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Research Article

POLISH PENSION SYSTEM IN TRANSITION: IMPACT ON THE INVESTMENT PORTFOLIO CONSTRUCTION

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ABSTRACT
The pension system reform in Poland was introduced in 1999. The new pension scheme combines two mandatory pillars: pay-as-you-go pillar and fully funded one, together with the third, voluntary funded pillar. In recent years the Polish government has been introducing several changes not only concerning the retirement age but also changed the contribution of earnings that is saved in both mandatory pillars, as well as the scheme of investments in mandatory funded pillar .The aim of our research is to analyze results of the changes introduced in the year 2013 to the pension funds' portfolio composition, especially - prohibition of investing in debt securities issued and/or guaranteed by the State Treasury.

***Keywords**: Pension System, PAYG, Pension Funds', Portfolio Composition*

INTRODUCTION
Population ageing in the majority of OECD countries, caused by the rise in life expectancy and declining fertility rates, leads to much higher numbers of pensioners than currently. Such situation requires reforms of pension systems to make pension systems more financially sustainable, and it has been high on the agenda of many governments for a decade. Although the recent economic crisis has heightened the pressure for decisive action, it is important to consider long-term scenarios rather than short-term views. By now it is widely accepted in most countries that pension systems and rules need to be changed over time, although these changes vary from country to country.

There are six pension reform key objectives (Pension at a Glance 2013, p. 18):

1. Pension system coverage in both mandatory and voluntary schemes.
2. Adequacy of retirement benefits.
3. The financial sustainability and affordability of pension promises to taxpayers and contributors.
4. Incentives that encourage people to work for longer parts of their lifetimes and to save more while in employment.
5. Administrative efficiency to minimize pension system running costs.
6. The diversification of retirement income sources across providers (public and private), the three pillars (public, industry-wide and personal), and financing forms (pay-as-you-go and funded).

Ensuring coverage of employees through one or more pension plans is fundamental to fighting income poverty in old age. All OECD countries have set up mandatory or quasi-mandatory pension plans, either public or private, to achieve quasi-universal coverage. However, mostly in low-income countries, there is still a significant share of society not covered by public or national schemes.

Policies to diversify and secure savings have taken four main forms (Pensionat a Glance 2013, p. 25):

1. Voluntary pension plans to improve investment options for workers and increase competition among funds. Canada, the Czech and Slovak Republics, Poland and the United Kingdom have introduced such schemes.
2. Regulations that allow individuals greater choice over the way their retirement savings are invested in private plans. Canada, Estonia, Hungary, Israel, Mexico and Poland, for example, have adopted this policy, supported by measures to move people automatically into less risky investments as they get closer to retirement, a policy recommended in earlier OECD analysis.
3. The relaxing of restrictions on investment options to foster greater diversification of pension funds' portfolios. Chile, Finland, Switzerland and Turkey have followed this path, with Chile and the

Slovak Republic allowing pension funds to take larger shares in foreign investments in order to hedge the risk of national default.

4. Action to improve pension funds' solvency rates. Canada, Chile, Estonia and Ireland have introduced stricter rules on investment in risky assets in order to protect pension plans' members more effectively. In Canada and Ireland, state direct intervention has helped financially insolvent funds to recoup losses in their asset values caused by the financial crisis. Finally, Finland and the Netherlands temporarily relaxed solvency rules to allow funds a longer time to recover.

The age at which workers can retire is the most often discussed component of a pension system. It is connected with the fact that people have come to live longer thus it is necessary to heighten the pension age, and to adjust women's retirement age upwards in line with men's age. In fact, recently, many OECD countries have done precisely that, especially that itrequires only administrative decision thus it is the easiest element of the pension scheme to change. As a consequence, the majority of OECD countries will have a retirement age of at least 67 years by the middle of this century.

The high costs of administering private pension plans that are passed on to members have been a policy concern for many OECD countries in recent years, especially in the states where systems are mandatory or quasi-mandatory. However, administrative efficiency is also a policy priority in voluntary plans. High fees discourage workers from joining voluntary plans and make mandatory ones very costly. In fact, cost inefficiencies are a threat to the sustainability and suitability of plans themselves.

The main reform of the pension system was introduced in Poland in 1999. The new system consisted of three pillars, two mandatory ones: pay-as-you-go (PAYG) pillar and fully funded pillar (pension funds), and the third one - voluntary, funded pillar. In recent years the Polish government has been introducing several changes not only concerning the retirement age but also changed the contribution of earnings that is saved in both mandatory pillars, as well as the scheme of investments in mandatory funded pillar. The aim of our research is to analyze results of the introduced in the year 2013 changes in the pension funds' portfolio composition, especially prohibition of investing in debt securities issued and guaranteed by the State Treasury

Reform of the pension system in Poland

Reform of the pension system in Poland, which took place in 1999, was a symptom of new and complex thinking about social policy and economy as integrity instead of treating them as opposite issues. There were two important changes of the system. The first one consisted in adding funded scheme to the mandatory system, while the second - in replacement of defined benefit system by defined contribution system. In the former the benefit is an ex ante known proportion of wage received before retirement. In the latter pension consists of individual stock of saving divided by one's remaining lifetime. In order to implement the defined contribution scheme, the legislation specified so called "initial capital" which was computed for all individuals based on individual employment tenure, with algorithms differentiated across genders and education levels. Of course there were no savings in Social Security Fund (ZUS) but this calculation permitted to evaluate pensions for the cohorts who were born too early to participate in the new pension system. Individuals who collected pensions in 1999 and being less than 10 years ahead of the official retirement age were exempt from the new system (Hagemejer et al., 2013).

The new scheme was based on a system of notional accounts. People under 30 (born in 1969 and after) at the time of the reform had also to participate in the funded scheme; people aged 30-50 (born between 1949 and 1968) could choose the funded option. However, the choice had to be made in 1999 and it was irrevocable, with the exception of those who could retire early.

The original reform replaced the one-pillar – pay as you go system (PAYG), by the three-pillars funded system, basing on the general rule that expected discounted sum of withdrawals from the system equals discounted sum of payments enlarged by the return from the capital. Such system was to provide pensioners incomes adequate to the level of wages, which they had been obtained during their activity on the labor market. This program for pension system reform was called by its authors "Security through Diversity"(Security 1997).

Under the system introduced in 1999, pension benefits consist of three pillars. The first and second pillars are universal and mandatory, and the third one voluntary. The first pillar remained to be pay-as-you-go financed, whereas the second and third pillars are to base on funded. In fact PAYG system was downsized and converted to a "notional defined-contribution" system, forming the new first pillar. In both the first and the second, funded pillar, contributions are registered in individual accounts, and the pension benefit depends on contributions paid, not contributions that were due (Góra and Rutkowski 2000; Hausner, 2002).

The second pillar was to base on Open Pension Funds (OFE) chosen by participants, who are able to change funds with no charge or penalty after a statutory minimum 12 months period of contribution to a fund. Each person can select only one fund. There is free choice between the funds, it means that pension funds are not permitted to refuse entry or restrict the right to transfer to another funds, either directly or indirectly, through the imposition of charges. Pension funds operate alike other open mutual funds. However they effectiveness is evaluated due to the average return of all pension funds.

A contribution of 12.22% of earnings (or 19.52% for workers born between 1949 and 1968 who do not choose funded tier) was credited to individuals' notional accounts, while 7.3% of earnings were to be transferred to the pension funds, which created the second mandatory pillar. The ceiling to contributions and pensionable earnings is set at 2.5 times average monthly earnings projected for a given year in the state budget law.

The minimum pension age has been 65 for men and 60 for women. From 1 January 2013 the retirement age started to increase by a month in January, May and September each year until it reaches 67 for both sexes (women in 2040, men in 2020). For the minimum pension, 25 and 20 years' contributions are required from men and women, respectively.

Pension benefits are subject to periodic indexation to account for inflation. As from 2008, the pension indexation has been carried out annually, based on the fixed indexation rate. The indexation rate is understood as an average annual index of consumer goods and services in the preceding calendar year, increased by at least 20% of real growth of average monthly earnings in the preceding calendar year. The indexation rate increase is subject to annual negotiations within the framework of the Tripartite Commission for Socio-Economic Issues.

There is a minimum pension under the pay-as-you-go scheme, which is about 25% of average earnings. In the new pension scheme, the minimum retirement guarantee shall be financed by state budget and paid when total mandatory old-age pension is lower than the minimum.

The first manipulation in the original pension reform was made in 2011 when the contribution to pension funds was diminished from 7.3% to 2.3% (Table 1). The remaining 5% has been placed in a special individual sub-account. These amounts is to be valorized by the average annual GDP growth rate (in current prices) of the last five years. The share of contributions allocated in the sub-accounts within the Social Security Fund (ZUS) and in the funded scheme will change until 2017, when it will reach 3.8% and 3.5% respectively. The accumulated capital can be inherited.

Table 1. Pension contribution to the national and funded scheme after manipulation in 2011

Period	Total	Contribution of earnings % National scheme		Funded scheme
		Notional account	Sub-account	Pension funds
To April, 30, 2011	19.52	12.22	-	7.3
May, 1, 2011 – DEC, 31, 2012	19.52	12.22	5.0	2.3
JAN, 1, 2013– DEC, 31, 2013	19.52	12.22	4.5	2.8
JAN, 1, 2014– DEC, 31, 2014	19.52	12.22	4.2	3.1
JAN, 1, 2015 – DEC, 31, 2016	19.52	12.22	4.0	3.3
From JAN, 1, 2017	19.52	12.22	3.8	3.5

Source: Pension at a Glance 2013, p. 315

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The new law, which went into affect in February 2014, shifts 51.5% of the assets, held by the OFEs (about 150 billions PLN, i.e. nearly 50 billions USD) to the state-run PAYG pension system i.e. to the Social Insurance Institution (ZUS), including all debt securities issued and guaranteed by the State Treasury. According to the new regulations, pension funds will be no longer obligatory and each employed person will have four months every four years to decide whether 2.92 percent of their income goes to a chosen private fund or to ZUS. Overhaul of the pension system also concerns changes in the OFEs' investment portfolio since private pension funds will no longer be allowed to invest in government bonds (President 2013). That will leave the pension funds with most of their assets held in shares of companies listed on the Warsaw Stock Exchange and give them an increasingly peripheral role in the future retirement benefits of Poles.

To describe the present situation in Poland key indicators are presented in Table 2. One may notice that average worker earnings in Poland are only 30% of the mean evaluated for all OECD states but public pension spending is relatively high i.e. 50% bigger than in OECD, although population over age 65 is only 21.6% in comparison to 25.5% as average in 34 OECD members.

Table 2. Key indicators

Indicator	Measure	Poland	OECD
Average worker earnings	USD	12,600	42,700
Public pension spending	% of GDP	11.8	7.8
Life expectancy	at birth	76.3	79.9
	at age 65	17.1	19.1
Population over age 65	% of working- age population	21.6	25.5

Source: Pension at a Glance 2013, p. 316

Both changes, which took place in the years 2011 and 2014, have been considered (by the government) necessary to lower Poland's budgetary deficit. Many specialists call these changes "significant step backward" (Bilefsky and Zurawik, 2013), un-privatizing the pension system (Hagemejer, 2013) or even the most drastic nationalization of private assets since Soviet times (Bilefsky and Zurawik, 2013). However Polish Prime Minister Donald Tusk claims "it is no more than a bookkeeping change in the way to handle the public's retirement money" (Bilefsky, Zurawik, 2013).

There is also another aspect of introduced changes since here the question arises how the pension fund reform will affect Polish capital market since the increasing capitalization of pension funds makes them one of the most important institutional investors. It is enough to mention that open pension funds created from 16% to 22% of the Warsaw Stock Exchange turnover among all institutional investors in the years 2005-2010 (Marcinkiewicz, 2011). Smaller contribution to the pension funds will cause the decrease of the investment level. It is also obvious that changes have increased the risk of investing in Poland (Bilefsky, Zurawik, 2013).

Open Pension Funds operating in Poland

Pension funds started to operate in Poland in 1999 creating the second mandatory pillar of the "new" pension system. At the beginning there were 21 OFEs but at the end of 2013 only 13 open pension funds were operating on the Polish market. In the years 1999-2013 number of participants together with value of assets were steadily growing. Due to Polish Financial Supervision Authority in the end of September, 2013 there were more than 163 millions of participants and value of OFEs' assets was bigger than 292 billions PLN. The development of open pension funds in Poland is presented on Figure 1.

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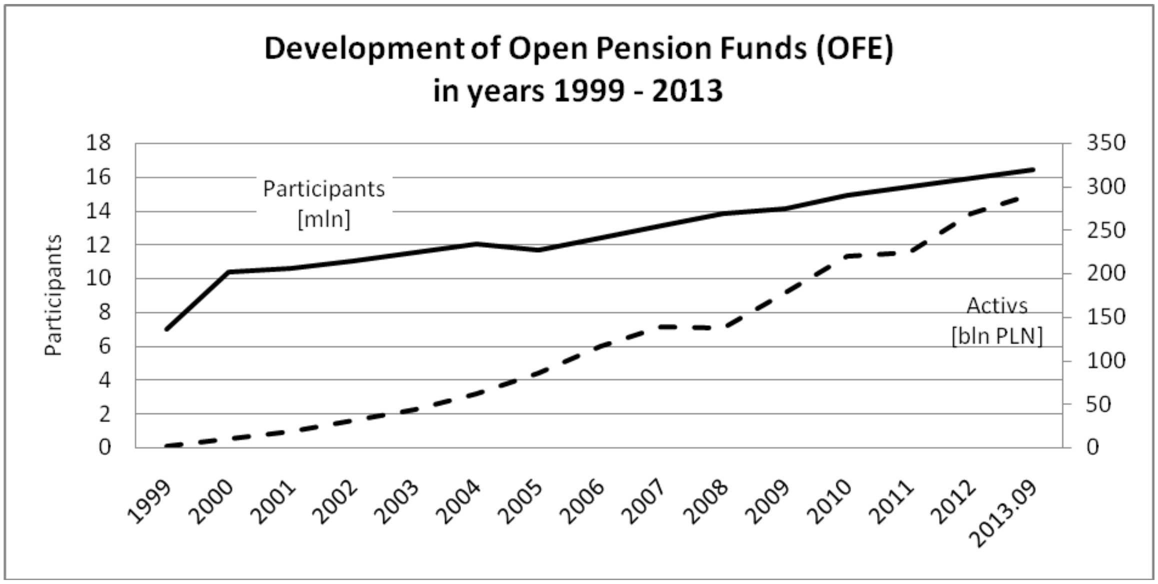

Figure 1. Development of Open Pension Funds in Poland in years 1999 - 2013
Source: own elaboration; data: Polish Financial Supervision Authority

Not only management of the fund determines the performance of the investment portfolio but also by the situation on the market. The period 1999-2013 was characterized by different economic and financial situation in Poland. Thus we may distinguish bull and bear markets at the Warsaw Stock Exchange that affect returns from investment. Figure 2 contains comparison of rates of return generated by bonds, shares and OFE in investigated years. Rates of return from debt instruments are established as average of reference interest rate weighted by the period when it was obligatory[1], and returns from the equity market were established as value of stock index WIG[2].

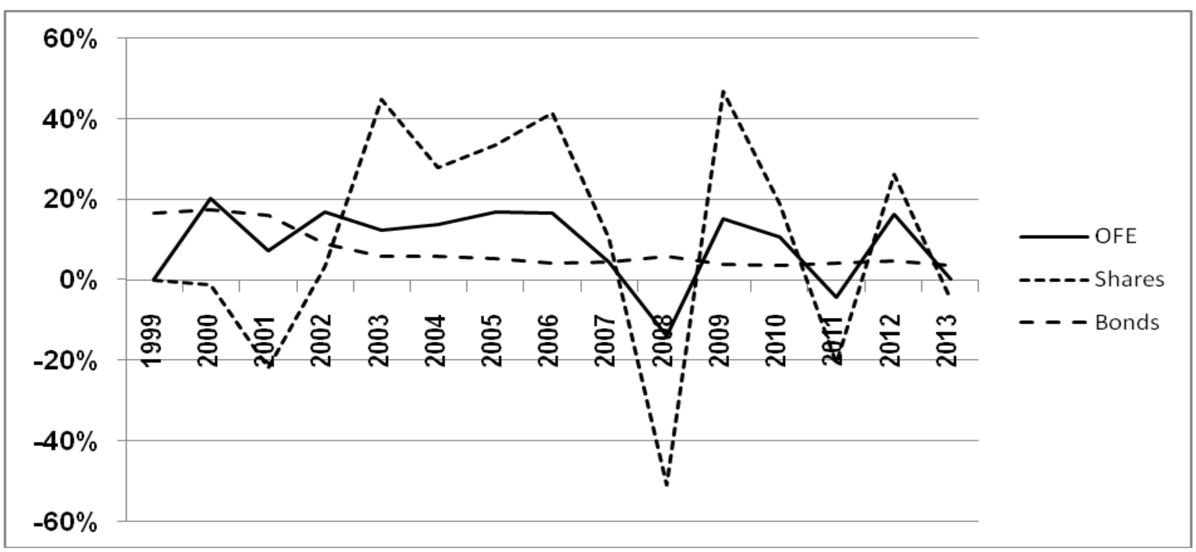

Figure 2. The rate of return of bonds, stocks and Open Pension Fund in years 1999-2013
Source: own calculations; data source: Polish Financial Supervision Authority, Warsaw Stock Exchange

[1]Por.:*Liquidityin the banking sector. NBP monetary policy instruments*, (in Polish), NBP web service, www.nbp.pl/publikacje/operacje_or/2012/raport2012.pdf
[2] Por.:*Basic statistics of WSE,* (in Polish),WSEweb service, www.gpw.pl/analizy_i_statystyki_pelna_wersja

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Open Pension Funds have been subject to conservative investment restrictions (Pelc, 2010) (investment in derivatives is forbidden, and their foreign investment is restricted to 5% of their assets), therefore their losses were not as great as those of pension funds in other countries, which were much more affected by the subprime crisis and its consequences. But also in Poland some serious problems occurred during the financial crisis. Firstly, Open Pension Funds lost a major part of the profits earned for their members before the crisis. Secondly, slower GDP growth caused the increase of the public deficit and the public debenture in relation to GDP. As a result, Poland is no longer in line with the Maastricht criteria.

The private funds hold assets worth about $92 billion, i.e. more than one-fifth of Poland’s gross domestic product, and are among the biggest investors on the Warsaw Stock Exchange (Bilefsky and Zurawik 2013). Also,due to high market concentration, there is a lack of price and investment competition between Open Pension Funds, and 2011 the OFEs’ commission equaled 553 millions PLN while wages for management – 981 millions PLN[3]. Such situation created broadly critique of pension funds in Poland. As a result of this critique the Polish government introduced the new pension law. It is estimated that the transfer of 51.5% of OFEs‘ assets will lead to a decrease of public debt in Poland from around 55% GDP to 47% GDP and this is the main short-term purpose of the reform, rather than providing improved financial security for retirees (Mrowiec and Mruk-Zawirski, 2014).

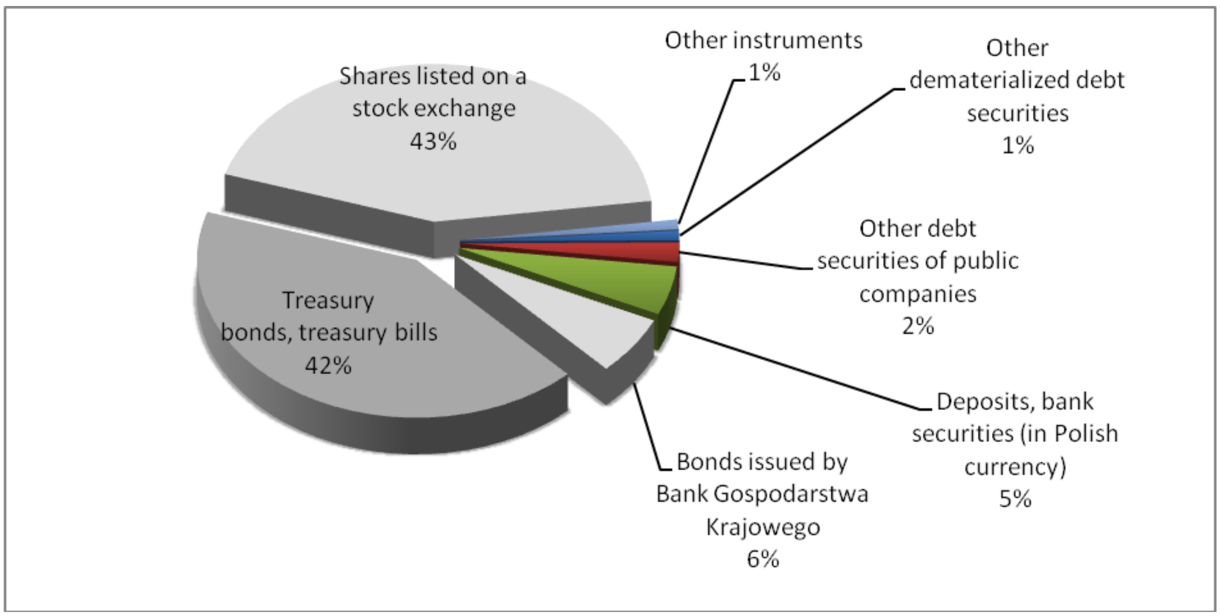

Figure 3. The structure of OFEs portfolio in November 2013
Source: Polish Financial Supervision Authority website

Analysis of the pension funds’ investment structure

The reform will also lead to a change in the composition of assets’ portfolios managed by OFEs not only due to the forced transfer of assets to ZUS but also due to new rules applicable to OFE investment activities. According to Polish Financial Supervision Authority the structure of OFEs portfolio in November 2013 is presented by the chart (Figure 3). As one can notice the shares of treasury bonds and equity instruments in the OFEs’ portfolios were the biggest among all instruments and nearly equal.

In our investigation we try to evaluate the impact of the prohibition of investment in government’s debt by simulate the performance of the portfolios containing treasury bonds and shares. Therefore we construct hypothetical OFE’s portfolios characterized by different structure of shares listed on the

[3] See:Retirement pension 2011? 94 zł monthly. (in Polish), Forbes.pl, 28-03-2012,http://www.forbes.pl/artykuly/sekcje/wydarzenia/emerytura-kapitalowa-2011--94-zl-miesiecznie, 25588,1).

Warsaw Stock Exchange and debt securities issued and guaranteed by the State Treasury (see Table 3). We assumed that the portfolio structure was the same in the whole analyzed period i.e. in the years 1999-2013. We also assumed that superannuation in the first year equaled 5,000PLN and it was rising by 4% annually.

Table 3. Structure of constructed portfolios

Symbol of portfolio	Percentage share of shares listed on the Warsaw Stock Exchange	Percentage share of debt securities issued and/or guaranteed by the State Treasury	Symbol of portfolio	Percentage share of shares listed on the Warsaw Stock Exchange	Percentage share of debt securities issued and/or guaranteed by the State Treasury
100-0	100 %	0 %	40-60	40 %	60 %
90-10	90 %	10 %	30-70	30 %	70 %
80-20	80 %	20 %	20-80	20 %	80 %
70-30	70 %	30 %	10-90	10 %	90 %
60-40	60 %	40 %	0-10	0 %	100 %
50-50	50 %	50 %			

Source: Own elaboration

Simulation of the returns was provided for the whole period of investigation thus it includes different market tendencies observed in Poland. Figures 4 and 5 contain comparisons of simulated results obtained by hypothetical portfolios and OFE.

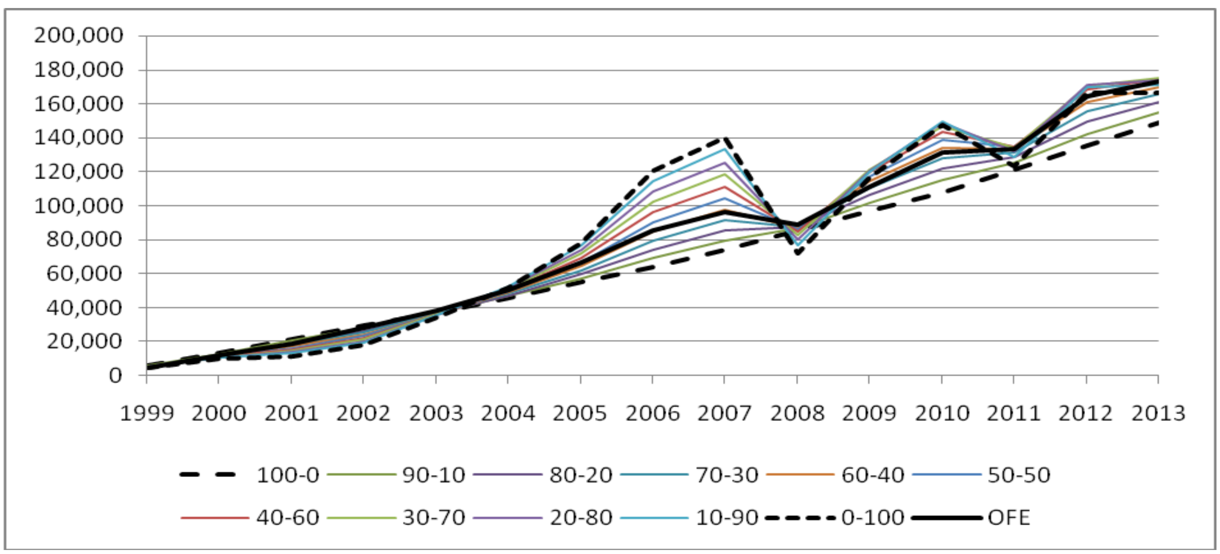

Figure 4. Cumulative return on OFE hypothetical portfolios in years 1999-2013
Source: own calculation

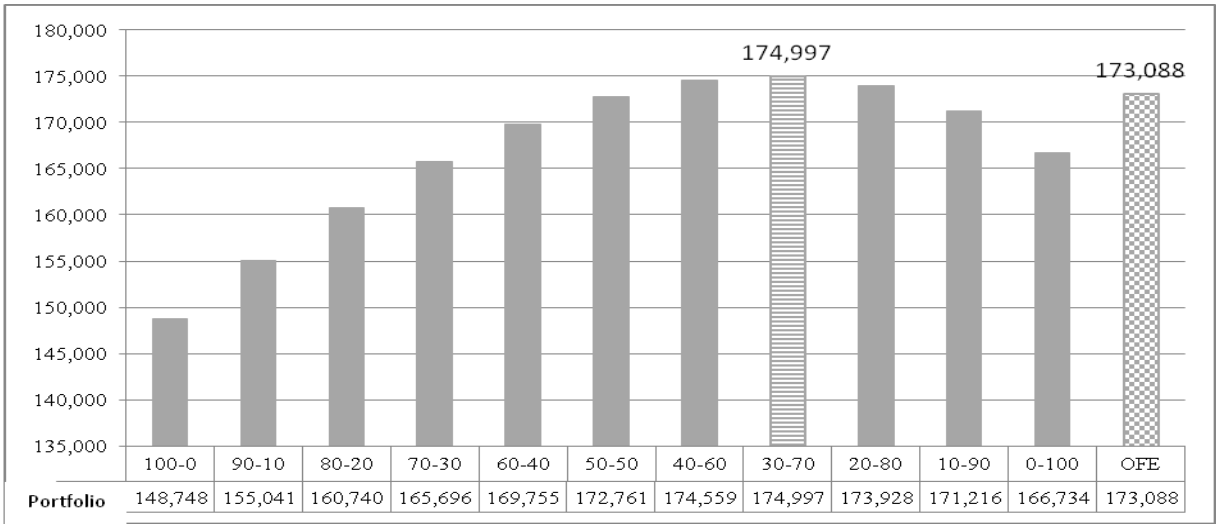

Figure 4. Cumulative return on OFE hypothetical portfolios; investment period 1999-2013
Source: own calculation

Obtained results let us to conclude that neither portfolio containing 100% of debt instruments nor the one including only shares generate the best financial performance. It is also visible that the rates of return from “average” Open Pension Fund are worse than returns from hypothetical portfolios i.e. OFEs could generate better results. The best result is obtained by the portfolio containing 30% of treasury bonds and 70% of shares, and the fund containing 40% of bonds and 60% of equity instru-ments is only slightly worse.

CONCLUSION

Changes in the demographic situation in the majority of European countries require reforms of the retirement systems to adopt it to the current situation. Therefore essential transformations of the pension systems have been introducing in many European states recently. However new reforms introduced in Poland (in the years 2011-2013) seem to be prepared to assure the government wellbeing more than to guarantee pensioners wellbeing. One of the major objectives of the pension system reform is diversification of retirement income sources that was in Poland essentially limited by the new law, which went into affect in February 2014. Thus the aim of our research was to check if changes of the portfolio composition, proposed by the government, could improve the Open Pension Funds Performance. Presented analysis is biased by the assumptions that were made to provide the simulation experiments. Although we use real data, we also assumed that portfolio structure is constant during the whole period of investigation, and the stable increase of superannuation. It is worth mentioning that situation in Poland, observed in the years 1999-2013, was characterized by essential changes thus our simulations cover all types of possible tendencies at capital market and the conclusion from the experiments is worth considering. Therefore taking into account new government regulations and the results of our simulations we state that prohibition of investment in government’s debt by Open Investment Funds in Poland is unacceptable since it causes the increase of risk and decrease of the efficiency of investments made by pension funds. The watchword “Security through Diversity” has been still valid also in construction of OFEs’ portfolios and new government regulation seems to be against future pensioners’ interest.

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