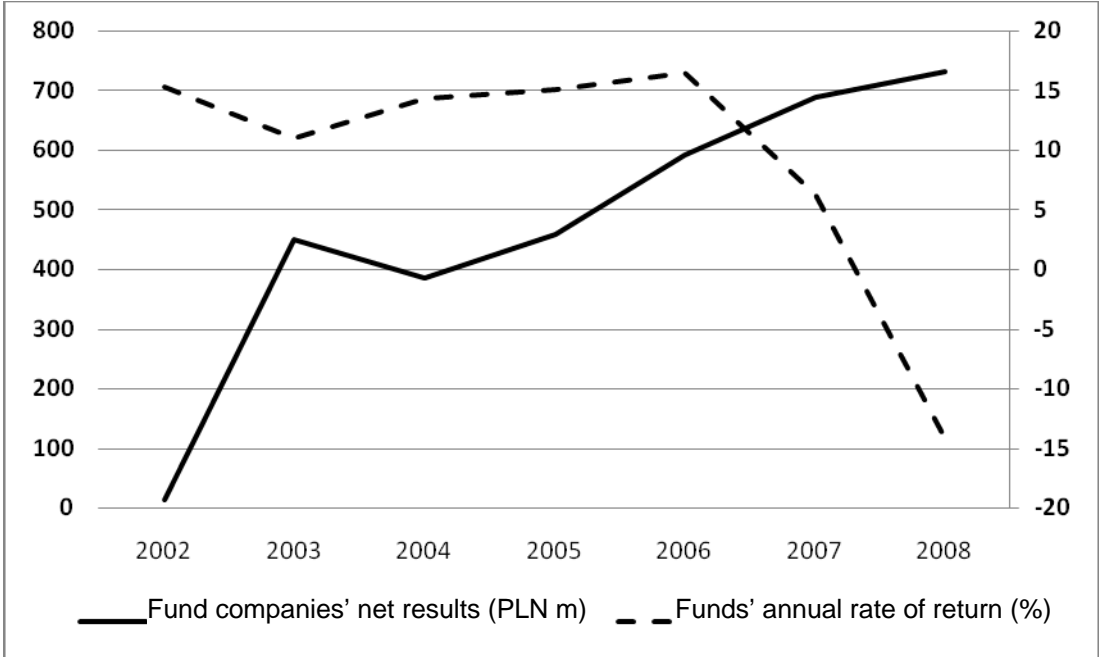
These barriers to increased effectiveness of investment by pension funds in Poland are discussed separately below.

3.1. The system of remuneration for pension fund companies

Pension fund companies obtain remuneration for their management of funds primarily in the form of two fees: a distribution fee and a management fee. All companies managing second-pillar pension funds in the Polish system have set the rate charged on contributions and the management fee at the maximum legally permitted level (the only exception is OFE Allianz, which has set the rate on contributions at a slightly lower level than the other fund companies). Pension funds therefore do not compete with each other on the basis of the level of fees charged, which represent the price of membership of a fund. The system of remuneration for pension fund companies does not motivate them to invest the accumulated assets as effectively as possible, since the results attained directly affect only the variable part of the management fee. Other charges, i.e. the levy on contributions, which is the clearly dominant source of the companies' revenue (more than 60%), and the fixed part of the management fee (more than 25%), are dependent on the size of the fund, measured by the number of members and the value of its assets. A fund's assets, particularly at the early stages, can be increased most easily by increasing the number of fund members. This means that the greatest contribution to pension fund companies' costs comes from selling and advertising (over 30%). As time passes and the value of a fund's assets grows, leading to an increase in potential investment profits, the share of revenue coming from management fees will probably increase relative to revenue from levies on contributions, which will make it worthwhile to invest the savings of future pensioners more and more effectively, although still the factor directly determining a fund company's revenue will be the value of assets, and not the investment results attained. In comparison with, for example, the system of remuneration for pension fund companies in Croatia, the Polish solution has little flexibility. Even though in 2008 the average weighted rate of return for open pension funds was negative (-14.2%), the net profit of all the fund management companies rose compared with 2007 (from 688.1m PLN to 730.9m PLN, i.e. by 6.2% in terms of face value). This means that the downturn on the financial markets was felt only by the fund members, and not by the

companies managing the funds. There is too weak a link between pension funds' results and the results of the companies managing them (see Figure 1).

Figure 1. Results of Polish open pension funds and of the companies managing them



Source: based on data from the Financial Supervisory Commission

Considering that membership of an open pension fund is obligatory, this system of remuneration seems unjust, since citizens are compelled to save in pension funds which generate profits for the companies managing them even though their assets may lose value. At a time of financial crisis, when funds are reporting negative results, this is the strongest argument put forward by supporters of greater liberalization of pensions system through abolition of compulsory membership of a pension fund. The proposed changes in Polish law, intended to limit the levy on contributions to 3.5% from the year 2010 and to establish an upper limit on the management fee, will certainly increase the amount of assets allocated, but will leave the system of remuneration for pension fund companies insufficiently linked to the funds' results. And with the introduction of an upper limit on the management fee, large funds (with assets in excess of 45bn PLN, this being the sum above which the management fee will not be incremented) will earn no premium for further multiplication of their assets.

3.2. The minimum required rate of return mechanism

3.2.1. Legal regulations

The Polish system includes a guaranteed rate of return for a fund (called the minimum required rate of return), determined in relation to a reference rate, this being the weighted average rate of return achieved by all funds. This guaranteed rate aims above all to protect the capital of fund members, since the assets of funds having significantly lower rates of return are required to be supplemented with assets from the companies managing them. It should be noted, however, that it has been very rare for any fund to fail to attain the minimum required rate of return. However this mechanism has a significant defect – it means that funds implement very similar investment strategies. Because the market for open pension funds, which at the end of 2008 comprised 14 companies, is strongly dominated by the three largest, which control more than 60% of the market measured in terms of asset value, it can be hypothesized that the others strive to achieve similar rates of return. In this way they minimize the risk of falling a long way behind the weighted average market rate of return, whose value is dependent chiefly on the largest funds (the weights used to calculate the market average rate of return are proportional to the funds' assets values). Smaller funds achieve this goal by making their investment portfolios similar to those of the largest funds. Attention has been drawn previously to the defectiveness of the minimum required rate of return mechanism (Góra, 2003; Jajuga, Ronka-Chmielowiec, Kuziak, Wojtasik, 2004; Dybał, 2008)

3.2.2. Analysis of similarity in the structure of open pension funds' portfolios

In order to test the above hypothesis, the author carried out research, in which he made an analysis of the similarity of structure between the investment portfolio of funds in the years 2003–2006 (as at the end of the second quarter), characterizing the investigated funds in two ways:

- firstly the general structure of funds' investment portfolios was determined, broken down into National Investment Fund shares, shares in companies listed on a regulated market, treasury bills, bank deposits and bank securities, bonds, and other investments (total 6 categories);
- secondly the shares contained in the funds' portfolios were broken down by sector: banks, insurance, finance, construction, chemicals, timber, electronics, light industry, building materials, metals, food, other industry, trade, IT, media, telecommunications, and other services (total 17 categories).

For each fund, a calculation was made of the percentage contribution of particular types of investment to the portfolio, and then city-block or Manhattan distance matrices between funds were constructed, as well as a correlation matrix, these being measures of the similarity of objects (Aldenderfer, Blashfield, 1984). In order to identify the funds least and most similar to the others in terms of investment portfolio structure, one of the methodologies of cluster analysis was used – hierarchical agglomeration methods – and hierarchical trees were constructed. The procedure of applying hierarchical agglomeration methods is as follows (Sneath, Sokal 1973; Aldenderfer, Blashfield, 1984, Nowak, 1990, Gatnar, 1998):

1. Create clusters each consisting of one of the investigated objects.
2. Based on the matrices of distances between clusters, find the two most similar objects (those for which the distance is least).
3. Combine the objects selected at step 2 into a single cluster.
4. Calculate the distance between the new cluster and all others, and create a new distance matrix.
5. Repeat steps 2–4 until a single cluster remains, containing all the objects.

In the grouping process an average linkage technique was used, also called the group average method, where the distance between two clusters is equal to the average distance between all pairs of objects belonging to those clusters.

In conclusion it was found that the values of this distance decreased significantly over the analyzed period. This means that at this time the general structures of open pension funds' portfolios were becoming increasingly similar. This similarity was very significant, as is shown at least by the fact that the values of the correlation coefficients were close to unity in all of the analyzed periods. In all of the correlation matrices constructed for the general investment portfolio structures, the correlation coefficients were statistically significant at a very low significance threshold ($\alpha = 0.001$). The high similarity of portfolios is also demonstrated by the average city-block distance per distinguished category of investments. In June 2003 the average difference between the contribution of a given type of financial instrument to the pension funds' investment portfolio was 2.43 percentage points, while in June 2006 it was already only half that value (1.22 percentage points). The situation was similar regarding the breakdown in shares in the portfolios. Here as well, the investigated objects became more and more similar over the analyzed period. The minimum value of the correlation coefficient in June 2006 was 0.6355 (significant at a significance level of $\alpha = 0.006$), the maximum value being 0.9873. The average city-block distance in the distance matrix per category of investments in June 2003 was 0.0295, while in June 2006 it was

0.0193. This last value means that the average difference in the percentage contribution of shares in companies from a given sector to the investment portfolios of two open pension funds was 1.93 percentage points, which demonstrates the high similarity of those portfolios in terms of shares from various sectors of the economy. Analysis of hierarchical trees showed that both in terms of the general structure of investment portfolios and the structure of the shares contained in them, in the process of agglomeration it is the largest funds which can be distinguished as most rapidly forming clusters. However among the funds which form clusters in the last iterations of the agglomeration process, it is the small funds that appear most often. This means that most funds are making their investment portfolios similar to the portfolios of the largest open pension funds, while it is the smallest funds which deviate from the others to the greatest extent. Similar analysis for the years 2007–2008 leads to the conclusion that at the initial phase of the financial market downturn, the pension funds began to implement somewhat more different investment strategies. However over time their portfolios again started becoming more similar.

3.2.3. Investment limits

The investment limits which govern the investment policy of the Polish open pension funds require those funds to engage significant amounts of the assets entrusted to them in treasury debt papers. On one hand the funds' assets are invested in bonds which help finance the state budget deficit, while on the other hand pension contributions are paid to the open funds on a pre-tax basis, meaning that income tax will be paid on benefits received in the future. The state, in forcing funds to invest significantly in its own debt papers, may in certain situations, particularly during stock market downturns, be reducing its own future tax revenue. It should be noted that open pension funds can invest a maximum of 40% of the assets entrusted to them in exchange-listed companies, although there are no limits for bonds, bills and other securities issued by the state treasury or central bank. The limit for investment in foreign securities is 5% of the assets of a fund, which should also be recognized as a significant barrier to increased effectiveness in open pension funds' investment, in particular at times of downturn on the Warsaw Stock Exchange, and in a situation where the stock market's capitalization is low compared to the value of the pension funds' assets. As has already been noted (see Table 2), the investment limits, particularly those relating to foreign investments, are among the least liberal among the post-communist countries. The inability to increase the geographic diversification of the investment portfolio, particularly at a time of financial crisis, is a significant barrier to the reduction of funds' investment risk, particularly since Poland is

an emerging market, and the Warsaw Stock Exchange reacts very much to falls on the exchange markets of other countries of this part of Europe, which has an adverse effect on funds' investment results. The ability of funds to engage more of their capital in the financial markets of developed countries might reduce this effect. While stock market indexes in Central and Eastern Europe are falling, in other parts of the world they may be falling more slowly or even rising. This would seem to be a sufficient argument, particularly at a time of financial crisis, for increasing the limit on foreign investment by Polish pension funds from 5% to at least 10%–15%. This process will very likely be speeded up, since in April 2009 the European Commission brought a case against Poland at the European Court of Justice, asserting that the restrictions to which Polish open pension funds are subject in the area of investment in other countries of the European Union are in breach of the rules on free movement of capital.

Investment limits on one hand restrict pension funds' investment possibilities, while on the other they aim to protect the capital accumulated on the second-pillar pension accounts. However, taking into account the differing levels of acceptable risk depending on age, subfunds of pension funds should be introduced as rapidly as possible. Then, with increasing age, open pension fund members would have their savings invested in financial instruments which carry less and less risk. This has not yet been successfully implemented in Poland, and consequently the first people to receive payments from open pension funds, in 2009, saw their assets decrease in value by 10–20% in 2008 as a result of the financial crisis, just before they drew their pension. The pension funds then had more than 30% of their assets in shares. Had the pension reforms in Poland been completed sooner, and funds with differentiated levels of risk been introduced, that scenario could have been avoided, or at least the negative effects of the stock market downturn could have been minimized for the oldest section of the population. The continued lack of such subfunds must be seen as a significant barrier, not so much to the growth of periodic rates of return from open pension funds, as to protection of the capital accumulated.

3.2.4. Irrational choice of funds by Poles

The reformed pensions system in the countries of Central and Eastern Europe involves society in compulsory pensions provision not only through the obligation to pay contributions, but also by enabling people to make a completely free choice of pension fund under the second pillar. This means that the public are able to influence those entities, at least by forcing them to compete in selected areas of their activity. Naturally the most desirable behavior of pension

fund customers would be such as to motivate the funds to compete for customers in the marketplace through their investment results – it is these results on which the amount of future pension benefits primarily depends. We can consider two sorts of choice of open pension fund: there are the choices people made for the first time, when starting work, and choices involving a later switch to a different open pension fund.

The choice of fund ought to be based on certain economic criteria, which are primarily measures of the effectiveness of the investment activity of each fund, the fees charged and the position of funds in the market. According to the two-period life-cycle model described in Bailliu, Reisen (1997), at the first stage, corresponding to the period of professional activity, a certain proportion of one's earnings are saved for old age, with the objective of obtaining a pension. The second stage is the period during which the pension is drawn. During the first of these stages we determine the amount of our income in the second stage. That income during old age depends on the amount saved during our working life, as well as on how effectively it has been multiplied, for example in a pension fund. That effectiveness, as has already been mentioned, is measured by a fund's real rate of return, which depends primarily on its investment results and the amount of fees charged. These should be the main criteria for selection of an open pension fund. Account may also be taken of the size of a fund, measured by its assets or number of members, which on one hand is a measure of its market position, and on the other may be identified with a feeling of security – a large fund may seem more credible, since it has more assets and more people have chosen it. Figures referring to the aforementioned measures are publicly available and apparently easily interpretable, meaning that specialist knowledge is not required to understand them. If we assume this to be the case, it can be expected that the choice of fund should be made above all based on information about the measures mentioned, which characterize the open pension funds. In order to test this hypothesis, the author performed the analysis described below.

Correlation analysis was used to investigate the relation between the number of members of a fund and the number of people joining it on one hand, and the following properties on the other: the fund's rate of return, its size measured by value of assets and number of members (in this case, for obvious reasons, only the correlation between number of members and number joining was investigated), and also fund companies' expenditure on marketing and selling activity. The data used came from the years 2002–2007. The factor based on the charges collected by the funds was omitted, since it has a quite negligible effect on the choice of fund in Poland at present, as this is not a factor which differentiates the open pension funds. An overall conclusion was reached that there is no link between the selected

measures characterizing the funds – including the rate of return, which is the basic criterion for their evaluation – and the number of members of those funds or the number joining them in subsequent analyzed periods. It was also noticed that there is a significant positive correlation between the amount of pension fund companies' expenditure on selling and marketing activity and the number of people choosing a given fund (see also Chybalski, 2003, Chybalski, 2006). In conclusion to this part of the research, it has to be stated that Poles do not choose pension funds rationally, based on objective criteria – including primarily the rate of return achieved by a fund, which characterizes the effectiveness of its investment – but probably they are influenced by the activities of the companies managing the funds in the field of marketing and selling. It can therefore be assumed that fund members or persons choosing a fund for the first time do not force, or even motivate, open pension funds to compete through their investment activity and results, but allow the fund companies to concentrate on planning and implementing the most effective sales strategies. It is hard to regard Poles' pension fund choices as rational due to income and time restrictions, as the problem of obtaining information is not a significant one in the case of the open pension funds market – that information is publicly available. A choice of fund which depends on its advertising and selling policy cannot be considered rational from the individual's point of view, since in that way the fund probably influences a person's decision without that person being aware of it. The choice is therefore made without awareness, and is thus irrational. The only standpoint from which it might be possible to regard the choice of open pension fund as rational is based on intellectual limitations, connected with a lack of sufficient knowledge enabling analysis of the measures characterizing the funds, or with a lack of sufficient prudence in the field of insurance, which seems to be more probable and to result from habits left over from the old pensions system, where everyone was insured under the first pillar only and the contributions were paid in full by the employer. The feeling of belonging to a pension system was much smaller. The reform thus placed society in a totally new situation, where every individual took on joint responsibility for his or her future pension benefits. We can therefore speak of a watershed period, as described by G. S. Becker in *Economic Theory of Human Behavior* (Becker, 1990), since the societies of post-communist countries going through the transformation process were forced to make choices, which is a measure of social freedom, but also of responsibility, in this case for the provision of financial security for one's own old age. However this requires certain knowledge, prudence or a sense of responsibility, which may be a significant limitation on the making of rational choices of fund, and thus is a

social barrier to increased effectiveness of investment by open pension funds. Similar problem was also observed in Latin America, for example in Argentina (see Arza, 2008).

It can be assumed that, sooner or later, the new system will engender in society the aforementioned prudence regarding insurance and feeling of joint responsibility, most probably as a result of the disappointment experienced by the first pensioners to receive benefits from the new system.

4. Summary

The most important thing is the effectiveness of the pension funds from the standpoint of their members. On the other hand, we cannot negate another purpose for which the fund management companies exist, namely their profit. An optimum solution, then, is to create a system of remuneration for pension fund companies which will motivate them to invest the assets of their managed funds as effectively as possible. In Poland at present, the companies' main source of revenue is the levy on contributions, which is not in any way dependent on the fund's investment results. It makes up more than 60% of the companies' revenue for management of the funds. Revenue from fees for asset management, which depend to a greater extent on the value of the fund's assets, but less on their investment results, make up more than 30% of the companies' revenue. It would seem that the system of remuneration for pension fund companies is the most significant barrier to increased effectiveness of investment by their managed funds. Another barrier of a legal nature, namely the minimum required rate of return mechanism, means that funds try to avoid shortfalls of assets – which would have to be made up by the company managing the fund – by adopting similar investment strategies. This is reflected in the structure of the funds' investment portfolios. However it must also be admitted that the minimum required rate of return mechanism provides a certain indirect guarantee of a minimum pension from the open fund, expressed not as an absolute value, but in relation to the overall market of funds. Also not without importance are the investment limits for pension funds, which are less liberal than those of other countries of the region, particularly with regard to foreign investments. At a time of stock market falls in the emerging economies, the Polish pension funds have very limited scope for geographical diversification of their investment portfolios. The absence of subfunds, which would reflect in their portfolio structure the different levels of aversion to risk depending on fund members' age, means that there is no mechanism for protecting the pension capital of older people approaching retirement age.

Also very important is the barrier of a social nature, whereby Poles choose pension funds in an irrational way. The rate of return, which should be the basic criterion for evaluation of a pension fund, is not used at all as a basis for choice of fund. A significant positive correlation is nonetheless noted between the number of members of a fund or number joining the fund, and the expenditure of the fund management company on selling activity and advertising. This means that Polish society is very susceptible to the influence of salespeople and the marketing operations of fund companies.

Open pension fund management companies take full advantage of a situation where there are numerous barriers to their increased effectiveness, and instead of striving to invest pensions assets in the most effective way possible, strive to maximize their own profits; and in the light of the Polish regulations and Poles' irrational way of choosing pension funds, this can most easily be achieved through an effective selling and marketing policy. There is an absence of factors which would stimulate increased competition in the pension funds market based on investment policy adopted and results achieved. Action to amend the laws governing the activity of open pension funds, including the creation of subfunds, combined with social education on the subject of capital pensions provision, would seem to be essential in this situation. Competition in the pension funds market is key to increasing the effectiveness of investment by those funds. And this effectiveness should be linked as much as possible to the pension fund companies' remuneration. Then there will be a chance to achieve convergence between the interests of fund members and those of the companies managing the funds.

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